



S.36A

**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

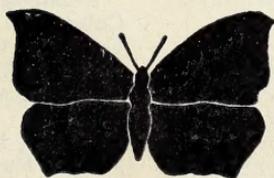
VOLUME 25

1966



Edited by

H. V. DANKS, B.Sc., A.R.C.S., F.R.E.S.



**The Amateur Entomologists' Society
42 Normandy Avenue, Barnet, Herts.**

INDEX

Compiled by D. H. Smith (2864).

CONTRIBUTORS

Badmin, J. S., 31, 36, 67, 135
 Berman, H. J., 33, 69, 106, 138
 Blathwayt, C. S. H., 108
 Bradbury, K., 23
 Brown, A. J., 34
 Brown, I. C. N., 36
 Burton, J. F., 91
 Caiger, H., 61
 Clements, P., 140
 Coles, B., 139
 Cooter, J., 51, 68, 143
 Cribb, P. W., 43, 53
 Danks, H. V., 1, 37, 74, 112
 Danner, J. M., 44
 Dickson, R. J., 60
 Else, G. R., 108
 Emmet, A. M., 81, 114, 119
 Fearnough, T. D., 120
 Felton, J. C., 4, 40, 82, 116
 Finlay, I. S., 72
 Gaydon, A. G., 140
 Goddard, P. A., 90, 118, 126
 Grey, P. R., 19, 134
 Heath, J., 96
 Hilliard, R. D., 7
 Howarth, T. G., 77
 Hughes, M. O., 36, 71
 Hugo, P. D., 108
 Kemp, R. J., 56
 Lewis, K. C., 49, 55, 123
 Lindsley, P., 76
 McLaurin, A. M., 118
 McLeod, L., 140
 Moore, J., 72, 142
 Muggleton, J., 54, 104
 Newton, A. H., 14
 Noyes, J. S., 46
 Ollevant, D., 38, 75
 Payne, R. M., 41, 82
 Pickard, E., 70, 125, 142
 Prior, G., 140
 Robinson, G. S., 93
 Roche, P. J. L., 33, 103
 Sheen, B., 131
 Smith, J. K., 15, 72
 Sorensen, J. T., 23, 50, 99
 Spoczynska, J. O. I., 58, 131
 Thompson, G., 9, 53, 87, 126
 Tisbury, W. J., 122
 Trebilcock, G. D., 47
 Walker, N., 36
 Watkinson, I., 139
 Watt, J. C., 64
 Whitehouse, S. J., 42
 Wilkinson, R. S., 28, 95
 Worling, P. M., 49
 Young, M. R., 48

SUBJECT

Addendum re Rosy Minor and Wormwood Shark, 36
 Advisory Panel, AES, 73
 addition to, 109
Agonum dorsale, Gregarious behaviour of, 53
 A.G.M. 1966, 1, 77
 Annual Exhibition, 1965, 4
 ditto, 1966, 74
 Apparatus:
 'Black light' attractors, American, 24
 Fluorescent 'Blacklight' lamps for collecting insects, 95
 Further remarks on American 'Blacklight' attractors, 93
 Light-trap construction, 58
 Notes on mercury-vapour traps and lamps, 91
 Setting-boards, 3
 Setting needles, 33
 Traps and Lamps, Notes on mercury-vapour, 91
 Articles, Guidance for magazine, 109
 Book Reviews:
 Freshwater Life of the British Isles, 34
 Introducing the Insect, 69
 Label List of European Butterflies, 138
 Breeding *Necrophorus humator*, 122
 Breeding the Muslin Moth, 121
 Butterflies of Europe, 1965, A few, 55
 Butterflies of the Isles of Scilly, 9
 Camping in the New Forest, 1965, 44
 Carding the larger Coleoptera, 50
 Chemicals:
 Aerosols, 131
 Glues and gums, 33
 Killing-agents, 49
 Coleoptera, Winter, 54
 Collecting flies without a net, 82
 Collecting in Norway, 132
 Collecting notes from Findhorn, Morayshire, 141
 Collecting Notes, Feb. 1966, 1
 ditto, May 1966, 38
 ditto, Aug. 1966, 78
 ditto, Nov. 1966, 112
 Hymenoptera Aculeata, 3, 38, 81, 114
 Smaller Moths, 1, 38, 78, 112
 1966, Scottish, 123
 Collector versus Scientist, A psychophilosophical phantasy, 31
 Communal roosting habits, Further notes, 118
 Conservancy's Representative's Annual Report, 1965/66, 76
 Day trip to Westerham, 47
 Diurnal appearances of moths, 48
 Dragonflies and Caddisflies, 13

Ecological approach to light-trapping, 29, 65, 134
 Editorial, 1, 37, 73, 109
 Entomological Welding, 131
 Entomology in New Zealand, 5, 61
 Eumeninae, Key to British Genera of, 115
 From an outer London suburban area, 87, 116
 Glanville Fritillary, A note on the, 119
 Gregarious behaviour of *Agonum dorsale*, 53
 Guidance for Authors, 109
 Holiday in Jersey, A, 9
 Honey Agar mixture as food for adult Lepidoptera, A, 49
 How to make a light-trap, 58
 Hymenoptera Aculeata, 3, 38, 81, 114
 Junior News Section, 33, 68, 104, 136
 Lepidoptera in Devon and Cornwall, 46
 Lepidoptera in Majorca, May 1966, (see lists), 133
 Lepidoptera in Malta, 15
 Letters to the Editor:
 Aberdeenshire Butterflies, 70
 Alder Kitten Moth, 139
 Diptera at the Mineries, Priddy, 34
 Oxalic acid, 139
 Lists:
 American Lepidoptera, Some, 23
 American Lepidoptera attracted to various light sources, 26
 Butterflies in Malta, 18
 Butterflies of Scilly, 9
 Hymenoptera in N. Zealand, 62
 Larger moths in Malta, 17
 Lepidoptera in Majorca, 133
 Lepidoptera in Scotland, 84
 Membership List and geographical key, 3rd supplement, 18
 Methods:
 Carding Coleoptera, 50
 Collecting methods, 51
 Rearing *Cassida rubiginosa*, 103
 Recording systems, 4
 Repairing wings, 131
 Modern collecting methods, 51
 Natural history of Renfrewshire, 118
 New Forest, Camping in the, 44
 New habitats, 41
 Note on a name, 142
 Notes and Observations:
 Experiences with a light trap in S.W. London, 72
 Flame Brocade in Worcs, 36
 Gypsy Moth, Pairing of the, 43
 Muslin Moth, Breeding the, 121
Necrophorus humator, Breeding, 122
 Notes at Random, 71
 Observations on *Amphimallon solstitialis*, 139
 Painted Lady Butterfly in February, 140
 Pinion Spotted Pug in Worcs, 142
 Second generation of the Light Emerald Moth in Hants, A, 108
 Small Blue in Scotland, 36
 Small Tortoiseshell, 36

Speckled Wood in N.E. Surrey, 71, 140
 Uncommon beetles in N. Yorks, 72
 Uncommon moth in N.W. Oxfordshire, 108
 Notes on collecting insects in the tropics, 100
 Organic solvents as killing agents for Lepidoptera, 49
 Pairing of the Gypsy Moth, 43
 Parasitised larvae of the White Admiral, 42
 Phantom Crane Flies, 40
 Portugal 1964, 19
 Readers' Replies, 60
 Reading Circles, An appeal to all AES members, 67
 Records of some local Scottish beetles, 14
 Reports:
 Council's Report 1965, 74
 Treasurer's Report, 1965, 75
 Saturniidae in the United States, 97
 Scottish Collecting Notes 1966, 123
 Scottish entomology, 83
 Scottish beetles, Records of some local, 14
 Some American 'Blacklight' attractors for collecting insects, 24
 Some American Lepidoptera, 23
 Spiders, The Study of (IV), 11, 56, 127
 To see ourselves . . . , 125
 Tropics, Notes on collecting insects in the, 100
 Very queer Summer, A, 52
 Warning, A, 126
 White Admiral, Parasitised larvae of, 42
 Winter Coleoptera, 54

ARACHNIDA

ARANEIDA

Amaurobius fenestralis, 12
ferox, 12
similis, 12, 57
Atypus affinis, 12
Bathyphantes dorsalis, 129
Diplocephalus cristatus, 129
Dolomedes fimbriatus, 56
Hilaira frigida, 130
Lepthyphantes pallidus, 130
zimmermanni, 130
Linyphia montana, 130
triangularis, 57, 130
Meioneta rurestris, 129
Oedothorax fuscus, 129
Oonops domestica, 57
pulcher, 57
Oreonetides vaginatus, 130
Pisaura mirabilis, 56
Savignia frontata, 129
Scytodes thoracica, 57
Segestria senoculata, 57
 Segestriidae, 57

Steatoda bipunctata, 57
Stemonyphantes lineatus, 130
 trilineatus, 130
Tegenaria, 57
 atrata, 12
 domestica, 12
 parietina, 12
Tetragnatha, 57
Walckenaera acuminata, 129

CRUSTACEA

BRANCHIOPODA

Daphnia, 68
Scapholebris mucronata, 68

COPEPODA

Cyclops, 68
Diaptomus, 68

ISOPODA

Asellus, 68

INSECTA

COLEOPTERA

Abdera flexuosa, 54
Acilius sulcatus, 55
Acupalpus dorsalis, 54
Adalia bipunctata, 54
Agabus, 68
Agonum dorsale, 53
 scitulum, 87
Amphimallon solstitialis, 139
Asemum striatum, 14
Caenorhinus aequatus, 48
Carabus granulatus, 53
 intricarius, 50
Cassida equestris, 103
 ruginosa, 103
Cicindela campestris, 14
Ctenoscelis coeus, 143
Cychrus rostratis, 15
Dascillus cervinus, 48
Dytiscus marginalis, 54, 61
Eremotes ater, 87
Feronia madida, 54
Hygrobia, 68
Hylobius abietis, 14

Ilybius fuliginosus, 68
Lampyrus noctiluca, 44
Leptinotarsa decemlineata, 22
Nebria brevicornis, 54
Necrodes littoralis, 60
Pentarthrum huttoni, 54
Phosphuga atrata, 14, 53
 subrotunda, 53
Phyllopertha horticola, 48
Pissodes pini, 14
Platycis minuta, 72
Pogonocherus fasciculatus, 87
Prosternon tessellatum, 48
Rhagium bifasciatum, 15
 indigator, 14
 mordax, 15, 54
Scaphidium 4-maculatum, 54
Selatosomus impressus, 14
Staphylinus brunnipes, 87
 erythropterus, 15
Strangalia aurentata, 50
Tetratoma flexuosa, 54
Thanasimus formicarius, 14

DIPTERA

Aedes cantans, 82
Allestylus diaphanus, 82
Bittacomorpha, 40
Crocota geniculata, 34
Cynomya mortuorum, 34
Dicranomyia aquosa, 82
 didyma, 82
Dolichopeza albipes, 82
Empis stercorea, 34
 tessellata, 34
Fannia scalaris, 34
Hilara maura, 34
Ilisia occoecata, 82
Medeterus tristis, 82
Molophilus ochraceus, 82
Polietes lardaria, 34
Ptychoptera albimana, 40
 contaminata, 40
Rhagio lineola, 82
 scolopacea, 34, 82
Rhingia campestris, 34
 rostrata, 34
Sciopus platypterus, 82
Tachypeza nubila, 82
Tetragoneura sylvatica, 82
Tipula cheethami, 82
Tricyphona claripennis, 82

HEMIPTERA

Corixa, 68
Gerris, 68
Notonecta, 68
Scolypopa australis, 64

HYMENOPTERA

- Amblyopone saundersi*, 62
Ancistrocerus, 115
Andrena, 39
Apis mellifera, 63, 87
Bombus terrestris, 64
Coelocrabro leucostomoides, 40
Crossocerus tarsatus, 40
Eumenes pedunculata, 115
Formica rufa, 76
 sanguinea, 8
Huberia, 62
Mesoponera castanea, 62
Microdynerus exilis, 116
Monomorium antarcticum, 62
Odynerus, 115
Panurgus banksianus, 39
 calcaratus, 39
Paracolletes, 63
Passaloecus corniger, 40
 gracilis, 40
 insignis, 40
Pison spinolae, 63
Polistes humilis, 63
Prosopis, 63
Pseudepipona 115
Rhyssa lineolata, 62
 persuasoria, 62
Salius fugax, 62
Sirex noctilio, 62
Stigmus solskyi, 40
Symmorphus 116
Tachytes nigerrimus, 63
Trypoxylon clavicerum, 40
Vespula germanica, 63
 vulgaris, 63

LEPIDOPTERA

- Abraxas grossulariata*, 86, 105, 124
Acherontia atropos, 11, 16
Acleris cristana, 114
Acontia luctuosa, 16
Acrolepia pygmaeola, 114
Actebia praecox, 48
Actias luna, 23, 98
Agapetes galathea, 45, 105
Aglais urticae, 9, 41, 68, 85, 118, 132, 137
Agrochola lota, 86
Agrotis ipsilon, 86
 segetum, 48
 trux spp. *lunigera*, 46
 vestigialis, 48
Alcis jubata, 47
 repandata, 45, 124
Anaea neidhoeferi, 142
Anarta myrtilli, 104
Angerona prunaria, 47
Antheraea luna, 23
 polyphemus, 23, 98
Anthracaris cardamines, 19, 47, 140

- Apamea epomidion*, 44
 monoglypha, 45, 123
Apatele alni, 36, 108
 psi, 45, 86
 rumicis, 123
Apatura iris, 52
Aphantopus hyperanthus, 44, 85, 133
Aporophyla nigra, 86
Arctia caja, 68, 71, 117, 141
Argynnis aglaia, 46
 euphrosyne, 85, 132
 lathonia, 11
 pandora (= *maja*), 19
 paphia, 44, 56
 paphia ab. *valezina*, 20, 45
 selene, 46, 85, 124
Aricia agestis, 21, 47, 55
Aspitates ochrearia, 11
Atethmia xerampelina, 60
Automeris io, 98
Axylia putris, 48
Biston betularia, 71, 86
Boarmia roboraria, 45
Boloria alethea, 132
Borkhausenia flavifrontella, 80
Bupalus piniaria, 44
Calasymphobolus excaecata, 23
Callimorpha jacobaeae, 11, 86, 116
Callophrys rubi, 10, 85
Callosamia promethea, 98
Caloptilia stigmatella, 114
Campaea margaritata, 45, 108
Caradrina clavipalpis, 114
Catocala fraxini, 11
Celastrina argiolus, 22, 55, 140
Celerio euphorbiae, 15
 livornica, 16, 108
Cerostoma mucronellus, 114
Charaеas graminis, 48, 133
Chiasmia clathrata, 132
Chlorissa viridata, 11
Cleora cinctaria, 45
Cleorodes lichenaria, 46
Cochylis roseana, 112
Coenonympha dorus, 21
 pamphilus, 20, 47, 85, 133
 tullia, 56, 85
Coleophora *adspersella*, 80
 artemisiella, 80
 asteris, 80
 atriplicis, 80
 clypeiferella, 80
 erigerella, 80
 flavaginella, 80
 laripennella, 80
 salinella, 80
 squamosella, 80
 sternipennella, 80
 versurella, 80
 virgaureae, 80
Colias croceus, 11, 18, 22, 55
 eurytheme, 23
 hyale, 11
 interior, 23
Conistra ligula, 89

- vaccinii*, 89
Craniophora ligustri, 45
Cupido minimus, 85
Cynia mendica, 121
Danaus chrysippus, 14
 plexippus, 7, 14, 90
Daphnis nerii, 16
Dasychira fascelina, 141
Dechtiria turbidella, 88
Diacrisia sannio, 11
Diarsia mendica, 48
Diataraxia oleracea, 86
Dichrorampha simpliciana, 113
Ectypa glyphica, 47
Ematurga atomaria, 86, 104
Endothenia gentianaeanae, 112
Endrosis lactella, 114
 sarcitrella, 114
Epermenia chaerophyllella, 114
 testaceola, 114
Ephestia elutella, 114
Epiblema foenella, 112
Erannis aurantiaria, 118
 defoliaria, 71, 118
Erebia aethiops, 85, 124
 epiphron, 85, 124
 ligea, 132
Erynnis tages, 47, 85
Euchloe cardamines, 19, 47, 140
 euphenoides, 19
Euclidimera mi, 47
Eucosma foenella, 112
Eumenis semele, 22, 46, 53
Eupithecia insigniata, 142
Euplexia lucipara, 45, 123
Euprepia pudica, 16
Euproctis chrysorrhoea, 11
 similis, 105
Eurois occulta, 108
Euschesis comes, 45, 48
 janthina, 86
Gastropacha quercifolia, 16
Gelechia rhombella, 38
Gnophos obscurata, 47
Gonepteryx cleopatra, 18, 55
 rhamni, 22, 140
Gonodontis bidentata, 86, 117
Gracillaria stigmatella, 114
Graphiphoria augur, 45, 124
Habrosyne pyritoides, 45, 60
Hadena bicolorata, 46
 conspersa, 104
Hemileuca maia, 98
Hemimene simpliciana, 113
Hemistola immaculata, 124
Hemithea aestivaria, 44
Hepialus humuli, 86
Herse convolvuli, 16, 108
Hippotion celerio, 16, 86
Hyalophora (=Samia) cecropia, 98
 columbia, 98
Hydraecia oculea, 48
Hydriomena furcata, 44, 118
Hyloicus pinastri, 10
Hyphoria parthenos, 23
Lampides boeticus, 11, 55
Lampra fimbriata, 105
Lampropteryx otregiata, 47
Loathoe populi, 53, 71, 86, 104
Lasiocampa quercus callunae, 104
 trifolii, 11, 16
Leptidea sinapis, 52
Leucania pallens, 48
Limenitis arthemis arthemis, 23
 camilla, 42, 44, 52
 sibylla, 55, 136
Lithosia deplana, 46
 quadra, 46
Lophopteryx capucina, 46, 86
Lycaeides idas, 132
Lycaena dispar, 37, 56
 phlaeas, 9, 19, 21, 42, 55, 84, 105, 140
 virgaureae, 56
Lygephila cracca, 46
Lygris populata, 104
Lymantria dispar, 43
 monacha, 46
Lysandra bellargus, 53
 coridon, 53, 56
Macroglossum stellatarum, 11, 16, 20
Maculinea arion, 76
Maniola ida, 22
 jurtina, 9, 18, 21, 42, 44, 85, 105, 140
 ab. anommata, 86
 ab. fracta, 86
 tithonus, 21, 42, 52, 105
Melanargia galathea, 45, 105
Melitaea athalia, 55
 cinxia, 10, 119
Memphis neidhoeferi, 142
Mesaocidalia charlotta, 86
Mesotype virgata, 11
Microsetia hermannella, 80
 stipella, 80
Miltochrista miniata, 45
Mompha fulvescens, 114
 subbistrigella, 114
Naenia typica, 123
Nepticula marionella, 88
Notodonta dromedarius, 46
 ziczac, 46, 71
Nymphalis io, 42, 47, 86, 118, 137
 polychloros, 19, 22
Ochlodes venata, 44, 55, 133, 137, 140
Odezia atrata, 123
Oeceticus omniverus, 62
Operophtera brumata, 71
Ornix anglicella (=fragariae), 78
 guttea, 2, 78
Ortholitha mucronata, 45
 plumbaria, 47
Orthosia gothica, 72
Ostrinia nubilalis, 113
Pachysphinx modesta, 23
Papilio glaucus canadensis, 23
 machaon, 18, 52, 55
 podalirius, 19, 22, 55
Parachronistis albiceps, 80
Pararge aegeria, 10, 19, 22, 42, 47, 55, 140
 megea, 42

- Perizoma bifasciata*, 46
 flavofasciata, 46
Peronea cristana, 114
Petilampa minima, 45
Phalera bucephala, 11, 117
Phalonia roseana, 112
Pheosia tremula, 71
Philosamia cynthia, 136
Philudoria potatoria, 45, 68
Phlogophora meticulosa, 71
Phragmatobia fuliginosa, 16
Phyllocnistis suffusella, 114
Phytometra viridaria, 45
Pieris brassicae, 18, 42, 84, 133
 napi, 22, 42, 85, 133
 rapae, 18, 21, 42, 85
Plusia gamma, 16, 86, 104
 interrogationis, 104
 iota, 123
 pulchrina, 104
Polia hepatica, 124
Polyommatus icarus, 9, 19, 42, 47, 52, 55, 84, 132
Pontia daplidice, 18, 20, 55, 107
Procus fasciuncula, 48, 123
 latruncula, 118
 strigilis, 118, 123
 versicolor, 118
Pseudopanthera macularia, 116
Pulicalvaria piceaella, 88
Pyrausta nubilalis, 113
Pyrgus malvae, 47
Recurvaria piceaella, 88
Saturnia pavonia, 23, 86, 104
Satyrus arethusa, 22
 circe, 21, 55
 statilinus, 21
Scrobipalpa atriplicella, 80
 seminella, 80
Smerinthus ocellata, 53, 71, 105
Spaelotis ravidata, 108
Sphinx cerisyi, 23
 ligustri, 11
Stauropus fagi, 47
Sterrha muricata, 44
Tarucus (=Syntarucus) telicanus, 21
Telphusa alburnella, 88
 luculella, 38
 proximella, 88
Thais hypermnestra, 19
Thecla quercus, 46
Thyatira batis, 124
Thymelicus acteon, 45
 sylvestris, 42, 44, 133
Trigonophora flammea, 36
Triphaena comes, 45, 48
 pronuba, 45, 48
Tubuliferola flavifrontella, 88
 josephinae, 88
Utetheisa pulchella, 16
Vanessa atalanta, 18, 70, 85, 125, 137
 cardui, 9, 14, 18, 42, 70, 85, 140
Xanthorhoe fluctuata, 117
Xylophasia monoglypha, 48
Ypsolophus (=Cerostoma) lucellus, 78
 mucronellus, 114
 radiatellus, 114
 scabrellus, 78
Zelleria hepariella, 114
Zygaena filipendulae, 47, 133, 137
 filipendulae anglicola, 105
 trifolii, 45
- MECOPTERA**
- Choristella philpotti*, 64
- NEUROPTERA**
- Archichaulioides diversus*, 64
Micromus tasmaniae, 64
Weelus acutus, 64
- ODONATA**
- Aeshna cyanea*, 54
 grandis, 44, 54
Anax imperator, 14
- ORTHOPTERA**
- Oedipoda coerulea*, 55
 germanica, 55
- PHASMIDA**
- Carausius morosus*, 105, 136
Clonopsis gallica, 136
Orxines macklotti, 105
Sipylodea sipylus, 136
- TRICHOPTERA**
- Odontocerum*, 68
-
- AMPHIBIA**
- CAUDATA**
- Proteus anguinus*, 136
- SALIENTIA**
- Bufo bufo*, 44

AVES**CHARADRIIFORMES**

- Larus argentatus*, 141
canus, 141
fuscus, 141
marinus, 141

MAMMALIA**ARTIODACTYLA**

- Capreolus capreolus*, 44
Dama dama, 44

RODENTIA

- Sciurus vulgaris*, 133

REPTILIA**SQUAMATA**

- Vipera berus*, 47

PHANEROGAMS

- Aceras anthropophora*, 47
Aegopodium podagratica, 53
Alnus glutinosa, 124
Ammophila arenaria, 141
Arctium minus, 103
Artemisia maritima, 80
vulgaris, 112
Asclepias cornuti, 7
Aster tripolium, 80

- Atriplex*, 80
Betula verrucosa, 54
Cakile maritima, 56
Calluna vulgaris, 124
Celtis australis, 22
Centaurea aspera, 10
Cephalanthera damasonium, 47
Cerantonia siliqua, 19
Chenopodium, 80
Cirsium arvense, 53, 103
vulgare, 103
Coriaria arborea, 64
Corylus avellana, 42
Crataegus, 1
monogyna, 48, 87
Empetrum nigrum, 141
Erigeron acer, 80
Euphorbia pinea, 17
Foeniculum vulgare, 18
Hieracium, 40
Hypericum perforatum, 11
Kentranthus ruber, 56
Lagurus ovatus, 10
Lonicera periclymenum, 42, 87
Malus, 3
Nerium oleander, 16
Origanum vulgare, 90
Pinus, 14
radiata, 62
Populus tremula, 87
Prunus spinosa, 87
Quercus, 38
robur, 46
Rubus fruticosus, 87
Sarothamnus scoparius, 11
Senecio jacobaeae, 48, 141
Sinapis arvensis, 47_i
Solidago virgaurea, 80
Stellaria media, 8
Suaeda, 80
Taraxacum officinale, 121
Taxus baccata, 114
Ulex, 11
Urtica dioica, 41, 53

CRYPTOGAMS

- Polyporus*, 54
Pteridium aquilinum, 87

VOL. 25

No. 270

•

FEBRUARY, 1966



J.C.



MELOE



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**

Reliable and valuable Books for Naturalists

Introducing the Insect Grasshoppers, Crickets and Cockroaches of the British Isles	30s. net 42s. net
The Freshwater Life of the British Isles	35s. net
Practical Entomology	17s. 6d. net
Flies of the British Isles	35s. net
Life of the Wayside and Woodland	30s. net
Wayside & Woodland Trees	30s. net
Butterflies of the British Isles	21s. net

Frederick Warne & Co. Ltd
1-4 Bedford Court, London, WC2

AES NOTICE

WHERE TO WRITE

Changes of address, offers of help, queries, etc., to: D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset.

*Membership applications and non-arrival of Bulletins to: D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset.
Yeovil 928.*

*Advertisers to: R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex.
GRlmsdyke 0460.*

*Offers to lead Field Meetings, exhibit, etc., to: B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27.
GIPsy Hill 0057.*

Manuscripts, drawings, and books for review to: H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

*Subscriptions (25/- per annum, 12/6 for Juniors) to: B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex.
Sunbury 2687.*

Youth matters to: H. J. Berman, St Ivo School, St Ives, Hunts.

THE AES PROSPECTUS

**CONTAINING FULL DETAILS
will be sent to anyone interested**

Please apply, enclosing 4d. stamp, to:

**Hon. Advertising Secretary,
A E S**

**18 GOLF CLOSE, STANMORE,
MIDDLESEX**

A E S

**Members can help the Society in
several ways:—**

- (a) By dealing with advertisers and mentioning the *Bulletin*.
- (b) By bringing in new Members.
- (c) By buying AES publications and suggesting Public Libraries should buy them.
- (d) By friendly co-operation with other Members.
- (e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin*.

THE AMATEUR ENTOMOLOGIST

Originally an annual publication (the Journal of the AES), containing longer articles than the *Bulletin*. Now used as a serial title for the Society's Handbooks. Volumes in print are listed below.

8. Includes several leaflets that are now O.P. : **Collecting Dragonflies ; Collecting Mosquitoes ; Making Sweepnets** ; an 8pp. list of standard books on entomology, etc. 48 pp., 32 figs., 6pl. **Price each : 5s. 0d.**
9. **Practical Methods and Hints for Lepidopterists.** Contains articles on rearing and collecting larvae ; illustrated instructions for making beating trays and cages for all entomological purposes. 42 pp., 48 figs., 6 pl. **Price each : 5s. 0d.**
10. Contains illustrated articles on **Collecting Lacewings ; Drawing Insects ; Collecting Caddises ; Photography of Caterpillars** ; etc. 40 pp., 10 figs., 12 pl., (Not many left). **Price each : 6s. 0d.**
11. **A Coleopterist's Handbook.** Describes the tools and methods for collecting British beetles ; their habitats, commensals and pre-adult stages ; how to record, photograph, make a personal collection, and conduct a local survey. 120 pp., 50 figs., 20 pl. **Price each : 15s. 0d.**
12. **A Silkworm Rearer's Handbook (2nd edn.).** How to breed 120 exotic species in Britain, including substitute foodplants and descriptions of stages. Systematic section refers to 1,400 species. Does not deal with the Mulberry Silkworm (*Bombyx mori*), q.v. Leaflet No. 3. 165 pp., 26 figs., 26 pl. (2 col.). **Price each : 17s. 6d.**

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

(World List abbreviation : Bull. amat. Ent. Soc.)

Some volumes are in short supply, so complete your set now. You can also complete your volumes or obtain particular articles by buying individual parts. Each volume complete with cover and index.

Volume 7 (1946-8) **21s. 0d.**

Annual volumes 8 (1949) and onwards per volume **15s. 0d.**

Individual issues published before 1963 per part **2s. 0d.**

Individual issues published 1963 onwards per part **4s. 0d.**

Silver Jubilee Number contains contributions by Honorary Members and past Presidents : The First 25 Years ; Studying the Commoner Insects ; Butterfly Botany ; Communication Among Social Insects ; Some Observations on Taxonomy ; Distribution, Range and the British Fauna. 18pp. **2s. 0d.**

Special Issue, August 1965 contains "A Guide to and Local List of Insects in North-west Cornwall" by G. D. Trebilcock, and "Insect Migration", a review by C. B. Williams. 80pp. 6 maps. **8s. 0d.**

These publications are obtainable from L. Christie, 137 Gleneldon Road, Streatham, London S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

LEAFLETS

Numbers not included are out-of-print or replaced by others.

	Price each
3. Rearing Silkworms. (The Mulberry Silkmoth). 4pp., 2 figs.	8d.
4. Collecting Sawflies. 12pp., (incl. 2pl.), 26 figs.	8d.
5. Collecting Flies (Diptera). 8pp., 1 fig., 8pl.	2s. 8d.
6. Collecting Beetles associated with Stored Food Products. 9pp., 6 figs., 3pl.	1s. 4d.
7. Some Improved Devices for Rearing Hymenoptera. 7pp., 3 figs.	8d.
8. Collecting Ants. 12pp., 5 figs.	8d.
9. Collecting Caddises. 5pp., 4pl.	1s. 0d.
10. Experiments with Bees. 12pp., 3 figs.	8d.
13. Collecting Microlepidoptera. 4pp., 1 fig.	8d.
14. Setting Microlepidoptera. 4pp., 5 figs.	8d.
15. Collecting Het-Bugs (Hemiptera-Heteroptera). 12pp., (incl. 2pl.), 5 figs.	8d.
18. Collecting Clearwings. 12pp., (incl. 2pl.), 4 figs.	8d.
20. Preserving Caterpillars. 14pp. (incl. 6pl.), 9 figs.	1s. 0d.
21. Collecting Psocoptera. 4pp., 10 figs.	8d.
22. Collecting Lacewings. 9pp., 8 figs., 5pl.	1s. 0d.
24. Entomology of Bird Pellets. 8pp., 4pl., 1 map.	1s. 8d.
25. Collecting Bumble Bees. 20pp., 83 figs.	2s. 0d.
26. Collecting Collembola. 6pp., 4 figs.	1s. 0d.
27. A Study of the Insects Living on the Wayfaring Tree. 20pp., 4 figs., 1 diagram.	1s. 0d.
28. Killing, Setting and Storing Butterflies and Moths. 13pp., 10 figs.	1s. 0d.

PAMPHLETS

4. Label List of British Macrolepidoptera. 32pp.	1s. 8d.
5. Check List of British Macrolepidoptera. 32pp.	4d.
6. Label List of British Butterflies. 2pp.	4d.
7. Directory of Natural History Societies. 155pp.	8s. 0d.
7a. First Supplement to Directory. 44pp.	2s. 0d.
10. Glossary for the Young Lepidopterist. 6pp., 2 figs.	4d.

Other Leaflets are in preparation

These publications are obtainable from L. Christie, 137 Gleneldon Road, Streatham, London, S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.



EDITORIAL

The third supplement to the *Membership List and Geographical Key* is included in this issue.

Although last season can be safely said to have been among the worst for sun-loving insects, at least in the home counties, it appears that the interest of Members in their hobby was undiminished, and the season ended with one of the best Annual Exhibitions the Society has ever held. Not only were there plenty of exhibits, but all were of an exceptionally high quality.

What particularly struck me was the thought with which exhibits had been prepared: each exhibitor was trying to demonstrate and explain a subject by his exhibit, rather than being content with a simple display. This was equally true of the Junior Members who exhibited, and competition for the Juniors' Prize established by the Council for this year was very keen and judging very difficult. This prize was won by Ronald Allen with an exhibit illustrating the classification and affinities of the Diptera. The standard of Juniors' exhibits generally was so high, however, that a second prize was established and awarded to P. M. Hawkey for the presentation of his exhibits of Lepidoptera from particular localities, and of larvae.

Those Juniors who failed to gain a prize, however, need not feel disappointed, for many of the 'unplaced' exhibits were of such a standard that at any ordinary entomological exhibition they would have been certain

of a Juniors' award.

I feel, therefore, that a creditable mention should be given to J. S. Collins, M. S. Collins and R. V. Bogue for their striking exhibit of the different lines of modification of the head in beetles; to R. Dransfield for his collection of Lepidoptera and the background data exhibited with them; to R. J. Dickson for his annotated exhibit of French insects; to K. Wilmott for his spirited attempt to 'wake up' Members to the dangers to insect life of urban development; and to the other Juniors whose exhibits I inspected but space will not allow me to mention individually.

I hope they will all exhibit this year too.

H. V. Danks (2907).



ANNUAL GENERAL MEETING

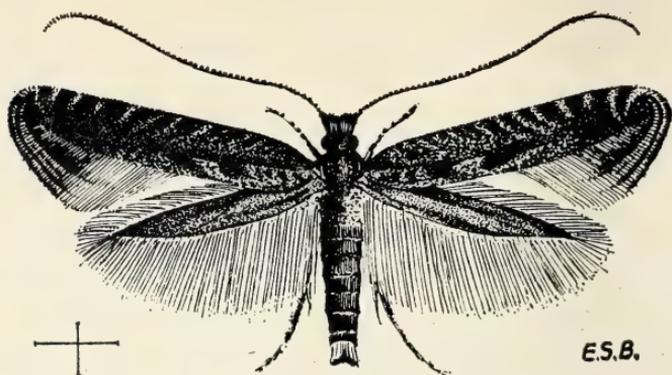
The A.G.M. for 1966 will be held on Saturday 19th March at the rooms of the Linnean Society, Burlington House, Piccadilly, London W.1, and will be preceded by a talk which will be announced in a circular sent to Members before the meeting.



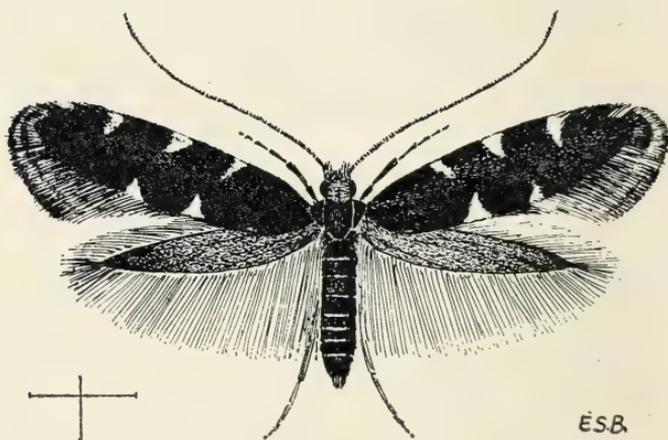
COLLECTING NOTES— FEBRUARY 1966

The Smaller Moths

Ornix anglicella Staint. (= *fragariae* Staint.). Mr Bradford's notes read: "The larva of this moth feeds on the leaves of hawthorn (*Crataegus* sp.). There are several species very much



Ornix guttea Haw.



Ornix anglicella Staint.

like this moth and they are very easily mistaken for it. The best way is to breed them out. The larva of this particular moth makes a cone out of a turned down corner of a leaf. Those I have bred have pupated in the cone.

There are two broods in a year, the larva can be found in July and August and the adult in May and August.

The forewings of the moth are

dark grey and the most conspicuous features are the two apical spots, the two thin sharp lines on the cilia and the two darker streaks near the inner margin. When resting the moth has the habit of sitting at about 45°; a posture common to a number of the 'Micros'."

Ornix guttea Haw. Mr Bradford's notes read: "The moth of this species is a uniform dark blackish brown all over; the posterior wings a bit paler.

The anterior wings have three silvery white costal spots or streaks and two dorsal spots or streaks. The head is a dark ochreous brown colour.

It appears in the adult stage in May and June; there being one brood a year.

The larva feeds on apple (*Malus* spp.) and like *O. anglicella* Staint. turns down a corner of a leaf. The larva can be found in July and August.

It is fairly generally distributed. I have several from my garden apple trees, from one of which the drawing was done."

Undoubtedly the most difficult part of preparing 'Micros' for the cabinet or store-box is pinning them. I use stainless steel pins, usually $0.0056 \times 12\frac{1}{2}$ mm. for the smaller moths, and 0.010×15 mm. for the larger ones. Many schemes can be thought out for holding the moth whilst it is pinned, for instance (a) grooves in a block of polyporus, (b) folds of a handkerchief (c) folds of cellulose wadding, or (d) on plastic sponge. The most important thing, I think, is to have a good light. A magnifier which leaves the hands free is very useful and needn't be of very great magnification.

For the larger moths, such as Pyrales, commercial settings boards may be bought. Others can be made from strips of soft balsa wood. These can be bought at shops which cater for modellers, and the softest pieces selected. Cut a channel down the middle with a saw blade. Different boards can have different widths suitable for different sized moths. The whole board is smoothed off with 'flour' glass paper. I usually use them like this, giving them a fresh smooth-down every so often; but they can, of course be papered, or covered with a thin card.

If the moth is correctly pinned and perfectly relaxed then the wings should spread out very easily, indeed, with the smaller moths they can be

blown into place.

Incidentally, the larvae may be 'blown' in the same way as 'Macro' larvae, only instead of the glass tube a fairly large hypodermic needle may be used.

D. Ollevant (1514).

Hymenoptera Aculeata

When a collector takes a specimen there are two important facts that should be recorded: where the specimen was and what it was doing. The first of these is usually the easiest to be precise about and yet is often neglected. I know I have mentioned this before, and also that this applies to all collecting, not only that of Hymenoptera, yet it is so basic to the study of any group that I think it warrants a little more constructive consideration here.

We in Britain are fortunate in that we have two extremely useful recording systems which we can utilise, the completely arbitrary National Grid system and the partly arbitrary Vice-County system. My own feeling is that we should use both. The Vice-County system was largely designed by the botanist H. C. Watson, in the last century, to overcome the inequity in size between the various administrative counties. It provides 152 Vice-Counties in Great Britain and Ireland, and these form an ideal basis for giving the overall distribution of species. A recent study among the Hymenoptera is that of the distribution of British ants by Collingwood and Barrett (1964). The National Grid system is ideal for pinpointing exact positions and for detailed studies and comparisons provides a valuable tool. The recently completed Botanical Society of the British Isles mapping scheme was based on the 10 km square as a unit, and such studies are now being encouraged by the Biological Records Centre of the Nature Conservancy.

A survey of mammals based on 10 km squares is being carried out by the Mammal Society. Among the Hymenoptera, two recent papers on ants can be mentioned, Barrett (1964) and Barrett and Felton (1965).

As well as giving a more precise picture of the distribution of insects (or sometimes of collectors!) there are other uses that can be made of the Grid reference system. Tynan and Philp (1956) have used the system to give an index of the relative commonness of *Bombus* spp. One 10 km square was chosen and visits were made to as many of its 100 constituent 1 km squares as possible. *Bombus* spp. were searched for in each, and the percentage occurrence of each species taken as an index of abundance.

It only remains to deal with the question of maps. For detailed work the standard 1 in. Ordnance Survey map is of most general use. For those who want to plot records, perhaps from the literature, over the whole country, then the Ordnance Survey Route Planning Maps have much to recommend them. Two maps at 6/6d. each cover the whole of England, Wales and Scotland, at a scale of about 10 miles to the inch. These maps have the 10 km squares of the National Grid clearly marked. As regards the Vice-County boundaries, an excellent map at a scale of 1:5,000,000 with the National Grid system indicated has been produced for the New Naturalist Series. Details of the Vice-County boundaries in the London area, where they differ markedly from the administrative boundaries, are covered by the maps produced by the London Natural History Society, see for example de Worms (1954) and Beven (1957).

Thus a complete data label would take the form: Vice-County name (and number), name of locality, 10 km square reference (or better still 1 km square reference), date of capture, name of collector. It is advisable that

any locality name should be one that is to be found on the 1 in. Ordnance Survey map. A code number can be added which would refer to any notes kept in a field notebook relating to the other main fact I mentioned, what the specimen was doing.

For any of you who are lucky enough to be able to collect abroad, a useful tip is to use the maps in the AA Continental Handbook. When on holiday any time-saving device is useful, and data labels can use the International Registration Letters as an abbreviation for the country name, and the reference to the page and square in the AA Atlas of Western Europe. For areas further afield, recourse must be made to locally available maps and in many areas the longitude and latitude are the best data to record, in addition to a locality name.

All the above systems are more or less arbitrary as regards ecological considerations. This can best be allowed for by study of geological maps supported by direct observation of the geology of localities in which much collecting is done.

May the 1966 Season be kind to all.
4.10.65. J. C. Felton (3740).

REFERENCES

- BARRETT, K. E. J. (1964). *Ent. Rec.*, **76**: 107-114. *Formica sanguinea* Latreille (Hym., Formicidae) in Southern England.
- BARRETT, K. E. J. and FELTON, J. C. (1965). *Entomologist*, **98**: 181-191. The distribution of the Wood Ant, *Formica rufa* Linnaeus (Hymenoptera, Formicidae), in South-East England.
- BEVEN, G. (1957). *London Naturalist*, **36**: 6-11. The distribution of the Grey Squirrel in the London area (1953-1956).
- COLLINGWOOD, C. A. and BARRETT, K. E. J. (1964). *Trans. Soc. Brit. Ent.*, **16**: 114-121. The identification and distribution of British Ants. 2. The Vice-County distribution of indigenous ants in the British Isles.
- DE WORMS, C. G. M. (1954). *London Naturalist*, **33**: 101-146. The moths of London and its surroundings.
- TYNAN, A. M. and PHILP, E. G. (1956). *Bull. Kent. Fd. Club*, **2**: 5-6. A distribution-study of Bumble-bees.

ANNUAL EXHIBITION—1965

The Exhibition was again held at the Hugh Myddelton Secondary School

on October 9th. Any fears that a below-average season would adversely affect us were quickly dispelled as exhibitors and visitors arrived in such numbers as to provide a record occasion. For further measure, there was a pleasing improvement in the presentation of many exhibits, especially those from Junior Members.

Possibly the most noticeable change over the last twenty-five years has been the spread of interest from strictly national species to world species. In the immediate post-war years my collecting was controlled by a strict code. A specimen must be in good condition, well set, British, and bred or caught by myself: there was a slight allowance for exchanging species from remoter habitats. These artificial rules are rapidly disappearing before a more scientific and comprehensive approach. Easier travel facilities have helped but possibly the greatest factor is that the declining British fauna and the urgent need to conserve the wild life of this country has compelled entomologists to seek richer and more varied pastures abroad. As an innovation this year, the Society offered two prizes for Junior exhibits. It had been felt that whilst there was no lack of enthusiasm by the Juniors for their hobby, there was a certain disinclination to show their efforts. The result was a splendid array of Junior exhibits and a very difficult job for the judges to single out two of them for the prizes. By a majority vote R. Allen (3628J) showing Diptera and P. M. Hawkey (3654J) showing Lepidoptera were selected.

Notable features included: a film by D. Cork, a continuous showing of the Society's colour slides by Messrs. Castle, Cribb and Ollevant and the extremely popular setting demonstrations by J. S. Robertson (2417). Surplus tables for the sale or exchange of Members' excess material were well patronised and, as in previous

years, all the leading entomological dealers were present covering the whole range of natural history requirements. Good refreshments and adequate parking facilities for cars added to the amenity for Members and friends.

Finally the Council wishes to express its appreciation of the efforts of Mr B. F. Skinner and all the helpers who contributed so largely to the success of the afternoon.

Exhibitors included:—

Ackland W. T. and Wilson K. J. (3736).

British Spingidae and exotic silk-moths. Specimens of *Nymphalis antiopa* Linn. (Camberwell Beauty) and *Epicnaptera ilicifolia* Linn. (Small Lappet) captured in Epping Forest and Weston-Super-Mare (Somerset) respectively.

Allen R. (3628J)

Series of Diptera and a large chart to show the relationship of this family with the other major orders.

Appleton D. (3631)

Coleoptera from Hampshire including living specimens and larvae.

Ashton R. N. (2987)

Representative collection of Coleoptera from South America.

Brown F. C. (2414)

Butterflies of Wimbledon Common (London) and a large selection of cartoons with an entomological bearing from papers and magazines.

Bruce C. M. (1746)

Lepidoptera from a riverside garden in Norfolk and a selection of moths from the Mediterranean area.

Burgess L. W.

Short series of British and foreign butterflies selected from the Nymphalidae, Satyridae, Danaidae, Amathusiidae and Lycaenidae to show the prevalence of purple colouring in these families.

Castle M. E. (2490)

A fresh version of a portable 'm.v.' light trap using two 12-volt accumulators and an adapted plastic

bucket. Examples of Mygal (American bird-eating) spiders with specimen packs for easy transit. A selection of British Lepidoptera.

Channon H.

Aberrant series of *Nymphalis io* Linn. (Peacock butterfly) and *Aglais urticae* Linn. (Small Tortoiseshell butterfly) resulting from cold temperature treatment during the early pupal stage.

Coles B. (3533J)

Series of North American butterflies related to and closely resembling British species.

Collins J. S. (3762J), Collins M. S. and Bogue R. W. (3418J)

An imposing collection of the giant 'horned' beetles (Lucanidae, Dynastinae, etc.). The horn, which in some cases is as large as the actual body mainly appears in the males of non-carnivorous species. It might be used for excavation, as an olfactory organ or for defence.

Cooter J. (3290J), Cooter R. J. (3166J)

Coleoptera found on visits to various English and Scottish localities, this year.

Cribb H. J. (2044)

Type collection of the British Burying and Carrion Beetles (*Necrophorus* and *Silpha*).

Cribb P. W. (2270)

Butterflies of Great Britain and some living examples of the parasites controlling them (Ichneumons, Chalcids and Tachinids). Native and migrant Lepidoptera taken in Sussex. Examples of extinct British Lepidoptera.

Dickson R. J. (3674J)

Series of insects resulting from three summer holidays in France. Notes on points of interest.

Dransfield R. (3492J)

Maps and notes of various localities in the Isle of Wight (Hampshire) and a representative collection of Lepidoptera occurring there.

Else G. R. (3881)

A collection of moths from South

Hampshire together with larvae and photographs of habitats.

Gardiner B. O. (225)

Showed a semi-synthetic diet for rearing *Pieris brassicae* Linn. and other species, evolved by him in conjunction with Dr W. A. L. David. A main obstacle to many breeding experiments is the restricted availability of the foodplant. This formula, based on dried cabbage, Bemax, and sucrose, with trace elements and preservative added, has been successfully used for rearing thirty species of Lepidoptera including 'White' butterflies, tiger moths, silkmoths (*Bombyx mori* Linn.) and Buff tip moths (*Phalera bucephala* Linn.). A full description is given in *Nature*, Vol. 207, No. 4999, pp. 882-3, 21.8.65.

Hawkey P. M. (3654J)

Lepidoptera taken in Stafford, Derbyshire and Dorset with supporting notes and some larvae.

Hilliard R. D. (99)

Type collection of species of Ennominae (Lep., Geometridae) bred from the Home Counties (London area).

Hoskins H. L. (3373)

Assisted by pupils of Milton Road School, Cambridge, showed various breeding experiments with tropical Lepidoptera, a muslin sleeve with the hybrid silkmoth *Philosamia cynthia-ricini* (true *P. cynthia* Drury \times *P. ricini* Boisd., the domesticated Asian form) being very attractive. Also photographs, anatomical drawings and easily constructed breeding-cages. The latter were insulated and heated by low-powered light bulbs encased in perforated tins.

Lewis K. C. (3680)

The Raynor strains of the Magpie moth (*Abraxas grossulariata* Linn.) and some striking exotic butterflies.

Muggleton J. (3253)

Series of *Papilio asterias* Frey. (American Black Swallowtail butterfly), a North American insect similar to *P. machaon* Linn. but darker.

London Zoological Gardens

A comprehensive exhibit of living natural history specimens from the Zoo collection.

Myall M. G. (3503)

Graphs to show the progress made to date in the examination of the populations of the Heart and Dart moth (*Agrotis exclamationis* Linn.) from selected localities.

McCormick R. F. (3375)

A collection of British Pyralid and Plume moths and other interesting Lepidoptera taken this season.

Oslevant D. (1514)

Examples of micro-lepidoptera with special attention to species occurring in the South-east of England.

Osborne R. (2437)

Butterflies caught in the Austrian Tyrol during August, 1965. Type specimens of some American butterflies.

Penney C. (3880J)

A collection of British Lepidoptera and large exotic silkmths.

Robertson J. S. (2417)

British butterflies bred and collected in 1965 with some varying forms and races.

Rogers P. J.

Examples to illustrate the variation in British Lepidoptera.

St Ivo School (2491A)

Mr Berman, assisted by a large party from his School, showed a large range of living creatures, studied and bred by them. In a collection which reached from beetles, spiders and frogs to snakes, alligators and chinchillas, the only obvious omission was birds. As in past years, a generous amount of surplus stock was given to interested Members.

Sadler E. A. (2966)

Collection of the smaller British moths ('Microlepidoptera'), captured in and bred from Hampshire.

Skinner B. F. (2470)

Series of Lepidoptera of special interest, including most species added

to the British List since the last war. Taylor P. (3571)

Butterflies, mainly Lycaenidae, Pieridae, Vanessinae and Satyridae taken in the French Alps during 1964 and 1965.

Wilkinson R. S. (3839)

Portable American devices for collecting nocturnal insects. These lightweight moth-traps are of special interest to amateur collectors, though not easily obtainable in this country at the moment. Further details are given in an article in this issue.

Willmott K. (3822J)

Lepidoptera that formerly occurred in his garden, surrounded by fields. Now, as a result of building developments, the disappearance of most species has been noted.

R. D. Hilliard (99).

'ASCLEPIAS CORNUTI'

On 9th September last year I was given two nearly full-grown larvae of the Monarch Butterfly (*Danaus plexippus* Linn.) by a colleague at work who had just returned from a month's holiday in Canada. Unfortunately, being a non-entomologist, he did not know that the Milkweeds (*Asclepias* spp.), which are the food-plants of this species, do not grow in this country and consequently had provided them with barely enough food to last the 'plane journey home. Also I was completely unprepared for this 'gift' the net result being that, a couple of hours after coming into my charge, one larva was dead (presumably from starvation) and the other had finished off the last scrap of leaf.

There now followed, on my part, a series of frantic 'phone calls to practically all the large seed firms and nurseries from Bedford to Tunbridge Wells in search of *Asclepias cornuti* DC. All gave the same reply—they

did occasionally stock various *Asclepias* spp. for use as border plants but only sold the roots. This of course was no use to me so I then 'phoned Kew Gardens to see if they could help, laying it on heavily that I was in possession of a rare insect which would shortly die if deprived of its foodplant, etc. The young lady there said that the botanists could not answer queries over the phone and would I care to write!

That evening I returned home from work with my solitary larva, and tried feeding it with samples of just about every different weed I could find on a large piece of waste ground near my home. It refused them all. I even offered it the carcass of the dead larva (no harm in hoping) but the species is definitely not cannibalistic.

Then I had an inspiration. Having heard that the Milkweeds 'bleed' a milky substance when injured, I tipped a few drops of ordinary cow's milk on to a piece of common Chickweed (*Stellaria media* (Linn.) Vill.—Caryophyllaceae) and offered the meal to my caterpillar. It did actually eat some of the milk-covered leaf but not very much.

That night I went to bed thoroughly dejected and resolved that if by the following evening I still hadn't obtained some *Asclepias cornuti*, I would kill my caterpillar to stop it starving.

The next day I made several more 'phone calls, all quite fruitless, and leaving work at 5.30 drove straight to Kew Gardens arriving there at 6.40 (They shut at 7 p.m.). This was my last hope and had I been to Kew previously, would never have attempted it owing to the enormous size of the place. I hurried round bed after bed of border plants on the left side of the main gate and suddenly struck lucky. The plant I found was not *Asclepias cornuti*, but it was *Asclepias* something-or-other so I stuffed a few leaves into my pocket, (I hope none of the Kew officials are

Members of the A.E.S!) and ran back to the car in which was the larva. I offered a silent prayer of thanks as I watched it greedily plough through half a leaf with an audible crunch. Never have I spent so much effort on any insect before.

On 12th September it pupated successfully on the lid of its box, turning into a beautiful jade-green chrysalis, and on the 30th of the same month a slightly undersize, but nonetheless perfect, male emerged. This, needless to say, has pride of place in my collection.

The final twist to the whole affair came some days later. Leaving my firm's canteen at the end of the lunch-hour, I bent to examine more closely a few of the potted indoor plants which were kept there and in one ornamental pot, yes—you've guessed it—a lovely example of *Asclepias cornuti* in full flower . . . Ah well!

6.7.65.

J. H. Mitchell (3752).

BUTTERFLIES OF THE ISLES OF SCILLY

Notes on 'Some Preliminary Observations on the Lepidoptera of the Isles of Scilly' by A. Richardson, F.R.E.S. and R. M. Mere, F.R.E.S. which appeared in the Entomologist's Gazette, Vol. 9, no. 3, July 1958.

The paper by Richardson and Mere was written on notes made from visits to the Isles of Scilly from 3rd September 1956 to 10th September 1957. Between 3rd and 10th September 1963 I visited these islands and it is of interest to compare my observations with those of the authors of the paper. The list includes every species recorded from the Scillies.

Species	Richardson and Mere, 1956-7	My list, 1963
1. <i>Danaus plexippus</i> Linn. (Milkweed)	[one seen in 1938]	—
2. <i>Pararge aegeria</i> Linn. (Speckled Wood)	[recorded this century]	—
3. <i>Maniola jurtina</i> Linn. (Meadow Brown)	abundant everywhere	abundant everywhere
4. <i>Vanessa atalanta</i> Linn. (Red Admiral)	several seen	only two seen
5. <i>V. cardui</i> Linn. (Painted Lady)	several seen	very common
6. <i>Aglais urticae</i> Linn. (Small Tortoiseshell)	a number seen everywhere	abundant
7. <i>Nymphalis polychloros</i> Linn. (Large Tortoiseshell)	[three recorded in 1934]	—
8. <i>N. io</i> Linn. (Peacock)	[reported as 'fairly common' by Blair in 1934]	—
9. <i>Polommatus icarus</i> Rott. (Common Blue)	fairly common on all islands	very common—not on Tean
10. <i>Lycaena phlaeas</i> Linn. (Small Copper)	common	common
11. <i>Pieris brassicae</i> Linn. (Large White)	common on Tresco and St. Mary's	fairly common
12. <i>P. rapae</i> Linn. (Small White)	common on Tresco and St. Mary's	common
13. <i>P. napi</i> Linn. (Green-veined White)	[reported as common by Blair in 1925]	—
14. <i>Colias hyale</i> Linn. (Pale Clouded Yellow)	[reported in 1900]	—
15. <i>C. croceus</i> Fourcr. (Clouded Yellow)	a few in 1957 on St Mary's and St Helen's	none seen
16. <i>Gonepteryx rhamni</i> Linn. (Brimstone)	[recorded this century]	—

It is significant to note that the resident and generally non-migratory species (Meadow Brown (*Maniola jurtina* Linn.), Small Tortoiseshell (*Aglais urticae* Linn.), Common Blue (*Polyommatus icarus* Rott.), and Small Copper (*Lycaena phlaeas* Linn.)) are the ones which have remained most constant in numbers. The difference between the numbers of the Painted Lady (*Vanessa cardui* Linn.) in 1963 and the 'several' in 1956-7 is curious. Richardson and Mere make special note that only one imago was seen on Tean, but in '63 the butterfly was flying commonly on that Island—almost in the same numbers as *A. urticae*! It will also be seen that there was an increase in most species in '63 compared with '56-7.

Tean, a small island off the coast of St Martin's, provides us with an interesting problem. Professor E. B. Ford's studies there with *P. icarus* are well-

known to most of us, but since 1948, when his experiments on the island finished, and since Dorien Williams removed his horses from it, the ecology has changed so much that *P. icarus* has now become quite rare, and probably extinct, on Tean. Ford, who was interested in my observations on the island, was not surprised that the removal of a few horses was sufficient to upset a balance and damage the populations of the insect to a state of ultimate extinction.

30.6.65. George Thomson (3689).

A HOLIDAY IN JERSEY

Early last June I stayed at L'Etacq, at the north end of St Ouen's Bay, in Jersey. The season and locality were

decided on for the botanical interest of the area, information on the plants of Jersey being reasonably easy to obtain. When it came to seeking out Lepidoptera prospects, however, it was brought home to me that, unlike botanists, most British entomologists seem quite unjustifiably to exclude the Channel Islands, considering them part of the Continent. Although their geographical position makes this understandable, they are still politically and linguistically British, and fully deserve to be included in books on our insect fauna. Undeterred by the apparent absence of useful literature in London, I wrote to the Société Jersiaise, and was rewarded with a copy of A. C. Halliwell's list of the Lepidoptera of Jersey, kindly sent by the author.

If I had hazy dreams of exotic butterflies I had never heard of, these were soon dispelled as I read through the list, and noted all those worth looking for in early June. Jersey Lepidoptera are very much the same as English ones, and there are no indigenous butterflies not found in England. But their relative abundance is quite another matter, as was very soon proved to me in those sunny and exciting ten days.

Everything was packed and ready, but I realised that there were a few of my pupae I could not leave at home for ten days, particularly certain precious ones which were clearly ready to emerge! So the journey proved to be far from uneventful. As we entered the taxi an Eyed Hawkmoth (*Smerinthus ocellata* Linn.) chose to emerge, and managed to spread its wings perfectly en route to Victoria Station. As our train moved out, so did a Pine Hawkmoth (*Hyloicus pinastri* Linn.), and this completed its wing development in a private part of Gatwick Airport. Fortunately, the rest were more considerate to me, and waited till we settled into our hotel.

On the following day, I set foot for the first time on the richly rewarding sand dunes which extend the entire length of St Ouen's Bay. A thick seamist maintained dull weather all day, but results were not affected by this. As I approached a sandy hollow, something orange slipped out of a large clump of Rough Star-thistle (*Centaurea aspera* Linn.) and glided low and gracefully over the coarse vegetation to settle precariously on a head of Hare's-tail Grass (*Lagurus ovatus* Linn.). Instinctively I knew what it was, and within moments I had triumphantly captured my first Glanville Fritillary (*Melitaea cinxia* Linn.). I was prepared for an abundance of this species along the whole bay, but it was generally scarce, with the memorable exception of one spot I discovered a few days later, where it more than compensated for its scarcity elsewhere. In this paradise, there were literally hundreds of Glanvilles and I could usually see five or six on the wing simultaneously. They were in perfect condition, too, indicating that their emergence was probably delayed a week or so by the cold weather at the end of May. I could not have timed it better. These butterflies quickly become worn and bleached by mid-June, but they manage to linger on until the end of the month. There is little apparent variation in this species in the Channel Islands, where it is generally common, though there is considerable variation on the Continent.

The sunny climate is also reflected by the abundant Speckled Woods (*Pararge aegeria* Linn.) the yellow markings of which in Jersey are a darker, richer colour than ours, very near the continental form, which they further resemble in their preference for open, bushy roadsides and overgrown, sheltered cliff-ledges, as well as woods. Woodland is comparatively scarce in Jersey.

If one is hard put to it to find a

locality in the Home Counties where Green Hairstreaks (*Callophrys rubi* Linn.) swarm, it is easy enough in Jersey where, in the north-west of the island, I found them in very large numbers among Gorse (*Ulex* sp.), and prostrate broom (*Sarothamnus scoparius* (Linn.) Koch subsp. *prostrata* Bailey) Tutin) bushes. They stayed close to, or on, these low bushes and were easy to catch. They were numerous on the south coast too, on heaths and cliff-tops.

Moth results were satisfactory though on the whole not outstanding. Yellow Belles (*Aspitates ochrearia* Rossi) were plentiful along the dunes, and I was fortunate enough to take three Small Grass Emeralds (*Chlorissa iridata* Linn.), another of those Jersey specialities very local in this country. Cinnabar Moths (*Callimorpha jacobaeae* Linn.) were common and very lazy on the roadsides, often sitting on the roads at their own risk. Grass Eggar larvae (*Lasiocampa trifolii* Linn.) occasionally turned up on coarse dune grasses, and at one spot, on low brambles, I found numerous larvae of that disgusting species, the Brown Tail (*Euproctis chrysorrhoea* Linn.), the urticating hairs of which have to be felt to be believed. Two Clouded Buffs (*Diacrisia sannio* Linn.) were netted on the Quennevais, a fascinating area of inland sand-hills in the south-west of the island, and two Oblique-striped (*Mesotype virgata* Hufn.) from St John's Wort (*Hypericum perforatum* Linn.) on coastal dunes nearby. Numerous 'Micros' are still to be identified.

Immigrant species and hawkmoths can very briefly be dealt with together. I saw not one of either! Clouded Yellows (*Colias croceus* Fourcr. and *C. hyale* Linn.), Queen of Spain Fritillaries (*Argynnis lathonia* Linn.) and Long-tailed Blues (*Lampides boeticus* Linn.) are all fairly regular late summer visitors, the last two usually in small numbers. The

commonest hawkmoth is the immigrant Humming-bird Hawk (*Macroglossum stellatarum* Linn.) with second place falling to the native Privet Hawk (*Sphinx ligustri* Linn.). Death's-head Hawkmoth larvae and pupae (*Acherontia atropos* Linn.) used to be fairly common in the countless acres of potato fields in Jersey, but spraying has greatly reduced these now. I was too early for all these, but about fifty years too late for the Spurge Hawkmoth (*Celerio euphorbiae* Linn.), once common in St Ouen's Bay. Pine Hawkmoths are now established locally.

I left sunny Jersey, and returned to cloudy London to find a profusion of egg-laying moths in my emergence cage! The release of some five hundred Buff-tip larvae (*Phalera bucephala* Linn.) is likely to have some effect on local trees. But the best things to come home to, entomologically, were the survival of three large Clifden Nonparail larvae (*Catocala fraxini* Linn.) sleeved on a now defoliated young poplar, and the laying of over a hundred fertile Eyed Hawk ova.

9.7.65.

B. Wurzell (3718).

THE STUDY OF SPIDERS

Part II

I hope I did not give you the impression in my last article that the study of spiders is a kind of armchair occupation comparable with that of the traveller who ventures intrepidly into the interior of his nearest public library. While it is true that the actual observation of their habits may conveniently be done by keeping spiders in captivity, you will have to venture afield—including to some of the less accessible spots—to obtain your spiders in the first place.

A good example of a spider which

is not found everywhere is *Atypus affinis* Eich., the first species on the British list and the only British representative of the extensive group Mygalomorphae or trap-door spiders. Our British Mygalomorph does not build a trap-door but a purse-like silken tube in the ground, one end of which protrudes two or three inches above the surface of the soil.

This species is found chiefly in the southern counties, particularly the seaboard ones such as Sussex, Hants and Dorset. It is not uncommon if looked for in the right places, and is immediately recognisable by the huge projecting chelicerae (jaws), which are the largest in any British spider. They are, of course, quite incapable of inflicting any injury on a human being, though, of course, they spell death to the stray beetle or other small creature which may be wandering in the vicinity of the silken tube.

The body length (i.e., excluding legs) of all species described is given (in millimetres) after their respective names. Females are larger than males, and the measurements given refer to full-grown specimens; *Atypus affinis* is 12 mm. in length.

Another species well worth looking for, although admittedly not one which turns up whenever you look for it, is the handsome *Amaurobius ferox* Walck. (10 to 11 mm.) This spider is stockily built, with short legs of more or less equal length, rather like a darker and slightly smaller edition of *Atypus affinis*, but without the huge jaws. Its abdomen is a dull black, faintly patterned with the typical *Amaurobius* markings, which are common to this and the other two members of this group, *A. similis* Blackwall and *A. fenestralis* Stroem. The cephalothorax, which is more of a burnt umber hue, has a shiny, polished appearance.

One of my strangest experiences with spiders was concerned with my first encounter with *A. ferox*. For

four and a half months I had searched for this species, in nine English counties, without avail; I had practically given up hope, and was turning my attention to another species, *Drassodes lapidosus* Walck., which had similarly eluded me.

One day I was in the garden, digging for earthworms for dissection in the biology class. I was idly overturning some bricks, when I noticed the unmistakable blue calamistrated webs characteristic of this group; I assumed they signified the presence of *Amaurobius similis*, the commonest of the three species. I did think that the webs were rather large for *A. similis*, but beyond that gave very little further thought to the matter.

Suddenly I noticed a slight movement, and as I looked more closely, there was a female *A. ferox* staring me in the face! I nearly dropped dead with shock, having looked assiduously for it everywhere for so long, only to find it in my own back garden!

A. fenestralis is more of a woodland species, though I have found it hibernating under an upturned wooden box in parkland. It is the smallest of the three, *A. similis* being the commonest and midway between the other two in size.

I made mention above of *Drassodes lapidosus*, which, as its name implies, is a denizen of stony habitats. My first specimen of this, too, was found under a brick in my garden; I had, in fact, been looking for a male *Amaurobius ferox*. On that particular occasion I found a female *D. lapidosus* (immature), also a very large female *Tegenaria atrica* (19 mm.), but subsequently, encouraged by my previous success (or rather, good luck) I found a male and another female *A. ferox*. I am now hoping that there will be the patter of baby *feroxes*' in the not-too-distant future!

The *Tegenarias* are sure to make your acquaintance very soon after you start spider-hunting; in fact, it is

ore likely that they will have ready done so before that, as this group includes the large hirsute features that come up the plug-hole into the bath or the kitchen sink. As a would-be wit said, the only spider that cannot go down a plug-hole is a wider spider; but this was an even better play on words than the innocent punster intended, since *Vider* was the name of a famous continental zoologist who was an authority on spiders and discovered several new species!

Tegenaria domestica Clerck (10 mm.) is the commonest of the three species; *T. atrica* Clerk (19 mm.) is like a much larger relative of *T. domestica*, with tremendously long hairy legs. This latter is the species that has startled many an unsuspecting non-arachnologist as he went down the coal-hole, and probably put him off spiders for good!

Tegenaria parietina Fourcr. is also very long-legged, but is less often found than the other two species, as it is more local in distribution. It is so smaller than *T. atrica*, and may be readily distinguished from it by the fact that its legs are ringed with alternate pale and darker stripes.

In my next article in this series I shall describe some of the spiders more commonly met with in wood-and habitats.

5.2.65. Joy O. I. Spoczynska,
F.R.E.S. (751).



DRAGONFLIES AND CADDISFLIES

I was interested in R. M. Payne's article in *The AES Bulletin* for November last entitled "Consider the flies"; interested because I have for years been disappointed that the Lepidoptera alone occupied the

attention of the great majority of the Members; so much so that I used to consider the title "The Amateur Lepidopterist's Society" would be more appropriate. I am glad to see, however, that during the last few years a few collectors have taken up other groups.

There are, however, two groups which have seldom or never been mentioned, dragonflies and caddisflies. I am surprised that so few turn their attention to dragonflies since they are among the most beautiful of our insect fauna and Miss Longfield's book makes it easy to identify them. I know, of course, that the way in which they lose their colours after death is a serious objection to collectors whose chief object is a beautiful display in their cabinets. There are, however, two ways in which this may be overcome to some extent; one, by allowing them to empty their intestines before being killed and the other by drying them rapidly on setting boards in heat. An old naturalist named Waterton used to eviscerate them and then paint the colours on the *inside* of the skin! My own method is to mount one pair for the cabinet but to keep all others folded in "envelopes" as, with the wings thus folded, it is much easier to study the wing venation and the genitalia, on both of which the classification is worked out. By slipping a piece of white paper between the wings the venation can be seen very easily.

They are interesting insects to keep in an aquarium from the egg stage. Eggs can be obtained by catching a female while ovipositing and expressing the ova into a tube of river water. Remember, however, that they are cannibals!

Caddisflies, I admit, make rather a dull show in the cabinet as they are mostly some shade of brown. They can be found on most streams and ponds by night as well as by day and

are easily taken with the ordinary net used for Lepidoptera. They too are quite interesting creatures to be kept in an aquarium. Fabre was interested in them and amused himself by giving them unusual things with which to build their cases, such, for instance, as grains of polished rice. etc. His notes on them can be found in his book "The Life of the Fly."

There is an excellent book on them by Mosley, perhaps out of print by now. I possess a copy which I am willing to sell to anyone interested at cost price, £1 1s. 0d., as it is of no use to me out here in South Africa. I had hoped to collect them when I came out here seventeen years ago but have only once found any; these were on a stream issuing from a forest at 6,000 ft. Here in Nqutu at 4,500 ft. I have never seen one; we are probably too warm.

They are extremely interesting from the varied and complicated form of the male genitalia, all of which are very well shown in Mosley's book.

Anyone living near Coventry might be interested to see a drawer of these insects in the collection which I gave to the museum there.

Another letter in the November issue which interested me was that from P. G. Gent, which gave the impression that he thought that the butterfly *Danaus plexippus* Linn. was confined to N. America. I can assure him that its close relative *D. chrysippus* Linn.—which he saw in Egypt—is almost our commonest butterfly here in Natal, in fact, it is so common that it has received an English name, "The African Monarch." *D. plexippus* was once taken in Glasgow in 1833; I saw this specimen in Coventry about forty years ago when it was still in good condition.

It may interest readers to learn that there are two English insects to be found out here, The Painted Lady,

Vanessa cardui Linn., which is quite common, and the dragonfly *Anax imperator* Leach, only seen occasionally.

A. H. Newton (1140).

P.O. Nqutu, via Dundee,
Natal, South Africa.

REFERENCE

MOSELY, M. E. (1939). *The British Caddis Flies*. Routledge, London.

RECORDS OF SOME LOCAL SCOTTISH BEETLES

During the Summer of 1965 I was able to spend a short time collecting beetles in various parts of Northern Scotland. The area first visited was a fairly large wood of mature conifers in Glen Feshie, Inverness-shire. On 29th June, which was a warm sunny day, this area was searched for beetles. *Rhagium bifasciatum* Fab. was found in fairly large numbers on fallen trees and decaying stumps together with several specimens of *Selatosomus impressus* Fab. Close by were several large stacks of newly felled pines (*Pinus* sp.) and these were examined in the early evening of the 29th June. Two species of weevil, *Hylobius abietis* Linn. and *Pissodes pini* Linn., were found to be fairly numerous. A single example of *Rhagium indagator* Fab., which is given as rare by Joy, was found at the sap of newly felled Scots Pine. *Thanasimus formicarius* Linn. was also found on the same log. Other beetles found in the area were *Cicindela campestris* Linn. and *Phosphuga atrata* Linn.

On 2nd July, an area of natural pine wood near Loch Maree, Ross and Cromarty, was visited. The fresh pine stumps, left after recent tree felling operations were carefully examined. *Thanasimus formicarius* and *Asemum striatum* Linn. were found in two localities, the latter being fairly numerous, at least six specimens

ing found on the same stump.

The third area visited on 3rd July was a stretch of coniferous woodland near Loch Arkaig, Inverness-shire. *hagium bifasciatum* was again found on decaying tree stumps, and the examination of a pile of bark, left after timber cutting, produced single examples of *Cychnus rostratus* Linn., *hagium mordax* Deg. and *Staphylinus rhythropterus* Linn.

All the areas visited were very good for beetle collecting, and if more time had been available (only an hour or so was spent collecting in any one locality) many more specimens would undoubtedly have been found.

I would like to thank Mr D. Crozer (36) of the AES Advisory panel, for general advice and assistance in identification and Miss H. Mollard for helping in the search for specimens.

8.65. J. K. Smith (3795).

REFERENCES

- UFFY, E. A. J. (1952). *Handbooks for the Identification of British Insects*, Vol. 5, Part 12, Coleoptera Cerambycidae. R. Ent. Soc., London.
 DY, N. H. (1932). *A Practical Handbook of British Beetles*. Witherby, London.

LEPIDOPTERA IN MALTA

Most people regard Malta as a hot, barren and rocky island; as there is normally no rain for the five months from May to September this is partly true but one has to live there throughout the year to obtain a true picture of the island's climate and natural history.

Malta is seventeen miles long and up to nine miles wide and lies in the central Mediterranean south of Sicily. The sister island of Gozo is about six miles by three. Both islands are composed of an upper and lower level of intensely hard coralline limestone and sandwiched in between is a thick stratum of soft globigerinal limestone

with small quantities of clay and greensand. The highest point, on the cliffs facing south-west, is about eight hundred feet.

The wild life is not, of course, nearly as rich as in southern Europe; even Sicily, about a hundred miles to the north of Malta, produces a much greater variety but nevertheless the entomological life in Malta was sufficient to resurrect in me the interest which, through professional studies and then the war, had fallen by the wayside soon after I left school.

I arrived in Malta, for a tour of duty with the Royal Air Force, in a ferocious thunderstorm at 6 a.m. on 6th November, 1961. This, they told me, was the first rain they had had this season and to make a good job of it over two inches had fallen during the night. In a few days the island turned from brown to green, the carefully fostered little stone-walled fields began to sprout their crops and, in every crevice in the areas of bare, rugged limestone where there was a small amount of soil, up sprang little bulb plants—tiny members of the iris, crocus, and lily families.

I had not been in Malta for more than a fortnight when I attended a cocktail party in the mess to welcome a V-Bomber squadron which had come out for a short stay. I was standing, drink in hand, talking to a group of young aircrew lads and I noticed that one of them appeared agitated and not 'with' the rest of us. Eventually, unable to contain himself any longer, he asked whether anyone knew anything about entomology; there was a stunned pause in the general conversation from which I rescued him by hesitantly admitting that I did know a little about it. He immediately grabbed me by the arm and led me out into the garden and there, resting near a light under a covered passage leading to another building, was a Spurge Hawkmoth (*Celerio euphorbiae* Linn.) surrounded

by three Gekkoes and dozens of small flies.

From this time onwards I was conscious of the various insects attracted to the light, also of the various sizes of Gekko which clamped themselves on to the wall or ceiling and took occasional swipes at small unsuspecting flies. The Spurge Hawkmoth turned out to be fairly common and a casual search each night along the covered ways usually produced two or three specimens of varying size.

At different periods during the autumn and spring, Striped Hawkmoths (*Celerio livornica* Esp.) appeared equally frequently and also, in smaller numbers, the Silver-striped Hawkmoth (*Hippotion celerio* Linn.) and Convolvulus Hawkmoth (*Herse convolvuli* Linn.).

Very few other moths came to the light but a delightful little Tiger Moth (*Euprepia pudica* Huebn.) was very common in the Autumn and so was the Four-spotted (*Acontia luctuosa* Schiff.), the Crimson Speckled Footman (*Utetheisa pulchella* Linn.), the Silver Y (*Plusia gamma* Linn.), the Lappet (*Gastropacha quercifolia* Linn.) and the Grass Eggar (*Lasiocampa trifoli* Schiff.). I also noticed several small types of Emerald which I was unable to identify and a species very similar to our Ruby Tiger, *Phragmatobia fuliginosa* Linn.

Although the Oleander bush (*Nerium oleander* Linn.) is widely grown in Malta for decorative purposes, the Oleander Hawkmoth (*Daphnis nerii* Linn.) is very seldom found there. I was very disappointed about this because I had hoped to undo a disaster which befell me in the Canal Zone of Egypt ten years before when I captured two of these delightful creatures and went to the length of making a setting board out of Balsa wood only to have the bodies of the specimens eaten by a mouse while they were still on the board in a drawer.

Humming-bird Hawkmoths (*Macroglossum stellatarum* Linn.) were extremely common in Malta for most of the year and were always to be found in gardens feeding on geranium and lantana.

The Death's Head Hawkmoth (*Acherontia atropos* Linn.) was also reputed to be common but the only specimen I saw was discovered in unusual circumstances. I was in my office on a hot May morning when a young pilot of a Shackleton aircraft telephoned me and reported that there was a "dirty great moth" in the radiator cowling of one of the engines of his aircraft. Over an hour elapsed before I could leave my office and drive to the other side of the airfield: in the meantime the engines had been started and 'run up' but the moth, incredibly, was still there. It was a Death's Head Hawkmoth and it was indeed dirty as it was now covered in a very fine film of oil which gave it an exotic glossy appearance. By means of an inspection ladder I rescued it on my finger and showed it to the genuinely interested mechanics who had gathered round; it then flew 'tweeting' away into some shrubs on a bank nearby.

The Hawkmoths which came to the light were seldom there in the morning so, in order to photograph them, I had to cheat a little. I found a long bamboo pole and attached a loop of thick wire to the end of it; when I saw a specimen worth photographing I would carefully reach up with the pole, much to the consternation of the Gekkoes, and gently coax the moth to crawl on to the wire; I would then hurry to my sitting room and leave the moth on the pole all night, leaving the light on so that it did not wake up, and in the morning before breakfast would take the moth out and place it on a shrub in the sunshine. If I was well organised I usually managed to take a couple of

Table 1. List of larger moths noted in Malta.

Death's-head Hawk	(<i>Acherontia atropos</i>)	May
Convolvulus Hawk	(<i>Herse convolvuli</i>)	Jun. Oct.
purge Hawk	(<i>Celerio euphorbiae</i>)	Jun. Sep.-Nov.
striped Hawk	(<i>Celerio livornica</i>)	May Jun.
silver-striped Hawk	(<i>Hippotion celerio</i>)	Nov. Dec.
Humming-bird Hawk	(<i>Macroglossum stellatarum</i>)	All year
Grass Eggar	(<i>Lasiocampa trifolii</i>)	Sep. Oct.
Appet	(<i>Gastropacha quercifolia</i>)	Sep. Oct.
Ruby Tiger	(<i>Phragmatobia fuliginosa</i>)	Mar.
	(<i>Euprepia pudica</i>)	Oct.
Crimson Speckled Footman	(<i>Utetheisa (=Dejopeia) pulchella</i>)	Sep.-Nov.
Word-grass	(<i>Xylena exsoleta</i>)	Dec.
Four-spotted	(<i>Acontia luctuosa</i>)	Jun.
Silver Y	(<i>Plusia gamma</i>)	All year

The dates given are not exhaustive but serve as a rough guide.

careful shots before the moth decided that the early morning sun was no place for him and would commence the very high frequency fluttering which precedes take-off.

I only once saw a Gekko take a moth and that was at a time of year when there were few flies about. The victim was a small specimen of silver-striped Hawkmoth and although the moth was fast asleep the Gekko's approach was extremely stealthy; when it finally struck it wiped the whole body in one 'chomp' and only the wings were to be seen protruding from its mouth.

Of all the Hawkmoths in Malta I found the Spurge Hawk most interesting. Apart from the differences in size there was a striking variation in the shade of green on the fore wings and in addition some specimens were distinctly pink in the areas which are normally light brown but these latter were mainly specimens which had been bred in captivity.

The colourful larvae of the Spurge Hawk were very easy to find. Their food plant was a small annual Spurge (*Euphorbia pinea* Linn.) which grew everywhere on waste ground and road-sides and one could often spot the larvae as one walked along. I therefore constructed a 'cage' from a large cardboard box and some mosquito netting and reared several larvae with complete success. I placed the foodplant in a small beer

bottle in the cage and was amazed at the larval appetite and speed of growth. On the advice of a Maltese entomologist I kept moist the box of earth which was provided for pupation but otherwise they were no trouble and it was a great thrill when the moths burst forth, usually while I was working at my desk in the evenings. I thus collected a series of both set specimens and photographs showing the variations in size and colour of this species.

It was not long after my arrival in Malta when I was seen admiring the mess gardens and, as is often the way of service life, I was deemed thereby to have volunteered to be Gardens Officer and was duly elected unanimously at the next mess meeting. Although a garden which grew oranges and bananas and which was subject to a hot dry Summer was strange to me, I was not unduly perturbed as there was a hard-working, fat little Maltese gardener who by force of habit appeared to go through all the right motions at the right time of year and did all the hard work.

I found this sub-tropical garden very interesting and gorgeous things like hibiscus, bougainvillea and poinsettia grew readily and rapidly. It only took me one spring to find out which flowers attracted the butterflies and after I had used (or misused) my influence for about a

year the garden had become an entomologist's paradise. The most successful flower was blue Statice, locally called Sempervivum or Everlasting Flower, closely followed in lepidopterous popularity by Zinnia and Bougainvillea. Fortunately not only did all three last well into the hot dry season but they were also considered attractive by the mess members in general who thought I was doing a great job on their behalf!

Thus instead of seeing an occasional Swallowtail (*Papilio machaon* Linn.) and 'Cleopatra' Brimstone (*Gonepteryx cleopatra* Linn.) in the garden I had several of each present at the same time, sharing the flower-heads with swarms of Painted Lady (*Vanessa cardui* Linn.) and large numbers of Red Admiral (*Vanessa atalanta* Linn.), Large and Small White (*Pieris brassicae* Linn. and *P. rapae* Linn.) Bath White (*Pontia daplidice* Linn.), Clouded Yellows (*Colias croceus* Fourcr.) and Meadow Brown (*Maniola jurtina* Linn.).

I spent many hours stripped to my shorts in the blistering sun trying to take close-up colour photographs of these delightful but restless creatures. The Swallowtail I found particularly difficult as its wings fluttered con-

tinually even while it was settled on a flower; in exasperation one day I conceived the evil notion of netting a specimen and giving it a whiff of the bottle but having replaced the poor bewildered thing on to a convenient flower it looked so wan, forlorn and unnatural that it was not worth photographing. I did in fact later come across an occasional more subdued specimen of the Swallowtail and achieved several good colour slides from these.

In Malta the Swallowtail prefers to lay its eggs on Rue (*Ruta bracteosa* DC.) but I also found a large number of larvae on Fennel (*Foeniculum vulgare* Mill.). The amount of blue colour in the butterfly varies considerably, the darker specimens being found later in the year; I found and photographed one specimen which was completely devoid of the blue normally present in the hind-wings.

It was a great delight to see such large numbers of Clouded Yellows; they appeared to prefer the lantana bushes (a form of flowering currant with variegated orange and red flowers) in the garden. In the spring brood the majority of the females were var. *helice* and I spent an interesting ten minutes one May morning

Table 2. List of butterflies noted in Malta.

Speckled Wood
Wall
Meadow Brown
Small Heath
Red Admiral
Painted Lady
Long-tailed Blue

Brown Argus
Common Blue
Small Copper
Large White
Small White
Bath White
Clouded Yellow
(Brimstone)
Swallowtail
(Skipper)

(*Pararge aegeria*)
(*Pararge megera*)
(*Maniola jurtina*)
(*Coenonympha pamphilus*)
(*Vanessa atalanta*)
(*Vanessa cardui*)
(*Lampides* (= *Cosmolyce*) *baeticus*)
(*Lampides* (= *Syntarucus*) *telicanus*)
(*Aricia agestis*)
(*Polyommatus icarus*)
(*Lycaena phlaeas*)
(*Pieris brassicae*)
(*Pieris rapae*)
(*Pontia daplidice*)
(*Colias croceus*)
(*Gonepteryx cleopatra*)
(*Papilio machaon*)
(*Gegenes pumilio*)

The months of abundance were April to June and September to November but the small species (Blues, Small Copper and Small Heath) appeared able to withstand the hot dry months of July and August. It was evident that *V. cardui* and *G. cleopatra* hibernated through the colder months of December, January and February.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

HIRD (1965) SUPPLEMENT TO THE 1962 MEMBERSHIP LIST and GEOGRAPHICAL KEY

NEW MEMBERS AND ADDITIONS TO MAIN LIST

- shdown, E. J. (3899), Cobwebs, Hadlow Down, Uckfield, Sussex.
skey, W. W. (3773), 91a Market Street, Chapel-en-le-Frith, Via Stockport, Cheshire. L.
xelsson, L. (3885), Jarnvagen, Kungsängen, Sweden. R.
adham, D. F. J. (3814), 58 Great House Road, St John's, Worcester, Worcs. L., C., O.
annister, R. J. (3817), Trelorgan, Lidden, Penzance, Cornwall.
ayntun, P. (3748J), Whitegates Private Hotel, 15 The Valley, Scarborough, Yorkshire. C., L.
eeby, J. (3896J), 94 Church Road, Stockingford, Nuneaton, Warwickshire. L.
owen, I. (3745), 5 Cowper Street, Roath, Cardiff, Glamorgan, S. Wales. L., mic., P.
owers, P. D. (3841J), 12 Theydon Park Road, Theydon Bois, Nr Epping, Essex. L.
radley, J. R. (3867J), 93 Marldon Road, Shiphay, Torquay, Devon. *Orth.*
rasier, J. A. S., N.D.A.Dip. Agric. (N.A.C.), F.R.E.S. (3786), Devon School of Agriculture, Bicton, East Budleigh, Devon. *Ag. ent.*
riddon, D. (3835J), 1 Chesterfield Road, Beeley, Nr Matlock, Derbyshire. L.O.C.
rook, M. P. (3838J), Woodsome View, Common End Lane, Fenay Bridge, Nr Huddersfield, Yorkshire. L.
rown, A. D. R. (3851J), 9 Stoke Park Road, Stoke Bishop, Bristol 9. L.
rown, A. J. (3854), 1 Weir View, Charminster, Dorchester, Dorset. D.
rown, C. G. (3904J), 14a Frogal Lane, London, N.W.3.
rown, I. C. N. (3743J), The Square, St Briavels, Nr Lydney, Gloucestershire. L.
urchell, R. W. (3900), 22 London Road, Pulborough, Sussex.
urden, Dr P. J. (3875), 10 Broadwater Down, Tunbridge Wells, Kent. R.
urrows, D. S. (3741), 22 Lime Tree Walk, West Wickham, Kent. L.
urrows, N. L. (3742), 22 Lime Tree Walk, West Wickham, Kent. L.
utterfly World (3876), 295 East 98th Street, Brooklyn 12, New York, U.S.A.
affell, C. R. (3857J), 4 Buttermere, Augustus Street, Regent's Park, London N.W.1. L.
artmell, M. W. J. (3826J), 21 Camberley House, Redhill Street, Regent's Park, London, N.W.1. L.
arvalho, Fernando Vaz dos Santos (3807), Av. Visconde de Valmor, 71 r/c, Lisboa - I, Portugal. L. C.
hadwick, G. B. (3827), 17 Kensington Gardens Square, Bayswater, London, W.2. L.
haphman, Mrs V. A. (3832), Flat 18/2B/1/3, Devils Tower Road, Gibraltar. L.
hoat, G. H. (3793J), 83 The Fairway, S. Ruislip, Middlesex. L.
lark, C. J. (3730), Threeways, 254 Ashington Road, Rochford, Essex. L.
lark, H. A. C. T. (3910), Guston, Chelwood Gate, Sussex. L. P.

- Clarke, B. T. (3810J), 2 The Fairways, North Wembley, Middlesex. *Orth.*, C., L., O.
- Clarke, L. C. (3801), 10735 Georgetown Drive, Rancho Cordova, California 95670, U.S.A. R.
- Coker, N. G. (3735J), The Red House, Mistley, Manningtree, Essex. L., O.
- Collins, J. S. (3762), 171 Long Lane, Bexleyheath, Kent. L., C.
- Cook, P. L. (3916), 27a Onslow Road, Richmond, Surrey. C., e.
- Crane, R. G. (3760J), Loxley, Barrow Hill, Goodworth, Clatford, Andover, Hants. L., O., *Orth.*
- Crouchman, D. W. P. (3886), 36 Harewood Road, Chelmsford, Essex. L.
- Collompton Junior Insect Club (3784A), County Primary School, Cullompton, Devon. *ent.*
- Danner, J. M. (3774J), 7 Cumberland House, Kensington Road, London W.8. L.
- Davies, N. R. (3818J), 34 Roche Gardens, Bletchley, Bucks. L.
- Dickinson, J. A. (3805J), 77 Cookridge Drive, Leeds 16, Yorkshire. L.
- Docwra, W. H. A. (3764), 36 Portnalls Road, Coulsdon, Surrey. L.
- Dublou, C. F. (3861), c/o Dr Dublou, The Flat, Broadgate Hospital, Beverley, Yorkshire. *ent.*
- Dutton, S. M. (3734J), 23 Greenstead Gardens, Woodford Green, Essex. L., C.
- Eales, H. T. (3874), 6 Middleton Avenue, Fenham, Newcastle-upon-Tyne, Northumberland.
- Edmonds, M. H. (3821), Gaveston, 938 Warwick Road, Solihull, Warwickshire. *bot.*
- Else, G. R. (3881), 10 King George Road, Portchester, Nr Fareham, Hants. C., L.
- Eschbacher, C. J. (3731), 38 Frith Road, Bognor Regis, Sussex. L.
- Evans, R. (3824), 28 Hunts Road, Stratford-on-Avon, Warwickshire. *ent.*
- Eve, H. C. (3765J), 173 Court Road, Orpington, Kent. C.
- Felton, J. C. (3740), Beechcroft, 20 Gore Court Road, Sittingbourne, Kent. H.
- Ferneley, E. H. H. (3744), Hall of Residence, Isle of Ely Horticultural Institute, Wisbech, Cambridgeshire. *ent.*
- Fitzjohn, F. E. (3815), 49 Hillside Avenue, Borehamwood, Herts. *ent.*
- Franks, D. S. (3843J), 3 Abbots Place, Crowmoor, Shrewsbury, Shropshire. L.
- Fraser, J. K. (3802), Killala, 12 Belmont Crescent, Londonderry, N. Ireland. D., *Hem.*
- Fricker, M. J. (3847), 16 Devonshire Road, Harrow, Middlesex. L.
- Gladwell, Miss A. (3733), Jason, 32 Woodside Road, Woodford Green, Essex. L.
- Goldsmith, B. L. (3751), 23 Chilton Drive, Higham, Nr Stood, Kent. C., L., *Orth.*
- Gregory, R. T. (3753J), 11 Grange Road, Bishop's Stortford, Herts. L., m.
- Grey, P. R. (3820), Ashleigh, St George's Road, Weybridge, Surrey. L.
- Griffin, W. G. (3836J), 2 Waldemar Avenue, Ealing, London, W.13. L., C.
- Grimsell, D. P. C. (3855J), 17 Avondale Road, Benfleet, Essex. L., C.
- Halliday, B. W. (3811), 15 The Oval, R.A.F. Henlow, Bedfordshire. *nh.*, P.
- Hall, M. L. (3868J), 39 Lowlands Road, Pontnewydd, Cwmbran, Mon. L., C., *Orth.*
- Hamilton, C. J. (3890J), 18 Ferrymead Avenue, Greenford, Middlesex. L., C.
- Hanbury, R. L., M.A. (Cantab.), F.P.S. (3739), The Gatehouse, Foxbury, The Ridge, Woldingham, Surrey. L., H.

- ansen, C. B. (3779), 4901, 39th Avenue South, Minneapolis, 17, Minnesota 55417, U.S.A. L.
- argroves, R. A. (3777), 55 School Road, Hall Green, Birmingham 28. L.
- arman, A. R. (3747J), 47 Eltham Park Gardens, Eltham, London S.E.9. L.
- art, C. (3845), 9 Donnybrook Road, Streatham, London, S.W.16. L., *ent.*, *nh.*
- artley, A. J. (3782J), The Pines, Lynch Green, Hethersett, Norwich, Norfolk, NOR 42X. L., O.
- arwood, A. (3862), 70 Camphill Road, Woolton, Liverpool 25. L.
- aynes, P. G. (3912), 152 Beech Hall Road, Highams Park, London E.4. L.
- ayton, P. (3775), Thornton, 21 Hall Park, Scotforth, Lancaster. L.
- leath, G. (3781), 35 Maxwell Avenue, Birmingham 20. L.
- leath, J., F.R.E.S. (3882), Merlewood Lodge, Windermere Road, Grange-over-Sands, Lancashire. ML.
- epworth, A. (3837J), 86 Palmeira Road, Bexleyheath, Kent. L.
- ing, J. (3771J), 4 York Drive, Ramsbottom, Via Bury, Lancashire. C.
- oe, S. T. (3914J), 50 Chesterfield Drive, Burton Joyce, Notts. L., H.
- oe-Richardson, J. A. (3778), 7 Riseway, Long Riston, Nr Hull, Yorkshire. b., L., ML., Ar.
- olford, N. A. (3804), 13 Invergordon Avenue, Drayton, Portsmouth, Hants. C.
- opkins, A. J. (3812), 98 Belvoir Street, Derby, Derbyshire. L.
- oward, V. M. (3871), 113 Waverley Road, Stoneleigh, Epsom, Surrey. H., *Orth.*, D.
- owe, J. J. (3879), 1 Danesfoot Avenue, Guisborough, Yorkshire. L.
- umm, R. J. (3776J), 34 South Western Road, East Twickenham, Middlesex. L.
- urie, Miss F. R. (3883), Science Department, Wispeis School, West Dean, Chichester, Sussex. e., *insect pests.*
- man, S. P. (3858J), 29 Mudeford Lane, Christchurch, Hants. *Hem.*, D. N.
- ackson, J. (3873J), 42 Hyde Road, Sanderstead, Surrey. H., b.
- ones, A. H. (3853), 3 Ruabon Road, Didsbury, Manchester 20. H., L.
- ones, A. L. (3750), 37 (F) Squadron, R.A.F. Catterick, Yorkshire. Ar., C., *Hem.*
- ones, D. J. (3852J), 62 Clapton Approach, Woodburn Green, High Wycombe, Bucks. L.
- ones, M. H. C. (3860J), 25 Charfield Close, Bournville, Birmingham 30. L.
- ones, P. E. B. (3889), Tanglewood, Boundstone Road, Boundstone, Nr Farnham, Surrey. L.
- ompson, S. A. (3828J), 66 Glebe Street, Caldmore, Walsall, Staffs. H.
- irchin, A. L. (3767), 2 Seymour Road, West Bridgford, Nottingham, Notts. L.
- ane, D. (3901), 118 Coldershaw Road, West Ealing, London W.13. L.
- ivender, T. J. (3806), 4 Radnor Avenue, Welling, Kent. L.
- ee, Miss A. J. (3749J), 6 Sandy Lodge Way, Northwood, Middlesex. *ent.*
- ckley, J. M. (3737), 64 Avondale Avenue, Hinchley Wood, Esher, Surrey. *ent.*, C.
- odge, D. L. (3906), 19 Jane Street, Saltaire, Shipley, Yorkshire. *Hr.*
- cCurdy, J. M. (3792), 144 Old Road, Ashton in Makerfield, Wigan, Lancs. C., L.
- cLean, I.F.G. (3848J), The Cottage, Cromer Hall, Nr Stevenage, Herts. L.
- ajer, C. P. (3893J), 5 Fairlawn Drive, East Grinstead, Sussex. *ent.*
- ajer, J. D. (3892J), 5 Fairlawn Drive, East Grinstead, Sussex. *ent.*, L.

- Mann, Miss D. (3840J), Greenacre, Cannon Hill, Southgate, London N.14. *L.*
Marcan, Miss H. (3763J), Marlow Nurseries, Boroughs Grove, Little Marlow, Bucks. *L.*
Marchant, R. (3888), 35 Kiln Drive, Great Cornard, Sudbury, Suffolk. *L.*
Mary, Miss P. (3788J), Birchwood, Ellerton Road, Wimbledon, London, S.W.20. *L.*
Mason, B. A. (3834), 79 Coolgardie Avenue, Chigwell, Essex. *L.*
Massey, W., LL.B. (3738), 24 River Walk, Townhill Park, Southampton, Hants. *D., C., mic.*
Mattheyse, F. J. (3755J), 39 Lovedale Avenue, Silverfields, Krugersdorp, Transvaal, South Africa. *R.*
Measday, A. V., Grad.I.Mech.E. (3917), 84 Meadow Road, Kingswood, Watford, Herts. *L., D., H., C.*
Mills, N. J. (3897J), 29 Homewood Road, St Albans, Herts. *L.*
Milton, C. (3869), 15 Carsington Crescent, Allestree, Derby. *Hr., C.*
Mitchel, J. H. (3752), 11 Tennyson Close, Huntingdon, Hunts. *L.*
Moon, D. J. (3850), 2 Fremantle Crescent, Sutton Estate, Middlesborough, Yorks. *L.*
Moor, F. (3800J), 80 North Albert Street, Fleetwood, Lancashire. *L., ML., C., D., H., O.*
Morrison, B., B.Sc., M.I.Biol. (3761), 12 St Vincent Street, Edinburgh 3. *L., N., ent.*
Mortimore, J. P. (3783J), 75 Sebright Road, Barnet, Herts. *ent.*
Nadolny, J. J. (3884), 35 Varmor Dr.—P.O. Box 53, New Britain, Connecticut, 06050, U.S.A. *Hr., O., C.*
Netherwood, A. (3859), 5 Glenborough Avenue, Stacksteads, Bacup, Lanc. *L.*
Newbury, Miss L. E. (2866), 16 Clifden Road, Twickenham, Middlesex. *L., Orth., O.*
Nicholson, A. A. (3844J), Rhyll Manor, Dulverton, Somerset. *L.*
North, D. P. (3891), 59 Hall Drive, Sydenham, London S.E.26. *L.*
Northey, P. W. (3758J), 10 Little Austins, Farnham, Surrey. *L.*
Northfield, R. G. W. (3766), 99 Lichfield Road, Cambridge, Cambs. *ent.*
O'Neil, A. J. (3746), 84 Featherstone Gardens, Borehamwood, Herts. *ent.*
Payne, R. G. (3856J), 27 Medway Grove, Kings Norton, Birmingham 30. *ent., L., bot.*
Payne, T. P. H. (3803), Lindum, Woodside Avenue, Dersingham, King's Lynn, Norfolk. *L.*
Penney, C. (3880J), 7 Percy House, Ullathorne Road, Streatham, London, S.W.16. *L.*
Perceval, M. J. (3798), Flat 5, 83 Holland Park, London, W.11. *R.*
Perkins, F. (3770), Palmeria, Slingsby Walk, Harrogate, Yorkshire. *C., L.*
Phillips, J. A. (3816J), 73 Prout Street, Longsight, Manchester 12. *L.*
Pool, M. (3829J), By-the-Way, Green Lane, Ilsington, Newton Abbot, Devon. *L.*
Powell, W. (3915), 21 Wheatsheaf Avenue, Sutton Leach, St Helens, Lancashire. *L., C.*
Prior, G. (3909), 23 Manor Way, North Harrow, Middlesex. *L.*
Proctor, S. I. Y. (3769J), Belfit House, Wingerworth, Nr Chesterfield, Derbyshire. *L.*
Ranson, F. E. (3849), 38 Westley Road, Bury St Edmunds, Suffolk. *L., C.*
Rawlings, C. J. (3902), 5 Berther Road, Hornchurch, Essex. *L.*

- ead, R. W. J. (3830), 43 Holly Terrace, Hensingham, Whitehaven, Cumberland. *ent.*
- edman, N. H. (3903J), 14 Wetherby Road, Borehamwood, Herts. *L.*
- ideley, T. (3895), 32 Buckingham Way, Flackwell Heath, Nr High Wycombe, Bucks. *ent.*
- oberts, F. (3825J), 115 Plas Dinas, Blacon, Cheshire. *L., ent.*
- oberts, K. A. (3905J), 85 Elers Road, Ealing, London, W.13. *ent., S., L.*
- obinson, G. S. (3911J), Heversham Grammar School, Milnthorpe, Westmorland. *L.*
- ock, M. A. (3846J), 182 Whitmore Way, Basildon, Essex. *L., O.*
- oiser, M. (3831), 19 Sylvan Close, Selsdon, Surrey. *ent.*
- oss, Miss S. M. (3913J), Monks Cottage, Leaveland, Nr Faversham, Kent. *C., L.*
- owden, R. (3866J), 20 The Ridgeway, Fetcham, Leatherhead, Surrey. *L.*
- oys, P. J. H. (3799J), Hanbury, 9 Clayton Drive, Prestatyn, Flintshire, N. Wales, *L., C.*
- ussell, P. H. A. (3772), Fyfield County Secondary Boarding School (Staff), Ongar, Essex. *L., H., D.*
- auders, A. P. (3780J), Yew Tree Cottage, Broughton, Stockbridge, Hants. *L.*
- chofield, P. K. (3809), 112 Beaconfield Road, Epping, Essex. *Orth., D., L.*
- cribot, A. (3768J), 67 Hartismere Road, London, S.W.6. *mic.*
- cutt, M. S. (3877J), 14 The Ridgeway, Putnoe, Bedford, Beds. *L.*
- hutt, A. (3787), 10 Southey Hall Road, Sheffield 5. *L.*
- martt, J. B. (3797), 89 Connaught Street, Phibsboro., Dublin 7, Ireland. *L., D., P.*
- nith, B. M. (3796), Masecraft, 17 Masefield Road, Painters Ash, Northfleet, Kent. *ent., L.*
- nith, C. D. W. (3908J), 166 Bromham Road, Bedford, Beds. *L.*
- nith, Miss E. H. (3808), Alderlea, Lealholm, Whitby, Yorkshire. *H.*
- nith, G. A. (3790), Attlebridge, Norwich, Norfolk, NOR57X. *L.*
- nith, J. K. (3795), 12 Oulston Road, Stockton-on-Tees, Co. Durham. *C.*
- nith, L. (3802J), Masecraft, 17 Masefield Road, Painters Ash, Northfleet, Kent. *L.*
- nith, M. W. P. (3907), 166 Bromham Road, Bedford, Beds. *L.*
- nith, R. M. (3823), 11 Elmwood Close, Balsall Common, Nr Coventry, Warwickshire. *L.*
- ophers, D. A. (3757), 392 London Road, Deal, Kent. *L.*
- rkes, A. (3794), 1 Sunny Heys West, Meltham, Huddersfield, Yorkshire. *L.*
- arrant, L. G. (3878J), 3 Blake Hill Crescent, Parkstone, Poole, Dorset. *L.*
- aylor, J. (3898J), 37 Cambridge Road, St Albans, Herts. *L.*
- ogal, M. (3872J), 10 Oak Close, Southgate, London, N.14. *L.*
- uck, F. C. (3754J), 101 Mead Way, Bushey, Nr Watford, Herts. *L.*
- ull, D. W. (3756), 3 Hythe Avenue, Bexleyheath, Kent. *L.*
- uler, D. B. (3865), 15 Church Lane, Norton, Letchworth, Herts. *L.*
- uszcza, J. M. (3813), 67 Sopwell Lane, St Albans, Herts. *ent., L.*
- ward, K. J. (3819), 22 Redriff Estate, Elgar Street, Rotherhithe, London S.E.16. *L.*
- warde, A. S. (3789J), 30 Weald Lane, Harrow Weald, Middlesex. *L., ent.*
- atson, P. A. (3842J), 39 Mayfair Avenue, Bexleyheath, Kent. *L.*
- Whitehead, A. J. (3833), 36 High Street, Blisworth, Northampton, Northants. *L.*

- Wilkinson, R. S. (3839), University College, London, W.C.1. L.
 Williams, I. T., F.Z.S. (3791), Min-y-Graig, Bryn-y-Felin, Dyserth, Flintshire. L.
 Willmott, K. J. (3822J), 34 Daybrook Road, Merton Park, London, S.W.19. L.
 Wills, H. J. (3732), Greylands, Furse Hill Road, Ilfracombe, Devon. D. C., *nh*.
 Wilson, K. J. (3736), 4 Station Road, Worle, Weston-super-Mare, Somerset. L.
 Wilson, M. R. (3887), 191 Castle Road, Ings Farm Estate, Redcar, Yorkshire. L.
 Winchester, J. (3863J), 3 Heath Side, Petts Wood, Kent. L.
 Wingate, B. (3894), 41 Buckingham Way, Flackwell Heath, High Wycombe, Bucks. *Hr*.
 Woodthorpe, Miss E. M. (3785J), Timber Rise, Rambling Way, Potten End, Berkhamsted, Herts. L.
 Worling, P. M., F.P.S. (3870), 5 Briar Close, Caversham, Reading, Berks. L.
 Young, G. H. (3864J), 4a The Parade, King's Road, Brentwood, Essex. L., C.
 Young, M. R. (3759J), Foxdown, Swainshill, Herefordshire. L.

ADDRESS CHANGES AND CORRECTIONS

- Altman, E. G. (3704), 125 Katoomba Street, Katoomba, New South Wales, Australia.
 Bailey, N. M. (1230), E.A.T.R.O., P.O. Box 96, Tororo, Uganda.
 Bobe, K. H. (912), 3 Strode Gardens, St Ives, Ringwood, Hants.
 Bradley, A. (269), 75 Bradham Lane, Exmouth, Devon.
 Burdin, J. W. (3562), 6 Davan Place East, Balgillo, Broughty Ferry, Angus.
 Bureau of Animal Population (2163A), c/o Parker & Son, Booksellers, Oxford, Oxon.
 Burgess, P. V. (3355), 16 Kendall Avenue South, Sanderstead, Surrey.
 Capener, A. L. (6), Hotel Caravelle, 509 Pretorius Street, Pretoria, South Africa.
 Coles, B. (3533J), Willowfield, Steeple Ashton, Oxon.
 Cooke, N. H. (3266), Ashlands, Hambledon, Godalming, Surrey.
 Cross, J. E. (3465), 3 Mallord Street, Chelsea, London, S.W.3.
 Dixon, G. F. (1809), 107 Cambrian Drive, Rhos-on-Sea, Colwyn Bay, Denbighshire.
 Divett, A. W. (3563), 46 Broadfern Road, Knowle, Solihull, Warwickshire.
 Docwra, G. (3538), 10 Lyndhurst Road, Coulsdon, Surrey.
 Dunn, A. (2963), 78 Phillips Lane, Formby, Nr Liverpool, Lancs.
 Dyer, J. L. (2319), 3 St George's Road, Sevenoaks, Kent.
 Dyson, R. C. (91), 58 Stanford Avenue, Brighton 6, Sussex.
 Fisher, R. E. G. (2404), Greenway, Gabwell Hill, Maidencombe, Torquay, Devon.
 Fox, T. H. (105), 30 St Mary's Close, Littlehampton, Sussex.
 Fraser Hay, Mrs M. (3535), Plum Tree Farm, School Lane, Manley, Cheshire.
 Hammett, M. J. (3527), Flat 4, Salisbury House, Church Road, Erdington, Birmingham 24.
 Hard, P. L. S. (3629J), Birdcombe Court, Wraxall, Nr Bristol, Somerset.
 Harman, A. J. E. (2721), 20 Chesnut Close, Hockley, Essex.
 Hilliard, R. D. (99), 18 Golf Close, Stanmore, Middlesex.
 Holmes, A. M. (3337), 260 Keewatin Avenue, Toronto 12, Ontario, Canada.
 Hughes, M. O. (3612), 4 Pleasant Street, Craig-y-Don, Llandudno, Caernarvonshire, North Wales.

- vin, R. R. (1220), 7009 South Loomis Boulevard, Chicago, Illinois 60636, U.S.A.
- Jnes, M. (3701), Guy's Hospital Medical School, London Bridge, London, S.E.1.
- Jnes, R. W. (1061), Torendo, 11 Station Road, Newhaven, Sussex.
- ittle, E. (3688), Roadside Mailbox 33, Leneva via Wodonga, Victoria, Australia.
- ewellyn, D. J. (3514J), 21 St. Andrew's Road, Heaton Moor, Stockport, Cheshire.
- ge, W. (3299), 36 Hornbeam Road, Theydon Bois, Essex.
- rmenter, L. (895), Woodside, Pinewood Road, Ferndown, Dorset.
- iche, Dr P. (2965), Central Laboratory, Queen Elizabeth Hospital, Jesselton, Sabah, Malaysia.
- Soczynska, Mrs J. O. I. (751), Jasmineholm, 100 Kingsley Park Terrace, Northampton, Northants. Ar.
- Seel, Mrs I. I. (3722), 8 Hogarth Road, Hove 3, Sussex.
- Sprey, W. H. (277), 26a Millington Road, Cambridge, Cambs.
- omas, A. W. (3499), Dept. of Biology, Hamilton Hall, McMaster University, Hamilton, Ontario, Canada.
- Yatt, J. C. (3578), 57 Arlington Drive, Old Marston, Oxford, Oxon.
- Yhicher, L. S. (1345), 10 Chanctonbury Chase, Redhill, Surrey.
- Yhite, E. S. (3454), 15 Hillbrook Road, Tooting, London S.W.17.
- Yirth, B. W. (3218), Wuhrmattstrasse 11, Zofingem/AG, Switzerland.
- Yncent, D. (3702), 1 North Cottages, Gussage-All-Saints, Wimborne, Dorset.

GEOGRAPHICAL KEY

ENGLAND

BEDFORDSHIRE

Bedford

Scutt, M. S.

Smith, C. D. W.

Smith, M. W. P.

Henlow

Halliday, B. W.

BERKSHIRE

Reading

Worling, P. M.

BRISTOL

Brown, A. D. R.

BUCKINGHAMSHIRE

Bletchley

Davies, N. R.

High Wycombe

Jones, D. J.

Rideley, T.

Wingate, B.

Little Marlow

Marcan, Miss H.

CAMBRIDGESHIRE

Cambridge

Northfield, R. G. W.

Wisbech

Ferneley, E. H. H.

CHESHIRE

Blacon

Roberts, F.

Chapel-le-Frith

Askey, W. W.

Manley

Fraser Hay, Mrs M.

Stockport

Llewellyn, D. J.

CORNWALL

Penzance

Bannister, R. J.

CUMBERLAND

Whitehaven

Read, R. W. J.

DERBYSHIRE

Allstree

Milton, C.

Chesterfield

Proctor, S. I. Y.

Derby

Hopkins, A. J.

Matlock

Briddon, D.

DEVONSHIRE

Cullompton

Cullompton Junior Insect Club

East Budleigh

Brasier, J. A. S.

Exmouth

Bradley, A.

Ilfracombe

Wills, H. J.

Newton Abbot

Pool, M.

Torquay

Bradley, J. R.

DORSETSHIRE

Dorchester

Brown, A. J.

Ferndown

Parmenter, L.

Poole

Tarrant, L. G.

CO. DURHAM

Stockton-on-Tees

Smith, J. K.

ESSEX

Basildon

Rock, M. A.

Benfleet

Grimsell, D. P. C.

Brentwood

Young, G. H.

Chelmsford

Crouchman, D. W. P.

Chigwell

Mason, B. A.

Epping

Schofield, P. K.

Hockley

Herman, A. J. E.

Hornchurch

Rawlings, C. J.

Manningtree

Coker, N. G.

Ongar

Russell, P. H. A.

Rochford

Clark, C. J.

Theydon Bois

Bowers, P. D.

Page, W.

Woodford Green

Dutton, S. M.

Gladwell, Miss A.

GLOUCESTERSHIRE

Lydney

Brown, I. C. N.

HAMPSHIRE

Andover

Crane, R. G.

Christchurch

Inman, S. P.

Fareham

Else, G. R.

Portsmouth

Holford, N. A.

Ringwood

Bobe, K. H.

Southampton

Massey, W.

Stockbridge

Saunders, A. P.

HEREFORDSHIRE

Swainshill

Young, M. R.

HERTFORDSHIRE

Barnet

Mortimore, J. P.

Berkhamsted

Woodthorpe, Miss E. M.

Bishop's Stortford

Gregory, R. T.

Borehamwood

Fitzjohn, F. E.

O'Neill, A. J.

Redman, N. H.

Letchworth

Tyler, D. B.

St Albans

Mills, N. J.

Taylor, J.

Tyszka, J. M.

Stevenage

McLean, I. F. G.

Watford

Measday, A. V.

Tuck, F. C.

MIDDLINGDONSHIRE

Huntingdon

Mitchell, J. H.

SUSSEX

Bexleyheath

Collins, J. S.

Hepworth, A.

Tull, D. W.

Watson, P. A.

Deal

Stopher, D. A.

Faversham

Ross, Miss S. M.

Northfleet

Smith, B. M.

Smith, L.

Orpington

Eve, H. C.

Petts Wood

Winchester, J.

Sevenoaks

Dyer, J. L.

Sittingbourne

Felton, J. C.

Stood

Goldsmith, B. L.

Tunbridge Wells

Burden, Dr. P. J.

Welling

Lavender, T. J.

West Wickham

Burrows, D. S.

Burrows, N. L.

LANCASHIRE

Bacup

Netherwood, A.

Bury

Hing, J.

Fleetwood

Moor, F.

Grange-over-Sands

Heath, J.

Lancaster

Hayton, P.

Liverpool

Harwood, A.

Manchester

Jones, A. H.

Phillips, J. A.

St. Helens

Powell, W.

Wigan

McCurdy, J. M.

LONDON

E.4

Haynes, P. G.

N.14

Mann, Miss D.

- Trogal, M.
N.W.1
Caffell, C. R.
Cartmell, M. W. J.
N.W.3
Brown, C. G.
S.E.1
James, M.
S.E.9
Harman, A. R.
S.E.16
Ward, K. J.
S.E.26
North, D. P.
S.W.3
Cross, J. E.
S.W.6
Scribot, A.
S.W.16
Hart, C.
Penney, C.
S.W.17
White, E. S.
S.W.19
Willmott, K. J.
S.W.20
Mary, Miss P.
W.2
Chadwick, G. B.
W.8
Danner, J. M.
W.11
Perceval, M. J.
W.13
Griffin, W. G.
Lane, D.
Roberts, K. A.
W.C.1.
Wilkinson, R. S.
- MIDDLESEX**
East Twickenham
Humm, R. J.
Greenford
Hamilton, C. J.
Harrow
Fricker, M. J.
Harrow Weald
Warde, A. S.
North Harrow
Prior, G.
Northwood
Lee, Miss A. J.
- South Ruislip
Choat, G. H.
Twickenham
Newbury, Miss L. E.
Wembley
Clarke, B. T.
- NORFOLK**
King's Lynn
Payne, T. P. H.
Norwich
Hartley, A. J.
Smith, G. A.
- NORTHAMPTONSHIRE**
Northampton
Whitehead, A. J.
- NORTHUMBERLAND**
Newcastle-upon-Tyne
Eales, H. T.
- NOTTINGHAMSHIRE**
Burton Joyce
Hoe, S. T.
Nottingham
Kirchin, A. L.
- OXFORDSHIRE**
Steeple Ashton
Coles, B.
- SHROPSHIRE**
Shrewsbury
Franks, D. S.
- SOMERSET**
Dulverton
Nicholson, A. A.
Weston-super-Mare
Wilson, K. J.
Wraxall
Hard, P. L. S.
- STAFFORDSHIRE**
Walsall
Kempson, S. A.
- SUFFOLK**
Bury St Edmonds
Ransom, F. E.
Sudbury
Marchant, R.
- SURREY**
Coulston
Docwra, W. H. A.
Epsom
Howard, V. M.
Esher
Lickley, J. M.
Farnham

Jones, P. E. B.
 Northey, P. W.
Leatherhead
 Rowden, R.
Redhill
 Whicher, L. S.
Richmond
 Cook, P. L.
Sanderstead
 Burgess, P. V.
 Jackson, J.
Selsdon
 Roiser, M.
Weybridge
 Grey, P. R.
Woldingham
 Hanbury, R. L.

SUSSEX
Bognor Regis
 Eschbacher, C. J.
Chelwood Gate
 Clark, H. A. C. T.
Chichester
 Imrie, Miss F. R.
East Grinstead
 Majer, C. P.
 Majer, J. D.
Littlehampton
 Fox, T. H.
Newhaven
 Jones, R. W.
Pulborough
 Burchell, R. W.
Uckfield
 Ashdown, E. J.

WARWICKSHIRE
Birmingham
 Hammett, M. J.
 Hargroves, R. A.
 Heath, G.
 Jones, M. H. C.
 Payne, R. G.
Coventry
 Smith, R. M.
Nuneaton
 Beeby, J.
Solihull
 Divett, A. W.
 Edmonds, M. H.
Stratford-on-Avon
 Evans, R.

WESTMORLAND

Milnthorpe
 Robinson, G. S.

WORCESTERSHIRE
Worcester
 Badham, D. F. J.

YORKSHIRE
Beverley
 Dublon, C. F.
Catterick
 Jones, A. L.
Guisborough
 Howe, J. J.
Harrogate
 Perkins, F.
Huddersfield
 Brook, M. P.
 Sykes, A.

Hull
 Hoe-Richardson, Miss J. A.

Leeds
 Dickinson, J. A.
Middlesborough
 Moon, D. J.
Redcar
 Wilson, M. R.
Scarborough
 Baynton, P.
Sheffield
 Shutt, A.
ShIPLEY
 Lodge, D. L.
Whitby
 Smith, Miss E. H.

EIRE

CO. DUBLIN
Dublin
 Smartt, J. B.

NORTHERN IRELAND

CO. LONDONDERRY
Londonderry
 Fraser, J. K.

SCOTLAND

ANGUS
Broughty Ferry
 Burdin, J. W.

MIDLOTHIAN
Edinburgh
 Morrison, B.

WALES**CAERNARVONSHIRE***Llandudno*

Hughes, M. O.

DENBIGHSHIRE*Colwyn Bay*

Dixon, G. F.

FLINTSHIRE*Dyserth*

Williams, I. T.

Prestatyn

Roys, P. J. H.

GLAMORGAN*Cardiff*

Bowen, I.

MONMOUTHSHIRE*Cwmbran*

Hall, M. L.

ABROAD**AFRICA***Transvaal*

Mattheyse, F. J.

Uganda

Bailey, N. M.

AMERICA*Canada*

Thomas, A. W.

U.S.A.

Butterfly World.

Clarke, L. C.

Hansen, C. B.

Nadolny, J. J.

ASIA*Malaysia*

Roche, Dr P.

AUSTRALASIA*Australia*

Altman, E. G.

EUROPE*Gibraltar*

Chapman, Mrs V. A.

Portugal

Carvalho, F. Vas dos Santos

Sweden

Axelsson, L.

Switzerland

Wirth, B. W.

The highest Membership Number on this Supplement is 3917. All corrections and address changes are included up to and including 31st October, 1965. Should any Member

find an error in their entry, I will be pleased to receive the correct information.

31.10.65.

D. E. Dodwell (3482)
Hon. General Secretary

atching one in a field flitting from one piece of clover to another quickly laying a single egg on each plant.

The Meadow Browns were all very fine specimens, larger than those found in Britain and the females were variable and very rich in colour. The peckled Woods (*Pararge aegeria* Linn.) were also richer in colour and were to be found in shady conditions among the Carob trees (*Ceratonia siliqua* Linn.).

The Small Copper (*Lycaena phlaeas* Linn.) varied very considerably in colour from very dark to the bright specimens that we find at home and, like the Swallowtail, the later broods were the darker. The Common Blue, *Polymmatius icarus* Rott.), which had more definite white edge to its wings, was not as numerous as the two types of tailed blues.

Now that my interest in Lepidoptera has fully revived I regret that I did not make a more detailed record while I was stationed in Malta. Before I conclude I should perhaps mention that during two brief visits to Sicily, in April and May, I noted several specimens of each of the following butterflies which are not found in Malta:—

Scarce Swallowtail (*Papilio podalirius* Linn.); Orange Tip (*Euchloe cardamines* Linn.); Southern Orange Tip (*Euchloe euphenoides* Staud.); Southern Fестоoned Butterfly (*Thais hypermnestra* Scop.); Large Tortoise-shell (*Nymphalis polychloros* Linn.).

I now count myself extremely fortunate that my original collection of British Lepidoptera, which during the war was twice shepherded with loving care by my old mother from one bomb-scarred London home to another, is still in excellent condition and although I now tend to prefer to photograph rather than to kill and set, the collection is most useful for reference (and for reminiscence!). Even my net, setting

boards, tweezers, pins and pill-boxes were still in the old oak chest and, after 28 years, again saw the light of day when I took them to Malta after my first home leave. My collection is arranged and labelled according to South whose three volumes were, and still are, my entomological bible. Now that I have been admitted to Membership of your excellent Society I must try to rid myself of my old-fashioned tendency to refer to "Vanessa io" and "Vanessa antiopa." P. R. Grey (3820).

PORTUGAL 1964

We all carry mental pictures by which we recall our first impressions of a country. Portugal will always be a green and refreshing land after the arid waste that is Central Spain at the height of the summer. During the first few days of July last year I crossed the border between Spain and Portugal at Vilar Formoso. I travelled with a group of non-entomological friends with a car and caravan. Once over the border the land began to rise and the road threaded over several miles of barren rocks and dwarf scrub. Soon the grass became greener and the heat less intense. Guarda, a town built on high ground, has extensive views over the Serra da Estrela and the little fields of maize and vines. Early the following day I noticed a group of fritillaries flying over land near the local camp site. The ground was covered with vetches and *Malva* sp. (Mallow) and the insects habitually settled either in a patch of melons or in a nearby tree. In the latter I made a capture. It was a slightly damaged specimen of *Argynnis pandora* Schiff. (= *maja* Cram.) which is the largest European species in this genus. The



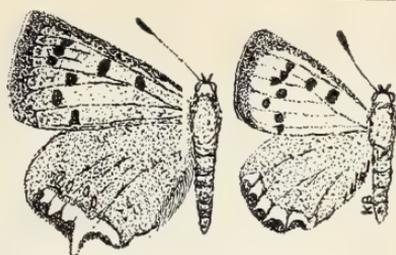
Fig. 1. The areas visited in Portugal

upperside strongly resembles that of *ab. valezina* Esp. of *A. paphia* Linn. (Silver-washed Fritillary), but the green suffusion is more intense in *A. pandora*. Several other specimens were eventually captured, and the highly developed androconia were noted on the forewings of the male. These androconia are confined to two patches over nervures Cu 1a and Cu 1b. *Pontia daplidice* Linn. (Bath White) abounded in gardens and on waste land wherever a few flowers

occurred and fussed and jostled for position on the inflorescences. *Coeronympha pamphilus* Linn. (Small Heath) was fairly common; to be found resting on the bare earth. By approximately 10.30 a.m. *Macroglossum stellatarum* Linn. (Hummingbird Hawk) had begun to appear, engaging in erratic flights over *Medicago* sp. (Lucerne) and *Zea mays* Linn. (Maize). In the evening an expedition to electric lamps in the back streets of the town proved

small failure from an entomological viewpoint, but a small restaurant serving local food proved a strong alternative.

Viseu, some 80 Km. from Guarda, surrounded by more wooded country and it is difficult to believe that Portugal, like Britain, has one of the smallest percentages of land under forest of any country in Europe. Slender eucalyptus trees with their leathery glaucous leaves and an exotic touch, with scent coming from both the flowers and foliage. Chestnuts and walnuts were so common, while the forests' commercial value is represented by the resin collected from various species and the oil derived from the leaves of the eucalyptus. The oil is distilled in primitive kilns, and it is a common sight to come upon two bullocks dragging a mass of branches to the kilns. One locality on the edge of Viseu was particularly productive for butterflies. Between open oak scrub (probably *Quercus cerris* Linn., the Turkey Oak) and a plantation of *Corylus avellana* Linn. (Hazel—grown for the nuts) ran a strip of uncultivated land. The ground was covered with vetches such as *Hippocrepis* sp. and *Melilotus* (Melilot), *Medicago*, *Galium* spp. (Bedstraws) and *Thymus* sp. (thyme). Giant orb spiders had made webs in nearby gorse bushes (*Jlex* sp.). The most abundant species of butterfly was *Tarucus* (= *Syntrichus*) *telicanus* Lang, a pretty little 'blue' with well developed tails and two metallic rings on the underside of the hindwings. Several of the plants mentioned above are given as food-plants for the larvae, so the abundance is perhaps more easily understood. *Pontia daplidice* was also common, and all the specimens seen were freshly emerged. *Aricia agestis* Schiff. (Brown Argus) swarmed over the wetches, but most of the specimens were very worn. *Coenonympha dorus* sp. is very similar to our Small



eleus

phlaeas

Fig. 2. Small Copper Butterfly

Heath (*C. pamphilus*), and was found resting on the herbage, and when disturbed flew only short distances. *Lycaena phlaeas* Linn. was also flying. The specimens seen here, as in other localities in Portugal, were similar to the form *eleus* Fab. It is characterised by being larger than the typical form found in Britain and has well developed tails, arising from one of the crescent-shaped marks along the margin of the hindwings. The iridescent copper colour of the forewings is suffused with black pigmentation that varies considerably from one that varies considerably from one specimen to another. (Fig 2). *Maniola tithonus* Linn. (Gatekeeper) and *Pieris rapae* Linn. (Small Cabbage White) were both common. The odd specimen of *Maniola jurtina* Linn. (Meadow Brown) was to be seen flitting over the gorse thickets. Amongst the oak scrub flew *A. pandora* and two large Satyrids which were new to me. *Satyrus statilinus* Huebn. is silky-black with two faint white dots on each forewing between two equally faint ocelli. They like to bask on the open ground between the trees, and when approached would 'hop' a short distance. *Satyrus circe* Fab., although not so fast in flight, was more difficult to capture for they always settled in the tree surrounding the sunny glades. This is a magnificent insect with a velvet-brown coloration and a cream sub-marginal band. The females have a wingspan of 7 cm. and the males a cm. less. Members may care to compare these observations

of this insect with those of Mr N. F. Gossling (1961) and Mr P. W. Cribb (1961).

The old university town Coimbra on the river Mondego has a particularly fine Botanical Garden. The bougainvillea and hibiscus flowers deserve special mention—the sight of *Papilio podalirius* Linn. (Scarce Swallowtail) gliding over them was breath-taking. Rice is grown along the banks of the Mondego between Coimbra and Figueira da Foz and here too *P. podalirius* was flying. Capture was decidedly difficult as one was restricted to the narrow baulks between the paddy fields whilst one's quarry obeyed no such convention. The road from Figueira da Foz to Leiria passed through flat countryside with occasional saltings. We stopped for a picnic lunch beside a field of maize. Along one boundary lay a mass of brambles (*Rubus* sp.) over which *Gonepteryx rhamni* Linn. (Brimstone) and *Colias croceus* Fourcr: (Clouded Yellow) were flying. *Celastrina argiolus* Linn. (Holly Blue) was present in small numbers. The open, undulating land north of Lisbon with its multitude of tiny windmills was not a productive area. The only common butterfly was *C. pamphilus* which was found flying in the olive groves.

A few days later our party was enjoying the comforts of the camp site at Monsanto Park just outside Lisbon. This surely must be one of the finest sites in Europe, and can be highly recommended. The immediate environs of Lisbon produced quite a few insects including *P. podalirius* seen flying in Parque Eduardo VII in the centre of the city and my first Colorado Beetle (*Leptinotarsa decemlineata* Say) of the trip found on a door jamb in a main thoroughfare. In Monsanto Park there was little herbage under the eucalyptus trees. Even so, *Lycaena phlaeas* and *Maniola tithonus* were both abundant. A third

species, *M. ida* Esp. was almost as common. It is rather smaller than *M. tithonus*. The uppersides of the females of the two species are virtually identical. The male of *M. ida* has the black bar of the forewing divided by yellow veins while in *M. tithonus* this division is lacking. *P. podalirius*, *Pararge aegeria* Linn. (Speckled Wood), *Maniola jurtina* Linn. (Meadow Brown) and *Arctia agestis* were also present. A chrysalis of *Nymphalis polychloros* Linn. (Large Tortoiseshell) was found hanging from a metal support of a fence. The imago was perfectly formed but had dried up. The foodplant of the larva has caused some speculation, for as far as I could ascertain none of the usual pabulum was available. *Celtis australis* Linn. (Nettle Tree) is given as a foodplant in southern areas of Europe and may have been present.

Sintra is worthy of special mention, if only for its historical connections and unique climate. The town is situated around the base of a group of hills that rise steeply above the surrounding countryside. Pena Palace crowns the highest hill. Cloud often hangs over the hills, and the vegetation is luxuriant. *Pieris napaea* Linn. (Green-veined White) was flying in moderate numbers amongst the trees, and *Satyrus arethusa* Esp. was found around the ruins of the Moorish castle in a rather more open situation. This latter species apart from a series of orange submarginal markings, is very similar to *Eumenis semele* Linn. (Grayling).

It is clearly impossible to draw many conclusions on the basis of one short visit to Portugal. The Algarve in particular was not visited. The climate of the central area of the country seems to be influenced by the low pressure systems that build up in Spain during the summer. The Atlantic, on the other hand, is quite cool (no Gulf Stream) as any visitor to Estoril will know. Even on the

varmest day there is a breeze, so that collecting insects is bearable. Butterflies and certain Orthoptera were plentiful and many localities could rival the best to be found in France and elsewhere. Portugal, being the western limit of so many butterflies commonly occurring in Europe, is worthy of special attention by all those who combine insect collecting with annual continental holidays.

4.7.65. Keith Bradbury (2627).

REFERENCES

RIBB, P. W. (1961). *Bull. amat. Ent. Soc.*, **20**: 47. Some further Observations on Butterflies in Provence, July 1960.
 ROSSLING, N. F. (1961). *Bull. amat. Ent. Soc.*, **20**: 32-3. Some Observations made in Southern France (Provence District) on Continental Lepidoptera, July 1960.
 CERF, F. (1963). *Lépidoptères de France*, Vol. 1. N. Boubee et Cie, Paris.
 EITZ, A. (1906 et seq.). *Macrolepidoptera of the World*. Section I, Vol. I and supplement. Lehmann, Stuttgart.

SOME AMERICAN LEPIDOPTERA

On June 26th 1965, I and my family left for a fortnight of vacation in northern Minnesota. We had planned to spend the first week at Scenic State Park, six miles east of Bigfork. Upon arriving we found stands of birch, poplar, and huge pines. That night I set and operated my Black Light trap, and because the trap was new I decided to stay up and watch it until it was shut off at 4.00 a.m. Among the many various species of Heterocera visiting my light were *Pachysphinx modesta* Harris (Big Poplar Hawk), *Sphinx cerisyi* Kirby (Cerisy's Sphinx), *Calasymbolus xcaecata* Abbot and Smith (Blinded Sphinx), *Actias luna* Linn. (Luna Moth), and *Antheraea polyphemus* Cramer (Polyphemus Moth). I took two female *A. polyphemus*, and three female *A. luna*, from all of which I managed to get 100 to 200 ova each piece. The highlight of my Heter-

ocera catch was six male *Hyphoria parthenos* Harris (St Lawrence Tiger-moth). W. J. Holland (1905), in 'The Moth Book' states that this moth is "comparatively rare in collections."

Our second stop was the Ash River Trail, which is about twenty miles south of the Canadian border. Here among a variety of 'commoner' species I was fortunate to secure a long series of *Colias interior* Scudder (Pink Edged Sulphur). *Limenitis arthemis arthemis* Drury (White Admiral) and *Papilio glaucus canadensis* Linn. (Tiger Swallowtail) were also present in some numbers; some feeding on carrion and dung.

There are two questions I would like to put forth. The first is that all Saturniidae I have thus far taken at my light (male and female alike) have the habit of flying towards it, and landing between fifteen to twenty feet on the ground away from it. They then beat their wings furiously, and walk towards the light for about one yard. If by this time they have not been netted, they fly away, not returning again that night. I should like to know if anyone has noticed this habit in *Saturnia pavonia* Linn. (Emperor Moth) or any other member of this family. Secondly, I have noticed that in many species, especially those of the genus *Colias*, one sex may be very predominate to the other during certain years. For example, all *Colias interior* taken in northern Minnesota were males, with not a female sighted: and in the vicinity of Minneapolis about 75% of all *Colias eurytheme* Boisd. (Orange Sulphur) sighted this year were females, while last year the same species in the same area had a majority of males. I should also like to know whether anyone else has noted this or has an opinion on this subject.

5.8.65. J. T. Sorensen (3719).

REFERENCE

HOLLAND, W. J. (1905). *The Moth Book*. Doubleday Page and Co.

SOME AMERICAN 'BLACK-LIGHT' ATTRACTORS FOR COLLECTING INSECTS

Although portable fluorescent blacklight devices have largely superseded the expensive and inconvenient generator-driven 'm.v.' attractors in the United States, some American adaptations of blacklight are not widely known in the U.K. The following discussion of the construction, theory and performance of these attractors may be of use not only to collectors who cannot afford the costly generator apparatus, but to all who desire a device which equals the 'm.v.' trap in attraction, yet weighs only a few pounds and may be operated from an automotive storage battery without fear of incapacitating the self-starter.

CONSTRUCTION

The construction of a blacklight attractor is quite simple. Although the author's experience is limited to American equipment, similar British parts are available. An ordinary fluorescent wall or ceiling fixture, of the type used in offices and homes, is fitted with a 'BL' (actinic blue, Phillips TL 20/05) or 'BLB' (blacklight, Phillips TL 20/08) tube. American collectors use 15-watt tubes, but these are not readily available in the U.K., and stock numbers of locally available 20-watt tubes are given here. The relative merits of the two sources of light will be discussed below.

Of course the fixture and tube may be used as an attractive source without the addition of further components, but alternating current is required to light the tube. In order to make the device portable and operable from a storage battery, a converter must be fitted to change the 12-volt D.C. battery current to 240 volt A.C., necessary for the fixture and tube. The converter will

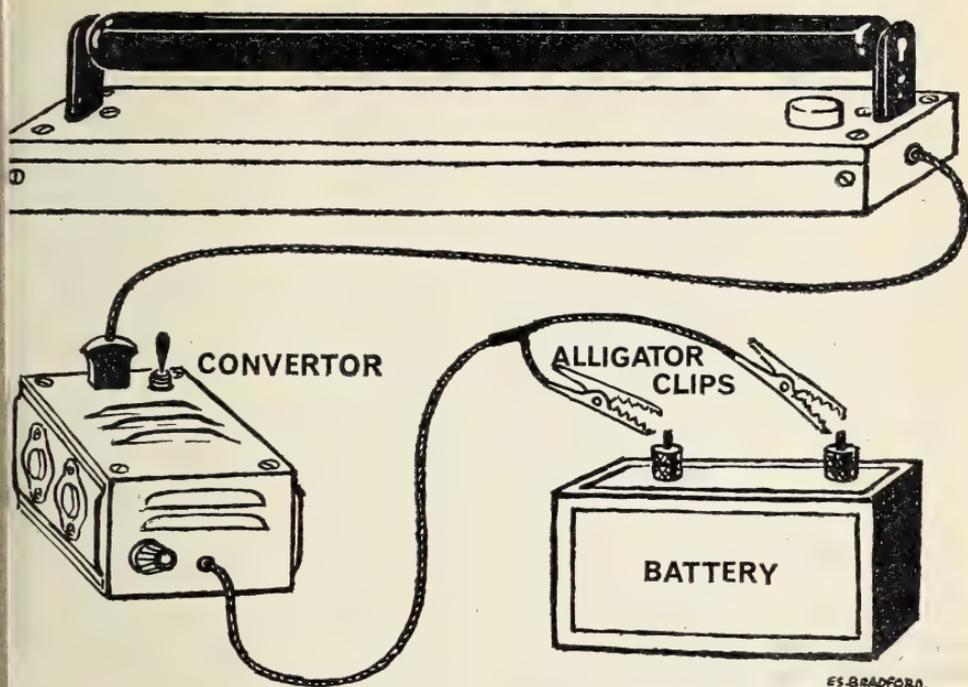
be the most expensive component, but a good one may be obtained for less than £10. There are many sorts available, ranging from small ones which enable an electric shaver to be operated from an auto cigar lighter, to more durable models for more demanding tasks such as the one at hand. It is best to ask a reliable electrical supplier.

For operation, the male plug affixed to the fluorescent fixture is inserted into the receptacle provided on the converter. The D.C. lead to the converter must now be affixed to the auto battery in some fashion. If there is a cigar lighter on the fascia the matter is simple enough; a plug may be purchased at an auto supply store which will fit the purpose. If no lighter is present, the converter must be connected directly to the terminal posts of the battery by fastening an alligator clip to each wire of the double-strand D.C. lead; see the diagram. If this solution is used, the negative wire of the D.C. lead must be connected to the negative post of the battery, and the positive wire to the positive post.

To operate the device, a white bedsheet is draped over the bonnet windscreen and part of the top of the auto, and made secure in some way closing the bonnet and front doors upon the edges of the sheet will suffice. The fixture is then placed on the bonnet near the base of the windscreen and the tube is lighted. The auto must, of course, be pointed in the direction from which it is desired to collect.

There are many possible variations on the theme. Some collectors suspend the sheet between two trees or affix it to a framework constructed of poles or tubing, and hang the fixture before it in some manner. A large converter enables the use of several tubes at various positions and the collector is limited only by his ingenuity in devising applications

LAMP



As for drain on the battery, I have found that one 15-watt American tube may be used for three or four successive nights before loss of starting power will be felt. If the car is driven during the day and the battery is in good condition, even this much use of the tube will not be noticed.¹ Some American collectors have fitted extra batteries in their autos for extended use of blacklight devices; to recharge, the cables are merely switched from one battery to the other, and the auto generator does the rest.

If the collector does not have an auto, or if he wishes to collect in an impenetrable area such as a forest or bog, the apparatus may be powered by a battery carried by hand or in a pack-pack. A miniature petrol gener-

ator, weighing less than ten pounds and producing a steady 300 watts, is now being mass-produced in the United States for use as an auxiliary power plant, and a number of American collectors are using it to power blacklight devices in isolated habitats *in lieu* of an auto or hand-carried battery. This small device, aptly named the "Tiny Tiger," is also sold and serviced in several European countries, and should soon be available in the U.K. It has a rubber hand-grip for easy carrying, is readily started and does not seem to over-heat. The cost in the U.S. is about \$70.00 (£25); unfortunately the device is so new that proper evidence of durability is not yet available from collectors.

Not only is the collector's dream of a truly portable outfit fulfilled by the fluorescent fixture, but the other unpleasant features of the standard 'm.v.' trap—noise and cost—are eliminated. When the high attractive power of fluorescent blacklight is

¹ I have not yet accumulated extensive data on battery drain from 20-watt tubes, my experience having been with the 15-watt variety. The 40-watt L and BLB tubes also sold in the U.K. are not operable on one 12v. auto battery, 24v. being necessary. At least one British collector is now using a 40-watt tube of considerable length, powered by mains current, but results will not be available until next season.

considered, it will be admitted that the device may be more than useful as a biological tool.

THEORY AND ATTRACTION

Fluorescent tubes are actually modified lamps, in which the discharge acts upon phosphors which generate light, much of it in the ultra-violet and near u.v. range. The BL tube, which may be recognized by its bright blue glow, converts the ultraviolet which would be radiated by a normal tube into longer wavelengths. The BLB tube, which has a very dark blue glow and emits less visible light, differs only in the filtering effect of the purple glass which screens out the visible light seen in the BL. Further discussion with curve tables may be found in Hinton (1961).

Comparisons of the attractive power of standard m.v. with BL and BLB have been undertaken by several authors.² Merkl and Pfrimmer (1955) evaluated the catches of 13 species of Lepidoptera at m.v. and BL sources and determined that 10 species were more attracted to BL. Pfrimmer (1955) conducted tests on several light sources including a 15 watt BL tube and an equivalent BLB tube. Twice as many insects (of 11 orders) were attracted to the BLB tube, and approximately 12½ times as many to the other source tested, an argon bulb. The BLB tube attracted nearly 2½ times as many Lepidoptera as the BL! But the response of individual species varied a great deal, and it is not possible to say that BL always attracts more insects than standard 'm.v.', or that BLB is consistently the

best of the three. I have used various devices and conversed with a number of American lepidopterists; all seem to agree that although species reaction varies, the number of individuals taken at BL and BLB is greater than at standard 'm.v.' Pfrimmer (1957) has studied reactions of numerous species to 'm.v.', BL and BLB at Tallulah, Louisiana, USA. The following samples are taken at random from his paper, the numbers denoting individuals captured (Table 1).

The tables, all of Lepidoptera, show a consistent and remarkable trend in favour of fluorescent tubes. Despite the variance in results, at least one fact may be established from the literature; BL and BLB tubes function as least as well as standard 'm.v.' and in some cases better.

Such writers as Ford (1955) and Tashiro (1961) have questioned the old idea that male moths are more attracted to light than females. The reader is referred to Ford's *Moths* for his argument. Tashiro points out that sexual response differs between species and changes as the wavelength of attracting light changes, and claims (as does Ford) that male:female ratio is affected more by position (i.e. height) of light and time of night than by other factors. Although little published research may be found to settle the question many collectors claim that BL and BLB tubes attract a higher percentage of females than standard 'm.v.'

Collectors of orders other than the Lepidoptera may use BL and BLB tubes with success, for the Coleoptera, Diptera, Neuroptera, Hymenoptera, etc., are attracted in quantity. It should not be necessary to add

² It will be noted that the research below was conducted with 15-watt American tubes, not their 20-watt British counterparts.

	'm.v.'	BL	BLB
<i>Agrius cingulatus</i> Fab.	93	114	101
<i>Agrotis malefida</i> Guen.	38	252	139
<i>Prodenia ornithogalli</i> Guen.	184	1213	1294
<i>Estigmene acrea</i> Drury	8	56	58
<i>Pseudaletia unipuncta</i> Haw.	283	1279	1275
<i>Heliothis zea</i> Boddie	1031	7792	4587

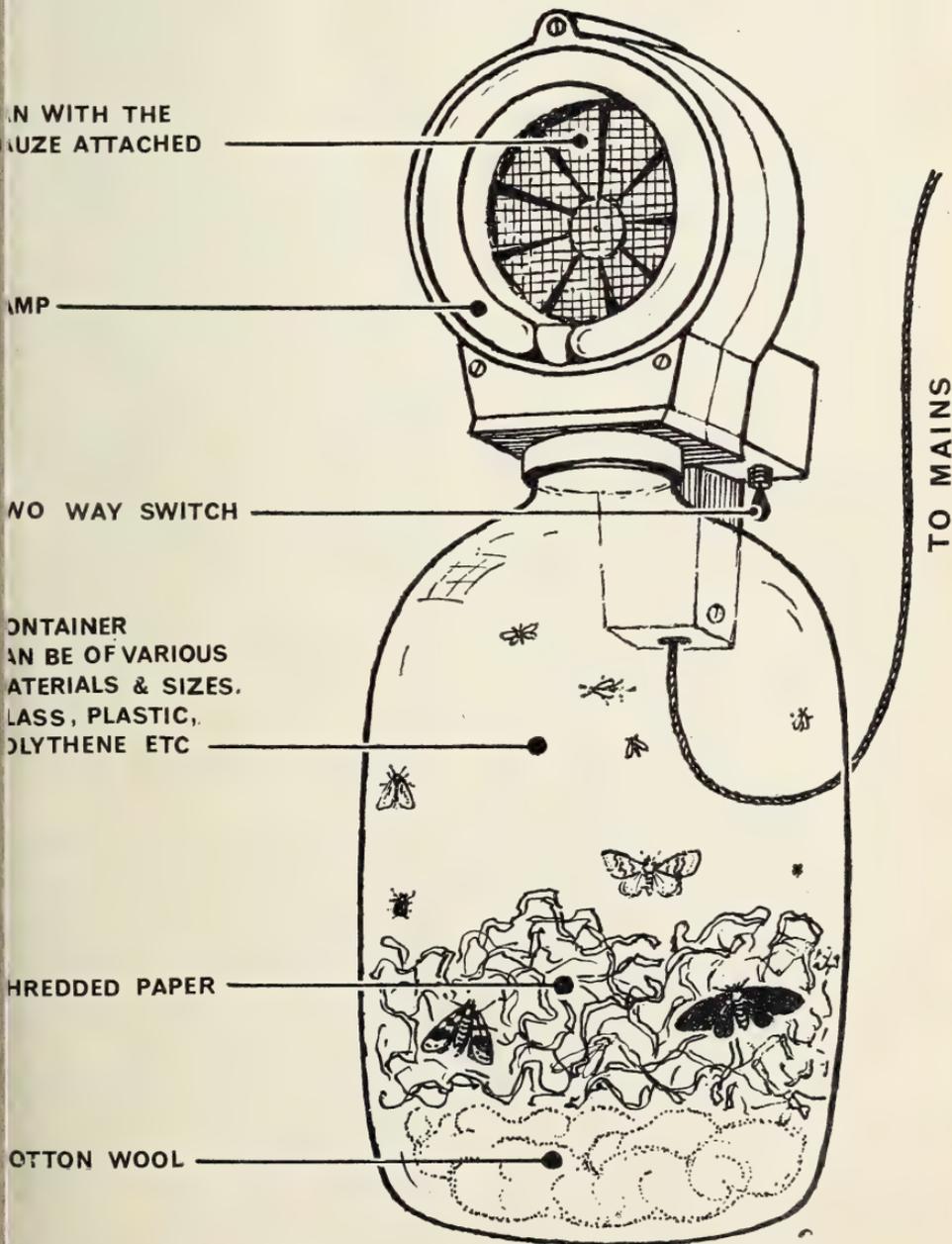
Table 1: Reactions of Lepidoptera to 'm.v.', BL and BLB

That such a convenient and inexpensive method of attracting night-flying insects should be used with extreme prudence.

THE NEWMAN TRAP

An ingenious application of black-

light attraction has been devised by John H. Newman, of South Lyon, Michigan, U.S.A. The Newman Trap, illustrated below, consists of a doughnut-shaped BL tube mounted in a commercially-produced plastic housing. A fan is mounted behind the



tube, and a disc of fine-mesh wire screening is attached so as to revolve with it. The fan operates at two speeds, rotating slowly for the collection of cabinet specimens, and at a faster pace for biological sampling. Insects attracted by the light strike the mesh-covered fan and are propelled through an aperture into a collecting bottle mounted below. The bottle may be used either as a killing device or for the collection of rearing material. At its bottom is a pad of cotton wool, which is charged with tetrachloroethane if it is desired to kill the specimens. Above this is a layer of shredded paper strips, into which the insects readily burrow.

The Newman Trap has now been tested by Michigan entomologists under all conditions for over two years. It may be erected as a permanent trap using mains electricity, or as a portable device run from an auto battery or petrol generator. A solar switch may be fitted so that the trap operates automatically, turning itself on and off. It is used extensively by Michigan State University which, in co-operation with the U.S. Department of Agriculture, operates numerous traps throughout the state to systematically collect insects of economic importance. Samples are forwarded to the University where they are identified, and bulletins are published weekly to warn farmers of the appearance of insects injurious to crops. This survey has been an immense boon to collectors of Lepidoptera, as for the first time it is possible to keep a close state-wide record of the times of emergence and distribution of nocturnal species; furthermore, moths previously unrecorded have been taken in some counties by the use of the trap. Newman's device has been used successfully in clearing planted fields and agricultural storage areas of noxious insects, and has great promise in the areas of economic control

and sampling.

Apart from its value to the collector as a biological tool, when used on its lower speed the Newman trap furnishes satisfactory cabinet specimens and rearing material. It would be supposed that the more fragile insects such as 'Micros' and crane-flies would be damaged by the process, but extensive testing shows that this is seldom the case, and almost ninety per cent of specimens caught are suitable for the cabinet. The stupefying agent quickly immobilizes them, and the rotating disc seldom inflicts injury. If the charge is correct, even hawkmoths are quickly stupefied before they can damage the other inmates of the bottle. Of course some loss must be expected in any trap, but Newman's device functions rather well in this respect.

If insects are to be captured for breeding purposes, a larger container may be used in place of the bottle and egg-crating material may be substituted for the shredded paper, although the latter seems to be quite satisfactory. It is hoped that if collector response is adequate, the Newman trap can be introduced into the U.K.

8.10.65. R. S. Wilkinson (3839)
University College, London W.C.1

REFERENCES

- FORD, E. B. (1955). *Moths. New Naturalist Series* Collins, London, 14-17.
- FROST, S. W. (1953). *Jour. Econ. Ent.*, **46**: 376-77. The response of insects to black and white light.
- HIENTON, T. E. (1961). *Response of insects to induce light: presentation papers*, U.S. Dep't of Agriculture ARS 20-10: 2-8. The nature of light sources and types of traps.
- HOLLINGSWORTH, J. P. (1961). U.S. Dep't of Agriculture ARS 20-10 (see above): 9-25. Relation of wavelength to insect response.
- MERKL, M. E. and T. R. PFRIMMER (1955). *Jour. Econ. Ent.*, **48**: 740-41. Light-trap investigations at Stoneville, Miss., and Tallulah, La., during 1954.
- PFRIMMER, T. R. (1955). *Jour. Econ. Ent.*, **48**: 619. Response of insects to three sources of black light.
- PFRIMMER, T. R. (1957). *Jour. Econ. Ent.*, **50**: 801. Response of insects to different sources of black light.
- TASHIRO, H. (1961). U.S. Dep't of Agriculture ARS 20-10 (see above): 38-42. Relationship of physiological development and condition of insect to photosensitivity.

AN ECOLOGICAL APPROACH TO LIGHT-TRAPPING—2

temperature relationships

To discover the main progress of temperature throughout the night, air and ground readings were noted at half-hourly intervals on several occasions. As expected the temperature dropped considerably at dusk (about 10°F in three hours), then remained steady till dawn when it rose to its previous level. Both air and ground readings followed a similar pattern, the former staying 0.5-1.0°F warmer except during a few autumn nights. From these results it was decided that the mean night temperature could best be assessed at 11 p.m. B.S.T., although a superior method would have been to use a maximum/minimum thermometer, but this was not available.

Threshold temperatures, when the first insects appeared, gave an interesting result when the separate orders were compared. A chart has been drawn to illustrate this, excluding the true flies which flourished below 39°F (see Fig. 1).

Generally, the lowest threshold

values were recorded by the largest insects. This can be explained as the increasing effect of the ambient temperature to activate smaller individuals, for larger insects have more internal 'energy' reserves and are therefore less dependent on the external conditions to influence them. A guide to the relative sizes of these groups, for the 'average individual' in each, is: Lepidoptera 93 mg.; Coleoptera 101 mg.; Heteroptera 4.2 mg.; Psocoptera 0.32 mg. Indirectly this controlled the number of each order flying because the lowest value subsequently meant more opportunities for that Order to fly, e.g., Diptera 75%, Lepidoptera 15% total number.

The relationships of the various groups were studied next, although several did not appear in sufficient quantity to justify their inclusion. In all cases a parabolic curve was obtained when the flying population was correlated with the air temperature. For instance, the number of moths flying above the threshold began with 2 individuals per degree Fahrenheit increase, finally reaching more than 100 individuals/°F increase (see Fig. 2 overleaf).

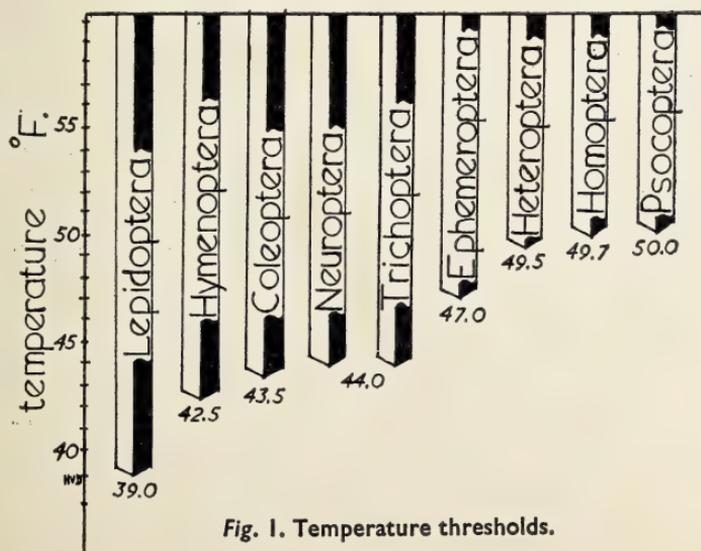


Fig. 1. Temperature thresholds.

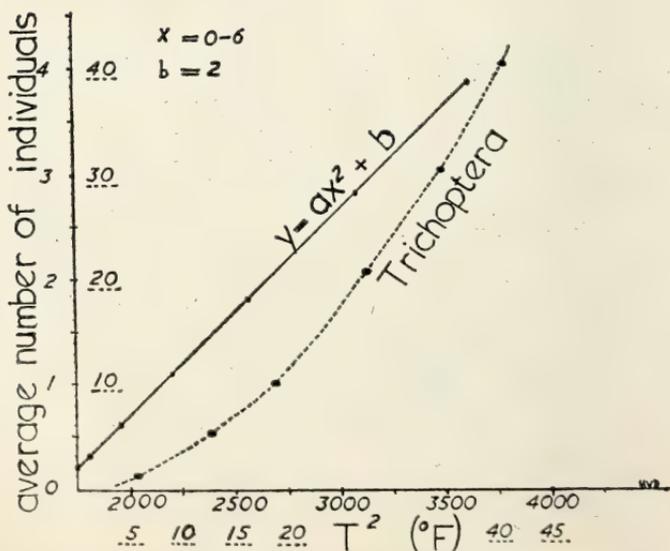
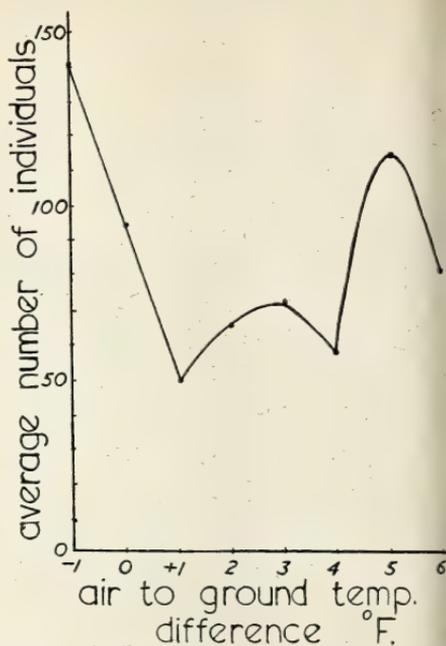
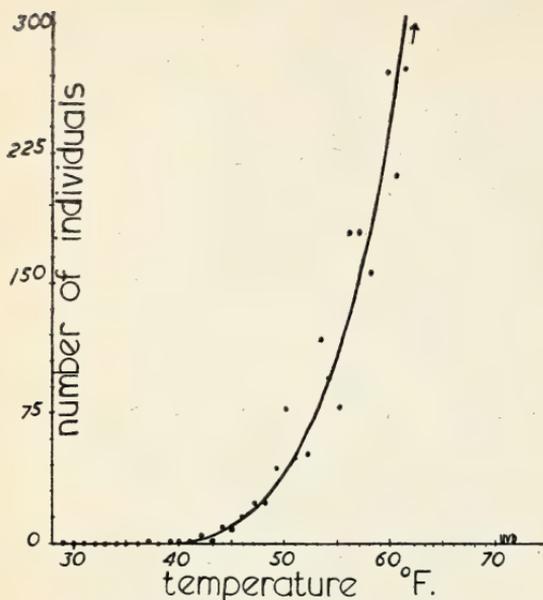


Fig. 3. Graphs to show the true parabolic curve, and that obtained for Trichoptera (y/x^3).

the curve has the general formula:

$$N = kT^2 + c$$

where N is the average number of individuals caught, T the temperature (°F) above the threshold value, and k and c are constants.

Unfortunately the equation only approximated to the correct form at high temperatures (see Fig. 3) but it did give a measure of the catch beforehand, if weather forecasts could be trusted.

In order to assess the effects of warmth in a microhabitat it was assumed that the ground temperature is the reading for the microhabitat and the total population. When the ground temperature was above that of the air large numbers of insects were caught, obviously influenced by the local conditions. Numbers were minimal when the air was 1°F higher than the habitat, but any further increase in air temperature induced large numbers to fly (see Fig. 4).

Heat absorbed during the day meant warmer nocturnal conditions and subsequently increased numbers in the trap. The effect continued to influence the next night's catch though to a lesser extent.

J. S. Badmin (3406).



COLLECTOR VERSUS SCIENTIST, A PSYCHO-PHILOSOPHICAL PHANTASY

The recent articles and letters on the philosophy of entomology have been most interesting; they have not changed my ideas, and I doubt whether the written or spoken word could convert any amateur entomologist from what he already is. I firmly believe that he is predestined to his state by a constitutional and congenital balance or imbalance of two instinctive factors which are unaffected either by his will or by his environment. These we may call

Collecting and Science.

The Collector. Some people have an inborn urge to classify things, the commonest manifestation of which is collecting. At this stage it is necessary to define rather more precisely the term collecting. The word is commonly used loosely to include two entirely different things. There is the amasser or accumulator of objects; he may be identified by the nature of the objects which he gathers round himself, e.g., such things as antique furniture or jade figurines which, by their very nature, are incapable of ever being a 'complete' collection. The collector in the more limited sense in which I am using the term is the man who collects objects capable of forming a 'complete' collection, such as British butterflies or postage stamps. Incontrovertible evidence of the existence of collectors is provided by the statistically significant number of names in the membership lists of entomological societies which also appear in those of philatelic societies. As the only relationship between insects and postage stamps is that they are both collectable and classifiable objects, it follows that collecting and classifying is the common factor in the numerous entomologists-cum-philatelists.

The Scientist has an equally powerful, primitive (but quite different) urge: to add to the sum of human knowledge, as distinct from merely the acquisition of the knowledge of others.

The Entomologist. Every entomologist has one or both of these two factors in varying proportions, and every entomologist, like every adult human being, has a personality which is either mature or immature or something in between. On these principles adult entomologists can be classified into five broad categories, as shown in the following table.

Category	Collector/Scientist ratio	Degree of maturity	Prominent diagnostic signs (as presenting in an adult lepidopterist).
(a)	2:0	Immature	Long series, exquisitely set, but probably without data labels. Runs 'm.v.' trap with killing agent. No concern for possible extermination of species or for needless slaughter of species whose allotted cabinet space is already filled. Never gives unwanted duplicates away.
(b)	2:0	Mature	Beautifully set collection of reasonably short series. Only breeds insects to get perfect imagines. Content to go to already known localities to get his series. Careful to keep his collecting well within accepted ethical bounds. Generous with duplicates.
(c)	1:1	Mature	Great pleasure derived from forming collection. Prefers breeding in order to study life-histories. Series variable in length as he studies genetic and geographical variation. Prefers specimens from new localities.
(d)	0:2	Mature	Only concerned with bionomic studies, such as breeding experiments, behaviour and population studies, etc. Any collection he may have had to form in the furtherance of his work is untidy, and is given away to his collector friends when his paper has been written.
(e)	0:2	Immature	Potters about on Field Meetings watching others, but doing nothing himself. Carries no equipment other than beer and sandwiches. May breed out a nearly full-fed larva, but doesn't bother to identify either the insect or the foodplant. (Probably keeps tadpoles in a jam jar as a side-line).

Discussion. The principles which emerge from this study may profitably be applied to the AES and the *AES Bulletin*. Adult entomologists falling into either category (a) or (e) are suffering from a developmental defect which unfortunately never responds to treatment after the age of about 17.

Category (a) adults are dangerous psychopaths who should be excluded from the AES and from the company of all other entomologists.

Category (e) adults should be shown compassion at all times when pressure of entomological activity allows. They are harmless and inoffensive; their subscriptions, if not their presence, are distinctly useful to the AES.

Junior Members showing the

slightest sign of a tendency toward either of these categories should be subjected to the most vigorous treatment. No improvement can be expected after the age of 17, and so such cases should then be re-assessed and any category (a)'s should be expelled, and category (e)'s forgotten, except on 1st January of each year, when their subs. should be collected.

The great majority of our Members are, happily, in categories (b), (c) and (d), and these are all people for whom our Society exists. Their relative numbers should be ascertained, and the *Bulletin* space should be allocated accordingly. Neither (b) (c) nor (d) is better or worse than the others; they are all equally worthy and they are complementary

each other. The finest entomological results derive from teamwork between members of these three categories.

Conclusions. Having got all this off my chest I am now going to resume my much more important activities with the Hemiptera of Borneo. May I suggest that we should all be well advised to get on with the entomology which is our common bond, and pursue that branch of it which especially appeals in the manner for which we are best fitted by our institutional make-up, instead of spending valuable time trying to decide whether our brand of entomology is better or worse than that of our fellows.

..8.65. P. J. L. Roche (2965).

JUNIOR NEWS SECTION

I expect this *Bulletin* finds you hibernating and waiting for the spring rains to wake up our dwindling insect population. Rest a little longer, but do not leave your preparations for the new season's collection and study till it is too late.

I have had two useful ideas given to me for those who set insects on cardboard. One is a cheap way of making needles in handles." Buy a yard of rip balsa wood for 3d. This can be cut up into three or four inch lengths and suitable sized pins or needles can be inserted in the ends of these handles. No glue or binding is necessary and a whole array of straight and hooked setting instruments can be produced economically. Entomological pins can be bent very easily with tweezers to form hooks just as mother's tailor's pins and needles do not need heating before they will bend.

The other idea does away with the fiddling business of mixing your own

Tragacanth gum. "Gloy" seems to work quite well, while "Polycel" wallpaper glue is bought very cheaply, mixed very easily and stores well for a reasonable length of time in a screw-topped jar.

If anyone finds anything wrong with the setting needles or glues I should very much like to hear about it. [See footnote.]

Rather belated congratulations to both R. Allen (3628J) and P. M. Hawkey (3654J) for being selected top Junior exhibitors at last autumn's exhibition. There were some very fine displays to choose from and I know the judges had a hard task selecting the prize-winners. Well done lads!

There will be another National Nature Week at the end of this coming April. I hope you will all take this opportunity to help both to introduce your fellows into the wonders of Nature and to educate them in the conservation of whatever Nature there is left to us. There should be plenty of study courses, Nature trails and exhibitions going on all over the country to mark this special week.

A very large National Nature Week exhibition is going to be held at Alexandra Palace, North London. It should be well worth a visit.

Encouraged by an excellent expedition to Luxembourg last summer, St Ivo School Entomology and Natural History Society, St Ives, Hunts, is planning a similar trip to the Yorkshire Dales for next July. We do not expect any outstanding beetle catches but the scenery is fine.

Do let us know if you are planning an entomological expedition this year: a postcard will do.

H. J. Berman, F.R.E.S. (2941A).

['Polycel' has a disadvantage similar to Gum Tragacanth in that the glue particles merely swell when wetted, and do not form a true solution in

water—consequently it is impossible to remove these glues from an insect once they have been applied, and this may interfere with study, particularly if too much is used. Most ordinary proprietary glues tend to dry shiny, so detracting from the appearance of the carded insect. For this reason Gum Arabic, which is a true water soluble and 'non-shiny' glue obtainable in powder form like Tragacanth, is often recommended.—Ed.]

•

LETTER TO THE EDITOR

Sir,—I read with interest the article 'A Naturalist's Paradise' by Mr D. J. Foxwell in the AES *Bulletin* of February 1965, which I received recently on becoming a Member of the Society (*Bull. amat. Ent. Soc.*, 24: 24-5).

I accompanied Mr Foxwell on a journey to the Mineries, Priddy, Somerset, on 26th May 1965. The weather was similar to that on Mr Foxwell's first visit, namely cold and windy, but with some sun. My main interest is Diptera, and I had not previously visited an area similar to the Mineries. My first catch was an excellent specimen of a female *Cynomya mortuorum* Linn. (Calliphoridae), considered uncommon which was in fact netted by my friend Mr D. G. Pope, who accompanied us. We walked around one of the larger pools in the area, and due to the cold weather I was able to collect several specimens without a net. Among these were some fairly large specimens of *Empis tessellata* Fab. (Empididae), both males and females, the males being more abundant. Also taken were a few specimens of the paler *Empis stercorea* Linn. Several hover-flies (Syrphidae) were seen and captures included a few specimens of *Rhingia campestris* Meig. The rare *Rhingia rostrata* Linn., which lacks

the black band down the back of the abdomen, was not seen.

On sweeping near the pond, several specimens of *Hilara maura* Fab. (Empididae) were taken. Also taken near the pond were two specimens of *Crocota geniculata* Fall. (Tachinidae) easily identified by the elongated proboscis.

Entering a nearby copse, almost every tree (though the preference seemed to be for pines) was found to have at least one specimen of *Rhagio scolopacea* Linn. (Rhagionidae) resting on it, with the head towards the ground. Specimens were easily taken without a net, again no doubt due to the cold weather. Six males and one female were taken. Of these, three males showed venation teratology in both wings, three showed it in the right wing only, and the female showed it in the right wing only. The abundance of specimens showing venation teratology suggests a colony with this mutation in the area.

Other specimens taken included a female *Fannia scalaris* Fab. (Muscidae) in the region of a farmhouse, and an excellent specimen of a male *Polietes lardaria* Fab. (Muscidae).

I must agree with Mr Foxwell in saying that I hope the area remains as it is, and I would like to thank him wholeheartedly for allowing me to accompany him on the expedition. The Mineries at Priddy certainly are a Naturalist's Paradise.

26.6.65. Alan J. Brown (3854)

REFERENCE

COLYER, C. N. and HAMMOND, C. O. (1951). *Flies of the British Isles*. Frederick Warne, London.

•

REVIEW

The Freshwater Life of the British Isles, by John Clegg. Pp. 352. Illustrated with 95 text drawings, Pl. XVI in colour and LI half-tone. Frederick Warne and Co. Ltd., London, 1965 (Revised

Third Edition, 1965, first published 1952). Price 35/-.

The Author's aim, when planning this volume of the Wayside and Woodland series, was to produce a standard reference book on freshwater biology, which would appeal to the intelligent layman, the student and the naturalist. I think this difficult task has been admirably attempted. This survey of the wealth of animal and plant life dependent on our ponds, streams and lakes must come as a revelation to the layman and accord both the student and naturalist a useful reference to the species and an inspiration to go out and look for himself.

The initial chapters review the three main types of aquatic environment—lakes, ponds and rivers—with mention of specialised habitats such as canals, subterranean waters and inland brine pools and proceed to illustrate the succession of the larger plants occurring from the marshy banks to the deeper waters.

Chapters four to twelve cover the numerous lesser known inhabitants of fresh or mainly fresh water areas. These include the simple plants (bacteria, fungi and algae), the Protozoa (single celled animals), the freshwater sponges, the Hydra, Rotifers, Polyzoa and the Crustaceans. All are completely aquatic and though many are individually of microscopic size, they quickly increase, under favourable conditions, to provide large quantities of food material for the more specialised inhabitants. Most are easily obtained from any natural accumulation of water and form excellent objects for study and experimental work.

Of special interest to our Members are the two chapters on insects. Twelve out of the twenty insect orders have aquatic representatives among which Stoneflies, Dragonflies, Mayflies, Alderflies and Caddisflies are exclusively aquatic in the im-

mature stages and bugs, beetles, moths and two-winged flies (Diptera) have some representatives. With the exception of a few bugs and beetles, none of the adult insects live in the water. It seems probable that insects only adopted the water at a late stage in their evolution and to do so showed an amazing versatility in overcoming the problem of breathing in this medium.

True aquatic lepidoptera are confined to the four species of China Mark moths (Pyralidae) whose larvae feed on the undersides of floating water plants, and *Acentropus niveus* Oliv. (Pyralidae), an interesting species whose female has both winged and wingless forms and whose larva feeds in deep water (noted as six feet deep), an essential feature for a larva which is susceptible to frost. The imagines of these species can often be taken freely at dusk or at artificial light during the summer months and the larvae bred on suitable foodplants in an aquarium. It could be noted that even a wider range of insect life is indirectly dependent on inland waters. The lepidopterist will immediately think of the wainscot moths (Amphipyrae), many of whose larvae feed in the stems of reeds and sedges growing in or adjacent to water.

The Molluscs, comprising the water-snails, freshwater limpets, mussels and cockles complete the range of invertebrates. A full list of the larger vertebrate population of inland waters—fishes, amphibians (newts, toads and frogs), reptiles, birds and mammals (otter, water vole and water shrew) is beyond the scope of this work but a brief reference is made to dominant species so as to afford the reader a full ecological picture.

Concluding chapters give a useful account of collecting methods and details of apparatus required, a review of the upkeep and uses of

inland waters from an economic standpoint, two appendices on pH values and anglers' names for aquatic insects and a bibliography.

I think that most amateur naturalists appreciate the Wayside and Woodland series: they make excellent reading and the relevant subjects are adequately covered without becoming a mere list of species. This volume, the Freshwater Life of the British Isles, is printed in a type you can easily read and in which you can quickly trace references. The larger size of this volume, $8\frac{3}{4}'' \times 6''$, is a better size for the bookshelf but too bulky for the pocket when out in the field. The number of illustrations greatly add to the value of this edition and it will certainly appeal to the student and the countrylover who wishes to learn a little more of what goes on under the surface.

R.D.H.

NOTES AND OBSERVATIONS

SELF DEFENCE

Whilst observing a Small Tortoiseshell Butterfly (*Aglais urticae* Linn.) fluttering around the garden, feeding, a House Sparrow (*Passer domesticus* Linn.) flew down and began to worry and chase it. The butterfly, unexpectedly, made a fast turn and approached the sparrow from the rear. The Small Tortoiseshell then began buffeting and chasing the bird until it gave up the conflict and flew off. The butterfly then returned and resumed feeding.

3.8.65.

N. Walker (3705J).

THE FLAME BROCADE MOTH IN WORCESTERSHIRE

Before I purchased my mercury-

vapour light-trap this year, I constructed a home-made trap using an ordinary household bulb (150 watt) and was lucky enough to capture two female specimens of *Trigonophora flamma* Esp. (Flame Brocade) on the night of 19th September 1964.

I thought it worth recording as on consulting South's 'Moths of the British Isles' I found that captures are rare enough to warrant articles to the *Ent. Gazette*. During the same night I captured also one perfect specimen of *Apatele alni* Linn. (Alder Moth). I was very pleased with this as I had heard that the captures of this moth had been comparatively few.

17.6.65.

I. C. N. Brown (3743J).

THE SMALL BLUE BUTTERFLY IN SCOTLAND

On 4th June 1965 I captured a male Small Blue (*Cupido minimus* Fuesl.) at HMS Fulmar, Royal Naval Air Station, Lossiemouth, Morayshire, Scotland.

To quote South the butterfly is found "in various places in Scotland extending as far north as Aberdeen."

As Lossiemouth is well north of Aberdeen I am wondering if my capture is the most northerly record for this insect. I should like to hear other readers' opinions on this.

11.9.65.

M. O. Hughes (3612)

REFERENCE

SOUTH, R. (1941). *The Butterflies of the British Isles* 3rd edn. Frederick Warne, London. P. 177.

ADDENDUM

I wish to inform readers that the Rosy Minor (*Procus literosa* Haw.) and Wormwood Shark (*Cucullia absinthii* Linn.) were observed in Solihull Warwickshire, for my communication (*Bull. amat. Ent. Soc.*, 24: 31) did not state where they were recorded.

J. S. Badmin (3406)

Exotic Butterflies

*SPECIAL OFFERS OF PAPERED (unset) BUTTERFLIES
Fully named with data*

- 10 South American Papilios for 25s.
- 10 Indian Papilios for 21s.
- 10 South American butterflies for 15s.
(Catagramma, Callicore, Heliconius, etc.)
- 10 Larger South American butterflies for 21s.
(Prepona, Victorina, etc.)
- 10 Assorted butterflies from India for 17s. 6d.
(Charaxes, Argynnis, etc.)
- 5 Blue Preponas from Peru for 21s.
- 5 Blue Morphos from South America for 30s.
(didius, anaxabia, etc.)
- 10 Assorted butterflies from North America for 17s. 6d.
(Argynnis, Liminitis, etc.)
- 10 Assorted butterflies from Mexico for 15s.
- 10 Assorted PIERIDAE from Peru, India, Mexico and
North America for 15s.

All above collections post free. Mail Orders Only

R. N. Baxter, 16 Bective Road, Forest Gate, London, E.7

Teen International Entomology Newsletter

The Newsletter, sponsored by the New York State Co-operative Extension Service, is edited by teenagers for the younger entomologist and — though centred in the U.S.A. — aims at a worldwide membership.

It offers an ideal opportunity for Junior members to extend their interests and make useful contacts with the younger collectors of other countries.

Members wishing further information should write to the address below, giving their name, full address, natural history interests and quoting the Amateur Entomologists' Society.

**Miss C. Seeley, T.I.E.N.,
47, Woodside Avenue, Oneonta,
New York, 13820, U.S.A.**

Silkmoth Rearer's Handbook

A complete reference book for those who embark upon the fascinating adventure of rearing the largest and most colourful moths in the world.

Part I records practical experience in breeding Silkmoths from all over the world during the past decade. It illustrates bought and home-made apparatus and gives hints on everything the beginner needs to learn about the life-cycle of the insects.

Part II, *for the first time in one book and one language*, gives complete or nearly complete descriptions of all stages of the life-cycle of over 120 species. Some 1,400 species and subspecies can be looked-up under 138 generic names.

Part III is a reference section, covering cross-pairing, the major reference works and an index of species and subspecies.

The Handbook comprises 165 pp. with full colour cover, 2 colour plates, 63 monochrome photos and 24 line drawings or charts.

Price **17s. 6d.** (plus postage)

A Coleopterist's Handbook

A symposium by various authors edited by

G. B. WALSH, B.Sc., M.R.S.T., and J. R. DIBB, F.R.E.S.

The Handbook describes the tools and apparatus and methods of collecting British Beetles; their habitats, commensals and pre-adult stages: how to record, photograph, make a personal collection and conduct a local survey.

Twenty full-page plates illustrative mainly of pre-adult stages (including seven reproductions of rare engravings) and fifty line-drawings and diagrams. 112 pp. and index.

Price **15s. 0d.** (plus postage)

from

Amateur Entomologists' Society

OFFICIAL PUBLICATIONS AGENT

137 Gleneldon Road, Streatham,

LONDON, S.W.16

(Please do not send money with order: an invoice will be sent)

WANTED

Lepidoptera and Coleoptera from all parts of the world. Will buy one or more or in mixed lots. Only first class material required. Butterflies should be packed in triangular paper envelopes, using correct size with only one specimen to an envelope.

For exchange. Lepidoptera from Brazil, named with full data, also many others from Africa and New Guinea including *M. riphaeus*, *Papilio weiskei* and *P. poseidon*.

Please write to—

**Butterfly World (A. Glanz), 291 East 98th Street, Brooklyn,
N.Y., U.S.A.**

MEMBERS' BADGES

A small enamel badge, in the form of a yellow Brimstone butterfly with the letters AES in gilt, is now available

*Price 3s. 6d. plus 6d.
postage and packing*

Please apply to:

**Hon. Enrolment Secretary,
28, Summerleaze Park,
Yeovil, Somerset**

ADVERTISEMENTS

displayed in these pages cost very little

Whole page £3

Half page £1 - 10s.

Quarter page £1

so

write to

18 Golf Close

Stanmore, Middlesex.

The Advertising Secretary
will be pleased to supply you with
further information about advertising
in the

AES BULLETIN

Worldwide Butterflies Ltd.

Charmouth, Bridport, Dorset

IMAGINES, OVA, LARVAE AND PUPAE

from many parts of the world

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

F O R A L L I N F O R M A T I O N O N B E E S

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mdx

Entomological Literature

CATALOGUES ON REQUEST

VOL. 25

No. 271

•

MAY, 1966



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**



A much needed new title

ROTIFERS

Josef Donner

These insects which are so abundant in aquatic and sub-aquatic waters have delighted and fascinated amateur microscopists and professional scientists since they were first described in 1703. However there has been a lack of a guide in English this new book fills this gap. In addition to the illustrations in the original text (translated by H. G. S. Wright) there are fine plates from photographs of living specimens taken by modern electronic flash techniques. 18s. net.

FREDERICK WARNE

1-4 Bedford Court, London, W.C.2.

AES NOTICE

WHERE TO WRITE

Changes of address, offers of help, queries, etc., to: D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset.

*Membership applications and non-arrival of Bulletins to: D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset.
Yeovil 928.*

*Advertisers to: R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex.
GR1msdyke 0460.*

*Offers to lead Field Meetings, exhibit, etc., to: B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27.
GIPsy Hill 0057.*

Manuscripts, drawings, and books for review to: H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

*Subscriptions (25/- per annum, 12/6 for Juniors) to: B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex.
Sunbury 2687.*

Youth matters to: H. J. Berman, St Ivo School, St Ives, Hunts.

GEOFF. A. SMITH

PET FARM

ATTLEBRIDGE

NEAR NORWICH: NOR 57X

Live Insects for Sale:—

Butterflies, Moths, Stick
Insects, Etc., Birds, Animals,
Aquatic Plants also available

PLEASE SEND S.A.E. FOR LISTS.

Fluorescent "Blacklight" M.V. Equipment

Portable, battery-operated, traps complete with 6 watt tube and transistor power unit, weight 5½ lbs. £17.

Battery operated units for use with sheet complete with 6 watt tube and transistor power unit, weight 2 lbs. £9 5s. 0d.

Traps and sheet units using 15 watt tubes available later.

Full details on receipt of S.A.E. from

ENTECH SERVICES

Windermere Road
Grange-over-Sands, Lancashire



EDITORIAL

The Society is making a special attempt to organise more field meetings for its Members this season.

In the past, unfortunately, it has sometimes not been possible to arrange many such meetings in the year because few people felt able to attend them.

However, there must nowadays be many Members who would be able to attend a meeting in their area or — in these days of private transport — an area known to them further afield. I would ask Members to consider this, as part of their contribution to the well-being of the Society, and perhaps any Members interested would write to Mr. C. Bignell-Pratt, 1 West Ham Lane, London, E.1, who has agreed to act as a 'Field Meetings Secretary' for the Society.

There has been relatively recently a realisation that conservation of our wild life is urgently necessary: indeed, in quite recent issues of the *Bulletin* we have read an appeal on this subject from the Royal Entomological Society of London, as well as appeals from our own Members.

In order to encourage positive conservation projects among our Junior Members, Mr S. J. Whitehouse (3551) has generously offered a Junior Conservation Prize as follows. The prize — value one guinea as a credit note on Worldwide Butterflies, Ltd. — will be awarded for the best report of a conservation project received by me, as *Bulletin* Editor, from a Junior Member, group of members, or Junior Club, in 1966. I would ask all Juniors to think

how they can help to conserve the habitats and numbers of our insects — and then actively to do something about it in their own areas. (See, for example, the article by Mr K. J. Willmott (3822J) in *Bull. amat. Ent. Soc.*, **24**: 158-9).

In contrast to this attitude of doing all we can to protect and conserve our fauna and flora, it is most disturbing that some quite influential opinion in America is hinting that the battle is already lost—even on a continent far more unspoiled than is Britain. In an address to the Lepidopterists Society published in the *Journal*, the President makes the amazing statements: "Because we cannot halt the spread of 'civilisation' we should collect adequate series of as many species of butterflies and moths as possible while they are still in existence." ". . . I would urge you most emphatically to collect extensively in all available natural habitats." This seems to me to be just the sort of defeatist logic which led to the rapid extermination of the Large Copper Butterfly (*Lycaena dispar* Haw.) in its last haunts in Britain as its rarity value increased. While normal collecting rarely does harm, the taking of long series to be stored up against their examination in the future by museum taxonomists—which seems to be the theme of the article in question—strikes me as a most dangerous philosophy.

I hope that in Britain we shall not let our butterfly fauna survive only as long cabinet series because we preferred collecting out the survivors to making the effort to conserve a worthwhile part of their habitats for posterity.

H. V. Danks (2907).

REFERENCES

- RINDGE, F. H. (1965). *J. Lepid. Soc.*, **19**: 193-5. The Importance of Collecting—NOW. (Presidential address to the twelfth annual meeting of the Pacific Slope section of the Lepidopterists Society).
- SOUTHWOOD, T. R. E. (1965). *Bull. amat. Ent. Soc.*, **24**: 152-3. Insect Conservation: an appeal (by the Conservation Committee of R. Ent. Soc. Lond.).
- WILLMOTT, K. J. (1965). *Bull. amat. Ent. Soc.*, **24**: 158-9. Let's Get Down to it . . . Now.

ANNUAL EXHIBITION 1966

The Annual Exhibition for 1966 will be held on Saturday October 8th, from 2.00 p.m. until 5.30 p.m., at the Hugh Myddelton School, Corporation Row, London, E.C.1. Full details will be given in the next issue.

COLLECTING NOTES MAY 1966

The Smaller Moths

Telphusa luculella Huebn. Mr Bradford's notes read: "The forewings are a dark brownish black with a very conspicuous creamy yellow arc in the centre of the costa. There are two more whitish buff streaks, one on the costa and a less distinct one just below. The hindwings are a pale grey.

The drawing is from two specimens taken from the boles of oaks (*Quercus* sp.) near to my home. They can often be found on the trunks during the day if you look carefully. The larva feeds on oak and spins two leaves together.

The adult is on the wing in May and June."

Gelechia rhombella Schiff. Mr Bradford's notes read: "The drawing is from several very nice specimens taken in the garden. I have not bred it yet, although it is most likely that it does breed there as I have a number of apple trees. The larva feeds on

apple and either joins two leaves together or folds a leaf over. It can be found in May and June and it is worth looking over the apple trees at this time for it.

The adult can be found on the wing in July and early August. The forewings are a creamy greyish colour. There are three black spots or streaks, one at the base of the costa, the other two on the disc. The wings are speckled with black scales. The hindwings are very similar in colour to the forewings but more translucent and darkening towards the apex. Also the veining is fairly distinct."

This is a local insect, and as far as I know hasn't been recorded for Wales or Scotland.

D. Ollevant (1514).

CORRIGENDUM

The illustrations of the moths in *The Smaller Moths* Collecting Notes for November 1965 (*Bull. amat. Ent. Soc.*, **24**: 155) and February 1966 (*Bull. amat. Ent. Soc.*, **25**: 2) were unfortunately printed with the captions transposed.

In the November issue the upper illustration as printed in fact showed *Swammerdamia caesiella* Huebn., while the lower figure was that of *Prays curtisellus* Don: while in the number for February, the upper illustration was that of *Ornix anglicella* Staint., and the lower one *O. guttea* Haw.

The Hymenoptera Aculeata

Although I am writing this in January, by the time it is read the new season will be well advanced, so I would first like to discuss another genus of bees the British species of which do not appear until July and August. The genus I have in mind is



E.S.B.

Telphusa luculella Huebn.

E.S.B.

Gelechia rhombella Schiff.

anurgus, jet black bees with the general fascies of *Andrena*. The genus may be recognised by the pointed tongue, four-jointed maxillary palps with the basal joint long but not beathing, and the wings with only two submarginal cells and with the marginal cell subtruncate and appenliculated.

However, it is not by these formal characters that the species will be recognised in the field. When once appreciated, the all black colour,

general hairiness particularly on the legs, and the typical curled-up position that the males assume in the flowers of yellow composites, are readily recognised. The two British species differ most obviously in size. In the smaller *P. calcaratus* Scop. the male has a large blunt spine under the hind femora, and the female has a virtually bare dorsal surface of the abdomen, compared to the larger *P. banksianus* Kirby.

Both species are locally abundant

in sandy and gravelly areas mainly in the South. They nest in the ground and are typical of open grassy areas where they visit in particular the yellow flowers of *Hieracium* and similar genera. Perhaps Members will look for these interesting bees this year in their own areas, and help to build up a more precise picture of their distribution, which is certainly patchy.

In 1965, I was particularly interested by the complex of small wood-boring wasps that inhabit the beetle holes in chestnut-pale fencing. In one spot near my home I took on June 19th five male and three female *Trypoxylon clavicerum* Lep., one male *Stigmus solskyi* Mor., eight male *Passaloecus corniger* Shuck., one male *P. insignis* van der Linden, two male *Coelocrabro leucostomoides* Richards and one male *Crossocerus tarsatus* Shuck., all within fifteen minutes and only with the aid of a pooter. A few days later in a similar catch in my own garden *Passaloecus gracilis* Curt. proved much more abundant than *P. insignis*. It would be of interest to hear how the pattern of species changes in the various parts of the country, another job for 1966!

In my notes for February 1966, I discussed labelling and recording. Since writing the article I have seen Dr D. R. Ragge's recent book: '*Grasshoppers, Crickets and Cockroaches of the British Isles.*' Mention of this book may seem hardly relevant to an article on Hymenoptera, but one particular section is of importance to all who study the distribution of animals and plants in Great Britain. I refer to the excellent account given of the Watson-Praeger Vice-County system. The information has been assembled from its original scattered sources, and both a written account and an excellent map of the vice-counties is provided. I hope that now an authoritative account of the Vice-County system is readily available,

more people will use this system of recording.

12.1.66.

J. C. Felton (3740).

REFERENCE

RAGGE, D. R. (1965). *Grasshoppers, Crickets and Cockroaches of the British Isles*. Frederick Warne, London and New York.

PHANTOM CRANE-FLIES

One family of crane-flies, the Ptychopteridae, forms a compact group of only seven British species, all in the single genus *Ptychoptera*. In American books, such as the standard entomological textbook by Borror and DeLong (1954), which is in many public libraries, these insects are called Phantom crane-flies, presumably because of the striking appearance of some of the species. In the words of Alexander (1919), "The adult flies [particularly a species of *Bittacomorpha*] are very conspicuous . . . The long, swollen legs, radiating out from the body like the spokes from the hub of a wheel and conspicuously banded with black and white, make the flies noticeable as they drift slowly thru the air, apparently as light as bits of down."

At least one British species, *P. albimana* Fab., has a very noticeable white band on its long hind legs.

Crane-flies of this family are more robust than those of the family Tipulidae. They are glossy black and yellow flies, about half an inch long, with blotched wings (which are never folded over the body when the insect is at rest). Although similar to the true Crane-flies in general appearance, their legs seem to be more firmly attached to their bodies, so that it is usual for specimens in the collection to be complete in this respect! In fact they make attractive cabinet specimens.

Ptychopteridae are insects of the margins of ponds and slow streams

where the elongate larvae are said to feed on decaying vegetable matter. These larvae have a long thin breathing-tube which extends up to the surface. The adult flies are on the wing from April to September, with May, June and July as the peak months. I have found the most widespread species to be *P. albimana* which—as with many common insects—has a long flight season, my own records extending from April 1st to September 15th. The other common species is *P. contaminata* Linn. This has strongly marked wings but lacks the prominent white metatarsi which are characteristic of *P. albimana*. I have not found it before June.

The other five species are apparently less widespread, though all have been taken in southern England. Cooper in a most interesting paper (1961) describes the habitats of four species he found at Robertsbridge, East Sussex, and in a subsequent letter he told me he had found a fifth species there. I have taken four species in Epping Forest, and others may well occur, because some of these flies are undoubtedly choosy in their habitats; for instance, *P. minuta* Tonn., one of the slightly smaller species, appears to occur in the Forest only at one pond which has a profuse growth of partially submerged moss at the edge.

Although the Ptychopteridae are all quite large flies, and as a genus can very easily be distinguished in the field, the seven species can only be identified with certainty by the use of a lens, and even then it is sometimes only the males that can be determined. Pairs seen in cop. should therefore be captured, and the female of such a pair kept with the associated male. The male genitalia are bright orange-yellow, and very prominent, each species having a distinct pattern. A key to the British species, with clear illustrations, is

given by Freeman (1950), and you may be able to borrow a very detailed earlier paper by Audcent (1934).

R. M. Payne (2982).

REFERENCES

ALEXANDER, C. P. (1919). *The Crane-flies of New York*, pt I. Cornell University.
 AUDCENT, H. L. F. (1934). *Trans. Soc. Brit. Ent.*, 1: 103-16. British Liriopidae (=Ptychopteridae).
 BORROR, D. J. and DELONG, D. M. (1954). *An introduction to the Study of Insects*. Rinehart and Co., New York.
 FREEMAN, P. (1950). Ptychopteridae in *Handbooks for the Identification of British Insects*, 9: (2). Royal Ent. Soc., London.
 ROOPER, P. (1961). *Ent. Rec.*, 73: 66-7. Ptychopteridae (Diptera: Nematocera) at Robertsbridge, E. Sussex.



NEW HABITATS

It was an interesting coincidence that the publication of an appeal from the Conservation Committee of the Royal Entomological Society of London for the protection of certain Lepidoptera, should appear at the same time as the two articles by Mr K. J. Willmott and Mr L. R. Lassman, both deploring the reduction in the insect population. (*Bull. amat. Ent. Soc.*, 24: (269)).

Mr Willmott's suggestion regarding the rearing of butterflies for release in depleted areas has already been tried by the writer. Between 100 and 150 Small Tortoiseshell (*Aglais urticae* Linn.) have been released in a small garden for the last three seasons. The short term results were encouraging, for many more of this species were seen, and in 1965 about 200 second-brood larvae were seen on a bed of nettles (*Urtica dioica* Linn.). It is doubtful however if in the long term the species will be strengthened without continued re-introduction. The reason for this is graphically illustrated in Mr Lassman's article—the destruction of the natural habitat, particularly by the widespread use of herbicides.

The over-zealous collector may be likened to a tin of insecticide in effect,

but the real villain of the piece is the man with his finger on the herbicide spray.

All this makes depressing reading to naturalists, and it is with some pleasure that a new habitat for Lepidoptera can be reported, being made quite accidentally by rail closures. During a recent holiday in North Cornwall last summer the following species were identified in a half-mile stretch of deserted railway line near St Agnes on August 17th:

Speckled Wood (*Pararge aegeria* Linn.), Wall (*Pararge megera* Linn.), Grayling (*Eumenis semele* Linn.), Meadow Brown (*Maniola jurtina* Linn.), Hedge Brown (*Maniola tithonus* Linn.), Painted Lady (*Vanessa cardui* Linn.), Small Tortoiseshell (*Aglais urticae* Linn.), Peacock (*Nymphalis io* Linn.), Common Blue (*Polyommatus icarus* Rott.), Small Copper (*Lycaena phlaeas* Linn.), Large White (*Pieris brassicae* Linn.), Small White (*Pieris rapae* Linn.), Green-veined White (*Pieris napi* Linn.), Small Skipper (*Thymelicus sylvestris* Poda.).

None of these species is of course rare, but they occurred in such large numbers that the conditions obviously suited the butterflies, provided as they were with the shelter of the railway banks, and the profusion of wild flowers growing in between the sleepers.

The land enclosing deserted railways is presumably still owned by 'British Rail', but they may be persuaded to use the land for conservation purposes. The writer wondered if other AES Members would be interested in forming a study group to investigate the potentialities of this type of land.

The kind of themes that might be studied are the effects of planting foodplants and nectar-bearing shrubs and herbs; rearing and releasing depleted species; and a quantitative survey of Lepidoptera along a given section of railway.

The scheme should be within the compass of a band of amateurs, and it at least has the merit of making a positive contribution to the conservation of our Lepidoptera.

28.12.65. S. J. Whitehouse (3551).

PARASITISED LARVAE OF THE WHITE ADMIRAL

With the build up of numbers of the White Admiral Butterfly, *Limenitis camilla* Linn., since the very cold winter of 1963, it seemed that the spring of 1965 would be a good occasion to look for larvae. During the summer of 1964 the butterfly had turned up in many woodlands from which it had been absent for several years and in many localities it could be termed common. I searched methodically a small section of woodland on the Sussex border on the 1st May with another member, Mr D. Downs. The female butterflies fly in under the scrubby undergrowth along the edges of the rides and lay their eggs on the more straggly pieces of honeysuckle (*Lonicera periclymenum* Linn.) particularly where they grow up among the clumps of stems of coppiced hazels (*Corylus avellana* Linn.). I found the first larva on the junction of a leaf shoot with the woody stem. Here the surface of the shoot is brown and hairy and matches very well the caterpillar, which was about a quarter of an inch long and appeared to have just left its hibernaculum. The second larva was half inside its hibernaculum, a dead honeysuckle leaf with the edges spun together to form a winter hammock and secured to the stem by silk. On the shoot beside it was another larva which had left its hibernaculum and started to feed. In all I found nine larvae, indicating how many there must have been

throughout the woodland as the area searched was chosen at random and was not very large.

At home I placed the larvae on potted honeysuckle together and a week later I noticed that two had moulted and now were green and brown in colour. I searched for the other seven larvae but found only two dried shrivelled larval corpses and hanging from the leaves were small cocoons, one for each larva. These are suspended by a silken thread about $1\frac{1}{2}$ " long and were yellowish with a third of their length dark brown. The cocoons were about $\frac{1}{16}$ ths of an inch in length and after ten days each produced a hymenopterous parasite.

These have yet to be identified but so far I have been unable to trace by reference to the parasitising of the larvae at such an early stage. For the insect to grow to maturity so soon after its host has come out of hibernation indicates that the introduction of the parasite must be very early in the life of the larva. The early emergence of the parasite in mid-May with the host not appearing as an adult insect until the third week in June indicates an intermediate host as the adult wasp seems to be fairly short lived. It would be interesting to hear of any other observations of similar parasitism of the White Admiral or if anything is known of his particular ichneumon.

197.65. P. W. Cribb (2270).

PAIRING OF THE GYPSY MOTH

In March I was able to procure myself a few ova of this moth (*Lymantria dispar* Linn.). The first larvae emerged on 24th March, pupated on 21st May, and produced imagines on 13th June.

In captivity this moth flies as well in the daytime as during the night. Its well developed wings enable it to have a light flight but a sure one. Having no proboscis it cannot feed itself, and as a consequence of this ignores nectar and sugar solutions. Therefore the only thing it does is breed, and all its behaviour leads towards the reproductive act for which it lives.

Bearing this in mind, I paired the moths into a rectangular wooden cage with netting on all four sides and on the top. (This cage can be bought from Worldwide Butterflies.) I noticed that the females hardly ever fly. They stay motionless and wait for the approach of a male. At the male's approach they keep calm, while the former gets very excited. He whirls around the female, fluttering like a humming-bird, and suggesting the noise of a ventilator. If he passes away from the female, he suddenly comes back as if attracted by some sort of powerful attraction. He gets hold of her with his legs, and brings his abdomen towards her: in his hurry he applies his abdominal extremity to any part of the female—on the head, on the wing, on the sides, etc., until he finds the female extremity. Sometimes I must admit he finds it straight away, but most often many seconds pass before he has found it, or rather joined it. At last he manages to connect his abdomen to the female's. The copulatory organ, long, pointed, and very thin, is insinuated at the proper place. Then the male, all of a sudden, completes pairing with a rapid lunge. His wings remain motionless, and will not move until the end of the pairing.

The pairing of my specimens did not last more than twelve hours. Once these have elapsed, the male separates himself from the female, and the female advances forward (without flying) to find a calm place to lay her eggs. The egg-laying period

also varies in time. My specimens took between four and six days to lay all their eggs.

Other observations of interest are that the females seem to lose their abdominal fluff, with which they cover their eggs. Also if we compare the size of the female's body before the egg-laying and after, we notice that the body has diminished in length and in thickness by half.

Pairing occurred as soon as the female emerged from the pupa, that is to say in the morning between 12 midnight and 2 a.m., at a temperature of 74°F., in which my specimens were kept throughout rearing.

25.6.65. J. M. Danner (3774J).

CAMPING IN THE NEW FOREST, 1965

On July 7th of this year two friends and I went camping in the New Forest. When we arrived at Lyndhurst I went to apply for a camping and hunting permit. After I had done this we caught a bus to Brockenhurst. We were going to camp in a camping site just outside Brockenhurst.

When we had selected a spot we erected the tents in pouring rain, and finally had a meal.

With one of my friends (Kerry) doing the washing, my other friend (David) and I went to see what we could find, as it had stopped raining.

As I had expected we did not find much except for the occasional Meadow Brown (*Maniola jurtina* Linn.) and Large Skipper (*Ochlodes venata* Br. and Grey). One species I took, which I had not seen before, was the Purple-bordered Gold (*Sterrrha muricata* Hufn.).

That night was a rather disappointing one, and the only species we took were the Common Emerald (*Hemitheta aestivaria* Hufn.), July Highflyer

(*Hydriomena furcata* Thunb.) and the ClouDED Brindle (*Apamea epomidion* Haw.). We also found some female Glow-worms (*Lampyris noctiluca* Linn.), which we could see quite easily some twenty yards away. That night the Common Toad (*Bufo bufo* Linn.) was so common that we had to watch where we trod for fear of stepping on one. One thing we had not expected to find was the Fallow Deer (*Dama dama* Linn.) which gave us quite a start as the animals ran out from behind a bush.

The next day David and I got up rather early to see if we could find some deer. Just after entering Park-hill enclosure we saw some of the pretty Roe Deer (*Capreolus capreolus* Linn.), but we soon lost them because of their speed.

In the afternoon Kerry and I took a walk in the same enclosure, and soon after entering it found the Ringlet (*Aphantopus hyperanthus* Linn.), Meadow Brown, and the Large Skipper in large numbers. Further inside the enclosure we saw the first Silver-washed Fritillary (*Argynnis paphia* Linn.), and as I had my net I was able to catch it after a long chase. Kerry had not brought his net with him, so he ran back to camp to fetch it and, at the same time, tell David of what we had found.

Before he returned I had taken another Silver-washed Fritillary and seen many others, and also a White Admiral (*Limenitis camilla* Linn.) which was flying high up in the trees.

A little further inside the enclosure we saw another specimen of *L. camilla* which I was unable to catch. Soon we came to a clearing where we found the Small Skipper (*Thymelicus sylvestris* Poda). It was here I caught my first *L. camilla* and also another *A. paphia*, and a Brown Aeshna (*Aeshna grandis* Linn.). Bordered Whites (*Bupalus piniaria* Linn.) were quite common here, but I was only able to take one as they were flying

her high. David joined us a few minutes after we entered the clearing. On walking down another path, we found a bramble bush covered with *paphia*, but no *L. camilla*.

The next afternoon we took the same route without catching anything exciting, but we found the Lead Belle (*Ortholita mucronata* Scop.) quite common, and one thing which did excite us was seeing a var. *valezina* of *gynnys paphia*. The nearest I got to catching it was when it landed on a bramble bush near me, but unfortunately my net was in my left hand and missed when I tried to net it. We also found the Five-spot Burnet (*Lygaena trifolii* Esp.), but it did not appear to be very common.

When we returned to our tents I decided to make some sugar for that night in the hope that I would attract some new species. Just after I had finished sugaring we met another lepidopterist who had just been doing the same thing and had caught a Rosy Footman (*Miltochrista miniata* Forst.), and we went back to camp for a talk.

Later that evening we met him again and accompanied him until we returned to camp. That night we took some Great Oak Beauties (*Boarmia roboraria* Schiff.), Ringed Carpets (*Cleora cinctaria* Schiff.), which I have taken once in Glamorgan, Mottled Beauties (*Alcis repandata* Linn.), Clouded Brindles, Double Darts (*Graphiphoria augur* Fab.), and one Small Dotted Buff (*Petilampyx minima* Haw.).

The following evening we caught only the common species plus the Buff Arches (*Habrosyne pyritoides* Hufn.) and the Lesser Yellow Underwing (*Euschesis comes* Huebn.).

On the 17th I went by myself to a place called Winspit Bay, about four miles from Swanage. I had heard from our lepidopterist friend that I would find the Lulworth Skipper (*Thymelicus acteon* Rott.) and Marbled

White (*Melanargia galathea* Linn.) there in large numbers, which I did. I also took one or two nice varieties of the Meadow Brown and found a pupa of a Drinker Moth (*Philudoria potatoria* Linn.) which later emerged as a rather dark female specimen.

When I got back to the tents my friends told me that when they had been in Brockenhurst, some ponies had flattened the tents and taken all our bread!

That night I went nothing by myself: on the first round I found nothing but a large number of Dark Arches (*Apamea monoglypha* Hufn.) and Large Yellow Underwings (*Triphaena pronuba* Linn.) and a few Clouded Brindles. On later rounds the Great Oak Beauty, Light Emerald (*Campaea margaritata* Linn.), Mottled Beauty, Grey Dagger (*Apatele psi* Linn.) and Small Angle Shades (*Euplexia lucipara* Linn.) were quite common. I also took a Coronet (*Craniophora ligustri* Schiff.) in perfect condition.

The next morning we were awakened by the sound of munching, and then suddenly the front of the tent collapsed on to us. Kerry rushed out and discovered that the ponies were busily eating our bread, and while Kerry chased them away David and I set to to mend the tents. This was to be our last day in the New Forest.

That afternoon I walked through Parkhill enclosure into the next one, and here I found one Small Purple-barred (*Phytometra viridaria* Clerk) which was in rather bad condition. The Purple-bordered Gold was also to be found in quite large numbers.

On returning to Parkhill enclosure I took some nice varieties of the Ringlet, one of which was typical on one side (underside), but with only four rings on one hindwing underside, two of these being quite small. Just before I left the enclosure I found a Five-spot Burnet, and also a large number of *A. paphia* on a bramble bush.

Back at camp David told me that he had taken a Purple Hairstreak (*Thecla quercus* Linn.), but was unable to catch any more because they were flying around the tops of the Oak trees (*Quercus robur* Linn.). That night we slept early as we had to get up early in the morning to catch our train. We were quite happy with what we had caught and were confident that we would return next year: perhaps one of us will catch that *Argynnis paphia* var. *valezina*!

24.8.65. J. S. Noyes (3523J).

LEPIDOPTERA IN DEVON AND CORNWALL

Once again I spent my summer holidays in the south-west. The first week we stayed at Croyde Bay, N. Devon. It was difficult to find a suitable place to run the 'm.v.' trap, but I set it up in the garden, which bordered the only road to Croyde Bay. It was amusing to hear the remarks of passers-by who seemed very concerned about my sanity! However, I was delighted to meet Mr A. A. Kent (3099), who was on holiday and staying about 200 yards away.

We spent a few hours in Braunton Burrows, where we succeeded in losing ourselves. After walking in the wrong direction—unknowingly towards the runways of a nearby R.A.F. station—we thought it better to about-turn. All ended in peace, after we had disturbed two soldiers in their tent and been sent off in the right direction. Although we saw many moths we were not successful in taking anything of interest.

The most common insect during this week (31st July-7th August) was *Perizoma flavofasciata* Thunb. (Sandy Carpet). Although many were faded,

I was able to take a few still in good condition. The other insects of interest were *Agrotis trux* Huebn. ssp. *lunigera* Steph. (Crescent Dart) and *Hadena bicolorata* Hufn. (Broad barred White).

At the end of the week my family and I travelled to St Mawgan in Cornwall. Here I met AES Member Mr Brind (3140) and Mr Whitehouse (3551). Mr Brind greeted me with the news that he had taken *Lygephilis cracca* Schiff. (Scarce Blackneck) a few days before at a spot known to both of us. We spent a few hours there later in the holiday but were unsuccessful in taking any more.

Mr Whitehouse joined us for our first collecting with 'm.v.' It was a good night and moths were flocking in. I took two males of *Perizoma bifasciata* Haw. (Barred Rivulet), and *Cleorodes lichenaria* Hufn. (Brussels Lace), *Lithosia deplana* Esp. (Buff Footman), and several others. The 'prominent' were quite numerous and *Lophopteryx capucina* Linn. (Coxcomb Prominent), *Notodonta dromedarius* Linn. (Iron Prominent), and *Niziczac* Linn. (Pebble Prominent) were present as well as *Lithosia quadra* Linn. (Four-spotted Footman). *Lymantria monacha* Linn. (Black Arches) were numerous.

A few days later Mr Whitehouse took both his family and mine to Perranporth. We left our families on the beach and went among the dunes. I was particularly interested in obtaining the Grayling (*Eumenis semele* Linn.): for years now I have been wanting to obtain a few examples, but have either been on holiday at the wrong time or not at the right spot. Although there was little sun and a fairly heavy drizzle it did not seem to perturb the butterflies too much. *Argynnis aglaia* Linn. (Dark Green Fritillary) and *A. selene* Schiff. (Small Pearl-bordered Fritillary) were numerous, as were *Polyommatus*

carus Rott. (Common Blue) and *Aricia agestis* Schiff. (Brown Argus). succeeded in obtaining two Graylings.

We returned to our families to have lunch, and were joined by Mr Brind. In the afternoon we walked over the headland and found the Grayling to be extremely common. It was flying in company with *Orthotricha plumbaria* Fab. (July Belle). During our chase over the headland I disturbed one Adder (*Vipera berus* Linn.) which appeared to be taking advantage of a period of hot sun.

Later that evening Mr Paul Siddons joined us and we went to some woodland. We camped in the middle of a railway track, leaving one Tilley lamp with a sheet spread over the rails. We followed the railway-line, carrying another lamp. Although it was an unfavourable night I was delighted to take one male *Lampropteryx otregiata* Metcalfe (Devon Carpet) in perfect condition. During his walk we took one larva of the obster Moth (*Stauropus fagi* Linn.) and one of the Orange Moth (*Angerona runaria* Linn.). Unfortunately, the obster Moth larva died whilst hanging instar. However, I was successful in getting the other larva to pupate. We ended our collecting with Jim Whitehouse brewing coffee in the railway track.

My last collecting was done in the same wood, again on a poor evening, but I was successful in taking *Alcis ibata* Thunb. (Dotted Carpet) and *Enophos obscurata* Schiff. (Annulet). The holiday was a great success, but without doubt it was 'made' by meeting other AES Members. It gave a good opportunity to exchange ideas and bits of knowledge. All credit, of course, must go to our patient wives who put up with our desertion of them and our endless talk on 'bug-hunting'.

G. D. Trebilcock (2976).

DAY TRIP TO WESTERHAM

On Whit Sunday, 6th June last, a party of four—my wife, Mr T. Lavender (3806), Mr R. Goodacre (3686) and myself (3680)—set out from Welling, Kent, to look for the larvae of the Orange-tip Butterfly (*Euchloe* (= *Anthocaris*) *cardamines* Linn.) near Westerham, Kent.

After a good start on a not too bright, but sultry, morning we arrived at our destination about 11 a.m.

We set up our nets and made our way through a small wood and halfway down the side of a steep hill at which point we left our equipment. It was here that Mr Goodacre made the first capture of the day—a female Orange-tip.

Other butterflies on the wing in this part of the field were *Coenonympha pamphilus* Linn. (Small Heath), *Pararge aegeria* Linn. (Speckled Wood) and *Nymphalis io* Linn. (Peacock), and moths *Zygaena filipendulae* Linn. (Six-spot Burnet), *Euclidimera mi* Clerk. (Mother Shipton) and *Ectypa glyphica* Linn. (Burnet Companion).

After lunch we found another field on an adjacent hill in which a large colony of Common Blues (*Polyommatus icarus* Rott.) was flying and emerging. Here we also found the Brown Argus (*Aricia agestis* Schiff.), Grizzled Skipper (*Pyrgus malvae* Linn.) and Dingy Skipper (*Erynnis tages* Linn.) and, to the delight of Mr Lavender, a keen botanist, two species of orchid, Man Orchid, *Aceras anthropophora* (Linn.) Smith, and Broad Helleborine, *Cephalanthera damasonium* Miller.

In both these locations the food-plant of the Orange-tip, Charlock (*Sinapis arvensis* Linn.) was very much in evidence but no larvae could be found.

We then decided to move to a third field where there were many

small Hawthorn bushes (*Crataegus monogyna* Jacqu.) which we beat, using a fishing umbrella as a beating-tray. The first bush produced some interesting Coleoptera, including the rather local Click-beetle *Prosternon tessellatum* Linn., *Dascillus cervinus* Linn.—whose larvae have been found at the roots of orchids—*Caenorhinus aequatus* Linn., and the common *Phyllopertha horticola* Linn.; the latter beetle was interesting in that its right tarsus was very stunted. In this field we found a small colony of Six-spot Burnet larvae.

By now it was getting rather late in the day and we decided to return to our first location to collect our equipment. As we were leaving the field I took a last look at a clump of Charlock which produced just one larva of the Orange-tip.

Although we were not successful in finding more of this species it was, nevertheless, a very enjoyable day, and I had taken two species of Coleoptera I had not collected before.
18.6.65. K. C. Lewis (3680).

DIURNAL APPEARANCES OF MOTHS

I was very interested to read, about a week ago, of moths being found feeding during the day on thistles. As no reason was given for this unusual occurrence I felt encouraged to write about a similar experience of mine in the hope of being enlightened, or at least being interesting!

While on holiday on Holy Island (off the coast of Northumberland) I repeatedly took large numbers of moths in the daytime feeding on Ragwort (*Senecio jacobaeae* Linn.). The area on which they were always to be found was mainly sandhills

partially covered by patches of sparse grass, dwarf sallow (*Salix* sp.) and a few thistles. Invariably the moths were on the Ragwort which grew in large clumps all over the area. On an average day (regardless of cloud coverage) I could usually be sure of finding at least twenty over an area of about three acres and sometimes I took about 60 over the same area. I have never encountered this before.

The moths which were thus found were the Ear (*Hydraecia oculea* Linn.), Dark Arches (*Xylophasia monoglypha* Hufn.), Portland (*Actebia praecox* Linn.), Archers Dart (*Agrotis vestigialis* Hufn.), Common Wainscot (*Leucania pallens* Linn.), Large Yellow Underwing (*Triphaena pronuba* Linn.), Lesser Yellow Underwing (*Triphaena comes* Huebn.), Antler (*Charaeades graminis* Linn.), Turnip (*Agrotis segetum* Schiff.), Middle-barred Minor (*Procus fasciuncula* Haw.) and Flame (*Axyليا putris* Linn.).

This, apart from the Ingrailed Clay (*Diarsia mendica* Fab.), also represents the entire number of species of 'Macros' that I found on the island.

The most obvious reason for this seems to be that the Ragwort is not attractive at night and is the only foodplant available. However, this was immediately ruled out by the fact that at night I could usually find about 80 moths over the same area; one night indeed I found well over 100 moths (using a red torch and allowing for repeated captures).

The only other evidence seems to be that the moths were most common at about 1 p.m. and just after (presumably the hottest part of the day). If anyone has any views on this problem (and I expect that I have overlooked some simple explanation) I would be very interested to hear from them. Perhaps an article to the *Bulletin* is the best idea.

18.12.65. M. R. Young (3759J).

ORGANIC SOLVENTS AS KILLING-AGENTS FOR LEPIDOPTERA

In the May 1965 issue, Mr M. Hull refers to the use of tetrachlorethane and comments on its unsuitability for use because of the unpleasant residual odour. Its other disadvantage is its extreme toxicity. Tetrachlorethane is chemically related to carbon tetrachloride. This has been used as a killing-agent for Lepidoptera, and Crotch (1956) has recommended its use for killing silkmoths by submerging the body of the moth in it, or by spraying the body with it using a pen-filler or an eye-dropper. Carbon tetrachloride is a colourless non-flammable liquid with a sickly smell, which is not unpleasant. It is relatively non-toxic, and therefore safe to use.

Another related substance is trichloroethylene. This is a clear non-flammable stable liquid and it is used as an anaesthetic. It is not entirely suitable as a killing-agent because it will cause drowsiness if inhaled. In addition, in the presence of a naked flame it is converted to an extremely poisonous gas. This would take place if the vapour was inhaled through a cigarette and because of this it should only be used in well ventilated areas and no one should smoke while it is being used.

Two substances which might be thought of as suitable for use as killing-agents are the anaesthetics chloroform and ether (diethyl ether). Both of these are in fact quite unsuitable for this purpose and should not be kept in the home. Chloroform is both flammable and unstable forming an extremely poisonous substance carbonyl chloride when exposed to air. Ether is also extremely inflammable and the vapour forms explosive mixtures with air. Both substances are too volatile for satisfactory use as killing-agents.

One of the most satisfactory killing-agents is ethyl acetate (acetic ether). This is a colourless, non-toxic liquid with a sweet smell. It is effective in reasonable concentrations used in a killing-bottle with the bottom covered with a layer of Plaster of Paris. It is cheap and can be obtained quite readily at any chemist. It has the big advantage of keeping Lepidoptera relaxed and ready for setting. This is the killing-agent which should be recommended to younger lepidopterists because of its safety.

It is very disturbing to see the recommendation of potassium cyanide as a killing-agent even in recent publications. This substance is extremely poisonous and is dangerous even in experienced hands. As it is a controlled poison it can only be obtained through a pharmacist after the proper entry has been made in the poison register, but with the wide choice of other, safer, substances available it should not be used. It is not only hazardous to use but its disposal presents problems. Although a cyanide killing-bottle may appear to be so old as to have lost its effect, the pieces set in the plaster matrix are still poisonous and should not be handled. The only safe way of disposing of an old cyanide killing-bottle is to incinerate it in a furnace. 16.7.65. P. M. Worling (3870).

REFERENCES

- CROTCH, J. B. (1956). *A Silkmoth Rearer's Handbook*. AES, London. p.38.
 FINAR, S. (1956). *Organic Chemistry*. Vol 1.
 HULL, M. (1965). *Bull. amat. Ent. Soc.*, 24: 46. Tetrachlorethane as a killing-agent for Lepidoptera.

A HONEY-AGAR MIXTURE AS FOOD FOR ADULT LEPIDOPTERA

Recently in the *Journal of the Lepidopterists' Society* (vol. 19, p. 233), a method for feeding adult Lepidoptera kept as breeding stock was dis-

closed. Mr Noel McFarland, of the South Australian Museum, introduced a honey-agar mixture which is used in the laboratory for food. This mixture has obvious advantages over wet or sticky solutions, such as sugar-water, as it is a jelly.

There are two basic recipes for the mixture, both of which I list as stated by McFarland. They of course can be proportionally reduced, if a smaller quantity is required.

200 ml of water are mixed with 6 to 8 grams of agar-agar (obtained at drugstores, possibly only through special order). This is then mixed with 250 to 320 ml of honey, and brought to a boil over a flame. The hot liquid is poured into a dish or container, and placed in the refrigerator to "set".

An alternative method of preparation may be used, which gives a more concentrated mixture.

300 ml of honey is blended with a mixture of 50 ml of water and 8 grams of agar-agar. This is prepared and stored in the same manner as the former.

When feeding, place a small bit of jelly in a bottle-cap, or similar holder, and add a drop of water to moisten the surface.

Although I have had no experience with them, I think this food may be used for ants, as well as other "sweet-toothed" insects.

5.1.66. John T. Sorensen (3719).

REFERENCE

McFARLAND, N. (1965). *J. Lepid. Soc.*, 19: 233-6. Additional notes on rearing and preserving larvae of Macrolepidoptera.



CARDING THE LARGER COLEOPTERA

I have seen in many collections of British Coleoptera rare species, such as *Carabus intricatus* Linn., with a large unsightly, corroded, sometimes bent pin producing from the right

elytron and spoiling the look of the collection.

I have tried to obtain uniformity in my own collection by mounting all of the beetles in the same style, on cards. The only beetle which is pinned and not duplicated by carded specimens is a perfect specimen of *Strangalia aurulenta* Fab. The method of mounting large species which I use is very simple and easy to carry out.

Remove the specimen from the killing-tube or jar and lay it on its back. Roughly arrange the legs and antennae into the desired position and apply a dab of rubber solution to the abdominal tergites and metasternum and another dab on the prosternum. Next cut a piece of cardboard large enough to fit under the beetle when its legs and antennae are extended.

Pin the card to a setting board or cork mat and place some rubber solution in the centre of it. When the rubber solution has dried place the beetle on the patch of rubber solution, so that it is held firmly in position.

The legs, mandibles, antennae and palpi can now be arranged in the desired position for setting and held in place by pinning through the cardboard into the cork. Setting finished, the insect is left in the drying cabinet for at least six weeks.

When the specimen is thoroughly set, remove the pins, take the card off the cork and place it in a tin or jar containing some benzene or toluene for twenty-four hours to dissolve the rubber solution. Make sure that the date is written on the lid of the tin or jar. After twenty-four hours the specimen should have floated off. If it has not the beetle can be lifted off by applying gentle pressure. Take it out of the benzene and lay it on its back, rub off any traces of rubber solution and if the beetle is not yet identified this is the best

me to identify it. The next step is to cut, from a stiff cardboard (purchased from any art shop) a size of card suitable for the size of beetle. Tick the beetle on the card with some rubber solution. There is no need to stick the legs or antennae. After the mount has been pinned, labelled and numbered it is ready to be placed in the collection.

It is best to standardise the sizes of cards, and personally I use the following sizes:

" x 2" ... *Lucanus cervus* males
 $\frac{1}{2}$ " x $\frac{5}{8}$ " *L. cervus* females, *Dytiscus*,
Prionus coriarius.

$\frac{5}{8}$ " x $\frac{1}{8}$ " *Geotrupes* spp., *Blaps* spp.,
Helops caeruleus, most larger
 'Chafers' and dung beetles.

Individual sizes will have to be used for the Cerambycidae, a family which vary too much in the size of antennae.

Cards for most of the long antennae species such as *Saperda*, or the imported *Monochamus* spp. will usually tend to be square.

Large beetles such as *Carabus* and larger *Pterostichus* present no problems and are generally carded.

Perhaps the main reason why the *Dytiscus* beetles are usually pinned is because examination of the post-coxal process is not possible with normal carding. To overcome this difficulty a hole can be punched in the approximate centre of the card and the beetle placed so that the process is visible through the hole. Make sure that no glue obscures the post-coxal region.

16.9.65. J. Cooter (3290J).

MODERN COLLECTING METHODS

The killing of Lepidoptera by a method which has no disadvantages and is safe, inexpensive and convenient has long been sought after

by all who pursue the creatures. Apart from the inconvenience of carrying a killing bottle in the field the chemicals used in them have their own drawbacks—cyanide is dangerous, ethyl acetate may stiffen, etc., etc.

The use of the hypodermic syringe with a saturated solution of oxalic acid has taken some time to become known as an effective killing agent, mainly because few people have bothered to try it. The two objections levelled at the syringe are that it cannot be used in the field and that it cannot be used on small specimens.

To deal with the second one first. A no. 20 needle can be safely used on specimens down to the size of a 'micro.' However, the quantity of acid required to kill the specimens of this size is so small that it can more easily be applied with a fine pin or needle dipped in the liquid.

If Lepidoptera are 'papered' there is no necessity to kill the specimens until returning home where they can be examined and set free if not required or kept for fertile ova—if female. Too many insects are hastily disposed of—to be found to be damaged and useless for the collection. 'Papering' stops this waste. It is an easy matter to inject a specimen in a semi-transparent envelope and absolutely no damage is sustained by the insect.

In short, killing by oxalic acid injection has the following advantages:

1. Completely safe, clean and pleasant.
2. Specimens are relaxed when killed and are less likely to 'spring' than if killed by any other method.
3. Inexpensive (probably the most inexpensive—a disposable syringe can be bought for a few pence.)
4. Convenient if specimens are 'papered.'
5. Specimens are not unnecess-

arily killed.

6. Suitable for all Lepidoptera and insects down to a very small size.

7. Specimens are killed instantly—so not battered to pieces, as in some killing jars.

8. The syringe can be used for relaxing.

Since my introduction to the hypodermic syringe some years ago my surprise is continually aroused when I hear of the 'entomological killing bottle' being used today. The cumbersome impedimenta used by our entomological forefathers certainly look ridiculous to our modern eyes, but doesn't the killing-bottle belong to the age of the scissors net, the cork-lined bowler and saddle setting-board?

Note: In a recent article in the *Bulletin*, Mr Trebilcock (*Bull. amat. Ent. Soc.*, 24: 12-3) states that when a specimen is relaxed by injection the antennae, legs etc. are not relaxed and are likely to break. This is not so. If the insect is injected with *almost* boiling water and left aside for *fully fifteen minutes*, all parts of it will be relaxed. When using a syringe for killing or relaxing, the needle should be inserted between the second and third pair of legs and pushed half way towards the head.

30.6.65. George Thomson (3689).



A VERY QUEER SUMMER

After the wonderful summer of 1964, much was hoped for in 1965 both in regard to a build up of native species and a large invasion of migrants from the Continent. In fact neither seems to have occurred and now on a bleak, wet and windswept September day, the 1965 summer in retrospect has few highlights and in many ways has been as bad as any that I can recall. The spring was very dry

following one of our driest winters and it was noticeable that many hibernating larvae made a very delayed start in feeding because of the tardiness of foodplants in coming into leaf. Subsequent bad weather further delayed feeding and most species were very late in emerging or the emergence period was a very extended one. Further bad periods hindered pairing and laying so that prospects for next year do not appear favourable. Because of the long emergence periods many species were at no time numerous as happens when good weather brings out a flush of insects within a very short period. The only species which was noticeably commoner and in some places abundant was the Gatekeeper (*Maniola tithonus* Linn.), when some very hot days brought out a large emergence in mid-August. I think that a few notes from my diary on some of the species might give a better picture of the general effects of the season.

White Admiral (*Limenitis camilla* Linn.). First emergences noted 13th June but newly emerged females observed on 18th July. Females still ovipositing on 11th August.

Purple Emperor (*Apatura iris* Linn.). First emergence noted on 6th July and one ovum found deposited on 18th July. Freshly emerged male observed 11th August and female seen depositing ovum on 12th August.

Swallowtail (*Papilio machaon* Linn.). Of eighty larvae raised from hand-paired specimens which emerged on 17th May, some seventy pupae were obtained and none of these emerged in August, all lying over. The colour of the pupae is of interest as the ratio of brown to green was just under 3 to 1. Is the colour controlled genetically?

Wood White (*Leptidea sinapis* Linn.). The summer brood (partial) was very late and did not begin to appear in Sussex until 12th August.

Common Blue (*Polyommatus icarus*

ott.). Males in Middlesex not out until 23rd May. Second brood began to emerge 16th August.

Chalkhill Blue (*Lysandra coridon* Poda). Newly emerged males and a few females observed on South Downs on 13th August. Newly emerged males and females on North Downs on 4th September, also one full fed larva found. Females depositing ova on 4th September.

Adonis Blue (*Lysandra bellargus* Rott.). First brood very strong. Second brood appeared to be only a very partial emergence and first males seen 30th August. Females on 4th September. Observations on North Downs.

Grayling (*Eumenis semele* Linn.). Very late in Sussex and Surrey localities. First seen 13th August. Female still laying on 4th September (Surrey).

Poplar Hawkmoth (*Laothoe populi* Linn.). Ova still being found with small, medium and nearly full grown larvae on 16th August in Middlesex.

Eye-dotted Hawkmoth (*Smerinthus ocellata* Linn.). Newly emerged male taken on 21st July.

I think that these few notes show something of the pattern and one wonders what the shortening of period of feeding for many species, due to the late emergence of their parents, will do to the butterfly population of 1966. The outlook is not very hopeful.

10.9.65. P. W. Cribb (2270).



GREGARIOUS BEHAVIOUR OF AGONUM DORSALE PP.

From 7th April 1965 until 12th June 1965 I kept a record of the numbers of *Agonum dorsale* Pp. (Col., Carabidae) that were to be found under a group of twenty-four stones at Staines, Middlesex. The stones averaged 10" x 8" in size and were

lying flat on the ground. They were in a sunny position, and from 6th May until 15th May there was very little rain. However, the ground beneath the stones remained damp all the time. The surrounding vegetation comprised Stinging Nettle (*Urtica dioica* Linn.), Ground Elder (*Aegopodium podagraria* Linn.), Creeping Thistle (*Cirsium arvense* (Linn.) Scop.) and various species of grasses.

From 7th April until 3rd May, the specimens of *A. dorsale* were concentrated in one group under a stone which was itself covered by a sheet of tin sixteen inches square. The maximum number of beetles in this group was fourteen, on 9th April, and the minimum was five on 1st July. The average number in the group was ten.

The observations were made either between 12 noon and 2 p.m. or between 4 p.m. and 10 p.m. The time did not appear to affect the numbers present. After 5th May the beetles were to be found singly under widely separated stones, the last being recorded on 5th June.

I also saw a similar group of ten specimens of *A. dorsale* under a stone at Crowcombe, Somerset, on April 17th 1965.

Since these original observations, I have discovered a group of twenty-three *A. dorsale* under a stone at Staines. This was on 12th December 1965 and the stone was only one foot away from the sheet of tin mentioned above. It will be interesting to see how these beetles fare during the winter.

I have found similar congregations of *Phosphuga atrata* Linn. (Silphidae) and *P. subrotundata* Leach under bark and rotting wood in March. Groups of the Carabid *Carabus granulatus* have been recorded, in rotting wood, by Mr M. J. Foreman (*Bull. amat. Ent. Soc.*, 20: 63) and by Mr P. W. Cribb (*Bull. amat. Ent. Soc.*, 23: 85). All these species of beetles presumably hibernate in this gregarious manner

throughout the winter, but why do aggregations of *A. dorsale* remain together for the first half of the spring as well?

I cannot, however, explain in this way a group of eight *Nebria brevicollis* Fab. and two *Feronia madida* Fab. found under a stone on 15th July 1961. I suppose that such gregarious habits in the summer could be explained by adverse summer conditions such as drought or high temperature.

3.1.66. J. Muggleton (3253).

WINTER COLEOPTERA

After the overeating and inactivity of Christmas I decided on a trip to the Forestry Commission Wood at Bexley, Kent. The hoar frost was still thick on the ground and trees when I arrived and I found great difficulty in turning over the stones and logs, but within an hour a rapid thaw had set in and the drainage ditches were soon filling with water.

The first log I turned over revealed about twenty specimens of the common beetle *Acupalpus dorsalis* Fab. None of these was taken as the species was already in my collection. A nearby log of about one foot diameter was then prised open producing many specimens of *Pentarthrum huttoni* Woll. 'Beetles of the British Isles' states: "The habit of feigning death is well developed in this weevil. The males are easy to remove from the surface of the wood but the females are always difficult to remove, as they attach themselves to the wood by clasping the surface, chiefly with the spines on the distal ends of the tibiae." I found the female indeed very difficult to remove without damage to the insect. There was also a single specimen of *Scaphidium 4-maculatum* Olivier.

From there a short walk took me

to a part of the wood that has not yet been cleared or planted by the Forestry Commission, and so I was able to leave the path and explore more fully. At this point I should like to impress upon young and old entomologists alike the need to follow the rules when on Forestry Commission land. As yet no permit is required to visit Bexley Woods, but last year about twenty acres of pine were lost by fire due to the carelessness and selfishness of the few. A few paces from the edge of the path I found three dead birches (*Betula verrucosa* Ehrhart (= *B. alba*)) in a close triangle, the tallest about fifteen feet and covered with *Polyporus* bracket fungi. Cutting this fungus open with a penknife produced specimens of *Abdera flexuosa* Payk., and under the bark of the tree the local *Tetratoma fungorum* Fab. and the common longhorn, *Rhagium mordax* Deg.

Cutting deeper into the tree, I came across some old larval galleries and exposed them back as far as the pupation chamber in which I found many hibernating *Adalia bipunctata* Linn. Also hibernating with them were five flies; I was unable to identify these with certainty but I think they were of the genus *Tephritis*.

In another part of the wood is a small pond, formed by a stick of bombs dropped in the last war, and I decided to net this for water-beetles. An hour's netting produced just one adult insect, and about 150 larvae of *Aeshna grandis* Linn. and *Aeshna cyanea* Muell. An interesting point to note is that all this time I had been netting the pond with a very high wind blowing towards me. On crossing the pond to the sheltered side the second dip produced a male *Dytiscus marginalis* Linn. This was unexpected, as Linssen states that it is unobtainable in December or January in the adult stage. Subsequent dips produced four female *Acilius*

ulcatus Linn. and many smaller beetles.

I wonder if any other Member has experienced similar conditions — high wind, etc. — as there were reeds and water grass all round the pond. I should be interested to hear.
..1.66. K. C. Lewis (3680).

REFERENCE

NISSEN, E. F. (1959). *Beetles of the British Isles*. Frederick Warne, London. Series I, p. 126; Series II, p. 210.

A FEW BUTTERFLIES OF EUROPE, 1965

From July 20th to September 1st of 1965 I spent a touring holiday in France, Italy and Switzerland with two colleagues.

Although these regions of the Continent are apparently rich in Lepidoptera, the main object of my visit was not to collect butterflies and moths but rather to see as much of the Continent as possible. However, as we moved from place to place I could not help but notice the wealth of butterflies, some familiar to me, and others truly foreign. As I had no net with me I could not identify many of the butterflies I saw, but below I record those the identities of which were known.

Our first port of call was a camp site (we camped for the whole six weeks) at La Seyne which is situated on the French Riviera south-west of Toulon. The camp site was well positioned on a woody slope and harboured many interesting butterflies. *Pararge aegeria* Linn. (Speckled Wood) abounded, as did *Papilio machaon* Linn. (Swallowtail), *P. podalirius* Linn. (Scarce Swallowtail) and *Satyrus circe* Fab. (Giant Tree Brown). A few specimens of *Limenitis ibylla* Linn. (Continental White Admiral) were also seen.

On a very dry pine-wooded slope south of La Seyne, cicadas were singing everywhere. We saw the following species of Rhopalocera: *Celastrina argiolus* Linn. (Holly Blue), *Gonepteryx cleopatra* Linn., *Satyrus* spp., *Colias croceus* Fourcr. (Clouded Yellow) and the Swallowtail. As we walked on the stony ground many grasshoppers flew from under our feet. Some had bright red wings (*Oedipoda germanica* Fisch. (= *miniata* Pall.)) and others pale blue wings (*O. coerulescens* Linn.).

After about a week we moved on to St. Tropez where *Pontia daplidice* Linn. (Bath White), *Colias croceus*, *Papilio machaon* and various 'Blues' were common by the sea shore. *Celastrina argiolus* was frequent by the hedgerows.

Our next trip, along the Italian Riviera, was entomologically uninteresting. Other parts of Italy, however, were more fruitful. Pisa near the north-west coast produced many species, including *Aricia agestis* Schiff. (Brown Argus), many fritillaries including *Melitaea athalia* Rott. (Heath Fritillary), *Polyommatus icarus* Rott. (Common Blue), *Lycaena phlaeas* Linn. (Small Copper) and *Ochlodes venata* Br. and Grey (Large Skipper). These species were found in an open field by the roadside. Fritillaries were especially common here sunning themselves on flower-heads and seemingly unafraid of the human eye.

We paid a brief visit to Southern Italy, in particular to the Naples area. Here *Pontia daplidice* was very common and on the slopes of Mount Vesuvius we found many Clouded Yellows and a pair of mating Long-tailed Blues (*Lampides boeticus* Linn.). Leaving Naples we made for Pescara on the Adriatic coast of Italy. Crossing the Appennines, we stopped by a wooded slope for a thirty-minute 'breather.' In a clearing on the slope I noted literally hundreds of 'Blues' some of which were *Polyommatus*

icarus. *Argynnis paphia* Linn. (Silver-washed Fritillary) was abundant, as were *Melitaea athalia*, other fritillaries, and *Satyrus* spp. I saw what looked to me like a male *Lycaena dispar* Haw. (Large Copper)—it had metallic orange wings but black spots were absent from the uppersides of both fore and hindwings. It may have been *Lycaena virgaureae* Linn. (Scarce Copper), said to be common in Central Europe, although this species has six or seven black spots bordering the upperside hindwing of the male.

We finally reached the Adriatic coast and camped on the sandy shore at a site thirty miles north of Pescara. The Bath White abounded here—we always seemed to find this species near the coast. The weather was unreliable so we moved on to the mountainous Dolomite region of Northern Italy, hoping for better weather. Unfortunately the weather was even worse. However, near Mismira on the slopes of the Tre Cime di Lavaredo I noted hundreds of 'Blues' and 'Browns'—species similar to *Coenonympha tullia* Muell. (Large Heath)—and *Colias croceus* (pale form) was also seen. After our visits to the Dolomites we crossed into Switzerland where the weather was very wet. In fact, during our five-day stay in Switzerland I can only recall seeing one butterfly on the wing—*Lysandra coridon* Poda (Chalk-hill Blue).

Looking back on my holiday, perhaps the most enjoyable times were spent on the French Riviera: I think of the many Swallowtails and Brimstones feeding on the flowers of the Red Valerian (*Kentranthus ruber* (Linn.) DC.) and the Bath Whites and Clouded Yellows on the Sea Rocket (*Cakile maritima* Linn.). The Cote d'Azur is certainly a naturalist's paradise, especially for the lepidopterist—but next time I'll take a net with me.

17.9.65.

R. J. Kemp (3152).

THE STUDY OF SPIDERS

Part III

Our mathematics master always used to urge us to look up logs, but I much prefer to look under logs, especially during the winter months when many different species of hibernating spiders can be found.

Pisaura mirabilis Clerck (12-15 mm.) is a very attractive species which I had long wanted to find, having looked for it in all the likely places without success during late summer and early autumn. It was not until midwinter, when turning over fallen logs in Salcey Forest (Northants), that I saw a large female *Pisaura mirabilis* sitting, rather demurely I thought, just waiting for me to turn up; she walked straight into the open tube I held before her.

This species has a most attractive shape, the abdomen being elongate and slender with a squared-off end, a light coffee shade with a velvety pubescence. The abdominal pattern of lighter oblique stripes, often shown rather garishly on the plates in some textbooks, is in the living specimen so faint as to be barely discernible; but even without it this species is unmistakable. It is one of the only three British representatives of the hunting spiders, the Pisauridae, which do not spin webs but lie in wait for their prey, and spring out and jump on it.

Another member of the Pisauridae, which must surely be one of the most fabulous of all spiders, is *Dolomedes fimbriatus* Clerck (22-24 mm.), often called the Raft Spider, from its habit of floating on a dead leaf downstream or on the surface of a pond. This water-loving species is, unfortunately, a rarity; I am very fortunate in having a splendid young immature female, 22mm. in length and apparently still growing, which was sent to me by an eight-year-old boy. The

vicinity of ponds in marshy localities is the most likely habitat, but the spider is certainly not easy to come by.

I made for my *Dolomedes* a miniature pond in a two-gallon glass jar, with two inches of water on the bottom, some pieces of well-washed sandstone and some water-weed, the rocks being arranged in such a way that some of them project a few inches out of the water. On these rocks *Dolomedes* spends most of her time, but on several occasions, always early in the morning, I have seen her actually swimming. Sometimes after her dip she climbs out straight up the projecting rocks, while on other occasions she secures a foothold first on the floating dead leaf I have provided for her, from which she progresses to the rock.

It is difficult, if not impossible, in the winter months to find flies and other winged insects on which to feed large spiders with voracious appetites, but they will normally take other spiders, which can be found easily enough. During the winter a hibernating or semi-hibernating spider will be somewhat torpid, and can manage on vastly smaller quantities of food than those needed during seasons of normal activity. Like humans, spiders certainly appear to have distinct food preferences; *Dolomedes*, for instance, has a great liking for *Steatoda bipunctata* Linn., *Linyphia triangularis* Clerck and *Amaurobius imilis* Blackwall, but *Tetragnatha* species are totally ignored, while the introduction of even a small immature *Regenaria* is the signal for *Dolomedes* to beat a hasty retreat!

While you are looking for *Dolomedes* around ponds in damp woodlands, you might try turning your attention meantime to the elusive *Oonops pulcher* Templ. Some authorities aver that *Oonops* seeks a dry habitat, but my experience has been exactly the reverse; I have found this

species invariably in damp woods—perhaps waterlogged might be a better descriptive term in some cases.

Oonops is very tiny—an adult female is 2mm. long at most—but it is impossible to mistake this species for any other. It has a slightly elongated body, devoid of any pattern, and is a bright salmon-colour all over, with matching legs.

Unlike most spiders, which have eight eyes, spiders of the family Oonopidae have only six, a feature shared with three other families, the Dysderidae, the Segestriidae and the Scytodidae. All these groups are very sparsely represented in this country. The family Oonopidae boasts only two species, *Oonops pulcher* Templ. and *O. domestica* Dalmeyer; the family Segestriidae contains only one species commonly to be found, *Segestria senoculata* Linn., and two extreme rarities; the Dysderidae number only three, this total including two uncommon species; while *Scytodes thoracica* Latr. is the only British representative of the family Scytodidae, this spider being confined to the southern counties, where its distribution is very local.

The use of your hand lens will enable you to count the eyes, so that if your specimen has only six, then it must be a member of one of these four groups; if it has eight, then these four families can be immediately eliminated.

I mentioned above *Linyphia triangularis*: this is the commonest of all the woodland species of the family Linyphiidae, which contains 227 species—more than two-fifths of all our native spiders. To my mind, this group is by far the most fascinating; the range of diversity among the many genera is fantastic. *L. triangularis* is about the biggest, reaching 6mm. in length; but this is a veritable giant as Linyphiids go—the average length for a species of this group is more in the region of 2mm. Many of

them, however, are much smaller than this; some are only a bare 0.5 mm. in length. These animated pin-points can run at an incredible speed, and are often beautifully marked and coloured. An hour or two watching them alive in a cavity slide under the microscope (X45 objective) is a revelation of sheer beauty.

In my next article I will describe some of the Linyphiids you will be sure to meet with during your first season — if you can see them!

15.2.65. Joy O. I. Spoczynska,
F.R.E.S. (751).

HOW TO MAKE A LIGHT-TRAP

Last May (*Bull. amat. Ent. Soc.*, 23: 52-4) I read of Mr John S. E. Feltwell's ingenious trap which caught over eighty moths a night. "Nothing like a bit of healthy exaggeration", thought I, and decided to try it.

I was amazed at the number of species caught, and decided to improve on my 'Heath Robinson' prototype. Throughout the season I tried many variants—large cones, small cones, transparent cones, massive receptacles and so on—and decided on a best design. A simple light-trap is such a boon to those whose time is restricted, and with that in mind I have drawn up the design below, which can be made for about 12/-, excluding electrical lead. You will need:

1. About three feet of thick galvanised wire (about 1/-).
2. A sheet of white cartridge paper (6d.-8d.).
3. A new-potato tub from a greengrocer (spring-time only 6d.).
4. A lamp-socket at about 1/6d.
5. A 150 or 200 watt clear electric light-bulb at about 3/-.

6. Half a yard of calico (cloth) at about 1/9d. per half yard.
7. Two and a half yards of elastic (as used in clothing) at 4d. or 5d. a yard, depending on quality.
8. Sixteen inches of wire of ordinary thickness (best to look in tool-boxes, etc.).
9. Some egg-packing.
10. A sheet of cardboard or hardboard at least fifteen inches square.
11. Sellotape.
12. A 5-amp. plug at 1/6d.-2/6d.

Saw the tub off just above the ring of wooden reinforcement such that its internal depth is 7" inches.

On the sheet of cardboard or hardboard concentric circles of diameters $14\frac{1}{2}$ " and $10\frac{1}{2}$ " are drawn. Using a very sharp knife, cut round these lines. With hardboard this is very slow and tedious, but a fret-saw may be used. Thus a ring of cardboard is formed (see Fig. 1, at top).

A cut-off cone is made out of the white cartridge paper by drawing the shape shown in Fig. 2, where: $OC' = 5.35$ "; $OB' = 12.55$ "; angle $XOC' = 150.5$ degrees (as marked); $B'A'$ is about $\frac{3}{4}$ " (i.e., $OA' = 13.3$ "). Cut out as indicated and join, edge to edge, side XZ to $C'A'$, fixing very firmly with Sellotape. You will now have the desired cone, and it remains only to fold back the tabs along ZA' , lower it into the hole you have cut in the cardboard top, and fix it with more Sellotape. The surplus cartridge paper can be Sellotaped to the surface of the cardboard ring to increase reflection. This unit will need replacing after about a season. The narrow end of the cone is now reinforced with wire, thus: on a 16" (approx.) length of the ordinary thickness wire, a scratch is made about $\frac{1}{2}$ " from one end, and exactly 14.1" along another is marked. The wire is bent into a circle with the two scratches opposite. Bind the overlaps firmly with

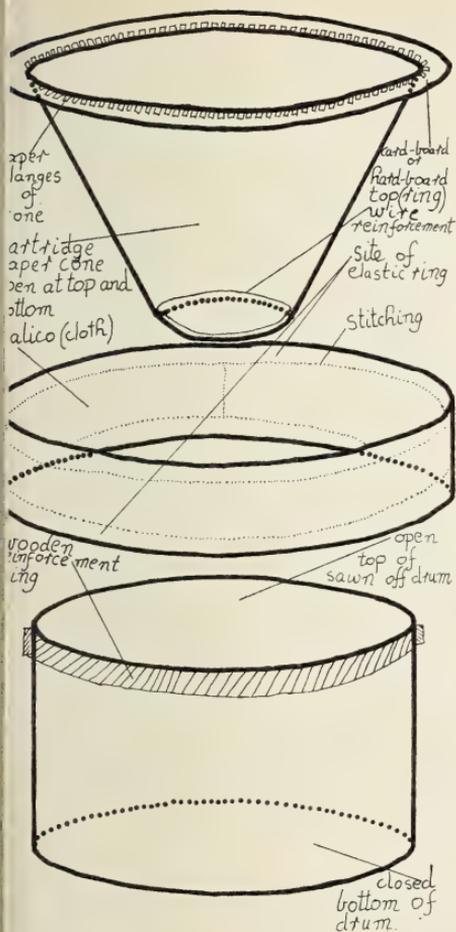


Fig. 1. Exploded view of trap.

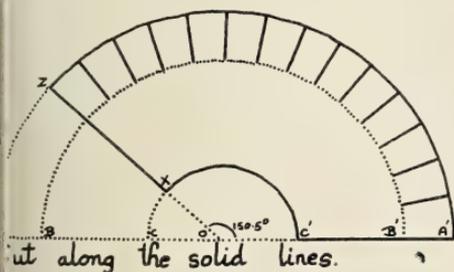


Fig. 2. Pattern for cone.

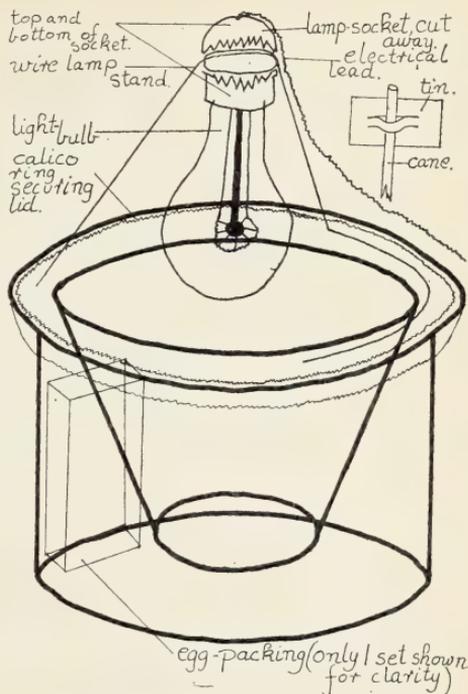


Fig. 3. Trap seen as transparent object (also shield).

cotton, and Sellotape the ring firmly into the inside of the narrow end of the cone. If this entire unit is now lowered into the drum, cone first, an impression of the trap is obtained. The lid, however, lacks stability and must be held down in one of two ways. It can be held down with drawing-pins through the cardboard ring into the drum walls. This becomes a real nightmare before long, so I use the method below.

Sufficient lengths of $4\frac{1}{2}$ " wide calico are cut so that when sewn together they produce a length $4\frac{1}{2}$ " by 45". The long edges of this are bent over and ironed to give a flange $\frac{3}{4}$ " wide either side. Each flange is sewn down its free edge, forming a tube of cloth each side of the calico strip. The elastic is cut into two lengths, of which one fits very tightly round the drum, and the other more loosely. These are threaded down the tubes, one in

each, and their ends stitched together. The free ends of material are then stitched together, completing the ring. This is used with the tighter elastic ring round the top of the drum and the looser one free on top of the cardboard ring, thus quickly and easily securing it.

A support for the lamp is made by bending the thick galvanised wire around the lamp-holder in the place provided for the lamp-shade frame. The free ends are then bent down and the top of the longer one bent again at right-angles to form another ring in the same place as the one round the lamp-holder. This is very difficult to represent in a three-dimensional manner, but I have attempted to do this in Fig. 3.

The egg-packing is best cut into a 2×3 'egg size' and pinned vertically around the walls.

The lamp should be centralised over the hole and the wires bent so that the shadow cast by the drum is about 3-4 feet wide.

Best results are obtained if the trap is run in an open space, and it is well worth examining the surrounding ground and kicking illuminated trees for strays. Never open the trap out of doors, as some of the more choice Geometers take wing on being disturbed and Buff Arches (*Habrosyne pyritoides* Hufn.) very soon start warming up. You may expect the commoner kinds including some of the showy ones, and with a sprinkling of better sorts such as the Centre-barred Sallow (*Atethmia xerampelina* Esp.). Even beetles visit occasionally, and I caught a Shore Sexton (*Necrodes littoralis* Linn.) on one night last autumn.

In his original article, Mr Feltwell mentioned that 200 watt bulbs crack in the rain, but not 100 watt ones. I have used a 200 watt bulb without difficulty, but a shelter can be made if required: ironmongers sell a thin polythene skin over a wire frame

very cheaply and this can be cut to the desired size and supported on a tripod of wood.

Neighbours may become justifiably annoyed by the light shining in through their windows at night. A shield (see Fig. 3) can be made to shadow the windows by cutting two three-inch slits an inch apart in the lid of an 'Oxo' or similar tin parallel to the long sides of the lid, and weaving a cane in through one slit and back through the other. By sticking this in a suitable position, the desired shadow can be obtained over the window or house. The further from the trap such shades are placed, the less they affect the catch.

For those interested in modifying the shape and size of the cone, it is given by the following expressions:

$$2h/W = 2(h + v)/D$$

where h is an unknown, representing the height of the imaginary cone cut off at the top. Solve to find h , since W is diameter of narrow opening of cone; D is diameter of wide opening of cone; v is vertical depth of 'sawn-off' cone.

Then:

where OB' is radius of large circle as in Fig. 2.

where OC' is radius of small circle as in Fig. 2.

$$\text{angle } XOC' = 180 \times D/OB'$$

the angle shown in Fig. 2.

I would be delighted to receive comments and questions. All this I would point out is a mere enlargement on Mr John S. E. Feltwell's original article, without which my collection and records would be much the poorer.

22.4.65.

R. J. Dickson (3674J).

READERS' REPLIES

In the *Bulletin* for February 1965, the Editor expressed regret that now-

lays there were far fewer replies to contributors' questions than there used to be. Figures quoted showed that such reader-reaction was several times greater in 1951 than in 1964.

A personal experience in this connection may therefore be of some interest.

The *Bulletin* for April 1961, contained a short article by myself concerning the water-beetle *Dytiscus marginalis* Linn. In the previous winter I had returned to Cheshire, after many years spent in more southern counties, ending with twenty-two years in Kent, whence I had also worked ponds in Surrey and Sussex. I was wondering, at the time, whether *D. marginalis* would prove to be as common in Cheshire as it had been in my boyhood, for during my many years in Kent and elsewhere I had found it far from common. Accordingly, I asked readers if they could kindly tell me their own experiences with this water-beetle, by writing either to the *Bulletin*, or to my home address, which was of course supplied.

My cunning in providing my address as a by-pass was well rewarded; for although, as far as the *Bulletin* was concerned, my request for information was completely ignored, no fewer than six Members wrote to me personally! This was gain for me, but no small loss, I think, to the AES. If these letters had been sent to the *Bulletin*, I believe the Editor would have published them, and so enabled other Members to share the pleasure and interest with which I read them myself. They would have been of most interest to pond-fishers, naturally; but there must be few Members, if any, who read the *Bulletin* only for what happens to concern their own particular subject and skip the rest! Actually, letters from readers are so popular that, even in these days of severe competition for space, all newspapers,

and most magazines, make room for them.

Moreover letters from readers, not only answering queries, but also about all sorts of entomological this and that, supply the *Bulletin* with literary balance, which I venture to suggest is particularly desirable in a scientific publication of its nature.

The *Bulletin*, more especially of late, contains long or rather long articles on one subject, and some of them are quite stiff reading. This, if I may express a purely personal opinion, is as it should be; for it is important that Members of the Amateur Entomologists' Society should recognise that "amateur" is not a synonym for "dabbler." Actually, of course, not only in entomology, but in a great variety of occupations, there are "amateurs" who have achieved the competence of experts. Nevertheless, after a solid course of meat and two veg. it is nice to have a sweet; and in the same way, after some solid articles it is nice to have a few pages of readers' letters, and general entomological small-talk.

4.11.65.

H. Caiger (2908).

ENTOMOLOGY IN NEW ZEALAND—5

Hymenoptera

The most recent catalogue of New Zealand Hymenoptera is that of Cameron (1903), and subsequent literature is scattered through a large number of journals. Until recently, the Hymenoptera of New Zealand have received less attention than some other Orders. Thus, I have selected only some of the most interesting and best-known families for discussion. Readers specially interested in Hymenoptera are referred to Miller's (1954) bibliography, and to the Zoological Record

for the most recent literature.

The hymenopterous fauna is in some respects sparse and fragmentary, and this impression is not due entirely to inadequate collecting and study. This contrasts strikingly with Australia, which has a rich and diverse fauna of Hymenoptera.

Tillyard (1926, p. 262) tabulated a census of native species of New Zealand Hymenoptera, including undescribed species, and the following summary is based mainly on his data. The classification follows that of Imms (1957). Symphyta (1 Orussidae, 1 Xiphydriidae), Ichneumonoidea (about 100), Evanioidea (3), Cynipoidea (1 Figitidae), Chalcidoidea (about 100, mainly Pteromalidae and Eulophidae), Proctotrupoidea (45), Bethyloidea (3), Scolioida (0), Formicoidea (15), Pompiloidea (13 Pompilidae), Vespoidea (0), Sphecoidea (14), Apoidea (19).

The Wood-wasp, *Sirex noctilio* Fab., was accidentally introduced into New Zealand, where it caused great concern because of the large forests of exotic pines there (chiefly *Pinus radiata* D. Don.). The ichneumon *Rhyssa persuasoria* Linn., which parasitises the Wood-wasp, was introduced to control it. Recently a North American species, *R. lineolata* Kirby, has established itself in New Zealand, presumably after accidental introduction, and may prove to be even more effective than *R. persuasoria* in controlling *Sirex* (Zondag and Nuttall, 1961). Native ichneumons parasitise wood-boring beetles or caterpillars. They include some of the most colourful and abundant indigenous Hymenoptera.

The New Zealand ants were reviewed recently by Brown (1958). He recognised twenty-three species established in New Zealand, of which only ten are endemic, while eight are certainly introduced, and the remaining five are thought by Brown to be probably introduced. Taylor (1961)

recorded ten further introduced species, established mainly in the vicinity of Auckland, the main overseas port. Other ants have been intercepted at ports, but have not yet become established.

The endemic ants comprise two species of an endemic genus *Huberia* Forel, and members of genera well represented in eastern Australia, or Australia and Melanesia. Brown (1958) states: "The endemics all belong to genera suspected on other grounds of being old. The picture is one of occasional colonisation through chance introduction of one stock at a time over sea, probably chiefly or entirely from Australia . . . Ten endemic species is an almost ridiculously small number of ant species for such large islands with apparently relatively favourable and varied climate and vegetation, especially when compared with such smaller islands as New Caledonia and the Fijis, which have 5 or 10 or more times as many species, and which show extensive radiation and speciation in particular stocks."

Amblyopone saundersi Forel lives in forests in soil, leaf litter, rotten logs or under stones, in small colonies. Most of the other native ants have similar habits, but *Monomorium antarcticum* White and *Mesoponera castanea* Mayr nest not only in forest but also in open pastures, and even in vegetable gardens. *M. antarcticum* is very variable taxonomically and biologically, and may represent more than one species.

Spider wasps (Pompilidae) of the genus *Salix* include some relatively large, colourful species. *S. fugax* is an efficient spider-hunter which stores its paralysed victims in the disused burrows of wood-boring beetles, while other species store their prey in empty cases of the Case Moth (*Oeceticus omniverus* Fered.), or in holes in the ground.

Although there are no native

species of Vespidae in New Zealand, there are two common introduced species. The red or Tasmanian Wasp, *Polistes humilis* Fab., is a common Australian insect which has been present in the warmer parts of the North Island for many years. It builds small papery nest with a slender stalk, and these are frequently found in trees or shrubs, especially near orchards, where the wasp is a minor pest.

The yellow or European Wasp, *Vespa germanica* Fab., first became established in New Zealand early in 1945, when seven nests were discovered near Hamilton. It is likely that hibernating queens were introduced from Europe in cases containing aeroplane parts. About the same time a few *V. vulgaris* Linn. were found at Auckland, but this species failed to become established. *V. germanica*, however, spread rapidly, in spite of early attempts at extermination such as location and destruction of nests, and a government bounty for queen wasps. Dispersal tended to follow main roads and railways, indicating accidental artificial transport of queens.

In the initial stages of expansion, there was considerable public concern, resulting partly from ignorance, about the wasps. On 1st April 1947, a radio announcer stated at the beginning of the "breakfast session", that a vast swarm of wasps was advancing from the Waikato district towards Auckland (which the wasps had not then reached). He continued to give progress reports from time to time of the advance of this mythical swarm, and recommended placing dishes of jam or honey outside as a means of appeasing the wasps, and preventing them from entering houses. Many listeners followed this advice. The announcer was later reprimanded for causing great alarm to his more gullible listeners.

The wasps quickly adapted them-

selves to New Zealand conditions, in the absence of parasites and competition from other Vespids. In the warmer parts of the North Island activity continues at a reduced rate through the winter. Nests tend to be larger, often much larger, than in Europe, and arboreal nests are quite common, although underground sites are preferred. A giant nest on the side of a tree trunk near Auckland measured 14 ft. 11 in. x 5 ft. x 2 ft.! Thomas (1960) discusses the spread, biology, control and economic importance of *V. germanica* in New Zealand in detail. The wasps are a minor pest in orchards, and sometimes rob winter stores of honey from beehives, but they kill many harmful insects.

The best known of the Sphecidae (*sens. lat.*) in New Zealand is the Mason Wasp ("mason-bee"), *Pison spinolae* Shuck. The female builds nests of clay indoors, behind bookshelves and pictures, under tables, in key-holes, under eaves, in empty tins, old hats, in fact in any accessible but reasonably secluded and undisturbed container or crevice. The nests contain a series of cells, each one of which is stocked with a paralysed spider on which an egg is laid, after which the cell is sealed, except for a small air hole. *P. spinolae* is shared with Australia, but there are also three endemic species of *Pison* in New Zealand. *Tachytes nigerrimus* Sm. is a relatively large, shiny black wasp, which stocks its nest with paralysed native cockroaches.

There are few native bees, and all of these are solitary, and make their nests in holes in the ground. The majority are Colletidae *sens. lat.*, of the genera *Paracolletes* and *Prosopis*, several species of which are quite common. There are also four species of *Halictus*.

The Honey Bee, *Apis mellifera* Linn., is very important economically for pollination and for producing

honey. In 1945 there was a serious outbreak of honey poisoning at Pongakawa (Bay of Plenty). Previously outbreaks had occurred occasionally for many years, but it was not until the Pongakawa outbreak that the course of the toxin in the honey was established. Chemical and biological tests showed the honey contained a poisonous substance mellitoxin, related to tutin which is the toxic principle in the poisonous plant Tutu (*Coriaria arborea* Lindsay). Field observations suggested that the source of the poisonous honey might be honeydew produced from Tutu by an introduced leaf-hopper, *Scolypopa australis* Walk. Chemical tests confirmed the presence of mellitoxin in this honeydew. The bees gathered honeydew in the later part of an exceptionally dry summer, when floral nectar was no longer available. Cases of honey poisoning have become much rarer as the land near bee-hives has become more closely cultivated, with the cutting down of Tutu, and provision of suitable sources of nectar (Palmer-Jones *et al.*, 1947).

Four species of *Bombus* were introduced into New Zealand for pollination of red clover. The tongue of the commonest of these, *B. terrestris* Linn., is too short for this, and instead the bee cuts directly into the ovaries of certain flowers, e.g., broad beans, to obtain nectar.

Mecoptera

A single species, *Choristella philpotti* Tillyard, (Panorpidae), is known. This was recently rediscovered near Cass (Canterbury) by Dr. R. Pilgrim, who found its larva, which is semi-aquatic, and its pupa. The general appearance of the adult is like a small lacewing, and it is found near streams in *Nothofagus* forest.

Neuroptera

The New Zealand members of this order were listed recently by Wise (1963). The Megaloptera are repre-

sented by a single species, *Archichaulioides diversus* Walk. (Corydalidae), commonly known as the New Zealand Dobson Fly. The larva, known to anglers as the Black Creeper, is a centipede-like creature (due to its lateral, leg-like gills), which is often abundant under stones in streams and rivers. It is fiercely predaceous on other aquatic insects, and is itself consumed by trout. Pupation occurs in cells under stones in moist soil, on the banks of the stream. The adult is a relatively large insect, orange-coloured, with speckled wings.

The following families of lacewings (Planipennia) are represented in New Zealand (*—species shared with Australia): Coniopterygidae (1*), Berothidae (1), Hemerobiidae (2 + 2*), Osmylidae (4), Myrmeleontidae (1). A common lacewing in both Australia and New Zealand is *Micromus tasmaniae* Walk. (Hemerobiidae), and its larva is important in destroying introduced scales and aphids in orchards and gardens. *Weelus acutus* Walk. (Myrmeleontidae) has typical ant-lion larvae, which construct conical pits in sandy soil, and bury themselves at the bottom of them, where they wait for prey to fall in. 20.10.65. J. C. Watt (3578).

REFERENCES

- BROWN, W. L. (1958). *Acta Hymenopt.*, 1: 1-50. Figs 8. A review of the ants of New Zealand (Hymenoptera).
- CAMERON, P. (1903). *Trans. N. Z. Inst.*, 35: 290-9. A list of the Hymenoptera of New Zealand.
- IMMS, A. D. (1957). *A general textbook of entomology*. 9th edn., revised by Richards and Davies, pp. 886, figs 609. Methuen, London.
- MILLER, D. (1956). *N.Z. Dept. sci. industr. Res. Bull.*, 120, pp. 492. Bibliography of New Zealand entomology, 1775-1952.
- PALMER-JONES, T., *et al.* (1947). *N.Z. J. Sci. Tech.*, (A), 29: 107-43. A recent outbreak of honey poisoning; parts I-VI.
- TAYLOR, R. W. (1961). *N.Z. Ent.*, 2 (6) 28-37. Notes and new records of exotic ants introduced into New Zealand.
- THOMAS, C. R. (1960). *N.Z. Dept. sci. industr. Res. Inform. Ser.* no 27, pp. 74, figs 30. The European wasp (*Vespa germanica* Fab.) in New Zealand.
- TILLYARD, R. J. (1926). *The insects of Australia and New Zealand*. Angus and Robertson, Sydney. pp. 560, pls many.
- WISE, K. A. J. (1963). *Pacific Ins.*, 5: 53-8. A list of the Neuroptera of New Zealand.
- ZONDAG, R. and NUTTALL, M. J. (1961). *N.Z. Ent.*, 2 (6) 40-4. figs 2. *Rhyssa lineolata* (Kirby) (Hymenoptera: Ichneumonidae: Pimplinae), a species new to New Zealand. J.C.W.

NECOLOGICAL APPROACH TO LIGHT-TRAPPING—3

Wind Relationships

The standard method of recording windspeed with an anemometer was impracticable, for the light-trap was situated in a sheltered position and only subject to sudden gusts of wind. Consequently a scale was adopted to indicate the general conditions, which can best be understood from *Table 1*.

0	Description
+	faint breeze
	noticeable breeze
	gusty breeze
	'March' wind
+	storm—gale force

The main object again was to compare different groups, although the trap's selectivity affected the results.

It became evident that there were successive stages between groups whose flying numbers were reduced, and those whose numbers increased, with windspeed (see below and *Figs. 1, 2*).

- Group I: Hymenoptera
Neuroptera
- Group IIa: Heteroptera
Coleoptera
Trichoptera
- IIb: Psocoptera
Lepidoptera
- Group III: Jassidae/Cercopidae
- Group IV: Ephemeroptera

Both orders flew most often when there was no wind, although the Chrysopids (green lacewings) preferred a night with a slight breeze. Any further increase appeared to

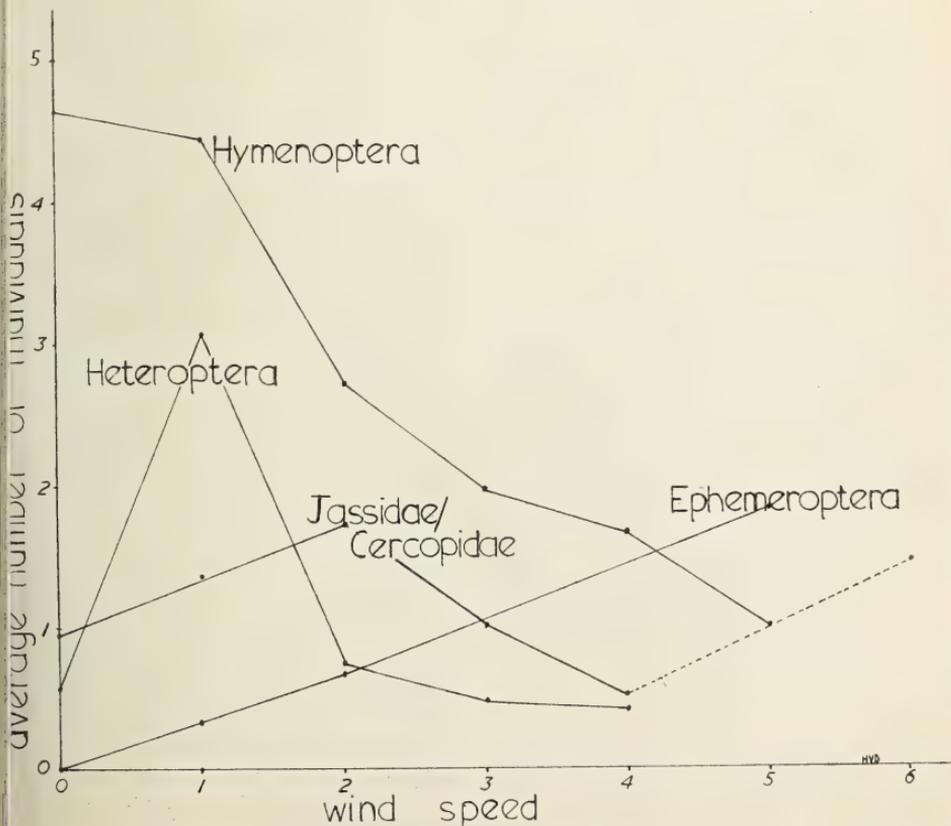


Fig. 1. Graphs of average catch against windspeed for Hymenoptera (Group I), Heteroptera (Group IIa), Jassidae/Cercopidae (Group III), and Ephemeroptera (Group IV).

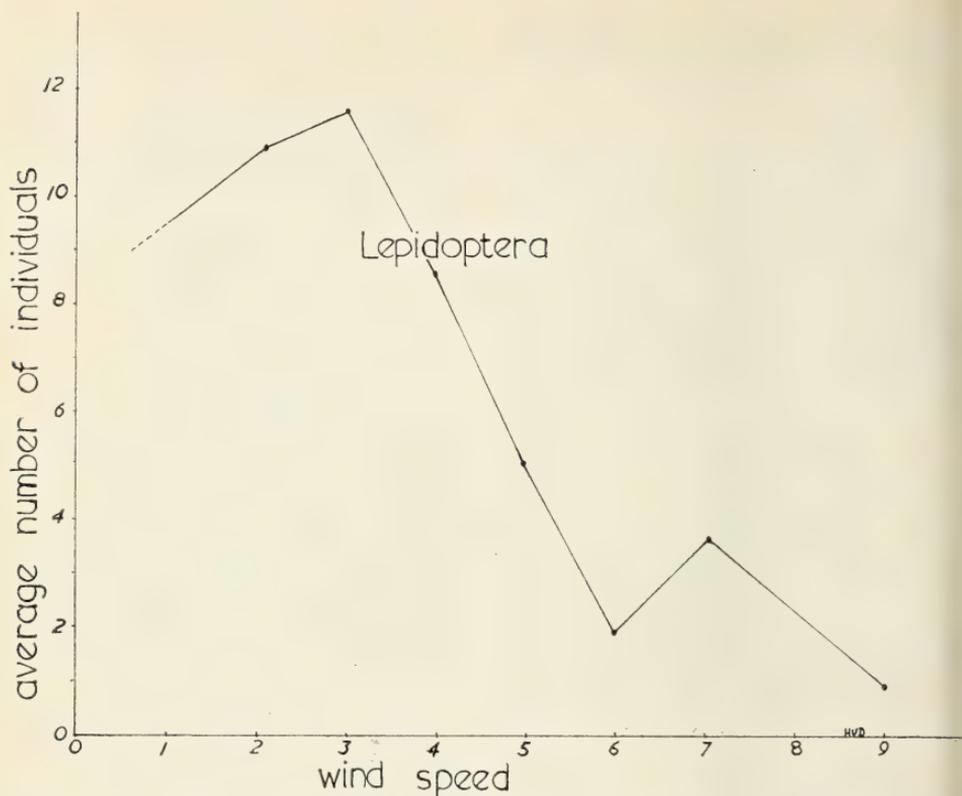


Fig. 2. Graph of average catch against windspeed for Lepidoptera (Group IIb). The scale differs from that of Fig. 1.

make flying conditions hazardous and fewer insects were seen.

Group II.

A quiet summer's night always produced a large flying population, but the best conditions were when a slight breeze was blowing. This could be explained if medium sized insects still flew upwind while a larger number were carried or helped along by the breeze to the trap area. Unfortunately this hypothesis could not be tested as the range at which individuals were sighted was inside the beginning of their spiral approach, so that their original direction was masked. Group IIb preferred windier nights than Group IIa, but any further increase in windspeed resulted in a decrease of the numbers of insects flying.

Group III.

Homoptera flew mainly on nights

with a breeze and surprisingly more often in a gale. One explanation is that their natural preference is to fly in a wind and then as it increases in force to be transported passively by it. Why is there a 'lull' and not a direct increase in this Group (Fig. 1)? Obviously the last two points on the graph for Jassidae/Cercopidae are insufficiently accurate and an alteration of one or the other could place the group in II or IV.

Group IV.

Mayflies rarely reached the light-trap, but on warm windy nights they arrived in such large swarms that the white sheet around the light appeared to shimmer. This was due to the fact that relatively few mayflies entered the trap but just remained on the surrounding white cloth in a damaged state using their long cerci to jump like springtails.

On another occasion an unidentified Tineid moth swamped the cover-net and performed an identical dance.

The enormous catches on stormy nights suggested that mayflies were carried over long distances by the wind if they strayed from the protection of their waterside habitats. Possible breeding sites were investigated and the nearest, three-quarters of a mile away to the south-west, produced the same genus (*Caenis*) that visited the trap, and so tied in with the theory that the mayflies were carried to the trap by the wind as indicated by Table 2.

Table 1: Wind conditions.

Number	wind direction
	S.
	S.E.
	S.S.E.
	N.E.
	S.W.

Table 2. Number of Ephemeroptera recorded in 1964 with various wind directions.

Besides the general reduction of the number of insects flying in an increased wind it was noticed that the number of species also became smaller, so that in high winds only a few individuals of a single species were seen. Also it became apparent that males were able to 'withstand' windy nights better than females.

These differences in behavioural response to wind speeds should be associated with an interplay of the nervous system and the muscles concerned with flight. As nervous systems have reached a similar level in the different groups it is mainly the morphology and flight muscles of the insects which vary: so the major adaptations for flight in insects are light, streamlined body with wings, light streamlined body with wings, and a large pair of accompanying thoracic flight muscles. Wing area is probably more important than wingspan but the former is difficult to calculate. Similarly a rough estimate of the size of flight muscles can be

obtained from the weight of the thorax, although it was found easier to weigh the complete insect. To compensate for the differences in these absolute measurements between, for example, a thin-bodied large Geometrid and a well-built Noctuid moth, a ratio of mass/wingspan (m/w) was introduced for establishing and comparing their relative 'flying capacities.' The m/w values set out in Table 3 are based on a selection of species from the Orders and are therefore very approximate.

Order	mass (mg)	wingspan (cm)	m/w
Lepidoptera	93.0	4.5	20.63
Coleoptera	101.0	2.7	37.4
Psocoptera	0.32	0.8	0.4
Heteroptera	4.2	1.1	3.82
Hymenoptera	18.4	3.0	6.13
Neuroptera	3.4	2.6	1.13
Trichoptera	30.0	3.5	8.55
Jassidae/ Cercopidae	0.4	0.8	0.5
Ephemeroptera	0.37	1.2	0.31

Table 3. m/w ratios for the Orders.

All the points so far mentioned have been concerned with the insect itself, not its surroundings. Flying may be for several reasons but basically it is for dispersal, feeding and meeting of the sexes. So a strong wind is advantageous for dispersal but it may lead to damage of the insect, while the zone for scent attraction from nectaries or a virgin female is rapidly reduced in high winds.

The conclusion, then, is that maximum activity does not occur during calm spells but on nights with a slight breeze, and that any further increase in wind results in a reduction of the flying population, except in the mayflies which are possibly carried at high wind speeds.

J. S. Badmin (3406).

AES READING CIRCLES—AN APPEAL TO ALL AES MEMBERS

Because of lack of response from

our Junior Members, membership to the Reading Circles is open to all members of the Society, Junior or Senior.

The subscription rate will vary according to the current cost of the magazine and to the number of subscribers, but it probably will not be more than 4/6 per magazine, per head, per year.

If you subscribe to the reading circle/s you can read the magazine/s for a mere fraction of the price it/they cost. The proposed magazines are :

The Entomologist's Monthly Magazine, *The Entomologists' Record and Journal of Variation*, *The Entomologist* and *The Entomologist's Gazette*.

Should you be interested in subscribing to any one, or all, of the above magazines, please send a post card with details of the magazine/s you would like to receive, to :

Jonathan Cooter, 174 Seaforth Gardens, Stoneleigh, Ewell, Surrey.

Please send no money at this stage.
26.9.65. J. Cooter (3290J).

JUNIOR NEWS SECTION

Having awakened from my winter sleep I was disappointed to find that your ink must have been frozen by the cold weather. I have only received three letters from Members during the winter.

One boy wanted to participate in a special arachnological society. There is one of these clubs in existence, "The British Spider Study Group," c/o D. W. Mackie, 11 Ashmore Avenue, Cheadle Heath, Stockport, Cheshire. It is mainly for adults but does take juniors.

R. Johnson (3488J) of 60 Deep Denes, Luton, Beds., is a budding 'phasmidologist' — he studies stick insects. Besides the Indian Stick

(*Carausius* (= *Dixippus*) *morosus* Br.) and Corsican Stick (*Clonopsis gallica* Charp.), he also has eggs of the Madagascan Flying Stick (*Sipylodea sipylus* Brunn.). I hope he will let us know how he keeps the Corsican and Madagascan phasmids so that we may all profit by his experience. We at St Ivo have plenty of *Carausius* and a few *Clonopsis* to spare quite free to Members.

Undaunted by heavy pressures exerted by 'A' level G.C.E. examinations, Richard Claypole (3688J) of 196 Lawrence St., Mill Hill, London N.W. 7, did find time to tell us a little about his last season's activities. He visited Swanage, Dorset, for three days last Easter and spent one of the days at the Studland Bay Nature Reserve. Richard was mainly on the look out for reptiles, amphibians and birds (on Brownsea Island), but did note a fair amount of the pondlife, as follows: Dytiscid beetles — *Ilybius fuliginosus* Fab., *Agabus* sp., *Hygrobia* sp. and larvae of *Acilius* sp; water bugs — *Corixa* sp., *Notonecta* sp. and *Gerris* sp; mosquito larvae — *Culex* sp; caddis larvae — *Odontocerum* sp; as well as various crustaceans — the water louse (*Asellus* sp.), copepods (*Diatomus* sp. and *Cyclops* sp.) and water fleas (*Daphnia* sp. and *Scapholebris mucronata* Muell.).

Last May Richard visited Lydd and Dungeness, but owing to the cold weather caught nothing in his 'm.v.' trap. There were, however, large numbers of larvae of the Small Tortoiseshell (*Aglais urticae* Linn.), Garden Tiger Moth (*Arctia caja* Linn.), and Drinker Moth (*Philudoria potatoria* Linn.) on the edge of the dykes.

I would like to wish Richard luck in his attempts to rear and breed African praying mantids, his latest venture.

I hope you will all let us know what you did for National Nature Week. With progress, ignorance and greed

destroying so much of our fauna and flora (poosh names for animals and plants) we really must make every effort to persuade other people that our natural heritage is really worth conserving, if we are not to have to travel thousands of miles just to see a ladybird.

I used to laugh at people who reared caterpillars and released the resulting butterflies and moths to enrich the countryside. I apologise most sincerely to them, and hope that many more of us can find ways of repaying Nature for the great amount of pleasure we get out of it. Let us try to ensure that next year will not bring the silent spring if we can help it.

Have a jolly good season. Collect what you like, but not too much. Please do not forget to drop me a postcard telling just a little of your entomological experiences this year: in the meantime try this quiz.

1. What type of beetle is *Phosphuga atrata* Linn?
2. Why are farmers encouraged to surround manure heaps with a small water trench?
3. Which African insects spread 'sleeping sickness'?
4. What is meant by "complete metamorphosis"?
5. What is the chief characteristic of the Order Lepidoptera?
6. How many eyes has a Housefly (*Musca domestica* Linn.)?
7. What is the name given to a moth's long sucking mouth-parts?
8. What are (a) Whirligigs and (b) Wart Biters?
9. Name the species of butterfly only found in Huntingdonshire.
10. What do insects use their palps for?
11. How are weevils different from other beetles?
12. What are 'ground' beetles and what do they eat?
13. Why are there no young ento-

mologists in Scotland?

14. What does the adult Atlas Moth (*Attacus atlas* Linn.) feed on?
15. What is a formicarium?
16. Why do some country beekeepers sometimes talk to their bees?
17. What are 'Leather jackets'?
18. How does the Devil's Coach-horse beetle (*Ocyptus olens* Muell.) show its defiance?
19. How did *Aedes* make it a very long sea journey to Australia?
20. Where does our casual visitor the Monarch Butterfly (*Danaus plexippus* Linn.) originally come from?

H. J. Berman, F.R.E.S. (2971A).

REVIEW

Introducing the Insect, by F. A. Urquhart, M.A., Ph.D. Pp. x and 258. Illus. 153. Frederick Warne and Co. Ltd., London. 30/-.

This book sets out to introduce the beginner to the study of entomology as a whole.

After introductory chapters on making a collection, on anatomy and life history, and on classification and identification, are chapters on most of the insect Orders. The larger Orders are discussed under families: thus under the Lepidoptera, for instance, twenty-three families — the main headings are in English — each have between one third of a page and a page and a half of information on them, in addition to the introductory pages, while the figure for Coleoptera is twenty-seven families. There is a final short chapter on galls.

The author has clearly gone to much trouble to make his accounts acceptable to the general reader, yet at the same time give a groundwork on which further knowledge can be based. It is pleasing to see that the

terminology of the important insect structures is given (with little 'hedging') under anatomy and used in simple keys to the Orders and major families within the Orders. Though often perhaps unnecessarily lengthy, the treatment of such general subjects as labelling of specimens, classification and use of the keys, is sound.

It is rather unfortunate that this book, first published in Canada, has not been more fully revised for the English edition: the treatments given to many of the insects of peculiar habits or economic importance include a high proportion of types strange to amateurs in this country, and the American-style colloquial names (e.g., "green-headed monsters" for Tabanid flies) can prove irritating to the English reader, particularly where the genus of non-British types referred to in this way is not given.

Although in a mere 250 pages or so the families more infrequently met with have had to be omitted, the general balance of the types surveyed is good, and all those met with by the casual observer are mentioned and explanations of behaviour, etc., given where necessary.

The numerous line drawings by E. B. S. Logier are an important part of the book, especially in the keys, and greatly increase its value to the reader.

The only notable omission is that of any sort of list of books for further reading; the conclusion says only that there are plenty available.

This volume may be recommended both for browsing by the general reader wishing to know something of the insects and for anyone starting to study the insects as a hobby or at school (indeed, the work is likely to be of much value as a teaching aid). Someone wishing to broaden their knowledge of entomology beyond the Lepidoptera alone — which is dealt with in a number of popular books —

could well start by reading the volume. It may, as the publishers claim it will, find acceptance with the student taking an introductory course of entomology at University, though its North American bias and relatively incomplete treatment of the more academic aspects of the life of insects decrease its value for this purpose.

H.V.D.

LETTER TO THE EDITOR

Sir,—With reference to Mr D. H. Fletcher's note in the November issue of the *Bulletin (Bull. amat. Ent. Soc., 24: 169-70)*, I can say that in this district too at Aberdeen Painted Lady Butterflies (*Vanessa cardui* Linn.) were plentiful in 1964. Most numerous too were Red Admirals (*Vanessa atalanta* Linn.).

On 13th June 1964 I saw single specimens of both butterflies at Newburgh, Aberdeenshire. Then in the month of July my children discovered some Red Admiral larvae on nettles in some vacant ground near my home. As a result of their forays thirteen larvae were found.

On 1st August 1964 I visited the estuary of the River Don, Aberdeenshire, and on thistles growing among the sand dunes only a few yards above the high water mark, my eldest son aged nine found a Painted Lady caterpillar. A colony of twenty was eventually discovered and these were bred out. They were almost full-fed and pupated within a week or so of capture. About fifteen days after pupation they emerged, and some were liberated.

During the later part of August and September both Red Admirals and Painted Ladies were constant visitors to my small garden.

Below are sketches of larvae and pupae which were made at the time.
3.1.66. E. Pickard (3928).



VANESSA
ATALANTA.

F.



VANESSA CARDUI.

F.

NOTES AND OBSERVATIONS

THE SPECKLED WOOD UTTERFLY IN N.E. SURREY

With reference to Mr D. H. etcher's note in the November Bulletin (*Bull. amat. Ent. Soc.*, 24: 170) should like to state that although I bred in Croydon for three and a half years the only specimen of the Speckled Wood Butterfly (*Pararge aegeria* Linn.) in my cabinet is that of a female of the summer brood which captured at a lighted shop window on the night of 11th September 1960 in George Street, Croydon, Surrey.
9.12.65. M. O. Hughes (3612).

NOTES AT RANDOM

Much has been written about the scarcity of butterflies, due mainly to weed-spraying and the destruction of

habitats. I have read very little about the effect on moth populations of these changes in the environment. It is probably very difficult to make truly scientific observations on this subject; the catch of any given species at a mercury-vapour trap varies so greatly from night to night for meteorological reasons alone that you would need a long series of yearly records before you could draw safe conclusions.

Lacking such data, I can only give my 'impressions' — that in my part of England (Glos.-Worcs. border) there has been no general reduction in the numbers at my 'm.v.' trap during the last ten years. Some of the more obvious species — Hawkmoths and Prominents — seem if anything to be more abundant; especially the Poplar Hawkmoth (*Laothoe populi* Linn.), Eyed Hawkmoth (*Smerinthus ocellata* Linn.) Swallow Prominent (*Pheosia tremula* Clerck) and Pebble Prominent (*Notodonta ziczac* Linn.) have been plentiful during the last few seasons. Last spring the Peppered Moth (*Biston betularia* Linn.) was commoner than I have ever known it; and in October the Angle Shades (*Phlogophora meticulosa* Linn.) had a small population-explosion locally: both in the trap and in the ivy blossom it was abundant for more than a fortnight.

A moth which comes to my mind as much less abundant than it used to be is the Mottled Umber (*Erannis defoliaria* Clerck). One reason, I dare say, is the grubbing up of old orchards and the spraying of fruit trees; yet the Winter Moth (*Operophtera brumata* Linn.) continues to be common everywhere — and its larva is no more polyphagous than that of *E. defoliaria*, which will eat almost anything.

I have the impression that the Garden Tiger (*Arctia caja* Linn.) is less common than it used to be — perhaps due to efficient weed-killing

of docks and dead-nettles? At any rate I seem to see fewer 'woolly-bears.'

Last spring I had a large brood of larva of the Hebrew Character (*Orthosia gothica* Linn.); they were bred from a female which was an extreme example of var. *gothicina*. In due course they all went to earth in a large wooden box filled with bulb-fibre and sterilized soil. The box, which had no lid, was kept in a store-room until the autumn. I then carefully sifted the soil, expecting to find forty pupae. I did not find a single one. Can anybody suggest an explanation of this mystery? 'Clothes moths' seems a possible one. Whatever it was that burrowed down into the earth and destroyed those pupae did the job without leaving a fragment of a pupa-case, or anything in the nature of a clue.

The killing-agents I use as a rule are chloroform and liquid ammonia; but when you are going to collect abroad it is better to take a cyanide bottle, so I asked my chemist to make one up. After a fortnight's delay he told me that though he'd tried hard to get it, potassium cyanide was "practically unobtainable nowadays," and suggested using sodium cyanide instead. Can anyone tell me if this is as effective and long-lasting as the potassium salt; also, what is the reason for the shortage of KCN?

John Moore (146).

EXPERIENCES WITH A LIGHT-TRAP IN S.W. LONDON

When I first started to use a mercury-vapour moth-trap four years ago, I had a purple bulb. I was rather disappointed by the results, but was surprised to find that the majority of moths were females.

Late in 1964 the bulb expired, and I decided to change to the white type. Since then the numbers taken have trebled, and many species, like the

Lime Hawkmoth (*Mimas tiliae* Linn.), which did not come previously have appeared in large numbers this year. About 78% of the moths are now males however.

During the three years I used the purple light I captured four female Privet Hawkmoths (*Sphinx ligustri* Linn.). This year I have caught thirty-seven *S. ligustri*, but all are males. This is true of many other species. With the Grey Arches *Polia nebulosa* Hufn. and others I formerly caught all females, whereas this year I have caught mainly males, with only the odd female occasionally.

I consider worthy of note two moths I have taken this year at 'm.v.' I took a Pine Hawkmoth (*Hyloicus pinastri* Linn.), as early as May 27th. This capture is particularly surprising as there are no pine woods near our garden, and my specimen is in perfect condition, as if it has only just emerged. I also took a very pale example of the Bordered Straw (*Heliothis peltigera* Schiff.), on July 8th, also in very good condition.

3.10.65. I. S. Finlay (3484J).

UNCOMMON BEETLE IN NORTH YORKSHIRE

On 17th August 1965 while collecting Coleoptera in an area of woodland near Hemsley, North Yorkshire, I discovered several brightly coloured beetles on an old oak log. The insects were about 7 mm. long and entirely black except for the scarlet elytra and the 10th and 11th joints of the antennae, which were yellowish. I identified the beetles as *Platycis minuta* Fab., a very local and more southerly species.

On 12th September I revisited the area and found several more of the insects. A specimen was sent to Mr D. Tozer of the AES Advisory Panel who kindly confirmed the identification.

11.12.65. J. K. Smith (3795).

THE AES ADVISORY PANEL

How and when to consult the Panel

Members of the Panel will advise you on the study of their special groups and will identify small numbers of British specimens which are of particular interest to you. Large collections should be taken to a museum for identification. Try to see a copy of the relevant standard work if you know of one, before approaching the Panel.

Always mention that you are approaching the Adviser as he is a member of the Panel and give your own **Membership number**. You must **enclose postage stamps** to cover the cost of a reply or return of specimens. Members of the Panel are busy people, so try to send dead material to them during the winter when their own time is less likely to be taken up with field work. You are recommended to **send a stamped addressed envelope** for acknowledgement of the receipt of material which may have to await time for its identification.

Labelling — with details of locality, host-plant, date, time and mode of capture, etc. — often greatly simplifies identification. Every specimen should be fully labelled on the same pin as bears the specimen or its mount. Details of locality will be treated as confidential if this is desired.

The Society is most grateful to the many specialists who serve on this Panel, without any remuneration other than the occasional specimen taken, with permission, from an interesting series that has been sent in. It is hoped that Advisers in those groups that are noticed incidentally or as pests will be sought after as frequently as members of the Panel willing to identify commonly collected Orders.

New advisers on appropriate subjects not covered below are always welcomed by the Hon. General Secretary.

ADVISORY PANEL

Coleoptera (Beetles)

General advice on identification

D. TOZER (36), 98 Copdale Road, Leicester.

Staphylinidae

H. R. LAST (117), 12 Winckworth Road, Banstead, Surrey.

Water-beetles

Prof. J. W. A. F. BALFOUR-BROWNE, M.A., c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Diptera (Two-winged Flies)

General advice

L. PARMENTER (895), Woodside, Pinewood Road, Ferndown, Dorset.

L. PARMENTER (895), 94 Fairlands Avenue, Thornton Heath, Surrey.

Larvae (approximate identification)

K. G. V. SMITH, c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Tachinidae (Parasitic Flies) *and Muscidae*

E. C. M. FONSECA, 58 Woodstock Road, Redland, Bristol 6.

Tipulidae (Crane-flies)

R. M. PAYNE (2982), 8 Hill Top, Loughton, Essex.

Ephemeroptera (Mayflies)

General advice and identification of larvae and adults

T. T. MACAN, M.A., Ph.D., Stevney, Outgate, Ambleside, Westmorland.

Heteroptera (Het-bugs)

General advice and identification

T. R. E. SOUTHWOOD, B.Sc., Ph.D., Imperial College Field Station, Silwood Park, Sunninghill, Berkshire.

Aquatic species

T. T. MACAN, address above.

Homoptera

Aphidoidea (Greenflies, Blackflies)

H. L. G. STROYAN, M.A., c/o
Insect Pathology Laboratory,
Hatching Green, Harpenden,
Hertfordshire.

Auchenorhyncha (Leaf-hoppers, etc.)

Dr W. J. LE QUESNE, Anne
Cottage, Lye Green Road, Ches-
ham, Buckinghamshire.

Hymenoptera

Aculeata (Bees and Wasps)

J. C. FELTON, 16 Park Drive,
Sittingbourne, Kent.

Formicoidea (Ants)

C. A. COLLINGWOOD, B.Sc.,
c/o National Agricultural Ad-
visory Service, Coley Hill,
Reading, Berkshire.

Parasitica (Chalcids, Ichneumons,
etc.)

G. J. KERRICH, M.A., c/o British
Museum (Natural History),
Cromwell Road, London, S.W.7.

Symphytta (Sawflies)

Dr V. H. CHAMBERS, 12 Doug-
las Road, Harpenden, Hertford-
shire.

Lepidoptera (Butterflies and Moths)

'Microlepidoptera' — *identification*

S. WAKELY (1860), 26 Finsen
Road, London, S.E.5.

ditto — *general advice*

D. OLLEVANT (1514), 3 Sal-
combe Drive, Morden, Surrey.

Noctuidae and their larvae

B. F. SKINNER (2470), 85 Elder
Road, West Norwood, London
S.E.27.

Saturniidae (Silkmoths)

B. O. C. GARDINER (225),
18 Chesterton Hall Crescent,
Cambridge.

European Butterflies

P. W. CRIBB (2270), 355 Houns-
low Road, Hanworth, Nr Fel-
ham, Middlesex.

Odonata (Dragonflies)

General advice and identification

A. E. GARDNER, 29 Glenfield
Road, Banstead, Surrey.

Orthopteroids (Cockroaches,
Grasshoppers, Mantids, Earwigs,
etc).

*General advice and identification of
British and imported species*

A. E. GARDNER, address above.

Plecoptera (Stoneflies)

*General advice and identification of
larvae and adults*

T. T. MACAN, M.A., Ph.D.,
Stevney, Outgate, Ambleside,
Westmorland.

Thysanoptera (Thrips)

General advice and identification

T. LEWIS, B.Sc., Ph.D.,
c/o Rothamsted Experimental
Station, Harpenden, Hertford-
shire.

Trichoptera (Caddisflies)

General advice and identification

T. T. MACAN, address above.

Insect Migration

Recorder and Adviser

R. A. FRENCH, B.Sc., (2129),
Rothamsted Experimental Sta-
tion, Harpenden, Hertfordshire.

Botany

Identification of foodplants

H. K. AIRY SHAW (545), Royal
Botanic Gardens, Kew, Surrey.

*Selection, propagation and cultivation
of foodplants and floral attractions*

R. C. DYSON (91), 58 Stanford
Avenue, Brighton 6, Sussex.

Plant Galls

D. LEATHERDALE, Eastfield
Lodge, Whitchurch, Nr Pang-
bourne, Berkshire.

Apparatus and Techniques (except microscopy)

General advice

M. E. CASTLE (2490), 'Avellana',
172 Greenfield Crescent, Hazel-
ton Gardens, Horndean, Hamp-
shire.

Photography

35mm. still and general advice

R. W. J. UFFEN (1660), 4
Vaughan Avenue, Stamford
Brook, London, W.6.

LEAFLETS

Numbers not included are out-of-print or replaced by others.

	Price each
3. Rearing Silkworms. (The Mulberry Silkmoth). 4pp., 2 figs.	8d.
4. Collecting Sawflies. 12pp., (incl. 2pl.), 26 figs.	8d.
5. Collecting Flies (Diptera). 8pp., 1 fig., 8pl.	2s. 8d.
6. Collecting Beetles associated with Stored Food Products. 9pp., 6 figs., 3pl.	1s. 4d.
7. Some Improved Devices for Rearing Hymenoptera. 7pp., 3 figs.	8d.
8. Collecting Ants. 12pp., 5 figs.	8d.
9. Collecting Caddises. 5pp., 4pl.	1s. 0d.
10. Experiments with Bees. 12pp., 3 figs.	8d.
13. Collecting Microlepidoptera. 4pp., 1 fig.	8d.
14. Setting Microlepidoptera. 4pp., 5 figs.	8d.
15. Collecting Het-Bugs (Hemiptera-Heteroptera). 12pp., (incl. 2pl.), 5 figs.	8d.
18. Collecting Clearwings. 12pp., (incl. 2pl.), 4 figs.	8d.
20. Preserving Caterpillars. 14pp. (incl. 6pl.), 9 figs.	1s. 0d.
21. Collecting Psocoptera. 4pp., 10 figs.	8d.
22. Collecting Lacewings. 9pp., 8 figs., 5pl.	1s. 0d.
24. Entomology of Bird Pellets. 8pp., 4pl., 1 map.	1s. 8d.
25. Collecting Bumble Bees. 20pp., 83 figs.	2s. 0d.
26. Collecting Collembola. 6pp., 4 figs.	1s. 0d.
27. A Study of the Insects Living on the Wayfaring Tree. 20pp., 4 figs., 1 diagram.	1s. 0d.
28. Killing, Setting and Storing Butterflies and Moths. 13pp., 10 figs.	1s. 0d.

PAMPHLETS

4. Label List of British Macrolepidoptera. 32pp.	1s. 8d.
5. Check List of British Macrolepidoptera. 32pp.	4d.
6. Label List of British Butterflies. 2pp.	4d.
7. Directory of Natural History Societies. 155pp.	8s. 0d.
7a. First Supplement to Directory. 44pp.	2s. 0d.
10. Glossary for the Young Lepidopterist. 6pp., 2 figs.	4d.

Other Leaflets are in preparation

These publications are obtainable from L. Christie, 137 Gleneldon Road, Streatham, London, S.W.16, England. Do not send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

Worldwide Butterflies Ltd.

Charmouth, Bridport, Dorset

IMAGINES, OVA, LARVAE AND PUPAE

from many parts of the world

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

FOR ALL INFORMATION ON BEES

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mdx

Entomological Literature

CATALOGUES ON REQUEST

VOL. 25

No. 272

•

AUGUST, 1966



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**

Grasshoppers, Crickets
and Cockroaches of
the British Isles

Although the grasshoppers and their relatives are among the most familiar of British insects, surprisingly little is known about them probably due to the lack of a handbook on the subject and this book attempts to meet this need. Dr Ragge's book is profusely illustrated with numerous colour illustrations, showing both top and side views of the species. An unusual feature is the song diagrams of the grasshoppers and crickets, also available on a record (12s. 3d.). 312 pp. **42s. net**

Write now for an illustrated prospectus

FREDERICK WARNE

1-4 Bedford Court, London, W.C.2

The
Entomologist's Record

and Journal of Variation.

Founded 1890 by T. W. Tutt.

Published monthly,
annual subscription 35/-.

Please write for specimen copy to F. W. Byers, 59, Gurney Court Road, St. Albans, Herts., enclosing 5/-. This amount will be deducted from the first year's subscription.

AES NOTICE — where to write

Membership applications and first subscriptions to:

D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset. Yeovil 3928.

Changes of address and non-arrival of Bulletins to:

P. Taylor, 18 Old Manor Drive, Isleworth, Middlesex.

Advertisers and for Prospectus of Society and Application forms to:

R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex. GRImSyde 0460.

Offers to lead field meetings, etc. to:

C. B. Pratt, 1 West Ham Lane, London, E.15

Manuscripts, drawings and books for review to:

H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

Subscription renewals (25/- per annum, 12/6 under 18 years) to:

B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex. Sunbury 2687.

Youth matters to:

H. J. Berman, St Ivo School, St Ives, Hunts.

Offers of help, queries, etc. to:

P. W. Cribb, 355 Hounslow Road, Hanworth, Feltham, Middlesex. FELtham 3099.

Annual exhibition matters to:

B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27. GIPsy Hill 0057.

WANTED

Seitz Macrolepidoptera of the World

Edwards Butterflies of North America

Scudder Butterflies of Eastern U.S.

Holland The Moth Book and other technical works pertaining to entomology especially Lepidoptera.

Quote for resale.

List available on request

J. J. NADOLNY

35 Varmor Drive

New Britain, Conn., U.S.A.

Fluorescent "Blacklight" M.V. Equipment

Portable, battery-operated, traps complete with 6 watt. tube and transistor power unit, weight 5½ lbs. £17.

Battery operated units for use with sheet complete with 6 watt tube and transistor power unit, weight 2 lbs. £9 5s. 0d.

Traps and sheet units using 15 watt tubes available later.

Full details on receipt of S.A.E. from

ENTECH SERVICES

Windermere Road

Grange-over-Sands, Lancashire

Entomological Store Boxes

Book type wooden store boxes, strongly made with tight fitting lids to keep out vermin. Cork lined and papered in both halves, the 10 x 8 size will hold up to 50 Large White size butterflies.

10 x 8 - 21s.

14 x 10 - 31s.

17½ x 12 - 41s.

Postage on one of any size 3s.

Other sizes made to order

J. R. ALLANACH,

10 Grange Park Walk, Roundhay,

Leeds 8, Yorkshire

A E S

Members can help the Society in several ways:—

- (a) By dealing with advertisers and mentioning the *Bulletin*.
- (b) By bringing in new Members.
- (c) By buying AES publications and suggesting Public Libraries should buy them.
- (d) By friendly co-operation with other Members.
- (e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin*.

Silkmoth Rearer's Handbook

A complete reference book for those who embark upon the fascinating adventure of rearing the largest and most colourful moths in the world.

Part I records practical experience in breeding Silkmoths from all over the world during the past decade. It illustrates bought and home-made apparatus and gives hints on everything the beginner needs to learn about the life-cycle of the insects.

Part II, *for the first time in one book and one language*, gives complete or nearly complete descriptions of all stages of the life-cycle of over 120 species. Some 1,400 species and subspecies can be looked-up under 138 generic names.

Part III is a reference section, covering cross-pairing, the major reference works and an index of species and subspecies.

The Handbook comprises 165 pp. with full colour cover, 2 colour plates, 63 monochrome photos and 24 line drawings or charts.

Price **17s. 6d.** (plus postage)

A Coleopterist's Handbook

A symposium by various authors edited by

G. B. WALSH, B.Sc., M.R.S.T., and J. R. DIBB, F.R.E.S.

The Handbook describes the tools and apparatus and methods of collecting British Beetles; their habitats, commensals and pre-adult stages: how to record, photograph, make a personal collection and conduct a local survey.

Twenty full-page plates illustrative mainly of pre-adult stages (including seven reproductions of rare engravings) and fifty line-drawings and diagrams. 112 pp. and index.

Price **15s. 0d.** (plus postage)

from

Amateur Entomologists' Society

OFFICIAL PUBLICATIONS AGENT

137 Gleneldon Road, Streatham,

LONDON, S.W.16

(Please do not send money with order: an invoice will be sent)



EDITORIAL

A number of changes in the administration of the Society have taken place recently, and Members are asked to consult the 'Where to Write' panel on the inside front cover to discover the correct officers to whom various correspondence should be addressed.

These changes have been necessary partly because of the discovery of some breakdowns in the *Bulletin* despatching system in recent times:

In particular, some Members who joined in 1965-6 have not been receiving *Bulletins*, but we have now remedied this situation and are grateful to Members for their co-operation during the change in replying to letters of enquiry and in returning the occasional extra *Bulletin*, sent because of faulty records. These troubles have meant, however, that Membership for the year 1965 is given in the Council's report—is not known exactly.

Perhaps a further point could be made which would help administration: would Members please write their names clearly when renewing subscriptions (please enclose a slip giving name in block capitals and membership number if the subscription form with this information on it is not being used—signatures on cheques alone, for instance, are not always easy to make out correctly).

There are two vacancies on the Council for Junior Members. If any Juniors who live near London would be interested in helping in the AES Council's work, would they please

write to the President, Mr P. W. Cribb.

In this August issue appears the first of the annual reports of our Scottish Correspondent, Mr G. Thomson. These reports will prove most valuable, particularly if continued for a number of years, but they do depend on the co-operation of Members in sending their records to Mr Thomson. Could I suggest that any Member who visits Scotland should let our Scottish Correspondent have a copy of the entomological notes he makes there.

Another new feature in the following pages is the first of a series of articles from Mr P. A. Goddard, who has kindly offered to act as a sort of 'London Suburban Correspondent.' There is a lot of insect life, too often little studied because the more distant countryside seems to offer better scope for entomological activity, in the ordinary suburban garden. London Members will doubtless find themselves encouraged to take a closer look around them by Mr Goddard's articles.

An established regular item shows a change of authorship in this issue, too. Mr D. Ollevant has handed over responsibility for the Smaller Moths Collecting Notes to Mr A. M. Emmet. We are very grateful to Mr Emmet for agreeing to take over the writing of these notes; and, of course, for Mr Ollevant's hard work on the notes over a long period.

The *Junior Conservation Prize* introduced by Mr Whitehouse (see the May Editorial) has been very generously augmented by Sir Robert Saundby—the Prize will now take the form of a first prize of three guineas and a second prize of one

guinea. For this reason the closing date for entries (received by me as reports for the *Bulletin* on the project entered) will be extended until 1st August, 1967.

I hope that the activity within the Society implied in the paragraphs above will be reflected at the Society's Annual Exhibition in October, details of which are given in this issue. We all hope it will be as successful as was last year's.

Finally, it is with great regret that I have to report the death, on 28th April 1966 at Buckhurst Hill, Essex, of Mr E. E. Syms, an Honorary Member of the Society, and well-known to entomologists particularly in the fields of insect photography and life-history studies. His services to entomology over a long period are remembered with gratitude.

H. V. Danks (2907).

ANNUAL EXHIBITION 1966

The Annual Exhibition will be held on Saturday 8th October at the Hugh Myddelton School, E.C. 1. Full details of how to reach the school, etc., are given on the back of this issue.

The following further notes may be of assistance to those intending to visit the Exhibition.

Exhibits are not confined to specimens captured this season: an item need not be new to be of interest. Any exhibit related to entomology in its broadest sense (and Nature study) may be shown. This includes not only set specimens, livestock and apparatus, but also the illustration of techniques, records and observations with or without specimens of the species concerned, etc. A covering for set specimens is advisable—a piece of 'Polyglaze' or similar material may be used as a cover to protect store-box specimens, for instance. Exhibits

from non-members and members of affiliated societies are welcomed.

Good labelling of exhibits is essential, as the value of an exhibit often lies in the explanation of what the material displayed represents. The name of the exhibitor should be added as this allows not only contact to be made between the exhibitor and people particularly interested in the exhibit, but also allows a note of the exhibit to appear in the exhibition report in the *Bulletin*, so that Members who are unable to visit the exhibition are aware of some of the special interests of other Members.

Juniors' Prize: As last year, there will be a special prize for the best Junior Member's exhibit. (A Junior Member is one who was eligible to pay the Junior subscription for this year). Group exhibits are allowed, and in the event of such an exhibit winning, the prize will be shared equally between the members of the group. The method of presentation in relation to the subject will be the chief criterion used in judging the exhibits—it is therefore not necessary to exhibit large numbers of specimens, or species which are rare, to win the prize.

Colour slides from the Society's collection will be shown throughout the afternoon, and Members are invited to bring along interesting slides of their own to show other Members.

Dealers: At AES Exhibitions nearly every entomological supplier in the country is always represented, and this will be equally true of this year.

Bring an exhibit, large or small.

COUNCIL'S REPORT 1965

The Membership for the year was approximately 750.

The quarterly *Bulletins* included a

special issue for August which contained an article on 'Insect Migration,' by Dr C. B. Williams and 'A Guide to and Local List of Insects in North-west Cornwall', by Mr G. D. Trebilcock. It is intended that this shall be the first in a series of such guides to holiday centres.

This special issue proved to be rather larger than had been anticipated and so rather strained the Society's finances. However, the increase in subscription, effective on September 1st, should balance this out in 1966. The total number of *Bulletin* pages for the year was 172, as compared with 144 in 1964.

The high standard of contributions to the *Bulletin* was maintained, but various difficulties delayed the dates of despatch to Members. The Council has been busy sorting out these difficulties and it is to be hoped that the dates will be better kept in 1966.

A working committee has continued to work on the compilation of new leaflets, and the General Editor hopes to be able to publish several in the near future.

The *Wants and Exchanges List* was published quarterly and was quite well patronised.

The Annual General Meeting was held in the rooms of the Linnean Society, Burlington House, on Saturday 27th March 1965. Those present enjoyed a very interesting illustrated talk by Mr R. W. J. Uffen entitled 'Expedition to Porto Santo, Madeira, 1963.'

What was probably the most successful Annual Exhibition in the Society's history was held on Saturday 9th October at the Hugh Myddelton School. A particular feature was the high standard of the Junior Members' exhibits. Further details are given in *Bull. amat. Ent. Soc.*, 25: 7.

The introduction of a badge has proved to be more popular than had been expected and by the end of the

year 325 had been sold.

The Council met six times during the year under the chairmanship of Mr D. Ollevant. Several officers found that unexpected changes in circumstances had made it difficult for them to devote sufficient time to AES affairs. Mr G. D. Trebilcock had to resign as Treasurer but the Society was fortunate that by October Mr P. Lindsley was able to take control of the Society's finances. Mr Dodwell found that he was unable to cope with all the Secretary's duties and the President took over for a short time. It is hoped that the position of General Secretary will be resolved in 1966.

The Society has maintained its position in 1965 and although it has still had its difficulties these have been less serious than previously: there is every hope that 1966 will be a good year in the Society's history.

The work involved in running the Society has been well done by a group of devoted workers; other Members can best help by contributing to the *Bulletin*, by encouraging others to join, and by generally supporting the Society in any way they can.

19.3.66.

D. Ollevant (1514),
Hon. General Secretary.

TREASURER'S REPORT 1965

This being my first report as Treasurer I feel rather disappointed that owing to pressure of work on myself and the auditors I have been unable to produce a final statement of the financial position of the Society in time for the A.G.M.

I have, however, sufficient information to be able to present an interim report of our position but I shall issue the full report in the very near future. Owing to the incomplete

nature of this report I would ask Members to bear in mind that the figures although carefully compiled may vary slightly when the complete report is issued.

	£	s.	d.
<i>Expenditure:</i>			
Cost of Bulletin ...	654	6	9
Printing and Stationery ...	53	12	9
Postage ...	66	8	7
Exhibition ...	16	0	9
Sundry expenses ...	19	19	5
Depreciation of addressograph ...	33	13	1
Depreciation of typewriter ...	2	19	10
Amount written off publications ...	55	5	2
	<hr/>		
	902	6	0
<i>Income:</i>			
Subscriptions ...	448	0	9
Donations ...	61	15	4
Sale of publications ...	165	15	7
Advertising ...	13	8	11
Sale of Badges ...	17	5	6
Building Society interest	23	6	0
Adverse balance carried to general income and expenditure a/c ...	132	13	11
	<hr/>		
	902	6	0

The reason for the loss shown is mainly the very high cost of the *Bulletin*, the August issue of which cost £223 alone. This figure is not quite so alarming as it at first appears because owing to the nature of the issue extra copies were printed as an addition to our publications. You will realise from what I have just said that the *Bulletin* is a tremendous drain on our reserves and together with generally increased costs the only path open to us was to increase subscriptions.

This action having been taken we seem likely to be able to build up our reserves over the next year or so and I look forward to being in the position of reporting a small credit balance at

the next A.G.M.
19.3.66.

P. Lindsley (3363),
Hon. Treasurer.

[The final Income/Expenditure figures have since been issued to Members and are almost identical—Ed.]

THE ANNUAL REPORT OF THE SOCIETY'S REPRESENTATIVE ON THE NATURE CONSERVANCY'S ENTOMOLOGICAL LIAISON COMMITTEE FOR 1965-1966

There were the usual two meetings during the year of this committee held at the Nature Conservancy's headquarters in Belgrave Square but unfortunately your representative was only able to attend the first as he was abroad at the time of the second. Among the more important matters which were discussed were straw and stubble burning, the importance of road side verges as reservoirs of insect life, the introduction of species, the management plans for several nature reserves, the control of the Wood Ant (*Formica rufa* Linn.) in reserves where it has become abundant, the scientific interest of the chalk fauna and the status of the Large Blue butterfly (*Maculinea arion* Linn.)

In a little more detail, the National Farmers' Union is again going to issue a directive warning farmers of the dangers of uncontrolled burning of stubble after the harvest. The whole question of toxic chemicals and their uses, etc., and wildlife is being considered with a view to suggesting what new legislation is needed. It was reported that a paper being produced might help to impress the Ministry of Transport on the ever increasing importance of road-side verges as places of scientific and

aesthetic value.

Much has been written, said and done regarding the introduction of insects, both foreign and British, by collectors who try to establish colonies of their favourite insects—the attempts often being unsuccessful—so that it should be unnecessary for our representative to repeat that it is imperative for any of our members to let the Conservation Committee of the Royal Entomological Society of London have details of their proposal before taking steps at an introduction, or if an insect is put down in an area surreptitiously, untold harm can be done to records both past and future and the natural distribution of a species can be completely obscured. As the survival of the Large Blue butterfly is still in doubt the remarks in the final paragraphs of the previous report still apply.

It is pleasing to report that several Members have shown considerable interest and have written or telephoned about conservation matters during the past twelve months and it is hoped that this will continue as it is imperative to know if a species or particularly an area is threatened before irretrievable damage is done.

T. G. Howarth (196).



ANNUAL GENERAL MEETING 1966

The Society's Annual General Meeting was held in the rooms of the Linnean Society at Burlington House, Piccadilly, on the afternoon of 19th March, 1966.

The formal business was preceded by a conversazione, at which we met several new Members, and a most interesting cine film showing snatches of entomological life in Mr Docwra's garden and breeding cages. The film included a record of Mr Docwra's

activity in rearing and releasing large numbers of Nymphalid and other butterflies that are becoming scarcer as his home district becomes more intensively built up and tidied up. There were some superb shots of Humming-bird Hawkmoths at *Buddleia* blossom in his garden.

Reports by Council, our Hon. Treasurer and our representative on the Entomological Liason Committee of the Nature Conservancy are published in the *Bulletin*.

The following Officers and Council were elected for 1966-7.

President

P. W. Cribb

Secretary

(vacancy)

Enrolment Secretary

D. E. Dodwell

Treasurer

P. E. Lindsley

Assistant Treasurer

B. R. Stallwood

Bulletin Editor

H. V. Danks

General Editor

R. W. J. Uffen

Meetings Secretary

B. F. Skinner

Advertising Secretary

R. D. Hilliard

Councillors

J. Cooter, G. Prior, D. Ollevant,

V. B. Shearer, P. Taylor, L. S.

Whicher, C. B. Pratt, G. D.

Trebilcock.

It remains for Council to co-opt a new Secretary and Junior representatives.

Messrs T. Dillon and W. J. Beer were appointed auditors.

In taking the Chair, Mr Cribb paid tribute to Mr Ollevant's many years of service to the Society in the Offices of President and Hon. Secretary.

Question time provoked a discussion of specialist groups which the Society encouraged for some years.

The concensus of Officers' opinions was that these groups were only successful when they were very informal correspondence groups between a handful of enthusiasts. Attempts to organise them to disseminate advice to beginners by some such means as a circular passed from Member to Member caused groups to expand until they became so cumbersome as to disintegrate. Few groups found leaders with the energy and facilities to cope with this stage of development and Council could not offer to assist.

It was complained that there had been some cases of Members not receiving *Bulletins* recently. Council had already discovered this and remedial action is being taken.

COLLECTING NOTES AUGUST 1966

The Smaller Moths

"Mr E. S. Bradford must be a very aggrieved man. After executing his drawings of microlepidoptera with the greatest skill and producing one of the best features of the *Bulletin*, he seems to be dogged by error.

In the February number (*Bull. amat. Ent. Soc.*, 25: 2) he has illustrated *Callisto denticulella* Thunb. (*Ornix guttea* Haw.) and *Parornix* (*Ornix*) *anglicella* Staint. The names have been transposed, in that each insect has been assigned the name which properly belongs to the other.

In the previous number (24: 155) the moths depicted were *Prays curtisellus* Don. and *Poraswammerdamia* (*Swammerdamia*) *caesiella* Huebn; on this occasion too the names of the moths were wrongly allocated.

Finally in August 1964 (23: 78) the lower of the two moths portrayed purports to be *Lithocolletis stettinensis*

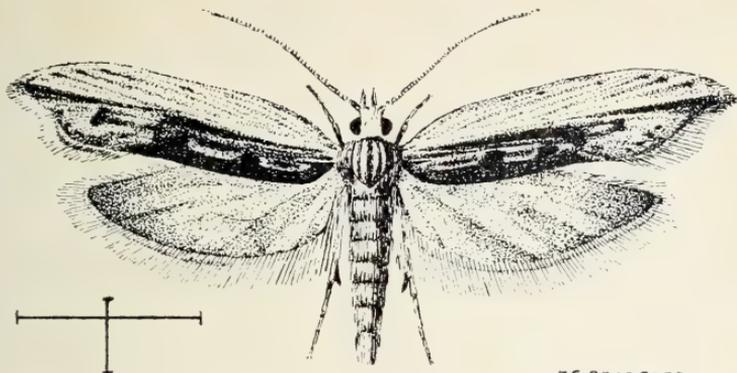
Nic. I have no doubt that the moth depicted is in fact *L. kleemannella* Fab., also an alder-feeder, but making its mine on the underside of the leaf. *L. stettinensis* has a short whitish or golden median streak from the base of the wing and three, not two, costal wedge-shaped spots beyond the ventral fascia. I have found both species mining the same leaf.

It is one's duty to correct such errors. However, I write only in part to find fault: doing so also gives me the opportunity to pay my tribute to Mr Bradford's fine work."

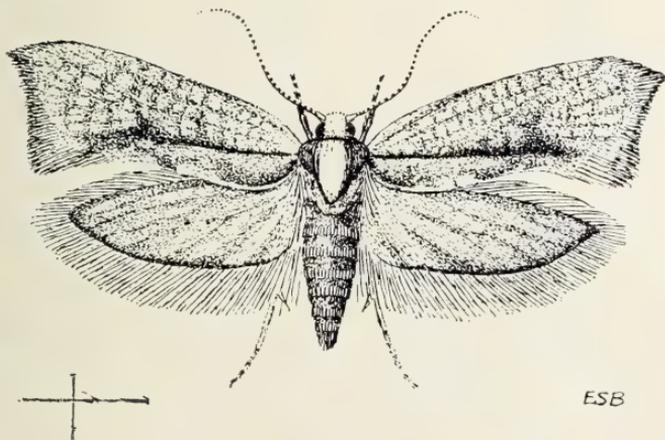
I sent the preceding note to the Editor last March. Someone had to write about these mistakes, but I had hoped that a better qualified entomologist would do so. It was with reluctance, therefore, that I at last put pen to paper: I also felt a vague sense of apprehension regarding the consequences of my officiousness. The outcome, however, was something quite unforeseen, for it was a letter from Mr Ollevant inviting me to take over from him the writing of these notes. I could not refuse without meriting the approbrium due to the destructive critic: I had entrapped myself, and so here I am. But I hope the moral of the story will not be lost on readers who spot the mistakes I shall make in the future.

Ypsolophus (= *Cerostoma*) *scabrellus* Linn. Mr Bradford's notes read: "The forewings are whitish brown with a darker strip along the dorsum, lighter patches in the middle. The rest of the wings are streaked with darker lines. The hindwings are pale brownish grey. The larva feeds on hawthorn (*Crataegus* spp.) and apple (*Malus* spp.). It is a local species in England and the imago appears in July and August."

Ypsolophus (= *Cerostoma*) *lucellus* Fab. Mr Bradford writes: "The drawing is from several specimens bred from



E.S. BRADFORD

Ypsolophus scabrellus Linn.

ESB

Ypsolophus lucellus Fab.

ak leaves collected in a local wood. The larvae make a slight web and pinnings among the leaves, and are rather energetic when disturbed, wriggling violently and more often than not dropping to the ground. They spin a silken boat-shaped cocoon amongst the leaves.

The forewings are an orangey brown all over and there is no marked distinguishing feature apart from an overall mosaic pattern, perhaps more

of a trellis-like pattern. The hindwings are a pale grey. The head and thorax are a very pale cream or whitish, and the antenna is sharply divided into black and white segments. The adult is on the wing in July and August."

Meyrick states (*Revised Handbook of British Lepidoptera*, p. 800), "The male of this species appears to be very rare in collections, an unexplained peculiarity." I have only two

specimens, both taken as adults and both females. I wonder if any Members, especially those who have bred the moth, have any comment to make.

The late summer and autumn is the time to look for the cases of the seed-feeding Coleophoridae. You are bound to do well if you can get to a saltern and examine the heads of goosefoot (*Chenopodium* spp.), Orache (*Atriplex* spp.), seablite (*Suaeda* spp.), and glasswort (*Salicornia* spp.). You may get *Coleophora versurella* Zell., *C. flavaginella* Zell., *C. atriplicis* Durr., *C. salinella* Staint. and, if you are very lucky, *C. clypeiferella* Hofm. and *C. adpersella* Benander. Other *Atriplex* feeders which may be found inland are *C. sternipennella* Zett., so far known only from the London area where it is common and so likely to turn up further afield, and *C. lari-pennella* Zett., which probably occurs beyond its Suffolk haunts. The moths are very similar, and the best guide to their determination is an article by E. C. Pelham-Clinton in the *Entomologist* vol. 92, p. 120 (1959). The cases, which are also much alike, should be kept separate according to locality and foodplant and overwintered in flowerpots covered with muslin placed fully exposed to the weather outside.

While searching for *Atriplex* and *Chenopodium*, look out for mined leaves; the white mines contain larvae of *Microsetia* (*Aristotelia*) *stipella* Huebn. and the green ones *M. hermannella* Fab. Spun seeds are likely to produce *Scrobipalpa* (*Phthorimaea*) *atriplicella* F.R. and *S. seminella* Pierce. You can force the last two species if you bring them indoors in the early months of the year.

Before you leave your saltmarsh, search the Sea Wormwood (*Artemisia maritima* Linn.) for cases of *Coleophora artemisiella* Scott, and also pick a bunch of blown flowers of Sea Aster (*Aster tripolium* Linn.). Although you

may see nothing at the time, it is probable that the larval cases of *C. asteris* Muehlig (*tripoliella* Hodgk.) will in due course crawl out of the seed-heads where they have been feeding hidden by the down. Meyrick gives Lancashire as the only locality, but the species also occurs in the Thames estuary and probably in many other suitable localities.

C. virgaureae Staint. has also been recorded from Sea Aster. This is normally a woodland species, and you are very likely to find it on Golden Rod (*Solidago virgaurea* Linn.) if this grows in your district. A third species which buries itself in seed-down is *C. erigerella* Ford, which feeds on Blue Fleabane (*Erigeron acer* Linn.). This is a local and rather inconspicuous plant, but it is well worth looking for, as the moth associated with it is of great interest. Mr R. W. J. Uffen tells me that it is identical to the mysterious *C. squamosella* Staint., which had been known only from two specimens taken many years ago. When L. T. Ford rediscovered the moth about 1935 he thought it was a new species and named it afresh, and it is only recently that they have been found to be one and the same: Stainton's name for it must now, presumably, take precedence. At present it has only been recorded from localities in the North Downs area, but it is quite likely to turn up elsewhere. Incidentally, Mr Uffen will be very glad of your records for these and any other Coleophorids.

Mr Ollevant has been giving practical hints in his recent notes, and I propose to follow his tradition. When you are setting 'Neps' or other very small 'Micros,' the wings sometimes refuse to 'stay put' after they have been raised into position and are awaiting their covering of paper strips. Some people recommend licking a fine paintbrush and slightly moistening the board, but I do not like this method, possibly because my

spittal is too viscous. I take a .0056 pin and lay it over the wings. If the pin is slightly bent it will not roll, and if necessary one or two other pins stuck in the board will anchor it. The wings can easily be manipulated under the weight of this pin, whereas a normal bristle brace would exert excessive pressure.

A. M. Emmet (1379).

REFERENCES

- MEYRICK, E. (1928). *A Revised Handbook of British Lepidoptera*. Watkins and Doncaster, London.
 PELHAM-CLINTON, E. C. (1959). *Entom.*, 92: 120-4.
Coleophora sternipennella (Zetterstedt) (Lep., Coleophoridae), a new British species with a key to the British *Coleophora* on *Chenopodium* and *Atriplex*.

The Hymenoptera Aculeata

There are two main ways in which any of you who have developed an interest in Hymenoptera (and perhaps even follow these notes) are able to follow up your interest (I leave aside the pure taxonomy aspect as this is a matter for the specialist few), by distributional studies and by behaviour studies. In building up a collection it will always be necessary to go to special places for particular species. If these are well-known localities then not much is being added to our general knowledge of the species, the value of such captures lying in the fact that they enable the collector more readily to identify his subsequent captures. The next stage is deliberately to collect in new localities and so to extend the known distribution of species. In its most refined form, this can be a stimulating and challenging pastime. The principle is to study the known localities of a species, attempt to establish the common factor(s) they possess that allows the species to exist, and then to predict other localities where the species might occur. These are then visited and searched diligently for the particular species in question. If it is found the feeling of achievement is

most gratifying, and well earned. Even if it is not found this type of intense collecting usually reveals something of interest. A recent example of this sort of collecting can be seen in the work of Barrett (1964) on the ant *Formica sanguinea* Latr. In a more general way the species I have singled out from time to time are candidates for such studies. No collector in fact ever ceases to work in this general way. However, a time does come when the majority of his time in the field is spent in localities he knows fairly well, and it is then that behaviour studies can open up a new field of interest. Naturally there is a wide range of possibilities, some simple, some complicated. A start will already have been made, in all probability, in the short notes made in the field note-book. Such comments as "nesting in sandy bank" "at dandelion flower," in fact relate to behaviour. And so these aspects can be proliferated. The relationship of bees and flowers is a much studied one, yet more can be learnt. The range of flowers visited by a species; why some species are restricted to one or a few species of flowers while related species are more catholic in their taste? How bees find and then exploit flowers? How flowers are modified to attract and lead bees?

Another topic that has attracted a number of workers over the years is the nesting habits and prey of solitary wasps of the family Sphecidae. The de Mattos translations of the books of that diligent French observer, Henri Fabre, are perhaps the best known studies on this topic. A recent book by an American, Dr H. E. Evans, presents in very readable form much of our knowledge on this subject. I recommend the book to any who wish to extend their interests in this direction. The more recent presentation by Dr Evans in the Annual Review of Entomology is also relevant. This field is far from

static, and a new technique has recently been added by Shinn (1966), an interesting case of the meeting of two technologies, in this case behaviour studies and pottery-making.

Before closing, I have one further suggestion to make on the subject of maps. In my notes for the Spring of this year (*Bull. amat. Ent. Soc.* **25**: 3-4) I mentioned the Ordnance Survey Route Planning Maps as being most useful for those working on a country-wide scale. I now find that the Geological Survey of Great Britain put out this same map over-printed with the major geological formations, and this increases enormously its value to those interested in distributional studies. It also puts the price up to 18/- instead of 6/6d. The maps are available from the Geological Museum, Exhibition Road, South Kensington.

25.4.66. J. C. Felton (3740).

REFERENCES

- BARRETT, K. E. J. (1964). *Ent. Rec.*, **76**: 107-114. *Formica sanguinea* Latreille (Hym., Formicidae) in Southern England.
 EVANS, H. E. (1964). *Wasp Farm*. G. G. Harrap and Co., London (pp. viii, 178).
 EVANS, H. E. (1966). *Ann. Rev. Ent.*, **11**: 123-154. The behaviour patterns of solitary wasps.
 SHINN, A. F. (1966). *Nature, Lond.*, **210**: 112-3. Kiln-firing as a technique for studying nest-building behaviour of mud-dauber wasps.

COLLECTING FLIES WITHOUT A NET

Collecting flies without a net has at least two distinct advantages. The specimens are much less likely to be damaged than if they are caught on the wing, or swept off vegetation; and you can observe them beforehand and study their behaviour, either with the naked eye or under a weak lens with a suitably wide field.

I have spent many pleasant hours looking for and at flies in situations that lent themselves to this technique, for example on tree trunks, on the wet moss and rocks by waterfalls, or on broad leaves in my garden. To

give you an idea of the variety of flies that occur in such places I will describe two particular occasions.

One day in June 1964 I strolled down a broad ride in Epping Forest, and paused to examine the trunks of a few oak (*Quercus* sp.) and Hornbeam (*Carpinus betulus* Linn.) trees. My only equipment was a number of glass tubes, a hand lens and a notebook. If you have not looked closely at a trunk in summer before, it is surprising what a lot of insect life is to be seen on its surface. In a very short time I had tubed specimens of twelve species of flies, in nine families.

By far the most abundant fly was the tiny Empidid *Tachpyeza nubila* Meig., which was running about on the trunk. The other species were: Tipulidae, *Ilisia occoecata* Edw. and *Molophilus ochraceus* Meig.; Culicidae, *Aedes cantans* Meig.; Mycetophilidae, *Tetragoneura sylvatica* Curtis; Rhagionidae, *Rhagio scolopacea* Linn. and *R. lineola* Fab.; Dolichopodidae, *Medeterus tristis* Zett. and *Sciopus platypterus* Fab.; Muscidae, *Alloestylus diaphanus* Wied.; and undetermined species of Cecidomyiidae and Phoridae (two very difficult families for which keys are not available).

The other occasion was very different. At the very end of June 1964 I was climbing up a shoulder of the Brecon Beacons, and stopped to have my sandwiches by a small waterfall about 2000 ft above sea-level. After I had eaten I looked closely over the sheets of wet moss hanging at the side of the waterfall, and found several males of the large *Rhagio scolopacea* Linn. sitting in their usual attitude face downwards. The other flies I noted on this moss were all Tipulids—perhaps because this is the family I am most interested in! Species were *Tipula cheethami* Edw., *Dolichozepe albipes* Stroem, *Dicranomyia didyma* Meig., *D. aquosa* Verrall and *Tricyphona claripennis* Verrall. All

these flies were captured simply by tubing them as they rested on the moss. In the case of one species—*Dolichozepe*—I was able to make some notes of their courtship behaviour while I watched them, subsequently capturing just one specimen to confirm the identity.

R. M. Payne (1982).

SCOTTISH ENTOMOLOGY 1965

Introduction

As this is the first of these reports, which I hope will become an annual feature of the *Bulletin*, some words by way of introduction might be in place.

As outlined in the November issue my aim is not only to gather together information on Scottish Entomology for the benefit of Scottish Members, but also to advertise the interesting fauna to Members south of the border, and to foster an interest therein by pointing out the numerous outmoded facts in our textbooks and attempting to bring these up to date.

It is unfortunate that I have to begin by making a request for more information to make these reports somewhat more comprehensive, but it has been far from easy to win the co-operation of Members in sending their records. I have a list of some twelve Members in Scotland of which about six could be classed as 'inactive' through age or choice. Only two have main interests outside Lepidoptera. For this reason I have had to call upon the help of the Royal Scottish Museum in Edinburgh, though it was hoped that 'outside' assistance would not be necessary. I therefore appeal to anyone who collects in Scotland to make the effort to pass on to me anything

which might be of interest in making a report such as this—or submit an article himself for the *Bulletin*. Even the knowledge that an insect does not occur in a particular area may be of some significance. A thousand records of one species could be less important than the absence of another in a certain locality. So please let me have your help.

On a brighter note, I would like to express my appreciation to D. C. Hulme for his selected records and kind help, E. C. Pelham-Clinton of the Royal Scottish Museum in Edinburgh and D. McNaughton, officer in charge of the Glasgow weather centre for obtaining advance information from the 'Monthly Report of the Meteorological Office.' also to Dr C. W. N. Holmes and J. Cooter for further information and records.

The time that I have been able to spend on preparing this report has been necessarily limited, and I beg to be forgiven if I have unwittingly failed to reply to correspondence. However, with the help of Members it is hoped that the report for 1966 will be more informative than this.

Weather

The effect of the appalling weather conditions of 1965 will not be known for some time, but it is not for me to add to the complaints that have already been unscrupulously aired. Instead, I give a few figures which give a completely undistorted picture of the spring and summer months (*Table I overleaf*).

The year began cold with about average rainfall and sunshine. This was followed by a very cold, dry February—the driest for thirty years. March and April were similarly cold and wet. A notable feature was the warm spell at the end of March with a temperature of 20.0°C in the east of Scotland. Although our memory of May will be coloured by the warm second week, the sun-hours recorded

Table 1. The figures refer to all Scotland.
Temperatures in degrees centigrade.
Air Temperature

	Highest Max.	Lowest Min.	Difference from Average				% of Average	
			Max.	Min.	Mean	Rain days	Rainfl.	Sunhrs.
January	11.3	-11.1	-0.6	-0.7	-0.6	-1	102	134
February	11.7	-8.2	+0.2	+0.2	+0.2	-5	37	79
March	20.0	-14.7	-0.8	-1.1	-0.9	-2	92	104
April	17.2	-5.2	+0.2	-0.7	-0.2	+2	120	114
May	23.9	-3.1	-9.0	+0.4	-0.2	+2	106	67
June	23.9	1.1	-0.2	+0.6	+0.2	+2	137	79
July	21.7	1.7	-2.6	-2.1	-2.4	-1	110	95
August	24.8	-0.1	-1.0	-1.1	-1.0	0	95	107
September	20.0	-0.2	-1.2	-0.3	-0.7	+2	135	67
October	19.9	-2.8	+0.5	+0.5	+0.5	-6	85	104
November	13.5	-7.8	-2.1	-2.1	-2.1	-2	77	129

at Fortrose were the lowest since 1911. It will be noticed that the mean difference in temperature for June is higher than the average by 0.2°, though the average sunhours are very low. June will be remembered as an extremely dull month. The trend towards dull, cool weather was continued through July and into August which did produce some sunshine, but also more than its share of misery. The tragedy came in September, perhaps the worst for twenty years, and it was but a few sunny days that heralded out the summer.

Lepidoptera—*Rhopalocera*

Emergence and flight period records are shown in Table 2. Scotland north refers to an area north of the Caledonian Canal, Scotland south to my own records in South-west Perthshire. Only a few of these deserve comment.

It is not generally realised that *Pieris brassicae* Linn. (Large White) does not, as far as is known, over-

winter in Scotland. Although it may appear early in the year in the south, it does not normally reach Scotland until June, occasionally producing a second brood if numbers are favourable. If any Member has any knowledge of *P. brassicae* overwintering, I would be very interested to hear from him.

I have tried to find out what I could about the cline between the single-brooded Scottish form of *Polyommatus icarus* Rott. (Common Blue) and the English form with its two generations. I was rather surprised to learn that this line of transition varies from year to year and takes up a position roughly following the border itself. In this belt, the width of which I have still to determine, *P. icarus* may be single-brooded in some years and double-brooded in others. I have not seen specimens from the border but would appreciate any help with the butterfly from any Member who has.

The occurrence of *Lycaena phlaeas*

Table 2

	Scotland North		Scotland South	
	1st recd.	Last recd.	1st recd.	Last recd.
HESPERIIDAE				
<i>Argynnis tages</i> Linn.				
(Dingy Skipper)	29.5	(29.5)	—	—
PIERIDAE				
<i>Pieris brassicae</i> Linn.				
(Large White)	2.6	22.9	9.6	(22.6)
<i>Pieris rapae</i> Linn.				
(Small White) Gen. 1	—	—	5.4	29.6
Gen. 2	—	—	—	18.9
<i>Pieris napi</i> Linn.				
(Green-veined White)	30.4	28.8	1.5	28.8
LYCAENIDAE				
<i>Callophrys rubi</i> Linn.				
(Green Hairstreak)	—	—	29.5	13.6
<i>Lycaena phlaeas</i> Linn.				
(Small Copper)	—	18.9	14.6	(30.6)
<i>Polyommatus icarus</i> Rott.				
(Common Blue)	15.7	9.8	29.6	23.8
<i>Cupido minimus</i> Fuessl.				
(Small Blue)	4.6	—	—	—
LYMPHALIDAE				
<i>Vanessa atalanta</i> Linn.				
(Red Admiral)	29.5	12.10	—	—
<i>Vanessa cardui</i> Linn.				
(Painted Lady)	—	17.6	—	—
<i>Aglais urticae</i> Linn.				
(Small Tortoiseshell)	28.3	8.10	28.3	30.8
<i>Clossiana selene</i> Schiff.				
(Small Pearl-bordered Fritillary)	24.6	19.7	—	6.7
<i>Clossiana euphrosyne</i> Linn.				
(Pearl-bordered Fritillary)	—	24.6	—	—
SATYRIDAE				
<i>Erebia epiphron</i> Knoch.				
(Mountain Ringlet)	—	—	—	4.7
<i>Erebia aethiops</i> Esp.				
(Scotch Argus)	25.7	19.8	—	—
<i>Aphantopus hyperanthus</i> Linn.				
(Ringlet)	—	—	16.7	—
<i>Maniola jurtina</i> Linn.				
(Meadow Brown)	30.6	20.8	29.6	1.9
<i>Coenonympha pamphilus</i> Linn.				
(Small Heath)	24.6	21.8	29.5	7.9
<i>Coenonympha tullia</i> Muell.				
(Large Heath)	—	—	13.6	17.7

Linn. (Small Copper) varies greatly from year to year, according to the weather. I saw the species only twice this year—on 14th and 30th June. If the conditions of 1965 are repeated this year, many of the colonies of this pretty butterfly could be in danger.

In the ten or so years that I have kept records of *Clossiana* (= *Argynnis*) *selene* Schiff. (Small Pearl Bordered Fritillary) the first specimens appeared a little later each year. In the

summer of 1956 *C. selene* emerged about the beginning of June, the flight period rarely extending into July. Now it is found not uncommonly in the second week of July, and the specimens that I took on 6th July this year were quite fresh. This is another species which could react in the same manner as *P. icarus*.

My remarks on *Maniola jurtina* Linn. (Meadow Brown) I am reserving for a later date. May I again take

this opportunity of appealing for (papered) specimens of this butterfly from anywhere throughout its range—particularly the Continent, and I would urge anyone contemplating a collecting trip abroad to write to me. Here I will note that in 1965 semi-albinism was fairly common. I took one ab. *fracta* Zweigelt (which I had previously taken in 1957), and one perfect ab. *anommatata* Vty, in which the apical eyespot is completely lacking. This form is considered very rare by Dr Lempke, an authority on the species.

Neither *Mesaocidalia charlotta* Haw. (Dark Green Fritillary) nor *Nymphalis (=Inachis) io* Linn. (Peacock), which normally turn up in small numbers, were seen by either Mr Hulme or myself.

Lepidoptera—Heterocera

Space does not permit a complete list of records. However, Table 3 shows the first records of some of the more common moths together with those of the rarer species. In future, and with the accumulation of material, it is hoped that flight periods of some of these moths will be determined in the same manner as I have done with the butterflies. Where only a few specimens of a species have been recorded the number is given in parenthesis.

Early this year Mr J. C. Metcalfe, who has been of assistance to me on more than one occasion, informed me that he had found a specimen of *Hippotion celerio* Linn. (Silver Striped Hawkmoth) in his garden near Glasgow. It was in rather poor condition and appeared to have been eaten by some predator or other. As far as I can tell this was the only specimen of this moth to be found in Scotland last year. (I assume that it was a 1965 arrival). Since 1850, when records began, less than twenty *H. celerio* have been taken in Scotland and I think we must congratulate Mr

Table 3.

Species	First record 1965
SPHINGIDAE	
<i>Laotloe populi</i> Linn. (Poplar Hawk)	18.5
SATURNIIDAE	
<i>Saturnia pavonia</i> Linn. (Emperor)	12.5
NOTODONTIDAE	
<i>Lophopteryx capucina</i> Linn. (Coxcomb Prominent) ...	18.7
NOCTUIDAE	
<i>Agrotis ipsilon</i> Hufn. (Dark Dart)	22.9 (1)
<i>Euschesis janthina</i> Schiff. (Lesser-bordered Yellow Underwing)	12.8
<i>Diataraxia oleracea</i> Linn. (Bright-line Brown-eye)	9.7
<i>Aporophyla nigra</i> Haw. ...	19.9 (1)
(Black Rustic)	
<i>Agrochola lota</i> Clerck. (Red-line Quaker)	30.9
<i>Apatele psi</i> Linn. (Grey Dagger)	9.6
<i>Plusia gamma</i> Linn. (Common Silver Y)	28.8
ARCTIIDAE	
<i>Callimorpha jacobaeae</i> Linn. (Cinnabar)	9.6
GEOMETRIDAE	
<i>Abraxas grossulariata</i> Linn. (Common Magpie)	5.7
<i>Gonodontis bidentata</i> Clerck. (Scalloped Hazel Thorn)	19.5
<i>Biston betularia</i> Linn. (Pepper and Salt)	8.6
<i>Ematurga atomaria</i> Linn. (Common Heath)	29.5
HEPIALIDAE	
<i>Hepialus humuli</i> Linn. (Ghost Swift)	14.6

Metcalfe on his find.

Coleoptera

As my knowledge of Coleoptera is severely limited it is difficult for me to determine the worth of most of the records which are sent to me. If any Member, not necessarily in Scotland, would like to offer his services by analysing records of Scottish Coleoptera which have been sent, I would be grateful if he would contact me. For last year's records I would like to draw attention to Mr J. K. Smith's article in the February edition of our *Bulletin* (Page 14). Mr J. Cooter kindly sent the following

information about beetles which he obtained from the Nethy Bridge area of Invernesshire.

Agonum scitulum Dej. (Carabidae) is considered rare, as is the northern *Pogonocherus fasciculatus* Deg. (Cerambycidae) and *Eremotes ater* Linn. (Rhynchophora). Another species which is somewhat local is *Ocypus (Staphylinus) brunnipes* Fab. (Staphylinidae). All these beetles were taken in the first week of May.

General

A few general observations may help to compare 1965 with other years. In South West Perthshire the first Honeybees (*Apis mellifera* Linn.) began collecting their pollen on 29th March, followed closely by the queens of the larger *Bombus* species. May 29th saw the first Zygoterid (Odonata). However, it was not until 29th June that the grasshoppers began to chirp. In contrast, as I write this in the middle of April, only a few Honeybees have made their appearance, and I have not yet seen the first *Bombus* queen. The spring weather has been marred by continuing wintry showers, but when the spring and summer weather does come it is hoped that conditions will be a bit better than those of last year.

19.4.66. George Thomson (3689).

FROM AN OUTER LONDON SUBURBAN AREA

This is the first article of a series which will, I hope, persuade entomologists to examine their home areas more intensively. Such a move can provide more useful information, and even greater personal excitement, than visiting localities far afield in order to collect species which are supposed to be confined to them.

In the edge of Suburbia, one's

interest is bound to be roused by the changes in wild life populations, associated with further encroachments of 'development' into the so-called 'Green Belt'. Small growths of certain plants, even in the heart of Suburbia, can support colonies of small insects (even exotic species imported with garden plants) and species may be overlooked because they are confined to isolated habitats which collectors have considered too small to be worth looking at. I hope to comment on all these aspects in this series, as well as adding my own collecting notes.

I live in Harrow Weald (Middlesex), in a quiet typically suburban street, which turns off the main road running between Wealdstone and Bushey and is just inside the main built-up area of Harrow; a short walk will take me to Harrow Weald Common, or, a little further along, Stanmore Common. My house backs almost on to Harrow Weald Recreation Ground; my window, in which a light is usually run, overlooks the whole Ground and a large number of back gardens bordering it.

In this issue I will mention briefly some of my most exciting finds, before I turn, next time, to the more sober matter of the changes occurring here.

Stanmore Common occupies about 120 acres, and is predominantly birch wood (*Betula* sp.), with oak (*Quercus*), Aspen (*Populus tremula* Linn.), Hawthorn (*Crataegus monogyna* Jacq.), Sallow (*Salix* spp.) (along streams), and a few other trees, with Bracken (*Pteridium aquilinum* Linn.), Blackthorn (*Prunus spinosa* Linn.), bramble (*Rubus fruticosus* agg.), and Honey-suckle (*Lonicera periclymenum* Linn.) undergrowth (some sort of replanting, with perhaps more drastic alterations, is starting, but I will say more about this when I know the full facts). Apart from the late L. T. Ford's finding of the Nepticulid moth *Dech-*

tiria turbidella H-S. (= *Nepticula marionella* Ford), not known elsewhere in Britain, in the Common, it seems that the area has been largely ignored by entomologists. Such an isolated wood, on the edge of Suburbia, might well be thought entomologically uninteresting, but it is the discovery of the unexpected which makes such a place exciting.

My own first question rose over a species of Gelechiid moth, with a very characteristic appearance, which I had noticed sitting in crevices in birch trunks in late July and early August for the last nine years at least. When I came to start having my 'micros' identified in late 1964, the one rather worn specimen in my collection, together with two photos of the living moths, were identified as *Telphusa proximella* Huebn. I noticed, however, that Ford (1949) gave May and June as the season of the adult of this species, giving also the species *T. alburnella* Dup. as having rather similar habits and emerging in the same period as the Stanmore specimens. On seeing series of these two species in the collection of the South London Entomological and Natural History Society, I was convinced that the Stanmore species was *T. alburnella*. So I looked in Meyrick's 'Revised Handbook,' and couldn't find it, but various microlepidopterists told me that my specimens couldn't be *T. alburnella*, because this is confined to extreme northern England and Scotland. Well, when I made a genitalia preparation of my specimen, I confirmed that it was the latter species, and last year I confirmed that all the specimens I could obtain (about twelve: most flew away at my approach, and I don't use a net!) were of this species; it looks as though the 'common' species, *T. proximella*, may not occur here at all. Why? Incidentally, *T. alburnella* has recently been found also in Oxfordshire, and I took a

specimen in Park Wood, Hillingdon (Middlesex) on 7th August 1965.

Surprise number two was another Gelechiid moth, which came to my light on the thundery evening of 20th July 1965. It was very strikingly striped, and so *small!* I should have passed it over as a Lithocolletid but for the fact that it was running about at a fantastic speed on the ceiling, and I saw that it had on either forewing a subdorsal straight row of three equidistant small intensely black scaletufts. From superficial appearance, the nearest I could find to it was a form of *Parachronistis albiceps* Zell., a common species which feeds largely on Hazel (*Corylus avellana* Linn.), which doesn't grow near my house. But the neater stripes and the straight row of three raised black spots on my specimen's forewings seemed to indicate a genuine difference, which was borne out by the genitalia. On examining specimens at the British Museum (Natural History), I found that this was *Pulicalvaria* (= *Recurvaria*) *piceaella* Kearfott, the third British specimen of this North American species, which, I suspect, may be establishing itself on garden conifers. It would be very worthwhile for anyone to examine such plants for signs of mining or other such insect damage, and try to rear out this moth (or send me the affected twigs so that I may do so).

Surprise number three has only just arrived; I have just determined an Oecophorid moth—supposedly *Tubuliferola* (= *Borkhausenia*) *flavifrontella* Huebn.—taken sitting on a birch twig in broad daylight in Stanmore Common, on 19th July 1965, as an allied species, *T. josephinae* Toll, which is virtually unknown in this country. In this case, however, I believe that *T. josephinae* is probably common enough, and is mixed in series of *T. flavifrontella*. The two species look virtually identical, but

the palpi of *T. josephinae* are slightly longer and more slender, the apical segment being relatively longer than in *T. flavifrontella*. The genitalia are so different that the species should be distinguished just by brushing away scales at the tip of the abdomen, and examining under a good $\times 20$ lens or binocular microscope.

I have gone to some lengths to describe the points of special interest regarding these moths in order to stress that one should always be questioning other people's information, particularly if it is from books. One should not just assume that, because of one or two futile collecting visits to some rather ordinary-looking habitat, one should search elsewhere; in fact you may have a new species lurking in your back garden, or even in your collection. Look again! And I have been referring only to the Lepidoptera—by far the most-worked Order of insects—which, unfortunately, is at present the only group of which I have sufficient knowledge to comment on.

As rather an anticlimax, here is one of my, more frequent, little observations. Every winter, from 1955 onwards, I have visited Harrow Weald and Stanmore Commons at night, searching trees, twigs, thickets, grass, fences, or in short, just about everything, using a Tilley lamp. These nocturnal visits would continue till the end of April, and, as one can imagine, one of the most regular moths to appear was *Conistra vaccinii* Linn. (Chestnut), which was found sitting on tree trunks and fences, and occasionally (or, in March and April, frequently) flying. I often wondered whether I might find the allied species *C. ligula* Esp. (Dark Chestnut), and consequently took home many *C. vaccinii* to examine closely to be sure I was not overlooking *C. ligula*. The latter species never turned up, and it surprised me to an increasing extent

that many other people should find it abundant. Last autumn I purchased an 'm.v.' lamp to run in my window (so avoiding the worst evils of conventional 'm.v.' traps, of which I normally strongly disapprove). Lo and behold, after three early spring Geometrids at this light on earlier dates, in came a *C. ligula* on 1st March! It still remains the only one, and since then I have had three *C. vaccinii* at the light. It would be interesting to hear whether other members find that *C. ligula* is not readily found in the open, even when it is common at light, as my meagre observation might suggest to be the case.

I will add a word about my method of 'm.v.' collecting. Having realised that the all-night-running trap takes a great toll of insect life owing to the depredations of predators (especially birds the following morning) not only on escaping insects, but also and possibly more important, on insects which have settled in large numbers in a wide area illuminated by the light, I always switch off the light when I go to bed, and supervise the light while it is running. As I usually run this light in my window (first floor), there is no great harm in my leaving it unattended on occasions, as no predators will get near it; supervision is still largely necessary in order to ensure that the moths that came in are all captured and released, in good form, as soon as the light is switched off (apart from the odd few moths that have to be retained for precise identification, photography, or my present studies on the British Gelechiidae). The theory, at least, is that by throwing the moths out of the window at 'lights-out', I allow them to fly far and wide by the following morning, so that no undue number should return on successive nights (and so confound my records) or fail to find time to carry out their natural duties

or to conceal themselves from predators by the next morning. I shall test my assumption on numbers of moths returning by marking some nights' catches in the summer, and will report on my results.

In the next *Bulletin* I hope to make some preliminary observations on the changes I have noticed here; meanwhile, I should be glad to supply fuller details of the above-mentioned 'Micros' to anyone who wishes to look for them in their own areas.

27.3.66. P. A. Goddard (2206).

REFERENCES

- FORD, L. T. (1949). *A Guide to the Smaller British Lepidoptera*. South London Ent. and Nat. Hist. Soc., London.
 MEYRICK, E. (1928). *A Revised Handbook of British Lepidoptera*. Watkins and Doncaster, London.

REPORT ON MONARCH BUTTERFLY MIGRATION EXPERIMENT, 1965

This autumn I agreed to assist Professor F. A. Urquhart of Toronto University, Canada, in his long term study of the migrations and orientation of the Monarch or Milkweed Butterfly (*Danaus plexippus* Linn.), by releasing in Britain live specimens tagged with special adhesive labels each bearing a serial number and Toronto University's address.

It was originally intended to release at least several hundred tagged butterflies in two places in England, but, unfortunately, owing to a disastrous breeding season in North America and to a virus outbreak in the University's laboratories, where many butterflies are reared annually for research purposes, it was only possible to allocate 50. All these had been reared in the laboratories and reached me by special airmail on 6th September 1965 after a four-day journey. Each butterfly was packed in a cellophane envelope with its wings folded flat above its back and

had a pad of cotton wool soaked in a dilute solution of unpasteurized honey (to which a little glucose and glycogen had been added) placed by its tongue for nourishment. They arrived in extremely good condition; only one was moribund and after showing signs of recovery eventually died. The others soon became active on being removed from their envelopes; indeed, some actually forced their way out as soon as the envelopes were opened and flew off strongly.

As only 50 butterflies were received I decided to release them all in one place: Cadbury Camp, near Clevedon, North Somerset (National Grid Map Reference ST/454725). They were actually released between 12 noon and 1 p.m. on 6th September 1965 in the presence of representatives of the press and B.B.C. television. The weather at the time was mainly dull, but with frequent bright periods and a light W.S.W. wind. On being released on clumps of Marjoram (*Origanum vulgare* Linn.) and other wild flowers, the majority fed freely from the flowers and flew about strongly.

I had to leave the locality soon after 1 p.m., but Mr T. B. Silcocks and his wife, who assisted me in the release, stayed on until 5 p.m., by which time only about ten butterflies were still to be seen. At around 3 p.m. he watched, through binoculars, one butterfly fly off due east. It rose about 100 feet above the hill, then lost height and flew for about half a mile before it became lost to sight against a background of trees. The next day, a gloriously warm and sunny one, Mr H. H. Davis visited Cadbury Camp at about 11 a.m. and failed to see a single specimen alive or dead despite a careful search.

The first sighting (considered by me to be correctly identified) of one of these butterflies came from Alvechurch, Worcestershire, not far from

Date of sighting	Locality	Distance travelled (miles)	Direction taken
Sept. 6th	Alvechurch, Worcestershire	80	N.N.E.
	Havant, Hampshire	86	S.E.
7th	Newbridge, Oxfordshire	65	N.E.
	Aldbourne, Wiltshire	50	E.N.E.
9th	Edgehill, Warwickshire	72	N.E.
13th	Edgehill, Warwickshire	72	N.E.
19th	Barnstaple, Devon	64	W.S.W.
20th	Poole, Dorset	62	S.E.
21st	Bristol	8	E.
22nd	Corsham, Wiltshire	22	E.
	Kettering, Northamptonshire	110	N.E.
26th	Lacock, Wiltshire	28	E.

Birmingham. It was seen at 4.40 p.m. the same day as I released them. Assuming that it was one of the first to be released, it must have travelled the 80 miles from Cadbury Camp at around 17 m.p.h. Since Monarch butterflies are known to fly at speeds of up to 30 m.p.h. it is clear that 17 m.p.h. is not beyond the bounds of probability.

At the request of its representative, I allowed *The Daily Mail* to release one of the Monarchs at Richmond Park, Surrey, on the evening of 7th September. This one was eventually picked up dead at Richmond Bridge twelve days later—only some 500 yards from the point of release. It was returned to Toronto University by the finder.

Although only one of the butterflies released has actually been recovered, some twenty reports of sightings have been received. I have checked each of these with the observers concerned as far as possible before accepting any of them. The eleven reports listed below I consider to be genuine sightings of those released at Cadbury Camp. One butterfly was seen in each case.

It must be emphasized that as far as Professor Urquhart is concerned none of these sight records can be relied upon for the purposes of his investigation; only actual recoveries of the released butterflies are accepted, rightly, by him. This year's experiment in Britain, which was a very small part of a much larger research programme, could only be

regarded as a pilot scheme. Scientifically the results have only proved that it is possible to transport successfully these butterflies alive across the Atlantic and no conclusions should be drawn from the sight records.

Nevertheless, these do, I think, suggest that similar experiments in future years on a much larger scale could yield useful and interesting results, and that released Monarch butterflies stand a good chance of recovery when the general public in the British Isles has been alerted by the excellent coverage it is possible to arrange with the willing co-operation of the British press, radio and television.

26.1.66.

J. F. Burton,
B.B.C. Natural History Unit,
Broadcasting House,
Bristol, 8.

NOTES ON MERCURY-VAPOUR TRAPS AND LAMPS

Perhaps more has been written and discussed about my father and P. J. M. Robinson's mercury-vapour trap than about any other method of insect trapping. Yet it seems that there still exists, especially among those collectors who have built their own traps of what they think to be the Robinson type, a large amount of misunderstanding of the basic principles and technical features upon which the

efficient working of the trap is virtually dependent. As a result, some home-made traps have not operated at anything approaching the true efficiency indicated in the original papers describing the design and operation of the Robinson trap, and many collectors have been disappointed.

Some collectors whose traps I have examined have utilised the basic principles of the Robinson trap, but omitted probably the most vital component, the transparent cone, instead replacing it with a metal or wooden one. Thus the insect in the trap in question may perceive a neatly-illuminated exit-point instead of a large expanse of light less than ten per cent of the area of which constitutes a mode of exit. Hence, in theory, the man with the opaque cone stands ten or more times as many chances of losing his insect as a man with a transparent cone. It was postulated some years ago that the most efficient type of container for a trap would be a glass or transparent plastic globe with cone and vanes of similar material, and I consider this to be perfectly true.

In addition, cones should be made of perspex to prevent penumbral shadows being thrown, and should rise to the level of the point of the light source, which in turn should be situated about three inches above the plane of the top of the trap, or the whole principle of the hemisphere of dazzle is destroyed.

The principles of electrical safety involved in the running of 'm.v.' lamps are surprisingly often not taken into account. I have seen several traps in operation, the circuits of which were literally potential killers, and the results, especially if there was a child in the house, could so easily be tragic. It cannot be stressed too strongly that chokes must be kept indoors, that electrical connections must be childproof and

waterproof and that flexes to traps should be checked at least once a month for breaks in insulation. Cows, it seems, are a menace and no doubt expensive to replace if electrocuted. I recently had fifty yards of flex eaten in one morning, luckily after my lamp had been turned off, so rural collectors please take note!

The dangerous accident of a bulb-socket filling with water can be easily prevented by encasing the lower part of the bulb stem in a Victorian-length polythene 'skirt' which is held in place by a rubber band. If a socket does fill with water, this may fuse the domestic power circuit into which the trap is plugged, and burn out the choke unless an independent fuse is put on the choke.

Mercury-vapour black bulbs and certain types of clear lamps should always be operated beneath a protective pyrex glass cover (a 500 c.c. pyrex laboratory beaker is ideal) as the lamp glass is not intended to withstand rain. There are many types of 'm.v.' lamps available, some from ex-W.D. sources (which are far cheaper than brand new lamps and entirely satisfactory). In buying 'm.v.' lamps, however, the principles involved in the theory of insect dazzle should be borne in mind, *i.e.*, that the smaller and more concentrated the light-source the better, and thus the popular type of 'm.v.' pearl bulb is relatively useless. There is only one answer for pearl-bulb or fluorescent-coated mercury-vapour lamps—they should be broken. If a file is run around the base of the glass stem and the file-mark given a sharp tap with a hammer, the bulb should break off neatly, and it should be possible to extract the filament without damage. The bare filament may either be run beneath a beaker as in a black 'u.v.' lamp, or enclosed in a large pyrex-glass laboratory boiling-tube, obtainable for about two shillings. Use of a mercury-vapour lamp beneath a tin

'roof' should be avoided as this throws a large vertical shadow, reducing the potential catch of insects by as much as one third. It may be noted that an 80-watt mercury-vapour lamp does not need to be operated with a choke, but runs satisfactorily with a 200-watt tungsten lamp as a series resistance across the mains.

Lamps of over 125-watts power are rare, and apart from the few 400-watt enthusiasts, few people experiment further. However, ex-W.D. high-pressure mercury-vapour lamps sometimes turn up, and are usually quite serviceable if handled carefully. They must be run beneath a pyrex cover, otherwise there will be a dangerous explosion when it rains. The light is far more concentrated than in a 125-watt lamp, and hence gives a larger catch, with more species represented. It is a good idea to avoid staring at it from short range. 250-watt lamps may be run with a pair of 125-watt chokes in parallel: 500-watt lamps with a 400-watt and a 125-watt choke in parallel across the phase side of the mains. The chokes should be on identical voltage tapings. I sometimes use a 500-watt lamp and the amount of light produced is fantastic and results are excellent, but it is a good idea to use them in an isolated position only, as neighbours are likely to complain. To many collectors, most of the above remarks are completely unnecessary, and I must apologise to them for a waste of their time.

Finally, I feel it my duty to remind collectors that the Robinson trap was designed purely as a research instrument and should be used as such. This, as much for ecological reasons as for reasons of conservation of rarer species, precludes killing or anaesthetisation of catches, whether trapping is being carried out in the locality of a rare species or not.

7.2.66. G. S. Robinson (3911J).

FURTHER REMARKS ON AMERICAN 'BLACKLIGHT' ATTRACTORS

I have received a number of queries concerning the equipment and methods described in my paper on "Some American 'blacklight' attractors for collecting insects" and should like to answer some of the more frequent ones here for the benefit of other readers of the *Bulletin*. Most have been questions about possible applications of the Newman Trap, and I suggest that John Newman would be more qualified to deal with these problems as he has spent several years developing the trap as a biological sampling device and eradicator of pest species. His address is: Department of Entomology, Michigan State University, East Lansing, Michigan, U.S.A. I must emphasize that I do not sell any of this equipment and am not a dealer or representative of any sort. I was however able to spot-check several local electrical suppliers and was assured that the tubes, fixtures and transistorized convertors are available here on order.

Several letters have suggested that the Robinson trap used by many collectors in the U.K. should attract more insects than 'u.v.' tubes. This should almost certainly be true; I was careful not to mention the Robinson trap in my paper as I am not familiar with proper comparative data and have not experimented with this design myself. I attempted to indicate clearly that my account was limited to American equipment and the 'm.v.' trap to which I referred is a modification of the Minnesota design tested by the U.S. Department of Agriculture and used in a number of experiments to determine insect response to light. Pfrimmer (1955, 1957) and Merkl and Pfrimmer (1955) used several modifications of 'm.v.' traps in their investigations but not the Robinson or Heath traps. It is a

fact that the tested American 'm.v.' designs have not fared very well in comparison with 'u.v.' as my paper indicates, and I should like to see a comparison between three Robinson traps; one fitted with the standard 'm.v.' bulb, another with a vertically-mounted BL tube, and a third with a BLB tube. From what I have seen of the Robinson design I suspect that a larger total number (perhaps much larger) of Lepidoptera would be taken in the 'm.v.' trap although species reaction would differ greatly between the three traps. The oft-heard statement that "one sort of light should be better than others" is a great oversimplification as published tests show.

I have had several queries about the seeming inconsistency of the Merkl-Pfrimmer data cited in my last paper. These might have been answered by a consultation of my references but I will attempt a brief explanation here. These U.S.D.A. experiments show the remarkable degree of order and species variation in response to different sources of light. The 1955 paper described studies with a 15-watt BL tube mounted vertically in the centre of a trap, the light being visible throughout 360° in the horizontal plane. Their 'm.v.' trap was equipped with a 100-watt lamp; "the perceptible illumination covered approximately two acres." Both traps were adjusted to turn on and off simultaneously and the insects were killed as they were caught. In their table of total captured Lepidoptera only three species of thirteen had a higher percentage in the 'm.v.' trap. The records showed much variation in species response; as example such closely related hawk-moths as *Protoparce quinquemaculata* Haw. and *Protoparce sexta* Johan. differed greatly in preference, although in general species of the same genus reacted similarly.

The tests conducted by Pfrimmer

(1955) at Brownsville, Texas were most interesting. Three light sources were mounted in separate traps similar to the Minnesota design; these sources were a 15-watt BL tube, a 15-watt BLB tube and three 2-watt General Electric S14AR-1 argon glow lamps. The traps were grouped in a triangular arrangement. Coleoptera were more numerous in the BL and BLB traps, Diptera in the argon trap. Of the total Lepidoptera, 6258 were caught in the BL trap, 15290 in the BLB and only 2094 in the argon. (Through an unfortunate omission of the word "as" between "many" and "to" in line 34, p.26 of my earlier paper, the argon catch was reported greater than was actually the case). Again species response varied greatly in the Lepidoptera: the author concludes that "the small catch in the argon trap was due largely to the much lower intensity of radiation." Among the traps "the proportion of Coleoptera and Ephemera in relation to the other orders decreased as the total output of fluorens decreased, whereas the reverse was true of Diptera and Lepidoptera."

Pfrimmer (1957) conducted a comparison between two Minnesota traps, one equipped with 15-watt BL, the other with 15-watt BLB, and a third trap containing a 100-watt 'm.v.' lamp; the reader is referred to the paper for the precise construction of the experiment. Concerning the Lepidoptera, "most of the species responded in greatest numbers to the BL trap both years (1955 and 1956) . . . The BLB trap did not rank first in the collection of any species in 1955, but it caught the greatest numbers of five species in 1956 . . . The BLB trap caught 34% of the total in 1955 and 43% in 1956. The mercury-vapour trap caught 18% in 1955 and dropped off to only 9% in 1956."

These Government tests were conducted in a most scrupulous manner

and show that insect reaction to light is affected by a great number of factors. I might point out that as different species of Lepidoptera have different reactions to BL and BLB, one cannot say that one of these sources is "better" than the other, and the two sources would vary in effectiveness throughout the season depending upon what species were flying at the time. This is why American collectors carry both BL and BLB tubes even though the latter are considerably more expensive. Unfortunately the few collectors who suggested to me that Merkl and Pfrimmer's results were dubious had not taken the time to read these interesting papers, which show the full complexity of the problem.

One correspondent has maintained that when using a 'u.v.' fixture placed on an auto bonnet as described on p.24 of my former paper that it would not be necessary to point the auto in the direction from which it is desired to collect, as the idea of attraction of insects from a distance is fallacious. I agree that evidence of attraction from a distance is very weak but still the auto must be pointed in the desired 'direction' as insects resting or flying by behind the car are unable to see the fixture at all if it is placed at the rear of the bonnet to light the vertical expanse of sheet covering the windscreen. Of course a vertically mounted sheet with a fixture suspended before it is a much better attractor and although I have not tried it, three vertically suspended sheets arranged in a triangular fashion with tubes before them would be the best adaptation of the method as it would allow collecting at 360° in the horizontal plane.

It will be understood that the fixture and sheet device is not designed as a trap and so cannot be compared with traps in general. The value of the method is that the

collector is at hand to select the insects he wants and observe the reactions of others as they come to the light. This way of collecting is very exciting and if the locality and night are well chosen one will have more than enough to keep him busy.

I have no comment about the use of a stupefying or killing-agent in the Newman trap except this: when critical determinations must be made in biological survey work these agents are often used. I do not condemn careful use of tetrachloroethane by scientific investigators any more than I advocate wanton destruction of the insect fauna by people who are just as likely to injure themselves as well by the use of poisons.

9.3.66. R. S. Wilkinson (3839).
University College, London W.C.I.

REFERENCES

- MERKL, M. E. and PFRIMMER, T. R. (1955). *Jour. econ ent.*, **48**: 740-41. Light-trap investigations at Stoneville, Miss. and Tallulah, La. during 1954.
PFRIMMER, T. R. (1955). *Jour. econ. ent.*, **48**: 619. Response of insects to three sources of black light.
PFRIMMER, T. R. (1957). *Jour. econ. ent.*, **50**: 801-3. Response of insects to different sources of black light.
WILKINSON, R. S. (1966). *Bull. amat. Ent. Soc.*, **25**: 24-8. Some American 'blacklight' attractors for collecting insects.

FLUORESCENT 'BLACK-LIGHT' LAMPS FOR COLLECTING INSECTS

As considerable interest will, no doubt, be aroused by Mr Wilkinson's paper on this topic in the February issue of this *Bulletin*, the following comments may be of interest.

When designing apparatus using ultra-violet lamps one should always remember the following remarks made by Summer (1962) in the preface to his book "*Ultra-violet and Infra-red Engineering*"—"Paraphotic (i.e., ultra-violet and infra-red) engineering deals with parts of the spectrum which are immediately adjacent to the luminous spectrum with which the lighting engineer is

concerned but their interactions with matter vary so considerably from those of light, that techniques widely different from those used by the lighting engineer must be used."

Bearing this and various electrical considerations in mind I would like to point out that :—

1. The ordinary fluorescent wall or ceiling fittings are quite unsuitable for use in the field and could be dangerous as they do not conform to the safety requirements for this type of use.

For field applications the tube should be mounted directly on to the trap baffles, which should be earthed, or on an earthed metal rod for sheet use, and the control gear mounted in an earthed metal box of suitable design remote from the lamp and connected to it by four-core cable.

2. BL (Actinic 5) lamps are available in this country in the 15-watt size but none of these lamps are freely available through normal electrical dealers.
3. The 20-watt lamp is much less efficient than the 15-watt lamp as its surface brightness is only one half that of the 15-watt whilst its total 'u.v.' output is only marginally greater.
4. For operation from 12-volt batteries specially designed transistor ballasts are available for fluorescent lamps which replace the usual choke and starter. These are lighter in weight and, as they operate the lamp on high frequency AC, give ten per cent more light output than the 'shaver type' invertors used with normal fluorescent control gear. Using this type of ballast and a 15-watt tube the current drain at 12-volts is 1.8 amps.
5. The small lightweight generators mentioned by Mr Wilkinson produce A.C. at higher than

normal frequencies which means that the usual control gear cannot be used. Therefore resistors have to be employed to limit the lamp current and, as this has to be critically controlled, the value of these resistors must be correct within narrow limits.

6. The mounting of a BL lamp on plastic, as in the Newman Trap, may result in the plastic becoming exceedingly brittle, due to polymerisation caused by the ultra-violet radiation.

I would like to add that the above remarks are not made as a criticism of Mr Wilkinson's excellent paper but are intended to point out to potential users of these lamps some of the factors which must be considered before purchasing this type of equipment.

J. Heath (3882).

REFERENCES

- SUMMER, W. (1962). *Ultra-violet and Infra-red Engineering*.
 WILKINSON, R. S. (1966). *Bull. amat. Ent. Soc.*, **25**: 24-8. Some American 'blacklight' attractors for collecting insects.

SATURNIIDAE IN THE UNITED STATES

The family Saturniidae is well represented in the United States, having over twenty-four species. For the sake of being brief, however, I shall only discuss those species native to my state, Minnesota.

Minnesota is located in the north-central section of the United States, and is just about in the geographical centre of the North American continent. The land is predominantly flat, except along the south-eastern boundary, which is rather hilly and contains the Mississippi River basin. The elevation is just over 1000 ft above sea level in the north, and gently slopes to some 640 ft in the southern portion. The state runs 400

representing the subfamilies Saturniinae and Hemileucinae. These seven are: *Hyalophora* (= *Samia*) *cecropia* Linn. (Cecropia or Robin Moth), *Hyalophora* (= *Samia*) *columbia* Smith (Columbian Silkmoth), *Antheraea* (= *Telea*) *polyphemus* Cramer (Polyphemus Silkmoth), *Actias* (= *Tropaea*) *luna* Linn. (Luna or American Moon Moth), *Callosamia* *promethea* Drury (Promethea or Spicebush Silkmoth), *Automeris* *io* Fab. (Io or Bull's Eye Moth), and *Hemileuca* *maia* Druce (Buck Moth).

The genus *Hyalophora* is the only one which is represented by two Saturniid species in Minnesota. *H. cecropia* and *H. columbia*, although of the same genus, and looking somewhat alike, are very different in habits. *H. cecropia* is probably our second most common Saturniid within the state's borders. It is of course regarded as an almost domestic or at least urban species, as it is quite at home in cities, and is usually the predominant silkworm in some. *H. cecropia* has adapted very well to urban life, this probably being due to the large range of foodplants of the larvae. The plants to which the females of the species are most strongly attracted are box elder (*Acer negundo* Linn.), wild cherry and wild plum (*Prunus* spp.). Willow (*Salix* spp.) is a favourite in marshy areas. Last summer, I even found two fully grown larvae on a winterberry bush (*Ilex* sp.) in my yard. In Minnesota, *H. cecropia* is single brooded, and flies during late June and early July. The larvae usually feed up by late August or early September, and begin to spin at this time. On a nationwide scale, *H. cecropia* is said to inhabit every state east of the Rocky Mountains.

Hyalophora columbia, on the other hand, is a shy moth, being fairly rare, and seldom seen. It is highly selective, and feeds only on Tamarack or Larch, thus being confined to the acid bogs

of the northern portion of the state. In reality, *H. columbia* has never been taken in Minnesota, but has been secured in the border state of Wisconsin, on the east of Minnesota. Sighting this fact, it would be a good bet that the species does occur here also. In its entire range, *H. columbia* is confined to an oval shaped region which surrounds the Great Lakes, enclosing Wisconsin (Minnesota), Michigan, southeastern Canada, and Maine. The moth is a bit smaller than *H. cecropia*, and lacks the red on the bands and eyespots of the fore and hindwings. The ground colour is more of a dark brown than that of *H. cecropia*. *H. columbia* flies earlier than *H. cecropia* in the U.S., and is on the wing at the end of May, lasting until the beginning of June.

For the state as a whole, *Antheraea polyphemus* is our most abundant silkworm. It also has an extremely large range of foodplants, some being: birch, oak, maple (*Acer* spp.), horse chestnut (*Aesculus* spp.), elm (*Ulmus* spp.), *Prunus* spp., and linden (*Tilia* spp.). Sometimes odd larvae can be found on wild rose (*Rosa* spp.), and related plants. The ground colour of the species varies considerably, from light tan to a fairly dark brownish chestnut colour. In the summer of 1965, while operating a black-light trap, I took a male which had a rather pretty pinkish hue to the fore and hindwings on the dorsal and ventral sides. The female of the normal *A. polyphemus* has the same wing shape as the male, including the slightly pointed apex. I, however, was also fortunate in breeding a female which had a typical *Antheraea* female forewing. That is it is very blunt, and resembles the forewing of a female *Antheraea pernyi* almost exactly. *A. polyphemus* has a wide range, which covers almost the entire United States. A western form *oculea* exists in the mountains of Arizona and New Mexico in the

outh-west, and differs from the type by having a blackish suffusion of scales on the ground colour. *Antheraea polyphemus* flies during late June and early July.

Actias luna is the only representative of the genus *Actias* in our hemisphere. It ranges throughout the eastern U.S., to the Mississippi river basin, north to southern Canada, and south into Mexico and Central America.

The moth favours the countryside, and feeds on a number of hardwoods, such as willow, oak, Pecan (*Carya linoensis* Koch), horse chestnut, and birch. In Minnesota, especially the north, the moth shows a definite preference for birch. As is *A. polyphemus*, and *H. cecropia*, *A. luna* is on the wing in early July, and late June. It is noted for its nervousness, especially while in copula. The species needs a rather large cage for the male to fly in if one intends to get a pairing. The moth is really considered a more southern species, and is the predominate saturniid throughout much of its southern range.

Callosamia promethea is probably best associated with the state of Wisconsin in our area, but enters Minnesota in the east, and is established in the east-central section of the state around Lake Mille Lacs. The species has very dissimilar sexes, the female being reddish brown, with a full wing expanse, and the male being black, with a light wing border, making it resemble *Nymphalis antiopa* Linn. to an extent. The female "calls" at dusk, and the male *C. promethea* can be seen flying to her. The food-plants of *C. promethea* include lilac (*Syringa* spp.), Sassafras (*Sassafras albidum* Nees), *Prunus* spp., Sweet Gum (*Liquidambar styraciflua* Linn.) and ash. In my area, *C. promethea* emerges about mid June, and the cocoon is usually spun in early August. The moth ranges through most of the eastern U.S., east of the Mississippi

River.

Automeris io and *Hemileuca maia* are members of the subfamily Hemileucinae, and both have larvae which possess stinging spines. *A. io* feeds on many trees and other plants, such as corn (*Zea mays* Linn.), cotton (*Gossypium* spp.), etc., while *H. maia* prefers oak and willow. *Automeris io* can be found just about in any situation, but *H. maia* prefers the low-lying areas of marshes. *A. io* emerges at the same time as the rest of the native silkmoths, June and July. At this time, however, *H. maia* is still in its larval stage, and will not be on the wing until September to October. *H. maia*, unlike the other native Saturniids, burrows into the soil prior to pupation. It breeds in the fall, and lays its overwintering ova around the twigs of the foodplant. The larvae of *A. io* are green, with a white and pink stripe running along the side. *H. maia* in its larval stage is often confused with the larva of *Nymphalis antiopa*, which it resembles strongly, until you reach to pick it up! Both *A. io* and *H. maia* have about the same range: the eastern United States, west to the Dakotas and Texas, and north to southern Canada.

As one can see, we have a nice number of native Saturniid species to contend with. For the last decade or so, the populations have decreased somewhat, but in the last few years, their numbers have been on the increase. Insecticides, though in heavy use, do not seem to harm local Saturniid populations very much, but the cycle of parasites of the species have a great deal to do with their relative abundance within my region, parasites being the chief controlling agents.

26.3.66. John T. Sorensen (3719).

REFERENCES

- COLLINS, M. M. and WEAST, R. D. (1961). *Wild Silk Moths of the United States, Saturniinae*. Collins Radio Company.
 CROTCH, W. J. B. (1956). *A Silkmoth Rearer's Handbook*. AES.
 HOLLAND, W. J. (1905). *The Moth Book*. Doubleday, Page and Co.

NOTES ON COLLECTING INSECTS IN THE TROPICS

These rather disjointed and un-literary ruminations derive from the writer's experience of spare-time collecting over a period of twelve years in West Africa and, for the past year, in Sabah, one of Malaysia's Borneo States. I have, like most, learnt the hard way and my main motive in writing is to enable others to avoid some of the mistakes which I have made—they will undoubtedly make plenty more of their own!

In recent years air travel has unquestionably caused the world to shrink with the result that what used to be referred to with bated breath as "the remoter corners of the earth" are now invaded annually by the sons and daughters of the present-day equivalent of the erstwhile "empire-builders" for the school summer holidays. In addition, a slightly senior cadre of young Britons appear for a year or so—I refer to the members of that admirable organisation, Voluntary Service Overseas. So far I have not come across any young entomologists, but there must be some. And it is to such that these notes are directed.

What to collect?

This, of course, must depend upon the personal interests of the individual. Insect life in the tropics is excitingly abundant, and the collector on his first visit will certainly be thrilled by the fact that practically every insect he sees is new to him. Thus, self-discipline must be exercised right from the start; he who attempts to collect everything will certainly end up in a mental hospital, while he who tries to collect a little of most things will probably not achieve anything of real value. Therefore, decide *before you get there* what you intend to collect, and stick to it. One word of warning: when your friends hear that you are going to

some interesting place they will all inevitably ask you to send them examples of their pet groups of insects. Resist this! I did not, and the result is that I always have numbers of apologetic letters to write.

Unless you are already a confirmed rhopalocerist, leave the butterflies alone. They are, everywhere in the world, the best known (or the least little known) insects; it follows that you are more likely to turn up new species if you concentrate on another group. In summary, I would advise the would-be breaker of new ground (a) to avoid butterflies, (b) to avoid insects of economic importance, (c) to go for the small and dull-coloured creatures.

The foregoing applies solely to the collection of adults. Information concerning the early stages, life-histories and foodplants of even common butterflies is often surprisingly scanty, and anything in this line is always well worth recording.

Collecting methods

With one exception, these are more or less the same as in the United Kingdom. Be careful of light traps; the catch will include heavy-weight beetles and lizards. These may well trample and/or devour everything else into a state of unrecognisable chitinous pulp. By all means use light—if possible ultra-violet light—but stay up and watch it. The use of bait for butterflies is important. Fermented banana is as good as any.

The great exception, mentioned above, is beating. This, in the tropics, is an utterly useless occupation. It results in a shower of ants, not now and again, but at every stroke of the stick. Most of these land on the beater who thereupon ceases to take any interest in any other insects for the next ten minutes. Even if one succeeds in avoiding the ants, the other insects immediately fly away. Beating is out . . .

By far the best method of collecting

s searching. Scratching about among vegetable rubbish is fairly profitable, but nerve-racking; dead leaves and so forth provide cover for creatures other than insects. A rule which the tropical entomologist must learn at a very early stage in his career is never to put his fingers anywhere out of direct vision. Loose bark must, of course, be looked under, but don't hook it off with the fingers: remember every bit of bark will cover at least one scorpion as well as any desirable insects. The same rule applies to the feet. Puff adders and other sluggish snakes are easily trodden on, and they react vigorously.

Once nearly trod on a large and entirely harmless monitor lizard on a river bank; its rapid departure was so crocodile-like as to justify my approaching a can of beer for purely medicinal and tranquilising purposes.

Equipment

This differs profoundly from the standard outfit used in England. The large rucksacks and bulging pockets seen on a Field Meeting at home are completely impossible in a tropical milieu. Let us start with clothing. This commonly consists of a shirt and shorts. I, personally, dislike and never wear shorts; I prefer a respectable pair of trousers with the added protection they provide against land leeches and aggressive vegetation. Short, short or long, the pants provide two side and one or two hip pockets. Shirts are commonly provided with two breast pockets. These are useless, as the entire garment is permanently saturated with sweat. I normally carry one rather small satchel; three-quarters of its space is taken up with bottles of liquid to maintain my fluid balance. On my feet I wear ordinary gym shoes. They provide a reasonable grip and in them I can slosh through streams without worrying. I do not bother about socks.

From the above, it will be clear

that elaborate collecting equipment is out. For butterflies, all I have ever used is a standard kite net and a 'Flat-50' cigarette tin containing folded newspaper. Killing, even of the smallest Lycaenids, is best done with finger and thumb; it requires a bit of practice, but it is worth it. For my Hemiptera, I use a 3" x 1" corked tube with a layer of chopped up X-ray film at the bottom. This absorbs about 1 ml. ethyl acetate, and is covered with a disc of blotting paper. In my right-hand trouser pocket there reposes an eight-ounce killing bottle, with crumpled toilet paper, and, in a cavity in the underside of the cork, a wad of cotton wool saturated with ethyl acetate. This container is, so to speak, the base reservoir into which the contents of the 3 x 1 tube are tipped from time to time. As I am under a moral obligation to collect Hymenoptera and Diptera which come my way, I keep a small cyanide killing bottle in my left-hand trouser pocket.

The normal calico sweeping-net as used in England is not of much value here. Beetles and bugs in the tropics do not walk about in a dignified and decorous manner—if they've got wings they fly immediately, and if they haven't got wings they run like hell. Thus, if one uses an opaque sweeping-net, the moment the net is opened, a frenzied cloud of insects rushes out. I therefore use a semi-transparent nylon net-bag which enables me to form some idea of what I have got to deal with by merely holding the net up against the sun. I can then plan things accordingly.

Finally, in this section, I will add a word about the killing-agents I have mentioned. I am in the fortunate position of being in charge of a laboratory in which ethyl acetate is used, and so the diversion of a small quantity to entomological uses is not impracticable. But it is a substance

which cannot be carried (legally) by air and which can only be imported into most countries under special licence. (The reasons for this are (a) it is highly inflammable, and (b) it is used for the conversion of morphine into heroin.) I strongly recommend, therefore, that a visitor to a foreign country establishes contact as soon as possible after arrival with the Agriculture Department. Their entomologist will undoubtedly be pleased to supply ethyl acetate. A safe substitute is chloroform, and a small bottle of this could well be carried to tide one over until the necessary arrangements have been made.

What to do with the catch

Here you are up against dear old Mother Nature in a big way; she provides ants, mites and mould in over-generous quantities. I have found the answer, so far as ants are concerned, to be purely mechanical; there is (an admittedly extremely small) aperture through which an ant cannot pass. Mites are effectively excluded by really liberal quantities of powdered naphthalene. Paradichlorobenzene is equally effective, but has the disadvantage of evaporating very much more quickly consequently making renewal a much more frequent necessity. In my own experience, thymol prevents mould, and I scatter a few crystals in every box, renewing it fairly frequently.

Anxiety concerning this diabolical trio—ants / mites / mould—can be further allayed by taking advantage of any air-conditioned room or office to which access is available, or, as a second-best, by rigging up an electric heater in a cupboard or wardrobe.

The next problem to be decided is whether or no to pin the collection. A pinned collection enables one to see what one has got, which is a great advantage. On the other hand it becomes a terrible embarrassment when the time comes for travelling home. Probably the most important

factor to be considered in this connection is the duration of one's stay in the tropics. If it is merely a matter of a few weeks I am sure that the correct thing to do is to collect like a vacuum-cleaner, keep everything in papers and sort it all out after one's return to the U.K.

For a longer stay (in my case for two years or so) it is highly inconvenient not to be able to see what one already has. As my beloved Hemiptera-Heteroptera are reasonably small creatures, I pin them as I go. I prefer not to think about getting them home . . .

British hemipterists will possibly be deeply shocked at all this talk of 'pinning'. Nicely carded and set collections are ideal for the British species, when nearly all of them can be definitely identified in the field. But, in a country like Sabah, an appreciable proportion of the catch can reasonably be expected to consist of new and undescribed species. And for these it will be essential to see the undersides. Therefore I pin everything with the exception of certain small Tingid bugs which have very bizarrely keeled and hooded pronotum and scutellum. These I have attached to very fine card points.

For unpinned storage I recommend paper, either in the form of individual triangles made from the best quality toilet paper, or in layers of paper handkerchiefs. Most books advise, rather glibly, the preservation of such insects as beetles in sawdust. I have two objections to this medium: (a) sawdust is by no means always an easy commodity to come by and (b) there is the difficulty of relating data labels to particular specimens.

I am very much aware that I have touched on only the more obvious points. Should any member of the AES have any specific query I will be only too pleased to do my best to answer it. At the moment of writing,

he State of Sabah has two professional, economic entomologists (one medical and one agricultural) and one amateur—me! So the field is wide open . . .

P. J. L. Roche (2965).

•

REARING *CASSIDA RUBIGINOSA* MUELL. (COL., CHRYSOMELIDAE)

In common with many of the Chrysomelid beetles, this species is very easy to rear.

The best way to attempt to rear this beetle is to search for the ova or larvae, which can be found on the foodplants in May and June. I have found that the most common foodplants are the Creeping Thistle (*Cirsium arvense* (Linn.) Scop.) and the Lesser Burdock (*Arctium minus* Bernh.)—and less frequently Spear Thistle (*Cirsium vulgare* (Savi) Ten.), the latter probably being due to the fact that the Spear Thistle is a more solitary plant than the other two.

The ova are laid both on the upper and lower surfaces of the leaves of the foodplant in May. The ova are laid in small batches and are cylindrical, the whole batch being covered by a brown translucent excrement which serves to disguise the ova. The ova should be removed from the leaves and kept until June, when the larvae hatch. The ova must be kept in an airtight box to prevent them drying out.

The larvae can be reared easily on the foodplant in plastic containers. This is much easier than sleeving on thistle, which can be a prickly business!

The larvae conceal themselves under an umbrella of frass which is attached to two spines which arise from the final segment of the abdomen. When larvae are kept in captivity this frass tends to become

covered by fungal growth, but it can be easily removed with forceps, and the larvae will soon replace it.

The larvae eat circular depressions in the leaves, leaving an opaque window consisting of the epidermis of the opposite leaf surface. This makes plants attacked by the larvae easy to recognise, and plants not eaten in this manner can be ignored when searching for the larvae. An illustration of the larva of a related species (*C. equestris* Fab.) can be found in *A Coleopterist's Handbook*, Plate V, fig. 30.

The larvae undergo several moults but these do not seem to present any difficulty. The larvae stop feeding and undergo the final moult into the pupal stage, on the surface of the leaf, at the end of July. The pupae can then be removed from the leaves without damage, and stored in an airtight container to prevent desiccation. The imagines will emerge after about a fortnight.

Some of the larvae fail to effect the final moult and the body turns black in colour, the lateral spines becoming yellow. When examined these larvae are found to contain several white larvae of what is, I think, a Dipterous parasite, although I must admit that I have never tried to rear these larvae. I have found that a large proportion of larvae captured in the wild are parasitised.

The imagines do not pair after emergence, but continue feeding into October, when they hibernate until May of the next year. The imagines can be overwintered in an airtight container kept in a cool place. I use a plastic box kept on a windowsill that is out of the sunlight. The imagines will cling to the corners of the lid of the container, which need contain no other material.

Members who normally rear lepidopterous larvae may consider trying to rear this and other Chrysomelid larvae, as they are generally easier

to rear and hardier than their lepidopterous counterparts. However, as little information is available about rearing them they do present more of a challenge to the rearer.

17.12.65. J. Muggleton (3253).

REFERENCE

WALSH, G. B. and DIBB, J. R. eds. (1954). *A Coleopterist's Handbook*. AES, London.

JUNIOR NEWS SECTION

Before I get down to giving you answers to the May quiz I would like to tell you about the busy 'Bs' among our new Members.

M. P. Brook (3838J), Woodsome View, Common Lane, Fenay Bridge, Nr Huddersfield is fairly new to the study of Lepidoptera. He collects but keeps his specimens to a minimum. I am glad to hear that while on expeditions with his school and with friends he makes careful notes on weather, environment and time in connection with the specimens that he sees.

D. Briddon (3835J) lives at 1 Chesterfield Road, Beeley, Nr Matlock, Derbyshire. Beeley is a small village in the beautiful Derbyshire Pennines with a fair sprinkling of birch, beech and ash trees, and one or two poplars. There is a large stretch of moorland nearby where the insect population is just beginning to recover from the devastating brush fire of 1959. Northern Eggars (*Lasiocampa quercus callunae* Palmer) and Emperor Moths (*Saturnia pavonia* Linn.) are common on the moor, while the following moths are also found there: Beautiful Golden Y (*Plusia pulchra* Huebn), Silver Y (*Plusia gamma* Linn.), Scarce Silver Y (*Plusia interrogationis* Linn.), Northern Spinach (*Lygris populata* Linn.), Beautiful Yellow Underwing (*Anarta myrtilli* Linn.) and Common Heath (*Ematurga atomaria* Linn.).

A mercury-vapour light-trap brought in some interesting captures

including a Marbled Coronet (*Hadena conspersa* Schiff.). Although Poplar trees are scarce around Beeley and no larvae have been seen on those that there are, quite a few Poplar Hawkmoths (*Laothoe populi* Linn.) have been caught.

It is not surprising that moorland insects are 'D's main interest. His 'm.v.' trap also takes up much of his time and I know he would like to correspond with other 'm.v.' enthusiasts. He would also like to join in excursions if only they were organised nearer home.

P. Baynlun (3748J) of Whitegates Private Hotel, 15/17 Valley Road, Scarborough, Yorkshire, wishes that the AES would organise some activities in the North of England. He is a Lepidopterist and has a small reference collection. The local butterflies, he says, are rather shabby and apart from a few common species are not too plentiful. Moths, including various hawkmoths, are more common. His ambition is to specialise in the not so popular Orders such as Diptera and Hymenoptera but is finding it a little difficult to get started. I know he will have opposition at home if he is thinking of breeding flies and wasps in the living room.

He is lucky in having been able to take part in an expedition to Raasay in the Hebrides and in also having the Scarborough Natural History Museum with its excellent insect collection so close. As a matter of interest the Scarborough Natural History Museum also houses the entomological library of the late G. B. Walsh.

John Beeby (3896), 94 Church Road, Stockingford, Nuneaton, Warwickshire, is also a Lepidopterist, and whose collection comprises some 250 specimens. The rarer ones he has reared from pupae, some bought and some collected on recent low-yielding digging forays. He has been unfor-

unate in not being able to breed from his reared stock although he has managed to raise some from eggs of common local species and some from purchased eggs.

A batch of Yellowtail Moth (*Euprocis similis* Fuessl.) caterpillars created a problem by waking up from their winter sleep too early. Only an intense search for hawthorn buds in February saved the day.

John has quite a large garden with both fruit and ornamental trees, and he has tried sugaring to catch insects. He has not had much success with this and would very much like information on how to make a mercury-vapour trap.

He has visited the National Trust nature reserve at Powerstock Common, Dorset, and seen fine specimens of the Marbled White (*Agapetes alathæa* Linn.), Gatekeeper (*Maniola litchon* Linn.), Meadow Brown (*Maniola jurtina* Linn.), Small Copper (*Lycaena phlaeas* Linn.), Six Spot burnet (*Zygaena filipendulae anglicola* Tremewan), Magpie (*Abraxas grossulariata* Linn.) and Broad-bordered Yellow Underwing (*Lampra fimbriata* Chreb.). John caught a glimpse of a resting bee hawkmoth (*Hemaris* sp.) which unfortunately made off before it could be identified. This nature reserve abounds in wild life and will certainly draw John Beeby back for another visit.

Christopher Brown (3904J), 14a Rognal Lane, Hampstead, London N.W.3, does more than conserve nature—he increases it. By collecting and rearing larvae of Coleoptera and Lepidoptera and releasing the adults both Christopher and his father, a one-time collector, do all they can to increase London's dwindling animal population. On one occasion 60 adult eyed Hawkmoths (*Smerinthus ocellata* Linn.) were reared from eggs and freed in Hampstead. I wish you every success, Christopher!

For over four years John Bradley

of 93 Marldon Road, Shiphay, Torquay, has been collecting and studying stick insects. He has nine different species from all over the world and has recently added the brilliant Javan Stick Insect *Orxines macklotti* de Haan, which is three times the size of *Carausius* (= *Dixippus*) *morosus* Br. on hatching. Would any other phasmidologists please write to John? He would like to swap specimens and notes. John Bradley is also a keen member of the Torquay Natural History Society and the Devon Trust for Nature Conservation.

I have an S.O.S. from Ronald Allen (3628J) of 26 Burnside Road, Dagenham, Essex. You will remember that Ronald has been trying to get Junior Members interested in the Diptera study group. He will be losing the 'J' from his AES number soon and would very much like to have formed a good nucleus of young Dipterists before he actually joins us 'old uns.' If you are keen on flies please write to Ronald without delay.

Now at last here are the answers to the May quiz.

1. *Phosphuga atrata* Linn. is the scientific name of the black snail-eating beetle which is related to the burying beetles.
2. Farmers were encouraged at one time to surround their manure heaps with water as the maggots of the Housefly (*Musca domestica* Linn.) leave the manure to find drier ground to pupate in: they thus drown in the attempt.
3. Sleeping sickness is spread by blood-sucking tsetse flies (*Glossina* spp.).
4. Metamorphosis is the name given to the life cycle of an insect. Complete metamorphosis consists of four stages—egg, larva, pupa and adult.
5. The special characteristic of the Lepidoptera is that the four wings are covered with scales.

6. The Housefly has three ocelli or simple eyes as well as two compound eyes. Each compound eye is said to consist of 4,000 separate hexagonal facets.
7. A moth's long sucking mouthparts, modified from the palps, etc., are termed the proboscis.
8. (a) Whirligigs are oval shaped beetles which hunt their prey on the surface of ponds and streams. (b) 'Wart-biters' are grasshoppers which are supposed to destroy warts by biting them.
9. Wood Walton Fen is a nature reserve in Huntingdonshire especially famous for Britain's only breeding population of Large Copper Butterflies (*Lycaena dispar* Haw.) They are under the protection of the Nature Conservancy which guards them jealously.
10. Palps are the small antenna-like organs around an insect's mouth. They are generally used to actually taste food before it enters the mouth.
11. Weevils are members of the beetle family Curculionidae: their heads are characteristically elongated.
12. 'Ground' beetles (Carabidae) are the streamlined hunters of the beetle world. They mainly feed on other insects.
13. I don't know why there are no young entomologists in Scotland.
14. This was a catch question, as the adult giant silkworm or Atlas Moth (*Attacus atlas* Linn.) has no mouthparts capable of eating anyway.
15. A formicarium is an artificial ants' nest used for observation and usually made out of two sheets of glass.
16. Some old country folk seeking a bit of peace say they are going to 'talk to the bees'. Bees have no ears and therefore cannot answer back.
17. The hard skinned grubs of crane-flies (daddy longlegs) are commonly called leather jackets. They feed on grass roots.
18. The Devil's Coach-horse Beetle (*Ocybus olens* Muell.) shows its annoyance by prancing up and down with its jaws open and its abdomen held high over its head. It is all bluff!
19. *Aedes* is a mosquito. *Aedes aegypti* Linn. is the species of mosquito which spread yellow fever among the workers on the Panama Canal and almost brought the project to a halt.
20. The Monarch or Milkweed Butterfly (*Danaus plexippus* Linn.) is a gorgeous black and brown insect which is sometimes seen in our southern counties. It originates in America.

I hope to meet many of you at the Annual Exhibition.

H. J. Berman, F.R.E.S. (2941A).

REVIEW

Grasshoppers, Crickets and Cockroaches of the British Isles, by D. R. Ragge. (Wayside and Woodland Series.) Pp. xii and 299. Pl. XXII in colour. Frederick Warne and Co. Ltd., London. 42s.

In his wee pocket-book of 1936 (*British grasshoppers and their allies*) Malcolm Burr wrote "I very much hope, therefore, that this little handbook will give the necessary stimulus, so that in a few years there will be adequate material to justify a fairly complete account of the Orthoptera and Dermaptera of Great Britain and Ireland." Ragge has now fulfilled Burr's call some thirty years later, except in omitting the earwigs.

With this new work on one of the smallest groups of British insects, Warne's have increased both the

format and the price, which is a pity, for nobody will feel inclined to take this very practical book into the field where it could be of much help. The larger page size will, however, be well suited to those compendia in this series that we all keep at hand at home.

The introduction contains the usual information on collecting, preserving and identifying specimens and some good advice on keeping Orthoptera alive. Other general information is divided rather uneasily between this chapter, the introductory passages on individual families and a series of appendices. Some of these paragraphs read like sections of a much more general handbook on the study of our fauna that remains unwritten. A particularly valuable contribution is the re-statement of the Watson-Praeger vice-county system for distributional records. It is unfortunate that whilst the map is in the introduction, the description of the vice-county boundaries that it illustrates is relegated to an appendix! Similar dissection has led to a little repetition.

Vice-county distribution maps are given for all the species: in some cases they show substantially more extensive records than those known to Burr.

Other notable features of this book include the collective diagram of life cycles and the diagrammatic representation of the song of grasshoppers. The keys to species are as clear as any to this group can be and the beginner will undoubtedly be helped by the coloured drawings, mostly to the generous scale of $2\frac{1}{2}$ times life size. Even at this scale, some figures on three plates in the review copy are illegible because of the poor registration of the blocks. This fault renders a substantial proportion of the plates in most works in this series worthless. At the prices now asked, it is time that the publisher tightened

his standards of acceptance, which are no better than those of mass-circulation newspaper supplements.

Information on each species is presented under a series of headings and is as consistent as knowledge allows. Established aliens are included and there is a chapter on casual introductions and migrants. A graphic chapter describing the quest for Orthoptera in the New Forest and Purbeck should give the beginner a feel for the habitats of his quarry. An essay on the distribution and history of the British Orthoptera very concisely picks out the important points. The glossary is well constructed, with some good definitions and without circular reference or trivialities.

One omission is any reference to the dipterous parasites of grasshoppers. Amateur orthopterists could make interesting observations on the behaviour of these flies and will certainly rear them from mature grasshoppers collected in the field.

This is an excellent book suitable for adult and serious sixth-form amateurs.

R.W.J.U.

LETTER TO THE EDITOR

Sir,—At the end of page 81 of the *Bulletin* for last August the following quotation from C. B. Williams' book '*Insect Migration*' occurs dealing with the Bath White (*Pontia daplidice* Linn.):—"In 1945 an immigration occurred on a scale quite unprecedented for the country. On 14th July, John Blaythwayt captured thirty-eight individuals in less than an hour on a field about two miles from the sea in North Cornwall". For the purposes of accuracy I would like to mention that this statement in C. B. Williams' book is not strictly accurate. First my christian name is not "John". Secondly the spelling of my

surname is not quite correct and thirdly the field was about two miles from Looe in South Cornwall. The incident is correctly reported on pages 124-5 of the *Entomologist* volume 78 (1945). About two hundred Bath Whites were seen by me at the time.

24.1.66. C. S. H. Blathwayt (651).

NOTES AND OBSERVATIONS

UNCOMMON MOTHS IN NORTH-WEST OXFORDSHIRE

Since acquiring an 80 watt mercury vapour moth trap in July of 1963 I have had some rather interesting captures which I would like to put on record.

In South's book *'The Moths of The British Isles'* it is stated that *Apatele alni* Linn. (Alder Moth) is rarely met with, yet during the last three years I have taken the species in fairly constant small numbers in the middle of June in the Chipping Norton district of North-west Oxfordshire.

The book also states that *Spaelotis ravida* Schiff. (The Stout Dart) has been recorded in most English Counties but most records are no more than casual, the chief preference of the moth being the edge of marshland. My own area is quite the opposite of this, being 700 feet above sea level in the Cotswold Hills, yet since 1963 I have taken something in the region of forty specimens, mostly this year (1965) and most of which were in appalling condition.

In July of last year I was fortunate enough to capture a rather poor specimen of *Eurois occulta* Linn. (Great Brocade).

In late September of 1963 I discovered a very badly damaged specimen of *Herse convulvuli* Linn. (Convulvulus Hawkmoth) in the trap.

Lastly, I am proud to record that on the nights of May 17th and 18th of this year I was fortunate enough to trap two specimens of *Celerio livornica* Esp. (Striped Hawkmoth). Both were in perfect condition. The weather on both nights was clear and cold with a fresh wind blowing and these constituted almost the entire catch.

As these were obviously immigrants from the continent, why were they in such fine condition?

2.12.65. Peter D. J. Hugo (3522J).

REFERENCE
SOUTH, R. (1961). *The Moths of the British Isles*. 4th edn. Frederick Warne, London, p. 265-6.

A SECOND GENERATION OF THE LIGHT EMERALD MOTH IN HAMPSHIRE?

On the evening of September 12th 1964 a small female specimen of the Light Emerald (*Campaea margaritata* Linn.) was taken at an illuminated shop window in Fareham, Hampshire. This insect deposited fertile egg batches freely in a pill box during the following day, but the resulting larvae died during the autumn. Most specimens of this species (which is common in the Fareham area) have been seen from mid-June to early July, none having been noted during August.

On September 17th 1965 another female was taken at a shop window in the same area. Again this specimen was small in size as compared to the larger summer insects. Fertile egg batches were again obtained and the larvae were released on Birch (*Betula* sp.) and should soon be going into hibernation.

I now believe that a partial second generation occurs in the South (probably doubtful further north, although I would like to hear of any late records from such areas) and it is improbable that these represented late emergences.

29.11.65. G. R. Else (3881).

LEAFLETS

Numbers not included are out-of-print or replaced by others.

	Price each
3. Rearing Silkworms. (The Mulberry Silkmoth). 4pp., 2 figs.	8d.
4. Collecting Sawflies. 12pp., (incl. 2pl.), 26 figs.	8d.
5. Collecting Flies (Diptera). 8pp., 1 fig., 8pl.	2s. 8d.
6. Collecting Beetles associated with Stored Food Products. 9pp., 6 figs., 3pl.	1s. 4d.
7. Some Improved Devices for Rearing Hymenoptera. 7pp., 3 figs.	8d.
8. Collecting Ants. 12pp., 5 figs.	8d.
9. Collecting Caddises. 5pp., 4pl.	1s. 0d.
10. Experiments with Bees. 12pp., 3 figs.	8d.
13. Collecting Microlepidoptera. 4pp., 1 fig.	8d.
14. Setting Microlepidoptera. 4pp., 5 figs.	8d.
15. Collecting Het-Bugs (Hemiptera-Heteroptera). 12pp., (incl. 2pl.), 5 figs.	8d.
18. Collecting Clearwings. 12pp., (incl. 2pl.), 4 figs.	8d.
20. Preserving Caterpillars. 14pp. (incl. 6pl.), 9 figs.	1s. 0d.
21. Collecting Psocoptera. 4pp., 10 figs.	8d.
22. Collecting Lacewings. 9pp., 8 figs., 5pl.	1s. 0d.
24. Entomology of Bird Pellets. 8pp., 4pl., 1 map.	1s. 8d.
25. Collecting Bumble Bees. 20pp., 83 figs.	2s. 0d.
26. Collecting Collembola. 6pp., 4 figs.	1s. 0d.
27. A Study of the Insects Living on the Wayfaring Tree. 20pp., 4 figs., 1 diagram.	1s. 0d.
28. Killing, Setting and Storing Butterflies and Moths. 13pp., 10 figs*	1s. 0d.

PAMPHLETS

4. Label List of British Macrolepidoptera. 32pp.	1s. 8d.
5. Check List of British Macrolepidoptera. 32pp.	4d.
6. Label List of British Butterflies. 2pp.	4d.
7. Directory of Natural History Societies. 155pp.	8s. 0d.
7a. First Supplement to Directory. 44pp.	2s. 0d.
10. Glossary for the Young Lepidopterist. 6pp., 2 figs.	4d.

Other Leaflets are in preparation

These publications are obtainable from L. Christie, 137 Gleneldon Road, Streatham, London, S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

Worldwide Butterflies Ltd.

Charmouth, Bridport, Dorset

IMAGINES, OVA, LARVAE AND PUPAE

from many parts of the world

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

F O R A L L I N F O R M A T I O N O N B E E S

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mddx

Entomological Literature

CATALOGUES ON REQUEST

MEMBERS' BADGES

A small enamel badge, in the form of a yellow Brimstone butterfly with the letters AES in gilt, is now available

*Price 3s. 6d. plus 6d.
postage and packing*

Please apply to:

Hon. Enrolment Secretary,
28, Summerleaze Park,
Yeovil, Somerset

ADVERTISEMENTS

displayed in these pages cost very little

Whole page £3

Half page £1 - 10s.

Quarter page £1

so
write to

18 Golf Close

Stanmore, Middlesex.

The Advertising Secretary
will be pleased to supply you with
further information about advertising
in the

AES BULLETIN

The Amateur Entomologist

(Illustrated with photographs and line drawings)

Volume 9 :

“Practical Methods and Hints for Lepidopterists”

CONTAINS ARTICLES ON—

Collecting Caterpillars

Breeding Cages for Macrolepidoptera

(describing 38 ways of making a cage)

Making a Beating Tray

(describing six different kinds of tray)

Price 5s. (postage extra)

from:

AES Official Publications Agent, 137 Gleneldon Road, Streatham, London S.W.16, England. Do not send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

THE AMATEUR ENTOMOLOGISTS' SOCIETY
ANNUAL EXHIBITION, 1966

SATURDAY, 8th OCTOBER

from 2 p.m. to 5.30 p.m.

HUGH MYDDELTON SECONDARY SCHOOL,
Corporation Row, London, E.C.1

ADMISSION FREE

EXHIBITS. The Hall will be open from 11.30 a.m. for receipt of exhibits. Bring along your specimens (any Order, living or set), equipment, apparatus, photographs, drawings, etc. If you require a large space, notify the Meetings Secretary in advance. Please label exhibits clearly.

DEMONSTRATIONS. Members will demonstrate setting of insects of several Orders.

GROUPS. Members of Groups who have been corresponding will be able to meet for discussion.

SURPLUS TABLE. If Members have spare ova, larvae, imagines, equipment, books, etc., for sale or exchange, bring them along labelled with name, price or exchange wants. No charge for use of this table.

ENTOMOLOGICAL TRADERS will be in attendance.

Light Refreshments will be available

Offers of help and enquiries to Hon. Meetings Secretary, B. F. Skinner, 85 Elder Road, West Norwood, S.E.27. GIPsy Hill 0057.

BRING YOUR FRIENDS AND AN EXHIBIT !

To get there: Farringdon Station (Underground) connects with most main stations, and numerous buses serve the area. Cars may be parked in permitted areas of the School grounds.

Notice is hereby given that neither the Amateur Entomologists' Society nor the London County Council can accept any liability for damage to vehicles or property which are left in these grounds



VOL. 25

No. 273

•

NOVEMBER, 1966



THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY

World List abbreviation : Bull. amat. Ent. Soc.



EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.



CENTIPEDES OF THE BRITISH ISLES

E. H. EASON

This book, admirably fills the gap in our rather limited knowledge of the study of Centipedes. Through the research and observations of the author, we are given a great deal of information about all the species found in the British Isles. It contains, as well as the identification of species, details of structure, life-history, natural-history, distribution, preservation of specimens and other details. Appendix Glossary and Bibliography. Fully illustrated. 63s. net.

FREDERICK WARNE

1-4 Bedford Court, London, W.C.2

DATA LABELS

Printed to your specifications on good quality card

	500	1,000
1-line	3/6	6/3 post free
2-lines.....	4/3	7/6 post free
3-lines.....	5/0	9/0 post free
4-lines.....	5/9	10/6 post free

Other labels printed to order

Full details and samples sent on request

P. D. J. HUGO

38 COTSWOLD CRESCENT,
CHIPPING NORTON, OXON

AES NOTICE — where to write

Membership applications and first subscriptions to:

D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset. Yeovil 3928.

Changes of address and non-arrival of Bulletins to:

P. Taylor, 18 Old Manor Drive, Isleworth, Middlesex.

Advertisers and for Prospectus of Society and Application forms to:

R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex. GRlmsdyke 0460.

Offers to lead field meetings, etc. to:

C. B. Pratt, 1 West Ham Lane, London, E.15

Manuscripts, drawings and books for review to:

H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

Subscription renewals (25/- per annum, 12/6 under 18 years) to:

B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex. Sunbury 2687.

Youth matters to:

H. J. Berman, St Ivo School, St Ives, Hunts.

Offers of help, queries, etc. to:

P. W. Cribb, 355 Hounslow Road, Hanworth, Feltham, Middlesex. FELtham 3099.

Annual exhibition matters to:

B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27. GIPsy Hill 0057.



EDITORIAL

When the style of the *Bulletin* was changed in 1962, a number of notes for the use of prospective contributors was published. These notes, repeated in February 1963 and 1964, led to a certain amount of correspondence, particularly about the procedures with regard to the inclusion of scientific names. Until the general opinion of Members on the changes had been ascertained, the notes were subsequently not published.

However, it now seems clear that the systems in use at present find general approval, and the opportunity is taken in this issue of repeating, with some changes and additions, the 'Guidance for Authors' item. Your Editor would, though, like to make two points about the notes: firstly that these are not orders but simply an outline of how Members who write in for the *Bulletin* can make the Editor's job easier; and secondly that the notes were written for all authors, so I would ask all the more experienced writers and draughtsmen to bear with me in the inclusion of the more obvious items. More general matters are dealt with in items (21) to (23).

At the time I write this Editorial (late July) the few fine weeks of the spring have been forgotten in the generally dull and wet weather of this year's summer. I hope that Members will make a particular effort to write up for the *Bulletin* their entomological observations for 1966—for it is frequently found that the value of data from good seasons is

diminished because no-one bothers to record similar observations (negative ones though some of them may be) from bad or indifferent seasons.

H. V. Danks (2907).

ADDITION TO ADVISORY PANEL

Microscopy

General advice

G. W. SWAYNE, A.I.S.T.,
F.R.M.S. (3949), 22A Thorpe
Road, S. Tottenham, London,
N.15.

GUIDANCE FOR AUTHORS

The following notes outline the most important of the methods which are used by the Editor to ensure that there is a tidy uniformity in the way in which material is published in the *Bulletin*. Authors who submit articles for publication in the magazine would be greatly helping the Editor, therefore, if they carry out the requests below—although material from Members who feel that they cannot carry out the ideas contained in these notes is still gratefully received. It is, however, very much appreciated if Members act on the information given and so lighten the Editor's task.

If any Member would like information on specific matters concerned with writing articles for the *Bulletin* and not given in these notes, the Editor will be pleased to help in any way he can.

(1) If possible, please submit material which is typewritten, and this should be double-spaced (i.e., with a whole line empty between successive lines of type), with very wide margins and on *one side only* of quarto (10" x 8") paper. If handwritten material is submitted, please ensure that there is again plenty of space between the lines and that the writing is clear. It is a good idea to have somebody else read your manuscript, as ambiguities are often shown up in this way.

(2) The title should be in capital letters throughout and *not* underlined. When choosing a title, always think how it will appear on a *Bulletin* page (is it too long?) and whether reference to the subject matter will be easy when the title has been carried into the index.

(3) The author's (authors') name(s), followed by AES Membership number(s) in parentheses, should be placed at the end of the article, on the right hand side, on a different line from the text, and not underlined.

(4) The date of writing should be placed on the left opposite the author's name, in the usual (shortest) form, e.g., I. II. 66.

(5) All species of living things, where exactly identified, should be named with their full scientific names, i.e., full name of genus with capital initial letter, specific name with small initial letter, both of these names underlined; name of author, not underlined but conventionally abbreviated if well-known (note that Linn. and Fab. are used for Linnaeus and Fabricius respectively, not L. and F.). [see also footnote.]

(6) If there is a well-known English name, this should be added in parentheses after the scientific name, each word of the former having a capital initial letter, e.g., *Pieris brassicae* Linn. (Large White Butterfly). "The Large White Butterfly (*Pieris brassicae* Linn.)" is the alternative form.

(7) If you do not know any item of this information, please leave a good-sized space where it should occur, so that the Editor can fill it in for you. (Make sure, of course, that you have supplied enough information for him to be able to identify the species to which you are referring!)

(8) Once you have given the full name of a species you may, if you wish, refer to it later in the same article by its English name alone or by its scientific name alone. If the latter you may, if no ambiguity can thus arise, omit the author's name and/or abbreviate the generic name to its initial letter followed by a full point (.)

(9) If the name of a genus is used on its own it should be underlined, and if it is followed by 'sp.' (singular) or 'spp.' (plural) meaning 'species', this should not be underlined, e.g., *Pieris* sp. 'ssp.' is the accepted abbreviation for 'subspecies'.

(10) The scientific names of groups above the rank of genus should have capital initial letters but *not* be underlined. Adjectives formed from one of these names (e.g., coleopterous), or nouns derived similarly and referring to students of the group concerned (e.g., coleopterist) should, however, have small initial letters. If, however, an adjective derived in this way (as in "a cerambycid beetle") is used as a noun ("a Cerambycid") it should be

[It might be added here for the benefit of anyone to whom the situation is not clear that the rules governing nomenclature differ in the animal and plant kingdoms, particularly with regard to the treatment of authors' names. In the animal kingdom, the rules require that where a species described in a certain genus by one author has been subsequently removed to another genus by a different author, the original author's name should be put in parentheses. Thus *Pieris rapae* (Linn.) is strictly correct, since all butterflies originally described by Linnaeus and including the species *rapae* were placed in the genus *Papilio*, since split into numerous genera and retained only for the

type species (*machaon*) and its allies. However, to avoid combinations such as "*Pieris rapae* (Linn.) (Small White Butterfly)" the parentheses are dropped in the *Bulletin* except when essential for discussions of taxonomy, etc. The botanical rules of nomenclature, however, require not only that this use of parentheses be made, but also that the name of the author who transferred the species from the original to the new genus be added. Thus for example "*Alnus glutinosa* (Linn.) Gaertn." is used for the Alder tree, a system which the *Bulletin* follows since reference to botanical information sometimes requires both authors' names.]

given a capital initial letter.

(11) English vernacular words which do not apply to any particular species of animal or plant (e.g., grass, butterfly, rose) should be given small initial letters.

(12) Abbreviations should be followed by a full point (.) *only* if the last letter of the word is missing. Thus Linn. should be used for Linnaeus, but Mr for Mister. The abbreviation AES will be treated as a cipher, with the points omitted.

(13) References to articles in the *Bulletin* should be indicated by the *World List* (19) abbreviation (*Bull. amat. Ent. Soc.*) underlined, followed by a comma, then the number of the volume, a full colon (:) and the number(s) of the page(s) occupied by the article(s). Indication of the bold type used for the volume numbers should be left to the Editor. Examples: *Bull. amat. Ent. Soc.*, 25: 110. *Bull. amat. Ent. Soc.*, 25: 1, 37-8 and 109. *Bull. amat. Ent. Soc.*, 23: 2-4. 25: 110-12.

(14) Where reference to an issue of the *Bulletin* is necessary (and no more exact reference is possible) this should be made by giving first the year of the volume and then the number of the issue concerned, the latter being placed in parentheses, e.g., *Bull. amat. Ent. Soc.*, 1966 (273).

(15) A reference in the text of an article to a book or paper should normally be made by giving the author, and then the date in parentheses, of the paper. Full details of the paper should be given at the end of the article (and preferably on a separate sheet), under the heading in capital letters 'reference(s)', and should take the form exemplified below.

FORD, E. B. (1955). *Moths*. *New Naturalist Series*. Collins, London.

YARROW, I. H. H. (1955). *Entomologist*, 87: 5-9. Some ways of distinguishing between the two common wasps *Vespula germanica* Fab. and *Vespula vulgaris* Linn.

(16) Numbers below fifty should be spelt in full, except when giving dimensions of apparatus, etc. Numbers above 51 should be given in arabic numerals.

(17) Normal rules of grammar will be applied to material before publication, e.g., every sentence must have a finite verb; ambiguities will be removed; etc.

(18) Some of the above notes may not be applied if a contribution is considered to be primarily of a literary, rather than factual, nature.

(19) Please count the actual number of words in your contribution and write this in pencil and ringed around in the top right hand corner of the top sheet of each article.

(20) If illustrations are required to clarify the article, and you feel like submitting your own drawings for publication, these should generally be between one and a half and three times as big, in both height and width, as they are to be printed. Twice as big is the best size for most purposes, and drawings *must* be made in water-proof Indian ink, preferably on white Bristol board. If graphs are drawn on faint blue-lined graph paper, these lines will disappear during the process and only Indian-inked material appear. Note that all writing will be reproduced smaller, and all line-thicknesses will be reduced, and to secure a good finish all lines must have exceptionally clearly defined edges. Lettering is best done with a stencil, unless the artist is experienced. Very small dots, and dots and lines in which the ink has not been applied at its full density, will reproduce patchily. Good results can generally be obtained most easily by the use of tubular-nibbed pens, which produce lines of constant thickness. If you feel unable to make your own drawings for publication, send the best you can and they can then be forwarded to one of several Members who have kindly offered their services

as artists.

(21) Major or factual alterations which appear to be necessary in the text of articles will be agreed with authors before material is sent to the printer. However, the above notes will be used automatically to make any minor changes necessary to render articles suitable for publication in the *Bulletin*.

(22) In order to save the Society unnecessary expense, proofs will not be sent to authors unless they are requested.

(23) Authors of longer articles who require reprints thereof may purchase them at cost provided the Editor is informed of their requirements when the manuscript is submitted. Reprints are not normally produced.

(24) Please read through your finished article and check that you are prepared to see its contents published over your name in the *Bulletin*, as later alterations and additions are likely to prove very expensive.

H. V. Danks, (2907), *Bulletin Editor*.

COLLECTING NOTES NOVEMBER 1966

The Smaller Moths

Cochylis (Phalonia) roseana Haw. Mr Bradford's notes read: "If you collect a number of teasels (*Dipsacus* spp.) during the winter months, and keep them in as near natural conditions as possible, later on in June, July and August this moth will emerge. You may be lucky and get another moth as well, called *Endothenia gentianaeanana* Huebn. *E. gentianaeanana* feeds on the pith inside the head and the top of the stem of the teasel. *C. roseana* on the other hand feeds on the seeds only and on breaking a head of teasel open you can see the holes through the seeds

made by the larva. I have been fortunate to breed both moths from the same teasel head.

"*C. roseana*, as its name implies, has in most specimens a beautiful rosy hue on the costa and over most of the forewings. In others there is more of a buffy brown colour. There is a darker brown streak from the inner margin which fades off towards the costal margin. The hindwings are grey-brown.

"The adult moth emerges over June, July and August, whereas *E. gentianaeanana* emerges mainly in July only."

In my part of the country (north Essex) *E. gentianaeanana* is a very common moth, but I have not yet located *C. roseana*. My *E. gentianaeanana* have all emerged in mid-June.

Epiblema (Eucosma) foenella Linn. Mr Bradford writes: "The drawing is from one of several specimens bred from the stems of *Artemisia vulgaris* Linn. (Mugwort). The roots containing the larvae were dug up from gravel pits in the Park Street area of Hertfordshire. On my returning home, they were put in flowerpots and kept in an out-building. The roots were dug up very early in the year. During this time the larvae are feeding in the base of the stem and rootstock and pupate in June. The adult is on the wing in July.

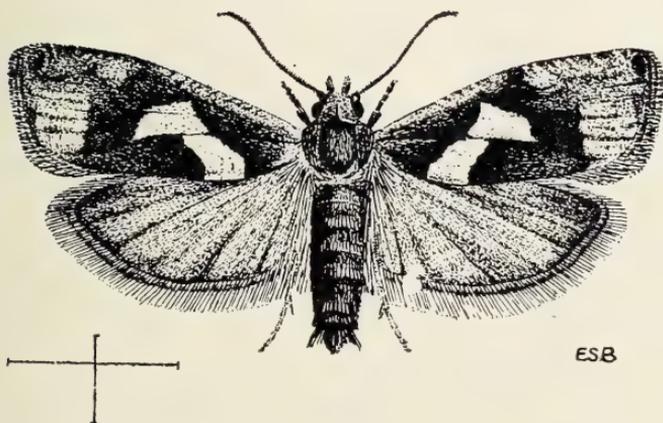
"The forewings are a dark chocolaty brown from the base to about two-thirds towards the apex. The other third is more greyish. The whitish patch leading from the inner margin and curving towards the inner angle is very much like a bird's head to me. In some specimens the light patch is very indistinct and faint.

"The specimens I have bred from the stems have varied in size from 18mm to 25mm long."

Do not throw away your Mugwort stems as soon as *E. foenella* emerges, as you may have a second species in them; this is the small *Dichrorampha*



ESB.

Cochylis roseana Haw.

ESB

Epiblema foenella Linn.

(*Hemimene*) *simpliciana* Haw., which comes out at the end of July and in early August. The stems further up may contain larvae of *Ostrinia* (*Pyrausta*) *nubilalis* Huebn. This is a common species in the Thames estuary, and I have taken it as far inland as Henley-on-Thames. The moths emerge in mid-June.

I find it best to leave all these larvae until the end of April, when they will have overwintered in natural

conditions and are easier to find, as the stems break off readily at the exit holes bored by the caterpillars. The teasels too can be left till the spring as the larvae, though fully fed, do not pupate till then; there is a risk, however, that the Goldfinches will have pecked out your larvae.

A method of collecting which was popular with past generations of entomologists seems rather to have fallen into disuse; this is the beating

of haystacks or thatch over a tray on mild days in late autumn or winter. Old stacks seem the most productive. Those made of straw which are so common nowadays may contain moths, but these are difficult to dislodge. The moths seem to congregate in favoured areas, and are most plentiful close to the ground. My district is too intensively cultivated to be very productive, but I have taken nearly twenty species by this method. This includes eight common species of *Depressaria*; also *Mompha subbistrigella* Haw., *M. fulvescens* Haw., *Endrosis sarcitrella* Linn. (*lactella* Schiff.), *Phyllocnistis suffusella* Zell., *Caloptilia* (*Gracillaria*) *stigmatella* Fab., *Epermenia testaceella* Huebn. (*chaerophyllella* auctt.), *Ypsolophus* (*Cerostoma*) *mucronellus* Scop. (*caudellus* Linn.), *Y. radiatellus* Don. and *Acrolepia pygmaeella* Haw.

Sometimes larvae fall into the tray. These are mostly the 'macro' *Caradrina clavipalpis* Scop. (Pale Mottled Willow), but I have also bred *Ephesia elutella* Huebn. from a larva so taken.

Beating branches of Yew trees (*Taxus baccata* Linn.) in winter can also yield several species of 'micro'. I have taken *Zelleria hepariella* Staint. and *Acleris* (*Peronea*) *cristana* Schiff. in the Bristol area by this method.

The nylon stockings discarded by the female members of your family have several entomological uses. The sounder sections make excellent sleeves for rearing larvae on growing plants; the material is the ideal covering for breeding containers; and if pupae are placed on a snippet, possibly in a loose fold, the emerging moths will find good footholds.

A. M. Emmet (1379).

The Hymenoptera Aculeata

Another season has come to an end,

and for those who study bees and wasps the only real occupation the winter offers is the identification of this year's captures and the planning of collecting trips and methods for next year, so I thought that I would deal with an identification problem here. I have often dealt with the social wasps in this series, but the solitary members of the family Vespidae are less well known and their identification has proved difficult in the past and is still not always satisfactorily accomplished.

We have in Britain twenty-one species of the sub-family Eumeninae, which is but a small selection of the species present on the Continent. In fact the group is typical of warmer climates and many of the British species are rare and confined to the south of England. The British species are small predominantly black and yellow wasps. They are commonly called Potter and Mason wasps, these names emphasising the use of mud in nest building, and they stock their nests with lepidopterous larvae, but otherwise there is considerable variety in the detail of their nesting habits.

The group is in fact a difficult one in that the characters on which a sound classification can be based are often difficult to see and appreciate, and equally the species are often difficult to separate. This has led to considerable confusion in the nomenclature of the group and this is by no means agreed on yet. All I can do here is to give a key to the genera as they were accepted by Yarrow (1943) and include notes on the species found in Britain and other generic names that may be met with in the literature. For those who want to pursue the matter further the most recent authoritative work on the European fauna is that of Bluthgen (1961). This includes all the British species, but the German is rather heavy.

Key to the British Genera of Eumeninae

1. First gastral segment petiolate, constricted apically, about half as wide as the second gastral segment . . . *Eumenes*.

—First gastral segment sub-petiolate, not or only slightly constricted apically, much more than half as wide as second . . . 2.

2. Propodeum evenly rounded, ventral shelf flat and at right angles to the posterior face, continued laterally into a ventral coxal shield. Tegula entire, evenly rounded posteriorly. Male antennae rolled . . . *Odynerus*.

—Propodeum with at least ventro-lateral carinae and lateral processes or, if these are absent, the ventral shelf makes an acute angle with the posterior face and is produced laterally into backwardly directed processes which appear toothlike in profile. Tegula emarginate posteriorly on the inner margin, thus appearing somewhat comma-shaped with the tail pointing posteriorly. Male antennae either simple or hooked . . . 3.

3. First gastral segment tuberously swollen at the apex. Propodeum without obvious lateral processes, but with the coxal shield appearing tooth-like in profile. Male antennae hooked or simple . . . 4.

—Apex of first gastral segment never tuberously swollen. Propodeum with well-marked ventro-lateral carinae and lateral processes. Coxal shield rounded in profile or only slightly projecting. Male antennae always hooked . . . 5.

4. First gastral tergite with anterior surface evenly rounded into dorsal surface. Propodeum with posterior and lateral faces evenly rounded and similarly punctured. Male

antennae hooked . . . *Microdynerus*

—First gastral tergite with a transverse ridge at junction of anterior and dorsal surfaces continued laterally to the apical swelling. Propodeum with a smooth, oval, dorsal depression; the lateral and dorsal faces very coarsely punctured in contrast to the smooth or weakly rugose posterior face. Male antennae simple . . . *Symmorphus*.

5. First gastral tergite with the anterior surface evenly rounded into the dorsal surface. Propodeum with ventro-lateral carinae and lateral processes, with or without an erect tooth-like lamina dorso-laterally, but with no obvious dorsal carina . . . *Pseudepipona*.

—First gastral tergite with an obvious transverse ridge separating the anterior and dorsal surfaces. Propodeum with a shield-like dorsal lamina continuous laterally with the ventro-lateral carinae, completely enclosing the posterior face . . . *Ancistrocerus*.

Eumenes Latr. Only one British species. The old *coarctatus* Linn. has been split up and our specimens are referable to the species *pedunculata* Panz.

Odynerus Latr. Five British species: *spinipes* Linn., *melanocephalus* Gmel., *reniformis* Gmel. and *simillimus* Mor. are referred to the genus *Oplomerus* Westw. by Bluthgen. The species *laevipes* Shuck. is placed in a separate genus *Gymnomerus* Bluthgen, and this will have to be accepted in the British list.

Pseudepipona D.T. Two British species: *herrichii* Sauss. our red-marked species, and *quadrifasciatus* Fab. This latter with its distinctive dorso-lateral laminae on the propodeum is placed in the genus *Euodynerus* Bluthgen, and this seems valid.

Ancistrocerus Wesm. Eight British

species: *parietum* Linn. *gazella* Panz. *trimarginatus* Zett., *parietinus* Linn., *antilope* Panz., *callosus* Thoms., *pictus* Curt., and *albotricinctus* Zett. I use here the names as given by Yarrow (1943). However, several will have to be changed to come into line with recent work.

Microdynerus Thoms. One British species, the smallest in the group, *exilis* H.-S.

Symmorphus Wesm. Four British species: *crassicornis* Panz., *elegans* Wesm., *sinuatissimus* Richards and *bifasciatus* Linn. These species are included in the sub-genus *Symmorphus* of the genus *Odynerus* Latr. by Bluthgen. Once again some specific names will need revision.

I hope this battery of names and threatened changes does not put anybody off studying this interesting group, as our species are in fact relatively easy to separate. I hope to cover the identification of the species of genera *Odynerus*, *Ancistrocerus* and *Symmorphus* in a future article.

Before I close, I have one request of my readers. If any of you have time during the long winter months, I would very much like to hear what type of articles you find most interesting and profitable. Over the past couple of years I have tried to cover the various aspects of observing, collecting and identifying, and comments from readers would be most welcome in planning future articles.

26.7.66 J. C. Felton (3740).

REFERENCES

- BLUTHGEN, P. (1961). *Abhandl. Deutsch. akad. Wissensch. Berlin*, 1961, no. 2: 251. Die Faltenwespen Mitteleuropas (Hymenoptera, Diptera).
 YARROW, I. H. H. (1943). *Hymenopterist's Handbook. Amat. Ent.*, 7: 55-81. Collecting bees and wasps.

London than Harrow that their local Lepidoptera populations have shown no great general decrease during the last few years. Unfortunately this is not the case here; in fact I can describe the decrease here only as catastrophic. I have no consistent light-trap records covering much of the period, but I have observed and collected in my home area for eleven years, with a lapse from 1959 to the first half of 1964 (inclusive), 'micros' being recorded only after this lapse (therefore the present conclusions can be drawn only from 'macros'). It seems that something nasty has happened to the Lepidoptera population here actually while it was not being properly recorded, as no marked decrease was evident up to 1958; it is still too early to say whether there has been further general decrease from 1964 levels, but there is clearly no continued sharp drop.

Even while not collecting and observing properly in the field, I did join Mr M. J. Hough for fairly frequent 'm.v.' sessions in his back garden in Stanmore. The records from these suggest that we had caught the tail-end of the population 'crash', as the numbers of individuals arriving per night during the first year (1963) were something like twice the numbers we have been averaging since then. I don't know of many species disappearing completely, although I have not seen *Pseudopanthera macularia* Linn. (Speckled Yellow) in its habitats in Stanmore and Harrow Weald Commons since 1958, and have not seen *Callimorpha jacobaeae* Linn. (Cinnabar) on my favourite disused railway embankment for almost as long. There is not enough space here to go into all the interesting details which have made up the gloomy picture, but there does appear to be quite a puzzle as to the causes of the decrease. One suspects insecticide residues, herbicides, and

FROM AN OUTER LONDON SUBURBAN AREA

I am pleased to hear from various people living much further out of

air pollution, but these will presumably result in a steady decrease in population—not the sort of ‘crash’ which appears to have occurred. Valuable habitats are being destroyed and built over, but there has been no sudden encroachment to account for the present observations. But there is one visible change which appears to have coincided with the decrease: the installation of electric-discharge street-lighting.

Whether there is really any causal relationship between the new street-lighting and the reduced moth numbers I don't know, and the situation could be clarified by people similarly summarising their records and seeing if any decrease in their moth populations coincided with the installation of new street-lighting.

Let us assume for the moment that the installation of these lights has caused the reduction in numbers. We should consider carefully how this has occurred. The more powerful lights might, for example, have attracted too many moths, which then fell prey to bats and birds. However, I have seen even less moths attracted to the sodium lights around the local Commons than to the old gas lamps they replaced. In this area there are very few roads lit by ‘m.v.’; in general major roads are lit by sodium lights, and the quieter streets by fluorescent strip lights.

That an increase in the lighting level in an area should cause an immediate ‘crash’ in numbers attending one particular light (e.g., Mr Hough's ‘m.v.’ light) is understandable, as there would be a lot of counter-attraction, and it is well-known that in order to be highly attractive a light source should be small and *isolated*. However, the fluorescent lighting in the vicinity of Mr Hough's light was switched on on 5th June 1963, and there was no sudden decrease in numbers then; it was not until the following year

that this became evident—and my field experience shows the drop in numbers to be more than apparent; even in the height of summer I normally fail to find any moths on the fences and tree trunks that would have yielded something like four to six species of macro alone on each excursion up to 1958 or so. I never see *Gonodontis bidentata* Clerck (Scalloped Hazel) or *Xanthorhoe fluctuata* Linn. (Garden Carpet) on our garden fences as I used to regularly up to about 1959, and the same comparative absence is noticeable for most other species: *Arctia caja* Linn. (Garden Tiger) and *Phalera bucephala* Linn. (Buff-tip) seem to have disappeared altogether.

One suggestion is that the high level of illumination, well shown in the well-lit sky over all of Greater London, is interfering with the normal nocturnal habits of the moths, and, even though they may still all fly, successful mating may be less general, and consequently less offspring would result.

If this is the case it could well be that populations gradually increase again, as those moths least affected by the increased illumination would be the ones to produce offspring, so that in fact a vigorous ‘natural’ selection would be occurring, resulting in the adaptation of the population to the changed conditions; some species would be less adaptable and would die out, leaving niches to be filled by other more adaptable (or just better-adapted) species. Certainly the lack of evidence of a continued drastic drop in moth populations gives hope that some recovery will gradually occur.

This would leave open certain questions. For example, why have butterflies and some day-flying moths also decreased? One should hardly have thought that slightly lighter nights would have affected them too. And not quite all species have de-

creased noticeably; *Hydriomena furcata* Thunb. (July Highflyer) is at least as common as it was, on the local commons, and *Erannis aurantiaria* Huebn. (Scarce Umber) has greatly increased (but its close ally, *E. defoliaria* Cl. (Mottled Umber) has correspondingly decreased); various other species too have not joined in the decrease.

I should be glad to collect information Members may care to send me on their local moth populations, and to try to find out more about what is happening. Unless we try to find out the causes of the present population changes we must accept part of the responsibility possibly for the eventual destruction of our insect population.

To end on a rather less gloomy note, I wonder how many people have taken the trouble to identify the 'difficult' *Procus* species that they encounter. It seems to be quite a done thing to put down just "*P. strigilis*" for want of anything better, and I have been guilty of this sin myself in earlier years. This year I am collecting samples of as many as possible (up to six per night) to be identified by genitalia in the winter. Already clear nonsense is made of the "*P. strigilis*" approach, as all the genitalia I have glanced at briefly, when pinning the moths, appeared to be *P. latruncula* Schiff. (Tawny Marbled Minor), although no doubt *P. strigilis* Clerck (Marbled Minor), and perhaps *P. versicolor* Borkh. (Rufous Minor), is present too.

12.7.66. P. A. Goddard (2206).

NATURAL HISTORY OF RENFREWSHIRE

The council of the Paisley Natural History Society and the Department of Natural History, Paisley Museum,

are collaborating in a complete re-survey of the natural history of Renfrewshire, last undertaken by the Paisley Naturalists Society almost exactly fifty years ago.

Since then a great many changes have taken place, and the purpose of the present joint undertaking is to bring our knowledge of all the county fauna and flora up to date; and to publish a series of handbooks on each subject, all of which will be available to the general public.

To this end a Central Survey Committee, with recorders for each subject, has been set up.

For entomology these recorders are: Mr A. M. McLaurin, Oldhall House, Kilmalcolm; and Mr Thos. Yeudall, 26 Abbey Road, Elderslie.

Any Member who possesses information, old or new, on any aspect of Renfrewshire natural history, or who can help in any other way, is requested to contact one of these recorders, or Mr F. R. Woodward, Deputy Director, Paisley Museum.

All communications will be answered, and full acknowledgement of all help received will be made when each handbook is published.

A. M. McLaurin (1282).

FURTHER NOTES ON COMMUNAL ROOSTING HABITS

Last year I recorded an instance of close-packed communal hibernation by the Small Tortoiseshell (*Aglais urticae* Linn.) and the Peacock (*Nymphalis io* Linn.) in a disused military pill-box (*Bull. amat. Ent. Soc.*, 24: 40). The point at issue was whether the butterflies were attracted by the merits of the selected spot in the shelter or were drawn together by a liking for each other's company. A further riddle was the disappearance of the butterflies by mid-winter. My

observations in the same pill-box last winter throw some light on these problems.

My first visit was on 25th October, when the building contained twenty-five butterflies grouped as follows: 16, 5, 3, 1. On 14th November the number was reduced to eighteen arranged thus: 13, 3, 1, 1; the previous group of five and the singleton had gone, and the two new singletons (both Peacocks) had taken up a position on the walls, all the remainder, both past and present, having been stationed on the ceiling. On 26th November the largest group had dwindled to eight, but the remainder had not moved, and this distribution still obtained on 11th December. By New Year's Day there were no butterflies left in the pill-box.

The fact that none of the butterflies was on or close to the spot where upwards of forty were assembled last year suggests that the insects are attracted to each other and not by the advantages of a particular location.

Last year I had been inclined to blame certain large 'well-liking' spiders for the decline in numbers and ultimate total disappearance of the butterflies (the *Bulletin* rendered the spiders 'well-looking' [misread manuscript—Ed.]). This winter another solution presented itself. My final visit was on a mild day after frost, and the whole ceiling was covered from wall to wall with large pendulous gouts of condensation. Such conditions could well prove intolerable to the insects, which might find themselves the nucleus of the globule. Moreover, they might account for the earlier migration of the two Peacocks (assuming they were not newcomers) from the roof to the walls.

A final point of interest is that the two Peacocks on the walls, on each of my visits, fanned their wings creakily when subjected to the beam

of my torch; no such reaction, however, ever came from any of the specimens of either species which were at rest on the ceiling. The latter, presumably, were reposing in the natural attitude for hibernation and were, therefore, in a deeper torpor.

A. M. Emmet (1379).

A NOTE ON THE GLANVILLE FRITILLARY

I was interested in Mr Wurzell's notes on the Glanville Fritillary (*Melitaea cinxia* Linn.) in Jersey given in his article in *Bull. amat. Ent. Soc.*, 25: 10. Firstly however I must disagree with Mr Wurzell in his suggestion that Jersey insects should be regarded as British. A glance at the map of France will show that the Channel Islands are not geographically a part of the British Isles.

Tutt (1896) in his book '*British Butterflies*,' wrote referring to *M. cinxia*, "It has been exterminated in recent years in Kent, on the undercliff at Sandown, and it has nearly met the same fate in other parts of the Isle of Wight. Most of the specimens which are found in collections made during the last thirty years have been caught in Guernsey and are therefore continental (French) specimens."

With regard to *M. cinxia* in the Isle of Wight today, the position is quite good. It is true that the butterfly has become scarce or extinct in some of the well-known haunts and a collector visiting the Island to look for *M. cinxia* in localities given in text books or old journals might well be disappointed. Unfortunately some of the Glanville Fritillaries old favourite haunts have also become favourite haunts of hordes of holiday makers and such ground-feeding species as *M. cinxia* are liable to be trampled out of existence. However, the

butterfly is still plentiful in some quieter and less known localities.

I am not surprised that Mr Wurzell found little variation in his Jersey specimens for they seem to have been very local and were probably all related. Here one can often notice a family likeness in the specimens of a colony such as tint of ground colour, a tendency to suffusion by dark scales, or a decrease in the upperside black markings. Colonies originating from a batch of eggs laid by a wandering female may often consist of inbred specimens.

For several years I have reared *M. cinxia* and have had no difficulty in approaching 100% success with F2 generations. Unfortunately my efforts have so far failed to produce any outstanding genetical aberrations, but one good feature is that I have been able to release a large number of specimens. *M. cinxia* seems to suffer little from parasites but I have had parasites (*Apanteles* sp.) occur in larvae which have been wintered outdoors on potted plantain (*Plantago* sp.). An attempt to form a small colony of *M. cinxia* in my garden on a planted area of foodplant was unsuccessful for the larvae were taken by Blackbirds (*Turdus merula* Linn.).

This year we have had very mild weather from late January so I was not surprised to find *M. cinxia* larvae feeding in the wild state as early as March 5th.

19.3.66. T. D. Fearnough (3966).

REFERENCE

TUTT, J. W. (1896). *British Butterflies*. Swan Sonnenschein, London.

[Mr Fearnough's address is 26 Green Lane, Shanklin, I.O.W.]



AN AFTERNOON AT DUNGENESS

On May 27th I went to see the R.S.P.B. bird sanctuary at Dungeness.

Near the sanctuary is a small lake, surrounded by shingle, on which grow small clumps of blackberry (*Rubus fruticosus* agg.) and Lesser Bulrush (*Typha angustifolia* Linn.). About ten yards from this lake is a thick hedge of willow (*Salix* sp.).

I was unsuccessful in finding larvae of the Grass Eggar (*Lasiocampa trifolii* Schiff.), which I had hoped to see, but I was able to find ten species of larvae in less than an hour.

Many of the willows had been completely defoliated by larvae of the Brown Tail moth (*Euproctis chrysorrhoea* Linn.), the majority of which had only just left their webs. There were also two webs of Lackey moth caterpillars (*Malacosoma neustria* Linn.), the largest of which contained over five hundred young larvae about a quarter of an inch long.

Larvae of the White Satin moth (*Leucoma salicis* Linn.) were common, and I saw several larvae of the Gold Tail moth (*Euproctis similis* Fuesell.) and the Vapourer moth (*Orgyia antiqua* Linn.) on the willows.

I found four Dark Tussock larvae (*Dasychira fascelina* Linn.) feeding on blackberry, two of which were nearly full grown. An Oak Eggar larva (*Lasiocampa quercus* Linn.) was crawling across the shingle, probably looking for a suitable place to pupate, as it made its cocoon shortly afterwards. Several Garden Tiger larvae (*Arctia caja* Linn.) were enjoying the sunshine.

There were one or two larvae of the Drinker moth (*Philudoria potatoaria* Linn.) on the Lesser Bulrushes also taking advantage of the sunshine, but they were much smaller than I expected them to be; I think they must be more backward than the ones found around Penzance.

There was a large colony of Six-Spot Burnet moths (*Zygaena filipendulae* ssp. *anglicola* Tremewan). Nearly all of them were in the cocoon stage, but there were one or two larvae.

Most grass and reed stems had at least one cocoon attached; one had seven on it, and several more stems had six!

Although I found nothing more on the bird reserve in the way of Lepidoptera, I regard that day's collecting as very successful.

4.6.66.

I. S. Finlay (3484J).

BREEDING THE MUSLIN MOTH

On May 20th, 1964, I boxed a female *Cynia mendica* Clerck (Muslin Moth) which I found resting in the herbage of a Worcestershire lane, and on arrival home found a small batch of ova had been deposited in the box. I set the moth, transferred the ova into a glass-topped box for hatching and then proceeded to look up any notes or articles on breeding this species from ova. However, my volumes of the *AES Bulletin* from 1956 onwards yielded no reference to *C. mendica* apart from occurrences of the imagines and my text books gave no useful information on rearing this moth, so I awaited the hatching of the ova with only the knowledge of the foodplants and the month of emergence.

On May 30th the ova all hatched successfully and the young larvae commenced to feed on the leaves of *Taraxacum officinale* Linn. (Dandelion). Growth was rapid and the larvae very active and healthy. They were transferred to a cylinder cage after a week and by mid July they appeared to be fully fed. It was during this stage that I was forced to leave the larvae to their own devices for a few days, so I covered the bottom of the cage with a quantity of dry peat, provided plenty of Dandelion leaves and left them to it. A few days later I found no sign of the larvae on the

foodplant but when the peat was examined a solid mass of cocoons was found. The larvae had all chosen the same spot in which to pupate, with the result that I was left with a small mat of cocoons and peat which lifted out of the cage in one piece.

The next stage was to provide winter quarters for the pupae. A wooden cage with a sliding glass front was selected and a small dish of water placed on the floor of the cage. A sheet of perforated zinc was placed on top of the water dish and the mass of pupae laid on the zinc. The cage was then put into a shed to await the spring. The water dish was kept filled at all times even throughout the winter, as I have found from past experience that pupae of the Arctiidae dry up very easily.

Early in April the following year I prepared a cylinder cage with a two inch layer of damp peat in the bottom container, and the mass of cocoons was placed on the peat. On April 24th the first male emerged followed by two females. The cage was kept in the kitchen so this would account for the earlier than average emergences. Within the next three days the rest of the moths emerged. Only two pupae failed to produce moths and these were found to contain fully formed dead moths. The sex ratio was very unequal, five males to eleven females, but of course the brood was incomplete and probably less than ten per cent of the total batch of ova normally laid. Four of the females were heavily marked with black spots on the forewings, the hind margin spots forming a bar, and I had no difficulty in pairing one of these females with a male.

The pairing resulted in a large batch of fertile ova that hatched on May 12th 1965. Two weeks later I found the size of the brood far too large to handle in my very limited spare time so I selected fifty larvae and released the rest to fend for

themselves. To cope with the frass problem I found tissue handkerchiefs placed on the cage bottom very useful. Disposal of frass was made quick and easy by simply removing the tissue from the cage each morning and putting in a fresh piece. However, a dozen of the larvae were found one morning busily engaged in spinning their cocoons within the folds of the tissue, so I decided to use this material instead of peat. Possibly it would keep the pupae separated to a certain extent and avoid the inconvenience of mass pupation. Several layers of crumpled tissues were introduced into the cage and the larvae left to pupate.

A fortnight later the cage was opened and the tissue carefully removed. I expected to find fifty neat cocoons within the folds of the tissue but only eleven larvae had spun cocoons, five had died and thirty-one had pupated in the folds of the tissue without attempting to construct a cocoon at all. The overwintering cage was prepared as before, a layer of peat being placed on the perforated zinc tray for the benefit of the unclothed pupae.

In mid April this year the emergence cage was prepared and the pupae put in. The first emergence, of a male, occurred on May 1st, followed by the emergence of two females on the 2nd. Four females and one male emerged on the 6th, all eight from cocooned pupae. From 7th to 16th May more moths emerged but only one female from the uncocooned pupae managed to expand its wings. The rest that did emerge were hopelessly crippled. Of the nineteen pupae that failed completely, five were found to contain fully formed dead moths and fourteen were just empty shells. None of the females displayed the heavy spotting of the parent, in fact the markings were extremely light and as I failed to obtain a pairing from any of the moths

no conclusions can be drawn as to the cause of the heavy spotting in the first brood. It seems likely that the markings are genetically controlled and had an F2 generation been bred, the heavy markings, if recessive, would have again appeared. The pupae experienced no violent temperature changes in either brood during the forming up period, in fact conditions were very similar for both. Emergences of healthy moths always occurred between 8 a.m. and 10 a.m. though it was interesting to note that the cripples emerged at all hours of the day.

As the last brood was only the F1 generation, I do not feel that the race could have weakened so quickly from inbreeding, and the fact that the cocooned pupae produced perfect imagines does point to the possibility that the cocoon is a very necessary part of the moth's well-being. The question is, why did so few of the ill fated F1 generation fail to provide themselves with a cocoon?

Any comments on this or allied species would be very welcome.
21.5.66. W. J. Tisbury (2717).

BREEDING NECROPHORUS HUMATOR

A pair of *Necrophorus humator* Goeze was first obtained on 17th April from under a dead fox in Chalk Wood, Bexley, Kent. On returning home, a biscuit tin 12" x 12" x 6" deep was half-filled with earth. A frog, killed the week before and left in the garden under a large stone, was used as carrion. This was placed in the tin with the beetles.

The next day the frog had been rolled into a rough egg shape and was lying in a shallow pit about one inch deep. Two holes in the carrion showed that one or both of the

beetles had made a meal of it during the night.

Nothing more specific was seen until 14th May when fourteen first instar larvae were found feeding and jostling each other around a hole the size of a pencil. It is about this time that the female may be aggressive towards her mate and drive him off, as was found to be the case. The female was found in a shaft under the carrion while the male was in a shaft in one corner of the tin.

By 24th May the larvae were one and a half inches long and all that remained of the frog were the bones, the larvae showing no further interest. Two days after this the male killed and partly ate the female.

Later the larvae were removed from the tin and the garden earth and carrion tipped out and the tin washed with boiling water. Clean, dry peat was then placed one inch deep in the tin and the larvae put in. The wriggling of the hind part of the larvae soon formed a pupa chamber. The first pupa emerged on 5th June and the rest at intervals of a day or two. The first imago emerged on June 16th and the last on June 29th.

All were rather small due, I think, to insufficient size of the carrion.

I hope these notes will be of use to those about to breed *N. humator*, although its breeding is not for the squeamish!

2.7.66. K. C. Lewis (3680).

SCOTTISH COLLECTING NOTES 1966

It is hoped that the following account of the varying degrees of success I had with 'sugar' during my holidays in west Scotland from 9th to 24th July 1966 may be of some interest.

On Friday 9th July I arrived with

my family at a point near Moffat, Dumfries-shire about 4 p.m., and it was sunny but with a fair N.W. wind. Chimney-Sweeper Moths (*Odezia atrata* Linn.) were flying in the sun. My two boys found a Plain Golden Y (*Plusia iota* Linn.) among bracken on a hillside. The weather rapidly deteriorated, the wind reaching gale force and bringing with it rain, so I did not venture forth after dark.

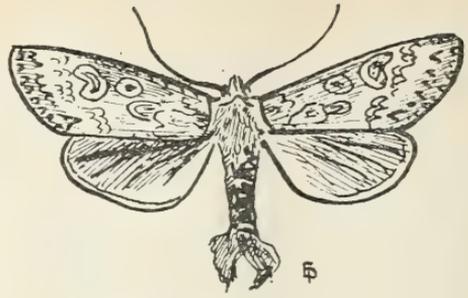
Saturday found us at Doon Loch in Ayrshire. There had been bright periods during the day but these gave way to rainy weather as darkness fell. This did not deter the moths, which came in fairly steady numbers to palings which I had sugared on a ridge in a moor. I had concentrated on half a mile of paling and then went across the moor to where an iron railing fenced off the road for a short distance. Although I put 'sugar' on this railing it yielded nothing. On the posts along the ridge I took the Small Angleshades (*Euplexia lucipara* Linn.), Knot Grass (*Apatele rumicis* Linn.) and a number of other species which are awaiting identification.

One of the best nights I had sugaring was Sunday 12th at Turnberry Bay, Ayrshire. After a day of practically non-stop torrential rain, it blossomed into a lovely evening. There was not a breath of wind and as dusk fell the air became alive with insects. I had sugared about half a mile of wooden fenceposts separating a weedy field from the beach. Here the moths swarmed greedily, but they were mostly Dark Arches (*Apamea monoglypha* Hufn.) although the Gothic (*Naenia typica* Linn.), Small Angleshades, Marbled Minor (*Procus strigilis* Linn.) and Middle-barred Minor (*P. fasciuncula* Haw.) were among others present.

The rainy weather stayed with us through Glasgow and Loch Lomond to Fort William. Then on Thursday 14th July the sun shone and we camped in Glen Nevis, Inverness-shire.

On the slopes of one of the mountains, Small Pearl-bordered Fritillaries (*Argynnis selene* Schiff.) flew. They were mostly rather worn specimens, indicating that they had been on the wing for some time. Chimney Sweepers were numerous too. I climbed to about 2000ft, looking for Small Mountain Ringlets (*Erebia epiphron* Knoch), but without success. Chimney Sweepers were more numerous than ever at this elevation. Every now and then a large grey moth would be surprised from its position on a rock face. These moths were very difficult to net, however, being swept away down the mountain when raised, so I did not catch any. I think they might have been Mottled Beauties (*Alcis repandata* Linn.), however, for I caught a moth of this species at sugar the same night. I also took a perfect specimen of the Peach Blossom (*Thyatira batis* Linn.) at sugar about 1 a.m. when most other moths stayed away. As dusk fell Small Emeralds (*Hemistola immaculata* Thunb.) appeared from the Alder trees (*Alnus glutinosa* (Linn.) Gaertn.) bordering the River Nevis, and I netted a number of them as they flew among the foliage. In all, four nights were spent in Glen Nevis, but as far as sugaring was concerned things were disappointing. Double Dart Moths (*Graphiphora augur* Fab.) were the commonest insects at sugar.

Our next camping site was near Portree, Isle of Skye. On the first of two nights which were spent on the island I sugared telegraph poles along the main road. Only Dark Arches moths came. On the moors a vast emergence of Magpie moths (*Abraxas grossulariata* Linn.) was taking place. Insects seemed to flutter from every heather clump. These moths became rather a nuisance after dusk as the air seemed full of them. They had apparently fed on Ling (*Calluna vulgaris* (Linn.) Hull), and many unhatched pupae were found thereon.



SILVERY ARCHES
Isle of Skye



PEACH BLOSSOM
GLEN NEVIS

The second night of our visit to Skye was spent near Kyleakin. Here I sugared trees at the edge of a coppice and the commonest moth at the feast was the Silvery Arches (*Polia hepatica* Clerck). Also taken were two Peach Blossom moths, but one of these was in rather poor condition. Double Dart moths were plentiful here too.

The last two days of my holiday were spent in the Inverness district where I hunted for the Scotch Argus (*Erebia aethiops* Esp.) in vain—I was too early. A return visit is planned for the second week in August. Very few moths were taken during these last two days although the weather appeared to be favourable for sugaring.

During the time I was on holiday the difficulty of transporting specimens arose. I had half a dozen setting-boards with me on which the best of the insects were set. Then I stowed

the boards in a recess under the car's back seat and they were quite safe until I returned home. The remainder of the insects are packed in boxes between layers of cotton wool waiting to be relaxed at a further date.

E. Pickard (3928).

• 'TO SEE OURSELVES . . .'

"There's a Red Admiral", said the middle aged woman to her companion, perhaps purely for reasons of conversation, but more likely to try to impress the unusual fellow with the butterfly net. The creature was in fact a Small Tortoiseshell—"Red Admiral" to the layman being a term which embraces not only *Vanessa atalanta* but any butterfly which is brown or red, the remainder of our fauna being, in the vernacular, 'The Cabbage White', 'Blues', 'Coppers', and others are classed as moths!

The amazing ignorance of the vast majority about these beautiful little creatures which enhance our countryside is difficult to understand at a time when the cult of Victorian eccentricity is being prolonged in the tastes of the very people to whom the creatures are most foreign. Perhaps at no other time was acquisitiveness, in all its forms, so much a characteristic of the contemporary citizen as in the 19th century. Not only were collections of stamps, coins and match-box labels part of the household, but the accumulation of clocks, ornaments, plants, skeletons, stuffed animals and *objets trouvés* was considered as much part of the Victorian society as loyalty to the Queen and church-going. The collecting of butterflies had been thought of as a pursuit indulged in by the eccentric few, but in the 19th century it was not unusual to witness the combination of clerical collar and butterfly net.

Today, the sight of a butterfly net rarely fails to stimulate some comment from those who happen to pass—that is if they realise you are not catching fish. Firstly, to be sure of your aim, 'What on earth are you doing?' Then you have to explain the operations of killing, pinning and setting and what happens when they are set. Finally, an unimpressed spectator poses the devastating question, 'Why?'—a question more difficult to answer than to recite the 'British List' in reverse order. The less inquisitive pass by politely ignoring my activities — but stealing a glance at the spectacle when it's thought that they won't be noticed, while the would-be comedians think I'm catching elephants.

Then there is the General who reminisces about his exploits in the 'Australasian Archipelago' and his encounters with the Hesperiid *Euschemon rafflesia* and his interest in its retention of the frenulum, or of his twenty mile trek through the Primæval jungles of North Queensland to capture *Ornithoptera priamus*—all of which is very impressive but he could probably not distinguish a Meadow Brown from a Scotch Argus.

My activities on the Continent, however, were greeted by a more genuine interest or sincere admiration for my pursuit, for, not infrequently have I been wished "*Bonne chasse*" by the strangers — though my limited command of the French language may have preserved me from derogatory comment.

The dress of the contemporary entomologist doesn't attract attention as did that of our ancestors who would sport unusual cork-lined bowlers, baggy pants and a 'wild' bow tie. To be in vogue in 1966 it seems that we must strive for the David Attenborough look — strong 'khaki' shorts (no less than six inches above the knee), green or 'khaki' shirt with twin breast pockets, knee length

socks, no hat, all purpose shock proof, waterproof and antimagnetic watch (showing time, date, temperature and barometric pressure), cine camera with close-up and telescopic lenses and aluminium and nylon kite net.

But is it not fortunate that so few take a pride in amassing large numbers of our butterflies in glass cases? For if as many members of the human race sported a butterfly net as do fishing rods, the days of our favourite insects would surely be numbered. So be thankful for that unusual look, that passing remark, the mild amusement that our hobby so frequently attracts, for it is to them that we owe the very existence of the things we affectionately call butterflies.

8.1.66. George Thomson (3689).

A WARNING

I view with deep concern the detrimental effects on our insect population of the destruction of habitats and the use of insecticides and herbicides. This concern I share presumably with all amateur entomologists at least. An increasing number of very well-meaning people, however, are considering breeding insects and releasing them to reinforce our fauna, and this I most earnestly warn against, as the long-term effects of this would probably be disastrous to the very insect species we are trying to preserve.

One must remember that each species existing today does so as a result of the most intensive genetic selection (in general only one pair surviving from each pair, even though hundreds or even thousands of eggs are laid by each female.) Each adult insect which survives to reproduce is thus in general the best-adapted to

its environment out of a whole brood; it may have survived just by luck, but in most cases it will be the best adapted in some way: possibly the toughest, or the best camouflaged, or the least attractive to certain parasites, and so on.

When you rear a lot of larvae from a batch of eggs and release the adults in large numbers you are helping to preserve the undesirable genetic traits, and eventually you will dilute the comparatively well-adapted individuals in the wild with a lot of less well-adapted ones, which under natural conditions would not have survived to compete with the wild ones.

The less well-adapted individuals and virtually all of their offspring will eventually die out, having caused at the same time a reduction in the original wild population owing to dilution, and even to downright competition. So you end up with less wild insects, not more.

This refers, of course, to attempts to reinforce existing species; the attempted introduction of a species is a different matter which I am not commenting on at the moment.

But you *can* do something positive: you *can*, and should, join in the present campaigns against destruction of valuable habitats and against the insufficiently-controlled use of agricultural chemicals.

How? Are you a member of your local Naturalists' Trust? There *is* one, so if you aren't, join it. If you aren't a member of your local Natural History Society, join that too. These organisations have *influential* voices, to which you can add yours; they are taking active measures to help save our countryside, but their effectiveness will depend on how much support each one of us gives to this work. You can stop mourning the gradual destruction of our insect fauna and do something constructive to save it.

13.5.66.

P. A. Goddard (2206).

THE STUDY OF SPIDERS

Part IV

In my last article in this series I said that I would describe some of the Linyphiids you would be sure to meet with during your first season, with the proviso that you might perhaps have some difficulty in spotting some of them! The reason for this is because the vast majority are extremely small, the greater proportion of them being 2mm. or under in total length.

The 227 species comprising the family Linyphiidae make up more than two-fifths of all our native spiders. More diversity of form, colour and habit may be observed in this group than in any other, at least as far as British species are concerned. In size they range from the tiny *Glyphesis cottonae* La Touche, which is under 1mm. in length, to the largest member of the group, *Linyphia triangularis* Clerck (6mm.) Only one or two of the other species approach this size, the great majority belonging to the sub-family Erigoninae, which consists of the tiny so-called 'money-spiders' that drop on us and run over our clothes during summer picnics.

The classification of the Linyphiidae presents considerable difficulties for the beginner, owing to their extreme diversity. The novice is advised to base his groupings fairly broadly at first, and then gradually, as he gains more experience, to sub-divide the two main sub-groups into smaller and more compact units for critical classification.

The family Linyphiidae is divided naturally into two main sub-divisions, the Erigoninae and the Linyphiinae. The chief general difference between the two sub-families apparent to the beginner is that the Linyphiinae are, in the main, larger spiders, usually with more or less clearly-defined abdominal patterns, while the Erigoninae are mostly very much smaller,

their average length being between 1mm. and 2mm. These little spiders usually have shiny black bodies with no abdominal pattern.

Habitat differentiation is not a reliable guide either, though it could be said with some degree of truth that a good many of the Linyphiinae are more usually found in bushes and shrubs in woods, where most of them spin conspicuous sheet-webs, while the Erigonids, though also frequently met with in the open, usually spend a greater amount of time in concealment, and show a considerable predilection for hiding under stones and rocks, rotten logs and leaf-litter. The Erigonids make up more than two-thirds of the group, though since many of them are extreme rarities or are very local or otherwise restricted in distribution, the beginner will probably find more of the Linyphiinae to start with, as these are usually larger and therefore more conspicuous.

Superficially a good many of the Erigoninae look very much alike, but under the low power of the microscope physiological and structural differences immediately become apparent; in fact some of these features form the only reliable guide to differentiation between the species.

A very important characteristic to look for, both in the Erigoninae and in the Linyphiidae, is the number of spines on the legs. These vary according to a kind of 'formula' in which the first, second, third or fourth pair of legs, as the case may be, are furnished with, usually, one, two, three, or occasionally four, spines, or in some cases may be devoid of spines altogether. Various genera and sub-groups have characteristic 'formulae', which it is usual to refer to as, for example, '1-3-2-2', '1-2-2-1', and so on. This is not a Chinese puzzle—it is simply a statement, in numerical form, of how many spines may be found on each leg, counting from the first to the fourth pairs (the actual number

of spines in the formula refers to one leg, of course, from each pair). By counting the spines and noting how many are present, it is possible (you hope) to separate the Erigonids down to at least sub-group, or even genus in some cases, though one may come a cropper when finding that several genera have the same number of leg spines. Still, that's all part of the fun.

As if that were not enough, to complicate matters still further we have the *trichobothria*—or rather, they have. These are like leg spines but are much finer, and each is set into a circular depression at its base. In the same way as spines, *trichobothria* also follow a formula consisting of a fixed number for the genus or sub-group concerned. The difficulty crops up when you are trying to sort out spines from *trichobothria* on a leg belonging to a specimen whose entire body is under 1mm. in length. Without a microscope this task is, of course, impossible, though in the case of the larger species a $\times 10$, $\times 15$ or $\times 20$ hand lens can be of some use in the field.

The number of leg spines and *trichobothria* varies so tremendously between one genus and another that the only really reliable way to use this feature as a guide is to study a key. What makes things so difficult is that the number of spines and *trichobothria* cannot be used as a differential feature for separating the Erigoninae and the Linyphiinae; the formulae for these overlap from one group into the other.

Once you have managed, however, to group your specimen reasonably accurately, you can now turn to the main distinguishing feature on which final critical identification depends. This is the form of the male palp, or the epigyne in the case of the female. The latter is usually far more difficult to differentiate than the former, but even this can present considerable difficulties on account of the fact that

its appearance can vary greatly according to the angle from which it is viewed. However, it is essential to be able to recognise minute differences in structure, since no two species are alike, although the palps of some closely-related species may be superficially similar.

This differentiation of the palpal structures is responsible for the fact that inter-specific breeding in spiders is an exceedingly rare occurrence, and in the very few authenticated records where it has been known to occur between closely-related species the resulting ova (if any) were invariably infertile. However, be this as it may, the most useful aspect of the matter is that the differences form an infallible guide to identification, though admittedly this does require a good deal of practice, especially where the smaller species are concerned.

The usual method employed for examining the genitalia of spiders is to place the specimen in alcohol on a slide under low power, $\times 45$ being usually the best to use. A powerful light must be directed on to the specimen from above, and in the case of the male the palp may be manipulated with a fine-pointed dissecting needle to arrange it into a position suitable for critical examination. In practice, however, it is not always necessary to kill the specimen first; in fact I very rarely do so, as my particular aspect of spider study is the observation of their behaviour, which I can hardly do with dead specimens! I find that the use of cavity slides and thin cover-slips obviates the necessity for killing the specimen, as a small spider will fit comfortably in the cavity with room to spare, the cover-slip preventing its escape. The spider will usually run round and round at first, but eventually settles down, when it can be examined at leisure. The bright illumination from the lamp tends to disturb some species,

but has the opposite effect on others, which can be examined without difficulty.

The standard reference work, essential for identification, is 'British Spiders' (Vols. I and II), by G. H. Locket and A. F. Millidge (Ray Society), which contains a series of keys for each of the twenty-four families, as well as full and detailed descriptions and text figures of the male palp and female epigyne of every species on the British list. Vol. I is out of print and difficult to obtain, but most of the larger natural history societies' libraries have a copy. Vol. II is obtainable from scientific booksellers or from the publishers. Other books I have listed in the References describe various aspects of the behaviour, ecology and distribution of British spiders.

I shall now describe a few typical members of the family, starting with the numerically superior Erigonids.

The Erigoninae resolve themselves naturally into several sub-groups, the first of which comprises species characterised by the curiously attenuated and sometimes grotesque heads of the males. The most striking of these is *Walckenaera acuminata* Blackwall (2mm.), whose head is elevated into a slender tower-shaped structure which bears pairs of eyes not only at its tip but arranged around the middle and also at the base.

This spider is said by some authorities to be 'found commonly' in the northern parts of Britain, occurring 'less frequently' in the southern counties. I have never found it myself either in the north, the south, or indeed anywhere else; this was certainly not for want of trying. I have searched assiduously for it in a number of suitable localities without success, but one of you no doubt will turn it up the very first time you go out spider-hunting.

Another species even smaller—under 2mm.—to which the same

remarks could well apply is *Savignia frontata* Blackwall, which also has the head of the male raised, though not to anything like the same extent as that of the previous species. A much commoner and universally-distributed species which is sure to come your way rather sooner than later is *Diplocephalus cristatus* Blackwall, about the same size, which is very similar to the foregoing in general appearance, and may be readily distinguished by the head being divided into two lobes, hence the generic name. I almost invariably find numbers of these on every collecting-trip, and have even found it indoors on the window-ledge!

Along with this last-mentioned species one nearly always finds the exceedingly common *Bathypantes* species, of which there are several; many of them can only be distinguished with any degree of certainty under the microscope. One of them, *B. dorsalis* Wider (2mm.) is easily recognised in the female by a long slender process projecting from the epigyne; the male may be recognised by his very large prominent palps, which look far too big for the rest of the body.

Another very common genus is *Oedothorax*, which also contains several closely-related species, one of the commonest being *O. fuscus* Blackwall (2mm.), which frequently turns up along with the even commoner *Meioneta rurestris* Koch (1.5mm.). All these spiders are very small, with shiny black bodies, and are most successfully looked for in grass and among low vegetation in meadows, the undergrowth of woods and hedgerows.

In the same sub-group we have the genera which are more partial to stony and rocky places. Many of them spin tiny sheet-webs only a few millimetres in diameter on the under-surfaces of rocks or across small depressions in the soil. I have seen

them spun across the impressions left in the mud by horses' hoofs. A good many of them are found only in northern Britain, several of them occurring only in the Highlands of Scotland. Eleven different species of Erigonids have been recorded from the summit of Cairngorm, just above the 4000ft line; these include *Hilaira frigida* Thorell, *Oreonetides vaginatus* Thorell and other rarities.

A day's collecting on the Cairngorm is an exhilarating experience: you ascend by the chair-lift, from which you have the most fantastic view across the mountains, Loch Morlich shimmering a deep blue in the haze far below, surrounded on all sides by seemingly impenetrable pines of Rothiemurchus and Queen's Forests. After a strenuous afternoon overturning frozen slabs of rock, some of which weigh anything up to 150lb., you begin to feel peckish; laden with your tubes full of specimens you make your way down to the chair-lift station, where there is an excellent cafeteria. At the risk of sounding like a television commercial, I can confirm that hot Bovril is never so good as when steaming on the table there as you come in from the crisp snow, and look through your pocket magnifier at the species you have obtained—species you will never find at lower altitudes.

Those of us who are more earth-bound and have no head for heights can do very well indeed looking for the larger and more conspicuous species which comprise the sub-family Linyphiinae, which are mainly denizens of the woodland. The most ubiquitous, as well as being one of the most beautiful, is *Linyphia triangularis* (6mm.), the largest of the group, which is distinctively marked with a row of overlapping triangles, usually chocolate-brown in colour, down the middle of the abdomen. The sheet-web of this species is a conspicuous feature of every bush; in one 6ft

square transect in our local woods I once found no fewer than thirty-six of them! The sides of the abdomen should really be looked at through a hand lens to appreciate the incredible beauty of the mottling in shades of coffee and cream, setting off in sharp contrast the clear-cut pattern of triangles on the dorsal surface.

Almost as common is *L. montana* Clerck (6mm.), which inhabits the same situations. I have found it equally abundantly in damp pine forests as in drier deciduous woodland; but its abdominal pattern is more in the form of a chocolate-brown folium, which is, in fact, rather similar to that of *Zygiella*. When I was a raw beginner I always used to get these two mixed up, but after gaining some experience I soon learned to recognise the typical Linyphiid shape, which is characteristically different from the shorter and stubbier *Zygiella* which is, of course, an Argoioid.

The genus *Lepthyphantes* is a distinctive group of species, closely related to the genus *Linyphia*, whose members are mainly woodland dwellers with similar habits. Most of them are smaller than *Linyphia* species, but still large enough to enable the novice to recognise their grouping immediately in the field by their abdominal patterns.

Lepthyphantes zimmermanni Bertkau is strikingly marked with oblique black stripes converging to a point in the centre; the posterior end of the abdomen is also more pointed in this species than in the others. *L. tenuis* Blackwall, as its name implies, is much more slenderly-built than its congeners. *L. pallidus* O. P.-Cambridge is, when fresh, quite a brilliant orange. All these species are about 4mm. in length.

Another easily-recognised Linyphiid is *Stemonyphantes lineatus* Linn. (= *trilineatus* Blackwall) (4.5mm.), whose specific name indicates its abdominal pattern of three longitud-

inal stripes; these stripes are, however, sometimes broken up into what may be more accurately described as dotted lines. This species breaks the rules and comes indoors quite a lot, where it seems to find quite a congenial home on window-ledges and the like. I have found it in the most diverse habitats, ranging from woodland to garden sheds and even our local bus-shelter, which houses quite a colony.

Several Linyphiids are extremely specific in habitat, choosing more unorthodox locations such as moles' nests, anthills and rabbit burrows; one species is found exclusively in the nests of sea-birds on cliff ledges and seaweed-covered rocks! The ant colonies which harbour the myrmecophilous species tolerate their tenants with impunity, not molesting them in any way as they wander about the corridors and chambers of the nest of their hosts, consuming Collembola, Thysanuroids and other small soil-dwelling invertebrates.

In a journal of this size it is, of course, impossible to describe with anything even approaching adequacy a family of this size. This account may be best described as a short introduction to the Linyphiidae, intended to give some idea of the tremendous scope afforded by this family, about which the books referred to in the References may be profitably consulted.

In my next article in this series I shall describe some of the jumping spiders or Salticidae, which, fortunately for the beginner, number only thirty-three species!

Joy O. I. Spoczynska, F.R.E.S., F.Z.S.
(751).

REFERENCES

- BRISTOWE, W. S. (1958). *The World of Spiders*. New Naturalist Series. Collins, London.
 LOCKET, G. H. and MILLIDGE, A. F. (1951-3). *British Spiders*; vols. I and II. Ray Society, London.
 SAVORY, T. H. (1928). *The Biology of Spiders*. Sidgwick and Jackson, London.
 — (1945). *Spiders and Allied Orders of the British Isles*. Wayside and Woodland Series. Frederick Warne, London.
 — (1952). *The Spider's Web*. Wayside and Woodland Series. Frederick Warne, London.

ENTOMOLOGICAL WELDING

When I was filing back AES *Bulletins* I noted an article by Mr A. M. Freebrey (3359) in the *Bulletin* for February 1963. He described a method of mending an insect's wing by putting drops of entomological glue along the tear.

I then thought up another method which may well be better especially with the more delicate insects.

Fix a polythene covering to an ordinary setting-board with drawing pins, allowing a sag to accommodate the insect's body. Spray the polythene with a silicone mould release agent (*Amberoids* do one in an aerosol) and leave it to dry. This takes some time. The polythene protects the setting-board and of course nothing much will stick to it.

Dilute some polyurethane varnish with the correct thinner and place in a laboratory 'Quickfit' spray flask. Pin the insect to be repaired on to the board, with the bits to be joined close together. Then spray the wing with varnish, which may be allowed to harden. Move the insect after ten minutes to make sure that it is not sticking to the board and leave overnight.

This method will not stick whole wings back but does work well with the more delicate tears. It is better to apply the varnish to the underside as some transparence occurs. A few trial runs on cabbage whites will help to perfect technique.

The silicone release agent could probably be replaced by a motor-car H.T. lead-proofing aerosol, and the spray by an old scent spray or even by a lacquer aerosol!

I would be interested to hear from Members who experiment with this method to see if any improvements can be put into practice.

27.2.66. Brian Sheen (2596).

COLLECTING IN NORWAY

Towards the end of July 1965, after I had taken my 'O' levels, my father and I set off for Newcastle, and thence by boat for Bergen, arriving on the 16th.

After disembarking, and passing through customs, we drove into Bergen itself. It was really hot, quite unlike cold Newcastle we had left the previous day.

Later that afternoon we motored a few kilometres and were soon in mountainous country. Parking the car in a suitable spot we walked through pine woods, by the side of a small stream. Surprisingly I saw few insects and caught only a male and female of the Dark Marbled Carpet (*Dysstroma citrata* Linn.).

In the evening, after returning to the hotel, we took the cable car to the top of Mount Ulriken, where we took a pleasant walk. At the hotel again we stayed up till eleven o'clock but as it refused to get any darker we went to bed.

The next day was just as hot as the first, and we went up Mount Ulriken once more. Walking along the well-signposted mountain paths, I caught several transparent Burnets (*Zygaenidae*) and several types of 'Micros.' In the afternoon we sampled some of the country south of Bergen. In a spruce plantation by the side of the road I caught several *Argynnis euphrosyne* Linn. (Pearl-bordered Fritillary), and *Boloria alethea* Hemming. I also saw a large brown butterfly, probably *Erebia* sp., and several *Chiasmia clathrata* Linn. (Latticed Heath). By the coast, at Milden, I saw some *Polyommatus icarus* Rott. (Common Blue). While returning to Bergen we stopped at Blomsterdalen and took a few more *A. euphrosyne* and *B. alethea* in a badly drained meadow. Back at our hotel I set about papering

my specimens, while in the evening we ascended Mount Floien in the funicular.

Sunday was an uneventful day as far as Lepidoptera were concerned, the only butterfly I saw being *Aglais urticae* Linn. (Small Tortoiseshell).

During the next three days we travelled from Bergen to Oslo. The mountain roads were very dusty, and murder to travel on, so progress was slow, although the scenery was wonderful. At Kvanndal we had a three hour wait for the ferry, and considerably later we arrived at Kinsarvik, on the Sorfjord. The night was spent at Eidfjord, where I saw a few 'micros' only.

Half of the next day was occupied traversing the very steep roads leading up to the Hardanger plateau. It was rather disconcerting to come across a coach on almost every hair-pin bend, and to be confronted with the road sign '!' (Danger). We stopped for a while at Fossli, where, amongst the heather, there were numerous little blue butterflies, *Lycaeides idas* Linn. Occasionally a fritillary would swiftly fly past, on the damper ground. These were *B. alethea* again. Fossli was at 1,150 metres, yet it was still hot, but as soon as the sun went in all the butterflies disappeared.

Two or three kilometres further on we stopped again to look at the 'Hardanger Jokulen' glacier. Here there were still pockets of snow, and when we climbed higher it was quite cold.

By the time we stopped at Geilo for lunch we had left the mountainous country behind. Having seen some more butterflies by the side of the road we stopped at Noss: on a grassy path leading down to a lake, I took half a dozen or so *Erebia ligea* Linn., and a female *Polyommatus icarus* Rott.

At about five o'clock the same day, we stopped at Austvoll for the night. Here I took *Aphantopus hyperantus* Linn. (Ringlet), *Coenonympha pamphilus* Linn. (Small Heath) and *P. icarus*, while I saw *E. ligea*, *Pieris napi* Linn. (Green-veined White), *Thymelicus sylvestris* Poda (Small Skipper), and *Ochlodes* (= *Augiades*) *venata* Br. and Grey (Large Skipper).

We reached Oslo the next day, and late in the afternoon we motored to a pine wood, where I saw *Lycaeides idas* and *Chiasmia clathrata* again; while in another part of the wood I saw *Aglais urticae* and a 'copper,' as well as a red squirrel (*Sciurus vulgaris* Linn.).

For the next three days the weather deteriorated, so we visited the museums at Bygdoy, and the Vigeland sculpture park. I took only *Cerapteryx* (= *Charaeas*) *graminis* Linn. (Antler Moth).

On the last day of our holiday, we went along the coast. The weather improved in the afternoon, and when returning to Oslo I saw *Pieris brassicae* Linn. (Large White), *A. hyperantus*, and *Zygaena filipendulae* Linn. (Six-spot Burnet).

The boat from Oslo took us back to Newcastle, and thence we returned home.

(My thanks are due to Mr P. W. Cribb, who very kindly identified the specimens for me).
6.2.66. Brian Coles (3533J).

**LEPIDOPTERA IN MAJORCA—
MAY 1966**

I visited Majorca for the middle two weeks of May this year and, although it was not exclusively an entomological holiday, I was continually on the look out for butterflies and moths in all parts of the island and had my folding net with me to ensure identification.

The countryside was green and there were plenty of wild flowers about but the number of butterflies and moths to be seen was most disappointing. I had expected that Majorca would compare favourably with Malta where insect life is abundant during April and May (see my article in the February 1966 issue of this *Bulletin*) yet Malta is a smaller and more barren island.

Table I is a list of the species I noted in Majorca.

I had hoped during my visit to find the Meadow Brown (*Maniola jurtina* Linn.) to add to the records of this species being compiled by George

Speckled Wood	(<i>Pararge aegeria</i>)	Numerous
Wall	(<i>Pararge megera</i>)	Numerous
Gatekeeper	(<i>Maniola tithonus</i>)	Small number, males only
Painted Lady	(<i>Vanessa cardui</i>)	One
Long-tailed Blue	(<i>Lampides baeticus</i>)	Two
Small White	(<i>Pieris rapae</i>)	Small number
Clouded Yellow	(<i>Colias croceus</i>)	Three
Brimstone	(<i>Gonepteryx cleopatra</i>)	One
Swallowtail	(<i>Papilio machaon</i>)	Two
Striped Hawkmoth	(<i>Celerio livornica</i>)	One (to light)
Humming-bird Hawkmoth	(<i>Macroglossum stellatarum</i>)	Numerous
Large Yellow Underwing	(<i>Triphaena pronuba</i>)	One (to light)
Silver Y	(<i>Plusia gamma</i>)	Numerous (to light)

Table I.

Thomson of Dunblane, but not one was to be seen.

It would be interesting to know whether Members who have been to Majorca during other months of the year have been more fortunate in their discoveries.

P. R. Grey (3820).

REFERENCE

GREY, P. R. (1966). *Bull. amat. Ent. Soc.*, 25: 15-19.
Lepidoptera in Malta.

AN ECOLOGICAL APPROACH TO LIGHT-TRAPPING—4

Pressure

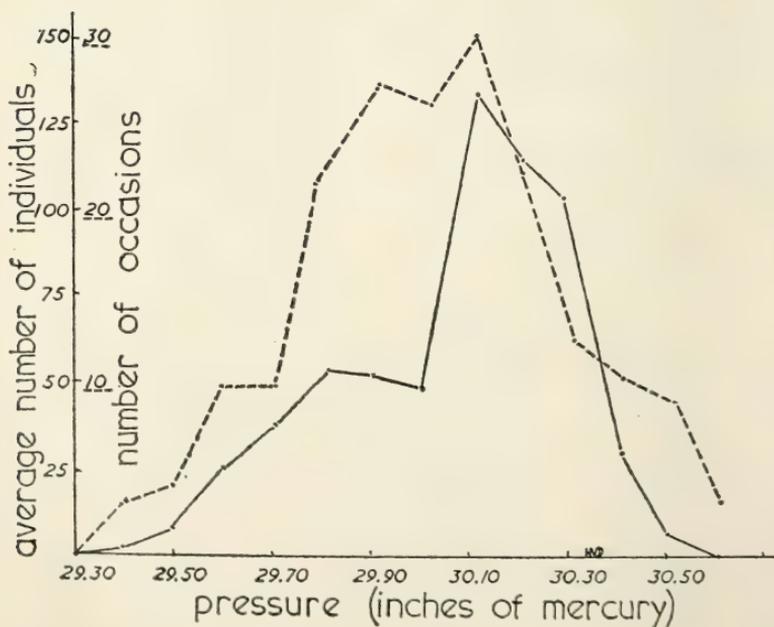
Animals and plants are only affected by pressure when considerable changes are involved. For instance, when the deep-sea Coelocanth *Lati-meria chalumnae* was hauled up to the surface it soon died. This happened because the forces normally acting on

the fish had been removed and the tissues reacted by 'expanding'. That animals can live safely in abyssal depths and high in the atmosphere means that they have individually reached equilibrium with the surrounding pressure and can probably tolerate a certain amount of variation.

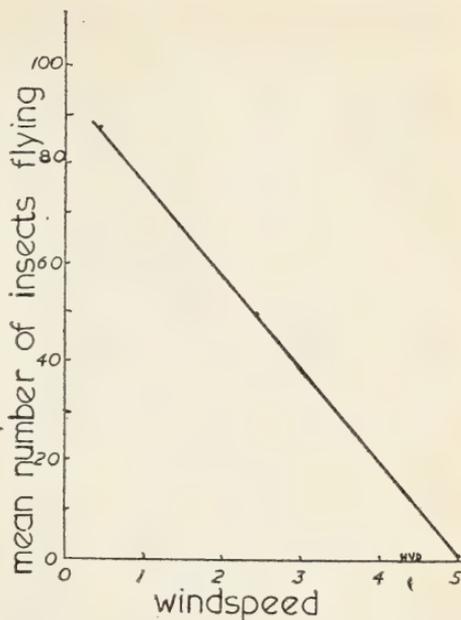
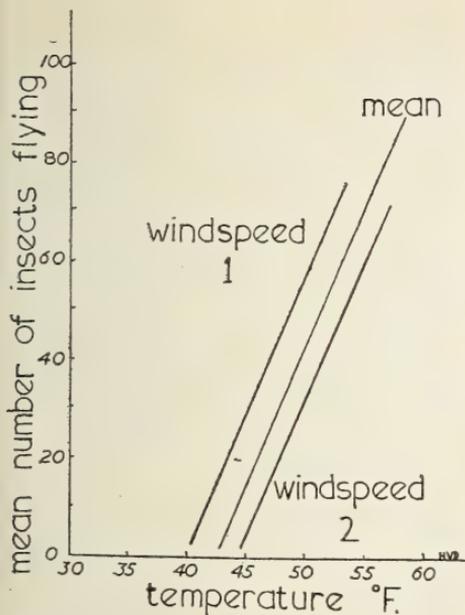
Consequently it was not surprising to discover that small daily variations in air pressure had limited direct effect on the number of insects flying. The results shown in *Graph 1* indicated:

1. A pressure zone where maximum numbers were recorded.
2. A direct correlation between the mean total and the natural distribution of air pressure.

To interpret these correctly one must first understand some of the functions of a barometer. When a series of readings are taken over a wide area, lines of equal pressure (isobars) can be plotted and regions of high and low pressure isolated. The meteorologist can then suggest



Graph 1. Pressure chart for Lepidoptera. Number of individuals (solid line) and frequency or number of occasions (dotted line) against pressure.



Graph 2. Mean number of Lepidoptera flying against temperature, at different windspeeds.
Graph 3. Mean number of Lepidoptera flying against windspeed.

Both relationships at constant pressure. Windspeed is on an arbitrary scale of 1 to 5 explained in *Bull. amat. Ent. Soc.*, 25: 65.

what the weather is over that area and what will be its probable future course—so one barometer site only gives an indication of the prevailing weather and can only forecast to a limited extent. Even so, barometers are usually supplied with a chart which ranges from wet and unsettled (low pressure) to extremely dry (high pressure).

On this basis, any increase at low pressure subsequently resulted in better weather and more insects flew. However, about the mean there was an emphasis on the dry conditions which were cold cloudless nights. Obviously the prevalence of a cold atmosphere meant a reduction in the number of moths flying, for we have already noted the marked effect of temperature in a previous article (*Bull. amat. Ent. Soc.*, 25: 29-31).

Normally the next stage in a laboratory would be to conduct an experiment under constant pressure. This is a difficult problem in the field but it was overcome by collecting a large

amount of data and extracting those records with a common pressure. Identical conditions occurred about once a fortnight on the average although it was more usual for them to be concentrated in successive nights with a long gap between. One point that emerged was that even under optimal pressure there were occasions when no insects flew. Windspeed and temperature showed themselves again as the influencing factors, acting antagonistically (*Graphs 2 and 3*). So for a similar number to be flying in a wind as on a calm night there must be a compensatory increase in the air temperature.

Summary: By itself the barometer cannot give an indication of the numbers flying, for it is only when it is coupled with the ambient temperature and wind force that a true estimate can be gained. Warmth tended to increase the flying population while a wind caused reduction in the flying population.

J. S. Badmin (3406).

JUNIOR NEWS SECTION

The 1966 summer season seemed particularly poor for nearly all kinds of insects. I do not know whether the late spring affected insect numbers or whether the 'insect spray ogre' took its toll. I received no really interesting records from anyone.

Stick insects (Phasmida) have become very popular over the last few years especially as several species can be obtained quite easily and kept equally easily. Besides *Carausius (Dixippus) morosus* Br., which probably originated in India, there are the bramble leaf eaters *Clonopsis gallica* Charp. from Corsica and a Madagascan flying or really gliding species *Sipyloidea sipyilus* Brun. which all do well at ordinary room temperature. I am interested to find out how many of you are phasmidologists, as the lepidopterists, like all young Scottish entomologists, seem to be a dying race.

Julian Evans (3580J), of 84 West Mead, South Ruislip, Middlesex, sent in a rather interesting observation concerning a silkworm, *Philosamia cynthia* Drury, cocoon he bought in October 1964. He was expecting the moth to emerge within a fortnight of his taking the cocoon home, but after six months in the airing cupboard nothing had happened. On June 3rd 1966, a year after the cocoon had been transferred to a stick-insect cage, a perfect adult appeared.

Have many of you experienced this with your chrysalids? It is called aestivation, a very similar condition to hibernation except that development is slowed down in hot, rather than cold, conditions. I suppose Julian's cocoon showed that whilst there's life there's hope.

I am sorry that it was not possible to organise the proposed AES Youth Expedition for the 1966 summer

season, and hope that something can be arranged for next summer. Rob. Dransfield (3492J) of Sussex and Gordon Maclean (3437J) of Glasgow joined St Ivo School Entomology and Natural History Society expedition to the Yorkshire Dales. I hope they will send in their reports in due course. St Ivo may go to Italy next summer if we can make it cheap enough.

John Young (3605J), of Brampton, Cumberland, was planning a hitchhiking entomological holiday round Britain last summer. Please let us know how you got on.

Here is one expedition that did take place and as you can see was very successful; Wesley Caswell's 1966 expedition to Yugoslavia. Wesley writes:— "You may remember that I wrote last year saying that I was going to Yugoslavia for my summer holidays then, and would let you know how I got on. Unfortunately we had to postpone our visit until this year. After months of "counting the days" we finally set off on 14th June, and reached Yugoslavia two days later—travelling by 'plane and coach.

Although I did not catch any reptiles (much to my disappointment), frogs could be heard most nights from our hotel, but in spite of searching I could not find any to catch—or even see! All I saw was one dead toad by the side of a road. While I am on the subject of amphibians, it might be of interest to others that while I was down in some caves (about 700ft down) I saw a specially lit small pool with a lot of Olms or Cave salamanders (*Proteus anguinus* Laur.) in it. These were of great interest to me and made the going down so far in a temperature of about 47-50°F. (in upper 70's at ground level) really worthwhile. They were, I would say, over a foot long, and looked just like eels in their movements, except for their legs, which seemed to be separated by a

great distance. I expect you have seen the picture of these in the book 'Reptiles and Amphibians of Europe.' In Yugoslavia they call it the 'human fish' because its colour is rather like that of human skin! What a temptation it was for me to have to go right by them without 'pinching one for my collection'. However, they were quite well guarded with a railing round the pond, and also by the fact that all the lights are turned off as soon as the visitors have left that part of the cave.

Now to go on to insects. As far as butterflies were concerned there were hundreds of them, especially away from any roads, buildings, etc. The commonest in one field was the White Admiral Butterfly (*Limenitis sibylla* Linn.). These flew in their hundreds and could be seen on almost any flower. When they were flying, one would swear they were black and white, but when caught they are brown and white!

There were also hundreds of very small blue butterflies—but what kind(s) I really don't know. These were so 'tame' that I could almost pick them off the ground.

Clouded yellow butterflies (*Colias* spp.) were also quite common, as were Large Skippers (*Ochlodes venata* Br. and Grey), whites (*Pieris* spp.) Small Tortoiseshells (*Aglais urticae* Linn.), Red Admirals (*Vanessa atalanta* Linn.), Peacocks (*Nymphalis io* Linn.), a meadow browns (*Maniola* sp.), and a few fritillaries, to which I did not get close enough to catch or identify.

Moths were not very common—at least not in the daytime—but Six-spot Burnets (*Zygaena filipendulae* Linn.) were very common in a few places, and could very easily be picked off flowers in the hand without them flying away. My 'highlight' as far as butterflies were concerned was when I saw a huge butterfly gliding round a seat at the top of a hill, and although I did not get close enough

for a proper look I am sure it was a huge swallowtail. Unfortunately it flew high up over trees every time I got near.

There were some huge dragonflies there including one type which had lovely velvety-blue wings and looked much more like a butterfly than a dragonfly, except for its long body. I managed to catch one of these after a long time and bring it home. Our own small blue damselflies were terribly common and flew everywhere, and also there were some huge bluish dragonflies, rather like our own but much larger. In one rather overgrown place with lots of tall grass, etc., I saw something which looked like a green tree frog jump right in front of me. After a chase—and a bite—I caught it, but it turned out to be an insect which looks rather like a very large cricket about two or three inches long and with legs which are longer than those of a locust. It has quite large wings but cannot fly. These were green and brown, and quite common in one small area. (A great bush cricket—H.J.B.)

If there is anyone who likes ants Northern Yugoslavia is certainly the place to go, as the ants there are not the common small ones we have here but are over half an inch long, much larger even than our own queen ants, and they swarm everywhere—they can also bite pretty hard, and most of us came back looking as though we'd been to war!

One evening we went out 'sugaring'—unsuccessfully—and were sitting in pitch darkness on a seat at the edge of a wood when we noticed what appeared to be someone approaching with a torch. Soon afterwards dozens more tiny bright lights appeared all over the place, both low down and high up in the air. These, as you probably have guessed, were fireflies, and were really amazing as they were so bright and could be seen dozens of

yards away, and were flying in every direction. I was very lucky just as we were leaving the woods on our way back to the hotel to find one resting low down on a bush with its light full on, and this I managed to catch. The firefly was only about half an inch long and a dull brown in colour, nothing to what it looked like while flying. (Beetles—H.J.B.).

As far as temperatures there are concerned, the average is 75°-85°F. most days, even if the sun is not shining. When we were there it was mostly sunny every day, and very hot and humid: however, thunderstorms were also very common at night."

As you can see, Wesley seems to have had a very worthwhile trip.

Now the evenings are getting darker, you will have plenty of time to write a short article for the *Bulletin*.

H. J. Berman, F.R.E.S. (2971A).

REVIEW

A Label List of the Butterflies of North, Western and Southern Europe, compiled by Peter W. Cribb. Pp. 9 quarto. Printed for the Amateur Entomologists' Society by S. Cribb, 355 Hounslow Road, Hanworth, Middlesex, England, 1966. Price 8/-.

The post-war popularity of continental travel and the present scarcity of butterflies in Britain have no doubt stimulated many entomologists to interest themselves in European species. However, as far as nomenclature is concerned, reference-books (in English) are few and most of these out of date and any modern information has to be sought for scattered in the periodicals. The most recent reference-books are expensive, and usually with the text in German,

which leaves the post-war '*Lepidopteres de France, Belgique, Suisse*' by Le Cerf, which is inexpensive and although written in French is easy to follow. However, here again the nomenclature is somewhat outmoded.

Very recently, Mr R. F. Bretherton has published a '*Distribution List of the Butterflies of Western and Southern Europe*' and our President Mr P. W. Cribb has followed on with the work under review, compiled in co-operation with Messrs Bretherton and W. L. Coleridge.

Printed on one side of the paper only, it can be used as a label-list for cutting up, or as a check-list with plenty of space for notes, etc. The nomenclature is that used by most modern workers and, especially if used in conjunction with Bretherton's list, should be very useful.

The arrangement of the families differs from that of most modern reference books, i.e., either from the primitive to the specialised, or vice versa. The order of families is as follows: HesperIIDae; Papilionidae; Pieridae; Danaidae; Apaturidae; Nymphalidae; Libytheidae; Riodinidae; Satyridae and Lycaenidae. It will be noted that Mr Cribb treats the 'Emperors' as a separate family—Apaturidae. Again, the splitting of the Argynnids into separate genera such as *Clossiana*, *Mesoacidalia*, *Mellicta*, etc., may not please the "lumpers." Among other changes it is interesting to see our old friend *Eumenis semele* Linn. (Grayling) back once more into *Hipparchia* after many years.

Only sub-species of special note have been included in this list. Synonyms have been added for the benefit of those using the older reference-books.

Mr Cribb and his son are to be congratulated in producing and printing this useful pamphlet for the benefit of the AES, the proceeds of the sale of which (after their expenses have been deducted) go to the

Society.

B.R.S.

piece of cotton wool introduced into the box containing the insect. Perhaps the best method for killing butterflies is by pinching.

Brian Coles (3533J).

LETTERS TO THE EDITOR

Sir,—I would like to put on record the capture of a perfect male specimen of the Alder Kitten moth (*Cerura bicuspis* Borkh.) at Orpington in Kent. It came to 'u.v.' light on the night of Friday 17th June 1966 towards 11 p.m. and is, I believe, the only specimen recorded from that immediate district.

Ian Watkinson (3130).

Sir,—In the May 1966 *Bulletin* (*Bull. amat. Ent. Soc.*, 25: 51-2) Mr Thomson stated that oxalic acid was "completely safe". I should like to point out that oxalic acid (and all oxalates) are extremely poisonous, a saturated solution being no less so, the agent owing its killing properties to this fact. It surprised me that Mr Thomson stated that only a small quantity was required without realising this.

Although this is not intended to deter the use of oxalic acid as a killing-agent, and it is one which I have found very useful for larger moths (after stupefying with chloroform or ethyl acetate), the agent should be treated with some consideration, even though no one is stupid enough to play around with it.

A few notes about killing agents may also be of interest. Now I use ethyl acetate almost entirely. It has quite a toxic effect on me, but it leaves specimens very relaxed, and is relatively harmless, but unlike Mr Worling in the same *Bulletin* (p. 49) I find it none too easy to procure.

Sometimes I use carbon tetrachloride, often for stupefying, but only when I run out of ethyl acetate. For 'micros' I use .880 ammonia on a

NOTES AND OBSERVATIONS

OBSERVATIONS ON *AMPHIMALLON SOLSTITIALIS* LINN. (COL., SCARABAEIDAE)

On 14th July 1965, at 9.10 p.m., I was walking by some willow trees (*Salix* sp.) at the side of the River Thames at Staines when I saw eight beetles flying around a willow bush. The bush was about twelve feet high and as the beetles rarely descended below six feet, capturing them was difficult. I was however able to knock some of them to the ground, and found that they were specimens of *Amphimallon solstitialis* Linn. (Summer Chafer).

The beetles did not alight on the bush, although they occasionally blundered into it. This caused them to lose height and fall to within two or three feet of the ground. The beetles remained circling around the same bush, although there were other bushes and trees nearby. Many other beetles could be seen flying around the uppermost branches of these nearby trees, all of which were willows.

Then at 9.35 p.m., by which time it was quite dark, the majority of the beetles suddenly disappeared. It seemed that they had descended into the surrounding low-growing vegetation, from which I was able to disturb them by walking through it.

I believe that this habit of circling around trees is a commonplace one for other chafer beetles and I wonder

if any Members have an explanation for this habit.

17.12.65. J. Muggleton (3253).

PAINTED LADY BUTTERFLY IN FEBRUARY

I should like to put on record the sighting of six Painted Lady Butterflies (*Vanessa cardui* Linn.) on 6th February 1966. I saw all these butterflies flying and sunning themselves on the cliff at Mevagissey, Cornwall.

Although these butterflies are not supposed to hibernate in this country, I should think that these had because they were fairly fresh looking, and they were not flying very fast, which this species usually does.

17.2.66. P. Clements (3918).

THE SPECKLED WOOD BUTTERFLY IN N.E. SURREY

I was interested to see Mr Fletcher's letter in the *Bulletin* (*Bull. amat. Ent. Soc.*, 24: 170) on Speckled Wood butterflies (*Parage aegeria* Linn.) at Cheam. I live about half way between Berrylands and Surbiton Stations and my garden runs down to the railway, which, here, is in a small wooded cutting. We are eleven and a half miles from Waterloo.

I see Speckled Woods in the garden every year. Also occasionally Small Coppers (*Lycaena phlaeas* Linn.), Holly Blues (*Celastrina argiolus* Linn.) and Large Skippers (*Ochlodes venata* Br. and Grey) besides the usual *Pieris* and *Vanessa* butterflies. On one occasion I found a Brimstone (*Gonopteryx rhamni* Linn.) This year, for the first time, I saw an Orange Tip (*Anthocaris cardamines* Linn.), but this could have been a descendant of a few live butterflies I released five years ago.

12.12.65. A. G. Gaydon (3198).

Concerning Mr Fletcher's letter in the *Bulletin* for November 1965, I too have seen *Parage aegeria* near Cheam. This was in 1962-3 in a small lightly wooded area adjoining a railway line. The thing that surprised me was the great number of the butterflies, as the woodland path along which they flew could hardly have been more than 300 yards long. They were as common as one sometimes sees the Meadow Brown (*Maniola jurtina* Linn.) on bramble hedges.

I moved from this area in 1964 and have not returned there since to see if the butterfly is still there. The only other place that I have seen *P. aegeria* near London is near Rickmansworth, one spot near the main London road, and another a small wood.

19.1.66. G. Prior (3909).

In reply to Mr Fletcher's note in the November *Bulletin* concerning the Speckled Wood Butterfly (*Parage aegeria* Linn.) in N.E. Surrey, I have known of a colony of this butterfly also fairly close to London. The locality was in the Cheam area and consisted of oak and beech woodland bordered by chalk pastures. The colony was present when I first visited the area in 1952 and was still present on my last visit in 1963. The butterfly never occurred in large numbers but could always be found.

Further south, of course, this butterfly occurs in very large numbers. I recall having counted several hundreds on a day's walk in the Cranleigh district in 1961.

15.2.66. L. McLeod (3534).

[Mr Fletcher records that the locality near Cheam is limited in extent, and that the butterfly should not be collected there—the area is therefore not specified.—Ed.]



Dasychira fascelina
DARK TUSSOCK

A COLLECTING NOTE FROM FINDHORN, MORAYSHIRE

On Wednesday 11th May 1966 I went with an ornithologist colleague to visit the Culbin Forest area in Morayshire, Scotland.

During the course of the day we went on to the Bar of Findhorn, which is an island in the Moray Firth, to record nests of Great and Lesser Black-backed Gull (*Larus marinus* Linn. and *L. fuscus* Linn.), Common Gull (*L. canus* Linn.) and Herring Gull (*L. argentatus* Pontopp.) which breed abundantly on the ground there.

In previous years I have found the larvae of the Garden Tiger Moth (*Arctia caja* Linn.) to be very numerous on the island and it was my intention on this visit to collect a few. It may be of interest to note that the larvae are only to be found on the West corner of the Bar although the

vegetation is the same throughout. The sandy soil supports Marram Grass (*Ammophila arenaria* (Linn.) Link), with vetch (*Vicia* spp.), Crowberry (*Empetrum nigrum* Linn.), Ragwort (*Senecio jacobaea* Linn.) and clover (*Trifolium* spp.) being common plants. The Garden Tiger larvae feed chiefly on the Ragwort but today they were not at all plentiful; after an hour I had collected only twenty-five, ranging in size from half an inch long to fully fed.

On one of the sand dunes which had a sparse covering of grass and vetch I discovered a colony of Dark Tussock moth (*Dasychira fascelina* Linn.) larvae. They were feeding on vetch and were almost fully fed. I collected twenty-six which were found on the one sand dune. On reaching home I tried them on various plants and found that they fed well on hawthorn (*Crataegus*) which is one of

the plants given as food in South's 'Moths of the British Isles'.

G. Pickard (3928).

REFERENCE

SOUTH, R. (1961). *The Moths of the British Isles*. 4th edn. Frederick Warne, London. p. 116.

PINION-SPOTTED PUG IN WORCESTERSHIRE

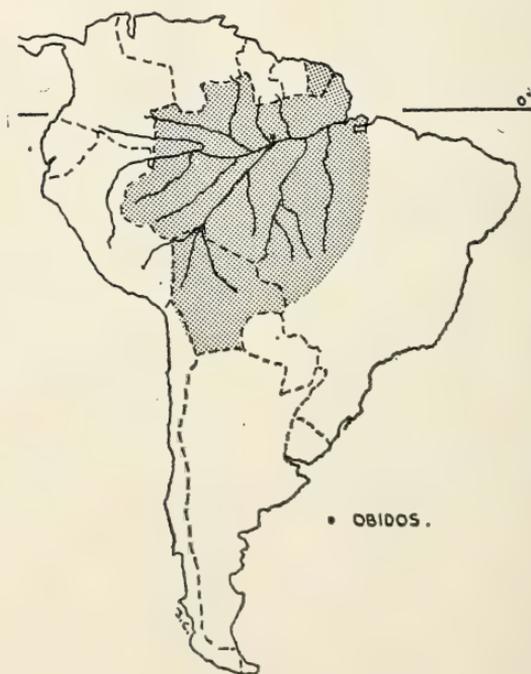
On May 4th 1966 I found three specimens of the Pinion-spotted Pug (*Eupithecia insigniata* Huebn.) in my 'm.v.' trap at Kemerton, Worcestershire. In 1965 I took a single specimen in the trap, and the previous year I found one on the Gloucestershire side of the county boundary, which runs within half a mile of my house. The insect seems worth recording, as there have been very few records from either Worcestershire or Gloucestershire.

John Moore (146).

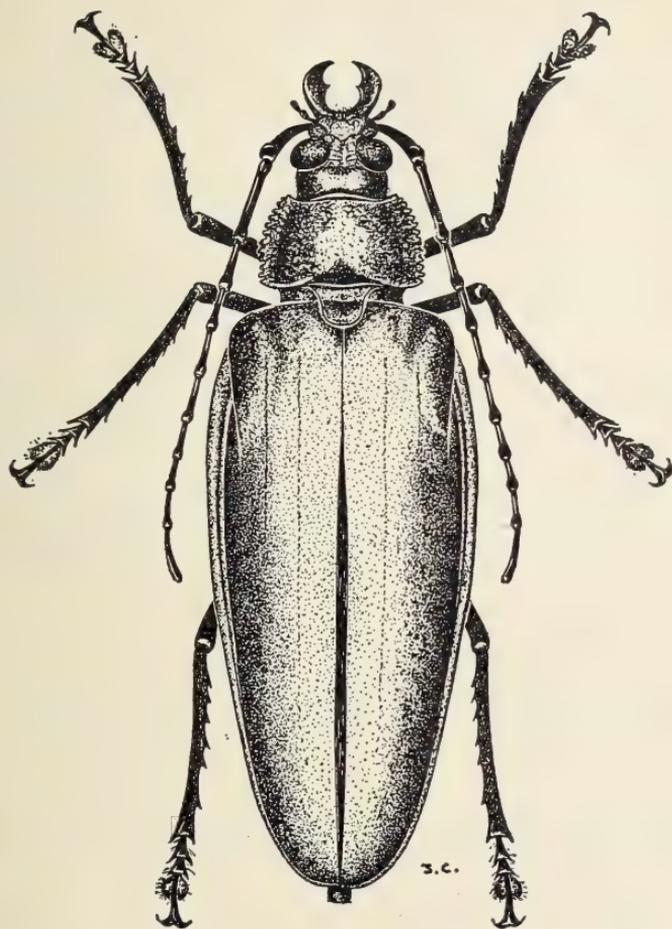
NOTE ON A NAME

AES Members may be interested to learn that one of our American Members, Mr J. R. Neidhoefer, of Menomonee Falls, Wisconsin, has had a species of butterfly named after him.

Anaea (Memphis) neidhoeferi Escalante (Nymphalidae) is a Mexican species, discovered in Vera Cruz. Dr T. Escalante established this name at the request of Mr D. Glanz, of Brooklyn, N.Y., who is a close friend of Mr Neidhoefer. Mr Neidhoefer is well-known in Wisconsin for his fine collection of Lepidoptera, which includes 350 butterflies which are bilateral gynandromorphs or sexual mosaics. Mr Neidhoefer now has two type specimens of *A. neidhoeferi* to add to his main collection.



The Distribution of *Ctenoscelis Coeus* Perty

CTENOSCELIS COEUS PERTY**Ctenoscelis coeus Perty.**

(Natural size)

Family Cerambycidae

Sub-family Prioninae

Tribe Macrotomini

Sub-tribe Titani

Genus *Ctenoscelis* ServilleSub-genus *Ctenoscelis*Species *Ctenoscelis coeus* Perty.

Drawn from a specimen taken at Obidos, Para, Brazil. The species occurs in the Amazon Basin, Bolivia and Cayenne (French Guiana). There

appears to be no record of its host plant. *Ctenoscelis atra* feeds on *Ficus* spp. and *C. acanthopus* feeds on the hardwood *Ocotea* spp. and *Theobroma cacao* Linn. (Cocoa).

I would like to thank Mr R. G. Adams of the British Museum (Natural History) for supplying the above information.

29.7.66. Jonathan Cooter (3290J).

THE AMATEUR ENTOMOLOGIST

Originally an annual publication (the Journal of the AES), containing longer articles than the *Bulletin*. Now used as a serial title for the Society's Handbooks. Volumes in print are listed below.

8. Includes several leaflets that are now O.P. : **Collecting Dragonflies ; Collecting Mosquitoes ; Making Sweepnets** ; an 8pp. list of standard books on entomology, etc. 48 pp., 32 figs., 6pl. **Price each : 5s. 0d.**
9. **Practical Methods and Hints for Lepidopterists**. Contains articles on rearing and collecting larvae ; illustrated instructions for making beating trays and cages for all entomological purposes. 42 pp., 48 figs., 6 pl. **Price each : 5s. 0d.**
10. Contains illustrated articles on **Collecting Lacewings ; Drawing Insects ; Collecting Caddises ; Photography of Caterpillars** ; etc. 40 pp., 10 figs., 12 pl., (Not many left). **Price each : 6s. 0d.**
11. **A Coleopterist's Handbook**. Describes the tools and methods for collecting British beetles ; their habitats, commensals and pre-adult stages ; how to record, photograph, make a personal collection, and conduct a local survey. 120 pp., 50 figs., 20 pl. **Price each : 15s. 0d.**
12. **A Silkworm Rearer's Handbook** (2nd edn.). How to breed 120 exotic species in Britain, including substitute foodplants and descriptions of stages. Systematic section refers to 1,400 species. Does not deal with the Mulberry Silkworm (*Bombyx mori*), q.v. Leaflet No. 3. 165 pp., 26 figs., 26 pl. (2 col.). **Price each : 17s. 6d.**

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

(World List abbreviation : Bull. amat. Ent. Soc.)

Some volumes are in short supply, so complete your set now. You can also complete your volumes or obtain particular articles by buying individual parts. Each volume complete with cover and index.

Volume 7 (1946-8)	21s. 0d.
Annual volumes 8 (1949) and onwards	per volume 15s. 0d.
Individual issues published before 1963	per part 2s. 0d.
Individual issues published 1963 onwards	per part 4s. 0d.
Silver Jubilee Number contains contributions by Honorary Members and past Presidents : The First 25 Years ; Studying the Commoner Insects ; Butterfly Botany ; Communication Among Social Insects ; Some Observations on Taxonomy ; Distribution, Range and the British Fauna. 18pp. 2s. 0d.	
Special Issue , August 1965 contains "A Guide to and Local List of Insects in North-west Cornwall" by G. D. Trebilcock, and "Insect Migration", a review by C. B. Williams. 80pp. 6 maps. 8s. 0d.	

These publications are obtainable from L. Christie, 137 Gleneldon Road, Streatham, London S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

**The
Entomologist's Record**

and Journal of Variation.

Founded 1890 by T. W. Tutt.

Published monthly,
annual subscription 35/-.

Please write for specimen copy to
F. W. Byers, 59, Gurney Court
Road, St. Albans, Herts., enclosing
5/-. This amount will be deducted
from the first year's subscription.

**Entomological
Store Boxes**

Book type wooden store boxes,
strongly made with tight fitting
lids to keep out vermin. Cork
lined and papered in both halves,
the 10 x 8 size will hold up to 50
Large White size butterflies.

10 x 8 - 21s.

14 x 10 - 31s.

17½ x 12 - 41s.

Postage on one of any size 3s.

Other sizes made to order

J. R. ALLANACH,
10 Grange Park Walk, Roundhay,
Leeds 8, Yorkshire

The Amateur Entomologists' Society

Published August, 1966

PAMPHLET No. 11

**A Label List of the Butterflies of
North, Western & Southern Europe**

Compiled by P. W. CRIBB

Listing 403 species and subspecies with up-to-date
nomenclature and older synonyms. Suitable as a
Label or Check List. Printed on white Bond paper,
set in 10pt. Times type. Size 8 x 10in. Price 8/-
per copy, postage extra at cost

From A.E.S. PUBLICATIONS AGENT,
137 Gleneldon Road, Streatham, London, S.W.16, England

*Do NOT send any money with your order. An invoice will be sent with
the publication*

Worldwide Butterflies Ltd.

Charmouth, Bridport, Dorset

IMAGINES, OVA, LARVAE AND PUPAE

from many parts of the world

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

F O R A L L I N F O R M A T I O N O N B E E S

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mddx

Entomological Literature

CATALOGUES ON REQUEST

**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

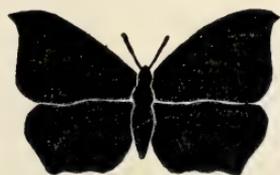
VOLUME 26

1967



Edited by

H. V. DANKS, B.Sc., A.R.C.S., F.R.E.S.



**The Amateur Entomologists' Society
42 Normandy Avenue, Barnet, Herts.**

INDEX

Compiled by D. H. Smith (2864)
and R. H. Allen (3628)

CONTRIBUTORS

Berman, H. J., 30, 62, 102, 135
Bradbury, K., 18
Bradley, J. R., 27
Cook, N., 29, 65
Cooter, J., 32, 66, 104
Corke, D., 63, 84, 86
Cribb, P. W., 14, 51, 52, 61, 95, 129
Danks, H. V., 1, 33, 70, 105
Dodwell, D. E., 65
Dransfield, R., 28, 45, 129
Emmet, A. M., 3, 36, 76, 107
Felton, J. C., 4, 37, 77, 109
Feltwell, J. S. E., 14
Finlay, I. S., 20
Gillery, A. J., 65
Goddard, P. A., 6, 38, 42, 79, 116
Grey, P. R., 48
Heath, J., 82
Heseltine, C. R., 31
Hilliard, R. D., 9, 86
Howe, J. J., 31
Johnson, R., 29, 50, 127
Jones, M., 63
Kemp, R., 131
Leech, R. A., 40, 56
Lindsley, P., 73
Longman, D. J., 54, 103
Maclean, G., 28
MacLeod, L., 26
Metcalf, J., 28
Morrison, B., 13
Muggleton, J., 54, 100
Osborn, M. J., 64
Payne, R., 133
Perceval, M. J., 97
Pickard, E., 42, 62
Pitt-Pladdy, D., 104
Plester, L., 22, 91, 103, 126
Porter, J. M., 28
Preston, E., 131
Rispin, P. N., 31
Robinson, G. S., 83, 136
Ross, S., 29
Scutt, M. S., 29
Spoczynska, J. O. I., 12, 119
Thomson, D. D. R., 28
Thomson, G., 114
Vincent, J. F., 64
Watt, J. C., 100
Wightman, J. A., 48, 89
Willmott, K. J., 13
Young, M. R., 136

SUBJECT

Advisory panel, 67, 70, 105
AES breeding group 1966, 13
A.G.M. 1967, 70
Annual exhibition, 1966, 6
Annual exhibition, 1967, 70
Apparatus and Methods:
 Charaxes trap, 24
 Marsh Fritillary (breeding), 51
 New Clouded Yellow Butterfly (breeding), 50
Bats, beetles and bees, 13
Breeding for reinforcement of species, 48, 114
Breeding group, 1966, AES., 13
Breeding of the Marsh Fritillary, (Portuguese sub-species), 51
Breeding the New Clouded Yellow Butterfly, 50
Breeding the Pasha with four tails, *Charaxes jasius*, 127
Butterflies and Industry, 38
Collecting in: (Home)
 Arran, 12
 Middlesex, 84
 Outer London suburban area, 4, 37, 77
 Yorkshire, 65, 129
 (Abroad)
 Finland, 20, 119
 Hungary, 18
 Majorca, 95, 98
 Nairobi, 22
 New Zealand, 100
 Pyrenees, 1966, 98
 Seychelles, 26
 Swiss Alps, 1966, 56, 91
 Yugoslavia, 1965, 14
Collecting Notes, February, 1967, 1
 May, 1967, 34
 August, 1967, 74
 November, 1967, 105
Council's Report, 1966, 72
Distribution of Finnish Insects—1:
 Butterflies, Part I, 119
Editorial, 1, 33, 69, 105
Entomological Liaison Committee. The
 Annual Report for 1966-1967 of our
 representative on the, 71
Exchange publications, 34
Female Insect reproductive system, The, 45
Finnish diary (I), Notes from a, 20
Fleas of New Zealand, 100

From an outer London suburban area, 4, 37, 77
 Frosted Orange, The, 82
 Further notes on Majorcan insects, 98
 Hungarian Lepidoptera, Some, 18
 Hymenoptera Aculeata, 36
 Hymenoptera Aculeata: Key, 108
 In search of the Scotch Argus, 42
 Insects in Arran, June 1966, Some, 12
 International exchange, 42
 Junior members' prize for ecological work, 90
 Junior members' trip, A, 27
 Junior news section, 28, 61, 100, 131
 Lepidoptera distribution maps scheme, 79
 Lepidoptera in Denmark, 1966, 54
 Lepidoptera in the Stanmore (Middlesex) district, 84
 Letter to the Editor, 30, 62, 102, 132
 M.V. traps, 136
Pieris pairing, 136
 Local Lists:
 Arran, 1966, 12
 Denmark, 56
 Finland, 121
 Hampshire, 132
 Majorca, 64, 96
 Pyrenees, 98
 Scotland, 111-114
 Yorkshire, 129
 Male insect reproductive system, The, 87
 Membership list, Fourth (1966)
 Supplement to the, 16
 More butterflies in Majorca, 95
 'M.V.' traps, Some misgivings on, 40
 Nairobi, Notes on butterflies from, 22
 Northern Eggar. The two year cycle of the, 83
 Notes and Observations:
Acherontia atropos, 30
Charaxes jasius, Rearing, 127
 Cinnabar moth larvae in October, 103
 Clouded Yellow butterfly, Breeding the New, 50
Eumenis semele, 31
 Grayling in Sweden, 31, 102
 Grey Bush Cricket in Somerset, 31
 Indian Moon Moth, Skin changing in the, 54
 Lepidoptera in Yorkshire, 65
 ditto, in the Yorks. Dales, 1966, 129
 Marsh Fritillary, (Portuguese sub-species), Breeding of the, 51
 Painted Lady, 103
Platycleis denticulata, 31
Procus literosa, 31
 Purple Emperor Butterfly (ab. *iole*), 65
 Stick Insects, 26, 48, 127
 Uncommon Lepidoptera on the Herts-Bucks border, 65
Vanessa atalanta, 30
V. cardui, 30
 Vestal Moth in Taunton, 103
 Notes from a Finnish Diary (I), 20
 Notes on Butterflies of Nairobi, 22

Prolonged larval stage in *Automeris aurantiaca*, 52
 Quiz, 61
 Rearing the Indian and Corsican Stick Insects, 48
 Review (books), 30, 135
 Scotch Argus, In search of the, 42
 Scottish entomology, 1966, 109
 Seychelles Stick Insect, The, 26
 Should entomologists feed birds?, 86
 Skin changing in the Indian Moon Moth, 54
 Some Hungarian Lepidoptera, 18
 Some Insects in Arran, June, 1966, 12
 Some observations on the Coleoptera from the Pyrenees, 1966, 98
 Study of Spiders, Parts 5 and 6, 9, 116
 Treasurer's Report, 1966, 73
 Where have all the Tigers gone?, 14
 Yugoslavia, 1965, 14

ARACHNIDA

ARANEIDA

Araneus ceropegius, 134
Attulus saltator, 10
Diaea dorsata, 118
Euophrys browni, 12
 erratica, 11
 frontalis, 11
 lanigera, 12
Evarcha falcata, 11
Hasarius adansonii, 12
Heliophanus cupreus, 11
 flavipes, 10
Hytia nivoyi, 10
Marpissa muscosa, 11
 pomatia, 12
Misumena vatia, 118
Neon valentulus, 12
Oxyptila trux, 118
Philodromus aureolus, 117
 dispar, 117
 histrion, 118
 Salticidae, 10
Salticus cingulatus, 10
 scenicus, 11
Sitticus floricola, 12
 pubescens, 11
Thanatus striatus, 119
Thomisus onustus, 119
Tibellus maritimus, 119
 oblongus, 119
Xysticus cristatus, 117
 lanio, 117
 sabulosus, 117
 ulmi, 117

INSECTA

COLEOPTERA

Agriotes obscurus, 14
Allomyrina dichotomus, 66
Callichroma auricoma, 104
Carabus auronitens, 134
Dytiscus marginalis, 22
Elater balteatus, 14
Geotrupes stercorarius, 14
Gnorimus nobilis, 134
Heliocopris dominus, 32
Leptinotarsa 10-lineatus, 18
Lucanus cervus, 14
Melolontha melolontha, 13
Necrophorus vespillo, 14
Notiophilus aquaticus, 13
 palustris, 13
Rhagium bifasciatum, 12
Trichius zonatus, 134

DIPTERA

Tipula czizeki, 5
 oleracea, 6
 paludosa, 6

HYMENOPTERA

Camponotus herculeanus, 58
Dorylus nigricans, 23
Formica rufa, 21
Microdynerus exilis, 76
Pollistes, 58
Xylocopa violacea, 98
 —also see Key: 108

LEPIDOPTERA

Abraxas grossulariata, 6, 78
Acherontia atropos, 30, 65
Acleris boscana, 75
 ferrugana, 75
 hastiana, 75
 rufana, 75
 schalleriana (logiana), 75
Acontia luctuosa, 20
Actias selene, 54
Adopaea flava, 59
Agapetes galathea, 18, 57, 84
Aglais urticae, 21, 40, 54, 60, 79
Agrodiaetus damon, 56
Agrotis exclamationis, 19

ippsilon, 16, 19
 segetum, 19
Albulina orbitulus, 91
Allophyes oxyacanthae, 19
Amathes c-nigrum, 19
 xanthographa, 38
Amauris echerea, 23
Anthocharis cardamines, 40
Apamea secalis, 19
Apatele megacephala, 19
Apatura iris, 18, 65, 93
Aphantopus hyperantus, 93
Aporia crataegi, 92, 134
Araschnia levana (form porima), 93
Arctia caja, 29, 85
 villica, 85
Argynnis aglaia, 84
 cydippe, 29, 84
 euphrosyne, 84
 paphia, 16, 29, 55, 84, 93
 paphia var. valesina, 29
 selene, 55
Aricia agestis, 18, 40, 56
Asterope (Crenis) boisduvali, 26
Automeris aurantiaca, 52
 illustris, 53
 io, 53
Axylia putris, 19
Bena fagana, 19
Boarmia roboraria, 27
Brenthis ino, 60
Brintesia (=Satyrus) circe, 94
Bryotropha domestica, 3
 terrella, 38
Bupalus piniaria, 20
Calamotropha (Crambus) paludellus, 36
Callimorpha jacobaeae, 14, 104
Callophrys rubi, 84, 97
Caloptilia alchimiella, 74
 betulicola, 74
 elongella, 74
 falconipennella, 74
 populetorum, 74
 syringella, 74
Calothysanis amata, 20
Caradrina clavipalpis, 19
Celastrina argiolus, 40
Celerio euphorbiae, 19, 65
Ceramica pisi, 19
Cerura vinula, 58, 85
Charaxes baumanni, 25
 berkeleyi, 25
 brutus, 25
 candiope, 25
 cithaeron, 25
 dilutus, 25
 jasius, 127
 nandina, 25
 pollux, 25
 varanes, 25
 zoolina (form neanthes), 25
Chazara briseis, 17
Chiasmia clathrata, 19
Chilodes maritima, 19
Clossiana titania, 60

- Clostera anachoreta*, 16
curtula, 19
Coenonympha arcania, 20, 59, 134
iphis, 20
pamphilus, 16, 20, 40, 55
satyrion, 57
Coleophora ochrea, 36
squamosella, 3
Colias australis, 16, 50, 58, 95
croceus, 16, 20, 93
hyale, 16, 20, 50, 93
phicomene, 60
Colocasia coryli, 65
Colostygia didymata, 19
Cosymbia annulata, 19
Cucullia umbratica, 19
Cupido minimus, 55, 92
Cyaniris semiargus, 94
Cybosis mesomella, 16
Cynica mendica, 85
Casyocera sulphurella, 1
Dechtria agrimoniae, 107
argyropeza, 107
Deilephila porcellus, 29
Deilinia pusaria, 19
Diarsia rubi, 19
Diataraxia oleracea, 19, 38, 41
Dipsophecia scopigera, 94
Dira maera, 58
megea, 40, 95
Dityta glyphica, 20
Daturga atomaria, 19
Dmelmia trabealis, 19
Darmonia (Laspeyresia) formosana, 34
Dendrosia sarcitrella (lactella), 106
Dinomus autumnaria, 19
Disnotia maculana, 4
Disphraea alternata, 19
Disphraea aethiops, 42, 58, 94
alberganus, 58
cassioides, 57
epiphron, 57, 60
euryale, 57, 94
ligea, 18, 58, 94
manto, 91
melampus, 91
meolans, 57
oeme, 61
triaris, 59
Doryctes tages, 94
Doryctes semele, 31, 55
Dryophanes aurinia, 28, 51
Dryophanes bilineata, 20
Dryophanes succenturiata, 65
Dryophanes quadripunctaria, 20
Dryophanes dryope, 26
hiarbas, 26
Dryophanes auroguttella, 74
Dryophanes bankiana, 20
uncula, 19
Dryophanes adulatrix, 19
Dryophanes nigricans, 19
Dryophanes alcetas, 59
Dryophanes adippe, 60
niobe (form eris), 58
Fomoria septembrella, 107
Gelechia nigra, 4
Gonopteryx rhamnii, 54, 93
Gortyna flavago, 69, 82
Graphium leonidas, 23
Habrosyne pyritoides, 19
Hadena w-latinum, 19
Harpyia bifida, 19
Heliothis maritima, 19
viriplaca, 20
Hemithea aestivaria, 19
Heodes tityrus (=dorilis), 16, 91, 94
virgaureae, 18, 58
Hesperia comma, 59
Hipparchia aristaeus, 17
fagi (=hermione), 16, 95
semele, 17, 58
statalinus, 20
Hippotion celerio, 28, 65
Hyloicus pinastri, 29
Hyponephele lupinus (=rhamnusia), 17
lycaon, 17, 58
Iolana iolas, 59
Iphiclides (=Papilio) podalarius, 16
Isotrias trifasciana, 34
Issoria lathonia, 55, 60
Lampides boeticus, 98
Lampra fimbriata, 14, 52
Laothoe populi, 19, 29
Lasiocampa callunae, 69, 83
trifolii, 55
quercus, 83, 94
Leptidea sinapsis, 16, 94
Leucania lythargyria, 19
pallens, 19, 20
Limenitis camilla, 29, 84, 93
populi, 93
Limnoecia phragmitella, 36
Lithina chlorosata, 19
Lithocolletis comparella, 74
lantanella, 75
nigrescentella, 74
scabiosella, 74
Lithosia deplana, 20
Lyaeides idas, 16, 57
Lycaenopsis argiolus, 57
Lycaena dispar, 16, 20, 45
phlaeas, 16, 40, 55
Lymantria dispar, 20, 44
Lysandra bellargus, 50
coridon, 16, 43, 50, 58
escheri, 58
Macroglossum stellatarum, 20, 58
Maculinea arcas (=nausithous), 93
euphemus (=teleius), 93
Mamestra brassicae, 19
Maniola jurtina, 16, 40, 55, 58, 61
tithonus, 93
Melanchna persicariae, 19, 38, 41
Melanitis leda, 26
Melitaea athalia, 16, 60
diamina, 91
didyma, 16, 58
Mellicta aurelia, 59
Mesoacidalia charlotta, 18

- Mimas tiliae*, 16
Minois dryas, 93
Mniophaga affinis, 3
Mompha miscella, 36
Monopis crocicapitella, 106
 ferruginella, 106
 monachella, 106
 rusticella, 107
Mycalesis safitza, 26
Mythimna turca, 19
Noctua pronuba, 19
Nymphalis antiopa, 16, 21
 io, 40, 51, 55
 io geisha, 45
 polychloros, 60
Ochlodes venata, 46
Ochropleura plecta, 19
Oegoconia deauratella, 38
Ortholitha bipunctaria, 20
 chenopodiata, 14
Palaeochrysophanus hippothoe, 58, 92
Papilio bromius, 22
 dardanus, 23
 demodocus, 23
 echerioides, 23
 jacksoni, 23
 machaon, 20, 43, 60, 93
 mackinnoni, 23
 nireus, 22
 nobilis, 22
 phorcas, 22
 rex, 22
Parachronistis albiceps, 38
Pararge aegeria, 40
Parnassius apollo, 59, 95
 phoebus, 91
Phalera bucephala, 85
Pheosia tremula, 85
Philosamia advena, 52
Philudoria potatoria, 29
Phragmatobia fuliginosa, 19, 29, 85
Phyllocnistis suffusella, 74
Pieris brassicae, 40, 55, 95, 97
 ergane, 16
 napi, 40, 42, 136
 rapae, 40, 55, 95, 136
Plebejus argus, 16, 55
Plusia chrysitis, 19
 gamma, 19, 55, 62, 65
Polygonia c-album, 20, 29, 84
 egea, 16
Polyommatus eros, 91
 icarus, 20, 40, 55
 tiresias, 20
Polyphaenis sericata, 18
Pontia daplidice, 16, 56
Procus latruncula, 38
 literosa, 31
 strigilis, 38
Pseudoips prasinana, 19
Psodos quadrifaria, 91
Pterostoma palpina, 29
Pulicalvaria piceaella, 38
Pyrgus malvae, 16
Recurvaria nanella, 38
Rhodometra sacraria, 103
Rhodostrophia vibicaria, 20
Satyrus bryce, 56
Scopula imitaria, 20
Semiothisa alternata, 19
Setina irrorella, 19
 roscida, 19
Smerinthus ocellata, 29
Spatalia argentina, 19
Sphinx ligustri, 29
Spilosoma lubricipeda, 19, 85
 lutea, 38, 41, 85
Stauropus fagi, 29
Strymon spini, 95
 w-album, 60, 84
Telphusa alburnella, 4
 proximella, 4
 seuax, 36
Thecla betulae, 55
 quercus, 29, 55, 84
Thyatira batis, 19
Thymelicus sylvestris, 55
Tinea palescentella, 105
 piercella, 106
 semifulvella, 105
 trinetella (lapella), 105
Trachea atriplicis, 19
Triphaena pronuba, 38
Tubulifercla josephinae, 4
Vanessa atalanta, 30, 40, 54, 97
 cardui, 13, 16, 31, 40, 54, 60, 65
Whitesia crataegella, 1
 (Scoparia) mercurea, 1
 resinea, 1
Yponomeuta cognatella, 6, 78
Zanclognatha nemoralis, 19
 tarsipennalis, 19
Zygaena fausta, 20
 filipendulae, 20
 purpuralis, 59

NEUROPTERA

Chrysopa carnea, 13

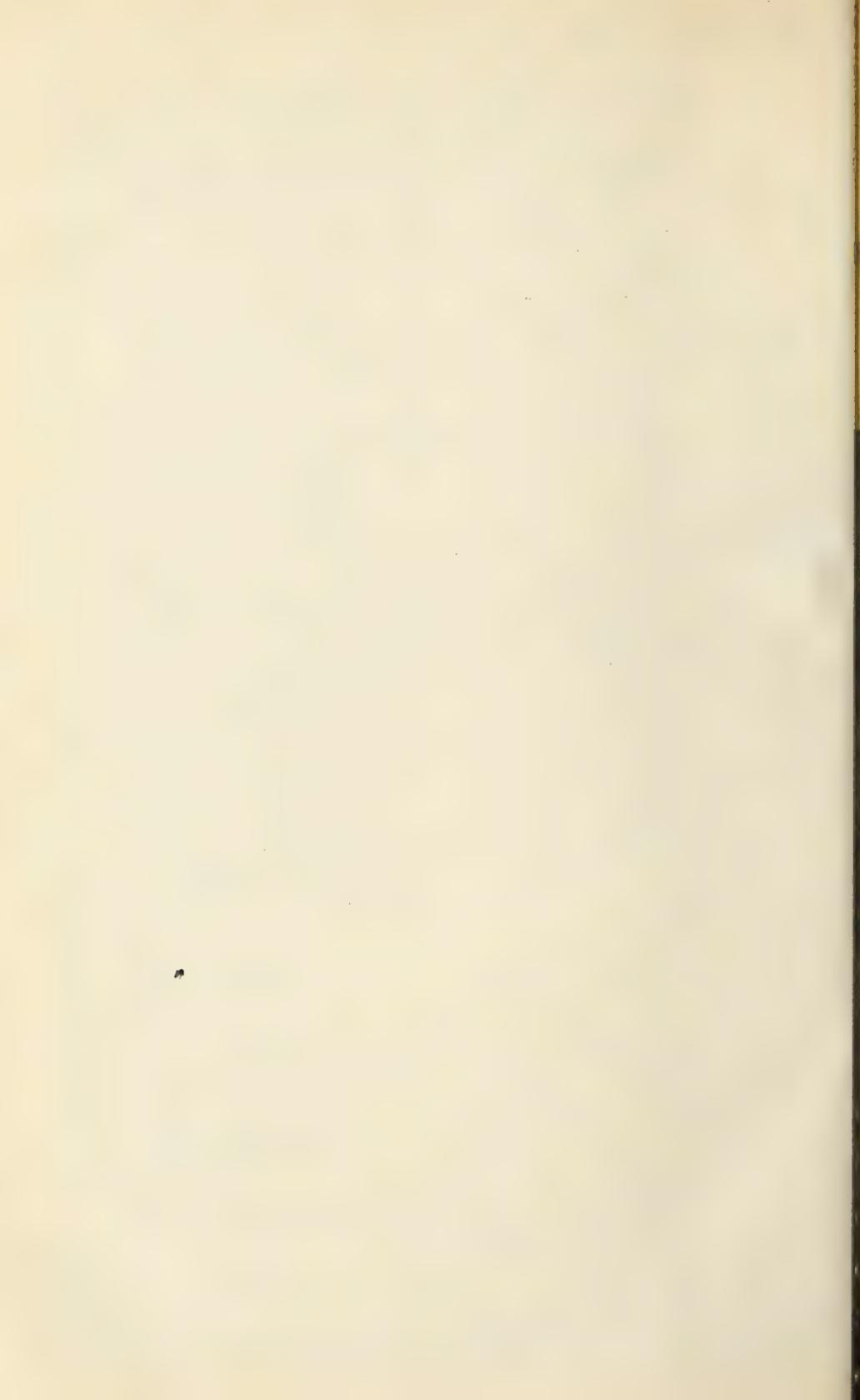
ORTHOPTERA

Platyleis denticulata, 31
Podisma alpina, 60

PHASMIDA

Acanthoderus prasinus, 29
Carausius allaudi, 26
 morosus, 26, 48, 61, 126
 sechellensis, 26
Clitarchus hookeri, 29
Clonopsis gallica, 29, 49, 126
Sipyloiaea sypylus, 29, 126

AMPHIBIA**CAUDATA***alamandra atra*, 92**SALIENTA***ombina variegata*, 93*ana dalmatina*, 58**AVES***Milvus migrans*, 93*Parus major*, 86*Trunella modularis*, 106*Turdus merula*, 86**REPTILIA****CHELONIA***Testudo graeca*, 15**OPHIDIA***Natrix natrix*, 93*purpurea*, 40, 51, 82*Dipsacus fullonum*, 51*Erigeron acer*, 3*Euonymus japonicus*, 6, 78*Eupatorium cannabinum*, 82*Fraxinus excelsior*, 74*Galium verum*, 58*Hippocrepis comosa*, 50*Hypericum perforatum*, 74*Juglans regia*, 18*Ligustrum ovalifolium*, 52*Linaria vulgaris*, 40*Lotus corniculatus*, 94*Lupinus polyphyllus*, 41*Lysopersicum esculentum*, 83*Lythrum salicaria*, 93*Malus sylvestris*, 18*Myrica gale*, 75*Platanus orientalis*, 18*Populus alba*, 74*italica*, 18*tremula*, 93, 107*Prunus avium*, 34*domestica*, 34*lauro-cerasus*, 34*persica*, 18*Rubus fruticosus* agg., 42, 55*Sambucus nigra*, 83*Sanguisorba officinalis*, 93*Sarothamnus scoparius*, 1, 118*Scabiosa columbaria*, 74*Scrophularia aquatica*, 82*nodosa*, 82*Senecio jacobaea*, 14, 40, 82, 118*vulgaris*, 14*Solanum dulcamara*, 18*tuberosum*, 83*Syringa vulgaris*, 74*Thymus serpyllum*, 94*Ulex europaeus*, 118*Verbascum thapsus*, 83, 118*Vicia sepium*, 74*Zea mays*, 18**GYMNOSPERMAE****DICOTYLEDONES***Aesculus hippocastanum*, 18*Agrimonia eupatoria*, 107*Alnus glutinosa*, 74*Arbutus unedo*, 127*Arctium lappa*, 82*Betula nana*, 21*verrucosa*, 21, 74*Carduus nutans*, 82*Chamaenerion angustifolium*, 40*Cicerbita alpina*, 59*Cirsium palustre*, 82*Celutea arborescens*, 59*Corylus avellana*, 42*Cyclamen hederifolium* (=neapolitanus), 14*Digitalis lutea*, 59*Ficea abies*, 21, 58*Pinus sylvestris*, 18**PTERIDOPHYTA***Phyllitis scolopendrium*, 26**FOSSIL***Corycium enigmaticum*, 21



VOL. 26

No. 274

•

FEBRUARY, 1967



90J



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**

FREDERICK WARNE

1-4 Bedford Court, London, W.C.2

INTRODUCING THE INSECT

The aim of this book is to set out a clear and concise introduction for the beginner without using too many technical terms. Much information is given on collecting apparatus, storage boxes, preparation of specimens, and many other topics. Profusely illustrated,

By F. A. Urquhart. **30s. nett**



THE BUTTERFLIES OF SOUTH PERTHSHIRE

by George Thompson



An up to date account of all the species and sub-species found in South Perthshire and the only publication dealing exclusively with the butterflies of this area. Only 500 copies printed by private press. 8 pp with map and illustrations.

2s. 6d. post free from G. Thomson,
98 George Street, Dunblane, Perthshire

AES NOTICE — where to write

Membership applications and first subscriptions to:

D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset. Yeovil 3928.

Changes of address and non-arrival of Bulletins to:

P. Taylor, 18 Old Manor Drive, Isleworth, Middlesex.

Advertisers and for Prospectus of Society and Application forms to:

R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex. GRImdsyke 0460.

Offers to lead field meetings, etc. to:

C. B. Pratt, 1 West Ham Lane, London, E.15

Manuscripts, drawings and books for review to:

H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

Subscription renewals (25/- per annum, 12/6 under 18 years) to:

B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex. Sunbury 2687.

Youth matters to:

H. J. Berman, St Ivo School, St Ives, Hunts.

Offers of help, queries, etc. to:

P. W. Cribb, 355 Hounslow Road, Hanworth, Feltham, Middlesex. FELtham 3099.

Annual exhibition matters to:

B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27. GIPsy Hill 0057.

The Amateur Entomologists' Society

Published August, 1966

PAMPHLET No. 11

A Label List of the Butterflies of North, Western & Southern Europe

Compiled by P. W. CRIBB

Listing 403 species and subspecies with up-to-date nomenclature and older synonyms. Suitable as a Label or Check List. Printed on white Bond paper, set in 10pt. Times type. Size 8 x 10in. Price 8/- per copy, postage extra at cost

From A.E.S. PUBLICATIONS AGENT,

137 Gleneldon Road, Streatham, London, S.W.16, England

Do NOT send any money with your order. An invoice will be sent with the publication

The Entomologist's Record

and Journal and Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription - 35s. post free

Write for specimen copy to F. W. Byers, 59, Gurney Court Road, St. Albans, Herts., enclosing 5/-. This amount will be taken into account in the first year's subscription.

THE AMATEUR ENTOMOLOGIST

Originally an annual publication (the Journal of the AES), containing longer articles than the *Bulletin*. Now used as a serial title for the Society's Handbooks. Volumes in print are listed below.

8. Includes several leaflets that are now O.P. : **Collecting Dragonflies ; Collecting Mosquitoes ; Making Sweepnets** ; an 8pp. list of standard books on entomology, etc. 48 pp., 32 figs., 6pl. **Price each : 5s. 0d.**
9. **Practical Methods and Hints for Lepidopterists.** Contains articles on rearing and collecting larvae ; illustrated instructions for making beating trays and cages for all entomological purposes. 42 pp., 48 figs., 6 pl. **Price each : 5s. 0d.**
10. Contains illustrated articles on **Collecting Lacewings ; Drawing Insects ; Collecting Caddises ; Photography of Caterpillars** ; etc. 40 pp., 10 figs., 12 pl., (Not many left). **Price each : 6s. 0d.**
11. **A Coleopterist's Handbook.** Describes the tools and methods for collecting British beetles ; their habitats, commensals and pre-adult stages ; how to record, photograph, make a personal collection, and conduct a local survey. 120 pp., 50 figs., 20 pl. **Price each : 15s. 0d.**
12. **A Silkworm Rearer's Handbook** (2nd edn.). How to breed 120 exotic species in Britain, including substitute foodplants and descriptions of stages. Systematic section refers to 1,400 species. Does not deal with the Mulberry Silkworm (*Bombyx mori*), q.v. Leaflet No. 3. 165 pp., 26 figs., 26 pl. (2 col.). **Price each : 17s. 6d.**

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

(World List abbreviation : Bull. amat. Ent. Soc.)

Some volumes are in short supply, so complete your set now. You can also complete your volumes or obtain particular articles by buying individual parts. Each volume complete with cover and index.

Volume 7 (1946-8) **21s. 0d.**

Annual volumes 8 (1949) and onwards per volume **15s. 0d.**

Individual issues published before 1963 per part **2s. 0d.**

Individual issues published 1963 onwards per part **4s. 0d.**

Silver Jubilee Number contains contributions by Honorary Members and past Presidents : The First 25 Years ; Studying the Commoner Insects ; Butterfly Botany ; Communication Among Social Insects ; Some Observations on Taxonomy ; Distribution, Range and the British Fauna. 18pp. **2s. 0d.**

Special Issue, August 1965 contains "A Guide to and Local List of Insects in North-west Cornwall" by G. D. Trebilcock, and "Insect Migration", a review by C. B. Williams. 80pp. 6 maps. **8s. 0d.**

These publications are obtainable from L. Christie, 137 Gleneldon Road, Streatham, London S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.



STOP PRESS

The Annual General Meeting will be held on Saturday 18th March 1967 in the rooms of the Linnaean Society, Burlington House, Piccadilly, London W.1. Further details will be circulated."

EDITORIAL

In this issue is published the fourth Supplement to the 1962 *Membership List*. The Council regrets that the *Geographical Key* is not included, but the cost of providing this in a supplement is at present not worthwhile.

The report of the 1966 Annual Exhibition appears on the following pages and it will be apparent that, as last year, the activity demonstrated within the Society is most striking. If I could add a word to that report it would be to reinforce the commendation of the standard of exhibits, and in particular those of the Junior Members. In my opinion it was an Exhibition even more remarkable in this respect than last year's: the indications for the future are most encouraging, therefore.

H. V. Danks (2907).

COLLECTING NOTES

FEBRUARY 1967

The Smaller Moths

Dasycera sulphurella Fab. Mr E. S. Bradford writes: "Head, thorax and body dark bronzy brown with head and thorax edged with yellow. The

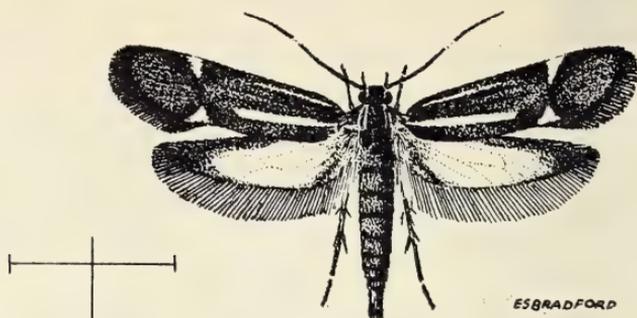
Front cover illustration: Larva and imago (pupa inset) of the White-letter Hairstreak Butterfly (*Strymonidia w-album* Knock) on Wych Elm (*Ulmus glabra* Huds.), drawn by Mr J. Cooter (3290J).

Mr P. J. Edwards' name was unfortunately omitted as the artist for the front cover illustration on the November 1966 issue. The error is regretted.

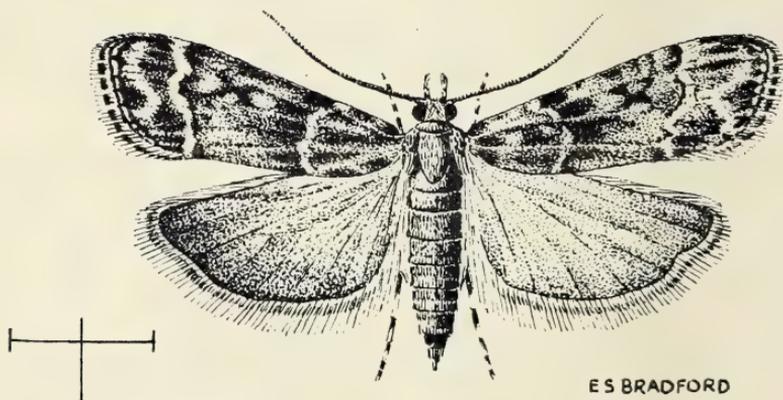
antenna has a white band about two thirds along. Forewings a dark bronzy brown streaked with yellow and with two patches of yellow on the costal and dorsal edges. The hindwings are bright yellowish chrome edged with black. The larva feeds on a variety of dead wood; patches of frass on the wood show where the larva is or has been feeding. The imago flies usually in the morning and can be found during May and June. I have it in the garden feeding on a decaying oak branch and have found it at Dungeness on broom (*Sarothamnus scoparius* (Linn.) Koch)." The yellow markings on the forewings are much restricted in some specimens.

Whitlesia (*Scoparia*) *mercuria* Haw. (*frequentella* Staint.). Mr Bradford's note reads as follows: "I have taken three specimens at Islington, London; there is not a lot of moss or lichen where I took them. The forewings are whitish ochreous speckled with black scales and with darker markings and streaks. The hindwings are a palish grey, darker towards the edges. The imago can be found from June to August."

The moths of this group are now divided into two genera, those whose larvae feed on roots being ascribed to *Scoparia* and those which feed on mosses to *Whitlesia*. Differences in the genitalia of the imagines reinforce this distinction. Fourteen species are comprised in these two genera and the identification of several of them has always presented difficulty. The moth depicted was, in fact, provisionally identified as *W. resinosa* Haw. by Mr Bradford, but I have taken the liberty, after discussion with him and Mr S. Wakely, of presenting it to you as *W. mercuria*. The other species to which it might be ascribed is *W. crataegella* Huebn. You can read in



Dasycera sulphurella Fab.



Whitlesia mercurea Haw.

the *Entomologist's Monthly Magazine* for 1890 a correspondence, which became so acrimonious that it had to be stopped by the editor, concerning the relative status of *W. mercurea* and *W. crataegella*: Mr C. R. Briggs maintained that they were varieties of the same species, while Mr E. R. Banks (rightly, as we now know) regarded them as specifically distinct. The problem is that while the extreme and even the typical forms look different enough, varieties of each come so close together as to be almost indistinguishable. If you disagree with the identification in

question, please say so. The most recent article on this group, entitled, 'A Revision of the British Scopariids' by P. E. S. Whalley and M. W. F. Tweedie, is to be found in the *Entomologist's Gazette* vol. 14 page 81 (1963). It is illustrated by sixty-six photographs of the fourteen species and will be found extremely helpful. Incidentally, the authors restore the older Linnean names *mercurella* and *resinella* for two of the species under discussion.

The moths illustrated suggest field-work which can prove profitable in the early months of the year, when

here are, as yet, no leaves on the rees, and the low herbage surviving from the previous season is too tough and insipid to please the taste of tender young larvae. There are two groups which are independent of the bourgeoning of the spring; I refer to those which feed on rotten wood and those which feed on mosses. The late Mr L. T. Ford in his 'Guide to the smaller British Lepidoptera' cites twenty-two species which are to be found in rotten wood, and of these at least seventeen feed in the period from February to April. They belong to the Oecophoridae and the Tineidae. The larvae may be found in old stumps, in decaying branches, under lead bark and even in sticks lying on the ground.

Of the twenty-four species listed by Ford as feeding upon moss, sixteen occur in the early months of the year. Mosses growing on roofs and walls, on trunks and stumps and on the ground in bogs and on sandhills are all liable to yield larvae. Some species, such as *Bryotropha domestica* Haw. and *Mniophaga affinis* Haw., are best searched for on sunny mornings before the dew has evaporated; they are then to be found on the surface of the moss. The majority, however, will only be located by pulling the moss apart. The moss-feeders are mostly *Whitlesia* spp. and Gelechiids, though species from other families are also included in their number. The moss containing larvae should be kept moist, preferably out of doors.

In my article last August, I recommended readers to look out for cases of *Coleophora squamosella* Staint, in the seed-heads of Blue Fleabane (*Erigeron acer* Linn.). I am happy to report that, by taking my own advice, I discovered this species plentifully in a field in the Thetford district of Norfolk—the first record of this moth north of the River Thames, so far as I am aware.

My current 'practical hint' con-

cerns the arrangement of antennae on the setting-board. They may be straightened out and adjusted symmetrically by means of a fine brush dipped in surgical spirit or wood-naphtha. They must then be anchored by paper braces, or they will spring back when the spirit evaporates. Care must be taken not to brush away the scales which ornament the antennae of some species and are aids to identification.

A. M. Emmet (1379).

The Hymenoptera Aculeata

In my notes for August 1966 (*Bull. amat. Ent. Soc.* 5: 81-2) I touched on certain aspects of the study of behaviour. Two recent publications prompt me to develop this topic. Those interested in the bees and wasps have chosen a group in which behaviour studies are particularly profitable, and several basic principles of animal behaviour have been worked out in studies of this group.

A recent book in the Studies in Biology series, *The Study of Behaviour* by J. D. Carthy (1966, Edward Arnold (Publications) Ltd., pp.57), gives a brief introduction to the whole field of animal behaviour. This helps to show how the studies best carried out on bees and wasps fit into the whole scheme of behaviour mechanisms. The second publication, *Insect Behaviour*, edited by P. T. Haskell (1966, London, Royal Entomological Society, pp. 113), is the proceedings of a symposium organised by the Society in September 1965. This gives a welcome opportunity to go back over some really stimulating lectures and assimilate them more fully. The most interesting paper for the Hymenopterist is that of Professor E. O. Wilson entitled "Behaviour of Social Insects".

One of the particularly striking features of the higher Hymenoptera

is the emergence of social, colony forming species. This has happened on several (at least ten) occasions within the order and yet only once elsewhere in the insects (in the termites). The theme running through Professor Wilson's lecture is that this evolution must be based on the behaviour of individuals, and that this behaviour must have significance not only for that individual, but also for the colony, and indeed for the group of colonies. This gives a clear and exciting aim for behaviour studies.

It has often been possible to show that the behaviour of individuals is adaptive in the sense that it is of advantage to that individual. It is also reasonably easy to demonstrate that the behaviour of individuals in a social colony is of advantage to the colony, though not necessarily to the actual individual. This is the concept of altruism. Thus individual guard bees in a honey bee colony, or individual soldiers in an ant colony, will rush forth to attack an intruder and in so doing be killed. However, their actions do serve to protect the whole colony. Professor Wilson's thesis, however, requires an extension of this to a stage that can be called colony altruism. Thus if in a particular place in a particular year there is insufficient food for all the ant colonies to develop sexual forms it would be more advantageous to the group of colonies for only a few colonies to attempt this arduous process, while the majority refrain from any attempt thus conserving the food supply.

Some evidence for this phenomenon has emerged from the study of a *Formica* species in the US. The position could be considered analogous to the sporadic rather than annual flowering of certain orchids, the ant colony being equivalent to an individual plant. The sort of evidence required need involve only a few simple observations, but these would

have to be made regularly over a period of years, in other words an ideal study for the amateur. Perhaps some of you may find this an interesting suggestion.

23.10.66. J. C. Felton (3740).

FROM AN OUTER LONDON SUBURBAN AREA

I have only just started identifying this summer's 'dubious' specimens, but it appears that nothing really new has turned up. Stanmore Common has been disappointing on the whole; no more *Tubuliferola josephinae* Toll, and no more of the very local moths *Gelechia nigra* Haw. and *Epinotia maculana* Fab., which were both moderately common around the aspen last year. Further to my remarks in the August *Bulletin* on the birch-feeding *Telphusa* spp., (*Bull. amat. Ent. Soc.*, 25: 87-90) I can now add that I searched very intensively during May and June for *T. proximella* Huebn; during early June I found one specimen in Harrow Weald Common and two in Stanmore Common—sitting on tree trunks as expected. Evidently *T. alburnella* Dup. is more common (or less secretive, perhaps), as I saw about nine specimens in Stanmore Common during July, this being a much poorer showing than in previous years, though.

I have felt tempted to blame the present 'management' of Stanmore Common for the poor numbers of Lepidoptera there this year: the cutting of artificial 'vistas' and the persistent flattening of all life in the clearings in the name of "bracken clearance to reduce the fire risk", with the inevitable result of an influx of horse-riders who then trample down more and more of the Common into a stinking quagmire. But numbers of Lepidoptera appeared to have

dropped in Harrow Weald Common also this year, rather suggesting that the decrease in numbers is general. It is all too usual to blame such observations on to the weather, but there is no clear indication whether this is the cause or whether we are witnessing just another bit of the longer-term decline which I mentioned in the last *Bulletin*.

I was interested in the suggestions from various people that disused railways should be preserved. There is one near me—the old Harrow and Wealdstone, Belmont, and Stanmore Park branch line. The section between Belmont and Stanmore Park is quite easily accessible to me, and I have found it to be one of the richest habitats I have encountered in the area, even though part of it is bordered on both sides by ordinary suburban-type gardens. However, there are signs that it is already earmarked for 'development' in the fairly near future. Recently I wrote to the Secretary of the Herts. and Middx Trust for Nature Conservation in order to ascertain the attitude of the Trust to the preservation of disused railways in general, and to see if they could do anything about the Stanmore Park line in particular. I received a very full and sympathetic reply pointing out for a start that any claim for an area to be obtained by the Trust to be run as a Local Nature Reserve would have to bear exceptional weight to be considered at all: the number and importance of such Reserves already existent, under negotiation, and projected, is such that any further areas would have to have exceptional scientific interest in order to be considered in the foreseeable future. Added to this is the work and expense involved in preserving such a 'linear' site; initial purchase prices are generally so high that the habitat would have to be of *National* Nature Reserve standard to justify such expense, and the work

and expense of maintenance would also be great. After all that, a change in the use of the bordering land is liable to upset the *status quo* of such a linear site, so that its preservation for particular species or type of habitat is still not ensured. So, however rich a habitat the Stanmore Park line may be, I should have to make out an *extra* special case for it to be taken over as a Nature Reserve. And I just haven't got an extra special case.

The only possibility that was suggested was that I could perhaps (a very big 'perhaps', I'm thinking) build up public opinion locally for the preservation of the site, and then, with the necessary body of support, could try to persuade the local Council to take over the site and to manage it as a sort of public bridleway, with management carried out by the Council but wholly agreed with the Trust.

It is no use expecting British Rail to preserve any such land, however valuable scientifically, as they are bound by Government policy. But yes, B. R. *could* conceivably be made to preserve them, but only by changing Government policy regarding the use of land and nature conservation generally. No bleatings of isolated individuals or amateur study-groups would be sufficiently powerful to effect such a change of policy, but the local Naturalists' Trusts *could* be the only answer here. I, for one, can see no hope for an enlightened Government policy on this issue unless every naturalist in the country joins and supports his local Trust—and this means *all* of us for a start. Only co-ordinated nation-wide effort can achieve what we want here; if we are not going to bother I might as well give up and play Bingo instead.

I don't know how widespread *Tipula czizeki* de Jong is, but Coe (1950) says of this crane fly, "Uncommon. Yorks, Lancs, Bucks, Herts.

10." It looks like *T. paludosa* Meig., but is of a much more constant dark grey, with silvery-grey coxae and thirteen antennal segments; *T. paludosa* has a ferruginous or at least yellowish-grey abdomen and yellowish-grey coxae, the antennae having fourteen segments (the terminal one so small that I can barely see it under my $\times 20$ aplanatic hand lens). Both *T. paludosa* and *T. oleracea* Linn. are our very well-known 'Daddy-long-legs', but I wonder how many people have examined them for the presence of *T. czizeki*. Maybe this latter species is already known to be more widespread than originally stated by Coe (1950), but in any case I was most surprised to find that nearly all the *paludosa*-group Tipulids at my light this October were *T. czizeki*, with the very last few *T. paludosa*, and *T. oleracea* at the very beginning of the month only. I also examined a large number of these crane flies in a field in Mill Hill on two days this month. They were all *T. czizeki*, and they appeared to be generally abundant there. Tipulists, your comments, please! In particular, it would be interesting to see whether this species occurs widely in the suburbs along with the other two species, or whether it is more a rural species, found in Harrow Weald and Mill Hill only because these areas are on the edge of some open countryside.

Now I have a puzzle. Those of us in almost any built-up area must be all too familiar with Evergreen Spindle (*Euonymus japonicus* Linn.), notorious for the unsightly webs of larvae of the Yponomeutid moth *Yponomeuta cognatella* Huebn. This shrub is normally grown as a garden hedge, but in this area such hedges are small and isolated. I am curious to know why just the odd few of these hedges have apparently permanent colonies of *Abraxas grossulariata* Linn. instead of *Y. cognatella*. I have been unable so far to find any correlation

in situation to account for this, and have so far failed to find *both* species on any one hedge. Why?

27.10.66. P. A. Goddard (2206).

REFERENCE

COE, R. L. (1950). Tipulidae in *Handb. Ident. Brit. Ins.* IX, part 2. R. Ent. Soc. Lond.

ANNUAL EXHIBITION 1966

A warm, sunny autumn day was a happy omen for our Annual Exhibition at the Hugh Myddelton Secondary School on 15th October 1966. Continuing the pattern of recent years, a capacity number of exhibitors, visitors and leading entomological dealers gathered to provide a most successful meeting. It seems that, reluctant as we are to change, larger premises may have to be sought for future years.

Possibly the most pronounced trend observed was in the presentation of the exhibits. In place of the formal British collections, typical of the pre-war and immediate post-war periods, many exhibitors concentrated on overseas material, others pursued a definite ecological theme and some, in face of the threat to wildlife, stressed the urgent need for conservation of the countryside and its inhabitants.

An interesting feature was the screening of natural history slides. Continuously through the day, Members showed and commented upon their own slides as well as the increasing collection of slides now owned by the Society. Mr T. S. Robertson valiantly demonstrated the setting of Lepidoptera to a large audience and Mr J. S. Collins explained his method of identifying coleoptera by means of characters listed on punched cards. Many of our regular visitors were disappointed at the absence of the St Ivo School Society. Unfortunately they had arranged to

attend on the planned date but the revised date clashed with another appointment. We sincerely hope to see them next year.

Encouraged by the interest shown last year, we offered two prizes for the best Junior exhibits. Points considered were presentation, degree of research and the general interest of the subject matter. With some difficulty, the judges reduced the choice to four extremely good efforts presented by Messrs R. H. Allen (3628J), M. S. Collins (3975J), P. M. Hawkey (3654J) and A. J. Hopkins (3812J) and after further consideration agreed that the first prize should be awarded to Mr A. J. Hopkins for his fine survey 'Lepidoptera of Derby'. The first prize of Australian insects was generously given by a Member resident in Australia. The second prize was awarded to Mr M. S. Collins for his comprehensive exhibit of beetles.

Finally the Council expresses its appreciation to the Organiser, Mr B. F. Skinner, the many helpers, including the excellent caterers, and by no means least to our Members and friends whose concerted efforts provided such an enjoyable day for us all.

As in previous years, brief notes were made of the exhibits: we apologise for the omissions which were due to the pressure of time and a few to the absence of the Member's name.

Allen R. H. (3628J)

Series of flies (Diptera) to illustrate their evolution from the primitive types to the more advanced families.

Appleton D. (3631)

Beetles (Coleoptera) from the New Forest and other localities in South Hampshire.

Bradley J. (3867)

Unusual species of Stick insects (Phasmida) from India and Java housed in a variety of suitable cages with heating arrangements. All species had adopted convenient

British plants.

Brown R. D. R. (3851J)

Butterflies collected during holidays in Spain and Switzerland.

Bruce C. J. (1746)

Large sized drawings of the dried genitalia of representative male moths as a guide to the identification of the species. Also a collection of the moths occurring in the Norfolk Marshes.

Coleridge W. L. (2194)

European species of *Erebia* (Ringlet type butterflies), a common genus on mountain slopes in the Alps and elsewhere in Europe, Asia and America but of which only two species are reported from the British Isles.

Cooter J. (3290J)

A selection of rare and local beetles (Coleoptera) collected in 1965 and 66.

Collins M. S. (3975J)

An extensive worldwide collection of beetles (Coleoptera) under the heading 'Beetle form and function' arranged to show the development of specific characters in relation to their particular modes of existence.

Cribb P. W. (2270)

Butterflies of Switzerland from numerous localities including the Rhone Valley, Simplon Pass and the Jura, many of which were bred. Beetles from Valaise and la Dole (Switzerland) and Normandy (France). Also the curious four-horned larvae of the local European butterfly, *Charaxes jasius* Linn. sent by courtesy of Mr. Ferdinand de Carvalho.

Dodwell D. E. (3842)

Varieties of British Butterflies. A unique series of all-red cinnabar moths (*Callimorpha jacobaeae* Linn.) bred from a female taken at Sherborne in Dorset. Some brilliant exotic butterflies (*Morpho* spp.).

Gardiner B. O. C. (225)

Long series of the Cabbage White Butterfly (*Pieris brassicae* Linn.) showing the extensive variation resulting from breeding experiments being carried out at the Cambridge Field Station.

Goddard P. A. (2206)

Large photographs of typical Lepidoptera including microlepidoptera of the Portland (Dorset) area obtained during a number of visits during 1966.

Grimsell D. (3855J)

Easily constructed heated breeding cage housing a brood of the Indian Stick Insect (*Dixippus morosus* Br.).

Hawkey P. M. (3654J)

A comprehensive review of the Lepidoptera of the Sevenoaks, Otford and Shoreham area with descriptive maps of the chalk, lower greensand, pleistocene clay and River Darent sections. Also special notes on species adapted to particular ecological conditions occurring in these situations.

Heslop Mrs J. (3356)

Imagines of the Painted Lady butterfly (*Vanessa cardui* Linn.) bred from ova obtained in the spring when a large immigration of this species occurred.

Hilliard R. D. (99)

Examples of the moths (not including the geometridae and microlepidoptera) noted in the first year (1966) in a London suburban garden, (Stanmore, Middx.). The total of approximately 140 species was obviously incomplete as a number of common species known to occur in the immediate vicinity were not recorded together with a few late autumn species not yet out.

Hopkins A. J. (3812J).

A review of the Lepidoptera of Derby based on local field work and a garden light-trap. The whole was illustrated with photographs and maps detailing the area and showing the relative abundance of the species and specific life-histories.

Lavendar J. S. (3806)

Representative collection of Japanese butterflies including many species allied to the European fauna.

Lewis K. C. (3680)

Illustrated life history of a leaf-cutting bee (genus *Megachile*) with examples of all stages. A nest of the Bumble bee *Bombus agrorum* Fab. with indications

of siting positions (surface nests).

Lucas A. (3934J)

Typical British butterflies from localities in the Surrey area.

McCormick R. F. (3375) and Hart C. (3845)

Interesting Lepidoptera noted in 1966.

Muggleton J. (3253)

Specimens and photographs of Coleoptera and Orthoptera from the Pyrenees, mainly the Hautes Pyrenees region of France. Orthoptera were found up to 6000 ft and Coleoptera up to the 8500 ft level.

Penney C. (3880J)

Butterflies occurring in various localities in the Home Counties.

Potter Dr N. B. and Young L. D. (4012)

An extensive research on the Small Copper Butterfly. (*Lycaena phlaeas* Linn.) showing the lines of variation and the extreme varieties bred.

Rivers C. D.

A review of the work of the Virus Research Unit with numerous examples and photographs of affected specimens, efficiency control rates and methods of building up stocks of virus. An essential requirement was that a virus should be selective, affecting only the required host.

Also series of the hybrid obtained by crossing the Poplar and Eyed hawk-moths. (*Smerinthus* hybr. *hybridus* Steph.).

Robertson T. S. (2417)

Types and varieties of British butterflies captured and bred during 1965 and 66.

Sadler E. A. (2966)

Rare and unusual lepidoptera noted in 1966.

Skinner B. F. (2470)

The local species of Lepidoptera noted in the Burren and Dingle Peninsula (County Clare, Eire) during a visit in August of this year.

Taylor P. (3571)

Small series of seventeen species of British butterflies reared from ova obtained from captured specimens:

the majority of the broods were returned to the original habitats with the intention of strengthening the colonies.

T.I.E.G.

A number of Junior members who are associated with the Teen International Entomology Group, an American-sponsored Youth Society with international membership, combined to present a T.I.E.G. exhibit. The presentation was excellent and resulted in an overall total of thirty new members for the Group.

Individual exhibits were :—

Dransfield R. D. (3492J)

Lepidoptera taken on a youth-hostelling trip in the Yorkshire Dales with the St. Ivo Society and including locality notes. North American Lepidoptera, Coleoptera and Orthoptera. Japanese butterflies with special notes by Mr Y. Okano.

Langdon M. R. (3708J)

Posters and charts for the stand.

Lewis D. V.

Varieties and geographical sub-species of selected British butterflies with relevant notes.

Majer J. D. (3892J)

Lepidoptera from the Calais area (France) and some North American larvae (Lepidoptera).

Scutt M. S. (3877J)

Easily constructed cages for rearing and pairing silkmoths (Saturniidae) with heating arrangements.

Trebilcock G. D. (2976)

Illustrated life history of *Papilio zelicaon* Lucas, a swallowtail butterfly from Santa Barbara (California), allied to the English *P. machaon* Linn. Some Papilionidae (swallowtail butterflies) from New Guinea, showing the diversity of local forms.

Uffen R. W. J. (1660)

Distinctive insects from the Swiss Alps including species of Neuroptera (Lacewing flies), Odonata (Dragonflies), Pyralidae (Medium sized moths including the Grass moths) and

Hymenoptera (Ants).

Warren-Smith C. D.

A large representative collection of European, including British, butterflies.

Watkinson I. A. (3130)

A surprisingly large collection of moths taken in his garden light-trap over a period of eight years. The situation was Orpington, Kent, in the southern suburbs of London.

Whitehouse S. J. (3551)

Series of *Leptidea sinapis* Linn. ab. *ganerew* (Wood White butterfly) and type for comparison.

Willmott K. J. (3822J)

An interesting selection of British butterflies compared with their continental counterparts. In some cases a different form and in others, closely allied species.

Wills H. (3732)

Large collection of British flies (Diptera) with especial emphasis on the beneficial hover flies (Syrphidae).

Zoological Gardens

As for many years, we welcomed the curator of the Insect House at the London Zoological Gardens who showed some of the live material of varied orders from their present collection.

R. D. Hilliard (99).

THE STUDY OF SPIDERS

Part V

In my last article in this series I promised to tell you something about the fascinating family of the Salticidae, or jumping spiders.

Of all the families of British spiders, none can lay claim to being as athletic as the members of this family. Jumping backwards and sideways as easily as forwards is their normal mode of progression, in addition to which they have the most engaging habit of

swivelling their heads from side to side, as though watching us watching them!

The Salticids are the most brilliantly-coloured of all the tropical spiders, many of them being decorated with bands of iridescent green, gold and other hues. But they can jump no further in proportion to their body length than our smaller and less spectacular species, which are really no less attractive in a more subdued kind of way.

The Salticids have the most highly-developed eyes of all spiders. The front row consists of a huge luminous middle pair, flanked by the smaller laterals, while four posterior eyes extend down the back of the head, enabling the spider to see in all directions at once. No Salticid could ever make the excuse "I haven't got eyes in the back of my head!" The movement of a fly or other insect behind the spider will be observed at a distance of several inches; the spider will then jump round at right angles to face it—an event for which the fly in all probability is not prepared.

The Salticidae are hunters and spin no web, but rely on their fantastic visual powers to spot their potential prey. Long before the unsuspecting victim is aware of impending doom, the jumping spider, walking in a characteristic series of jerks, stalks it as stealthily as a cat until within pouncing distance. It is thought that the great luminous pair of middle eyes enlarge the image of the prey.

Many observers have noticed the rapid flickering movements of the battery of eyes, accompanied by apparent changes of colour as the spider stalks its prey; the greenish-bronze glints are probably the result of a change in the direction of the light. Dr W. S. Bristowe thinks that this may be part of a pattern of hypnotising the prey, or at least riveting its attention as the spider draws nearer, when the flickering movements are

intensified and accompanied by a fluttering movement of the palps.

In the Salticidae the first pair of legs are normally much more powerfully-built than the others, and nowhere is this more evident than in *Hyctia nivoyi* Lucas, an uncommon species of sand dunes, whose massive front legs are often used to hold the prey on alighting from the jump. As may be realised, however, it is actually the hind legs that play the greatest part in the motor activation of the jump, just as in grasshoppers and frogs, despite the fact that the hind legs are less robustly-built. This has been proved by various experiments conducted by Dr Bristowe and described in his book, 'The World of Spiders' (1958).

The proverb 'Look before you leap' is never ignored by a Salticid. An almost invisible thread is invariably fastened to the ledge, wall, plant-stem or other surface along which the spider is walking, before the final leap upon the prey; this ensures her security, in much the same way as a window-cleaner's safety-belt, preventing the possibility of her falling off. Pads of adhesive hairs on the tarsi of the legs also aid her ability to cling to vertical surfaces.

The prodigious leaps of which these animals are capable must be seen to be believed. The distance jumped by *Attulus saltator* Simon, another uncommon sandhill species, on measurement was found to be twenty times its own body length (W. S. Bristowe, 1958), while a larger species, *Salticus cingulatus* Panz., jumped twenty-three times its own body length (A. Cuthill, 1965).

The jumping spiders are sun-lovers, rarely venturing forth when the sun is not shining, though on one occasion I observed *Heliophanus flavipes* Koch covering the stony pathway through a dark pinewood at a considerable speed on a dull after-

oon. It is extremely entertaining to watch Salticids running and jumping on a brightly sunlit wall on late summer and early autumn afternoons; the moment the sun disappears behind a cloud, the spiders vanish almost instantaneously into crevices and holes between the stones, or cracks in the mortar between the bricks.

In my garden I once had the pleasure of watching the amusing antics of no fewer than five species simultaneously—*Salticus scenicus* Clerck and *S. cingulatus*, *Heliophanus cupreus* Walck. and *H. flavipes*, and *Euophrys frontalis* Walck.—for about two hours before the sun finally disappeared and the spiders decided to call it a day; within seconds there was not a spider in sight, although I had counted twelve of them on an expanse of 3 ft wall about 6 ft long!

It is the spiders of this family which are so well-known to naturalists for their fantastic mating dances. Although April and May are the main months for these courtship displays, I have watched them as late as September, when they were carried out with zeal at least as great as, if not greater than, that shown by the same species much earlier in the year. The species which I have seen actively pursuing mates from spring until well into autumn include *Salticus scenicus* and *S. cingulatus*, *Heliophanus cupreus*, *Euophrys frontalis* Walck. and *Evarcha falcata* Clerck.

These displays can last for anything up to four hours, during which the retiring male, whose powers of physical endurance must be at least equal to his enthusiasm, gyrates rapidly round and round his intended spouse, or, in some species, jigs and sways from side to side in a manner ludicrously reminiscent of the Highland fling. Front legs will be elevated to an impossible angle; palps will be vibrated, or jerked up and down in a regular rhythm. Both front legs and

palps are frequently decorated with black and white stripes, white fringes and other adornments, all of which are shown off to their fullest extent during these dances.

One of the most interesting spiders to watch during one of these performances is *Sitticus pubescens* Fab., a widely-distributed species partial to the outer walls of houses and sheds. The male will often start his gyrations while still several inches away from a female, raising one leg at a time in a most comical manner. Usually the female will stand immobile, staring at him as though mesmerised by his movements; but sometimes she will for some reason take exception to his attentions, and will respond by leaping at him aggressively, but, to quote Dr Bristowe, "(the male) can move so quickly himself that he is somewhere else by the time she alights where he has been standing. If she moves out of view behind a leaf, it is amusing to watch him standing on tiptoe in an effort to look over it or peep round the side before he goes in pursuit".

The actual time taken by the spiders of this family to perform the act of fertilisation varies from one species to another. Both palps are employed, one at a time, for varying lengths of time. *Marpissa muscosa* Clerck has been observed to complete a mating in twenty minutes (Bristowe, 1958), while at the other extreme I have watched a mating—or rather, a successive series of matings—in which a very enthusiastic pair of *Salticus scenicus* took nearly seven hours, during which the left palp was used a total of six times and the right palp twice. Dr. Bristowe, again, has observed a mating of *Hyctia nivoyi* lasting forty-seven minutes, in which one palp was used five times and the other four (1958). A. Cuthill (1965) has observed a pair of *Evarcha falcata* whose palpal activities required two and a half hours, but while Dr Bris-

towe says that, from his observations, this species uses each palp only once, Cuthill states that the left palp was inserted three times and the right palp four.

More Salticids are found in the south than in the north of Britain, as may be expected in a family the majority of whose members are tropical in distribution. While all our thirty-three species occur in the southern counties, only eleven of these have been recorded from Scotland. The probable reason for this is the fact that hot sunny days are more limited in the north of Britain, which would seem to be a more important factor than mere temperature considerations. One species, *Hasarius adansoni* Audouin, is found only in hothouses, having been imported from the Continent.

Some of the British Salticidae are exceedingly restricted in distribution. *Euophrys lanigera* Simon has been recorded from only eight localities in England; moreover, it is a specialist under the roofs of houses. I have been very fortunate in that I happened, until recently, to have lived in one of those eight localities, and have found this rarity under my own roof! Another even greater rarity, *Euophrys browningi* Mill. and Lock., is found only in one place on the Suffolk coast, where it affects empty whelk-shells!

The Cambridgeshire fens provide a habitat for the little *Neon valentulus* Falconer, only 2.5mm in length, and also for *Marpissa pomatia* Walck., one of our largest and most handsome spiders, which I have taken in Wicken Fen. *Sitticus floricola* Koch occurs only in Delamere Forest, near Crewe; if you are looking for this one, confine your attentions to the heads of cotton-grass, for you will not find it anywhere else!

Dr Bristowe says that those who have a real affection for this family will have to travel far and work hard in order to find all our thirty-three

species. As an arachnologist with a real affection for this family myself, I would only add that any travel and hard work involved in looking for them is well worth while.

In my next article in this series I shall describe some of the Thomisidae or crab spiders, which, unlike the Salticids, rely on keeping still rather than on speed in outwitting their prey!

Joy O. I. Spoczynska, F.R.E.S., F.Z.S.
(751).

REFERENCES

- BRISTOWE, W. S. (1958). *The World of Spiders*. New Naturalist Series. Collins, London.
CUTHILL, A. and SPOCZYNSKA, J. O. I. (1965). *Wonders of the Spider World*. (To be published Spring 1967 by the Brockhampton Press.).

SOME INSECTS IN ARRAN JUNE 1966

In Mr J. K. Smith's article on local Scottish beetles (*Bull. amat. Ent. Soc.*, **25**: 14-15) he mentions that he obtained *Rhagium bifasciatum* Fab. on fallen timber. This, I believe, is the beetle's normal habitat. While on holiday in Arran this year during the last fortnight of June, I fulfilled a lifelong ambition to climb Goatfell (2866ft). On reaching the summit I was astonished to discover a perfect specimen of *R. bifasciatum* walking slowly over the surface of the bare rock. There were no trees for miles around; indeed, at that height there was very little vegetation of any kind at all. This was the second time I had come across *R. bifasciatum* in unusual surroundings. The other occasion was while I was in a provender warehouse inspecting the various commodities in store, for insect pests. I found an adult *Rhagium* climbing up the outside of a large wooden grain hopper in the centre of the building.

However, I must add that I have also seen the insect on fallen timber.

In fact, while beetle-hunting with a number of other students at Tyn-drum, Perthshire in June 1960, I was fortunate in being able to obtain all three species of *Rhagium* in the one day.

During my ascent of Goacfell this year, I came across two other beetles which might be worth mentioning. They are *Notiophilus aquaticus* Linn. and *N. palustris* Dufts. Both these insects were found at a height of about 2000 feet and in similar habitats—rather stony ground with damp moss and short grass as the commonest herbage.

One other notable capture of my Arran visit was *Vanessa cardui* Linn., the Painted Lady Butterfly. I had not seen this species for many years and on this occasion the butterfly was sunning itself on a rock at the top of an almost vertical grass slope some 800 feet above sea level. My first memory of this species is of the summer of 1948 which in the west of Scotland at least was very warm and once again I was holidaying in Arran. I was able to collect a large number of Painted Lady caterpillars which were feeding on thistles (*Carduus* spp.) growing by the roadside near Lam-lash. I had always associated the arrival of this butterfly in Scotland with warm summers and therefore I was rather surprised to read in Sandars' *Butterfly Book for the Pocket* that the great 'invasion' years of 1879 and 1903 were remarkable as very wet seasons. Since coming to live in Edinburgh, however, I have learned that while I was happily collecting caterpillars in hot sunshine away back in 1948, this side of the country was experiencing some of the worst flooding of the century. Perhaps then there is some connection between Painted Ladies and wet weather.

19.8.66. B. Morrison (3761).

REFERENCE

SANDARS, E. (1939). *A Butterfly Book for the Pocket*. Oxford University Press.

AES BREEDING GROUP 1966

In 1965 a Breeding Group was formed within the AES and at the time of writing has fifteen members. The aim of the group is to breed Lepidoptera solely for the purpose of releasing in known localities to strengthen the population of various species. In these days it can well be imagined the necessity of such a group as ours.

Group members are spread far and wide across the country from Nottingham to Devon. The Group needs many new members of any age. It does not matter if you only have limited time and therefore can only breed one or two insects. Livestock is distributed throughout the group and a circular is published now and then.

If you would like to become a member of our group please write to me. My address is in the latest membership list.

24.8.66. K. J. Willmott (3822J).



BATS, BEETLES AND BEES

I believe that the other creatures which are associated with mercury-vapour moth-traps are worth mentioning besides the usual catch of Heterocera. These insects which I have found in my 125 watt trap have been very varied.

The common Cockchafer (*Melolontha melolontha* Linn.) has been a regular visitor. (This insect has been causing a great deal of trouble in the United States and other countries where planes having flown in from Orly airport, Paris, release live cockchafers on unloading. These insects are attracted to the bright lights at the loading bays at Orly and get mixed up with the baggage.)

The green lacewing *Chrysopa carnea*

Steph., houseflies, horseflies and ichneumons are very common. Some of them are dead—it being difficult to ascertain whether this is due to the heat of the bulb or to natural death. Among the Coleoptera I have noticed—not collecting them myself—have been the burying beetle *Necrophorus vespillo* Linn., the female Stag Beetle (*Lucanus cervus* Linn.), *Agriotes obscurus* Linn., *Geotrupes stercorarius* Linn. and *Elater balteatus* Linn.

I have on many occasions found worker bees, very inactive and seemingly drugged, around and inside the trap in the morning. What significance has this? I have also seen in the daytime a bee fly directly towards the white trap, which looks like a beehive, and come to rest on it. But would this apply in the night?

Perhaps other operators of moth-traps have regarded how bats will soon get used to there being an unusual number of insects around one's trap. Having found an area where insects seem to abound unceasingly these animals will fly continually around the trap darting off now and then to pursue some incoming moth. Presumably the bats catch and eat their prey whole but there is only one moth which shows signs of attack, these being in the form of semi-circular notches in the wings, probably inflicted by the mouth of the bat. This moth is the Broad-bordered Yellow Underwing (*Lampra fimbriata* Schreb.). Perhaps it exhibits a well-developed power of evasion.

10.8.66. John S. E. Feltwell (3618J).

WHERE HAVE ALL THE TIGERS GONE?

Until the summer of 1966 the Cinnabar moth (*Callimorpha jacobaeae* Linn.) has been one of the commonest

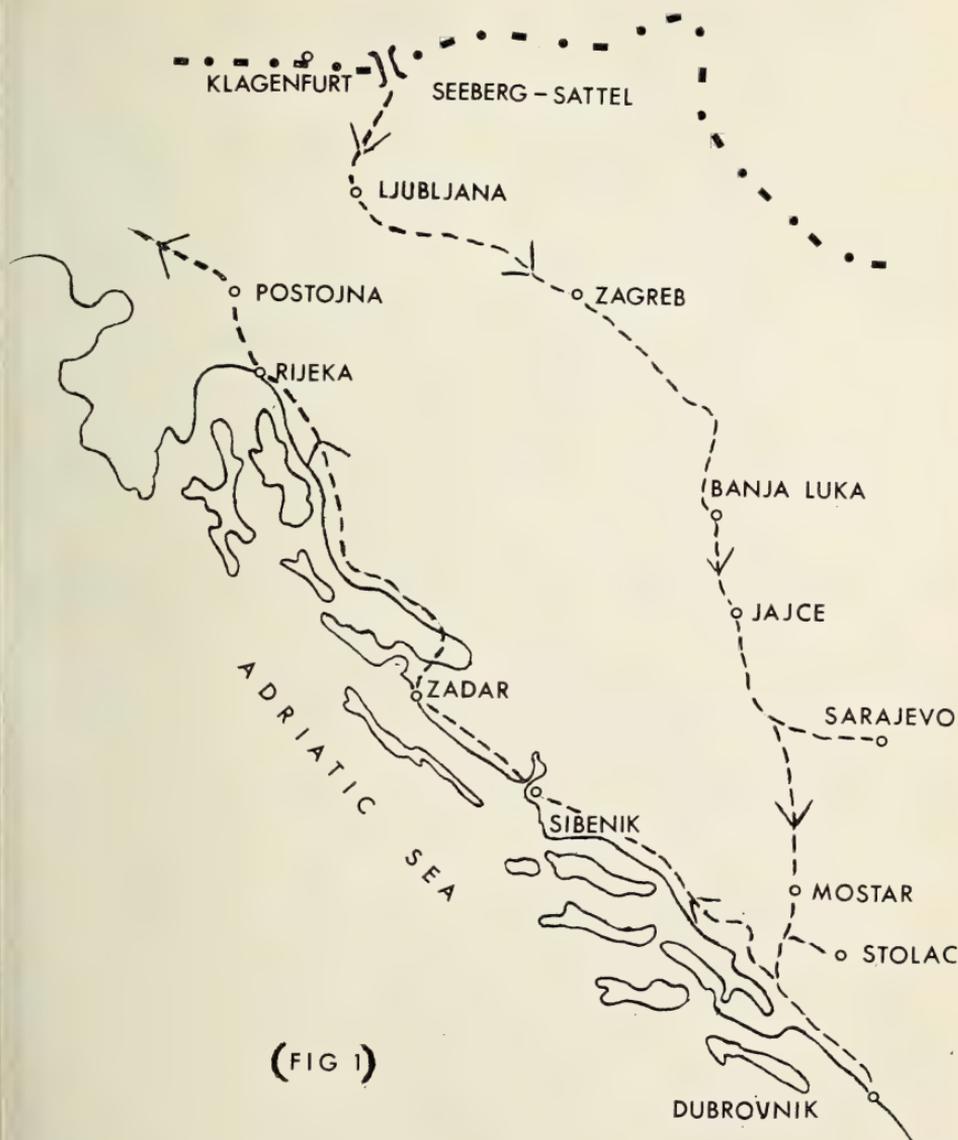
moths in south-west Middlesex. Each year the larvae throng the Ragwort (*Senecio jacobaea* Linn.) and attack the Groundsel (*Senecio vulgaris* Linn.) in and around my garden and the Hounslow Heath. I got the moth very commonly in my light-trap, and as the moth is avoided in the larval and adult stages by the Sparrows it appeared to be safe in our area. Yet in this year, 1966, it has completely disappeared. I have failed to find one larva and no imagines have come into the trap. At first I did not notice its absence but I did see that the Ragwort had excelled itself both in height and flower and then my searches failed to reveal any larvae. It was equally disturbing that I failed to find larvae anywhere in the whole area and throughout the summer the only feeding larvae I saw on my wanderings were on Ranmore Common on the North Downs. I cannot think what the cause of this sudden decline (or extinction) can be. It would be interesting to hear the observations of others on this point and some possible explanation of the phenomenon.

12.10.66.

P. W. Cribb (2240).

YUGOSLAVIA 1965

During early August 1965 I travelled with a friend via Volkermarkt, Eisenkappel and Bad Vellach in Austria towards the border with Yugoslavia. We entered by the Seeberg Pass in preference to the Loibl Pass where there are frequent delays at the height of the season. As we climbed the pass rain fell heavily. *Cyclamen hederifolium* Ait. (= *neapolitanum* Ten.) grew in profusion in the dripping forest on each side of the road. The only insects seen were numerous *Ortholita chenopodiata* Linn. (Shaded Broad-bar) in the short grass



(FIG 1)

at the roadside. On being approached they would fly a few yards before taking cover from the downpour. The descent on the Yugoslavian side was through similar coniferous forest, and eventually opened on to a series of fertile valleys with good farming, but the villages were a little tawdry.

The inclement weather gave little incentive to linger and so we pressed on through Ljubljana, the Slovenian

capital, and then south-east along the Autocedar (motorway) to Zagreb. This road passes over reclaimed marshland and there remain frequent pools and flooded fields with attendant storks. There was remarkably little traffic and every few miles a tortoise (*Testudo graeca* Linn.) would be met meandering across the concrete. Most drivers seemed to take avoiding action, but in any event they

are perhaps better adapted than the poor hedgehog to withstand the impact of vehicles. At Zagreb there was a series of thunderstorms during the night. Morning brought the sun, with *Lycaeides idas* Linn., *Colias hyale* Linn. (Pale Clouded Yellow) and *Colias croceus* Fourcr. (Clouded Yellow) present in moderate numbers along the banks of the river Sava. It did give me cause to wonder how these fragile insects with their large wing area can survive such downpours and come out apparently unscathed.

South-east of Zagreb, at Ivanicgrad on the road to Belgrade, a number of familiar species were found—*Melitaea athalia* Rott. (Heath Fritillary), *Lycaena dispar* Haw. (Large Copper) *L. phlaeas* Linn. (Small Copper) and *Pyrgus malvae* Linn. (Grizzled Skipper) were flying at the roadside, and at Laktast *Lysandra coridon* Poda (Chalk-hill Blue) and *Coenonympha pamphilus* Linn. (Small Heath) were flying in a rough pasture field. We turned south through Banja Luka, and then to Jajce via the Vrbas Valley with a series of rocky ravines through the great massif of limestone. Relief from the hot dry karst was found at the village of Jezero by the Pliva lakes, and a few miles from Jajce. The pastures around the lakes had an abundance of flowers, and the following species were recorded:—*Argynnis paphia* Linn. (Silver-washed Fritillary) *Melitaea didyma* Esp., *Lysandra coridon*, *Lycaeides idas* Linn., *Plebejus argus* Linn. (Silver-studded Blue), *Colias croceus*, *Leptidea sinapis* Linn. (Wood White), *Hipparchia fagi* Scop., (= *hermione* Linn.) and *Iphiclidea* (= *Papilio*) *podalirius* Linn. (Scarce Swallow-tail). A few miles away at Mrkonjic a number of specimens of *Maniola jurtina* Linn. (Meadow Brown) were captured on the heads of thistles. One of these, together with specimens from other parts of Yugoslavia, were sent to George Thomson (3689) who pointed out that the most

extreme forms had many of the characteristics of subspecies *telmesiaeformis* (i.e., deep red sub-marginal bands, and forewings of a different shape).

Sarajevo with a large moslem population, a bazaar, and several mosques, is in all essentials an Eastern City. Near one end of the Princip Bridge over the river Miljacka is the spot where Gavrilo Princip shot Austrian Archduke Franz Ferdinand and precipitated the First World War. At the other end of the bridge was a small grassed square where a solitary, but apparently pristine, *Nymphalis antiopa* Linn. (Camberwell Beauty) was flying. On the outskirts of the town *Colias hyale* Linn. and *Colias australis* Verity (Berger's Clouded Yellow) were common and a few specimens of *Pontia daplidice* Linn. (Bath White) were seen.

Mostar, the capital of Herzegovina, is situated between two karst mountains, the Hum and the Podrelez, and becomes extremely hot in Summer in this sheltered position. Beside the ancient bridge over the river Neretva the following species were found resting on damp rocks close to the water:—*Polygonia egea* Cramer, *Vanessa cardui* Linn. (Painted Lady) and *Pieris ergane* G-H. The specimens of the last species were very small. The species differs from other European *Pieris* by the absence of black markings on the underside. At Buna, a few miles down the Neretva from Mostar, *Heodes tityrus* Poda (= *dorilis* Hufn.) was flying in large numbers. *P. malvae* and *M. didyma* were also flying but most specimens were worn. During the late evening a typical specimen of *Mimas tiliae* Linn. (Lime Hawk) was captured at light together with a solitary *Cyboista mesomella* Linn. (Four-dotted Footman), a *Clostera anachoreta* Fab. (Scarce Chocolate Tip) and numerous *Agrotis ipsilon* Rott. (Dark Dart).

At Stolac is a cemetery of the

AMATEUR ENTOMOLOGISTS' SOCIETY

FOURTH (1966) SUPPLEMENT TO THE 1962 MEMBERSHIP LIST NEW MEMBERS AND ADDITIONS TO MAIN LIST

- Beard, P. E. (4003), 114 Birch Way, Hayes, Middx. L.
Bedingfield, R. (3984J), Little Foxes, Park Close, Ashley Park, Walton-on-Thames, Surrey. L., *Orth.*, *ent.*
Betts, B. (3977), 256 Strone Rd, Manor Park. E.12. L.
Boraston, R. C. (3931), 27 Woodbury Drive, Sutton, Surrey. L., *aq.*
Borrington, D. (3929J), 17 Austen Av, Littleover, Derby. L.
Borrington, H. L. (3930), 17 Austen Av, Littleover, Derby. L.
Bowen, Rev. N. A. (3989), Hope, North Dakota 58046, U.S.A. L.
Brant, Miss A. B. (3993J), 40 Castlebar Park, Ealing, London W.5. L.
Bright, T. N. (3960J), Garlands, Rookery Close, Leatherhead, Surrey. L.
Broughton, M. E. (3957J), 171 Harrowby Lane, Grantham, Lincs. L.
Clements, P. C. (3918), Notre Chateau, School Hill, Mevagissey, Cornwall. L.
Collins, M. S. (3975J), 171 Long Lane, Bexley Heath, Kent. C.
Cook, N. J. (3962J), Tangle Trees, 24 Hall Park Hill, Berkhamstead, Herts. L., *aq.*
Cooke, P. (3944), 12 Innis Rd, Earlsdown, Coventry, Warwick. C.
Cooper, E. J. (3923J), 27 Steyning Cres, Glenfield, Leicester, Leics. L., C.
Cunningham, J. C. (3922), Insect Pathology Unit, Commonwealth Forestry Institute, South Parks Rd, Oxford, Oxon. L.
Davies, J. P. (3948J), 27 The Drive, Bexley, Kent. L.
Davies, Mrs. S. E. (3946), 27 The Drive, Bexley, Kent. L.
Davies, Miss S. R. (3947J), 27 The Drive, Bexley, Kent. L.
Dewhurst, C. F. (3990), Crapstone House, Buckland Monachorum, Nr Yelverton, Devon. L., *H.*
Dunn, R. L. (3945), 8317 West 119th St, Palos Park, Illinois 60464, U.S.A. C., L.
Eaton, R. P. (3926), Teesdale House, Low Conniscliffe, Nr Darlington, Co Durham. L., C., D.
Ekins, G. R. (4014J), 7 Blackfriars, Spitalfields, Yarm on Tees, Yorks. H., *ent.*
Evans, J. J. A. (3980), 30 Maesglas, Cardigan, Wales. L., *ent.*
Evans, N. (3986J), 57 Highland Rd, Chelston, Torquay, Devon. *Orth.*
Everall, F. V. (3971), The Tropical Bird Gardens, Rode, Nr Bath, Somerset. *ent.*
Fearnehough, T. D. (3966), Drexel Cottage, 26 Green Lane, Shanklin, I.o.W. L.
Follett, P. C. (3935), 39 Cromer Rd, Hornchurch, Essex. L.
Freeman, D. H. E. (4010), 256 Whaddon Way, Bletchley, Bucks. *Orth.*, *Hr.*
Gilford, S. J. (3921), 30 Yonge Park, Finsbury Park, N.4. L.
Gothard, P. G. (3927J), 102 Foster Rd, Trumpington, Cambridge. L.
Gove, C. D. (3961J), 60 Salterford Rd, Tooting, S.W.17. *ent.*, *D.*, *b.*
Haddock, R. (3941), 35 Fashoda Rd, Selly Park, Birmingham 29. H., L.
Henning, W. H. (4002), P.O. Box 1584, Johannesburg, South Africa. L.
Holmes, M. V. (3996J), 22 Knockvale Park, Belfast, Northern Ireland. L.
Hooton, Dr N. S. (3995), Graylings, 7 Croydon Rd, Keston, Kent. L.
Hutchinson, R. (3969J), 92 Marlborough Cres, Sevenoaks, Kent. L.
Janssen, D. (3938J), 60 Lichfield Rd, Copnor, Portsmouth, Hants. R., *Hr.*
Kelly, L. S. (3970), 205 Roose Rd, Barrow in Furness, Lancs. C.
Kinnersley, A. (3920), White Cottage, Midsomer Norton, Nr Bath, Som. L., C.

- Kuen Teck Chiang (3940), c/o Entomology Division, Dept of Agriculture Kuching, Sarawak. L., D., O.
- Leech, R. A. (3950J), 61 The University, Keele, Staffs. L.
- Leigh, R. (3998), 321 Willow Lane, Accrington, Lancs. L.
- Lewis, D. V. (3963J), 4 Erw Sant, Llanaelhaearn, Caernarvonshire, N. Wales. L.
- Lewis, I. J. (3997J), 82 Grantham Rd, Bracebridge Heath, Nr Lincoln, Lincs. L., H.
- Lorrimore, P. W. (3979J), 23 Hornbeam Av., Enfield, Mddx. L.
- Lucas, A. (3934J), 25 Inwood Av., Old Coulsdon, Surrey. L.
- Macdonald, R. C. (3964J), 37 Sandyhill Rd, Shirley, Solihull, Warwick. L., O., C.
- Macwilliam, P. A. (3983J), 7 Meadowcroft, Aylesbury, Bucks. Col. D., H.
- Marshall, A. D. (3972), 165 College Rd, College Town, Camberley, Surrey. L.
- Masters, J. H. (2459), P.O. Box 7511, Western Heights, St Paul, Minnesota, 55119 U.S.A. L., O.
- Mawson, A. (3965), 232 Oldham Rd, Middleton, Manchester. ent.
- Miller, M. (4006J), 13 Salisbury Av., Rainham, Kent. L.
- Milner, D. (3958J), 6 Pennine Way, Barnehurst, Kent. H., C.
- Mobbs, P. G. (3956J), Chilver Bridge House, Arlington, Polegate, Sussex. L., C.
- Moore, R. R. (3924J), Boldmere Lodge, Sutton Park, Sutton Coldfield, Warwick. L.
- Nolan, P. (3939J), 32 Venwood Rd, Prestwich, Manchester. L.
- Ookio Toshio (3952J), 1155 Shinanoryo, Motomara, Mathumoto, Nagano, Japan. R.
- Parker, T. E. C. (4001), Woodcot, Beacon Rd, off Skip Lane, Walsall, Staffs. L.
- Payne, M. J. (3932J), The Kennel, Crudwell, Malmsbury, Wilts. L., ent.
- Perrie, M. R. J. (3955), 15 Great North Rd, Stansborough, Welwyn Garden City, Herts. L., ent.
- Pickard, E. (3928), 105 Kirkhill Rd, Aberdeen, Scotland. L.
- Piron, M. C. (3973J), 8 Bowhill, Putnoe, Bedford, Beds. Hr.
- Price, J. M. (3978), 145 Comer Rd, St Johns, Worcester, Worcs. L.
- Ramtorp, J. C. (3959), Bancovagen 5, Skalby, Sweden. C., L.
- Revels, R. C. (3942), Top Field Farm, Dunton Lane, Biggleswade, Beds. L.
- Ricci, P. L. (3992J), 23 Copthall Way, New Haw, Weybridge, Surrey. L.
- Richards, C. A. (3925), Springfield, Blakes Hill, North Littleton, Worcs. L.
- Ridge, M. C. (3982J), 18 Brampton Rd, Bexley Heath, Kent. L.
- Rispin, P. N. (4000J), 39 Lee Crescent, Stretford, Manchester, Lancs. L.
- Roberts, M. J. (3953), 36 School Rd, Chequerfield, Pontefract, Yorks. P., aq.
- Rock, M. R. (3954), 182 Whitmore Way, Basildon, Essex. L.
- Rocker, G. M. (4007J), 138 Carlton Avenue West, North Wembley, Middx. R.
- Rolfe, Miss R. E. (4015J), Engineers House, Oakwood Hospital, Maidstone, Kent. H., D., L., C.
- Russell, I. F. (3974), Flat 4, Cranbourne House, Cranbourne Drive, Hoddesdon, Herts. L.
- Sackett, A. W. (3981), 66 Warene Rd, Fetcham, Leatherhead, Surrey. ent.
- Schadt, A. (3987), 179 Becker St, Kitchener, Ontario, Canada. L.
- Schuman, D. J. H. (3999), 106 Odessa Rd, Forest Gate, West Ham, E.7. C., D.
- Sidaway, I. (3943), 42a Watling St, Wilnecote, Nr. Tamworth, Staffs. C., H., Hem.
- Southwell, P. R. (3976), Brook House, Brook St, Cannington, Som. fw., L.
- Stobie, C. N. (3951), 5 Wych Elm Cres., High Heaton, Newcastle on Tyne. Northumberland. L., D., C.

- Sturgeon, A. M. (3985), Lexden Garage, London Rd, Colchester, Essex. H.
 Sturgess Lief, G. P. (3933), 32 Barons Court Rd, W.14. L., C.
 Swayne, G. W. (3949), 22a Thorpe Rd, South Tottenham, N.15. ent., L., mic.
 Sweeney, M. J. (4013J), 157 Clare Rd, Stanwell, Staines, Mddx. L.
 Taylor, F. (3988), S.A.C.Y. 4255720, Room 262, Devils Tower Black, R.A.F.
 North Face, Gibraltar. D.
 Thompson, J. A. (3991J), 5 Canongate, Northgate, Cottingham, Yorks. L.
 Tomlinson, R. C. (3937), 51 King St, Stanford le Hope, Essex. L.
 Trzaskos, J. Z. (4004), R. D. 4 Voorhees Rd, Amsterdam, New York, 12010
 U.S.A. L., P.
 van Ronzelen, O. H. (4008), 1160 Forder Rd, St Louis, Missouri, 63129 U.S.A.
 ent.
 Watt, A. N. (4009), 5 Quarry Rd, Hurtmore, Godalming, Surrey. L.
 Whitaker, T. M. (3919), Gwynllidiart, Cefnllan, Llanbadarn, Aberystwyth,
 Cardiganshire, Wales. O., L., H.
 Whitney, R. V. (3994), Hurstlea, Broseley, Shropshire. L.
 Wilkins, R. (3968), 17 Boot Hill, Grendon, Nr. Atherston, Warwick. L.
 Wilson, M. R. (4011), 67 Harcourt Rd, Thornton Heath, Surrey. L.
 Young, D. I. (3936J), Rhubaan, Tollerton, York. L.
 Young, L. D. (4012), 1 Stanhope Cottages, Riverside Rd, Stanwell Staines,
 Mddx. R.

ADDRESS CHANGES AND CORRECTIONS

- Armstrong, M. A. (3664J), Yonder View, 1 Venlake Close, Gore Lane, Uplyme,
 Devon.
 Ashdown, P. D. A. (2823J), 5 Copeland Rd, Millbrook, Southampton, Hants.
 Baynton, P. (3748J), Whitegates Private Hotel, 15/17 Valley Rd, Scarborough,
 Yorks.
 Blakiston, J. R. (3621), Woodsorrel Cottage, Nursery lane, Nutley, Sussex.
 Bruce, G. E. (3019), 28 Watson St, Morley, Leeds.
 Burgess, P. V. (3355), 37 Craigen Avenue, Addiscombe, Croydon, Surrey.
 Burton, P. J. K. (3720), 54 Albany Park Rd, Kingston-on-Thames, Surrey.
 Capener, A. L. (6), Hotel Caravelle, 509 Pretorious St, Pretoria, South Africa.
 Carr, N. C. L. (2932), 1 Tellisford, The Green, Esher, Surrey.
 Chadd, J. D. (3597J), The Vicarage, Fareham, Hants.
 Chapman, Mrs V. A. (3832), 16 Catalina House, R.A.F. North Front, Gibraltar.
 Churchill, P. J. (3583), 24 Huntingdon Gdns, Worcester Park, Surrey.
 Coates, D. L. (3525), Daldreshaid, Aberfoyle, Perthshire.
 Conway, C. R. (2218), 19 Upper Park Rd, Kingston-on-Thames, Surrey.
 Danner, J. M. (3774J), c/o M. Meylan, "Gai Soleil", Le Brassus, Vallee de
 Joux, Switzerland.
 Davies, C. L. (3724), 21 Greenock Close, Newcastle under Lyme, Staffs.
 Dickens, M. C. (2958), c/o Butterfly Farm Ltd, 42 Salisbury Rd, Bexley, Kent.
 Down, D. G. (2153), 30 St Georges St, Prittlewell, Essex.
 Edwards, Miss Susan. (2921), 42 Oxford Drive, Waterloo, Liverpool 22.
 Emmet, A. M., M.B.E., T.D., M.A., (1379), Labrey Cottage, Vichnia Gardens,
 Saffron Walden, Essex.
 Eve, Dr A. (2601), 51 Broad Lane, Hampton, Middlesex.
 Felthwell, J. S. E. (3618), Gallipot Hill Farm, Hartfield, Sussex.
 Fox, Dr K. J., M.B., B.Ch., D.Obst., R.C.O.G. (1459), P/O Box 23, Manaia,
 Taranaki, New Zealand.

- Goddard, D. (3584J), 52 Clarendon Park Rd, Leicester.
- Goldsmith, D. C. (3483J), Pineview Redhill Cres., Bessett, Southampton.
- The Grammar School (2844A), Mill Hill Lane, Winshill, Burton on Trent, Staffs.
- Hanbury, R. L., M.A., F.R.E.S., (3739), The Gate House, The Ridge, Woldingham, Caterham, Surrey.
- Hargroves, R. A. (3777), 58 Rowlands Cres., Solihull, Warwick.
- Hawkey, P. M. (3654J), 18 Lyndhurst Drive, Montreal Park, Sevenoaks, Kent.
- Henwood, G. A. (3716), 3475 West 21st Av., Vancouver 8, British Columbia. Canada.
- Irwin, R. R. (1220), 7009 South Loomis Boulevard, Chicago, Illinois, U.S.A. 60636.
- Ison, C. H. (1343), 17 College Rd, London, E.17.
- Jackson, M. (3713J), 23 Craven St, Melton Mowbray, Leics.
- James, M. J., B.Sc. (3701), 62 Walmley Ash Rd, Walmley, Sutton Coldfield, Warwicks.
- Janes, C. T. (1635), 6 Garden Close, Watton, Nr Thetford, Norfolk.
- Jeffs, G. A. T. (910), Flat 1, 37 Bargate, Grimsby, Lincs.
- Jones, A. L. (3750), "A" Flt, 37(F) Squadron, R.A.F. Catterick, Yorks.
- Jones, R. G. J. (3698), 18 Conway Rd, Bromsgrove, Worcs.
- Levett, R. J. R. (1867), 32 St Annes Rd, Beccles, Suffolk.
- Linder, G. C. (3502), 109 Aldershaw Rd, South Yardley, Birmingham 26.
- Lockyer, W. (3856J), 74 Frant Rd, Thornton Heath, Surrey.
- Long, D. R. M. (3052), Grey Squirrels, Hawthorne Rd, Bickley, Bromley, Kent.
- Lovitt, G. J. (3327), 280 Willowfield, Harlow, Essex.
- Ollevant, D. (1514), 95 West Heath Rd, Farnborough, Hants.
- Parmenter, L., F.R.E.S. (895), Woodside, Pinewood Rd, Ferndown, Dorset.
- Perceval, M. J. (3798), Homedale Cottage, North Holmwood, Nr Dorking, Surrey.
- Porter, J. M. (3187), 37 Abbots Way, Winsford, Cheshire.
- Roberts, F. W. (3825), 115 Plas Dinas, Blaenau, Cheshire.
- Russell, P. H. A. (3772), 45 Huddersfield Rd, Delph, Oldham, Lancs.
- Shannon, R. T. (2334), 69 Birmingham St, Palmerston North, New Zealand.
- Shearer, V. B. (2827), Gardeners Cottage, off Spencer Rd, Chiswick, W4.
- Tesch, L. R. (1, Hon), Woodside, Mill Rd, Cromer, Norfolk.
- Walford Huggins, A. P. (3076), c/o P.O. Stratford, Cairns, N. Queensland Australia.
- Walter, P. W. R. (1493), 27 Vicarage Gdns, Scunthorpe Lincs.
- Weston, S. F. (2291), 1 Short Av., Allestree Park, Derby.
- White, R. J. (3602), 69 Collingwood Cres., Boxgrove Park, Guildford, Surrey.
- Whitton, P. (2803), 111 Heron Way, Cranham, Upminster, Essex.
- Wilding, N. (2528), 8 Cromwell Hill, Luton, Beds.
- Wyatt, J. F. (2985), c/o Min of Local Govt and Housing, P.O. Box R.W. 27, Ridgeway, Lusaka, Zambia.

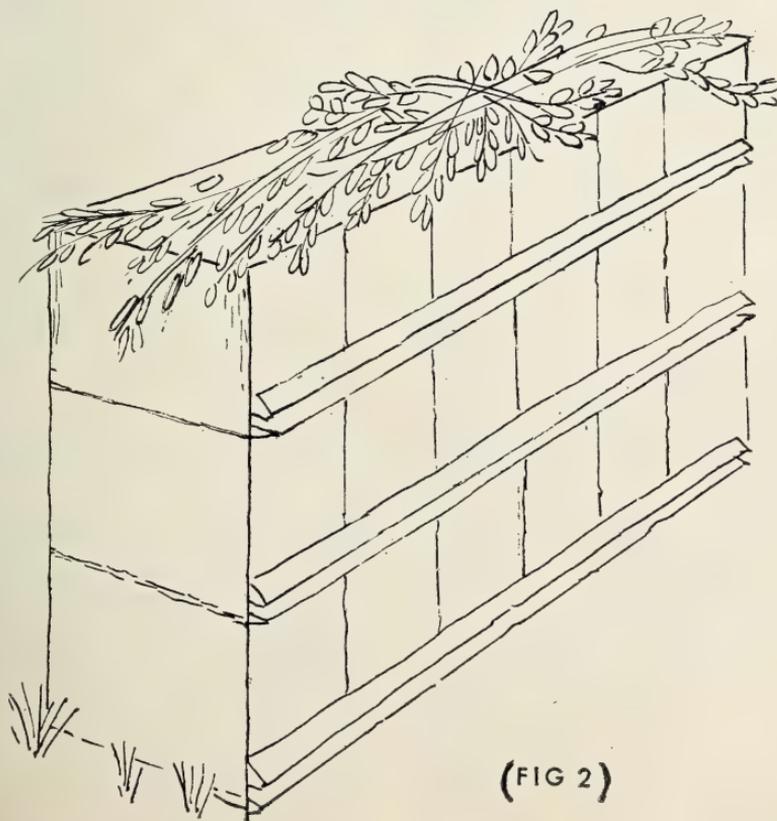
The highest Membership number on this Supplement is 4015J. All corrections and address changes are included up to and including 9th September 1966. Should any Member find a mistake in their entry, I will be pleased to receive the correct information.

G. Prior (3909)
Acting General Secretary

Heretical Bogermills—a people of a bygone age with beliefs unique at their time in this part of Europe. The site is situated on a high stony plateau several miles from the village of Stolac. Due to the very poor condition of the roads, and the lack of signposts on the minor routes, it was late in the day when we arrived. There seemed to be no insects flying, and our attention was directed to the massive tombstones with scenes from everyday life of the times and cryptic inscriptions. The sun was setting as we left the site. I was surprised to see a number of butterflies resting in the open on various low plants. Most of the specimens were *P. ergane* but there were a few representatives of a species new to me. The two specimens I brought back are males of *typonephele lupinus* Costa (= *rhamnu-*

sia Freyer). The androconial bands are much darker and more clearly marked than in *H. lycaon* Kuhns., and the hindwings have more dentated margins.

The coast from Dubrovnik to Rijeka is almost entirely dry karst with sparse vegetation. Near Sibenik the following species were captured amongst aromatic scrub:— *M. didyma*, *M. athalia* Rott. (Heath Fritillary), *V. cardui*, and two large Browns, *Hipparchia fagi* Scop. (= *hermione* Linn.) and *Chazara briseis* Linn. Another interesting find was a single specimen of *Hipparchia aristaeus* Bonelli, captured at Starigrad Paklenica just north of Zadar. This species is a large brightly-coloured edition of our own Grayling (*H. semele* Linn.) and was originally considered to be a subspecies of *H. semele*.



(FIG 2)

Postojna near Trieste has gained international renown for the local limestone caverns. There are extensive pine forests, and along the rides of these the following species were recorded:— *M. didyma*, *M. athalia*, *Mesoacidalia charlotta* Haw. (Dark Green Fritillary), *Erebia ligea* Linn. *Agapetes galathea* Linn. (Marbled White), *Heodes virgaureae* Linn., *L. coridon*, and *Aricia agestis* Schiff (Brown Argus). The beekeeping of the region is of some interest as many hives are housed in one unit (Fig. 2). The individual hive was quite small and comprised one brood chamber with no provision for the future expansion of the individual colony. The bees were of the 'Italian type' with predominantly yellow colouration. This race of bee swarms very readily and this fact coupled with the numerous small hives must involve the apiarist in a good deal of work.

Leptinotarsa 10-lineata Say (Colorado Beetle) abounded on every clump of *Solanum dulcamara* Linn. (Woody Nightshade), or a very similar species, that grew along the woodland rides. The plants had been stripped of all their leaves. A diligent search failed to uncover either eggs or larvae.

Almost ten days after entering Yugoslavia we passed into Italy via Trieste. A week was spent collecting in Switzerland—but that is another story. There is left perhaps one short anecdote. On leaving Switzerland we stopped at Framberg north of Basle. On getting out of the car a large butterfly was seen to fly from a nearby wood and alight on the roof. To my surprise it was a perfect specimen of *Apatura iris* Linn. (Purple Emperor). I tried to scoop the insect into my net without scratching the cellulose and I missed. The butterfly was knocked to the ground but did not fly away. Instead it settled on the roof again, and this time I was able to pick it up and place it in a killing

bottle. Afterwards I wondered if the insect had mistaken the car roof in the sun for a puddle of water!

7.7.66. Keith Bradbury (2627).

REFERENCE

- BRETHERTON, R. F. (1966). *Trans. Soc. Brit. Ent.*, 17: 1-94. A Distribution List of the Butterflies (Rhopalocera) of Western and Southern Europe. [This paper provides a convenient source of modern nomenclature.]

SOME HUNGARIAN LEPIDOPTERA

From 5th until 21st of August 1966 I was in Hungary collecting butterflies and moths.

I stayed at Siofok on the S.E. shore of Lake Balaton until 18th, when I moved on to Budapest. The land around Siofok is mainly flat, and, for the most part, highly cultivated. Maize (*Zea mays* Linn.) seemed to be the principal crop, but Walnuts (*Juglans regia* Linn.) and Peaches (*Prunus persica* (Linn.) Batsch) were also grown. In Siofok itself numbers of Plane (*Platanus orientalis*) and Lombardy Poplar (*Populus italica* (Duroi) Moench) trees were planted. Outside the town the commonest tree was undoubtedly a small species of *Acacia*, but birch (*Betula*) and several varieties of willow and sallow (*Salix* sp.) were moderately abundant. Scots Pine (*Pinus sylvestris* Linn.), Horse Chestnut (*Aesculus hippocastanum* Linn.) and Crab-apple (*Malus sylvestris* Mill.), were rarer.

The weather was hot most of the time, temperatures being around 90°F. during the day and 76°F. at night. Darkness descended more quickly than it does in England and it was totally dark by 8.00 p.m.

When I first arrived at Siofok it was evening and already dark. I immediately saw a specimen of *Polyphaenisericata* Esp. but was unable to catch it and I did not see another. Late that evening I walked down to the front of the town and here I found several glass-fronted shops. As there

were powerful lights just the other side of the glass a number of moths had congregated there. The commonest of these moths were *Spilosoma lubricipeda* Linn. (White Ermine) and a small species of Agrotid moth which I cannot identify. I saw but a single specimen of this Agrotid after that first night however, but *S. lubricipeda* was to be seen in numbers every night, although many of them had longer fore-wings than ours, and only had one or two black spots on them.

One or two specimens of *Phragmatobia fuliginosa* Linn. (Ruby Tiger), *Diataraxia oleracea* Linn. (Bright Line Brown Eye), *Ochropleura plecta* Linn. (Flame Shoulder), *Amathes c-nigrum* Linn. (Setaceous Hebrew Character), *Caradrina clavipalpis* Scop. (Pale Mottled Willow) and *Chiasmia clathrata* Linn. (Latticed Heath) were present every night, and *Laothoe populi* Linn. (Poplar Hawkmoth), *Agrotis segetum* Schiff. (Turnip), *Agrotis exclamatoris* Linn. (Heart and Dart), *Agrotis ispilon* Hufn. (Dark Sword Grass), *Diarsia rubi* View. (Small Square Spot), *Mamestra brassicae* Linn. (Cabbage), *Melanchnra persaricae* Linn. (Dot), *Ceramica pisi* Linn. (Broom), *Leucania pallens* Linn. (Common Wainscot), *Cucullia umbratica* Linn. (Shark), *Plusia gamma* Linn. (Silver Y), *Lithina chlorosata* Scop. (Brown Silver-line), *Cosymbia annulata* Schulz. (Mocha), *Ematurga tomaria* Linn. (Common Heath), *Deilinia pusaria* Linn. (Common White Wave), and *Epirrhoe alternata* Guell. (Common Carpet), were usually present.

I sometimes saw specimens of *Setina roscida* Linn., which is very similar to a small *Setina irrorella* Linn. (Dew Footman), and *Euxoa nigricans* Linn. (Garden Dart), *Axylia putris* Linn. (Flame), *Hadena w-latinum* Hufn. (Light Brocade), *Eustrotia uncula* Clerck. (Silver Hook), *Allophyes oxycanthae* Linn. (Green Brindled Crescent), *Plusia chrysitis* Linn. (Burnished

Brass), and both *Bena fagana* Fab. and *Pseudopsis prasinana* Linn. (Green and Scarce Silver Lines) were quite common, but, like the specimens I sometimes catch in my 'm.v.' moth-trap in London, were invariably damaged.

I captured a female of *Celerio euphorbiae* Linn. (Spurge Hawkmoth) in good condition, but released it shortly afterwards as I bred a short series from Swiss larvae. I also saw single specimens of *Harpyia bifida* Brahm. (Poplar Kitten), *Spatalia argentina* W.V., *Habrosyne pyritoides* Hufn. (Buff Arches), *Thyatira batis* Linn. (Peach Blossom), *Apamea secalis* Linn. (Common Rustic), *Chilodes maritima* Tausch. (Silky Wainscot), *Emmelia trabealis* Scop. (Spotted Sulphur), *Heliothis maritima* de Graslin (Shoulder Striped Clover), *Semiothisa alternata* Schiff. (Sharp-angled Peacock), *Hemithea aestivaria* Huebn. (Common Emerald) and *Colostygia didymata* Linn. (Twin-spot Carpet). I also caught a battered *Clostera curtula* Linn. (Chocolate-tip).

Each day I looked on the tree-trunks in Siofok, and I was once rewarded by finding a perfect female *Ennomos autumnaria* Wernb. (Large Thorn). I saw a pair of Poplar Hawkmoths in copulation on a fence, and *Apatele megacephala* Schiff. (Poplar Grey) could often be found on poplar trunks.

At Tihany, on the opposite side of the lake, I was pleased to take a single *Trachea atriplicis* Linn. (Orache), at an illuminated shop window. I only spent one day at Tihany, but I was able to add the following moths to my list which I found flying around the flood-lights at the famous abbey there—*Mythimna turca* Linn. (Double Line), *Eutelina adulatrix* Huebn., *Leucania lythargyria* Esp. (Clay), *Noctua pronuba* Linn. (Large Yellow Underwing), *Zanclognatha tarsipennalis* Treits and *Z. nemoralis* Fab. (Fan-foot and Small Fan-foot).

On rough grassy places near Siofok

Macroglossum stellatarum Linn. (Humming-bird hawkmoth) could sometimes be seen during the day, and also *Zygaena filipendulae* Linn. (Six-spot Burnet) and its continental relative *Z. fausta*, which has pink rings round the spots, but the two commonest moths were *Ectypa glyphica* Linn. (Burnet Companion) and *Chiasmia clathrata*. *Bupalus piniaria* Linn. (Bordered White) and many moths like *Leucania pallens*, which in Britain usually fly only by night, could often be seen in daylight sucking nectar from flowers. I also saw a Spurge Hawkmoth flying in the sunshine. Males of *Lymantria dispar* Linn. (Gypsy Moth) were flying round trees, and I saw two batches of ova of this species on tree-trunks. *Heliothis virescens* Hufn. (Marbled Clover) and *Eustrotia bankiana* Fab. (Silver Barred) were sometimes to be seen in the afternoons.

I spent one afternoon at Tihany collecting. Here the predominant tree was oak (*Quercus*). Moths on the wing here which I had not seen at Siofok included both *Calothyranis amata* Linn. (Blood-vein) and *Scopula imitaria* Huebn. (Small Blood-vein), *Rhodostrophia vibicaria* Clerck (a relative of *C. amata*), *Euphyia bilineata* Linn. (Yellow Shell), *Lithosia deplana* Esp. (Buff Footman), and numbers of rather small *Euplagia quadripunctaria* Poda (Jersey Tiger) flew round two oak trees.

At Siofok *Polyommatus icarus* Rott. (Common Blue) and most other common British butterflies were on the wing, also *P. tiresias* Rott. (Small Tailed Blue), and *Coenonympha pamphilus* Linn. (Small Heath) and its continental relatives *C. arcania* Linn. and *C. iphis* W. V. *Colias hyale* Fab. (Pale Clouded Yellow) was commoner than *C. croceus* Fourcr. (Clouded Yellow), but both occurred in most suitable areas. One of the commonest butterflies in marshes seemed to be *Lycaena dispar* Haw. (Large Copper), which

was flying wherever there were reeds, but it kept within these wet areas. *Papilio machaon* Linn. (Swallowtail) and *Polygonia c-album* (Comma) were not as common as I had expected them to be.

At Tihany *Leptidea sinapis* Linn. (Wood White), and *Hipparchia statilinus* Huebn. seemed to be common and at the very top of a dry hill several miles away I found *Hipparchia briseis*, a species new to me. Unlike its relative *H. (=Satyrus) circe* Fab. (Giant Tree Brown), *H. briseis* settled on the ground and was very easy to capture.

On 18th I moved on to Budapest and spent a day in the very beautiful Buda Hills. Unfortunately it was a dull day and not much was on the wing. I did manage to add *Acontia luctuosa* Schiff. (Four Spotted) and *Ortholitha bipunctaria* Prout. (Chalk Carpet) to my moth list, however.

Altogether I found 78 species of moths and 32 butterflies, so the trip did not lack numbers, but I was a little disappointed in the quality of the species.

6.9.66. I. S. Finlay (3484)

NOTES FROM A FINNISH DIARY (I)

When I made known, last June, my intention of departing to the northern climes for a year or two, very soon realised that few English people had more than a hazy idea of what Finland was, and of what was to be found here. Furthermore, although our *Bulletin* often contains interesting accounts of trips made abroad by Members each year, notes about Finland appear to be sadly lacking. I hope to be able to rectify this situation in some measure by making regular contributions to the *Bulletin*.

I arrived here on August 8th, after

a dismal trip by car through Denmark and part of Sweden. It was with pleasure that I greeted a hot, sunny day as we finally sailed into Naantali through the myriads of tiny islands which dot the Baltic south-west of the Finnish mainland.

It was then late in the season. Spring usually comes in April and lasts into May. The summer is over by the end of August in most years, and the best collecting months, according to the literature, are June and July, when most insects are on the wing. A few, such as the 'whites' (*Pieris* spp.), the Small Tortoiseshell (*Aglais urticae* Linn.) and the Camberwell beauty (*Nymphalis antiopa* Linn.) are to be found in September.

The country between Turku and Tampere, the only area I have so far been able to study, consists of Spruce (*P. abies* (Linn.) Karst.), and Birch (*Betula verrucosa* Erhart and *B. nana* Linn.) forest, with groves of Pine (*Pinus sylvestris* Linn.) and Poplar (*Populus tremula* Linn.), Sphagnum swamps, and, of course, very many lakes. The exposed igneous rocks near the village of Aitolahiti, some 30 kilometres from Tampere, are reputed to be among the oldest in the world. It was there that the strange "fossil" known as *Corycium enigmaticum* was discovered. The forests contain an herbaceous layer which strongly reminds one of the coniferous woods of Wales, though the similarity often ends at the generic level of classification, and lichens are far more prolific.

Around the lakes in August one could find many damselflies and dragonflies, but few things stir there now that September is past, save for the occasional pale brown caddis fly.

On the last Sunday in September I made a short survey of the spruce forests to the west of Tampere, and was treated to the wonderful sight of yellow and reddish-orange leaves which characterise the Finnish

"ruska-aika" period after the first autumn frosts. I searched for the Camberwell Beauty but saw nothing more enchanting than a Small Tortoiseshell basking on a rock in the afternoon sun. I did discover, however, a rather interesting grasshopper (fam. Acrididae) which was scraping soil from side to side, using its abdominal appendages as a sort of 'grab' with which to actually seize the particles. I watched it for some minutes, before deciding that it was probably covering up an egg-pod which it had just laid. It was to my discredit that, at the exact moment when I pounced forward, pipe in mouth, empty match-box in hand, to secure it, the first Finn I had seen for four hours came trotting past in a track-suit!

I was unable to identify the grasshopper from Ragge's '*Grasshoppers, Crickets and Cockroaches of the British Isles*', and it merely deposited a few pieces of frass before dying the following day. It is some 2.5 cms long, with a pronotal length of 5 mm., and its short wings measure only 3.5 mm. in length. It is definitely a female, and its most striking feature is the deep crimson colouration on the inner face of the left femur (the right one being missing!). I shall take it to the local museum eventually, but if any Member knows this species, I should be glad to hear from him.

In the less open parts of the Spruce forest I noticed several Wood Ant nests (*Formica rufa* Linn.) which were about one metre high and remarkably dome-shaped, quite unlike the flattish aggregations I have been used to in the Wyre forest between Shropshire and Worcestershire. I intend to pay some attention to these, and other ant nests next year, since I have with me a paper from the '*Acta Entomologica Fennica*' (12), entitled "On the ants of the rocks and their contribution to the afforestation of rocks in Southern Finland," in which the

writer (Eino Oinonen) suggests that Pine seedlings become established in ant nests from seeds gathered by the ants.

The final note of collecting interest is that on September 17th I was handed a dead Great Diving-beetle (*Dytiscus marginalis* Linn.) which had been found in the greenhouse next door! The gentleman who gave it to me suggested that it might have entered in the peat which he had recently carried inside.

The night-time temperatures have recently been in the region of -4°C and I expect that, with the coming of the very cold weather soon, entomology will become an armchair hobby. I hope this winter to be able to discover from field workers here (of which there are few) what effect, if any, last mid-winter's temperature of -40°C had upon the fauna in these parts.

10.10.66. Leigh Plester (2958).

REFERENCES

- OINONEN, E. (1956). *Acta Entomologica Fennica*, 12.
 PEKKARINEN, A. (1966). *Metsiemme elaimia* (Animals of our forests). WSOY, Helsinki.
 RAGGE, D. R. (1965). *Grasshoppers, Crickets and Cockroaches of the British Isles*. Frederick Warne, London.

NOTES ON BUTTERFLIES OF NAIROBI

As well as possessing one of the most numerous and varied mammal and bird faunas of the world, East Africa also has an equally abundant insect fauna. Butterflies are not lacking in this respect, as can be seen from the following list of families and the numbers of species represented (Table I).

These figures are taken from Dr V. G. L. van Someren's unpublished distribution lists and are representative of Kenya and Uganda. If Tanganyika is included, the figures may almost be doubled. R. H. Carcasson (Director, Coryndon Museum) quotes 83 species of *Papilio* from the

Danaidae	12
Pieridae	96
Papilionidae	43
Satyridae	61
Hesperiidae	212
Libytheidae	2
Riodinidae	3
Lycaenidae	394
Nymphalidae	
Charaxiinae	73
Acraeidae	96
other Nymphalidae	180

Total species 1172

Table I. Families of butterflies of Kenya and Uganda.

three countries.

This large amount of speciation has been possible because of the great variety of habitat and topography. The forests of Uganda and those of the Kenya coastal strip afford the maximum of variety and abundance, yet even the highland forests possess much of interest.

Although Nairobi is bordered to the south by vast grasslands it is included in the Highland Forest area. Situated at an altitude of 6000 ft Nairobi is a very attractive, modern city, and possesses a useful asset to the entomologist, namely the Coryndon Museum, in which is an extensive entomology department where east african insects may be easily identified. Fifteen minutes from the city centre, the Karura, Langata and Ngong Forests provide very profitable collecting grounds.

The Swallowtails, because of their large size, are first to catch the eye, especially the bright orange swallowtail *Papilio nobilis* Rogenh. *P. rex* Oberth., a large orange, brown, and cream, tailless swallowtail, never fails to please me, with its easy, gliding, soaring flight, usually high in the treetops, completely out of reach. The low-flying black and green *P. phorcas* Cram., and the blue-banded black swallowtails *P. nireus* Linn. and *P. bromius* Doubl. are often so intent on chasing one another that they almost collide with one's face

The yellow-banded, dark brown swallowtail *P. mackinnoni* Em. Sharpe sometimes appears to have a fixed territory which it guards by flying round the boundary, darting at any other butterfly which enters the territory.

P. dardanus Brown, the male of which is tailed and mainly pale yellow in colour, while the female is tailless and very variable, is very interesting in that the female "mimics" certain other butterflies which are distasteful to bird and lizard predators, i.e., the Danaiids or Monarch butterflies.

P. jacksoni Em. Sharpe and *P. cherioides* Trim. appear to frequent the shadier parts of the forest. Both of these swallowtails exhibit extreme sexual dimorphism. The females, again, are said to "mimic" a Danaid butterfly *Amauris echerea* Stoll. The males are black with a median band reduced to well-separated spots in the forewing. The median band is cream in *P. echerioides*, slightly narrower and white in *P. jacksoni*. The female forewing is black with white spots and the hindwing black with a large pale creamy-yellow discal area, and white submarginal spots. In *P. cherioides* the white apical spot touches the margin of the forewing but in *P. jacksoni* it is well inside the margin.

P. demodocus Esp., the citrus swallowtail, is another very common, tailless species. It is coloured yellow, spotted with black, with an eye spot outlined with red, on both the anterior and posterior margins of the hindwing. Larvae of this and *P. nireus* can be found throughout the year on citrus trees. The first four instars show no camouflage against the foliage, and they are easily collected during the daytime, when they sit motionless on the upper surfaces of the leaves. However, the incidence of parasitism in wild-caught larvae is so high that it is better to catch a female and cage her with foodplant, raising

unparasitised larvae from the resulting eggs.

This too can have its difficulties because sooner or later a column of Safari Ants (*Dorylus nigricans* Illig.) will find the breeding cages. Usually this happens at night, and on going to give fresh food in the morning, all that is left of the treasured specimens is a heap of wings and remains of larvae and pupae.

Swallowtail males are very easy to capture. They may even be taken between the forefinger and thumb when they come to drink at wet places. Near to my house at Karen (twelve miles from Nairobi), a small stream has been dammed resulting in several acres of water. During the dry season, the water level falls very low and a shallow backwater gradually dries out. This results in a broad band of mud some 3-4 ft wide, which follows the waterline out as it retreats. This mud makes an ideal surface upon which swallowtails can alight and drink, and consequently an ideal collecting spot.

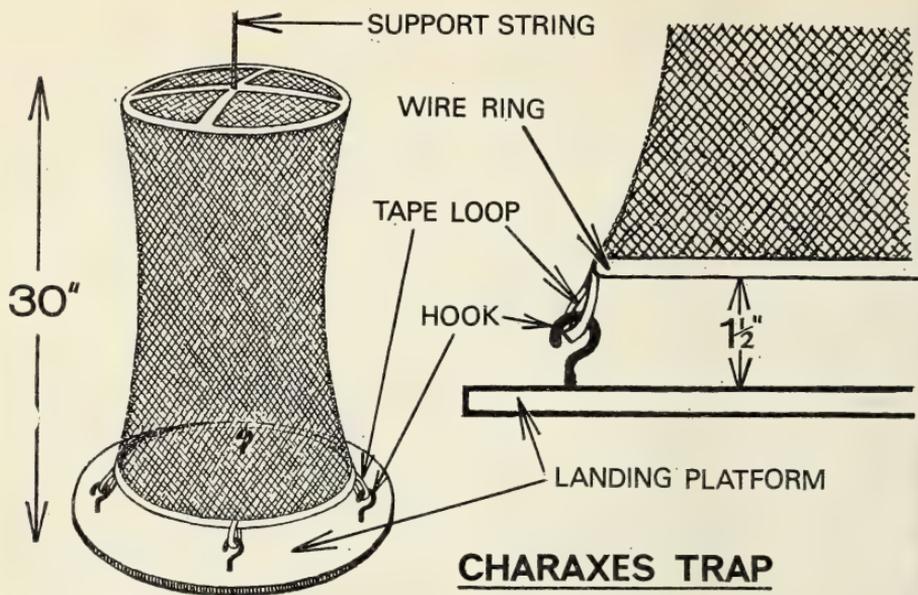
High flying males may often be decoyed within reach of the net by placing a dead specimen in a strategic position. This method is specially applicable for *P. nobilis*.

Females are generally less often seen than the males, and are best taken either as they feed on flowers or when they are being chased by a male.

The small tailless swallowtail *Graphium leonidas* Fab. although very widely distributed, is only an occasional visitor to my net. It is coloured black with pale blue spots and patches.

The group of butterflies most sought after by lepidopterists in East Africa are the *Charaxes* species. These are truly splendid insects, rapid fliers and difficult to capture in the normal manner.

Charaxes spp. can often be seen feeding on animal dung and I have



CHARAXES TRAP

taken several perfect specimens between forefinger and thumb while they were feeding intently on the fresh faeces of my dog. Fruit trees are also a favourite haunt of these butterflies when the fruit are ripe and rotting fruit litters the ground. The fact that these insects are attracted by such odoriferous material, has been utilised in the 'Charaxes trap' illustrated in Fig. 1.

The trap consists of a cylinder of mosquito netting 30 inches in length, mounted at the top and bottom on wire rings. The top is covered with gauze and crossed by two or more tapes, to which the support string is tied. On to the bottom of the net are affixed four tape loops.

The landing platform is 12 inches in diameter and can be made of any convenient material (plywood, hard-board etc.). Four hooks are attached to the platform so that it can be suspended from the loops on the bottom of the net. The gap between the platform and the net is 1 1/2 inches.

The trap is hung in the forest in a suitable position so that one can reach inside with ease.

A bait is made by mashing up

bananas, together with their skins with a little beer. I also include a few guavas when they are in season. This mixture is allowed to ferment for a day or two before use. Some authorities do say that a couple of dead frogs added to the fermenting mixture will bring in more males! A few spoonfuls of bait are placed in the middle of the landing platform, preferably on a saucer, so that easy removal is possible in the evening.

The butterflies alight on the platform, go inside, and commence feeding. When they have taken their fill, they fly upwards into the top of the net.

At first I used to leave the butterflies inside my traps overnight, and I was rather puzzled in the mornings to find them torn down and ripped. I decided to discover what manner of creature was causing the damage, and one evening I ventured to the edge of the forest bordering my house, where my traps were hanging, armed with a torch and panga. The forests in the Langata/Karen area have many resident leopards and at the time I was rather cautious. I did not have long to wait before I heard animal

cries coming through the trees, and when they were fairly close I shone my torch up into the branches and illuminated many pairs of shining red eyes. They were not scared—and slowly came down to within a few feet of me. The destroyers of my *Charaxes* traps were in fact bush babies (*Galago*)—a whole family of them. Since then, I remove the bait from my traps at every sundown, at the same time putting out a tray of fruit scraps to encourage the bush babies to visit my garden, so that I can 'show them off' to my friends.

During the daytime the traps may be forgotten. In the evening after a hard day's work, it is very pleasant to stroll from trap to trap, where the butterflies are sitting motionless at the top of the net. The pleasure of anticipating what will be caught, and then seeing a long desired rarity resting at the top of the net, can almost equal a chase with a hand-net through forest or bush. Insects can be removed from the trap without damage by unhooking one of the loops and inserting a killing-bottle. Of course, if the specimens are required for breeding purposes, plain jars can be used. On a good day a trap may contain as many as twenty butterflies. It is obvious that one must use discretion and liberate the majority of those caught, only retaining the odd perfect specimen. In the hands of an over-enthusiastic collector, a local population might become drastically reduced in a very short time. It is also advisable to release the unwanted specimens rather than to leave them in the trap to find their own way out, because they can be destroyed by predators.

The butterfly which turns up most often in my traps at Karen, is *Charaxes andiope* God. This is an extremely colourful insect having a basal area of yellow and an outer portion of orange-brown, becoming dark brown at the edges. The wings are transver-

sed by green veins. Each sex has two tails on each hindwing and the foremost of these are shorter in the male than in the female.

Other species of *Charaxes* which are common in the Nairobi area are: *C. cithaeron* Feld. and *C. nandina* Roths. Both exhibit extreme sexual dimorphism. The males of the two species are somewhat similar in that they are royal blue in colour. The male of *C. nandina* lacks the large white patch on the hindwing of *C. cithaeron* and possesses four white spots on the forewing instead of two in *C. cithaeron* (both possessing several other silvery blue spots on the forewing). *C. brutus* Cram., the white barred *Charaxes*, with its very colourful underside. *C. varanes* Cram., very brightly coloured. The basal area is white with the outer portion of the wings orange.

The following, although only occurring as occasional visitors in my traps can be found in larger numbers only a matter of a few miles away.

C. dilutus Roths.—a small green *Charaxes*.

C. zoolina Westw. form *neanthes* Hew.—a very pale green

form *zoolina* Westw.—orange.

Both forms of this species show two tails in the female but only one in the male.

C. pollux Cram.—Orange with a black border. The hindwing is greatly serrated and appears to have five tails, two main and three lesser.

C. berkeleyi van Som. and Jacks. The male is deep black with a blue sheen and a greyish margin to the wings. The female is white-barred, the bar being bordered by pale blue in the hindwing and distinctly separated into cream coloured spots in the forewing. The female has submarginal cream spots on the fore and hindwings.

C. baumanni Rogenh.—A small black *Charaxes*.

Butterflies other than *Charaxes* which often enter the traps are:

Satyridae: *Melanitis leda* Linn. This is a large brown butterfly with a reddish orange discal patch below the apex of the forewing. Each patch contains a large eyespot with white pupils.

Mycalesis safitza Hew. The extremely common "bush brown" which exhibits seasonal variation.

Nymphalidae: *Asterope (Crenis) boissiduali* Wallengr. (Brown tree nymph)

Eurytela dryope Cram. (Golden Piper). Brown with orange bars.

Eurytela hiarbas Dr. (Pied Piper). Black with white bars.

22.8.66. L. MacLeod (3534)

THE SEYCHELLES STICK INSECT

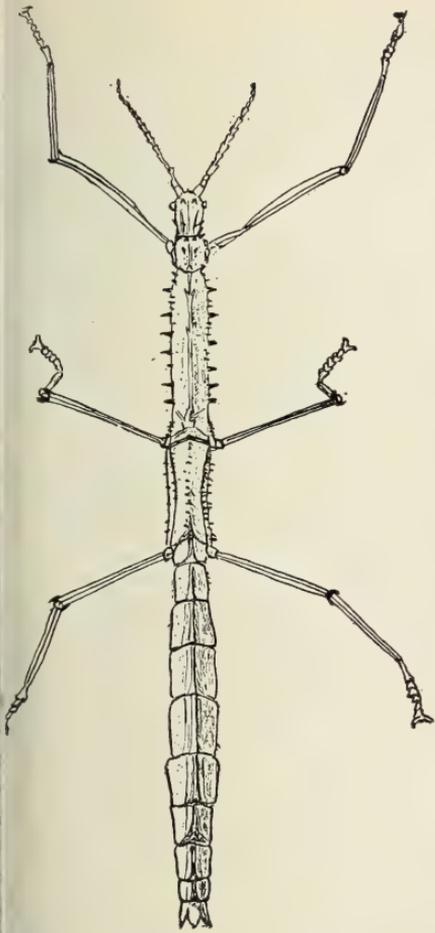
My quest for this insect (*Carausius sechellensis* Bolivar) began last year when I read an article about a group of Bristol University students who had gone to the Seychelles Islands to study the wildlife there and find out the state of the rare animals on the islands. Hoping for another contact abroad, I wrote to the author of the article and eventually contacted the Leader of the expedition. The job of collecting some stick insects for me fell to Mr Peter Dawson.

He managed to collect four species but only one survived in captivity. On July 18th 1965 at Castor on Mahé, the chief island of the group, in the high hardwood forests he found eight adults of the species which he eventually brought home. His description of them was "large females slightly flattened with lateral spines, mid brown, males darker, more slender, without the spines".

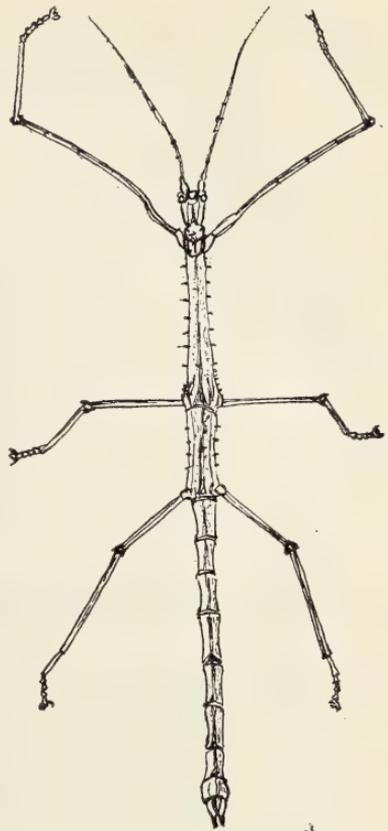
This led the experts to suspect *Carausius allaudi* Bolivar, a slightly larger species also found on the islands, and so it was not until a specimen was identified at the British

Museum that the species was shown to be *C. sechellensis*.

While still on the islands, Mr Dawson fed the insects on the ferns he had found them on but when the time came to leave he took a supply to last the journey and hoped that the insects could be persuaded on to Privet (*Ligustrum* spp.). Soon after he arrived home in early September the fern supply ran out. He gave the insects Privet but they would not eat it. The two weaker males died and the others would have followed them. However, he tried to find some ferns of the same texture as the original food-plant. He gave them Hart's tongue fern (*Phyllitis scolopendrium* (Linn.) Newm.) which they fell upon and devoured in best Phasmid manner. Soon after, the female started laying small mottled eggs which varied in colour but were all the same size. At the beginning of November, a friend of mine apprehensively brought them down from Bristol for me and I settled them down in a heated cage. There they remained, merrily laying eggs until they began to die at the beginning of this year. The first to die was one of the females and this was immediately sent to London for identification. Dr D. R. Ragge wrote back saying that was not *C. allaudi* but *C. sechellensis*. There were, of course, several requests for specimens and besides the one in the British Museum, one of the males was embedded in resin and sent to the University of Michigan in Detroit. After the last insect died, there remained only the eggs. I kept them warm and moist but unfortunately they were left in direct sunlight and all dried up. This was a great blow to me as I had hoped to study the species and also to attempt to cross it with the common *Carausius morosus* Br. However, at the time of writing I am waiting for a reply to a 'collector's plea' which I sent to the Department of Agriculture in Victo-



Carausius sechellensis Bolivar
female (78mm)



male (70mm)

Mahé, so there is still a chance of fresh specimens and fulfilling my original aim of establishing a breeding stock.
3.66. J. R. Bradley (3867J).

make use of these facilities on such a trip. The charges at present are seventeen shillings per day, which includes supper, breakfast, lunch packet, accommodation, hire of sheet sleeping bag and the use of the field study facilities. Members of a visiting party, apart from the leader, do not have to hold YHA membership cards.

A JUNIOR MEMBERS' TRIP

The suggestion has been made that Junior Members in the North of England would like to take part in a field trip of about a week's duration. The Youth Hostels Association now provide some hostels with field study facilities such as a work room. It strikes me that the Society could well

The main problem of course would be the transport to the hostel. This can only be decided when the Members who wish to go decide which of the following hostels they prefer. The following two hostels would seem to be the best for situation and type of country:

Grinton Lodge is in the Yorkshire

Pennines near Swaledale, providing peat-bog moorland, heather moorland, rough pasture, meadow and woodland.

Leam Hall is near the Derwent Valley in the Peak District and has oakwood and moorland.

If any Junior Member who is interested will contact me, we can decide on the most convenient hostel and date for the majority. I would suggest that the best time for the trip is straight after the end of the school summer term at the end of July or beginning of August 1967.

14.8.66. J. M. Porter (3087),
37 Abbots Way, Winsford, Cheshire.

JUNIOR NEWS SECTION

A happy New Year to you all! I do hope that one of your new year resolutions is to write in a report to this section about your entomological experiences. Please do not forget to include your Christian name if you are writing in and your age if that won't embarrass you.

Sorry I was not able to be at the Annual Exhibition last October and to meet those of you who were. My school society, St Ivo Entomology and Natural History Society was committed to turning up at the Association of School Natural History Societies meeting at Alperton, London, on the same day. We shall make every effort not to miss future AES gatherings.

A question posed in a past quiz certainly stirred up a hornets' nest. It was the one which asked why there are no young entomologists in Scotland. I had hoped you had guessed it was my way of getting our junior members over the border to write in about their various interests. My scheme did not work. Most of the letters I received were from older people (over 18) but I have eventually

managed to find 3 Scottish junior entomologists.

D. D. R. Thomson, 15, of 24, Viewbank Road, Bennyrigg, Midlothian Scotland (near Edinburgh) is anxious to contact any people of round about his own age in the Edinburgh area who are interested in entomology.

16 year old John Metcalfe (3616J) of Dumbartonshire is particularly interested in Hawkmoths and Silk moths but does not collect, just breeds and releases in his own district. He has not yet been on any special excursions but Mr George Thomson of 98, George Street Dunblane, Perthshire, has suggested a search for the Marsh Fritillar (*Euphydryas aurinia* Rott.) in Perthshire. John has been writing to Mr Thomson about a Silver-striped Hawkmoth (*Hippotion celerio* Linn) which he actually found in his back garden. This is a very exciting find as the Silver-striped Hawkmoth is normally found in South East Asia and parts of Africa.

John Metcalfe would very much like to hear from anyone who is experimenting with a fluorescent black-light trap as he now has one (5ft, 80 watt). His address is 3, Cairn Drive, Milngarvie.

Gordon Maclean, 16, of 53 Rannoch Drive, Bearsden, Glasgow is another Lepidopterist. He got his first taste for entomology in West Africa when he was living out there with his parents. Gordon very bravely joined St Ivo's expedition to the Yorkshire Dales last Summer and was soaked with the rest of us.

An English hero who also joined St Ivo on our hiking, hostelling, safari is the beautiful Yorkshire Pennines was Rob Dransfield (3492J), 16, of 3 Erringham Road, Shoreham-by-Sea, Sussex. Rob., a Lepidopterist, is a member of the London Zoo's X.Y. club and editor for T.I.E.N. (well worth joining) in Southern England.

By the way our expedition to te

Yorkshire Dales was a real wash out with a good time had by all. Our moth enthusiasts had some success with an easily made portable 200 watt Tungsten-filament light-trap (3 lbs) which was carried in a rucksack and worked from the bedroom light socket (details on request).

Nicholas Cook of 24, Hall Park Hill, Berkhamsted, Herts., managed to get away last summer with two friends, camping and hunting butterflies in the New Forest. Mr Siggs (243) who lives in that part of Hampshire helped the boys by taking them to places of special interest. He took them first to a spot just outside Lyndhurst where four Silver Washed Fritillaries (*Argynnis paphia* Linn.) were caught and a rarer variety, var. *valesina*, of his butterfly seen. They met a school party which had managed to catch a White Admiral (*Limenitis camilla* Linn.). After Lyndhurst, Mr Siggs drove over to Roe Wood where they found five more Silver Washed Fritillaries plus another specimen of this rarer variety *valesina*, a High Brown Fritillary (*Argynnis cydippe* Linn.) and a Comma (*Polygonia c-album* Linn.). The next day, Thursday 8th July, Nicholas and his friends cycled to a spot recommended by Mr Siggs called White Parish, where they were lucky enough to catch three White Admirals. Even the rain did not spoil their luck, for while sheltering under a tree Nicholas managed to catch a perfect female specimen of the Purple Hairstreak (*Thecla quercus* Linn.) which fell from the top of an oak tree practically into his net.

An 'm.v.' trap used on the trip was quite useful and attracted among other things some Drinker Moths, *Philudoria potatoria* Linn.) Garden Tigers (*Arctia caja* Linn.), Ruby Tigers (*Phragmatobia fuliginosa* Linn.), and Poplar Hawkmoths (*Loathoe populi* Linn.). On the Saturday before they left Mr Siggs came to say goodbye and brought parting gifts of Lobster Moth

caterpillars (*Stauropus fagi* Linn.), Great Oak Beauty Caterpillars (*Boarmia roboraria* Schiff.) and Pale Prominent eggs (*Pterostoma palpina* Clerck.). He also gave Nicholas a Small Elephant Hawkmoth (*Deilephila porcellus* Linn.), three Eyed Hawkmoths (*Smerinthus ocellata* Linn.), two Privet Hawkmoths (*Sphinx ligustri* Linn.) and two Pine Hawkmoths (*Hyloicus pinastri* Linn.). Our huntsmen had a wonderful trip thanks to Mr Siggs.

R. Johnson (3488J) is a keen Phasmidologist as well as being interested in Praying Mantids and Lepidoptera. He is at the moment compiling articles on rearing and breeding the Corsican Stick Insect, *Clonopsis gallica* Charp. and the Madagascan Flying Stick Insect, *Sipyloidea sypylus* Brun. I hope he will let us know of his progress. He is also rearing two New Zealand species, *Acanthoderus prasinus* Westw. and *Clitarchus hookeri* White. How about a drawing of these? R. Johnson's address is 60, Deep Denes, Luton, Bedfordshire.

Another young entomologist in Bedfordshire is M. S. Scutt (3377J) of 14, The Ridgeway, Putnoe, Bedford. He is a Lepidopterist and says he finds the AES a great help. Butterflies are his main interest. He catches them and attempts to breed them in special cages to be released later in the wild. Quite a nice idea of M. S. Scutt's is that there should be special nature parks set aside where butterflies could be released for visitors to see in their wild surroundings.

M.S. has a friend in America with whom he exchanges butterflies and moths.

I am delighted to have heard from my next contributor, a young lady entomologist of Monks Cottage, Leaveland, Nr Faversham, Kent, Miss Shelagh Ross (3913J). Shelagh says she enjoys the *Bulletin*, especially those articles which show ways of making equipment. She is mainly interested

n Coleoptera and is studying various life histories, and was seeking a stock of Lesser Stag Beetles, *Dorcus*. Foreign Silkmoths also take up some of Shelagh's time but she would like to hear from someone who can suggest some interesting research she could carry out with them.

I do hope those of you who go with Mr Porter on the AES junior's expedition have lots of interesting things to tell us when you return. St Ivo Entomology and Natural History Society is off to Northern Italy and Switzerland in the Summer. I hope we have better luck than we had last year.

Don't forget to write. A post card will do.

H. J. Berman, F.R.E.S. (2941A).

REVIEW

The Dancing Bees, by Karl von Frisch. Translated by Dora Isle and Norman Walker. Pp. x and 198. Illus. 117 text figs. Methuen and Co. Ltd., London, 1966. Price 30s.

The careful observations of Karl von Frisch on the way of life and behaviour of the honey bee have been well known in this country ever since the publicity given to the communication system by means of dances—the 'language of the bees'—originally pinpointed by his work.

Many people read about this bee language for themselves when the first English edition of this book, published in 1954, was produced. Since then a further two German editions have appeared, and the latest of these, published in 1964, now appears in an English translation.

The revisions and additions which have been made are by no means as striking as the original discovery of

the bee dances: but this little book is now a well-rounded exposition of the life of bees as we at present understand it, with numerous illustrations, and will perhaps appeal to an even wider audience than did the first English edition.

It is inevitable, of course, that the simplification needed for this type of book has meant that in one or two places some as yet not universally accepted theories have been advanced as fact. With this small qualification, however, the standard of presentation of the facts as we know them, the simple experiments which illustrate them, and the sequence of contents as the author takes us into the lives of the insects of which he is clearly so fond, is high.

"The life of bees", he says in his preface, "is like a magic spring. The more one lets it run, the more abundantly it flows." We are fortunate that Karl von Frisch was at the source.

This volume is recommended reading for naturalists, bee-keepers and experimenters.

H.V.D.

LETTER TO THE EDITOR

Sir,—I am pleased to report that on 13th June I was presented, by a work colleague, with a fine female Death's Head Hawkmoth (*Acherontia atropis* Linn.). It had apparently flown across the top of a nitric acid fume stack I.C.I. Wilton, and had barely touched down before dying. Upon receipt slit open the abdomen, hoping to salvage perhaps any ova, but unfortunately the moth was completely devoid of eggs.

I would also like to comment on the countless Red Admiral (*Vanessa atalanta* Linn.) and Painted Lady (*Vanessa cardui* Linn.) larvae which

are available this year. Not since 1947 have I noted these in such great numbers.

9.66. J. J. Howe (3879).

Mr. —I would like to put on record two specimens of the Rosy Minor moth (*Procus literosa* Haw.) which I caught at light on 15th August last year. I consulted South (1961) and discovered that this species is well distributed around our coast but rare inland.

The place of capture was in my garden at Stretford, Manchester, a long way from the coast. The larva feeds on grasses, wheat, oats and barley.

P. N. Rispin (4000J).

REFERENCE

SOUTH, R. (1961). *The Moths of the British Isles*. 4th edn. Frederick Warne, London. Series II, p. 224.

Numerous records of this nature in the Bulletin and elsewhere have established that the moth is in fact widely distributed inland. The information in South is misleading—Ed.]

NOTES AND OBSERVATIONS

GREY BUSH-CRICKET IN SOMERSET

According to the distribution maps Ragge's recent book on the Orthoptera (1966), the Grey Bush-Cricket (*Latycleis denticulata* Panz.) is not found in Somerset. Near Nailsea, in north Somerset, however, there is a respectably-sized resident population of this insect. Incidentally, this is under five miles from the sea.

19.8.66. R. L. Hard (3629J).

REFERENCE

RAGGE, D. R. (1966). *Grasshoppers, Crickets and Cockroaches of the British Isles*. Frederick Warne, London.

AN OBSERVATION ON THE GRAYLING IN SWEDEN

During last August I was staying at Stromstad, in the west of Sweden just south of the Norwegian border. Just off the coast were a multitude of small rocky islands, on which a large number of Grayling butterflies (*Eumenis semele* Linn.) breed.

On one rather hot but windy day I watched some female Graylings settling on the lichen covered rocks. The lichen was very dry and brittle, and of a greyish brown colour. Each thallus was like a small leaf, sticking up at an angle of about forty-five degrees from the rock. On alighting, the butterflies moved across the rock, until their antennae came in contact with a lichen thallus; then the abdomen was arched under the body, between the legs, until it came as far forward as the head, thus depositing a single milk-white egg on the underside of the lichen. They would then move to another position and repeat the process.

This was not an isolated case, as I saw several butterflies doing this, though only on this particular day. But why should they want to lay their eggs on lichens? Their normal food-plants consist of a variety of grasses, one at least of which was growing on the island, and on which I observed other females laying. However, the nearest grasses to the eggs laid on the rocks were about thirty yards away. I can think of no logical explanation for this, unless the caterpillars eat the lichen (which looked almost as inedible as the rock on which it grew!), which seems most improbable. Perhaps some reader could offer a reason or explanation. I should be most interested to hear of one.

1.9.66. C. R. Heseltine (3659).

HELIOCOPRIS DOMINUS BATES**HELIOCOPRIS DOMINUS Bates.**

Superfamily Scarabaeoidea
 Family Scarabaeidae
 Subfamily Scarabaeinae
 Genus *Heliocopris*.
Heliocopris dominus Bates.

A large and little known dung-beetle, its distribution at the turn of the century was; 'British East India (East Pakistan, Assam etc.), Burma, Laos and the Malay Peninsula'. The Laos and the Malay Peninsula. The male is black with long red-brown pubescence on the legs, under side, head and front of the pronotum. Like other dung-beetles of this type, the front legs and head are developed for digging and the body is almost cylindrical, making burrowing easier.



I would like to thank Mr R. Adams of the British Natural History Museum, South Kensington, for his assistance in identifying the specimen illustrated.

5.11.66. Jonathan Cooter (3290)

MEMBERS' BADGES

A small enamel badge, in the form of a yellow Brimstone butterfly with the letters AES in gilt, is now available

Price 3s. 6d. plus 6d. postage and packing

Please apply to:

Hon. Enrolment Secretary,
28, Summerleaze Park,
Yeovil, Somerset

ADVERTISEMENTS

displayed in these pages cost very little

Whole page £3

Half page £1 - 10s.

Quarter page £1

so
write to

18 Golf Close

Stanmore, Middlesex.

The Advertising Secretary
will be pleased to supply you with
further information about advertising
in the

AES BULLETIN

THE AES PROSPECTUS

CONTAINING FULL DETAILS
will be sent to anyone interested

Please apply, enclosing 4d. stamp, to:

Hon. Advertising Secretary,
AES
18 GOLF CLOSE, STANMORE,
MIDDLESEX

AES

Members can help the Society in several ways:—

- (a) By dealing with advertisers and mentioning the *Bulletin*.
- (b) By bringing in new Members.
- (c) By buying AES publications and suggesting Public Libraries should buy them.
- (d) By friendly co-operation with other Members.
- (e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin*.

Worldwide Butterflies Ltd.

Our new address is:

Over Compton, Sherborne, Dorset

Our new showroom is:

21, Brighton Square, Brighton, Sussex

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

FOR ALL INFORMATION ON BEES

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mdx

Entomological Literature

CATALOGUES ON REQUEST

The London Natural History Society

This Society has sections covering all aspects of natural history and in particular, entomology. Lectures and field meetings are arranged and research work carried out. Papers on entomological subjects are prepared by members and published in the Society's journal, "The London Naturalist". The Society has a library housed at Ealing Public Library.

*Further details may
be obtained from:*

The General
Secretary,
Mrs L. M. P. SMALL,
13 Woodfield Cres.,
Ealing, W.5

Entomological Store Boxes

Book type wooden store boxes, strongly made with tight fitting lids to keep out vermin. Cork lined and papered in both halves, the 10 x 8 size will hold up to 50

Large White size butterflies.

10 x 8	-	21s.
14 x 10	-	31s.
17½ x 12	-	41s.

Postage on one of any size 3s.

Other sizes made to order

J. R. ALLANACH,
10 Grange Park Walk, Roundhay,
Leeds 8, Yorkshire

Entomological Display Cases

Made from Mahogany timber and polished light mahogany. Cork lined and papered. Brass hooks and eyes. Glazed.

14" x 10" x 2½"	-	£1 8s. 6d.
12" x 18" x 2½"	-	£2 0s. 0d.
18" x 18" x 2½"	-	£2 12s. 6d.

Carriage paid

Extras—

Brass wall hangers, fitted	-	2s.
Coloured paper lining, various colours	-	1s.

Other sizes made to order
Quotations gladly given

R. N. BAXTER,
16, Bective Road, Forest Gate,
London, E.7
MAIL ORDERS ONLY

Young Entomologist ? Yes ?

Are you a member of the
T.I.E.G.?

No !! Then READ ON . . .

- A Quarterly Newsletter written and edited by Teenagers
- Opportunities to correspond with Young Entomologists Overseas
- Facilities for selling, buying and exchanging through the wants and exchange lists.
- The British section is arranging field meetings for the coming season. (The first will be in the New Forest over Whitsun).
- FREE MEMBERSHIP. (No Strings).

If you can think of any good reason for not joining please let either of the following know it. Otherwise simply join.

Write to

ROB DRANSFIELD,
3 Eringham Road,
Shoreham by Sea,
Sussex
British Editor

COLLEEN SEELEY,
47 Woodside Avenue,
Oneonta,
New York 13820, U.S.A.
Head Editor

SPONSORED BY
THE NEW YORK STATE COOPERATIVE EXTENSION SERVICE, CORNELL UNIVERSITY

VOL. 26

No. 275

•

MAY, 1967



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**



G.T.

FREDERICK WARNE

THE FRESHWATER LIFE OF THE BRITISH ISLES

BY JOHN CLEGG

This guide to the plants and invertebrate animals of ponds, lakes, streams and rivers, is intended for those generally interested in the subject, as well as for the serious student. Among other subjects are described the physical and chemical conditions in water, Plant and Invertebrate life and in addition the Vertebrates are fully dealt with. Fully illustrated.

37/- net.

1-4 Bedford Court, London, W.C.2

Insects, Reptiles, Aquatic Plants, etc.

Please send
S.A.E. for
1967 Lists

GEOFF. A. SMITH,
PET FARM, ATTLEBRIDGE,
NORWICH, NORFOLK
NOR 57X

AES NOTICE — where to write

Membership applications and first subscriptions to:

D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset. Yeovil 3928.

Changes of address and non-arrival of Bulletins to:

P. Taylor,* 18 Old Manor Drive, Isleworth, Middlesex.

Advertisers and for Prospectus of Society and Application forms to:

R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex. GRImSyde 0460.

Offers to lead field meetings, etc. to:

C. B. Pratt, 1 West Ham Lane, London, E.15

Manuscripts, drawings and books for review to:

H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

Subscription renewals (25/- per annum, 12/6 under 18 years) to:

B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex. Sunbury 2687.

Youth matters to:

H. J. Berman, St Ivo School, St Ives, Hunts.

Offers of help, queries, etc. to:

P. W. Cribb, 355 Hounslow Road, Hanworth, Feltham, Middlesex. FELtham 3099.

Annual exhibition matters to:

B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27. GIPsy Hill 0057.

The London Natural History Society

*Further details may
be obtained from:*

The General
Secretary,
Mrs L. M. P. SMALL,
13 Woodfield Cres.,
Ealing, W.5

This Society has sections covering all aspects of natural history and in particular, entomology. Lectures and field meetings are arranged and research work carried out. Papers on entomological subjects are prepared by members and published in the Society's journal, "The London Naturalist". The Society has a library housed at Ealing Public Library.

The Entomologist's Record

and Journal and Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription - 35s. post free

Write for specimen copy to F. W. Byers, 59, Gurney Court Road, St. Albans, Herts., enclosing 5/-. This amount will be taken into account in the first year's subscription.



EDITORIAL

The official reports from the Annual General Meeting will—as is now usual because of the early despatch of copy to the printer—be published in the issue for August, and are not to be found in this issue.

For the first time for a number of years the quantity of material in hand for this issue has significantly exceeded the amount of space available for it. I hope very much that Members will maintain this trend in continuing to write up their notes for the *Bulletin*. It may be interesting to observe that, when short of copy some time ago, I speculated in an editorial (*Bull. amat. Ent. Soc.*, **24**: 1-2) that this was because short notes and 'Letters to the Editor' were not as forthcoming in our present *Bulletins* as in those of the 1950's: this issue contains five 'Letters to the Editor', the most for some time.

May I remind Junior Members of the *Junior Conservation Prizes* set up by Mr Whitehouse and Sir Robert Saundby (see *Bull. amat. Ent. Soc.*, **25**: 37 and 73-4). These take the form of a first prize of three guineas, and a second prize of one guinea as a credit note on Worldwide Butterflies Ltd., and are to be awarded for the best reports of a conservation project—in the broad sense—received by me, as *Bulletin* Editor, by 1st August 1967. Entries may be from individuals or groups of Juniors, and the projects reported need not necessarily have finished. The season is just beginning in earnest—are you doing something actively to help conserve our flora

Front cover illustration: The ichneumon *Rhyssa* laying an egg in its wood wasp host, drawn by Mr G. Thomson (3689).

and fauna: I am waiting for your entries.

Finally, Members will no doubt have noticed (in this issue and in previous issues) the fine drawings by Mr Cooter of foreign beetles, which are part of a series of such drawings serving to round off the contents of the *Bulletin* in a suitable manner.

H. V. Danks (2907).

THE BULLETIN

Mr H. V. Danks has told the AES Council that he will be forced by personal circumstances to relinquish the Editorship of the *Bulletin* after production of the May 1968 number.

Although this may seem some way ahead, it is in fact only four further issues of the *Bulletin*, and a new Editor will have to be found before the last issue of these four appears. Mr Danks has expressed his willingness to explain all facets of the job to anyone in doubt as to what it entails. The Editorship of the *Bulletin* is one of the most important tasks in the AES, and the two really essential requirements are the necessary amount of available time, and a good deal of enthusiasm. The present Editor is ready to provide instruction if necessary on all other points.

If there is any Member who feels that he might be able to help the Society by taking over the Editorship in due course, would he please write (without any commitment) to the Hon. President, Mr P. W. Cribb, 355 Hounslow Road, Hanworth, Nr. Feltham, Middlesex.

20.1.67.

The AES Council,

EXCHANGE PUBLICATIONS

Members may be interested to know of the publications received by the Society in exchange for *Bulletins*. The following bodies exchange publications with the AES, and these can be made available on loan to Members. Anyone requiring to see any of those listed should contact the President, Mr P. W. Cribb.

Bibliotheek, Nederlandsche Entomologische Vereeniging, Holland (library of the Dutch Entomological Society) (*Entomologische berichten*).

Council for Nature, London (*Habitat*).
Entomologist's Monthly Magazine, Oxford.

Entomologist's Record, St Albans.

International Union for Conservation of Natural Resources, Switzerland (*IUCN Bulletin*).

Lepidopterists' Society, U.S.A. (*Journal of the Lepidopterists' Society*).

Natural Sciences Dept., UNESCO, France (*Nature and Resources*).

H.V.D.

COLLECTING NOTES MAY 1967

The Smaller Moths

Enarmonia (Laspeyresia) formosana Scop. (*woeberiana* Schiff.). Mr E. S. Bradford's notes read as follows: "The larva of this richly marked moth mines the bark of Cherry (*Prunus avium* Linn.), Cherry-laurel (*P. lauro-cerasus* Linn.), Plum (*P. domestica* Linn.) and apple (*Malus* spp.). The drawing is from specimens whose larvae feed under the bark of Cherry trees in my garden. Several other trees in the locality harbour the moth. Originally it was confined to the base of the tree in the garden up to about eighteen inches, but last year it appeared at five feet. Evidence

of its occurrence in the tree is seen in the bright orangy-brown frass that the larva exudes. I have fixed up a tent-like arrangement of fine mesh round the base of the tree before the imagines are due to emerge and have thus taken a series of the moth. The moths emerge in the morning before midday.

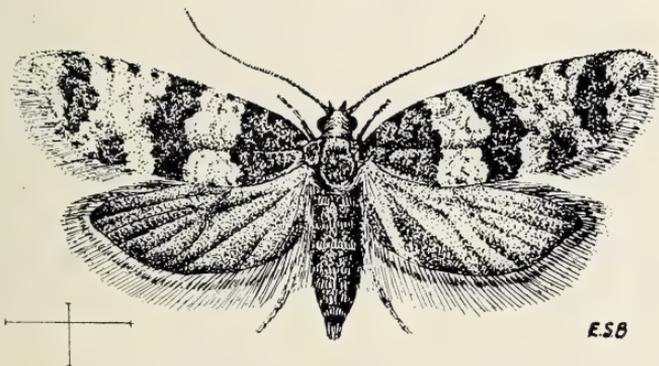
"The forewings are a mixture of black, orange and a metallic bluish grey. The hindwings are dark brown. The adult is on the wing in June and July."

It is well worth while looking out for the signs of this larva in May, and Mr Bradford's "tent" is the best way to secure the moth. In my experience trying to extract the pupae kills many of them and damages the tree.

Isotrias trifasciana Don. (*rectifasciana* Haw.). Mr Bradford writes "According to Ford in his *Guide to the Smaller British Lepidoptera* the adult is found in May and June. The life history, as far as I know, has not been worked out yet. I have found nothing else about it in my own books. It has been fairly common here for the last two years; I have found it resting on fencing, especially along the bottom of the garden. Ashdown Forest is another area where I have taken it.

"The forewings are a creamy buff and the bands of darker colour are a mixture of orange brown and vandyke brown. The hindwings are a darkish grey brown except for the cilia which are the same creamy buff as the forewings. Near the base of the cilia there is a dark brown area which gives the effect of a dark band edging most of the hindwings and standing away from the wing itself; you get a light band, then the dark band and then the light again. This band is a very common feature on 'Micros' and varies a great deal in colour, or depth and intensity of colour."

It is surprising that the full larval history of such a common moth is still unknown. The young larvae feed

*Enarmonia formosana* Scop.*Isotrias trifasciana* Don.

on hawthorn (*Crataegus* spp.) and possibly other foodplants, and start to hibernate when they are still small. After that all is mystery. If they returned to their hawthorn in the spring, some undoubtedly would have fallen by this time into a collector's beating-tray. Likewise they would have been detected if they made a spinning on low plants like many of their cousins. My guess is that their diapause ends soon after the New Year and that they then feed on

fallen leaves. If we all kept any females we box for ova, bred as many larvae as we could manage to the hibernation stage and then divided them into batches for alternative experiments, we might be able to solve the problem. For example, some could be left sleeved on hawthorn, others placed in a large flower-pot with fallen leaves and a third consignment put in another pot with growing grass, in case they fed on the roots. Reports of failures

would help future investigators to avoid fruitless repetitions.

If you see last year's bulrush heads (*Typha* spp.) presenting a moth-eaten appearance, that is literally their condition: the extruding down is the work of the larvae of *Limnoecia phragmitella* Staint., which is the largest of our Cosmopterygidae. Bring home a few heads and tie them up tight, for the larva is a veritable Houdini. The imagines emerge in July. At the same time cut off some of the old bulrush stems, starting as low as possible, and work your way up. If you find a mine running up the stem, you probably have a larva of *Calamotropha (Crambus) paludellus* Huebn.; the larvae feed till mid-June and the moth emerges at the end of July.

The larvae of a number of 'Micros' feed on rock-rose (*Helianthemum* spp.). Two of these are easy to find and breed. The first, which occurs in April and again in July, is *Mompha miscella* Schiff. The larvae mine the leaves, readily changing from one leaf to another. The second species is *Telphusa sequax* Haw., whose larvae spin together the tender terminal shoots in late May and early June. Either pot up a growing plant or change the food supply often, for it quickly turns mouldy. Keep your eyes open for the large cases of *Coleophora ochrea* Haw., a fine moth of which little seems to have been heard in recent years.

Instead of giving a hint in this issue, I am going to ask for advice. All too often I find when I remove a 'Micro' from the setting-board that a patch of the cilia adheres to the paper leaving an ugly gap in the fringes. How is this to be avoided? Should the boards be covered with some special kind of paper? Should the surface be rubbed with French-chalk or some similar preparation? Do polished but unpapered balsawood boards give better results? Is it just that I suffer

from sweaty and uncontrolled fingers? Perhaps some Member who has experienced and overcome this problem will tell us how he did it. Our scientists have produced the non-stick saucepan: let them now turn their attention to our setting-boards.

A. M. Emmet (1379).

The Hymenoptera Aculeata

Although this is the fourth year of these notes, I find that I have not dealt at length with the mounting of specimens. The collecting kit, killing methods, data labels, recording, identification, all have received attention, but not the actual presentation of the specimens.

There are two main schools of thought about mounting. One stresses the neatness of the final collection, the other speed of preparation and ease of identification. The choice between these must rest largely on personal preference. The former school follows the general practice of Lepidopterists, produces a fine looking collection, but often the specimens are hard to identify and, of course, a lot of time is required to produce the best results. My own leanings are towards the second school. I find three different methods are required to deal with all the Aculeates. For large specimens I use direct mounting with a large pin formerly a No. 11 white, now a No. 16. Many people favour a shorter pin but I find that the longer pin allows plenty of room for the data and name labels below the specimen. Of course the deepest double-sided store boxes have to be used. The main danger to avoid is buckling of the pin, so even if a shorter pin is used, don't make it thinner. For small species I use staging on *Polyporus* strip. The specimen is pinned with a stainless steel micropin on to the strip, and the strip mounted on a No. 16 white pin

which also carries the labels. I find four sizes of stainless steel micropins are sufficient: 0.01×15 mm, 0.0089×15 mm, 0.0076×10 mm, 0.0056×10 mm. The last method, used for ants and Bethyloidea, is pointing. I cut card into strips 12 mm wide, and then make the points, acutely pointed isosceles triangles, by cutting across the strip gauging the shape by eye. The points are mounted with a No. 16 white pin through the broad end, and the specimen stuck to the tip using Seccotine diluted 50:50 with water. The specimen is placed on its side with the head to the right, the legs towards the staging pin, and with the point between the mid and hind left legs.

With all these three methods the specimen receives the minimum of preparation. The legs are extended clear of each other and so as not to obscure the underside of the body. The wings are flicked aside to reveal venational characters and to allow a view of the propodeum and dorsal surface of the abdomen. The mandibles are opened out by passing a fine pair of forceps between them and allowing it to spring open. With male specimens the genitalia are extracted.

The only other matter that needs consideration is the actual placing of the pin through the specimen and the dividing line between small and large species. The puncturation and sculpturing of the dorsal thorax can present vital characters in identification, and care must be taken not to obscure these. Thus the pin should be placed to one side of the centre line of the meso-scutum, and midway between the prothorax and the scutellum. If a No. 16 white pin takes up more than about one eighth or one sixth of the surface area of the meso-scutum, then I would say the specimen should be considered small, and a micropin used. In fact I tend to use a large pin if I possibly can. To illustrate the dividing line, I mount *Pemphredon*

lugubris Fab. and *Halictus tumulorum* Linn. with large pins, but mount *Cemonus* spp. and *Halictus morio* Fab. with micropins on *Polyporus*.

I mentioned above that one attribute of the methods I adopt is that of speed. The importance of this lies in the fact that in a group such as the Aculeates a lot of specimens have to be handled if the fauna of an area is to be understood. In my experience most localities, at least in the South of England, hold a fauna of about 100 species of Aculeates. Many of these will be so similar that it is unlikely that they will be separated in the field, and so even with reasonably selective collecting it is unlikely that the 100 species will be represented unless some 500 specimens are taken. This general thesis has repercussions from the point of view of conservation as well as the handling of specimens, and I hope to deal with it in a future article.

I hope that the 1967 season proves successful for all, and I look forward to hearing of any particular experiences of readers.

5.1.67.

J. C. Felton (3740).

FROM AN OUTER LONDON SUBURBAN AREA

I am disappointed to have encountered no response so far to my first two articles in this series; I should have thought that, considering the large proportion of Members living in and around London and other urban centres, at least a few people would have had something to discuss on the points I have raised, and would have at least written to me with further observations, or disagreements. Anyway, I hope the lack of immediate response means that Members are writing up their observations and suggestions for early pub-

lication in the *Bulletin*: if they are not doing anything of the sort I am wasting my time, for a start, writing these notes. Perhaps, though, I can't expect all that much, for most entomologists appear to collect primarily to build up a collection, and as most AES Members restrict their interest to the 'Macro'-Lepidoptera, which are comparatively well-worked, they think all they can find in the urban and suburban areas is a number of well-known and mostly common species which they already have enough of in their collections. So interest is displaced to areas where rare or local species are found to fill 'gaps' in the collections. I hope that in saying that much I have trodden on a few delicate toes, and I further hope that Members (and of course any non-Members) will show how wrong I am, and not just say so!

Certainly by having an interest in 'Micros' one gives oneself the opportunity of discovering something new even in the most well-worked types of habitat; for example I would refer readers to my recent article on the moth *Oegoconia deauratella* H.-S., a common species at least in the London suburbs, which was previously unrecognised in this country as a distinct species, and whose habits and life-cycle are little-known.

Several examples of the pretty little moth *Parachronistis albiceps* Zell. came to my 'm.v.' light in July, and I recently examined them in the hope that one or more of them might be another *Pulicalvaria piceaella* Kft., or an allied conifer needle-miner but in vain. The occurrence of *P. albiceps* in these circumstances is of interest because its textbook food-plant is Hazel (*Corylus avellana* Linn.) and this does not occur anywhere near my light as far as I know. Some other food-plant is thus indicated, and it would be interesting to know whether it occurs in gardens much more isolated from the countryside

than mine; somehow I imagine it will be found to be feeding on the garden apple trees (*Malus*), like the very closely allied *Recurvaria nanella* Huebn.

I mention in another article the very low numbers of the common weed-feeding 'Macro' larvae in my garden, compared with what I used to find, and it has occurred to me that one possible explanation is that the species concerned (e.g., *Diataraxia oleracea* Linn. (Bright-line Brown Eye), *Melanchnra persicariae* Linn. (Dot), and *Spilosoma lutea* Hufn. (Buff Ermine)) cannot maintain themselves, and never could, in the normal suburban garden, without reinforcement continually from comparatively undisturbed land (odd patches of waste ground in particular). The annual performance of digging the flower beds must result in the killing or harmful disturbance of a very high proportion of the subterranean pupae. True, the larvae tend to wander before pupation, but only a very low proportion may find odd safe corners. And then the mown lawn must surely present a hazard to the species whose larvae dare feed on the grass there, for surely they will get trampled to death: but apparently they do not. In my garden the most abundant grass-feeders are *Amathe xanthographa* Schiff. (Square Spot Rustic), and *Triphaena pronuba* Linn. (Large Yellow Underwing), and these along with all other species taken of the grass, are winter feeders; it just happens that for the same period nobody cares to mow or to walk much on the lawn; and it also happens that the larvae of these species are not showing any vast reduction in numbers. It may also be significant that the ubiquitous moth *Bryotropha terrella* Schiff. shows no sign of living in my garden, although a few worn specimens do come to my light. The larva is supposed to feed at the base of grass stems in the early spring, and

in all probability fails to avoid the effects of resumed mowing in the spring. The autumn weed-feeding 'Macros' could be suffering their decrease because the destruction of nearly all the wasteground habitats and odd nettle-crammed corners in the area during the last ten years or so has progressively cut off the vast reinforcement of the garden populations.

The area around Harrow Weald Recreation Ground certainly appears superficially to have undergone little change, but when one looks closely and remembers hard it becomes apparent that little clumps of nettles have been replaced by mowed lawns, larger waste patches by houses, car parks, and even a clinic. Still plenty of green around, one may think, but it is largely mowed grass. The many large oak (*Quercus*) and elm (*Ulmus*) trees which used to grace many roads near here have nearly all gone; they are replaced in some roads with the usual little flowering cherries (*Prunus* spp.) and other even less interesting trees. And now another major habitat is going: a large stretch of waste ground with many large Elm and oak trees and a thick hawthorn (*Crataegus*), elm, and Blackthorn (*Prunus spinosa* Linn.) hedgerow, by the Uxbridge Road, is now being made into the other half of a new dual carriageway. The latest 'shock' is the news I have been expecting about the disused Belmont and Stanmore branch railway line; this is to become part of a new major road if plans just announced are accepted by the Ministry of Transport. I make the above remarks bearing in mind what I have already said in an earlier article (*Bull. amat. Ent. Soc.*, 25: 116) about the possibility that an increased level of lighting at night

might have caused the great reduction in numbers of moths. No single theory can be pushed in isolation, as so many factors could be involved.

I have examined the genitalia of 74 specimens of the 'difficult' *Procus* species taken at my light from 2nd June to 22nd July 1966 inclusive (the fortnight 18th June to 1st July was missed owing to holidays). They were taken on twenty-three nights, and I give the figures in Table I.

It will be noted that only *P. latruncula* Schiff. and *P. strigilis* Clerck were present, there being no *P. versicolor* Borkh. On busy nights I took only a sample of the moths, giving priority to any that looked at all different (these all proved to be *P. strigilis*), tending to leave the usual small nearly uniformly blackish ones (nearly all *P. latruncula*); thus the actual proportion of *P. latruncula* will be rather higher. I find that the blackest specimens of *P. strigilis* do tend to have some bronzy sheen, and this makes some of them very difficult to distinguish from *P. latruncula*, although the former is the larger species.

28.1.67. P. A. Goddard (2206).

REFERENCE

GODDARD, P. A. (1966). *Ent. Rec.*, 78: 243-5. On the occurrence of *Oegonia deauratella* H.-S. in the British Isles.

BUTTERFLIES AND INDUSTRY

Rereading an AES *Bulletin* (*Bull. amat. Ent. Soc.*, 1965 (271)), I came across an article mentioning the suitability of an old railway track for butterflies. This brought to mind two instances rather similar to this in my own limited experience. The first is a very close parallel to Mr Whitehouse's case—a disused railway

Total specimens determined	<i>P. latruncula</i> 46 males 9 females	<i>P. strigilis</i> 17 males 2 females
Attendance per night	0-10 approx.	0-3

Table I: *Procus* species at 'm.v.' light.

track where I have identified the following species:

Wall (*Dira megera* Linn.), Meadow Brown (*Maniola jurtina* Linn.), Small Heath (*Coenonympha pamphilus* Linn.), Painted Lady (*Vanessa cardui* Linn.), Red Admiral (*Vanessa atalanta* Linn.), Small Tortoiseshell (*Aglais urticae* Linn.), Peacock (*Nymphalis io* Linn.), Common Blue (*Polyommatus icarus* Rott.), Brown Argus (*Aricia agestis* Schiff.), Small Copper (*Lycaena phlaeas* Linn.), Large White (*Pieris brassicae* Linn.), Small White (*Pieris rapae* Linn.) and Green-veined White (*Pieris napi* Linn.).

This particular track is in North Staffordshire, about eight miles west of Stoke-on-Trent. I have only collected there in March, April, August and September but I have never found a species anywhere else in Staffordshire which I have not also taken on this railway. As in Mr Whitehouse's case, none of the species are rare, but all can be found in great numbers. I met a local farmer who said he had always found butterflies abundant there since before the war.

The virtues of this particular cutting, which stretches for about two miles, with a break for a village, seem to be the shelter its high banks afford, the abundance of wild flowers of all kinds and the fact that apart from the occasional walker and a few dogs, it is quite deserted. Among commoner wild flowers, I have noticed Ragwort (*Senecio jacobaea* Linn.), Yellow Toadflax (*Linaria vulgaris* Mill.), Rosebay Willow-herb (*Chamaenerion angustifolium* (Linn.) Scop.), Foxglove (*Digitalis purpurea* Linn.), plus any amount of brambles (*Rubus*), nettles, heather and grasses. There must be many others I am unable to identify. For once much-maligned industry has provided a perfect habitat for butterflies.

The other example is of a different kind. In the case of the railway it was departing industry which helped

butterflies. In this one industry is still carrying on and is equally helpful. A quarry near Shrewsbury is still in use for gravel blasting and as a result the country round about is useless for grazing. It is unsuitable for crops and has gone to waste. I saw, between May and July last year, all the species previously mentioned except the Peacock and Brown Argus. In addition, there were the Speckled Wood (*Pararge aegeria* Linn.), Holly Blues (*Celastrina argiolus* Linn.), Orange Tips (*Anthocharis cardamines* Linn.), and Large Skippers (*Ochlodes venata* Br. and Grey.).

Unfortunately a colony of burnet moths (*Zygaena* spp.) was destroyed by gravel tipping, but the unexpected benefits for butterflies more than outweigh this setback.

I think these are two definite cases where the spread of industry has helped rather than hindered the wild life of the countryside. It would be interesting to hear of any more instances of this nature.

2.1.67. R. A. Leech (3950J)

'M.V.' TRAPS—SOME MISGIVINGS

I am becoming increasingly disturbed at the increasing emphasis being placed by entomologists and collectors on the use of mercury-vapour light-traps. A small portable 'm.v.' trap might be forgivable if it is not used regularly in one place, but even these are a menace because they are bound to be used by collectors in order to obtain species known to be restricted to particular localities ("rarities", in pre-'m.v.' parlance) so threatening their very existence. But the continual use of such powerful light-trap, and particularly the usual mains-voltage type, find little justification among those who wish our insect fauna (especially the

Lepidoptera) to be preserved. I have argued myself well-nigh black in the face with collectors who insist that these traps have no significant effect on their local moth populations. Most of these people don't have accurate and comprehensive records to support such an assertion. In any case, when you are contemplating doing something which could conceivably affect a population you wish to preserve, the onus is clearly on you to show beyond all reasonable doubt that it will *not* adversely affect the population concerned. "In ignorance, refrain", as the saying goes.

Here are some facts. In the late 1950's I used to find the common weed-feeding autumn 'macro' larvae (e.g., *Diataraxia oleracea* Linn., *Spilosoma lutea* Hufn., and *Melanchra persicariae* Linn.) in vast numbers, particularly on the Foxgloves (*Digitalis purpurea* Linn.) and Lupins (*Lupinus polyphyllus* Lindl.) in my back garden. The last few autumns have shown only the occasional one or two larvae of these species in spite of careful search, the garden plants being left largely to the snails and slugs. Presumably this situation is general in the area, and must reflect a very low population density. During this year I ran a standard 80 watt pearl 'm.v.' lamp in my window, overlooking the gardens bordering Harrow Weald Recreation Ground. *Melanchra persicariae* Linn. (Dot Moth) can be taken as a good example of what happened. During the first half of July I counted about ten to twenty-five actually having flown into my room each night when the weather was not really dreadful, and many more were attracted and flew away again; in my back garden and the three adjacent gardens moths (no doubt including many more 'Dots') were settling in considerable numbers. At about midnight each time I switched off the light in desperation, being thoroughly surfeited. Some of

the moths from previous nights returned, but apparently something less than one tenth. No doubt these figures do not seem excessively high to many collectors, but the point of interest is that it was clear that the population over a very wide area was being affected by the lamp. True, I let them all go at 'lights-out', but have we any evidence that the released moths were able to continue their reproductive activities as though their day-night cycle of activity hadn't been disrupted, and as though they hadn't had any traumatic experience? No. I repeat, "In ignorance, refrain".

As one can well imagine, I was so dismayed at the havoc the lamp appeared to be playing with the moth population of the neighbourhood that I cut the 'm.v.' sessions down to one per week, on a pre-selected day (the deliberate selection of a 'good' night each week would to some extent defeat the purpose of the six-day-per-week ban). With the death of my lamp I have resolved not to get another. Time spent sorting out 'm.v.' specimens is surely better spent observing in the field—yes, even in one's own garden at night.

The scientist or keen amateur carrying out a definite study the results of which are useful, and *presumably would be published*, is no doubt justified in using a 'm.v.' trap for the purpose, but the usual utterances of amateur entomologists—usually to the effect that they are "surveying" their local moth populations—are no justification at all. How many of these "surveys" get published, even? Precious few, as far as I know.

It is in this context that I must express concern at the recent spate of articles in the *Bulletin* on 'm.v.' traps.

These, while very interesting, are clearly telling us how to collect still more moths (phew!). If the writers of these articles really intended the

'm.v.' trap to be a tool for *bona fide* research and not collecting or vague unpublished "surveys", they would clearly have submitted these articles to the appropriate technical journals and not to an exclusively amateur publication. And let's face it, if an ordinary 80 watt pearl 'm.v.' bulb attracts *more* than enough moths, why take the theory of attraction to the bitter end by removing the protective envelope from the bulb? Do you *really* want still more moths? And your retinas irreparably damaged by the stray short-wave ultra-violet rays that are now escaping?

28.10.66. P. A. Goddard (2206).



IN SEARCH OF THE SCOTCH ARGUS

At 6.30 a.m. on the morning of 14th August 1966 I set out from Aberdeen with two of my sons and a colleague who is keen on entomology (whom I hope to recruit for the AES) to hunt for Scotch Argus (*Erebia aethiops* Esp.) in the Inverness district.

We could not have hoped for a better day, for after a preliminary bank of dark cloud we came into sunshine which lasted throughout the day.

In Inverness-shire the Scotch Argus is very much an insect of the roadside verges and can often be found in numbers along the shores of Loch Ness.

This morning our first Argus was sighted at 10.10 a.m. fluttering over rough herbage near a lay-by which was flanked by Hazel trees (*Corylus avellana* Linn.). We spent a happy couple of hours at this spot, pursuing the insects, capturing some and taking photographs of others. Green-veined Whites (*Pieris napi* Linn.) were also common along the roadside verges, pausing briefly to feed on

flowers of bramble (*Rubus fruticosus* agg.).

After a snack we moved on, branching off the Inverness road at Dores, and heading for Errogie. The Scotch Arguses were here in plenty, being often seen in groups over rough ground. They were quick to scatter when we stopped the car and started in pursuit of them.

Having captured enough to satisfy our needs we started for home and it was some time afterwards that it was discovered that the carbon tetrachloride which I had used as a killing-agent had not done its job. My method of transporting insects after a day's collecting is to carry them in a receptacle between layers of cotton wool until I reach home, when they are set as soon as possible. On this occasion most of the butterflies had only been stupefied and had revived to crawl about among the cotton wool, rendering them disappointingly useless.

23.11.66.

E. Pickard (3928)



INTERNATIONAL EXCHANGE

Over the past few years it has become increasingly easy to get in contact with entomologists overseas through the AES and other societies. Partly because of this, and partly because the Continent is now well within the budget of many British entomologists for their summer holidays, more and more have taken an interest in foreign insects. This widening of interests however is not always welcomed by all English collectors—the mere suggestion of anyone in this country having anything 'foreign' in their collection is unthinkable. This was understandable in the days when certain hillsides in the south were covered with Chalk



SCOTCH ARGUS

hill Blues (*Lysandra coridon* Poda), and when the Swallowtail (*Papilio machaon* Linn.) could almost certainly be netted on a visit to the Fens, but those days are gone and, whether we like it or not, gone for ever. In England Lepidopterists must concentrate on saving what is left, by a determined fight to save the remaining habitats.

It is natural, however, with this decrease in the numbers of British insects and the other factors mentioned above that many entomologists, especially the younger generation, should become interested in the world situation through corresponding and exchanging specimens and livestock with entomologists in other parts of the world. There are dangers in this, the obvious one being that collectors will send masses of our

rare insects over to America, for example, for somewhat more spectacular American specimens in return. This of course is to be greatly discouraged, but fortunately in practice there is little danger of overcollecting, because almost invariably foreign collectors only want at the most four specimens of each species, two males and two females. In fact some are positively insulted if sent more than four of any one species!

After some experience in exchanging one soon realises that it is pointless to collect foreign Lepidoptera indiscriminately. Apart from the fact that there is never enough storage space for them all, the sheer number of specimens prevents any serious study of them. It is far wiser either to keep to one foreign country or just to collect two or three families, say

Satyridae and Sphingidae, and study the different geographical sub-species found throughout the world. It is here that there are opportunities for the really serious entomologists. For this sort of collecting it is, in my view, far more interesting to exchange for livestock of the family you wish to collect, than merely exchange papered specimens.

There are many precautions to be taken when exchanging livestock which, if not observed, may well result in the discovery of the ova of some long-awaited new species crushed out of recognition. The first is to send all livestock by air-mail labelled clearly for the customs—Natural History specimens; of no commercial value. I have as yet had no livestock, either coming in or going out, intercepted by the customs, but there is always a first time. It is of course important to put the ova in a light, strong container which will stand up to all the buffeting the G.P.O. and foreign postal services can give it. Finally, and without doubt the most important precaution, make sure that the ova are not likely to hatch in the post and ask your exchange partner to do the same. To find all the newly-hatched larvae dried up in a small container is more disappointing than not getting them at all. I have myself had no experience in sending live larvae by air-mail—it is certainly very expensive and, I should think, almost impossible to provide enough food for the larvae during the journey which to America lasts from five to ten days.

One of the criticisms of exchanging livestock in this way is that there is always a chance of introducing insect pests into a country, through foreign specimens escaping or being released. It is therefore vital that no livestock of any foreign species should be released as such an action could quite easily give similar results to what happened in America when speci-

mens of the Gipsy Moth (*Lymantria dispar* Linn.) were released. This species quickly became established, multiplied rapidly, and soon became one of the most destructive insect pests in America.

There are problems in rearing unusual livestock from a different continent, one of which is that of finding a substitute foodplant. This is often impossible if the climate of the insect's native country is substantially different from ours, but otherwise it is usually possible to find a plant of the same genus—this at any rate is true in my experience as regards most American species. One's troubles are still not over however even with a good supply of substitute foodplant. Too often it is found that a species from another continent will quite happily emerge from its cocoon in mid-winter when there is no foodplant in leaf for the resulting larvae.

Despite the many difficulties involved in the exchange of livestock it is still the best way to obtain specimens of a foreign species. More important it is extremely interesting and absorbing to be able to record and observe the life histories of species perhaps never before bred in this country.

Of course, it is not always possible for foreign entomologists to obtain livestock of certain species, and also many foodplants are unobtainable in the U.K. Here then collectors must obtain such species by exchanging papered specimens. When I exchange specimens, I always send them in cellulose acetate papers together with full data and scientific name. With the data, incidentally, to avoid confusion, it is best to write the date with the month in words and not in numbers. In America, and I expect many other countries, when putting the date in numbers, they put the month first, then the day, and finally the year so June 1st 1966 is written 6.1.66—I spent hours puzzling out how so many specimens could be

caught in mid-winter! When I receive papered specimens I relax them using first a relaxing tin in the airing-cupboard and then injecting them with hot water—I find neither of these methods used alone works effectively with large specimens.

The cost of postage for this method of exchange can be high. By air-mail a parcel of about twenty papered specimens sent to America costs about 13/6. By surface mail on the other hand the cost is cut to about 4/- but the time to America is increased to about twenty days and to Japan as long as three months. In the past I have found it reasonably cheap and practical to send America-bound parcels by surface-mail and Japanese parcels by air.

How then does one get in contact with someone abroad who is also interested in corresponding and exchanging? The AES of course has overseas members and it was through the AES that I got in touch with a collector in Japan two years ago. Since then we have exchanged several parcels of each other's Lepidoptera, concentrating on one or two families. One particularly interesting species I received was *Nymphalis io geisha* Seichel, a subspecies of our *Nymphalis io* Linn. (Peacock); it is darker and slightly smaller than ours. The other main society is Teen International Entomology Group, which caters mainly for teenage entomologists. This club has members throughout the world particularly in America, Japan, Malasia, and the U.K. and so makes getting in contact with foreign entomologists a matter of picking out a name in the membership list and writing. The results are not always as expected—anything from a pop-music fanatic with scarcely any interest in entomology to a collector I wrote to who calmly replied that he no longer needed any British butterflies as his collection of them was completed the previous year when he

was given a pair of English Large Coppers (*Lycaena dispar* Haw.) for Christmas! Between these two extremes it is possible to find someone as keen as you are, with whom to exchange successfully.

I have concentrated mainly on how to exchange Lepidoptera but I know many people exchange Coleoptera and Orthoptera just as successfully. In fact, for the AES exhibition I thought some live American spiders would make a good exhibit. An American T.I.E.G. member promised to get me some so I waited hopefully. Then about a fortnight later a parcel arrived labelled "live spiders—dangerous". On opening the parcel I discovered I had been sent a Black Widow (*Latrodectus* sp.), a species of *Tarantula*, and a medium-sized specimen with a horned abdomen. Much to my disappointment (although to the relief of my mother and brother) the Black Widow and *Tarantula* had died in the post so I had to be content with preserving them in alcohol. I now take the precaution of asking what species I'm being sent before the parcel is posted to me.

26.11.66. R. Dransfield (3492J).

THE FEMALE INSECT REPRODUCTIVE SYSTEM

Female insects have a pair of ovaries situated in the abdominal cavity. In all orders except the Collembola (springtails), the ovary is divided into a number of egg tubes or *ovarioles* (Fig. 4). The number varies considerably from one insect to another, some termites having over two thousand, whereas the tsetse fly has only one.

The ovariole (Fig. 1) is divided into a *terminal filament* which joins the ovarioles and suspends the ovary from the dorsal wall of the abdominal

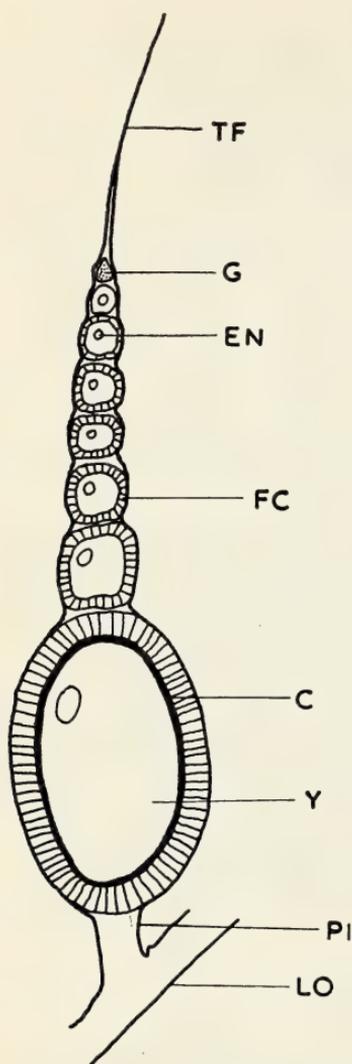


Fig. 1. The panoistic ovariole.

Key: C=chorion; DE=developing egg; EN=egg nucleus; FC=follicle cells; G=germarium; LO=lateral oviduct; NC=nurse cells; PI=pedicel; TF=terminal filament; Y=yolk.

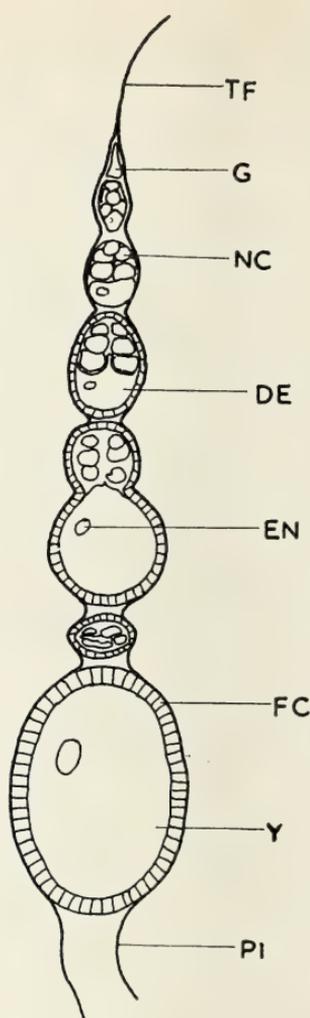


Fig. 2. The polytrophic ovariole.

cavity. The *germarium* is the region of cell division in which the developing eggs are formed. The major part of the ovariole consists of the *vitellarium* which contains the developing eggs, and it is in this region that yolk is formed in the egg. There is usually only one egg developing at a time in each egg tube. The pedicel joins the ovarioles to the lateral oviducts which fuse to form a median oviduct.

Opening into the median oviduct are various accessory glands, and very often a *receptaculum seminis* which stores sperm after mating. The ovariole is covered by an inner and outer ovariole sheath.

The maturing eggs are surrounded by a single layer of *follicle cells* (the follicular epithelium). The mature egg is covered by a chorion which prevents the egg from drying up—the

chorion may be delicately sculptured as can be seen on the eggs of some butterflies, and the eggs of some stick insects (Phasmida) have a chorion impregnated with calcium carbonate (chalk) which makes them extremely brittle but resistant to desiccation. The chorion may also be modified to assist in gaseous exchange, which, for instance, occurs in some bugs.

Ovarioles are classified according to the presence of *nurse cells*. Ovarioles without nurse cells are known as *panoistic* (Fig. 1). These occur in the more primitive insects such as cockroaches, grasshoppers and mayflies, and also in fleas.

Ovarioles with nurse cells are

known as *Meroistic*. There are two types:—

1. *Polytrophic*—the nurse cells are enclosed within the follicle cells and are adjacent to the developing egg (Fig. 2). Beetles (Adephaga), butterflies, flies and earwigs have these.
2. *Acrotrophic*—this type of ovariole has the nurse cells concentrated in the germarium. They are connected to the developing eggs by tubes—the trophic cords. These occur in bugs (Hemiptera) and beetles (Coleoptera Polyphaga) (Fig. 3).

[The nurse cells or trophocytes are believed to be associated with the deposition of yolk in the

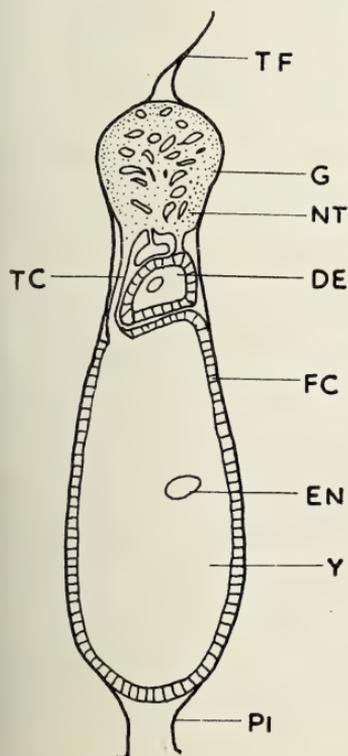


Fig. 3. The acrotrophic ovariole.

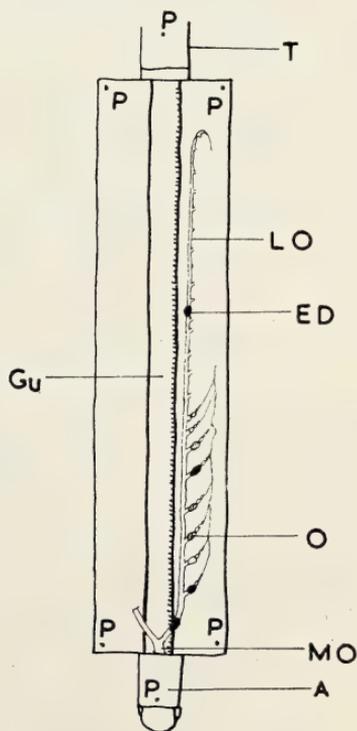


Fig. 4. Diagram of a Phasmid dissected to display the ovaries (right ovary shown).

Key: A=abdomen tip; DE=developing egg; ED=egg developing oviduct; EN=egg nucleus; FC=follicle cells; G=germarium; Gu=gut; LO=lateral oviduct; MO=median oviduct; NT=nurse tissue; O=ovariole; P=pin; PI=pedicel; T=thorax; TC=trophic cord; TF=terminal filament; Y=yolk.

developing egg, but the way they do this is not really known. They may accelerate yolk deposition as they occur in insects which have relatively few ovarioles but are capable of producing large numbers of eggs in a short time.]

The female reproductive system is very easy to find on dissection. All that is needed is a tobacco tin with candle wax covering the bottom (about $\frac{1}{4}$ " deep), a pair of fine scissors (nail scissors will do), and a few pins. The adult insect is pinned on to the wax—dorsal side uppermost, with one pin through the thorax, and another put through the tip of the abdomen, which should be stretched slightly. The insect is then covered by water. Wings and legs should be removed and the abdomen opened by snipping up the mid dorsal line with the scissors. The abdomen can then be pinned open. At first all that can be seen is a mass of fat body and tracheae but gentle teasing with a pin, or a mounted needle, will reveal the ovaries, usually situated on each side of the gut. A useful insect to start with is a Phasmid, where the ovaries can easily be seen on both sides of the gut. Before starting, make sure that the insect is adult and female!

For a more detailed discussion of particular Orders of insects textbooks such as *A General Textbook of Entomology* by A. D. Imms (Methuen) or *Reproduction in the Insects* by K. G. Davey (Oliver and Boyd) should be consulted. Both books mentioned have a good bibliography. I shall be pleased to answer any questions you may have, and give advice as to further reading.

John A. Wightman,
9, Chawton Close, Harestock, Winchester, Hants.

REFERENCES

- DAVEY, K. G. (1965). *Reproduction in the Insects*. University Reviews in Biology, 5. Oliver and Boyd, Edinburgh.
IMMS, A. D. (1957). *A General Textbook of Entomology*. 9th edn, revised by O. W. Richards and R. G. Davies. Methuen, London.

BREEDING FOR REINFORCEMENT OF SPECIES

I was surprised and perturbed to read Mr Goddard's article "A Warning" on page 126 of the November *Bulletin* (*Bull. amat. Ent. Soc.*, 25: 126). A large number of entomologists fondly imagine that they are doing great work for the cause of entomology when they breed butterflies and moths and release them in favourable habitats. There is, I believe, a Breeding Group within the Society which exists for this very purpose.

I therefore find myself wondering whether Mr Goddard's warning is based on definite evidence or whether it is theoretical. The matter is very important and many entomologists more knowledgeable than I am must surely have something to say on the subject.

If insects are bred in captivity they are protected from their natural enemies such as birds and parasitic insects. Is the species necessarily weakened by so doing? One might even say that subjecting the larvae to unnatural climatic conditions and perhaps not giving them quite the same food that they would select if free to roam, would tend toward "survival of the fittest"!

There must be many entomologists who disagree with Mr Goddard, and others who agree with him. Perhaps they would air their opinions and help us ordinary folk out of our bewilderment.

I. I. 67. P. R. Grey (3820)
[See "Letters to the Editor"—Ed.]

REARING THE INDIAN AND CORSICAN STICK INSECTS

The Indian Stick Insect (*Carausius* (= *Dixippus*) *morosus* Br.) and the

Corsican Stick Insect (*Clonopsis gallica* Charp.) are the best two species to start rearing, as they are hardy and are prolific breeders. *Dixippus morosus* is probably the best known, coming from India and feeding on privet (*Ligustrum* spp.).

They require no special heating equipment, room temperature being quite sufficient, but they must be kept out of the sun's rays.

For rearing different species I use the same methods, ova being kept in small round transparent boxes until they hatch, then moved to a larger plastic box measuring 7" x 4½" x 2½" which is stood on its end, so that the lid is at the front. This is because if the box is stood normally the insects crawl on to the lid and not on to the foodplant.

The base is lined with paper to make it easier to clean out, and the foodplant renewed every other day.

After a few weeks when the nymphs reach about an inch long they are again moved, to a cylinder cage measuring 12" in height and having a diameter of 9". Again the base is lined with paper and a small jar of water stood in the centre of the cage, and the foodplant stood in this. It is essential to plug the mouth of the jar with cotton wool, to prevent any insects falling in and drowning.

The foodplant should be fairly long and straight, and as the foodplant is stood in water it should be renewed every 3-4 days. If this is not done the insects will start to eat each other, become contorted and eventually die.

These two species do not pair, their eggs are always fertile, and if only a small quantity are reared a male insect may not be produced for several generations.

The Indian Stick Insect

Ova look like small brown seeds, each having a yellow speck at one end, from which the insect will eventually hatch. Ova take 7-8 months to hatch

if kept at room temperature, but can be made to hatch earlier with extra heat.

On hatching the young nymphs are totally brown and soon change to green, the colour of the adult insect. They grow to a fair size—3-4 inches in length—and have a red flash on the forelegs.

They remain quite still throughout the day and start feeding after dusk. If handled they remain quite still or close their legs and straighten themselves out looking like a greenish twig.

Egg-laying takes place about 10 months after the nymph has hatched, but this varies. Ova are dropped freely to the bottom of the cage, and each insect may produce anything up to 500 eggs, these being easily distinguished from the litter and dead leaves and collected when the cage is cleaned out.

Finally, in case you think you may have a male insect among your stock, this is what to look for. They are much thinner in body and have longer legs and antennae, and also the reproductive organs are clearly visible at the tail end.

The Corsican Stick Insect

The adults are about the size of *D. morosus*, but their adult colouring ranges from light green, a wood brown and a rusty red, each having a green streak running along the side of the abdomen.

They lay their eggs 7 months after hatching, again about 500 eggs per adult. These are dropped to the bottom of the cage, and are black with a rough surface. They hatch earlier than *D. morosus*, after about 3-4 months, again kept at room temperature.

One problem I have found with both these species is that when the nymphs hatch they may have their hind legs still caught in the egg: if this is not too serious, careful dis-

secting of the egg may save the insect, otherwise it is best to kill it, as it will die eventually.

The young insects are totally green on hatching, feeding on Bramble (*Rubus fruticosus* agg.). When disturbed they do not straighten out their legs, but move very quickly, and you have to keep your eyes open when the foodplant needs renewing.

Their life span is about 2 years, and in both species egg-laying usually takes place during the winter months, but this is not always the case and the best way to find out when your insects should start laying is to note the month when the insects hatch and add the months I have given above, as an approximate guide.

11.11.66. R. Johnson (3488J).

BREEDING THE NEW CLOUDED YELLOW BUTTERFLY

On previous trips to the Continent, I have taken specimens of *Colias australis* Verity at Digne, Basses Alpes, and near Fayence, Var, basing their identity on the fact that on each occasion the insects were flying over or settling on the Horseshoe Vetch, *Hippocrepis comosa* Linn., the foodplant of its larvae. The Pale Clouded Yellow (*Colias hyale* Linn.) was also taken in both areas but its flight was obviously migratory, being swift and purposeful and in one direction. The superficial difference in the markings of the butterflies makes definite identification on that basis uncertain but when coupled with the other observation in the field, I felt that I could be sure which was which. This summer I was able to put this partly to the test. While collecting on the slopes of the lower part of the Simplon Pass we found large quantities of the Chalkhill Blue (*Lysandra*

coridon Poda.) flying and amongst them was an occasional *Colias* species. I was able to net one or two very fresh males which had the appearance of *C. australis* and then obtained a female. I placed this in a large pill-box with a sprig of *H. comosa* and placed it on the window ledge of the hotel in shaded light. Very quickly she laid about two dozen eggs, all on the plant, and then died. I packed the pill-box and nearly a fortnight later when we had arrived back in England the ova hatched. I transferred the young larvae on to some *Hippocrepis* in the cages in which I was breeding the Adonis Blue (*Lysandra bellargus* Rott.). This was on 2nd August. The small larvae were yellowish and lay along the lamina of the small leaves of the food-plant. After moulting they became green with pale yellow longitudinal lines but already the black spots which differentiate them so quickly from the larvae of *C. hyale* could be seen and as the larvae grew these became even more obvious. The general appearance of the adult larvae was reminiscent of burnet moth larvae (*Zygaena* spp.). It was a constant worry to keep them fed as the nearest *Hippocrepis* was on the North Downs about twenty miles away. I tried all the local trefoils, vetches and clovers but to no avail but with the help of Mr Peter Taylor (3571) I was able to get sufficient *Hippocrepis* and by 4th September all had successfully pupated. The pupae are not so strikingly different from *C. hyale* being pale green with a faint yellow line from the tail end to the middle on each side and a reddish flash below this near the tail. A few of the pupae dried up but the remainder produced perfect but rather small imagines. The size may have been due to the occasional shortage of pabulum. The last emerged on 20th September. Five males emerged followed by fourteen females, three of which were of the primrose form, the other

being white. Three of the females were varieties, having an oblique line above the black discoidal spot on the upper wing underside, looking like an eyebrow (suggested name *abnascara*!). In view of the bad weather at the time of emergence it was not possible to try further breeding attempts so all were killed and set. Previous descriptions of this insect have referred to the discoidal spot in the lower wing being more brightly orange than in *C. hyale* but this was untrue of this series, the spot being rather pale. The only constant factor was the near-total absence of the black marginal marking on the upper-side lower wings and the failure of the black marginal marking in the upper wings to reach round the lower angle of the outer edge of the wing. The wings in general are rounder than those of *C. hyale* but with two species in which there is such a gradation of markings and colouration it does seem that the only way to be absolutely certain is to breed the insect and identify it by its foodplant and larvae.

It is of interest to note that the pictures of the larvae shown in South and Lang appear to be in both cases of *C. australis* although intended to be of *C. hyale*, and the foodplant pictured in both cases is also *Hippocrepis comosa*. The description in the text in South is, however, of *C. hyale*.

20.10.66. P. W. Cribb (2270).

REFERENCES

- LANG, H. C. (1881). *The Butterflies of Europe described and figured*. L. Reeve, London.
 SOUTH, R. (1941). *The Butterflies of the British Isles*. 3rd edn. Frederick Warne, London. Plate 20.
 WALLINS, F. T., DEWICK, A. J. and HARBOTTLE, A. H. H. (1950). *Ent. Gazette*, 1: 113-26. *Colias australis* Verity.

BREEDING OF THE MARSH FRITILLARY (PORTUGUESE SUB-SPECIES)

In February, 1966 I received from a Member in Lisbon, Mr F. Carvalho

(3807), a nest of small *Euphydryas* species larvae which he had found hibernating on honeysuckle (*Lonicera* sp.) near Lisbon. The young larvae appeared to be *E. aurinia* Rott. and I put the nest outdoors in a cage on potted honeysuckle. My Sussex *E. aurinia* larvae came out of hibernation to sun themselves and to feed tentatively on 27th February but the Portuguese larvae did not start to move until sixteen days later and development of the two races ran parallel this distance apart, the first Sussex imago emerging on 13th May and the other on 29th May. This difference is probably due to the more southern race requiring a longer day to trigger off activity. Both were fed on garden honeysuckle supplemented by Field Teasel (*Dipsacus fullonum* Linn.).

The larvae of the Portuguese race when fully fed were nearly a third larger than the Sussex race and in appearance much blacker, lacking much of the fine white speckling. They were more like the larvae of the Peacock, *Inachis io* Linn., in colour. The pupae bore similar markings but were again much larger. Of the pupae, several failed to emerge, turning a dark plum colour soon after pupation—this is a common occurrence in my other stocks of *E. aurinia*. The resultant imagines were very different. Not only were they huge, being about a third bigger, but the general colouring was almost 'ginger' and comparable with nothing amongst the various colour forms of these islands. Its brightness made it look like a different species. I tried to mate a female with a late emerging male of the Sussex stock but without success. I did get a pairing between the members of the Portuguese stock but a week of dull damp days after this resulted in the female dying without laying eggs.

The Portuguese race is referable to the sub-species *beckeri* Lederer and

although it has been bred before in this country I cannot find a record of its normal foodplant and medium of hibernation previously recorded.

20.11.66. P. W. Cribb (2270).

PROLONGED LARVAL STAGE IN AUTOMERIS AURANTIACA WEYM.

On 23rd May 1966, I received a batch of eighteen ova of *Automeris aurantiaca* Weym. from a dealer. Of these, five hatched on 1st June and a further ten hatched the following day. The larvae in the remaining three ova ate only a small part of the eggshell and not enough to enable them to escape from the ova. On 4th June, I was successful in helping one of these larvae out of the eggshell without any apparent damage. This larva ate a little of the privet (*Ligustrum ovalifolium* Hassk.) offered it, but did not appear to be very active and died on 11th June. Its death may have been due to my injuring it or it may have been weakened by its prolonged period in the egg.

Out of the remaining fifteen larvae, three had died by 10th June. The remaining twelve larvae were healthy but it was already apparent that they were growing at different rates. By 8th August there were only ten larvae left (two having escaped); of these, two were in their final (sixth) instar, six were in the fifth instar, one was in the fourth instar and one was in the third instar. On 20th August the two largest larvae started to spin up and a further larva died. Two more larvae began spinning up on 7th September and these were followed by two more on 9th September and a further one on 11th September. Thus by 25th September five larvae had pupated and two larvae were pupating. This still left two larvae feeding,

one in its fourth instar and one in its fifth instar. Of these two, the larger started spinning up on 29th October and this had pupated by 13th November when the remaining larva moulted for the fourth time, entering its fifth instar. This larva now started growing with hitherto unaccustomed vigour and underwent its final moult on 28th November. It then grew into a magnificent specimen and finally pupated on Christmas Day, 25th December, having spent a little over twenty-nine weeks as a larva! This was more than twice as long as the first two larvae took to pupate and six weeks longer than the previous larva (only twenty-three weeks!).

Mr P. G. Taylor (*Bull. amat. Ent. Soc.*, 21: 11-2) refers to a size difference in the larvae of *Lampra fimbriata* Schreb. (Broad-bordered Yellow Underwing) and another example was reported by Mr H. V. Danks (*Bull. amat. Ent. Soc.*, 21: 50-1) in the larvae of *Philosamia advena* Packard. Mr Taylor suggested that the size difference may have been due either to a difference in the sex of the larvae, one sex feeding up faster than the other or that the larvae were of two physiologically different types. Mr Danks suggested that in his case the reason was that the smaller larvae were from an inbred stock.

In the case of my larvae, I think the sex difference can be ruled out. I have examined six of the nine pupae and I found that three were males and three were females. The first two larvae to pupate were males, as was the last but one to pupate. The last larva to pupate was a female. The remaining two female pupae were from those that started spinning up at the beginning of September. Therefore the sex of the larvae does not seem to have any effect on the length of time spent as a larva.

Next we come to the possibility that the larvae might have been inbred. I think that this too can be

ruled out, on the grounds that the smaller larvae were as healthy as the larger larvae and did eventually pupate normally. If they were inbred one would expect the smaller larvae to die and not to recover and attain full growth. Also since they all came from the same batch of ova, inbreeding would normally be expected to weaken the majority of the larvae from the batch. Inbreeding could however explain why the three larvae failed to hatch (see above).

Therefore we are left with the suggestion that the larvae are of two or more physiologically different types, and this would seem to be the most reasonable suggestion. The majority of the larvae (five) started spinning up within four days of each other. The first two started spinning up eighteen days previous to this and the last two were considerably later. It may be added here that the two larvae that escaped were very small, hence the escape, and would probably have been included with the slow growers.) The majority of the larvae could exhibit a normal growth rate and the last two could be a slow growing type. The first two larvae could even represent a third, fast growing, type. If this is the case it should be possible to prove it by breeding experiments.

Now assuming that this is the correct explanation, then what is the reason for this behaviour? Such a prolonged larval period would normally be disadvantageous to the larvae, in that it exposes them to predators, etc., for a far longer period than is usual. Therefore I think that there must be some factor in their natural environment that makes it advantageous to have a prolonged larval stage. In support of this idea, I have noticed similar behaviour in *Automeris illustris* Walk. which also inhabits Brazil. In this case I had eleven larvae (I do not know whether they came from the same batch of

eggs), which I received on 4th November 1961. All these larvae were in their fourth instar. The first larva started spinning up on 27th November and had pupated by 2nd December. The majority of the remaining larvae spun up between 4th and 8th December, but this left two larvae still in their fourth instar. One of these died on 13th December, and the other moulted for the last time the following day. This then continued growing slowly until 7th January 1962 when it started spinning up, pupating on 18th January. As before the sex of the larvae made no difference to the order in which they pupated. The first moth emerged on 1st March 1962, and this was from a larva that had pupated on 14th December 1961. The larva that pupated on 2nd December gave rise to a moth on 11th March. A moth emerged from the pupa of the last larva on 10th April, but this was only three days after a moth had emerged from the pupa of a larva that had pupated on 19th December. Thus the emergence of the moths was spread over a period of six weeks. It may therefore be that the prolonged larval stage results in a lengthened breeding season for the moths and it is worth noting here that the time spent in the pupal stage is not uniform. With such a long pupating period some correction to the time spent in the pupa would be necessary if the different growth types are to interbreed. I would expect the same behaviour from *A. aurantiaca* and I await the emergence of these moths with interest. However the length of the breeding season may not be the sole reason. Such similar behaviour in two related species from the same region seems to me to be more than a coincidence. I have not noticed the same behaviour with *Automeris io* Fab. which inhabits North America.

If any other Member has another explanation for this behaviour or has

some knowledge of the habits of *A. aurantiaca* in its natural habitat, I would be pleased to hear from them. 30.12.66. J. Muggleton (3253).

SKIN CHANGING IN THE INDIAN MOON MOTH

Last year (1966) I bred some *Actias selene* Huebn. (Indian Moon Moth). They were easy to breed, but turned out to be rather a problem in the winter, because the only food that they would take was *Rhododendron* and I had to keep getting fresh supplies, which were about ten miles away.

The small larvae hatched from fairly large ochreous coloured eggs and assumed a red colour with black warts with white hairs arising from them. This skin lasted for just under a week.

The second skin was much the same, although there was a black band running cross-ways over the body. This skin lasted for just under two weeks.

The third skin was considerably different from the previous two. Its main colour was a transparent green, but the warts had changed colour to yellow. In this skin, and in the future skins I saw the front four warts become more prominent. This skin lasted for approximately two and a half weeks.

The only difference in the fourth skin was the increase in size, and the time that the larvae kept the skin. I now expected the larvae to pupate, but instead they kept feeding. They changed three more skins before pupating in a thin, papery cocoon, which was made by bringing two or three leaves together with a few strands of brown silk. The larvae did not complete the cocoon straight away, but waited for about forty

hours before commencing again. It took about three days' work by the larvae to complete the cocoon.

The pupae were about $1\frac{1}{2}$ inches long, with a rich dark brown surface. There was no sign on the wing cases of the long tails that are present on the hindwings.

Would anyone who has had a larva change more than seven skins, please let me know?

8.1.67. D. J. Longman (4042J)

LEPIDOPTERA IN DENMARK 1966

From 17th August to 3rd September 1966 I holidayed in Denmark travelling there via Holland and Germany. We stayed in the Hague for a night and visited the model village at Madurodam which has exact replicas of many famous buildings, railways, ships and aeroplane all to a scale of one-tenth. Although we went there about 6.00 p.m. Vanessa butterflies abounded. Large crowds prevented me identifying any we saw, but there were certainly the Small Tortoiseshell (*Aglais urticae* Linn.), the Painted Lady (*Vanessa cardui* Linn.) and the Red Admiral (*Vanessa atalanta* Linn.). Apart from that the journey was uneventful except for the sight of a bush of *Buddleja*, in a north German village, smothered in butterflies, among which a male Brimstone (*Gonepteryx rhamni* Linn.) stood out conspicuously.

My first catch in Denmark was most unexpected. We arrived at our destination at 1.30 on the morning of Sunday 21st August after a drive of 478 miles that day. As we carried the cases in I noticed a large brown moth which had flown through an open door and stunned itself on the stairs. It turned out to be a female *Grise*

Eggar (*Lasiocampa trifolii* Schiff.).

The place we were staying at was on the east coast of central Jutland and was a laboratory attached to the University of Arhus where my uncle had a botanical research fellowship. Thus I had a whole range of scientific facilities open to me, including a reference collection of the insects of the area. Unfortunately these did not, however, include a moth trap of any kind and I was unable to do any collecting of nocturnal moths at all.

I was not up the following morning when my brother came in to announce the capture of a Queen of Spain Fritillary (*Issoria lathonia* Linn.) near a cabbage field. I went out there and found that on a nearby hill covered in gorse and heather various butterflies were flying, including the Painted Lady, the Peacock (*Nymphalis io* Linn.) and the Common Blue (*Polyommatus icarus* Rott.). The cabbage field itself attracted many Large Whites (*Pieris brassicae* Linn.) and small Whites (*P. rapae* Linn.). To the back of the house a path led through a large area of grassland, which in turn gave way to sandier ground with heather predominant. A day or two later I went down this way and found more Queen of Spain Fritillaries, many Small Tortoiseshells, Peacocks and Red Admirals and various blues, mainly Common Blues but the occasional Small Blue (*Cupido minimus* Guesl.) or Silver-studded Blue (*Plebejus argus* Linn.).

Leading down towards the sea a rough track was flanked on either side by more long grass, heather and gorse, with the addition of some juniper scrub. Here Small Coppers (*Lycaena phlaeas* Linn.) were extremely common and in addition to most of the species seen before there were a few Brimstones and Small Skippers (*Thymelicus sylvestris* Poda). A few yards from the sea among the sandunes Graylings (*Eumenis semele* Linn.) could be seen, although all of

them were old and worn, as it was by now near the end of August.

On the far side of a ridge which lay behind the laboratory, I discovered an unexpected meadow, with a patch of true marsh to one side. Here were Small Pearl-Bordered Fritillaries (*Clossiana selene* Schiff.), accompanied by numerous Meadow Browns (*Maniola jurtina* Linn.) and Small Heaths (*Coenonympha pamphilus* Linn.). I saw a Silver-washed Fritillary (*Argynnis paphia* Linn.) fly from a bramble bush (*Rubus fruticosus* agg.) into the trees at the foot of the ridge and once, to my surprise, a Purple Hairstreak (*Thecla quercus* Linn.) on another patch of Brambles. I did not know the species fed on bramble flowers—indeed I thought it was seldom seen on flowers at all. I took two remarkably small Meadow Browns in this meadow, one of each sex. The male measured little more than an inch and a quarter in wing span and the female not much more. I have never known such marked variation in size in this species before.

My uncle had mentioned that he had seen a patch of scabious which might be good for butterflies to the back of the house, on a path leading to a wood. I followed his directions and on the way saw innumerable Silver Y Moths (*Plusia gamma* Linn.) on the heather. Their peculiar whirling flight and zigzag movements can be quite startling if one happens to trip over one in the heather. Sure enough, there were thirty or forty Peacocks on the scabious, with a fair sprinkling of Red Admirals and one or two Brimstones. On the other side of the path were some high oaks (*Quercus* spp.) round which both Purple Hairstreaks and Brown Hairstreaks (*Thecla betulae* Linn.) were flying in fair numbers. I went through the wood and found myself back in the fields where I had seen the Small Pearl-Bordered Fritillaries. Exploring some fields I had not previously been

Grayling	<i>Eumenis semele</i>	several
Speckled Wood	<i>Pararge aegeria</i>	one
Meadow Brown	<i>Maniola jurtina</i>	abundant
Small Heath	<i>Coenonympha pamphilus</i>	abundant
Peacock	<i>Nymphalis io</i>	abundant
Small Tortoiseshell	<i>Aglais urticae</i>	abundant
Red Admiral	<i>Vanessa atalanta</i>	abundant
Painted Lady	<i>Vanessa cardui</i>	abundant
Silver-washed Fritillary	<i>Argynnis paphia</i>	one
Small Pearl-bordered Fritillary	<i>Argynnis selene</i>	numerous
Queen of Spain Fritillary	<i>Issoria lathonia</i>	numerous
Silver-studded Blue	<i>Plebejus argus</i>	several
Small Blue	<i>Cupido minimus</i>	several
Brown Argus	<i>Aricia agestis</i>	numerous
Common Blue	<i>Polyommatus icarus</i>	abundant
Brown Hairstreak	<i>Thecla betulae</i>	several
Purple Hairstreak	<i>Thecla quercus</i>	numerous
Small Copper	<i>Lycaena phlaeas</i>	abundant
Large White	<i>Pieris brassicae</i>	abundant
Small White	<i>Pieris rapae</i>	abundant
Green-veined White	<i>Pieris napi</i>	numerous
Brimstone	<i>Gonepteryx rhamni</i>	numerous
Small Skipper	<i>Thymelicus sylvestris</i>	several

Table 1. Butterflies seen in Denmark.

in I found many Common Blues and also the Brown Argus (*Aricia agestis* Schiff.).

All these butterflies were seen in an area of about a mile square—an area given over to the laboratory for research purposes. I was unable to explore the rest of the surrounding area for want of transport. On infrequent excursions outside walking distance I found nothing out of the ordinary. Nevertheless, if I could find as many butterflies as this during one fortnight in one square mile anywhere in England, I should be well pleased.

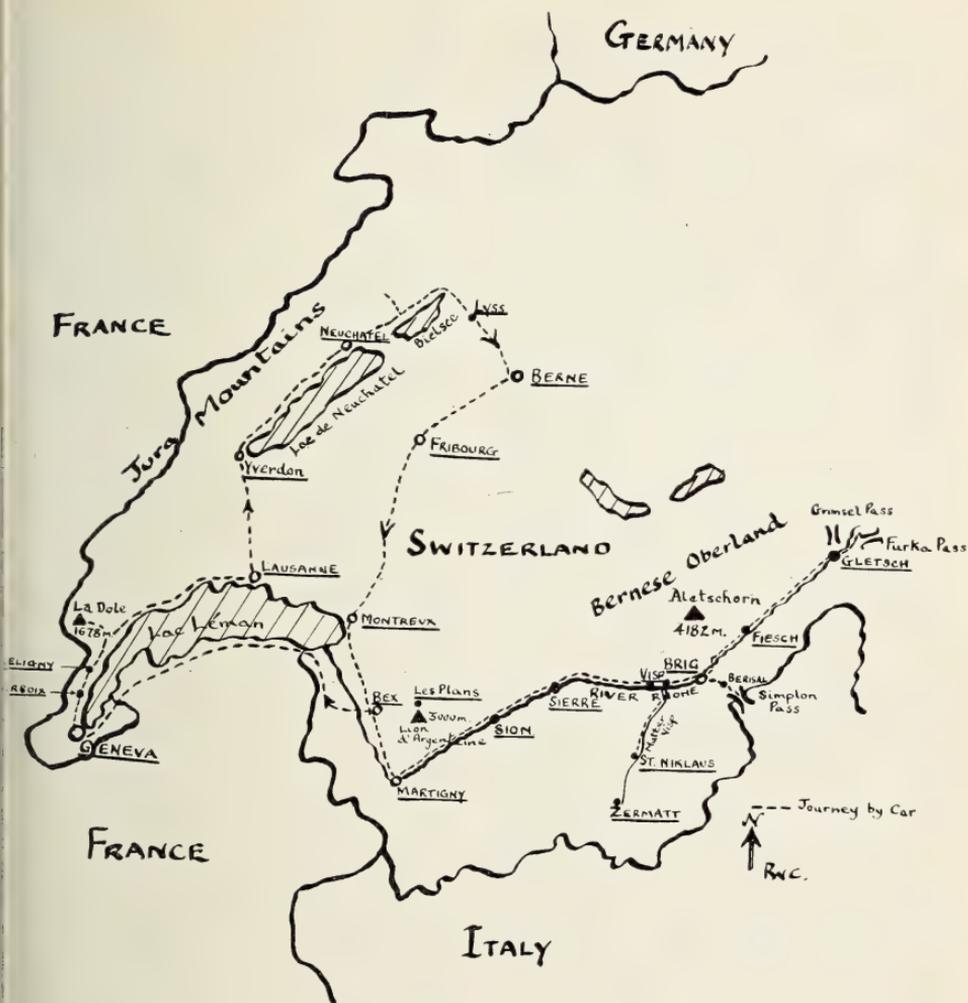
The butterflies I saw during the fortnight, with their relative frequencies, are given in Table 1.

1.7.67. R. A. Leech (3950J).

COLLECTING IN THE SWISS ALPS 1966

Having visited the French Alps and the Pyrenees in previous years, we decided to have a look at the Swiss Alps in 1966—we being Messrs. W. L. Coleridge, Raymond Uffen and

myself. We left England on 15th July and travelled via Dover-Calais car ferry and then train ferry to Lys near Berne in north Switzerland. From here we drove south through Fribourg, Montreux and Martigny and then on to Brig, the town which lies at the foot of the Simplon pass. Our first stop was at Sierre in the Rhone valley. Here we climbed up winding road through dense vine yards until we reached some grass slopes above the vines. The sun was hot and there were quite a few butterflies on the wing. I saw my first Bath White (*Pontia daplidice* Linn.) flying by the roadside. The slope consisted of small rough meadow split up by copses with irrigatic channels running through some areas here the herbage was lush and thick with flowers. The 'blue' *Agrodiaeta damon* Schiff. was common and several were in copulation. Female Mazarine Blues (*Cyaniris semiargus* Rott.) were laying along the edge of one of the lush meadows and the males were dashing about among the flowers. Above the meadows were some rocks and here the large Say *Satyrus bryce* Huebn. was flying. I watched a female depositing her



large white eggs on dried grass stalks and closer inspection discovered these eggs all over the place, being very easily seen on the brown grass. Mr Coleridge captured a Holly Blue *Lycaenopsis argiolus* Linn.) newly merged and the Marbled White *Agapates galathea* Linn.) appeared to be the commonest butterfly present.

After a roadside lunch we drove on to Brig where we had booked rooms in the Hotel de Londres and after leaving our luggage we drove up to the slopes at the top of the Simplon Pass. These rise above the roadway fairly steeply but are not too difficult

to walk over for collecting purposes. The flora is typically high alpine with *Gentiana* spp., alpine Rock Roses (*Cistus* sp.), dwarf willows (*Salix* sp.) and *Vaccinium* sp. In the afternoon sunshine there were quite a few *Erebias* on the wing and I netted *E. epiphron* Knoch, *E. meolans* de Prun., *E. euryale* Esp. and *E. cassioides* R. and H. The only 'blue' seen was *Lycaeides idas* Linn. and there were several *Coenonympha satyrium* Esp. on the wing. The sun was now overclouded and we decided we would return to this area next day as it appeared to be an ideal spot. We

were in for a sad awakening on the morrow for during the night it poured in the valleys and snowed heavily in the mountains so that these same slopes lay under about six inches of snow. We were therefore forced to look to the lower slopes but a fine rain continued to fall and mists enveloped the peaks and rolled down into the valleys so that collecting for much of the time was restricted to searching the grasses for roosting insects. Mr Uffen, who was after Microlepidoptera and various other orders, was not so put out by the lack of sun but the lack of light did make photography difficult and his flash gun was overworked. The lower slopes of the pass are quite heavily wooded with Spruce (*Picea abies* (Linn.) Karst) intermingled with a lot of deciduous trees and bushes and every now and then grassy clearings and short grassy slopes. We were able to search those near to the roadside at about 3,000 ft and up to Berisal which is about half-way up the Pass. At the lower level I found the Chalkhill Blue (*Lysandra coridon* Poda) to be the commonest butterfly and every grass clump produced a few, and amongst them was the occasional *Lysandra escheri* Huebn., a blue very like a large Common Blue (*Polyommatus icarus* Rott.). We also found our first *Erebia aethiops* Esp. (Scotch Argus) and *E. ligea* Linn. here in a grassy meadow beside a small plantation. Amongst other insects here were the nests of the wasp *Pollistes* sp. and in a rotten Spruce stump a nest of huge ants (*Camponotus herculeanus* Linn.), large black shining brutes, about twice the size of our Wood Ant (*Formica rufa* Linn.) I found one caterpillar of the Humming-bird Hawkmoth (*Macroglossum stellatarum* Linn.) on Yellow Bedstraw (*Galium verum* Linn.) beside the road, and on the small willows growing in a dry water course several large larvae of the Puss Moth (*Cerura vinula* Linn.).

Under a large rock I also found a Large Wall (*Dira maera* Linn.) settled, its light grey underside exactly matching the rock. During one sunny spell we saw several *Colias* spp. and I was able to capture a female *C. australis* Verity, which subsequently laid eggs. One single specimen of the Grayling (*Hipparchia semele* Linn.) was also taken—its size being greater than our own race and the colouring very vivid. At this altitude (3,000 ft) the Meadow Brown (*Maniola jurtina* Linn.) is replaced by *Hyponephele lycaon* Kuhns., an insect which haunts the rock-strewn grass areas and uses the broken ground as a camouflage when settled. The males were rubbed but the females only just emerging. Higher up the pass just below Berisal, we found a beautiful valley with short grass and plenty of flowers. This lay beside the stream which flows under the Gante Bridge. As the mists rose we were able to collect here but as the sun still failed to shine we had to search for our insects. On the heads of flowers we found the Silver-spotted Skipper (*Hesperia comma* Linn.) and the fritillaries *Melitaea didyma* Esch. and *Fabriciana niobe* Linn. (form *er* Meig.). The Scarce Copper (*Heodolus virgaureae* Linn.) was quite common resting on clumps of Alpine Sorrel (*Rumex* sp.) and Mr Uffen was able to photograph the only specimen of the Purple-edged Copper (*Palaeochrysopephanus hippothoe* Linn.) which we saw. The commonest *Erebia* was *E. euryd* and there were a few *E. albertanus* Prun. and *E. epiphron* Knoch with them. My biggest haul was of beetles. Every thistle head had a chafer and a longhorn beetle present and I also took several bee beetles. There were several frogs by the stream and they were of the species *Rana dalmatica* Fitz. (The Dalmatian Frog). Above the valley we stopped at Berisal and made a sortie into the woods above, using a winding path which went

through the tall Spruces. We found a massed display of a tall blue flower which turned out to be Alpine lettuce (*Cicerbita alpina* Linn.). With some sunshine this would have proved a wonderful spot and towards evening we did have a brief period of sun during which butterflies appeared from nowhere to race up and down the clearings in the woods. Beyond the woods was a wide valley with pine meadows on each side and a row of trees. A farmer and his wife and four children were scything the meadows and this intensive harvesting of fodder results in a considerable reduction in the butterfly population in such areas. I did find one specimen of *Erebia cassioides* in the meadows, but compared with the woodland clearings the meadows were a waste of time.

As the mists and drizzle in the higher mountains persisted we made a sortie down the Rhone Valley to the small town of Visp and here a tributary joins the Rhone, coming down from the direction of Zermatt. A road runs along this stream to St. Niklaus and here the road ends and the journey to Zermatt must be continued by Rack Railway. We left the car in St. Niklaus and walked up the pathway which is now being converted into an extension of the roadway. Lasting and roadworks were in progress and the drizzle which had accompanied us from Brig cleared up as we walked along the pathway running through wooded slopes and small meadows. We overlooked the Visp stream and the Zermatt railway along which the crawling trains whistled their way towards the Matterhorn. In a rocky ravine we found our first *Parnassius apollo* Linn. resting on a thistle head. A search discovered several more, all males. *P. virgaureae* was common here, being the form *zermattensis* Fall. We feasted on wild raspberries and strawberries growing amongst the rocks and

found a group of the alpine foxglove *Digitalis lutea* Linn., which is much smaller than our native species and pale yellow. One *Erebia triarius* de Prun. was taken and the Small Skipper (*Adopaea flava* Brunnich) was common. The Burnet *Zygaena purpuralis* was just emerging and I also found one specimen of *Coenonympha arcania* Linn. Again lack of sunshine did not enable us to assess the full potential of this area. Lower down near Visp right beside the river we found some small clearings and these yielded a new species for me, the Short-tailed Blue *Everes alcetas* Hffsgg., which is like the Bloxworth Blue (*E. argiades* Pall.) but has no orange/yellow marking on the underside near the tails. We found some Bladder Senna (*Colutea arborescens* Linn.) growing above the stream and as this is the food plant of the rare 'blue' *Iolana iolas* Ochs. we searched the bladder-like pods for larvae. There were plenty of 'Micro' moth larvae present but no *I. iolas*. Again rain drove us back to the hotel long before we were weary.

Our next jaunt was up the Rhone valley towards the town of Gletsch at the foot of the famous Furka and Grimsel Passes. This drive along the young Rhone was very beautiful with the mountains of the Bernese Oberland on our left in the distance and the peak of the Aletschhorn and on our right meadows thick with alpine flowers and the river running through its rocky bed, with small villages dotting the narrow plain. We stopped just above the village of Fiesch and climbed across the railway line to find small meadows along the edge of a forest which we found is called the Fieschwald. The sun blessed us this morning and we found a feast of butterflies—all the species we had seen elsewhere and many more. For the first time I took the fritillary *Mellicta aurelia* Nickerl. which was flying with the Heath Fritillary (*M.*

athalia Rott.). I captured several of the latter for breeding purposes. All along the edge of the wood the Cow-wheat (*Melampyrum* sp.) was thick and is one of the foodplants of the two butterflies. On the thistles were larvae of the Painted Lady (*Vanessa cardui* Linn.) and several Queen of Spain Fritillaries (*Issoria lathonia* Linn.) were sunning themselves on bare patches. This is a habit of the butterfly and they will return to the same spot again and again, a useful habit for the photographer. Mr Coleridge captured a very fine *Papilio machaon* Linn. with a ground colour of soft yellow and we saw several other specimens of this butterfly dashing about in the clearings. Single specimens of the Large Tortoiseshell (*Nymphalis polychloros* Linn.) and the mountain *Colias C. phicomene* Esp. were also taken, and the typical (silver-spotted) form of *F. niobe* replaced the form *eris* in this place. Mr Coleridge also took a specimen of *Aglais urticae* Linn. which was a rich brick red and lacked the two forewing spots (form *ichnusa*?). Unfortunately when we left this spot I left my net behind and despite a search later it was not recovered. I had brought a second net, in case, and this saved the day (a warning to others collecting abroad).

The approach to Gletsch is through and over a gorge overshadowed by a wall of permanent snow ice alongside which runs the Rhone, newly born from the glacier which hangs at the end of the valley behind the village. It is an awe inspiring sight and the winding passes of the Furka on the right and the Grimsel on the left leave a stark impression of the rugged grimness of these high mountains. The valley between along the sides of the river was a contrast, being like a great rock garden, strewn with large rocks and carpets of alpine flowers. We had our lunch here but the bitterly cold wind blowing down the

valley from the glacier made it too uncomfortable to stay long. We photographed many of the flowers and I caught two *Erebias*, *E. epiphron* and a male *E. manto* Esp., though the conditions were against butterflies flying. There was no cultivation here and little grazing and with better weather the valley should be quite fruitful.

With the continuing heavy mists and drizzle in the mountains we decided to leave and try a spot recommended by a member living at Geneva, Mr C. Garrett-Jones (1989). This was near the town of Bex in the Vaud Canton. We drove up from Bex into the Vaud mountains to the Pont de Nant where two wild valleys join to make a pleasant arena of grassy meadows. There is an artificial Alpine Garden here with most of the alpine flowers growing—being dedicated to a Swiss botanist. We stayed at a Hotel just below this in a very small village called Les Plans. The Hotel was wooden and delightfully clean with a view of the chief peak, the Lion d'Argentine, from our bedroom window. Woods of a very mixed coniferous and deciduous nature clothed most of the slopes around and in the vicinity of the village the meadows were thick with flowers. We spent one day climbing up the slopes towards the Lion d'Argentine finding butterflies in the woodland clearings. The fritillary *Brenthis ino* Rott. was quite common and very large and its marking much paler than those I have taken in the Basses Alpes. Another was *Clossiana titania* Huebn. and the High Brown Fritillary (*Fabriciana adippe* Rott.). Mr Coleridge captured one specimen of the White-letter Hairstreak (*Strymon w-album* Knoch) and we found a bright green grasshopper which was wingless (*Podisma alpina* Koll.). This winglessness seems to be a characteristic of high mountain Orthoptera. Above the tree line and on the edge

of the mists we came upon an open grassy slope furrowed by partly dry water courses and clothed with short grasses and scattered flowers and bushes. Here were two butterflies, *C. satyrion* and a new *Erebia*, *E. oeme*. This latter was very common and at the slightest sign of sun the slopes came to life with their black bobbing forms. The females were fresh but the males rubbed. Sheep were grazing at this altitude, about 6,000 ft, but again the mist and lack of continuing sun did not allow us to assess the butterfly population.

1.11.67. P. W. Cribb (2270).

(To be concluded in Bull. amat. Ent. Soc., 1967 (276).)

JUNIOR NEWS SECTION

I feel I must congratulate the Junior Members who, I hear, put on a good show at the 1966 autumn Exhibition in London. I must not miss this year's AES Annual Exhibition.

Unfortunately the winter months have not brought in much correspondence, so I have very little news of you for you.

John Young (3650J) of 'Closeghyll', Hallbankgate, Brampton, Cumberland, went seeking butterflies and moths in south-west England last summer astride his brother's motor-cycle.

He spent an enjoyable time collecting at Treyarnon Bay in North Cornwall, but only managed to catch Meadow Browns (*Maniola jurtina* Linn.) and Burnet moths (*Zygaena* spp.). Following the coast road, our hero sped into the New Forest, where he camped and collected. Neither of these proved to be very rewarding. For one thing only the commoner species again turned up, for another the New Forest ponies

trampled his tent into the ground and the camp was flooded. Mr Siggs (243) came to his rescue with specimens from his own light-trap. You may think that this was the turning point in John's luck, but not a bit of it, for on the way home he crashed the motor-bike and ended up amid 'butterfly caps' in hospital. I hope you are up and about now John—better luck next time. Strange to tell, John decided to travel by motor-cycle as he thought hitch-hiking would have been suicidal.

As some of you have sent in answers to past quizzes, I thought it an idea to offer a small prize to any of you gaining a sufficiently high mark in the quiz I am setting in this issue. When sending me your entries (within two weeks of receiving your copy of the *Bulletin*), please say which of the following prizes you would prefer: an AES badge, a copy of the *Bulletin* from the period 1949 up to the time you joined the Society, some live Indian Stick Insects (*Carausius morosus* Br.) or, providing I can supply, any specimen you are after. Don't forget your name and age on your entry.

1. What do adult cabbage white butterflies (*Pieris* spp.) eat?
2. Draw and colour a Stag Beetle (*Lucanus cervus* Linn.).
3. Name four Orders of insects which pass through complex metamorphosis.
4. What do insects use their spiracles for?
5. Give three reasons why spiders are not insects.
6. Which large rare butterfly is only found wild in Norfolk and nowhere else in the British Isles?
7. What connection did *Schistocerca gregaria* Forsk. have with Moses?
8. Draw and colour an adult *Gonepteryx rhamni* Linn.

9. What is meant by a melanic variety of insect?
10. In which county in the British Isles is that beautiful butterfly the Large Copper (*Lycaena dispar* Haw.) found.
11. Give two Orders of insects which have biting mouthparts and two which have sucking mouthparts (see figure).



Biting mouth parts



Sucking mouth parts

12. Draw and colour a larva of the Privet Hawkmoth (*Sphinx ligustri* Linn.).
13. To which Order of insects do mosquitoes belong?
14. What in fact is a scorpion fly?
15. Draw and colour an adult Common Speckled Footman Moth (*Coscinia cribraria* Linn.).
16. Name at least fifteen species of British bumble bee.
17. Where are oil beetle (*Meloe* spp.) larvae reared?
18. Draw and colour an adult Peach

Blossom Moth (*Thyatira batis* Linn.).

19. Locusts, crickets and bush crickets stridulate. What does this mean?
20. Draw a caddisfly larva.

Even if you do not feel like trying the competition please let me have all your news—a postcard will do.

St Ivo School's proposed expedition to northern Italy and Switzerland proved to be too expensive so the club is going to the Massif Central in southern France instead. If anyone wants specimens from this area please let us know. As long as you do not want too many we will do our best.

I shall be interested to hear about the T.I.E.G. entomological camp in the New Forest and of course our own AES camp being organised by Mr Porter. I wish you a happy season—don't collect too much!

31.1.67. H. J. Berman (2971A).

LETTERS TO THE EDITOR

Sir,—I would be interested to learn whether the abundance of the Silver Y Moth (*Plusia gamma* Linn.) was general over the British Isles this season, for in my district (Aberdeen) the insects appeared in countless numbers in every type of locality.

A small influx of the insects was noticed on 1st June 1966 and a few were taken at Wallflower (*Cheiranthus cheiri* Linn.) in my garden at dusk. After a week or so no more Silver Y's were seen until early September when they were extremely plentiful. They were to be seen on sunny days hovering around night-scented stock (*Matthiola* sp.) and *Dahlias*, while in the evening, apart from being seen at these plants they were often taken at 'sugar'.

9.11.66.

E. Pickard (3928).

Sir,—The 'A Warning' by Mr Goddard in the November *Bulletin* on the dangers of pesticides and the unwise policy of releasing large numbers of insects is most appropriate, as is his advice to join a local conservation society to help protect wildlife (including insect) habitats.

Some of your members may wish to support the Council for Nature as a National Organisation which is working at government level to control the use of pesticides. The minimum subscription for individuals is £1. Alternatively, they can write to the Council for Nature, Zoological Gardens, Regents Park, London N.W.1 to ask for addresses of local natural history societies or conservation organisations in their areas.

16.11.66. Martin Jones,
Information Officer, Council for Nature.

season's weather or by a farmer's misuse of a chemical spray; to the point at which male and female butterflies no longer meet each other sufficiently often for breeding to be assured and the population to survive. If such a population is reinforced by introductions, it stands a good chance of the population density being kept above danger level and hence ensuring survival.

Good luck to those enlightened Members who are actively attempting to save our insect heritage. May the 'well-adapted' entomologist, who has exchanged his nets and cabinets for cameras and breeding cages, rapidly spread through the population and may the still-surviving Victorian-era collectors meet a timely death in their own cyanide jars.

12.12.66. D. Corke (2962).

Sir,—I was sorry to see the article in the November *Bulletin* ('A Warning' by Mr Goddard) in which the author attempts to prove by his misunderstood genetics that breeding and releasing butterflies is harmful.

Let us consider the facts. As the author said, in a batch of 100 larvae only about two will survive in the wild. Thus the average larva has a 98% chance of dying before it breeds. Except in the very rarest of mutations this chance does not vary much between individuals, a 'well-adapted' larva having perhaps a 97.95% chance of death and a 'badly-adapted' larva a 98.05% chance of death.

It takes several hundred generations for adaptive advances to spread through the population. Hence breeding one or two generations of butterflies for release will hardly affect the genetics of the population at all.

Let us now consider the good points of breeding butterflies for release. A wild population may be reduced by an exceptionally bad

Sir,—I read with interest the article by Mr J. S. Badmin (*Bull. amat. Ent. Soc.*, 25: 134-5). I have the following criticism to make:

With reference to the graph relating the activity of Lepidoptera to the barometric pressure, I would like to ask whether this is really just a graph of the distribution of barometric pressure. In other words, before one can read anything from it, one must compare the Lepidoptera activity graph with a graph showing the frequency with which one can expect any particular barometric reading. This latter graph, much as the 'number of occasions' line in the published graph, comes out as a slightly skew normal curve. If the two graphs were seen to be similar in shape, then one could say that the barometric pressure did *not* bear any relationship (direct or indirect) to the numbers of Lepidoptera flying. Note should also be made of the differing flight times of Lepidoptera (see a paper by Dr Trevor Lewis of Rothamsted, published by the Royal

Entomological Society), and the effect that this will have on any study attempting to correlate numbers of insects with the barometric pressure.

In short, I would like Mr Badmin to re-examine his argument, since I do not think that he has presented any proof for his contention that the activity of Lepidoptera is related, directly or indirectly, to the ambient barometric pressure.

19.11.66. J. F. Vincent (3027).

REFERENCE

LEWIS, T. and TAYLOR, L. R. (1964). *Trans. R. ent. Soc. Lond.*, **116**: 393-469. Diurnal periodicity of flight by insects.

Mr J. S. Badmin comments:

In reply to the above criticism by Mr J. F. Vincent, I feel that several facts require clarification.

The main point of the article was to underline that temperature and wind were the most important factors influencing flight activity.

One aspect of the work which interested me was the investigation of possible guides for estimating the approximate size of a trap sample in advance. As I remarked in the summary of the article in question, pressure did not prove to be in this category. In fact being dubious of its influence I stated earlier that pressure had limited effect. I agree that a more decisive statement is required that pressure has no direct relationship. However, as pressure zones entering an area produce differences in the climatic conditions and hence alterations in the flight activity, there must be an indirect relationship.

Flight periodicity would appear to complicate the issue, but my original intention here was to study the more apparent large scale variations in pressure. During the work nocturnal periodicity was briefly studied and it would appear that temperature and windspeed play a more active part in controlling local variations than any other factors, including pressure.

Sir,—With reference to Mr Grey's article on Majorcan Lepidoptera (*Bull. amat. Ent. Soc.*, **25**: 133-4), I too visited Majorca during the first two weeks of August this year and, like Mr Grey, was most disappointed with the number of butterflies seen.

The countryside was dry and barren with little green, if any at all, except in the cultivated fields. When I arrived the island was experiencing a heat wave with temperatures well up in the nineties and once over a hundred degrees Fahrenheit. It had been a month since it had last rained.

After visiting the Costa Brava, on the east coast of Spain, last year and bringing home a fairly large catch of Swallowtails, Walls, fritillaries, Clouded Yellows, cabbage whites, and seeing quite a number of continental species, I came to Majorca well equipped but came home again with only two specimens in all. These were a Wall Butterfly and a Crimson Speckled Footman Moth, which was caught during the daytime.

The only other moths I noticed were a few specimens flying around the mercury-vapour street-lamps, but these moths were too high up to identify.

I had also expected to see plenty of swallowtails but I failed to see any; I only had a report from someone that a swallowtail had been seen in one of the hotel gardens.

There was also a small colony of 'blue' butterflies in a tree outside the hotel at which I was staying although I never had a chance to catch one.

Species noted were: Wall (*Dira megera* Linn.)—relatively common though not numerous; Red Admiral (*Vanessa atalanta* Linn.)—one; Small White (*Pieris rapae* Linn.)—one; Clouded Yellow (*Colias croceus* Fourcr.)—four; Swallowtail (*Papilio machaon* Linn.)—one; Crimson Speckled Footman Moth (*Utetheisa pulchella* Linn.)—one.

29.11.66.

M. J. Osborn (3710).

NOTES AND OBSERVATIONS

UNCOMMON LEPIDOPTERA ON THE HERTS.-BUCKS. BORDER

On August 8th 1966 I took, in my Rothamsted type moth-trap, a variety of *Colocasia coryli* Linn. (Nut-tree Tussock). This trap is situated on a hill in Berkhamsted, Hertfordshire, and it overlooks the valley. This moth is lacking the broad vertical brown bar on the forewings. The grey colour on the forewings is of a deeper shade than normal. On the underwings the brown colour is deeper than it usually is, and there is a broad blackish line along the edge of the hindwings. Unfortunately it is a rather worn specimen.

Ten days later, in the same trap, I took a specimen of *Eupithecia succenturiata* Linn. (Bordered Pug), and to quote South: "The species is most frequent, perhaps, on the coast, but it is widely distributed in England and Wales."

When I returned to school this year (on September 16th), a friend told me that he had found a specimen of *Acherontia atropos* Linn. (Death's Head Hawkmoth) at Amersham in Buckinghamshire. He also told me that he had accidentally trodden on the tail end of a *Celerio euphorbiae* Linn. (Spurge Hawkmoth) caterpillar, and that a specimen of *Hippotion celerio* Linn. (Silver-striped Hawkmoth) had flown in through his back door, also in Amersham. I bought the Silver-striped Hawkmoth from him for five shillings. Unfortunately it has only one antenna and two legs (the front two). Its forewings are slightly tattered and most of the pink scales on the right hindwing have been rubbed off. I would like to hear from anybody else who has taken one of

these insects this year.
16.9.66. N. Cook (3962J).

REFERENCE

SOUTH, R. (1961). *The Moths of the British Isles*. 4th edn. Frederick Warne, London. Series II, p. 224.

LEPIDOPTERA IN YORKSHIRE

The following observations made this summer may be of interest to Members.

On 10th August 1966 at Tunstall, near Withernsea, East Yorkshire, approximately 1½ dozen Painted Lady Butterflies (*Vanessa cardui* Linn.) were seen flying northwards along the coast at intervals of about one every fifteen minutes from 8 a.m. to 12 noon. The wind was west-south-west moderate to strong, and it was dry weather with sunny intervals.

Also, the Silver Y Moth (*Plusia gamma* Linn.) was abundant in late August and early September at Tunstall and York.
30.11.66. A. J. Gillery (3653).

THE PURPLE EMPEROR BUTTERFLY AB. IOLE

There has, according to I. R. P. Heslop in his book *Notes and Views of the Purple Emperor*, been only one recording of ab. *iole* in the female of this butterfly (*Apatura iris* Linn.). This is the specimen bred by Mr A. J. Wightman.

I wish to record a second specimen that was taken as an adult whilst at rest on a willow bush (*Salix* sp.) in Salcey Forest, Northamptonshire, on July 8th 1959, by the Rev. J. Denning, now of Yeovil, Somerset.

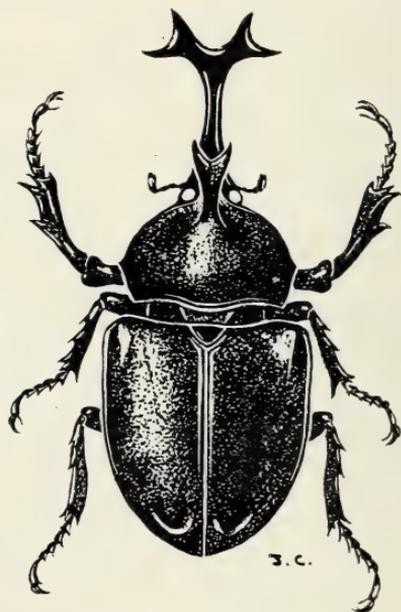
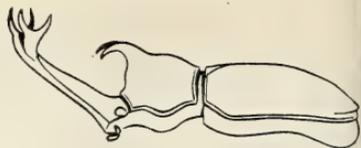
D. E. Dodwell (3482).

REFERENCE

HESLOP, I. R. P., HYDE, G. E. and STOCKLEY, R. E. (1964). *Notes and Views of the Purple Emperor*. Southern Publishing Co., Brighton.

**ALLOMYRINA DICHOTOMUS
LINN.**

Family Scarabaeidae
Sub-family Dynastinae
Genus *Allomyrina* Arrow.
Species *Allomyrina dichotomus* Linn.



***Allomyrina dichotomus* Linn.**

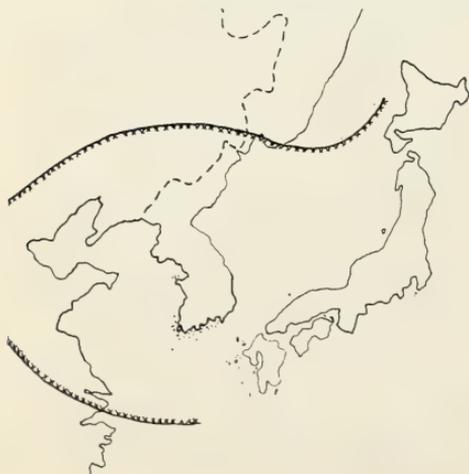
A formidable looking beetle found in most parts of Japan, Korea and North China. Like most of the other members of the Dynastinae it feeds

on vegetable debris, decaying tree stumps and palms.

The female of the species is much the same, but without the large horns.

I would like to thank Mr R. G. Adams of the British Museum (Natural History), South Kensington, for supplying the above information. 20.1.67. Jonathan Cooter (3290J).

[The information about the distribution of this beetle, and the others which Mr Cooter has drawn in earlier issues, is derived from a very old catalogue, and the ranges of the species may well be wider than that indicated. *A. dichotomus*, for instance, may also occur in U.S.S.R. around Vladivostok, in the Ryukyu Islands or in Formosa.—Ed.]



THE AES ADVISORY PANEL

How and when to consult the Panel

Members of the Panel will advise you on the study of their special groups and will identify small numbers of British specimens which are of particular interest to you. Large collections should be taken to a museum for identification. Try to use a copy of the relevant standard work if you know of one, before approaching the Panel.

Always mention that you are approaching the Adviser as he is a member of the Panel and give your own **Membership number**. You must **enclose postage stamps** to cover the cost of a reply or return of specimens. Members of the Panel are busy people, so try to send dead material to them during the winter when their own time is less likely to be taken up with field work. You are recommended to **send a stamped addressed envelope** for acknowledgement of the receipt of material which may have to await time for its identification.

Labelling — with details of locality, foodplant, date, time and mode of capture, etc. — often greatly simplifies identification. Every specimen should be fully labelled on the same pin as bears the specimen or its mount. Details of locality will be treated as confidential if this is desired.

The Society is most grateful to the many specialists who serve on this Panel, without any remuneration other than the occasional specimen taken, with permission, from an interesting series that has been sent in. It is hoped that Advisers on those groups that are noticed incidentally or as pests will be sought after as frequently as members of the Panel willing to identify commonly collected Orders.

New advisers on appropriate subjects not covered below are always welcomed by the Hon. General Secretary.

ADVISORY PANEL

Coleoptera (Beetles)

General advice on identification

D. TOZER (36), 98 Copdale Road, Leicester.

Staphylinidae

H. R. LAST (117), 12 Winckworth Road, Banstead, Surrey.

Water-beetles

Prof. J. W. A. F. BALFOUR-BROWNE, M.A., c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Diptera (Two-winged Flies)

General advice

L. PARMENTER (895), Woodside, Pinewood Road, Fern-down, Dorset.

Larvae (approximate identification)

K. G. V. SMITH, c/o British Museum (Natural History), Cromwell Road, London, S.W.7.

Tachinidae (Parasitic Flies) and *Muscidae*

E. C. M. FONSECA, 58 Woodstock Road, Redland, Bristol 6.

Tipulidae (Crane-flies)

R. M. PAYNE (2982), 8 Hill Top, Loughton, Essex.

Ephemeroptera (Mayflies)

General advice and identification of larvae and adults

T. T. MACAN, M.A., Ph.D., Stevney, Outgate, Ambleside, Westmorland.

Heteroptera (Het-bugs)

General advice and identification

T. R. E. SOUTHWOOD, B.Sc., Ph.D., Imperial College Field Station, Silwood Park, Sunninghill, Berkshire.

Aquatic species

T. T. MACAN, address above.

Homoptera

Aphidoidea (Greenflies, Blackflies)

H. L. G. STROYAN, M.A., c/o

Insect Pathology Laboratory,
Hatching Green, Harpenden,
Hertfordshire.

Auchenorhyncha (Leaf-hoppers, etc.)
Dr W. J. LE QUESNE, Anne
Cottage, Lye Green Road, Ches-
ham, Buckinghamshire.

Hymenoptera

Aculeata (Bees and Wasps)
J. C. FELTON, 16 Park Drive,
Sittingbourne, Kent.

Formicoidea (Ants)
C. A. COLLINGWOOD, B.Sc.,
c/o National Agricultural Ad-
visory Service, Coley Hill,
Reading, Berkshire.

Parasitica (Chalcids, Ichneumons,
etc.)

G. J. KERRICH, M.A., c/o British
Museum (Natural History),
Cromwell Road, London, S.W.7.

Symphya (Sawflies)
Dr V. H. CHAMBERS, 12 Dou-
glas Road, Harpenden, Hertford-
shire.

Lepidoptera (Butterflies and Moths)

'*Microlepidoptera*' — identification
S. WAKELY (1860), 26 Finsen
Road, London, S.E.5.

ditto — general advice
D. OLLEVANT (1514), 3 Sal-
combe Drive, Morden, Surrey.

Noctuidae and their larvae
B. F. SKINNER (2470), 85 Elder
Road, West Norwood, London
S.E.27.

Saturniidae (Silkmoths)
B. O. C. GARDINER (225),
18 Chesterton Hall Crescent,
Cambridge.

European Butterflies
P. W. CRIBB (2270), 355 Houn-
slow Road, Hanworth, Nr Fel-
tham, Middlesex.

Odonata (Dragonflies)

General advice and identification
A. E. GARDNER, 29 Glenfield
Road, Banstead, Surrey.

Orthopteroids (Cockroaches,
Grasshoppers, Mantids, Earwigs,
etc).

General advice and identification of
British and imported species

A. E. GARDNER, address above.

Plecoptera (Stoneflies)

General advice and identification of
larvae and adults

T. T. MACAN, address above.

Thysanoptera (Thrips)

General advice and identification
T. LEWIS, B.Sc., Ph.D.,
c/o Rothamsted Experimental
Station, Harpenden, Hertford-
shire.

Trichoptera (Caddisflies)

General advice and identification
T. T. MACAN, address above.

Insect Migration

Recorder and Adviser

R. A. FRENCH, B.Sc., (2129),
Rothamsted Experimental Sta-
tion, Harpenden, Hertfordshire.

Botany

Identification of foodplants
H. K. AIRY SHAW (545), Royal
Botanic Gardens, Kew, Surrey.

Selection, propagation and cultivation
of foodplants and floral attractions
R. C. DYSON (91), 58 Stanford
Avenue, Brighton 6, Sussex.

Plant Galls

D. LEATHERDALE, Eastfield
Lodge, Whitchurch, Nr Pang-
bourne, Berkshire.

Apparatus and Techniques (except microscopy)

General advice

M. E. CASTLE (2490), 'Avellana',
172 Greenfield Crescent, Hazel-
ton Gardens, Horndean, Hamp-
shire.

Microscopy

General advice

G. W. SWAYNE, A.I.S.T.,
F.R.M.S. (3949), 22A Thorpe
Road, S. Tottenham, London,
N.15.

Photography

35mm. still and general advice

R. W. J. UFFEN (1660), 4
Vaughan Avenue, Stamford
Brook, London, W.6.

LEAFLETS

Numbers not included are out-of-print or replaced by others.

	Price each
3. Rearing Silkworms. (The Mulberry Silkmoth). 4pp., 2 figs.	1s. 0d.
4. Collecting Sawflies. 12pp., (incl. 2pl.), 26 figs.	2s. 0d.
5. Collecting Flies (Diptera). 8pp., 1 fig., 8pl.	4s. 0d.
6. Collecting Beetles associated with Stored Food Products. 9pp., 6 figs., 3pl.	3s. 0d.
7. Some Improved Devices for Rearing Hymenoptera. 7pp., 3 figs.	2s. 0d.
9. Collecting Caddises. 5pp., 4pl.	2s. 0d.
10. Experiments with Bees. 12pp., 3 figs.	2s. 0d.
13. Collecting Microlepidoptera. 4pp., 1 fig.	1s. 0d.
14. Setting Microlepidoptera. 4pp., 5 figs.	1s. 0d.
15. Collecting Het-Bugs (Hemiptera-Heteroptera). 12pp., (incl. 2pl.), 5 figs.	3s. 0d.
18. Collecting Clearwings. 12pp., (incl. 2pl.), 4 figs.	2s. 0d.
20. Preserving Caterpillars. 14pp. (incl. 6pl.), 9 figs.	3s. 0d.
21. Collecting Psocoptera. 4pp., 10 figs.	1s. 0d.
22. Collecting Lacewings. 9pp., 8 figs., 5pl.	3s. 0d.
24. Entomology of Bird Pellets. 8pp., 4pl., 1 map.	2s. 0d.
25. Collecting Bumble Bees. 20pp., 83 figs.	5s. 0d.
26. Collecting Collembola. 6pp., 4 figs.	2s. 0d.
27. A Study of the Insects Living on the Wayfaring Tree. 20pp., 4 figs., 1 diagram.	3s. 0d.
28. Killing, Setting and Storing Butterflies and Moths. 13pp., 10 figs.	3s. 0d.

PAMPHLETS

4. Label List of British Macrolepidoptera. 32pp.	4s. 0d.
5. Check List of British Macrolepidoptera. 32pp.	1s. 8d.
6. Label List of British Butterflies. 2pp.	8d.
7. Directory of Natural History Societies. 155pp. published 1948, of considerable historical importance.	12s. 0d.
7a. First Supplement to Directory. 44pp. published 1949.	3s. 0d.
10. Glossary for the Young Lepidopterist. 6pp., 2 figs.	1s. 0d.
11. Label list of the Butterflies of North, Western and Southern Europe. Set in 10pt Times type.	8s. 0d.

Other Leaflets are in preparation

These publications are obtainable from AES Publications Agent, 137 Gleneldon Road, Streatham, London S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

COLEOPTERA REQUIRED

(Exchange OR Cash)

REQUIRED—Species of Cetonidae and Goliathinae
from Rhodesia, Tanganyika, and South Africa

OFFERED—Species from Ivory Coast, former Belgian
Congo and most French species

*Please write to:—***MONGUILLON MICHEL,**
7, Rue Berryer, Paris, 8

THE BUTTERFLY FARM LTD.

As from the 1st of APRIL 1967 the only address of The Butterfly Farm will be as follows:—

The Butterfly Farm Ltd.,
Bilsington,
ASHFORD,
Kent.

Telephone No: Ham Street 513

Please make sure that you are on our index of addresses to receive future lists.
We will tell you more later on of our ENTIRELY NEW Butterfly Farm

The Amateur Entomologists' Society

Published August, 1966

PAMPHLET No. 11

A Label List of the Butterflies of North, Western & Southern Europe

Compiled by P. W. CRIBB

Listing 403 species and subspecies with up-to-date nomenclature and older synonyms. Suitable as a Label or Check List. Printed on white Bond paper, set in 10pt. Times type. Size 8 x 10in. Price 8/- per copy, postage extra at cost

From A.E.S. PUBLICATIONS AGENT,
137 Gleneldon Road, Streatham, London, S.W.16, England

Do NOT send any money with your order. An invoice will be sent with the publication

Worldwide Butterflies Ltd.

Our new address is:

Over Compton, Sherborne, Dorset

Our new showroom is:

21, Brighton Square, Brighton, Sussex

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

**Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.**

FOR ALL INFORMATION ON BEES

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mddx

Entomological Literature

CATALOGUES ON REQUEST

EXOTIC INSECTS

Below are a selection of exotic lepidoptera and other insects, etc. from my extensive stock.

LEPIDOPTERA

Lepidoptera		Formosan	
Papilio xuthus	2/-	Papilio horishianus	4/-
protenor	2/-	polytes	2/-
maacki	7/6	demoleus	2/-
bianor	3/-	thiawanus	2/-
dehaani	3/6	dialis	2/6
Indian		bianor	2/6
Ornithoptera aecus	6/-	paris	2/6
cerberus	6/-	hoppo	5/-
Papilio protenor	2/6	eurous	2/6
memnon	3/6	Danais chrysipus	2/-
paris	5/-	mellisa	2/-
x'enocles	2/6	Hestia leucinoe	3/6
ganesa	5/-	Euploea dufresne	1/9
arcturus	7/6	mulcibar	1/9
sarpedon	2/-	koxinga	1/9
gyas	3/6	Euthalia formosana	2/9
Delias descombesi	1/6	Apatura ulupi	2/6
thysbe	1/6	Sephisa chandra	4/-
Hebomia glaucippe	2/6	Kalima inachis	2/6
Ixias pyrene	1/6	Sticophthlma howqua	3/-
Argynnis hyperbius	2/-	Australian	
rudra	2/-	Delias aganippe	2/6
Cynthia erota	2/-	harpalyce	3/6
Cethosia cyane	2/-	argenthona	3/6
Siamese		SouthAmerican	
Papilio aristeus	3/6	Papilio thoas	3/-
Appias nero	3/6	serville	5/-
Amathusa phiddipus	12/6	zagreus	15/-

COLEOPTERA

Heliocopriss dominus pair 35/-; Lucanus cuvera 7/6; Cladognathus giraffa 7/6; Eupatorus hardwickei 10/-; Acrocinus longimanus 12/6; Xylotrupes gideon 3/6.

Siamese Scorpions 17/6. Whip Scorpions 17/6.

R. N. BAXTER

16 BECTIVE ROAD, FOREST GATE, LONDON, E.7,
ENGLAND

VOL. 26

No. 276

•

AUGUST, 1967



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**

OBSERVER'S BOOK OF POND LIFE

A new edition of this remarkable comprehensive book illustrates and describes briefly something of the almost incredible wealth and variety of the animal life in ponds and streams. There are also sections on collecting methods and the ecology of Freshwaters. This third edition has been completely revised, both text and illustrations.

John Clegg. 6s. net

FREDERICK WARNE
1-4 Bedford Crt., Strand, London,
WC2

MEMBERS' BADGES

A small enamel badge, in the form of a yellow Brimstone butterfly with the letters AES in gilt, is now available

*Price 3s. 6d. plus 6d.
postage and packing*

Please apply to:

Hon. Enrolment Secretary,
28, Summerleaze Park,
Yeovil, Somerset

AES NOTICE — where to write

*Membership applications and first
subscriptions to:*

D. E. Dodwell, 28 Summerleaze Park, Yeovil,
Somerset. Yeovil 3928.

*Changes of address and non-arrival
of Bulletins to:*

P. Taylor, 18 Old Manor Drive, Isleworth,
Middlesex.

*Advertisers and for Prospectus of
Society and Application forms to:*

R. D. Hilliard, 18 Golf Close, Stanmore, Mid-
dlesex. GRImdsyke 0460.

Offers to lead field meetings, etc. to:

C. B. Pratt, 1 West Ham Lane, London, E.15

*Manuscripts, drawings and books
for review to:*

H. V. Danks, Imperial College Field Station,
Silwood Park, Sunninghill, Ascot, Berkshire.

*Subscription renewals (25/- per
annum, 12/6 under 18 years) to:*

B. R. Stallwood, 17 Claremont Avenue, Sun-
bury-on-Thames, Middlesex. Sunbury 2687.

Youth matters to:

H. J. Berman, St Ivo School, St Ives, Hunts.

Offers of help, queries, etc. to:

P. W. Cribb, 355 Hounslow Road, Hanworth,
Feltham, Middlesex. FELtham 3099.

Annual exhibition matters to:

B. F. Skinner, 85 Elder Road, West Norwood,
London, S.E.27. GIPsy Hill 0057.

DATA LABELS

Printed to your specifications on a choice of surfaces.

				500		100	
				Card	Thick Paper	Card	Thick Paper
1-Line	...	...	...	4/9	4/-	8/-	7/3
2-Line	...	...	...	6/3	5/3	10/6	8/6
3-Line	...	...	...	7/6	6/6	13/-	11/9
4-Line	...	...	...	9/6	8/-	16/-	13/6

Other Labels to order.

Details and sample labels supplied on request.

P. D. J. HUGO, 38 Cotswold Crescent, Chipping Norton, Oxon.

THE AES PROSPECTUS

CONTAINING FULL DETAILS will be sent to anyone interested

Please apply, enclosing 8d. stamp, to:

Hon. Advertising Secretary, AES

18 GOLF CLOSE, STANMORE, MIDDLESEX

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription - 35s. post free

Write for specimen copy to F. W. Byers, 59, Gurney Court Road, St. Albans, Herts., enclosing 5/-. This amount will be taken into account in the first year's subscription.

ANNUAL EXHIBITION 1967

The Annual Exhibition will be held on 7th October, 1967 at the Hugh Myddelton School, W.I. Full details of how to reach the school, etc., are given on the back cover.

The following further notes may be of assistance to those intending to visit the exhibition.

Exhibits are not confined to specimens captured this season: an item need not be new to be of interest. Any exhibit related to entomology in its broadest sense (and nature study) may be shown. This includes not only set specimens, livestock and apparatus, but also the illustration of techniques, records and observations with or without specimens of the species concerned, etc. A covering for set specimens is advisable—a piece of 'polyglaze' or similar material may be used as a transparent cover to protect storebox specimens, for instance. Exhibits from non-Members and Members of affiliated societies are welcomed.

Good labelling of exhibits is essential, as the value of an exhibit often lies in the explanation of what the material displayed represents. The name of the exhibitor should be added as this allows not only contact to be made between the exhibitor and people particularly interested in the exhibit, but also allows a note of the exhibit

to appear in the exhibition report in the *Bulletin*, so that Members who are unable to visit the exhibition are aware of some of the special interests of other Members.

Juniors' prize: There will be a special prize for the best Junior Member's exhibit (A 'Junior Member' is one who was eligible to pay the Junior subscription for this year). Group exhibits are allowed, and in the event of such an exhibit winning, the prize will be shared equally between the members of the group. Exhibits will be judged by the President. The method of presentation in relation to the subject will be the chief criterion used in judging the exhibits—it is therefore not necessary to exhibit large numbers of specimens, or species which are rare, to win the prize. Age will also be taken into account.

Colour slides from the Society's collection will be shown throughout the afternoon, and Members are invited to bring along interesting slides of their own to show other Members.

Dealers: At AES Exhibitions it is no exaggeration to say that nearly every entomological supplier in the country is always represented, and this will be equally true of this year.

Bring an exhibit, large or small



EDITORIAL

The official reports from the Annual General Meeting held in March are published in this issue.

Matters raised during question time at the A.G.M., and the contents of the report of the AES representative on the Nature Conservancy's Entomological Liaison Committee, serve to highlight our still increasing consciousness of the necessity for continuous cooperation between all sections of the community in conservation matters—a necessity clearly demonstrated in a number of articles in the pages which follow.

It is only by linking our own studies as entomologists into the network of accumulating information about the insects that we can help in preserving the habitats of those insects: for conservation requires a thorough knowledge of the *lives* of animals and plants in their environment, the study of which we call ecology. Mr Felton in his Hymenoptera Aculeata notes indicates the sort of thing which can be done by amateur entomologists, even with limited time: so too does Mr Goddard in the present and previous contributions in his series 'From an Outer London Suburban Area'. Mr Goddard indicates that it is in habitats like the areas of London that studies on the effects of urbanisation on habitats may be made—simply, for example, by accumulating pieces of information, relatively trivial in themselves, on particular species: Mr Goddard has now moved away from London and it is to be hoped that another London Member will

continue where he has left off in contributing to the *Bulletin*.

Again, studies not of particular habitats, but of the same species in different habitats, may give an insight into the ecological requirements of those species—here contributions such as those of Mr Robinson on *Gortyna flavago* Schiff. (Frosted Orange), or work as suggested by Mr Corke on *Lasiocampa callunae* Palmer (Northern Eggar) will all eventually help in indicating the true pattern of animal communities.

More specifically, Members can help greatly in the Lepidoptera Distribution Maps Scheme described in this issue by Mr Heath: it is the careful amateur with his records from particular areas who can fill many gaps in the knowledge of the distribution of the larger Lepidoptera which are the object of this survey. I hope that all our Members who are able to do so will assist Mr Heath in this project.

It is to be hoped too that Junior Members thinking of entering for the Junior Prize for ecological work kindly set up by Mr Plester in an article in this issue will realise how exciting and rewarding any sort of ecological study can be: by giving an insight into how the life, abundance and distribution of an animal is woven into that of the plant community in which it lives and into those of the other animals which fit into the dynamic framework forming a field population of living organism.

So great is the amount of material contributed by Members on different facets of such populations that pressure on *Bulletin* space has forced some contributions to be held back. My apologies to the authors of these con-

tributions, who will, however, see their articles in the next issue.

H. V. Danks (2907).

ANNUAL EXHIBITION 1967

The Annual Exhibition will be held on Saturday 7th October at the Hugh Myddelton School, E.C.1. Further details will be found on the back cover, and facing the previous page.

ADVISORY PANEL

Address change

R. M. PAYNE (Adviser on Tipulidae) is now at Westwood, Highwalls Avenue, Dinas Powis, Glamorgan.

ANNUAL GENERAL MEETING 1967

The Society's A.G.M. for 1967 was held in the rooms of the Linnaean Society at Burlington House, Piccadilly, on the afternoon of 18th March.

The formal business of the meeting was preceded by a conversazione and by a talk, illustrated with colour slides, given by Messrs R. W. J. Uffen and P. W. Cribb on their expedition to the Swiss Alps in the summer of 1966.

Members were able to gain a useful impression of the commoner and more conspicuous insects and plants to be met with in the mountains, and were also impressed with the quality of the slides taken by the two Members particularly in view of the generally poor weather for photography encountered on the expedition. Members will have seen a report of the

trip in the previous issue of the *Bulletin*, concluded in this number.

The report of the Society's Representative on the Nature Conservancy's Entomological Liaison Committee, and the reports of the AES Council and Treasurer, were read at the meeting and are published in the *Bulletin*.

Following the elections at the A.G.M., the Officers and Council of the AES for 1967-8 are as follows:

President
P. W. Cribb
Secretary
G. Prior
Enrolment Secretary
D. E. Dodwell
Treasurer
P. E. Lindsley
Assistant Treasurer
B. R. Stallwood
Bulletin Editor
H. V. Danks
General Editor
R. W. J. Uffen
Meetings Secretary
B. F. Skinner
Field Meetings Secretary
C. B. Pratt
Advertising Secretary
R. D. Hilliard
Youth Secretary
H. J. Berman
Councillors: R. H. Allen, E. S. Bradford, J. Cooter, R. J. Cooter, P. W. Cribb, H. V. Danks, R. D. Hilliard, P. E. Lindsley, C. B. Pratt, G. Prior, V. Shearer, B. F. Skinner, B. R. Stallwood, P. Taylor, L. S. Whicher.

It remains for Council to co-opt two senior and two junior members.

Messrs. T. Dillon and W. J. Beer were appointed auditors.

Question time showed a healthy interest in various matters from the floor of the meeting: the main topics discussed centred around Mr Cribb's comments from the Chair about the necessity of cooperation by entomologists with the Nature Conservancy

and similar bodies, as indicated in Mr Howarth's report as the Society's representative on the Conservancy's Liaison Committee.

It was felt by several Members that the attitude of the Conservancy to relevant material contributed (e.g., faunal lists of a particular area) at present often left much to be desired. It was to be hoped that any such information would be properly recorded by the Conservancy, though with adequate safeguards against the possible exploitation of the records by, for example, unscrupulous collectors. The President undertook to draw Mr Howarth's attention to the matters raised. It appeared from his report that the organisation within the Conservancy now existed to make full use of any data contributed.



THE ANNUAL REPORT FOR 1966-1967 OF THE SOCIETY'S REPRESENTATIVE ON THE NATURE CONSERVANCY'S ENTOMOLOGICAL LIAISON COMMITTEE

Your representative attended the usual two meetings held at the Conservancy's Headquarters in Belgrave Square.

Amongst the various subjects discussed were entomological surveys, straw and stubble burning, the status of *Maculinea arion* Linn. and a Nature Reserve for it, and the control of the Wood Ant in Blean, Kent.

For several seasons now, the Committee has urged the Conservancy to take some action to control the Wood Ant, *Formica rufa* Linn., in the Blean Wood Nature Reserve. As was mentioned at the last meeting, the Conservancy is carrying out an investigation of the problem before destroying any of the nests. However, it

was pointed out that on the Continent this ant is used as a biological control of leaf-eating insect pests and can only do harm generally by adversely affecting the remaining insect population within the reserve. A sub-committee was set up to go into the whole matter in order to work out a management plan and to find out and suggest suitable areas for elimination for comparative purposes which do not clash with the work and observations that have already been made.

The matter of entomological surveys and the report of the sub-committee dealing with this was discussed. Some of our Members might be interested to know that there is much survey work still to be done throughout the country in which they might like to participate—see for example the details on the Lepidoptera distribution maps project given in this issue.

Management plans for various reserves were discussed as was the proposed reintroduction of certain species.

The intensive study of *Maculinea arion*, the Large Blue butterfly, being carried out on behalf of the Nature Conservancy has continued throughout 1966 and the desirability of a coastal reserve being made for this and other species in the area was once again brought to the attention of the Conservancy. Any of our Members who are familiar with this particular area and who have records of other species of interest are asked to get in touch with your representative so that as good a case as possible can be made for the establishment of a National Nature Reserve.

The Conservancy is always anxious to have entomological information, for without it many areas are ruined before any preventive measures can be taken. Our Members can help again by letting your representative

know confidentially, so that the necessary steps can be taken to safeguard particular habitats against possible future despoliation, for much is destroyed in ignorance, so please get in touch. In order to have this distributional data immediately available, for conservation purposes, the Biological Records Centre of the Conservancy at Monks Wood has been set up with the necessary data processing equipment and staff in order to get as complete a distributional picture as possible in nature reserves, sites of special scientific interest and elsewhere.

COUNCIL'S REPORT 1966

Business of the Society. During the year the Council met on six occasions to consider the business of the Society, twice under the Chairmanship of Mr. D. Ollevant and the remainder under that of Mr P. W. Cribb. As no new General Secretary had been appointed at the A.G.M., Mr Cribb undertook these duties assisted by Mr G. Prior.

Arising out of complaints at the A.G.M., the Council's first task was to review the whole of the Membership and the arrangements for the despatch of *Bulletins*. Mr Peter Taylor undertook the task of operating the addressograph and to deal with the non-arrival of *Bulletins* as these duties could no longer be carried out by Mr A. M. Freebrey. The whole of the card indices and addressograph cards were then checked against the Membership roll and each other and corrected. It was found that some sixty Members had been omitted from the address stencils while an equal number of lapsed Members had been receiving the *Bulletin*. Several Members who had allowed their Membership to lapse were written

to by the President and rejoined the Society. Mr G. Prior then undertook the task of keeping the Secretary's card index and the preparation of the membership supplements for the *Bulletin*. The Council apologises to any Member who may have been inconvenienced by these difficulties and trusts that matters will now run smoothly.

Bulletin. This was published on time each quarter, thanks to the efforts of Mr H. V. Danks and our printers. The *Wants and Exchanges Lists* were again dealt with efficiently by Mr R. W. J. Uffen and the Council urges Members to make greater use of this publication.

Publications. Our first leaflet for some years was published in August—a label list of European butterflies by P. W. Cribb—and the work of preparing other publications was continued during the year. This aspect of the Society's work is most important and there is a great need for well written specialised leaflets for beginners which will bridge those gaps left in other publications. During the year the Council also reviewed the status of our existing stocks of publications and readjusted prices to bring them into line with a more realistic appreciation of current printing costs and the cost of their eventual replacements. The Society's thanks must be given for the considerable help of the Publications Agent, Mr L. Christie. It was also decided that publicity should be given to the back numbers of the *Bulletin* and that they should be made available at an attractive price.

Field Meetings. Mr C. B. Pratt was able to arrange some Field Meetings which were led by Members of the Council and these met with reasonable success. The Council would like to see field meetings arranged in the more distant parts of the country, by Members living in those areas. Past meetings have been mainly for those in the Home Counties.

Meetings. An entertaining talk was given at the A.G.M. 1966 by Mr C. V. Docwra who showed cine and still films of insects in his own garden. The Annual Exhibition was again held in the Hugh Myddelton School in October and was very successful, being well attended and the standard of exhibits being very high. The event was marred only by a late change in date, due to booking difficulties. The Council is attempting to secure a permanent date and site for the event so that such confusion will not occur again; suggestions on this point would be of help to the Council.

Junior Members. The Council would like to record its thanks to Mr H. J. Berman of St Ivo School for his work as Youth Secretary as it considers his side of the Society's work to be of great importance—the Society must continue to be a group of enthusiastic entomologists seeking information, exchanging knowledge and material, and seeking friendship among those who share our interest, but equally important is the task of handing on the torch to the new generation, training them in the right methods and encouraging them to persevere in our fascinating pastime.

Membership. The Membership at the end of 1966 stood at 560 adult and 170 Junior Members. We record the passing of Mr E. E. Syms, Hon. Life Member. The Council elected Mr Douglas Ollevant as an Honorary Life Member in some little recognition of his services to the Society over many years in many capacities.

TREASURER'S REPORT 1966

After such a poor year in 1965 it is very pleasing to be able to report a marked improvement in our financial position during 1966.

At the end of 1965 our balance showed a loss of £133, but 1966 has finished with a credit balance of £233.

	£	s.	d.
<i>Expenditure:</i>			
Cost of Bulletins ...	553	17	0
Printing and Stationery ...	37	15	10
Postage ...	64	16	10
Sundry Expenses ...	34	11	5
Depreciation of addressograph ...	33	13	1
Amount written of publications ...	36	19	11
Excess of Income over Expenditure carried to general income and expenditure a/c ...	233	10	7
	<hr/>		
	955	4	8
<i>Income:</i>			
Subscriptions ...	761	15	10
Donations ...	51	17	0
Sale of Publications ...	147	19	9
Advertising ...	10	10	7
Sale of Badges ...	10	12	2
Building Society Interest ...	11	0	0
Annual Exhibition ...	1	9	4
	<hr/>		
	955	4	8

The reason for this great improvement is largely the increased subscriptions which have caused the income in 1965 of £448 to rise to £761 in 1966. Added to this gain we have reduced *Bulletin* costs, from £654 to £554 over the same period. On the debit side however our income from sales of publications and badges, advertising and donations are all down, so although we have finished 1966 in a very much healthier state than in 1965, care must be exercised to consolidate our position.

I feel therefore that providing we hold our expenditure reasonably stable we shall be able to build up our reserve in the Halifax Building Society and be able to look forward to a much happier financial future.

18.3.67. P. Lindsley (3363),
Hon. Treasurer.

COLLECTING NOTES AUGUST 1967

The Smaller Moths

Caloptilia alchimiella Scop. Mr E. S. Bradford writes: "The drawing is from specimens taken in my garden. The forewings are purplish brown and yellow. The reddish purplish sheen is quite marked when the light strikes it at certain angles. The light patch on the costa is yellow. The hindwings are a dark grey. This is a double-brooded species: the adult is on the wing in May and again in August.

"The larvae mine oak leaves when young and later feed in a conically rolled leaf.

"One habit of the *Caloptilia* is to sit up on their tails with their heads raised up in the air, unlike the *Argyresthia* which do the opposite and tend to stand on their heads with their tails in the air."

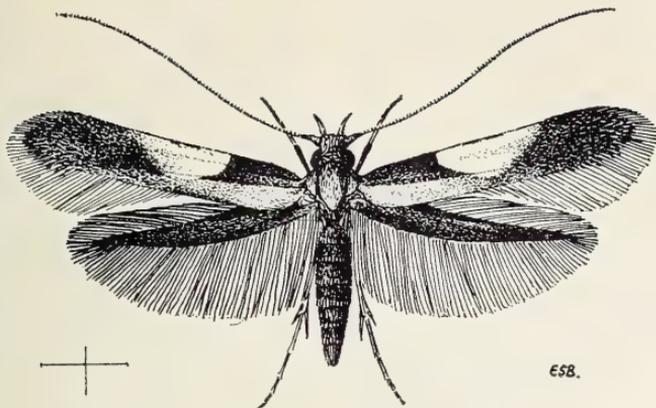
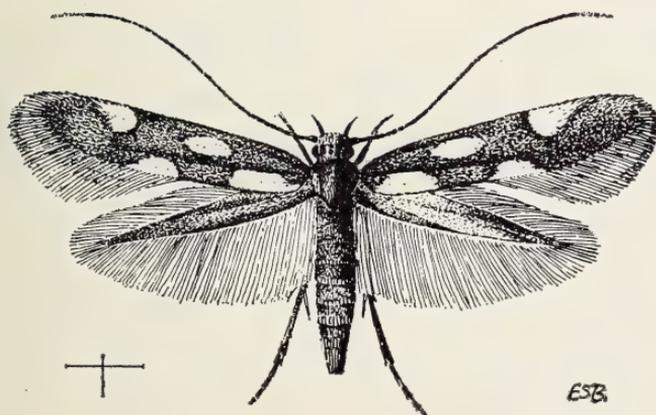
Euspilapteryx auroguttella Zell. Mr Bradford's note reads as follows: "This moth was bred from Common St. John's Wort (*Hypericum perforatum* Linn.) along with *Lathronympha strigana* Fab. The larvae first of all mine and then make a rather tightly rolled leaf. There are two broods in the year, the adult appearing in May and again in August and September. Two specimens made a late appearance in October.

"The forewings are grey with the lighter patches in yellow. The grey has perhaps a slight purplish tinge, more so in the hindwings. The tips of the antennae are whitish."

By August the microlepidopterist starts to look ahead and collect larvae for the next season's moths, but the Gracillarias suggest work which may still be done by those who wish to add specimens to their collections before the onset of winter; many of them emerge in the late summer or autumn, some over-wintering as

adults. You can hardly miss the bold, conspicuously rolled leaves of Alder (*Alnus glutinosa* (Linn.) Gaertn.) that are the work of *Caloptilia elongella* Linn. If you are collecting this species, you should also look out for a timid little fold at the leaf's edge; this will be the rare and local *C. falconipennella* Huebn. *C. elongella* has a 'double' which feeds on Birch (*Betula verrucosa* Ehrh.), namely *C. betulicola* Her., and the only sure way of distinguishing them, apart from the genitalia, is to breed them. *C. betulicola*, too, has a rarer relative which may keep it company; it is *C. populetorum* Zell., which folds rather than rolls the Birch leaves. It tends to emerge earlier than the other species, but you may still find larvae in August. *C. syringella* Fab. is sure to be disfiguring your Lilac (*Syringa vulgaris* Linn.), privet (*Ligustrum* spp.) and Ash (*Fraxinus excelsior* Linn.), while the cones made by *C. stigmatella* Fab. on poplar (*Populus* spp.) and willow (*Salix* spp.) are generally easy to find.

While searching poplar, look out for the glazed little mine on the upper surface of a leaf, made by *Phyllocnistis suffusella* Zell., or for its pupa in the partially overturned edge of the leaf. *Lithocolletis comparella* Zell. also mines poplar, preferring the white variety (*Populus alba* Linn.); it occurs on some of the London commons. The moth emerges in October and overwinters—the only British Lithocolletid to do so. If you live within range of the North Downs in Surrey or the extreme west fringe of Kent you can hunt for the mines of *L. scabiosella* Dougl. on the lower leaves of *Scabiosa columbaria* Linn. (Small Scabious); the moths begin to emerge in late August. Another rather late-emerging member of the family is *L. nigrescentella* Logan, the larvae of which feed on Bush Vetch (*Vicia sepium* Linn.). This is a very local species, but common enough where it occurs.

*Caloptilia alchimiella* Scop.*Euspilapteryx auroguttella* Zell.

Among the Tortricidae there are several species of *Acleris* (*Peronea*) of which the larvae feed in the late summer and the imagines emerge in the autumn and overwinter. These include *A. schalleriana* Linn. (*logiana* Schiff.), which feeds in leaves of *Viburnum* spp. making what resembles an outsize mine of *Lithocolletis lantanella* Schrank; *A. boscana* Fab., which spins together the leaves of elm (*Ulmus* spp.); *A. hastiana* Linn.—a Proteus among 'Micros'—on willow; *A. ferrugana* Schiff. on birch; and—mainly for those who live in the

North—*A. rufana* on *Myrica gale* Linn. (Bog Myrtle). You will be too late for the larvae of most other members of this family, but the imagines of many may be disturbed from their foodplants or beaten from hedgerows.

One of the main problems in setting microlepidoptera is to obtain suitable magnification without impeding the hands. A watch-maker's eyeglass, which is worn like a monocle, is the simplest solution; the type I chiefly use clips on to my glasses and brings my eye to a distance

of three inches from the object. Another ordinary one, which I generally use for setting 'Neps', has a focal length of only two inches. If you can afford it, there is a lamp made by 'Anglepoise', mainly for the assistance of old people, with a built-in magnifying glass flanked by two bulbs which give excellent glare-free illumination to the object. With the eye close to the glass, the focal length is about three inches, the illuminated target-area about five inches by three, and there is all round movement for the hands, since the carrier-arm can be extended up to two feet from the base.

A. M. Emmet (1379).

The Hymenoptera Aculeata

In this article I want to return to a topic I raised towards the end of the last notes (*Bull. amat. Ent. Soc.*, 26: 35-7), that of the large number of specimens that have to be taken to establish the species present in any locality. The need to handle these large numbers was the reason behind the simple mounting methods which were the main topic of that article. These days the mere amassing of specimens is rather frowned upon, and it is the duty of all collectors to ensure that the specimens they do take yield the maximum amount of scientific information. At its simplest this means an accurate recording of the data label details I have stressed before, but with a little planning much more can be gleaned.

I envisage collecting at three levels of intensity. Firstly, casual. By this I mean the general alertness of the entomologist wherever he is. I always carry at least a small specimen tube with me, and take any interesting creature that happens by. A good example is that of Yeo (1955) who happened to have a few minutes to spare at East Malling Station and in walking to the end of the platform

added that beautiful little wasp *Microdynerus exilis* H-S. to the Kent list.

Secondly, there is the general collecting trip, a visit to a particular locality, perhaps a well-known one, though I hope many will be to lesser known or better still to new localities. I think it is here that the majority of specimens will be captured, and so it is here that a little bit of extra trouble can make the records so much more valuable. The extra data should be designed to relate the captures to their place in the total ecology of the habitat. Surely any locality that is interesting enough even for only one special expedition is interesting enough for some simple ecological notes to be entered into the field note book. Firstly, the geology of the area, most conveniently from the Geological Survey maps, supplemented with notes from direct observations on the spot. For example in my own area where the underlying rock is chalk, the capping deposits, largely of clay with flints, are very patchily distributed and affect the ecology quite profoundly giving areas with acid loving plants.

The ecological structure of a locality is based on the plant communities. These have been classified into a logical sequence of zones of significance to animals by Elton, who expounds these at length and with great interest and insight in a recent book (1966). The main divisions of the Terrestrial System are related to the height of the plant cover, and so the four main formation types are: Open Ground or Ground Zone, up to 6 in.; Field Type, 6 in. to 6 ft; Scrub, 6 ft to 15 ft; and Woodland, above 15 ft. The lines or strips along which two of these zones meet are of particular significance to many animals, and in Elton's classification are termed 'edge' of the higher of the two zones. Thus hedges, such important features in our countryside, are

referred to as Scrub Edge. Within this general framework, the actual dominant plant species can be added for each zone, and so in a few brief lines the major structure of the habitat defined. Then the actual insects captured can be related to this structure.

It is important to record the zone and layer at which particular captures are made, or behaviour observed. Aculeate Hymenoptera are very mobile members of the community, and as such form an important part of what Elton has defined as the 'girder system' or the bridging fauna between the various zones in any community. Thus many bees would nest in the soil of the Ground Zone, visit flowers in the Field layer and mate with males swarming around the tops of bushes in the Scrub layer. Similarly, some wasps would also nest in the Ground Zone while hunting for their prey in neighbouring Woodland.

This classification of the habitat is the more important in the third type of collecting, the special study. The sort of study I envisage is the capture of a reasonable number of specimens in the same place, or doing the same thing, in order to assess the relative abundance of the species. These studies can be extended in depth in two ways, by making similar catches in the same place throughout the year and hence following the succession of species, or by making similar catches in different places over a reasonably short period and thus following the geographical and ecological variation of the fauna.

This general thesis raises two interesting topics which I hope to pursue in future articles. The general collecting trip benefits greatly from ability to identify creatures in the field before capture, and the special study depends on the ability to take a random sample.

J. C. Felton (3740).

REFERENCES

- ELTON, C. S. (1966). *The Pattern of Animal Communities*. Methuen, London.
 YEO, P. F. (1955). *Entom.*, **88**: 68. *Microdynerus exilis* (Herrich-Schaffer) (Hym., Vespidae) in Middlesex and Kent.

FROM AN OUTER LONDON SUBURBAN AREA

This is my last article which can have appreciable claim to be from a 'London suburban correspondent', for I have just moved to Pirbright (Surrey), and it is therefore highly desirable that some other Member (or Members) continues to publish notes and observations from the London area. This ought to be no problem, for there is a great concentration of membership in London and the suburbs, and as very few notes and observations from the area have been published in the *Bulletin*, at least since I joined in 1952, there is clearly a lot to say. For those Members who feel that their many observations from the area are too trivial to be worth publishing, I hope that my own articles will have given a lead and shown how even largely trivial observations can form the basis for discussion of the widest and most serious issues.

"But why waste print on rotten old London when you could be thoroughly enjoying the unspoiled countryside and writing about that?", I can hear some bright spark saying. Well, any fool (or otherwise) can go out into the countryside where wild life abounds, and enthuse about it. I do; we all do. But we want the wild life to stay abundant. With the threats from civilisation being increasingly recognised, conservation has become almost a household word. In the last few years in particular, entomologists (hearteningly, particu-

larly the younger generation) have woken up a good deal about the need for conservation (even if only to help preserve species so that they may be collected in years to come). But conservation doesn't begin simply with fencing off interesting bits of land. Neither does it start with attempts to 'freeze' a transient habitat (such as birch wood, or chalk grassland where scrub is beginning to grow). Even to preserve one single species (such as any of those mentioned in the recent Royal Entomological Society appeal) one must fully understand the community to which it belongs. Also one must know what adverse factors, both present and likely in the future, one must try to preserve it from. Clearly, the more observations published from a particular habitat the better will be the conservationists' understanding of what they are really trying to preserve. But, *equally necessary* are observations from areas where civilisation is affecting such habitats, as these give some understanding of some of the factors which a habitat should be protected from in order that its value be preserved. And this is where you London Members can help. London, from the City right out to the peripheral open countryside, is one vast experiment in human encroachment on, and interference in, wild life populations—albeit unintentionally—the results of which would be of great value to the cause of the conservation of wild life throughout our country, but so far the results in the entomology department are hardly documented at all. This is where conservation starts: it does NOT start with such ill-considered moves as 'reinforcing' wild insect populations with captivity-reared stock, or frantically cutting down scrub that is overgrowing, say, a habitat of *Lysandra bellargus* Rott. (Adonis Blue). Whatever you do in the field of conservation you *must*

first know what you are doing. So come on, you London Members, make a start now and get writing about your home area, whether or not you also write about your more distant excursions. You *can* start helping the conservation movement with very little effort, and I've told you how—just in case there were any doubts. Need I say more ?

The Magpie and the Spotted White

Further to my note on the larvae of *Abraxas grossulariata* Linn. (Magpie Moth) and *Yponomeuta cognatella* Huebn. both on *Euonymus japonicus* Linn. (February *Bulletin*), I am grateful to Mr Brian Wurzell for permitting me to quote in full (with minor editing) the relevant part of a recent letter I had from him.

"In 1958 I bred my first 'Spotted Whites', as I then called *cognatella*, and at the same time found out the true identity of the 'Privet' they were feeding on. I found swarms of these larvae in Springfield Park, near Stamford Hill. Now, in my own, and in neighbouring streets there are several *Euonymus* hedges in front gardens, and I secretively swiped pieces from them to feed my *cognatella*. It was then that I found my first Magpie larvae, and, as you know, these are locally very numerous on these bushes, while they are non-existent on others. In 1959 and 1960 I studied both the Magpie and *cognatella*, and found both to be very numerous on particular bushes throughout Tottenham. Occasionally they would be on bushes only a few yards apart, but they *never* both occupied the same bush, and this long puzzled me. I well remember saying to myself time after time as I approached a new bush—which would it have: Spotted White or Magpie?

"I am sure of two things:

1. that the presence of one or other species is not dependent on the situation or size or health of the

Euonymus:

2. that it is indeed *E. japonicus* that is attacked in each case, and not a closely-related species; after all, other very similar *Euonymus* spp. are used for hedging.

"I have successfully bred Magpies on foliage collected from *cognatella*-infested bushes, and *vice versa*.

"Is it pure coincidence? After all, if one assesses the number of bushes affected by each, against the number completely unaffected by either, it leaves room for this possibility, even though we have both been struck, quite independently, by the same phenomenon.

"But in fact I doubt if it is. I think this phenomenon belongs to the same class as questions like 'Why do big Lepidoptera tend to lay eggs singly?' We know that the resulting big larvae will have more adequate food supply if on their own, but the moth doesn't reason it thus. It is a process of evolution to the best method of its survival. Similarly, 'Why do some gregarious larvae (e.g., *Aglais urticae* Linn.) disperse in their final instar?' Again this ensures each fully-grown larva food quantities adequate to its ultimate size. Transfer this thesis to *cognatella* and the Magpie, and it could be argued that each species avoids the other simply as a means of self-preservation; that each, being a prolific and voracious species, seeks its own bush by instinct to avoid food shortage through competition. In what stage of development one is recognised by the other I don't know. I have never seen *cognatella* ova, and I suspect that it is not a question of one species seeing another and saying 'I must keep my eggs away from that bush!'—rather it is that the first animal, whichever it is of the two, has 'taken over' a bush and predominated on it to the suffering or expulsion of the other species if it happened to be present at any time. Remember that both will

occupy their specific bushes for many years and establish firm colonies.

"It's a fascinating problem, well worth taking up by the ecologist who has time and facilities for such research, for not only is it a question of these two moths—it would throw light on many parallel cases of competition in the insect world, and be of considerable value: my own gropings in the dark are, as you must agree, far from satisfactory."

I'm sure that last sentence is resoundingly true, but who can throw more light on the problem? I certainly can't at present. I might add, however, that it might be in some way significant to the problem that the larvae of *both* species tend to feel in fairly exposed situations in the bushes in recognition of their bad taste to most predators, even the powdery green with black spots of the *Y. cognatella* larvae being some measure of warning coloration.

25.4.67. P. A. Goddard (2206).



LEPIDOPTERA DISTRIBUTION MAPS SCHEME

The collection and publication of information on the distribution of Lepidoptera in the British Isles has been a major activity of entomologists for many years. This information is widely scattered in museums, private collections and literature, both published and unpublished. If all this were put together in the form of distribution maps and published as an *Atlas*, an important contribution would be made to the study of British butterflies and moths. The Biological Records Centre at Monks Wood therefore proposes to organise a Distribution Maps Scheme and asks all lepidopterists in Britain for their support. Initially only the macrolepi-

doptera will be dealt with.

Outline of method

The basis of the scheme is to indicate by means of a conventional symbol the presence of each species of macrolepidoptera in each ten kilometre square of the Ordnance Survey National Grid in which it occurs. To achieve this for the nine hundred species involved it is estimated that over a million records will have to be assembled and transferred to maps. This will be done using the punched card system with mechanical sorting and mapping used for the production of the *Atlas of the British Flora*.

It is probable that almost complete distribution maps of the rarer species can be prepared from data already available, but it is also certain that data on the distribution of common species will be inadequate. For the latter, field recording will be necessary and it is in this part of the scheme that the amateur lepidopterist can play a vital role. Lists, as complete as possible, are required from each of the three thousand five hundred ten-kilometre squares which cover the British Isles: special record cards have been designed (see Fig. 1) which will be sent to all volunteers. In

addition some individual record cards will be necessary to support records of special interest (see Fig. 2). These cards are now available and will be sent to any entomologist who wishes to take part in the scheme, together with detailed instructions on their use.

Accuracy of records

To ensure absolute accuracy for every record is impossible but checks will be made (1) by referring records to County Recorders who will indicate which require verification, (2) by specialist examination of material from the critical groups and (3) by noting and checking outlying records when interim and final maps are produced. A list of critical species has been prepared and as soon as possible illustrated keys to the identification of these will be published.

Completeness of survey

As the project proceeds a pattern of unrecorded areas will emerge and it is anticipated that special expeditions to these areas will be organised in order to give as complete and uniform coverage as possible. With maximum co-operation from lepidopterists it should be possible to complete the project in ten years.

311071-1431-										J. Heath										78		THE BOTANICAL SOCIETY OF THE BRITISH ISLES																	
E F G H A B C D		10 15 16 DATE		E P L		10 VICE R G H W C N T Y		AD LO T M H 20 A 10 B		DATE		STATUS		15-8																									
M Y R 17 18		H Y R 19		GRID REFERENCE		H		30		1966																													
SPECIES																		VICE COUNTY		ALTITUDE																			
Lampra fimbriata																		North		6			200																
LOCALITY																		Somerset																					
Warren Farm, Watchet, Somerset																		COLL. DET.		No.			1																
HABITAT																		SOURCE																					
Cliff top																		Field																					
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40																																							

Fig. 2 (above). Example of record card for specific observations.

Fig. 1. (opposite). Example of standard record card.

Grid Ref.	LOCALITY	BUTTERFLIES and MOTHS 6446			
	HABITAT		Date	V.C. No.	
			V.C.	Alt.	Code No.

Warren Farm, Watchet, Somerset

Cliff top

15.8.66 6

North Somerset

200' 78

BUTTERFLIES

2	Aglais <i>urticae</i>	23	Callophrys <i>rubri</i>	70	Lysan <i>bellargus</i>	99	Dicis <i>scopi</i>
4	Anth <i>cardamines</i>	27	Celast <i>argiolus</i>	71	Mastis <i>coridon</i>	100	Dicis <i>rapae</i>
8	Aphant <i>hyperant</i>	29	Cero <i>glaucus</i>	75	Mastis <i>justini</i>	104	Polygona <i>c-al</i>
12	Argynnis <i>aglaia</i>	30	Cro <i>tullia</i>	76	Melan <i>galaetha</i>	106	Polygona <i>scabi</i>
13	Cydia <i>cydippe</i>	34	Colias <i>croceus</i>	78	Melan <i>titthonus</i>	110	Pyrrus <i>malvae</i>
14	Euphydryas <i>cuphrosyne</i>	36	Cupido <i>minimus</i>	84	Mastis <i>phalaena</i>	116	Thecla <i>quercus</i>
17	Papilio <i>paphia</i>	48	Eumenis <i>semele</i>	88	Ochlodes <i>venata</i>	119	Thymel <i>lineola</i>
18	Selenis <i>selenis</i>	54	Phaenocarpa <i>chamaea</i>	93	Phaenocarpa <i>chamaea</i>	120	Phaenocarpa <i>chamaea</i>
20	Aricia <i>agestis</i>	64	Limnitis <i>camilla</i>	94	Phaenocarpa <i>megeva</i>	122	Phaenocarpa <i>megeva</i>
		68	Lycophotia <i>phlaea</i>	98	Dicis <i>basalis</i>	123	Phaenocarpa <i>scabi</i>

MOTHS

301	Alucina <i>procuti</i>	427	Apatele <i>aceris</i>	606	Clostera <i>pigra</i>	750	Ectypa <i>glyphica</i>
303	Alucina <i>sylvata</i>	433	Megacephala <i>megacephala</i>	614	Colocasia <i>coryl</i>	752	Electroph <i>coryl</i>
305	Acasis <i>viretata</i>	434	Menyanthidius <i>menyanthidius</i>	616	Colostygia <i>didy</i>	754	Ellopia <i>fasciaria</i>
309	Achlyia <i>flavico</i>	435	Psithyrus <i>psi</i>	617	Multistrigaria <i>multistrigaria</i>	756	Ematurus <i>atomar</i>
312	Acontia <i>luctuosa</i>	436	Rumicis <i>rumicis</i>	618	Olivata <i>olivata</i>	766	Ennomis <i>quercin</i>
324	Aegeria <i>culicis</i>	439	Apeira <i>syringaria</i>	619	Pectinataria <i>pectinataria</i>	768	Entephria <i>caes</i>
328	Myopaeformis <i>myopaeformis</i>	443	Apocheima <i>hispi</i>	620	Salicata <i>salicata</i>	777	Epione <i>repandar</i>
331	Tipuliformis <i>tipuliformis</i>	449	Aporophyla <i>lut</i>	622	Colotois <i>pennar</i>	780	Epirrhoe <i>alter</i>
334	Aethalura <i>punct</i>	450	Aporophyla <i>nigra</i>	626	Comibaena <i>pust</i>	781	Galiata <i>galiata</i>
336	Agrochola <i>cunct</i>	453	Archicaris <i>par</i>	629	Conistra <i>ligula</i>	782	Rivata <i>rivata</i>
337	Lota <i>lota</i>	455	Arctia <i>caja</i>	630	Vacciniis <i>vacciniis</i>	783	Tristata <i>tristata</i>
338	Lychnidis <i>lychnidis</i>	456	Villica <i>villica</i>	636	Cosmia <i>difflinis</i>	785	Episema <i>caerul</i>
339	Macilenta <i>macilenta</i>	461	Arenostola <i>elmy</i>	638	Trapezina <i>trapezina</i>	787	Erannis <i>auran</i>
341	Agrotis <i>clavis</i>	465	Phragmitidis <i>phragmitidis</i>	640	Cossus <i>cossus</i>	788	Defoliaria <i>defoliaria</i>
343	Denticulatus <i>denticulatus</i>	466	Pygmina <i>pygmina</i>	644	Cosymbia <i>albi</i>	789	Leucophaearia <i>leucophaearia</i>
344	Asphalia <i>diluta</i>	468	Asphalia <i>diluta</i>	645	Annulata <i>annulata</i>	790	Marginaria <i>marginaria</i>
346	Ipsilon <i>ipilon</i>	473	Asthena <i>albulata</i>	646	Linearia <i>linearia</i>	792	Eremobia <i>ochrol</i>
347	Putia <i>puta</i>	475	Aethmia <i>xeramp</i>	648	Porata <i>porata</i>	794	Eriogaster <i>lan</i>
348	Ripac <i>ripac</i>	477	Atolmis <i>rubri</i>	649	Punctaria <i>punctaria</i>	800	Euchoeca <i>nebul</i>
349	Scetum <i>scetum</i>	479	Axyliia <i>putris</i>	652	Craniophora <i>lig</i>	806	Euclidimera <i>mi</i>
352	Vestigialis <i>vestigialis</i>	483	Bapta <i>bimaculata</i>	654	Crocallis <i>eling</i>	808	Eugonistima <i>dep</i>
356	Alcis <i>repandata</i>	485	Bimaculata <i>temerata</i>	660	Cryphia <i>perla</i>	810	Eumichtis <i>adus</i>
358	Allophyes <i>oxyac</i>	487	Bena <i>fagana</i>	666	Cucullia <i>chamom</i>	814	Euphyia <i>bilin</i>
360	Alsophila <i>aes</i>	489	Biston <i>betularia</i>	671	Umbiatrica <i>umbiatrica</i>	815	Cucullata <i>cucullata</i>
362	Amathes <i>agathina</i>	490	Strataria <i>strataria</i>	672	Verbasci <i>verbasci</i>	817	Picata <i>picata</i>
363	Alpicola <i>alpicola</i>	494	Bombycia <i>vimin</i>	674	Cybosia <i>versomel</i>	818	Rubidata <i>rubidata</i>
365	Baja <i>baja</i>	501	Brachion <i>sphinx</i>	676	Cynia <i>medicaria</i>	819	Unangulata <i>unangulata</i>
367	Castanea <i>castanea</i>	505	Bupalus <i>pinariaria</i>	682	Dasychira <i>fas</i>	821	Eupithecia <i>abb</i>
368	C-nigrum <i>c-nigrum</i>	509	Callimorpha <i>jac</i>	683	Pudibunda <i>pudibunda</i>	822	Absinthiata <i>absinthiata</i>
369	Ditrapezium <i>ditrapezium</i>	517	Callithysan <i>amat</i>	687	Deilephila <i>elip</i>	824	Assimilata <i>assimilata</i>
370	Exanthematica <i>exanthematica</i>	519	Campaea <i>margar</i>	688	Porcellus <i>porcellus</i>	825	Castigata <i>castigata</i>
371	Stigmatica <i>stigmatica</i>	523	Caradrina <i>alsin</i>	692	Deilinia <i>exanth</i>	826	Centaurata <i>centaurata</i>
372	Triangulum <i>triangulum</i>	525	Blanda <i>blanda</i>	693	Pusaria <i>pusaria</i>	828	Distinctaria <i>distinctaria</i>
373	Anthophora <i>anthophora</i>	526	Clavipalpis <i>clavipalpis</i>	695	Deuteronom <i>aln</i>	829	Dodoneata <i>dodoneata</i>
375	Ammogrotis <i>luc</i>	527	Morpheus <i>morpheus</i>	696	Erosaria <i>erosaria</i>	830	Exiguata <i>exiguata</i>
377	Amphipyra <i>pyram</i>	530	Carsia <i>sororiaria</i>	697	Fuscantaria <i>fuscantaria</i>	832	Goossensata <i>goossensata</i>
378	Tragopoginis <i>tragopoginis</i>	536	Catocala <i>nupta</i>	699	Diacrisia <i>san</i>	833	Haworthiata <i>haworthiata</i>
380	Anagoga <i>pulver</i>	540	Celaena <i>haworth</i>	701	Diarsia <i>brunnea</i>	834	Icterata <i>icterata</i>
382	Anaitis <i>efform</i>	541	Leucostigma <i>leucostigma</i>	703	Dahlia <i>dahlia</i>	835	Indigata <i>indigata</i>
383	Plagiata <i>plagiata</i>	543	Celama <i>confusul</i>	705	Mendica <i>mendica</i>	836	Innotata <i>innotata</i>
385	Anaplect <i>prasinia</i>	555	Ceramica <i>psi</i>	706	Diataraxia <i>oler</i>	839	Intricata <i>intricata</i>
389	Anarta <i>myrtilis</i>	559	Cerapteryx <i>gram</i>	709	Dipsosiphia <i>scop</i>	841	Inturbata <i>inturbata</i>
391	Anchoscelis <i>hel</i>	560	Cerastis <i>rubric</i>	713	Drepana <i>binaria</i>	842	Lariciata <i>lariciata</i>
392	Litura <i>litura</i>	563	Cerura <i>vinula</i>	719	Cultraria <i>cultraria</i>	844	Linariata <i>linariata</i>
396	Angerona <i>prunar</i>	565	Chaonia <i>ruficor</i>	720	Falcataria <i>falcataria</i>	846	Pimpinellata <i>pimpinellata</i>
398	Anticlea <i>deriv</i>	571	Chesias <i>legatet</i>	721	Lacertaria <i>lacertaria</i>	848	Plumbellata <i>plumbellata</i>
407	Apamea <i>crenata</i>	572	Chiasmia <i>clath</i>	723	Drymonia <i>dodon</i>	849	Pulchellata <i>pulchellata</i>
408	Epomidion <i>epomidion</i>	574	Chloroclysta <i>miat</i>	727	Dypterygia <i>scab</i>	850	Pygmaeata <i>pygmaeata</i>
410	Furva <i>furva</i>	581	Chloroclysta <i>cor</i>	729	Dyscia <i>fagaria</i>	851	Satyratea <i>satyratea</i>
411	Infesta <i>infesta</i>	582	Debiliata <i>debiliata</i>	733	Dyscia <i>fagaria</i>	852	Sobrinata <i>sobrinata</i>
413	Lithoxyalea <i>lithoxyalea</i>	584	Rectangulata <i>rectangulata</i>	735	Diarsia <i>brunnea</i>	853	Subnotata <i>subnotata</i>
414	Monoglypha <i>monoglypha</i>	585	Cidaria <i>fulvata</i>	737	Earias <i>clorana</i>	855	Succenturiata <i>succenturiata</i>
415	Oblonga <i>oblonga</i>	586	Cilix <i>glauca</i>	741	Erophiola <i>badia</i>	857	Tantillaria <i>tantillaria</i>
416	Ophiogramma <i>ophiogramma</i>	590	Cirrhia <i>gilvago</i>	743	Eclipoptera <i>sil</i>	858	Tenuiata <i>tenuiata</i>
418	Remissa <i>remissa</i>	592	Citria <i>lutea</i>	745	Ectropis <i>biund</i>	859	Tripartita <i>tripartita</i>
420	Anticlea <i>deriv</i>	593	Cleora <i>rhomboid</i>	746	Consonaria <i>consonaria</i>	861	Valerianata <i>valerianata</i>
421	Sordens <i>sordens</i>	597	Cleora <i>clerodes</i>	747	Crepuscularia <i>crepuscularia</i>	862	Venosa <i>venosa</i>
422	Sublustris <i>sublustris</i>	600		748		863	Virgaureata <i>virgaureata</i>
423	Unanimis <i>unanimis</i>	602					
424	Ypsilon <i>ypsilon</i>						

Publication of results

As soon as sufficient data are available provisional maps will be published in the entomological journals together with progress reports. Also as the records build up it will be possible to produce rapidly and economically county lists, nature reserve lists and habitat lists for all the Lepidoptera or for specific groups.

This project offers an opportunity for co-operation between amateur and professional entomologists and the various societies and Naturalists' Trusts on a scale not previously known in entomological science in this country. Full details of the scheme, record cards and instructions are available from The Biological Records Centre, Monks Wood, Huntingdon.

16.2.67.

J. Heath.

THE FROSTED ORANGE

Unfortunately there was too little response to my request about eighteen months ago for records of *Gortyna flavago* Schiff. (Frosted Orange) to compile anything more than a cursory survey of its distribution and interesting features. I should like to thank all those who did contribute, especially Mr L. W. Siggs whose detailed records of nine years' trapping made possible an interesting comparison of the flight period, size and behaviour of Southern and Northern specimens.

G. flavago is a peculiar insect in that it is widespread in occurrence throughout England, but the population density is everywhere remarkably low. An 'm.v.' trap run continuously rarely yields more than a dozen specimens a year. Mr Siggs, at Minstead in the New Forest takes an

average of 8.33 specimens per year and I (at Heversham in Westmorland) take an average of 7.5. *G. flavago* seems to be distributed fairly evenly throughout the south of England to a northern limit of the line between Barrow-in-Furness and the Tees. North of this line, the occurrence is sporadic: South (1904) states that it occurs up to Aberdeen and Perthshire, but there is for example no reliable record of it in Cumberland (Vine-Hall, 1966). There are records from the Isle of Man (very infrequent, J. Hedges) and it again occurs sporadically in Ireland.

Mr Siggs and I seem to be at opposite ends of *G. flavago*'s English range and our specimens show marked differences in size. My specimens from Heversham provided the following data: average male wingspan 32.4 mm, average female wingspan 35.6 mm, combined sexes average 34.6 mm. Mr Siggs recorded a combined sexes average of 39.7 mm.

The emergence period seems to be fairly constant, and there is only one generation per year. Mr Siggs has taken *G. flavago* in different years between August 25th (1964) and October 20th (1965). In Westmorland, the flight period seems to be shorter and, understandably, later. My extreme dates both occurred in 1966 and in that year the first and last specimens were taken on September 18th and October 10th.

The staggering difference in the size of *G. flavago* I believe to be due to its feeding habits. It is an internal stem feeder and has been found in *Cirsium palustre* (Linn.) Scop. (Marsh Thistle), *Carduus nutans* Linn. (Musk Thistle), *Digitalis purpurea* Linn. (Foxglove), *Scrophularia aquatica* Linn. (Water Betony), *S. nodosa* Linn. (Figwort), *Senecio jacobaea* Linn. (Ragwort), *Eupatorium cannabinum* Linn. (Hemp Agrimony), *Arctium lappa* Linn. (Great Burdock) and

Verbascum thapsus Linn. (Mullein). In addition there are peculiar records of it in Elder (*Sambucus nigra* Linn.), Tomato (*Lysopersicum esculentum* Linn.) and Potato (*Solanum tuberosum* Linn.) stems. In Westmorland, it relies largely on *Carduus*, *Cirsium* and *Arctium* and these are subject to grazing by sheep and cattle, a short growing season and a relatively bleak type of environment: consequently these plants tend to be dwarf versions of those found in the South. Hence *G. flavago* has to live in small, thin-stemmed plants and is consequently also of small size.

This explanation is a hypothetical one but further evidence is supplied by the fact that other stem feeders, e.g., *Hydraecia* spp., are also smaller in the North.

23.2.67. Gaden S. Robinson (3911J).

REFERENCES

- SOUTH, R. (1904). *Moths of the British Isles*. Frederick Warne, London.
 VINE-HALL, J. H. (1966). *Ent. Gaz.*, 17: 31-41. A comparison of the Lepidoptera of a South Westmorland and a mid-Cumberland parish. p.35.

[*G. flavago* may well be commoner as an adult than it is thought to be, as it is not very strongly attracted to light, and the species can sometimes be found commonly as a larva—see for example *Bull. amat. Ent. Soc.*, 24: 45-6.—Ed.]

THE TWO YEAR CYCLE OF THE NORTHERN EGGAR

The peculiar life cycle of *Lasiocampa callunae* Palmer (Northern Eggar) was described in the *Bulletin* (*Bull. amat. Ent. Soc.*, 21: 92-4) by Mr W. E. Collinson. Moths appear almost exclusively in even years, 1960, 62, 64, etc. In between these "moth years" the larvae take about sixteen months to grow up Mr P. G. Taylor, in a foot-

note to Mr Collinson's article, suggested that this extended life-cycle was due to the low temperature, in the north of England, necessitating a longer period of growth for the larva. Mr Taylor also suggested that it was chance in the evolution of the species, which decreed that only one cycle of moths should exist and not two cycles each taking two years and some moths emerging each year. I would like to suggest that the two year cycle, with moths hatching every other year may be a distinct advantage to the moth.

Lloyd and Dybas (1966 a and b) studied three species of 'periodical' cicadas which have life cycles of thirteen or seventeen years and all emerge together every thirteenth or seventeenth year. They suggested that the advantages of the long cycle and synchronisation of all individuals of a species, and even of separate species, is that in the years when a particular stage is absent the predators or parasites 'specialising' in that stage, are reduced in numbers by the absence of food. Hence a far higher population of cicadas is possible than if all stages of the cicada life cycle existed at once and had to support a high population of predators and parasites.

Perhaps similar reasoning can be applied to the Eggars. In the sort of varied habitat where *Lasiocampa quercus* Linn. (Oak Eggar) lives there is such a variety of insect life that any one species developing an extended, synchronised life cycle would gain little advantage, since the predators could easily survive the 'lean' years on the other species present. However, on heather moorland where *L. callunae* lives there is much less variety of insect species and *L. callunae* must represent a fairly high proportion of available insect prey. Hence the two year cycle may reduce the parasite or predator populations

by the absence of moths or young larvae in some years.

This is only an 'armchair' hypothesis and interested Members could easily carry out tests which would help confirm or reject this hypothesis.

1. The extent to which temperature and quality of food demands a two year cycle (but not a synchronised one) could be tested by rearing a batch of *L. callunae* and a batch of *L. quercus* larvae at the same time, in the north of England and feeding both batches on heather. Would the *L. quercus* (a) take two years like *L. callunae* (b) take only one year as normal (c) die?

2. Field studies in the north and south would provide information on the number and variety of predators taking moths and larvae of each species.

3. Rearing batches of wild collected larvae and identifying all the parasites emerging from them, would answer the question "does the two year cycle eliminate some of the parasites which are themselves unable to adopt a two year cycle?"

I hope this note will stimulate some of our Members to do some work on *L. callunae* and *L. quercus* and if I can help any Members contemplating such work I should be glad to do so.

26.2.67. David Corke (2962).

REFERENCES

- LLOYD, M. and DYBAS, H. S. (1965a). *Evolution*, **20**: 133-49. The periodicity of Cicada populations (1) Ecology. (1966b). *Evolution*, **20**: 466-505. The periodicity of Cicada populations (2) Evolution.

especially interesting to me as I have observed the Lepidoptera in this area for over thirty years, excepting a wartime break. The writer describes the gradual disappearance of the Lepidoptera from 1958 to 1963 and then a drastic reduction in 1964 and 1965: possible causes are considered.

My first experience of the Edgware, Stanmore and Harrow areas was in 1935 when they were surrounded by farm land and open spaces and included a large number of undeveloped sites. In my experience, moths were relatively plentiful and most of the commoner butterflies occurred in the immediate vicinity. There was a strong colony of High Brown Fritillaries (*Argynnis cydippe* Linn.) in Scratch Wood and the Marbled White (*Agapetes galathea* Linn.) was common in Whippendell Wood: Dark Green, Silver Washed and Pearl-bordered fritillaries (*Argynnis aglaia* Linn., *Argynnis paphia* Linn. and *Argynnis euphrosyne* Linn.), the Comma and the White Admiral (*Polygonia c-album* Linn. and *Limenitis camilla* Linn.), and three Hairstreaks, the Purple, Green and White Letter (*Thecla quercus* Linn. *Callophrys rubi* Linn. and *Strymon w-album* Knoch.) all occurred freely in suitable places.

By 1939 the suburban crawl had swallowed up most of the open sites but the woods and commons were still protected as Green Belt. The numbers of Lepidoptera to be found in the garden and locally had visibly decreased but the woodland fauna did not appear to be materially affected.

Returning home in 1945 offered a pleasant surprise. The respite offered by the War years, with its black-out, increase of weedy habitats and the decreased pressure on the open spaces had enabled many species to flourish. Numerical notes I kept of a fair number of the commoner and easily traceable species, including all the local butterflies, moths which

LEPIDOPTERA IN THE STANMORE (MIDDLESEX) DISTRICT

The article 'From an outer London suburban area' by Mr P. A. Goddard in the November 1966 *Bulletin* (*Bull. amat. Ent. Soc.*, **25**: 116-8) was

settle openly or come freely to sugar or light and other species easily obtainable by beating for the larvae or digging for the pupae, produced figures which were never equalled in the ensuing two decades. Admittedly 1945 was a good year for Lepidoptera but it was more than a coincidence that so many species, each with particular ecological requirements, should be at their optimum simultaneously.

During the post-war years, the butterflies suffered most. By 1947 the colony of High Brown Fritillaries had disappeared from what was possibly the last stronghold in this part of the country and although the Marbled White lingered for a while, no more were seen after 1957. The other species mentioned still (1966) retain a precarious hold in a few localities: the Comma and the White Admiral have shewn their typical cycles of abundance but the peak numbers are progressively less pronounced. Even the ubiquitous species, notably the 'browns' (Satyridae), only occur in small numbers where once they swarmed.

The number and variety of moths have also gradually decreased though my records do not reveal any violent movements. Some families, such as the Arctiidae, seem to have suffered most. I have not seen the Garden or Cream Spot Tiger moths (*Arctia caja* Linn. and *Arctia villica* Linn.) for several years and the two common Ermines (*Spilosoma lubricipeda* Linn. and *S. lutea* Hufn.), the Ruby Tiger and the Muslin (*Phragmatobia fuliginosa* Linn. and *Cynica mendica* Clerck.) are now relatively scarce. The Hawk-moths (Sphingidae), possibly reinforced from more rural areas, have held their position and although the status of the Buff Tip (*Phalera bucephala* Linn.) has changed from that of a pest to a fairly common visitor, other members of the Notodontidae, e.g., Swallow Prominent (*Pheosia*

tremula Clerck.) and Puss Moth (*Cerura vinula* Linn.) are at least as common as they were twenty years ago. Regrettably, I must agree with Mr Goddard that a young collector today, who confined his activities to the immediate district, would only record a few of the British butterflies and many of the moths in very small numbers.

What factors are causing the disappearance of our Lepidoptera? In a suburban area such as the one under consideration, it would appear to be mainly the advance of urbanisation with the consequent air pollution and the continuous dusk to dawn street lighting. Probable additional factors are the growing use of pesticides and the increase of the local bird population. The latter point is well illustrated in my own garden where large flocks of birds appear regularly from the adjacent golf course to systematically quarter the garden for grubs.

Precise information on these points is scarce but three cases where I have considered the effects of light may be of interest. A rural road in Putney and another locally were changed from inefficient gas lighting to a 'm.v.' system soon after the last war. In each case a fence ran along one side of the road and in the first season became a moth trap par excellence. During the next two to three years the number of moths seen drastically decreased and by the fifth year they had almost vanished. From this point the numbers improved slightly and seem to have levelled off at a small annual attendance. It would be useful to ascertain whether the species appearing now are those that have acclimatised themselves to the changed conditions or are merely immigrants from more favoured areas. The third case was the exhibition of Lepidoptera I was privileged to see at the South London Ent. and Nat. Hist. Society's Annual Exhibition this year. A 'm.v.' light-trap had been run for a

number of years in the grounds of Buckingham Palace, in the heart of London. Speaking from memory, I believe there were almost 400 species of lepidoptera recorded of which nearly half were macro-lepidoptera. Although this area is a veritable green oasis, alongside a formal London Park, it is inconceivable that any insect life at all should occur there. Surrounded by miles of town, brilliantly lighted all night and the air polluted by the never ending traffic, a good number of species appear to breed there and many more populate the area after having survived the hazards of miles of bricks and mortar. As with the bombed-site habitats where certain species flourished in the post-war period, the situation must confer some significant advantages although one would have thought that these would have been nullified by the corresponding disadvantages.

Much more information is required but nevertheless it seems that there is a possible chance for the survival of some of our flora and fauna if immediate steps are taken. The obvious and easiest way is to support the work of the County Trusts and Conservation Bodies with personal service, information and, where possible, financial backing. This would entail such aims as:—

1. An intelligent control of green belt and common lands near the centres of population.
2. The considered preservation of more distant areas which would act as reservoirs for wild life and could automatically replenish less favoured areas.
3. Particular attention to the education of the younger generation so that the disinterested majority would at least respect the countryside and the interested minority would actively assist in its preservation.
4. Where thought necessary for special cases such as parts of our

coastline and localities of special scientific interest, to restrict access by motor traffic and provide limited facilities to pedestrians.

5. To personally act as guardians of our heritage and ensure that none of it is despoiled for lack of interest or merely because nobody in authority was informed before an irrevocable act of vandalism was committed.

R. D. Hilliard (99).

SHOULD ENTOMOLOGISTS FEED BIRDS?

Recent studies of the Great Tit (*Parus major* Linn.) which are described and discussed by Dr David Lack (1966) have shown that the main factor controlling the population size is the availability of food in the winter. The scarcity of invertebrate food in the winter limits the population and so in the breeding season, when insect food is more plentiful, only a fairly small proportion of the insects are eaten. Other studies have shown that the same applies to all the garden birds. For instance the town populations of Blackbirds (*Turdus merula* Linn.) are fifteen times as dense as country populations. This is due to humans feeding the birds in winter.

These large town populations of birds must take a very high percentage of the insect larvae to feed their young in the spring. This could explain the disappearance of many butterflies and moths near towns, where poison sprays cannot be blamed, e.g., in Epping Forest.

May I suggest that in towns, where the birds will be fed anyway, entomologists should feed them especially in the breeding season and so keep them away from the caterpillars?

26.2.67.

David Corke (2962).

REFERENCE

LACK, D. (1966). *Population Studies of Birds*. Clarendon Press, Oxford.

THE MALE INSECT REPRODUCTIVE SYSTEM

The male reproductive system in the Insecta consists primitively of a pair of gonads (testes) and associated glands and ducts (Fig. 1), cf Female Reproductive System (Wightman 1967). The testis is usually made up of tubes or *follicles*. Each follicle consists at first of a layer of epithelium sitting on a basement membrane. The whole group of follicles is enclosed in a 'scrotum' which may be coloured (Fig. 2). The follicle is the 'unit' of the testis, in the same way that the ovariole is the 'unit' of the ovary. Similarly it consists of a series of zones in which the sex cells are at different stages of development (Fig. 3). These are as follows:—

1. *Germarium or Zone of Spermatogonia*: This is in the apical region of the follicle. There are many cells in this region which are continuously dividing. These are the spermatogonia or primordial germ cells.

2. *Zone of Spermatocytes*: As each newly 'budded off' cell is forced down the follicle by its successors, it becomes covered by a coat of cells. The cell continues to divide and each ball of cells surrounded by its coat is known as a *cyst*. Each cyst becomes polyhedral in shape because of the pressure of neighbouring cysts. There are between 64 and 256 cells or spermatocytes in each cyst, all derived from one spermatogonium.

3. *Zone of Maturation and Reduction*: The spermatocytes undergo a further two divisions to form four spermatids. The first division is known as a 'reduction division'. This is of great significance and will be briefly discussed.

Every cell has a nucleus which can be described as the control centre of the cell. The nucleus contains thread-like structures called chromosomes, which are responsible for transmitting the inherited characters of an organism to its offspring. Nearly always the chromosomes occur in

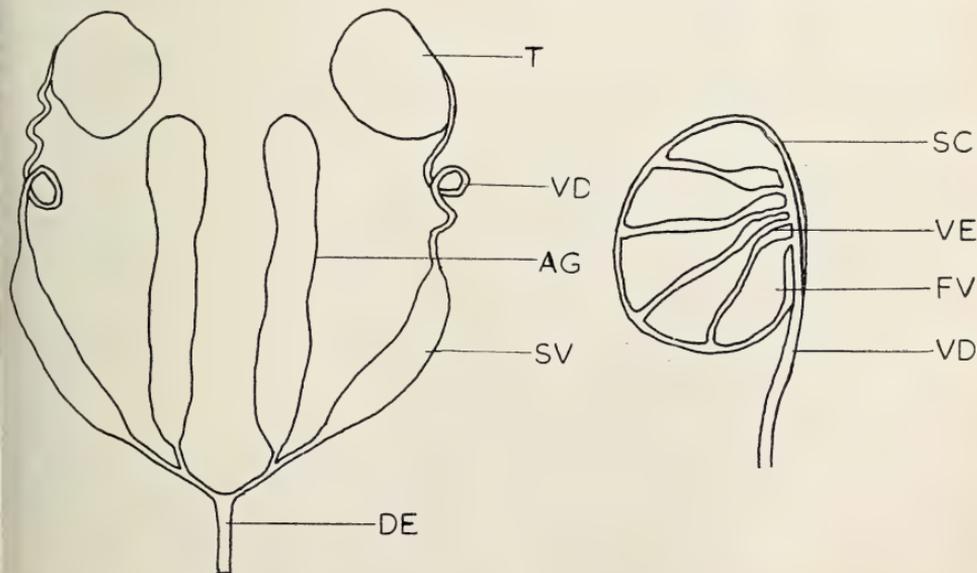


Fig. 1. The male insect reproductive system. Fig. 2. The testis.

Key: AG = accessory gland; DE = ductus ejaculatus; FV = follicle; SC = scrotum; SV = seminal vesicle; VD = vas deferens; VE = vas efferens.

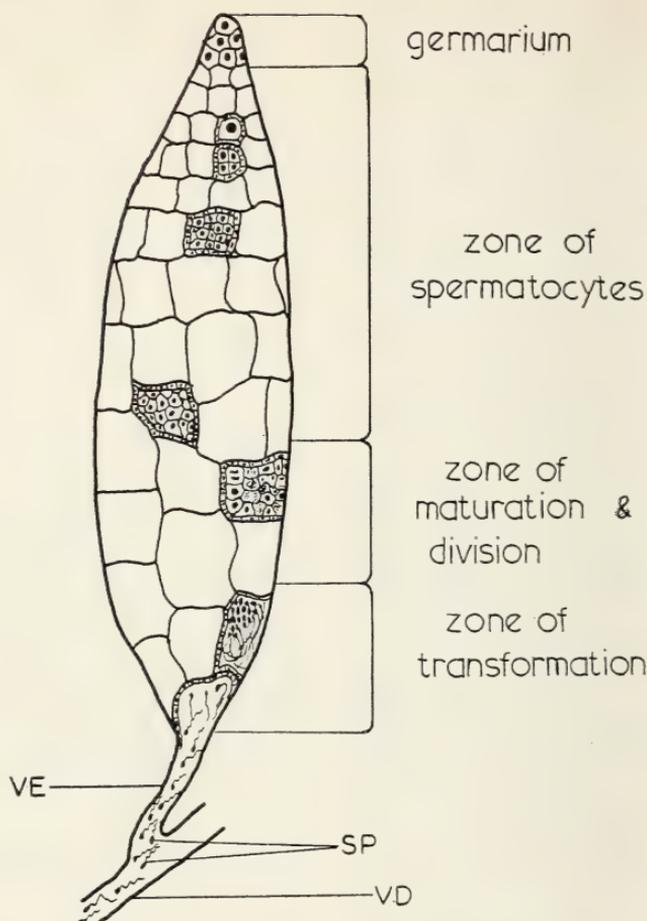


Fig. 3. Diagram of a longitudinal section through a follicle, showing the zones of development. Key: SP = spermatozoa; VD = vas deferens; VE = vas efferens.

pairs. The reason for that will now be explained. When a sperm fertilizes an egg the nuclei of the two gametes fuse so that the zygote has twice their number of chromosomes—the diploid ($2n$) state. In order to prevent successive generations doubling the number of chromosomes at every mating, the gametes at some stage in their development undergo a reduction division or *meiosis*. Each of the homologous pairs of chromosomes come together and then separate, each group of homologues being incorporated in the nucleus of the daughter cells which are then said to be haploid (n). The reduction division is invariably

followed by a maturation division.

4. *Zone of transformation*: The spermatids develop the characteristic *flagellum* or tail. They are then known as spermatozoa.

The sperms break free of their cyst and enter the genital ducts. Movement is effected by the lashing of their flagella. They pass down the *vas efferens* (in the follicle) (VE, Fig. 2) and into the *vas deferens*. This tube is very often dilated to form a *vesiculum seminalis* where the sperms are stored. Accessory glands are usually associated with the genital ducts, but their function is not really

known. They may produce a secretion that keeps the stored spermatozoa dormant whilst they are being stored.

Sperms are emitted through the ejaculatory duct which is formed by the fusion of the *vasa deferentia*. Spermatogenesis is usually complete by the time the adult is mature. It takes place during the pupal stage of holometabolous (endopterygote) insects and during the preimaginal nymphal stage of hemimetabolous (exopterygote) insects.

The male reproductive system of several of the larger orders will now be discussed.

Coleoptera

The male reproductive organs consist of the testes, *vasa deferentia*, one or more pairs of accessory glands and a median ejaculatory duct. Vesiculæ seminales are often present as dilations of the *vasa deferentia*. In the Adephaga, e.g., ground and tiger beetles, the testes are closely coiled, whereas in the Polyphaga, e.g., scarabs and weevils, they are divided into a number of separate follicles.

Lepidoptera

Each testis primitively consists of four follicles. Usually a certain degree of coalescence occurs until, in the higher Lepidoptera, both testes have fused to form a single median gonad. Two principal arrangements are distinguishable (i) The testes are paired and enclosed in separate scrotums or (ii) fused and enclosed in a common scrotum. Sometimes fusion is not complete in (ii) and the paired nature of the gonads is evident.

Diptera

The testes are usually ovoid or pear shaped, and frequently pigmented. The *vasa deferentia* are generally short, and fuse to form a common ejaculatory duct. In association with the latter there is very often a muscular *ejaculatory sac* which may regulate the discharge of the seminal

fluid. A pair of accessory glands is often present.

Hymenoptera

In the Symphyta (i.e., sawflies and woodwasps), and the honey and bumble bees the testes are separate. They are fused to a greater or lesser extent in the rest of the Hymenoptera. They are enclosed in a double membrane, and may consist of 250-300 follicles as in bees and wasps. They are much less numerous in ants and are usually reduced to three in other Hymenoptera. The *vasa deferentia* enlarge to form vesiculæ seminales which are cylindrical or sac-like in form. The paired accessory glands open into the ejaculatory canals.

Hemiptera

Heteroptera (bugs) usually have seven follicles in each testis; deviations from this number are not uncommon. The *vasa deferentia* are usually dilated at some point to form the vesiculæ seminales. There are usually one or more pairs of accessory glands.

Homoptera (such as aphids and froghoppers) may only have a single follicle per testis, but more are usual. The ductus ejaculatorius may be modified to form a sperm pump (Psyllidae and Aleyrodidae).

Readers keen to gain first hand knowledge of the male reproductive system of insects in which they are interested may use the same dissection method as was described for the female reproductive system in *Bull. amat. Ent. Soc.*, **26**: 45-8.

John A. Wightman, 9, Chawton Close, Harestock, Winchester, Hants.

REFERENCES

- DAVEY, K. G. (1965). *Reproduction in the Insects*. University Reviews in Biology, 5. Oliver and Boyd, Edinburgh.
- IMMS, A. D. (1965). *A General Textbook of Entomology*, 9th edn, revised by O. W. Richards and R. G. Davies. Methuen, London.
- WIGGLESWORTH, V. B. (1934). *Insect Physiology*. Methuen, London.
- WIGHTMAN, J. A. (1967). *Bull. amat. Ent. Soc.*, **26**: 45-8. The Female Insect Reproductive System.

JUNIOR MEMBERS PRIZE FOR ECOLOGICAL WORK

I had the good fortune to be working, two years ago, with an organisation one of whose concerns was the lack of contact between professional biologists on the one hand, and amateurs on the other. It was felt that the first group possessed academic qualifications at a very high level of specialisation, as well as the ability to carry out original research of a high order, whilst the second group possessed a treasury of first-hand knowledge of such animals as insects actually in the field.

I would very much like to see the Society helping to bridge this gap by producing individuals who are as much field workers as laboratory scientists, and vice versa, which is the reason for my writing this note.

I am offering a prize of three guineas to the Junior Member who, in my opinion, carries out the most interesting short-term ecological survey, and who submits a report on it by 1st August 1968. The following notes are for the guidance of Junior Members who are prepared to enter:

1. A report must be submitted to the *Bulletin*, and not merely to myself. It must appear in the November 1968 issue, at the latest.
2. Each survey should be undertaken by not more than three people of junior age (in September 1967) for the purposes of AES Membership.
3. The importance of the project should lie in stressing the relationships of the animals to their environment (which includes one another). It will be judged on its merits as a piece of serious ecological work, rather than as a merely systematic list of all the species noted.
4. The study should largely be concentrated on insects and other

Arthropods, but attention ought to be given to any other animals preying on them, or otherwise directly influencing their populations. Special adaptations, such as concealment techniques, would be a valuable consideration if studied in the field.

5. Observations may be accompanied by information extracted from books, periodicals, or museum labels, etc. The ability of the writer to make field observations and to correlate these with information that has already been published will be taken into account when the final article is considered.
6. Bulletin articles (which must, of course, be acceptable to the Editor) should contain at least one diagram displaying the apparent relationships of all, or a few of, the species studied, with each other and with other environmental factors such as vegetation.
7. Work which is already in progress, or which has been completed and is previously unpublished *in toto*, may be submitted.

The Member taking the prize in August 1968 will be asked to display some sort of an exhibit at the Annual Exhibition of 1968. This should not contain more specimens of each species than is necessary to illustrate the notes and drawings accompanying it. Specimens of the Large blue butterfly (*Maculinea arion* Linn.) and similar rarities should not be collected when the work is in progress, and in the display drawings or photographs should be substituted if it is necessary to represent such species.

A few random ideas for habitats in which to base the study are the following:

- Hedgerows (possibly of a specialised character)
- A moorland tract
- Waste land within a town or city

limits

Rotting logs (standing or fallen, or both).

Ditches

Hydropetric habitats

A certain kind of herb, shrub or tree.

Because this sort of study involves considerably more work than just collecting, there will probably be a low number of "competitors". So, if you are a Member, and under 18, make a start before the winter!

I.4.67. Leigh Plester (1968).

[Project reports submitted for publication in the *Bulletin* may be accompanied by additional notes, lists or other information which would not find a place in a concise report for the magazine itself. Any such notes will be returned after they have been used in the assessment of the projects—Ed.].



COLLECTING IN THE SWISS ALPS 1966

[Messrs. W. L. Coleridge, R. W. J. Uffen and P. W. Cribb are motoring through the Alps of Switzerland. The weather in the mountains around Brig remains dull, and the party travel to the village of Les Plans near Bex, and spend one day on the slopes below the Lion d'Argentine. The story of their entomological trip continues from Bull. amat. Ent. Soc., 26: 57-61.].

Another day was spent in the wild valleys at the Pont de Nant. The scenery here is quite wonderful with a grassy valley flanking a mountain torrent and high rocky cliffs towering on each side. The trees hang on the face of the cliffs, again being mostly Spruce. We climbed the winding rock path up the right hand valley and in the clearings beside the stream found the fritillary *Melitaea diamina*

Lang commonly, and *Erebia melampus* Fuessl. (like *E. epiphron* but with more rounded wings) and one female *E. manto*. I climbed up the steep sides of the valley to where there were grassy slopes amid big rock slips. These areas were catching the sun and there were plenty of butterflies on the wing. The small Apollo *Parnassius phoebus* Fab. was an exciting capture and I also took several of the Alpine Copper *Heodes tityrus* ssp. *subalpina* Spey.). Collecting on such steep slopes is always difficult and the best results are obtained by quietly sitting down and waiting for the insects to find you. At the far end of this valley was a great cirque or wall of rock which closed the valley and above it was a glacier from which a pencil waterfall dropped to form the source of the torrent. The valley below the glacier was strewn with rocks and some boulders larger than a house. A small farm lay near the mouth of the spot where the valley opened out below the cirque and herds of goats and cattle fed on the sparse grasses growing amongst the rocks. Just below the snow there was a feast of alpine flowers with gentians, *Dryas*, alpine *Ranunculus* and saxifrages filling all the patches between the rocks. Unfortunately on both occasions that we visited this area the sun was shrouded by the pall of cloud hanging from the glacier and the second occasion ended with a torrential downpour, catching me out high up near the ice. However by searching the short grasses I did find two alpine 'blues', *Albulina orbitulus* de Prun. and *Polyommatus eros* Ochs., the blue of which matches the coldness of the ice. We also found the Black and Gold Mountain Moth (*Psodos quadrifaria* Sulz.) which Mr Uffen was able to photograph. This is a beautiful insect and one which I have also taken at La Grave, Hautes Alpes. Our most successful morning at Les Plans was spent in a few



meadows immediately above the village on the only really hot sunny morning of our stay. I eventually got chased out of these meadows by an irate farmer but while there saw most of the species seen at Fieschwald and the 'copper' *P. hippothoe*, the males of which were almost over though some of the females were quite fresh. The Black-veined White (*Aporia crataegi* Linn.) was a new species for this trip and along the pathside I took several Small Blues (*Cupido minimus* Fuessl.). This short period of hot sun showed us how much there was here when the conditions were right.

However the weather reverted to rain and mist and we decided to move to the lowlands near Lake Geneva. During our stay at Les Plans we had found several alpine Salamanders (*Salamandra atra* Laur.). These are about five inches long, shining black and newt-like in form, with the head rather large in proportion. They were found mainly in wet situations under stones. I found four in an area of a few yards in the cirque at Nant. Unfortunately they all failed to survive the journey home. I also found a jet black lizard (*Lacerta* sp.) which did come home safely and produced a family

shortly afterwards.

We went from Bex via Evian and along the Lake of Geneva (Lac Lemman) passing twice through French/Swiss customs, to the City of Geneva and on along the North West side of the Lake through Versoix to a village called Celigny. Here we found a hotel right beside the railway station and made this our headquarters for the next three days. Mr Garrett-Jones had told me about some woods near the French border here and we spent two very interesting days collecting along their rides. The woodland was mixed deciduous trees, mostly young oaks (*Quercus* sp.) but with many plantations of other species and all the rides had a scattering of *Populus tremula* Linn. (Aspen) and *Salix* spp. All the butterflies that one associates with English summer woodlands were here—White Admirals (*Limnitis camilla* Linn.), Silver-washed Fritillaries (*Argynnis paphia* Linn.) and masses of Brimstones (*Gonepteryx rhamni* Linn.). The commonest butterfly was probably the Gatekeeper *Maniola* (= *Pyronia*) *tithonus* Linn.) with the Ringlet (*Aphantopus hyperantus* Linn.) a close second. Added to these were newly emerged males of the large Satyr *Minois dryas* Scop., which on the wing look just like giant Ringlets. Through the wood ran a concrete drainage canal which still had a little water trickling through it and this supported a very large number of dragonflies and damselflies (Odonata) and the Purple Loosestrife (*Lythrum salicaria* Linn.) along its edge attracted most of the butterflies flying. I saw eight Brimstones at one time on a clump of it. While we were here the sun was very hot and conditions ideal for collecting. A big surprise was to find the Scotch Argus common at this altitude (the Lake is about 1,000 ft above sea level). The vegetation and habitat is typically lowland and not one that I would have associated with an *Erebia* species. One

wonders why the butterfly is not more widespread in Britain. Along by the woodland path were several pools left by recent rains and in these we captured half a dozen toads with vivid black and orange/yellow bellies—these turned out to be *Bombina variegata* Linn.—and Mr Coleridge was able to get them back to England alive. I also disturbed a huge Grass Snake (*Natrix natrix* Linn.) which plunged into the canal and swam off into some reeds. Mr Garrett-Jones had told me that both *Limnitis populi* Linn. and the Apaturids *A. iris* Linn. and *A. ilia* Schiff. flew in these woods. Most of the Aspens appeared to have been searched as they were pulled down over the rides but on the fallows I found six ova of *A. iris* and four small larvae, one with its horns already. Unfortunately due to travelling home I lost all but one of these which at the time of writing has started to hibernate. Another exciting find was the intermediate form of *Araschnia levana* Linn. (form *porima* Ochs.) which sailed round me twice before settling on some bramble blossom to be photographed. We disturbed several groups of Black Kite (*Milvus migrans* Boddaert) while walking along the glades and these were apparently adults in pairs with one or two young. At the end of the woods were open fields flanking the canal and here in marshy areas was growing the plant *Sanguisorba officinalis* Linn., the food plant of two near relatives of the Large Blue (*Maculinea arion* Linn.). These two 'blues' are *M. arcas* Rott. (= *nausithous* Bergstr.) and *M. euphemus* Huebn. (= *teleius* Bergstr.) both of which are symbiotic with ants (*Myrmica* spp.). We were able to capture one or two specimens and found these fields very well populated with butterflies. *Colias croceus* Fourcr. and *C. hyale* Linn. and several fast-flying Swallowtails (*P. machaon*) were netted, and Mr Uffen discovered a Six-belted Clearwing (*Dipsophecia*

scopigera Scop.) laying its eggs among the Bird's Foot Trefoil (*Lotus corniculatus* Linn.), where we also found *Heodes tityrus* Poda and the Mazarine Blue (*C. semiargus*) to be common. Back in the woods I saw one male Purple Emperor (*A. iris*) drinking at a small puddle but it was badly damaged though the purple was still visible when it flew off. A butterfly which was flying here and which I had not expected so late in the year was the Dingy Skipper (*Erynnis tages* Linn.). These woods were certainly some of the most interesting that I have encountered on the Continent—it would certainly have been interesting to see what a light-trap would have turned up at night.

Beyond and to the north-west of Celigny we could see the Jura mountains and our next trip was via Nyon to La Dole, a high mountain above the village of St Cergue. The Jura in this area are heavily wooded and one has to search for suitable clearings where butterflies can be found. There is an ancient castle overlooking the village and a path winds up to it through the woods. We followed this and passed the path to the castle, eventually coming out into some alpine meadows where cattle were grazing. Again the mountain mists hindered operations but, in the breaks of sunshine that we did get, we found the two Erebias *E. euryale* and *E. ligea* to be quite common. The latter were very large and the females had huge eye-spots. I was able to capture a pair in copulation and later the female deposited her eggs in a pill-box. The Wood White (*Leptidea sinapis* Linn.) was very common wherever we went in this area, much commoner than the other 'whites', but we were rather disappointed that the bad weather had again hindered us. Coming down to lower altitudes proved more successful and we again came into the sun on some slopes overlooking the Lake. These slopes

were very like our South Downs and I was able to photograph the Large Blue for the first time, laying on some clumps of Thyme (*Thymus serpyllum* Linn.) Mr Uffen found the full grown larva of *Papilio machaon* on some wild carrot (*Daucus* sp.) and most of the Downland species were present. *Erebia aethiops* was also flying and I saw one specimen of the largest of the Satyrs, *Brintesia* (= *Satyrus*) *circe* Fab. We stayed on these slopes until the sun started to slip behind the hills making the most of the respite from clouded skies.

We spent one afternoon driving through the wooded slopes of the Jura north of Nyon using the winding roads which traversed the slopes. We stopped here and there to explore off the road up the forestry tracks. The woods are very dense except where forestry clearing is going on and consequently the butterfly population seems sparse. The Wood White was again common and I found a full fed larva of the Oak Eggar (*Lasiocampa quercus* Linn.), but the woodland butterflies which we had found near Versoix were completely absent from these areas indicating how much effect dense forest has on the butterfly population.

Our two weeks' stay in Switzerland was now almost at an end and we had to catch the train ferry again at Lyss on the Saturday evening. We left Celigny early on the Saturday morning and drove along Lake Geneva to Lausanne and then north to Yverdon and skirted the Lac de Neuchatel to the town of Neuchatel. It was a hot day and we decided to have a last look at the Jura. The Lake north of Lac de Neuchatel is called the Bielsee and we drove up into the high land overlooking this lake until we came to a stone quarry by the roadside and parked our car here. The slopes were typically downland with grass dotted with clumps of

bushes and a woodland above climbing to the top of the ridge. Butterflies were moving up and down the slopes and we again found the Apollo, *Parnassius apollo*. *Colias australis*, *C. hyale* and *C. croceus* were abundant and the 'copper' *Heodes tityrus* was common in one corner of the quarry. While we were lunching a large female *Hipparchia fagi* Scop. (= *hermione* Linn.) settled near us and I was able to net it. This Satyr is almost as large as *B. circe* but coloured more like *H. semele*. Our English Wall, *Dira megera* Linn., was flying in the quarry, and the Chalkhill Blue flew on the slopes. After spending some time here we drove up to the top of the ridge but found the woodland too dense and returned to some meadows about halfway down. A large migration of *Pieridae* was taking place here, mostly *Pieris rapae* and *P. brassicae*. *Colias* species were also present and the general direction of movement was westwards up the slopes. Walking into the woods beside the meadows we discovered some delightful open areas which were strewn with very large limestone boulders, and small rock gardens flourished among them. *Sedum*, *Allium*, *Veronica* and crimson *Dianthus* were the main flowers and there were plenty of butterflies to set them off. Both *B. circe* and *H. fagi* were common, sitting camouflaged upon the rocks until disturbed. Painted Ladies, *V. cardui*, and Apollos drifted into and out of the clearings and *Erebia aethiops* skulked along the edges. A new species was flying round the trees surrounding the clearings, the hairstreak *Strymon spini* Schiff. Although I have found this butterfly commonly in the French Alps, this was the first specimen we had seen in Switzerland. The clearings were so well concealed from view from the road or fields that it was sheer chance that we discovered them. Much collecting is like this and the missing

of the right places is a constant hazard when collecting abroad without any previous knowledge or advice on the terrain. We stayed here as late as we dare and then started off on that rather tedious journey back to home. This part of the trip was uneventful entomologically apart from a fleeting sight of a Clouded Yellow, *C. croceus*, dashing across the loading yard at Calais Ville. On the boat back we did discover that the French have no idea of what is meant by 'Bacon and Eggs' despite our excellent orders in French. Discounting the bad weather and a little bad luck we had had a very memorable two weeks in Switzerland, filled a few gaps in our collections and knowledge and taken a lot of interesting photographs.

All specimens taken and killed were set in setting cases each evening. Reptiles which came home safely were kept in muslin bags, damped where appropriate, and a few botanical specimens were brought home safely in polythene bags.

1.11.66. P. W. Cribb (2270)

MORE BUTTERFLIES IN MAJORCA

I read with interest Mr P. R. Grey's article in the last *Bulletin* (*Bull. amat. Ent. Soc.*, 25: 133) in which he expressed his disappointment at the limited number of butterflies he encountered in Majorca during mid May this year (1966). I was on holiday there in July 1965 and again in April this year and I am glad to say that my own experiences were somewhat better. I believe that about thirty species occur in the Balearic Islands, though I have only encountered twenty-one in my two recent visits.

In July 1965 I found the eighteen

Papilio machaon Linn. (Swallowtail), one poor specimen taken and one other seen.
Pontia daplidice Linn. (Bath White), common on open ground.
Pieris rapae Linn. (Small White), only a few seen.
Gonepteryx cleopatra Linn., quite common around gardens.
Colias croceus Fourcr., numerous in specific localities.
Vanessa cardui Linn. (Painted Lady), only one taken.
Pandoriana pandora Schiff., a number seen but only one taken.
Pararge aegeria Linn. (Speckled Wood), common in shady places.
Pararge (= *Dira*) *megea* Linn. (Wall), not common.
Hipparchia fidia Linn., common.
Maniola jurtina Linn. (Meadow Brown), only a few seen.
Pyronia cecilia Vallentin, very common.
Coenonympha pamphilus Linn. (Small Heath), common.
Lycaena phlaeas Linn. (Small Copper), quite numerous in the *right localities*.
Syntarucus piriouthus Linn., common.
Celastrina argiolus Linn. (Holly Blue), a number seen in one place.
Polyommatus icarus Rott. (Common Blue), quite common.
Aricia cramera Esch., not common.

Table 1. Butterflies in Majorca in July 1965.

species given in Table 1.

Majorca in July is generally very hot and dry. Most of the uncultivated and much of the cultivated land becomes parched and bare. Only a few species seem to favour these conditions, *Pontia daplidice* and *Pyronia cecilia* being most common. In these dry conditions the occasional moist spot where the vegetation is more verdant attracts numerous butterflies to a small area. I remember one such area which cannot have been much bigger than a tennis court, and was probably the source of a small spring. Although for hundreds of acres all round the ground was completely parched and with hardly a butterfly to be seen, this little patch was literally alive with *Polyommatus icarus*, *Lycaena phlaeas* and *Syntarucus piriouthus*. There were always a few *Colias croceus* and it was at this place that I took the only specimens of *Papilio machaon* and *Vanessa cardui*.

The *P. icarus* were of the subspecies *balearica* Rebel: they are generally much smaller than our own Common Blue. The males are a very bright blue. The females tend to be brown with only limited blue scaling. The orange markings are prominent on both wings making the uppersides resemble those of *Aricia agestis* Schiff.

(Brown Argus).

The *L. phlaeas* were ssp. *eleus* Fab. in which the little points on the hindwing are much more pronounced and the forewings are often suffused with black.

There was an interesting difference in the *Hipparchia fidia* from different parts of the island. I was staying at San Agustin, just outside Palma, and *H. fidia* were very abundant along the paths through the trees. However these specimens were considerably smaller than those I took near Formentor on a trip to the North of the island.

The specimens of *Gonepteryx cleopatra* I took on the island were appreciably different from those I had taken in the South of France the previous summer. They were smaller, and the males had less orange suffusion on the forewings.

That gorgeous insect *Pandoriana pandora* was not common. I think I only saw about half a dozen. They were mostly tearing along at a great rate and uncatchable, anyway by the likes of me, since the four minute mile is far from being one of my accomplishments. I did however manage to take one which settled in the garden.

The Majorcan specimens of *Coenon-*

nympha pamphilus differ from our native ones in that the underside of the hindwings is a buff colour rather than grey.

Aricia cramera is an interesting little species which at first sight could easily be taken for *A. agestis* (Brown Argus), the ground colour on the underside is however a pale coffee colour rather than the blue-grey of *A. agestis*.

On my second trip to Majorca at Easter 1966 I stayed at Puerto Pollensa at the other end of the island and I was able to add three more species to my list, *Pieris brassicae* Linn. (Large White), *Vanessa atalanta* Linn. (Red Admiral) and *Callophrys rubi* Linn. (Green Hairstreak).

I took only one specimen of *P. brassicae* and this was rather an interesting one. It was a male and only about the size of a Small White. The black spot in the centre of the forewings was present on the upper-side as well as the underside. As I took only this single specimen I do not know if it is the usual form found on the island or not.

V. atalanta was not common, and I believe I saw less than half a dozen on the wing. I did however spot a fully grown larva marching across the main road in Puerto Pollensa. It came back to England with me as a pupa and produced a nice specimen.

I took only a single *C. rubi*. The upper side was much lighter than in the British specimens, being almost ginger, and the white hairstreak on the underside was completely absent. I have recently obtained a copy of R. F. Bretherton's 'Distribution List of The Butterflies of Western Europe', (*Transactions of the Society for British Entomology*, Vol. 17, Part 1), and I was interested to note that *C. rubi* "does not seem to be recorded from the Balearic Islands." This capture is thus of special interest as it establishes the presence of the species in Majorca.

The most common species in April was undoubtedly *V. cardui* and these were everywhere. *G. cleopatra* and *C. croceus* were also common. *P. machaon* were quite numerous and the specimens I took were generally larger and darker than those I had previously taken in the South of France.

P. daplidice, which had been so common in July, were nothing like so numerous and I only saw a few.

Of the nine butterflies recorded by Mr Grey in May all but two were also seen by me in July and April. I never saw *Lampides boeticus* Linn. and nor did I see *Maniola* (= *Pyronia*) *tithonus* Linn. (The Gatekeeper). This latter species in fact rather surprises me. As Mr Grey did not record *Pyronia cecilia* which I found was perhaps the most common butterfly on the island, I wonder if he is by any chance confusing the two. This would of course be easy to do, especially if the specimens were just observed in the field and not actually caught and examined, as the uppersides are very similar.

On my first visit I had no idea what to expect as at that time I had done no research on butterflies in the Balearics. I was surprised at the complete lack of the smaller fritillaries which are so abundant on the mainland. I had also expected to find skippers but saw none. I believe however that *Carchardus alceae* Esp. exists on the island and that *Gegenes nostradamus* Fab. has also been found there.

Of the more glamorous species I believe *Charaxes jasius* Linn. is present on the island and also that *Nymphalis antiopa* Linn. (Camberwell Beauty) has been recorded there.

I expect other Members who have visited the islands can add to my list and I would be interested to learn of their experiences. I hope my observations will be of interest to Members planning holidays in Majorca.

14.11.66.

M. J. Perceval (3798).

FURTHER NOTES ON MAJORCAN INSECTS

Editorial note :— Mr Brian R. Dickson (4044) has written to me as *Bulletin* Editor with some notes which supplement Mr Perceval's article above. Mr Dickson's observations were made during the period 10th to 22nd July 1966, and the species of butterflies he observed were as in Table I in the above article with the exception of *Pandoriana pandora* Schiff., *Maniola jurtina* Linn., *Lycaena phlaeas* Linn., *Syntarucus pirthous* Linn., *Celastrina argiolus* Linn. and *Polyommatus icarus* Rott., but with the addition of *Lampides boeticus* Linn. (Long-tailed Blue). Mr Dickson continues: "The majority of the butterflies were seen near a military fort up above Porto Pi Palma and near the Madrid Hotel. *Hipparchia fidia* Linn. was found to be an extremely agile insect, and I found great difficulty in catching the species. *Colias croceus* Fourcr. (Clouded Yellow) was seen only by a farm at the Eastern end of the Island, and also several times on boat trips in the Mediterranean, in this case apparently flying from Africa, resting on the boats but rarely staying more than a few seconds before flying north to the island.

Other insects of interest were large hornets (*Vespa* sp.) and bees, including one of the genus *Xylcopa* (probably *X. violacea* Linn.). There were also large Cicadas which the locals call 'Pinos' which were very noisy flyers, and grasshoppers of several varieties and colours.

A non-entomological item of interest was an eagle (*Aquila* sp.) which soared overhead down into a valley at 3,500 ft in the mountains near Puerto Sollet.

Incidentally no chemist would supply killing-fluid without a doctor's prescription! The moral is to take your own—I had to kill my specimens with after-shave lotion!"

SOME OBSERVATIONS ON COLEOPTERA FROM THE PYRENEES, 1966

From 27th July to 5th August, I was fortunate enough to attend a field course in the Pyrenees. This was a botanical field course, but whenever I had the opportunity, I made notes on the Coleoptera that I found.

The majority of the localities visited are in the Hautes Pyrenees departement of France; some additional localities were visited on the journey back, and these are mentioned below. We stayed at St Sauveur until 4th August, when we travelled east along the Pyrenees and entered Andorra, where we spent the night. The next day we crossed into Spain and travelled south, before turning north and crossing back into France to spend the night at Perpignan. St Sauveur lies on one side of the Gave de Pau, with its twin town Luz on the other side. The altitude of Luz-St Sauveur is 2,333 feet.

During our stay the weather was hot and sunny, although on a few occasions mist was encountered at higher altitudes. At several of the localities we visited there were snow patches. There was snow as low as 5,200 feet in the Cirque de Gavarnie, where the ground is sheltered from the sun, by the walls of the Cirque, for part of the day. The highest point we visited during our stay was the Pic du Midi de Bigorre, at an altitude of 9,439 feet.

The vegetation on the north side of the Pyrenees shows an altitudinal zonation. The first zone is deciduous forest which extends to a height of about 3,300 feet, above this and extending to about 5,000 feet there is a mixed forest with both deciduous and coniferous trees. Above this, the evergreen coniferous forest reaches up to 6,500 feet, where it is replaced

by first sub-alpine, and then true alpine, grassland. This then is a general picture of the vegetation, although in many areas it has been modified by man's activities. The south-eastern end of the Pyrenees shows the influence of the Mediterranean climate and the vegetation at low altitudes is of a Mediterranean type.

In a previous article (*Bull. amat. Ent. Soc.*, 23: 22-3), Mr H. J. Cribb has described some of the species of Coleoptera that he found in the Western Pyrenees. Therefore in the following list I have avoided duplication of information as far as possible, and I have included some species that were not mentioned in his article.

Carabus monilis Fab. Found under rocks in the Cirque de Gavarnie.

Carabus splendens Olivier. This is a metallic copper coloured species that is not found in Britain. It was found in a rotting tree stump in the woods above the Lac d'Estaing and also in the road outside the hotel at St Sauveur.

Harpalus puncticollis Payk. Common under stones at high altitude.

Calathus melanocephalus Linn. This was found under stones in the wood below the Lac de Gaube (4,900 feet).

Zabrus obesus Serville. This occurred under stones near a snow patch at a height of around 8,500 feet on the Pic du Midi.

Feronia nigrita Fab. Although this is a common beetle it is worth mentioning since it was one of the few species that were found in the woods above the Lac d'Estaing. It was found under logs.

Silpha obscura Linn. This was found in grassland at a height of 5,400 feet, at the roadside 4 km east of Bareges.

Staphylinus caesareus Cjederh. A single example of this species was found near a stream at the side of the road between Bareges and the Col de

Tourmalet. Mr Cribb also mentions the occurrence of this species near streams.

Hister unicolor Linn. and *Margarinotus (Hister) carbonarius* Ill. Both these species were found in cow-pats at the Col de Soulor. (4,700 feet).

Coccinella septempunctata Linn. Rather surprisingly this was the only Coccinellid that I found in the Pyrenees. It was found up to a height of 5,400 feet.

Geotrupes stercorosus Scriba and *Aphodius fossor* Linn. These were another two species that were found at the Col de Soulor. They were associated with both sheep and cow dung. It is well known that *Geotrupes* spp. stridulate and these French specimens seemed particularly voluble.

Aphodius merdarius Fab., *A. ater* Deg., *A. coenosus* Panz. These three species were found commonly, under stones at 8,500 feet on the Pic du Midi.

Lucanus cervus Linn. A single male was found after it had flown into the coach, as we approached Luz on the first day of our visit.

Leptura cerambyciformis Schrank. This beetle was found on the flowers of an umbelliferous plant at the roadside between Bareges and the Col de Tourmalet.

Cryptocephalus aureolus Suffr. This was found on the flowers of Hawkweed (*Hieracium* sp.) in grassland at the roadside 5 km east of Bareges at a height of 5,400 feet.

Prasocuris junci Brahm, *Timarcha tenebricosa* Fab., *T. goettingensis* Linn. These three species were all found walking about on the stony ground in the Cirque de Gavarnie.

Sermylassa halensis Linn. This was common under stones at the higher altitudes and was found both in the woodland above the Pont d'Espagne and on open ground on the Pic du Midi. It was absent from Gavarnie, which is surprising, as it is, like *Timarcha* spp., associated with

Galium sp.

Otiorrhynchus nodosus Muell. This black weevil (a mountain species, also found in Scotland) was found under stones on the Pic du Midi.

Lastly here are some notes on three species that were found on the Spanish side of the Pyrenees.

Clytus varius Muell. This was found on an umbelliferous flower at Vich, Catalonia. It is similar in size to our own *C. arietis* Linn., its yellow and black coloration is almost the reverse of that of *C. arietis*.

Oryctes nasicornis Linn. and *Leptinotarsa decemlineata* Say (Colorado Beetle). Two examples of these species were found dead on the forecourt of a garage at Llierca, Catalonia.

The variety of habitats to be found in the Pyrenees make these mountains an ideal locality for the coleopterist. It is obviously an area that deserves as much attention from the coleopterist as it has had from the lepidopterist.

Finally, I should like to express my thanks to Dr B. Frankland and Dr B. M. G. Jones, of the Botany Department, Queen Mary College, who led the field course, and also to the many members of the course who brought me specimens.

I.3.67. J. Muggleton (3253).

FLEAS OF NEW ZEALAND

Readers of the *Bulletin* may like to note that my account of New Zealand Siphonaptera (*Bull. amat. Ent. Soc.*, 24: 27) has been completely outdated by a recent paper by Smit, F.G.A.M., 1965, Siphonaptera of New Zealand, in *Trans. roy. soc. N.Z. Zool.*, 7 (1): 1-50, 16 figs. This paper records twenty species in the New Zealand subregion, of which seven are endem-

ic, three also subantarctic, two also Australian, one European and seven cosmopolitan.

24.2.67. J. C. Watt (3578).

JUNIOR NEWS SECTION

Was this the Silent Spring for you this year or have the insects and other animals in your area recovered from the ravages of winter and human so-called pest control? The Nature Conservancy's staff are trying to find out exactly what is left of our native animal and plant life. I know they would be pleased with help from responsible naturalists. They are particularly interested in records of Odonata, Orthoptera, Lepidoptera, Hemiptera, weevils, molluscs, spiders and of course frogs, toads and newts as well as reptiles and various plants. Even if you cannot help the Nature Conservancy with records, do help by not over-collecting and by doing all you can when you can to prevent Britain becoming the desert islands of the North Atlantic.

I feel I must congratulate Chris Hamilton (3890J) of 18 Ferrymead Avenue, Greenford, Middlesex for his organisation of the Junior Members Silkmoth Club. Congratulations are also offered to Rob Dransfield of Teen International Entomologists Group for the admirable way in which he is organising it in this country.

The Editor has asked me to give the answers to the spring quiz as some of you may have thought them too hard or even too easy to attempt. I cannot illustrate the answers which demanded an artistic skill as there is not room for all the drawings nor can I use colour. You will just have to look at an actual specimen or resort to our old friend the reference book. (It is just possible that I don't know

what they look like anyway.)

Here then are the answers to the Spring Quiz.

1. Adult cabbage butterflies, *Pieris* spp., like most butterflies, feed on nectar made by flowers.

2. A drawing of a Stag Beetle was required here.

3. There are in fact ten Orders of insects which pass through the four stages of complex metamorphosis. They are all placed in the Division Endopterygota. There are the Neuroptera (lacewings), Megaloptera (alderflies), Mecoptera (Scorpionflies), Trichoptera (caddisflies), Lepidoptera (butterflies and moths), Diptera (true flies), Siphonaptera (fleas), Hymenoptera (sawflies, bees and wasps), Coleoptera (beetles), and finally Strepsiptera (stylops). All you had to do was to pick out four.

4. This was an easy question. Spiracles are those tiny holes in the side of the insect's body which lead air into its body.

5. Although almost as interesting, spiders are not insects. These Arachnids differ in many ways from insects. They have only two divisions to their bodies, a cephalothorax and abdomen, never wings and always eight legs attached to the cephalothorax. Insects on the other hand have three divisions to their bodies, head, thorax and abdomen with six legs attached to the thorax. They also usually have wings.

6. The gorgeous Swallowtail Butterfly (*Papilio machaon* Linn.) is still said to be found in the Norfolk broads. It is now extinct as a wild animal in all other parts of England. The stock in Wicken Fen nature reserve in Cambridgeshire is bred specially for the reserve.

7. *Schistocerca gregaria* Forsk. is the scientific name of the Desert Locust with which the Egyptians were punished as one of the great plagues.

8. Anyone of you could have drawn our Society's butterfly symbol, the

Brimstone (*Gonepteryx rhamni* Linn.), just by copying it off the front cover of the *Bulletin*.

9. Melanic varieties of animals are black. They have great deal of dark colour pigment in their 'skins'. Albino animals have no colour pigment in their 'skins' and are white.

10. An introduced Dutch variety of the Large Copper Butterfly (*Lycaena dispar* Haw.) is still found in my home county of Huntingdonshire, in the Nature Reserve of Wood Walton Fen.

11. Basically all the Orders of insects have either biting or sucking mouthparts. Of all the twenty-nine different Orders the following have sucking mouths: Protura (simple tails), Thysanoptera (thrips), Hemiptera (true bugs), Siphunculata (sucking lice), Lepidoptera, Diptera and Siphonaptera (fleas). The Ephemeroptera (Mayflies) have no mouths at all and the Trichoptera (caddisflies) have a special mouth adapted for licking. All the rest have biting mouthparts. You had to pick out two of each.

12. You had to draw and colour a larva of the Privet Hawkmoth (*Sphinx ligustri* Linn.).

13. Our dear little summer evening companion the gnat or mosquito is really a true fly, a member of the Order Diptera.

14. Scorpionflies are nothing to do with scorpions or flies. They are members of their own insect Order Mecoptera. Our common British species *Panorpa communis* Linn. is just over half an inch long and has four black-spotted wings, a slender body and a long head. The males have a swelling at the ends of their abdomens looking like the sting of a scorpion. Although these insects are carnivorous they are quite harmless to humans.

15. Another drawing was wanted here; this time a recognisable picture of *Coscinia cribraria* Linn., the Speckled Footman Moth.

16. You were asked for fifteen

species of Bumble bees and I am afraid that I really do not have enough room to put down the names of the twenty-five British species. The book in the New Naturalist Series 'Bumble Bees' by Butler and Free has them all mentioned as does that excellent work by T. B. Poole, AES leaflet twenty-five on Bumble bees, also obtainable in Volume eleven of the *Bulletin*. By the way Bumble bees are the same as Humble bees.

17. The very strange oil beetle, *Meloe* spp. (illustrated on the cover of the February 1966 issue of the *Bulletin*) has a very strange life history. The female lays thousands of eggs in the soil which hatch into active larvae. These little creatures swarm up flower stems in order to hitch a lift on the bodies of certain solitary bees. Back in the nursery cell made by the bee for its own larvae the baby oil beetle settles in. It is said to eat the bee larva and then to live quite happily on the pollen and honey left there until ready to pupate. Only after pupation does the oil beetle leave for the outside world.

18. Yet another drawing, this time a Peach Blossom Moth (*Thyatira batis* Linn.).

19. Although I realise it is only a matter of opinion I always think of stridulation as summer music. It is the beautiful rasping noise made by the Orthoptera usually to attract a mate. Crickets vibrate their wings together to do this while the true grasshoppers rub their back legs against their forewings.

20. My final contribution from you was another drawing. This time all I really wanted was a caddisfly larva in its characteristic cocoon tube house made of stones, shells, etc.

Do keep writing in your views, records and criticism. It is the only way we can tell that the young entomologist is not becoming as

rare as the creatures he (or she) is so interested in.

H. J. Berman (2941A).

LETTERS TO THE EDITOR

Sir,—I refer to Mr C. R. Heseltine's article (*Bull. amat. Ent. Soc.*, **25**: 31) entitled 'An observation on the Grayling in Sweden', in which he records watching Grayling butterflies (*Eumenis semele* Linn.) depositing eggs, not upon their normal foodplant, but upon lichens. I had occasion during the summers of 1958-59 to question South's statement that the ova of the Pearl-bordered fritillary (*Clossiana euphrosyne* Linn.) were deposited on the foodplant (*Viola canina* Linn.). Along the railway track running through the Wyre Forest, between Shropshire and Worcestershire, Mr C. D. Gadd and myself repeatedly saw females depositing eggs on dead leaves, grass stems, and even twigs, often several inches away from the Dog-violet plants.

Captive specimens of the Glanville fritillary (*Melitaea cinxia* Linn.), obtained from Mr P. W. Cribb in 1959, also deposited their eggs at some distance from the foodplant we had provided. Probably this was owing to the artificial conditions in which they were kept.

Butterflies which I have personally observed laying eggs on their foodplants in the wild state are the following: Small White (*Pieris rapae* Linn.) (Worcestershire), Large White (*P. brassicae* Linn.) (Worcs.), Common Blue (*Polyommatus icarus* Rott.) (Worcs.—on clover), Orange Tip (*Anthocaris cardamines* Linn.) (Worcestershire), Speckled Wood (*Pararge aegeria* Linn.) (Worcs.), Small Heath (*Coenonympha pamphilus* Linn.) (Worcs.), Small Tortoiseshell (*Aglais urticae* Linn.) (Worcs.), Swallowtail

(*Papilio machaon* Linn. ssp. *gorganus* Fruhst.) (Corsica) and *Charaxes jasius* Linn. (Corsica).

I, too, would be interested to hear any explanations with respect to Mr Heseltine's Graylings, and my Pearl-bordered Fritillaries, but these will possibly have to wait until someone decides exactly by what means a female butterfly selects the correct foodplant for her larvae. If the antennae are the organs by means of which the foodplant is finally detected then, firstly, how are they equipped to do this, and secondly, why do Swedish Grayling butterflies sometimes lay their eggs deliberately on lichens?

11.3.67. Leigh Plester (2968).

[Taste sensillae associated with oviposition site selection are known to occur on the tarsi and lower part of the tibiae in Lepidoptera. Airborne oviposition attractants (i.e., scents) presumably act on the antennal sense organs. Work with other groups has indicated that sight is often important in foodplant recognition (shape, colour). The relative importance of these senses for foodplant selection by the ovipositing female in the Lepidoptera is unknown at present. —Ed.]

Sir,—I was interested to read Mr J. J. Howe's short note (*Bull. amat. Ent. Soc.*, 25: 30-31) in which he commented upon "the countless Red Admiral and Painted Lady larvae" available in 1966. I was taking part in an ecological weekend study with some Sandhurst Cadets on the Isle of Grain, Kent, on 18th-19th June 1966. On a few thistles which were growing along one wall of a concrete structure I found no less than eleven Painted Lady larvae (*Vanessa cardui* Linn.) in various stages of growth. The location was a very few yards away from the embankment overlooking the Medway in

a roughly ENE direction. Thistles are very common on the rough pastures of this area, but I did not find any more larvae. It is of personal significance that these were the first larvae of that butterfly I have ever seen in nine years of diligent searching, and as many again of childhood enthusiasm.

A single imago of this species was also seen basking in the sunshine on May 22nd at Cuckmere, Sussex.

11.3.67. Leigh Plester (2968).

NOTES AND OBSERVATIONS

THE VESTAL MOTH IN TAUNTON

I would like to bring to the notice of Members the capture of a male *Rhodometra sacraria* Linn. (Vestal Moth), in Taunton on the night of 11th September 1966.

The specimen was in perfect condition, probably the result of a migration which arrived in the spring, but as it was only the second night that I had had my new mercury-vapour bulb in operation, I can not be sure of this.

Would any Member please inform me if he has caught any specimens in 1966?

I wrote to the British Museum about this capture, and they wrote back and told me that the species was no longer classed as a rarity and that they no longer kept records of its capture.

8.1.67. D. J. Longman (4042J).

CINNABAR MOTH LARVAE IN OCTOBER

As I am a new Member of the AES I could not report this finding earlier.

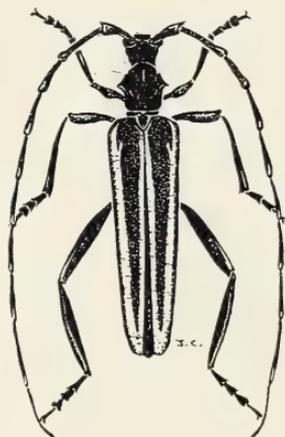
In the middle of October 1965 I found two larvae of the Cinnabar moth (*Callimorpha jacobaeae* Linn.) feeding on a Ragwort plant (*Senecio jacobaea* Linn.) in an open space in Wembley, Middlesex. They were not fully fed and I took them home. One died but the other pupated successfully. Unfortunately it did not emerge. Is such a late occurrence worth putting on record?

17.1.67.

D. Pitt-Pladdy (4050J).

●

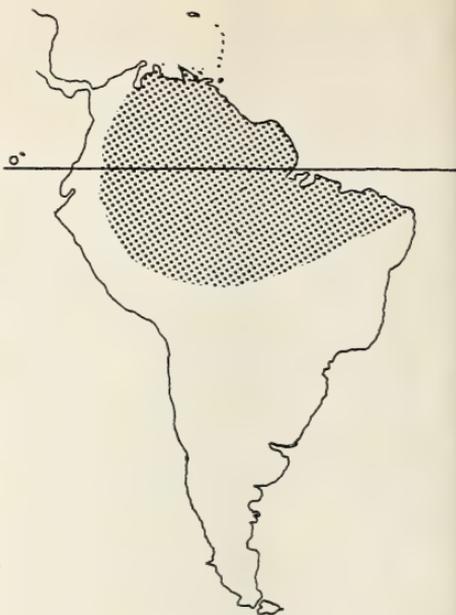
CALLICHROMA AURICOMA LINN.



CALLICHROMA AURICOMA (Linn)

Superfamily Phytophaga
Family Cerambycidae
Subfamily Cerambycinae
Genus *Callichroma* Latr.
Callichroma auricoma Linn. (= *Callichroma suturale* Fab.)

This beetle has been recorded from Brazil (Central and Para); Columbia (Bogota); Guyana; French Guiana; and Surinam. I would think it likely to be found in the Amazon Basin from the Atlantic Coast to the forested slopes of the Andes in Peru, and Venezuela.



Like most Cerambycid beetles the *Callichroma* larvae are wood-borers. The larvae of *C. auricoma* have *Ficus* spp. (fig) and *Neoxythece* (*Oxythece*) *ambelanifolia* Sandwith as their recorded hostplants.

The beetle is metallic green covered with dark grey pubescence. The legs, thorax and head are black covered with thick black pubescence. The elytra are metallic red with a stripe of metallic green and blue which is covered with thick black pubescence. When viewed directly from behind or from the front the red colouring changes to a pale metallic green. Where the pubescence has rubbed off patches of metallic blue-green show through.

The specimen from which the drawing was made was captured in Brazil (Para), at Obidos on the River Amazon.

I would like to thank Mr R. G. Adams of the Department of Entomology at the British Natural History Museum, South Kensington, for identifying the specimen illustrated and supplying the information.
16.4.67. Jonathan Cooter (3290J).

Worldwide Butterflies Ltd.

Our new address is:

Over Compton, Sherborne, Dorset

Our new showroom is:

21, Brighton Square, Brighton, Sussex

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

FOR ALL INFORMATION ON BEES

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mddx

Entomological Literature

CATALOGUES ON REQUEST

THE AMATEUR ENTOMOLOGIST

Originally an annual publication (the Journal of the AES), containing longer articles than the *Bulletin*. Now used as a serial title for the Society's Handbooks. Volumes in print are listed below.

8. Includes several leaflets that are now O.P.: **Collecting Dragonflies; Collecting Mosquitoes; Making Sweepnets**; an 8pp. list of standard books on entomology, etc. 48 pp., 32 figs., 6pl. **Price : 10s. 0d.**
9. **Practical Methods and Hints for Lepidopterists.** Contains articles on rearing and collecting larvae; illustrated instructions for making beating trays and cages for all entomological purposes. 42pp., 48 figs., 6 pl. **Price : 10s. 0d.**
10. Contains illustrated articles on **Collecting Lacewings; Drawing Insects; Collecting Caddises; Photography of Caterpillars**; etc. 40 pp., 10 figs., 12 pl., (Not many left). **Price : 12s. 0d.**
11. **A Coleopterist's Handbook.** Describes the tools and methods for collecting British beetles; their habitats, commensals and pre-adult stages; how to record, photograph, make a personal collection, and conduct a local survey. 120 pp., 50 figs., 20 pl. **Price each : 25s. 0d.**
12. **A Silkmoth Rearer's Handbook** (2nd edn.). How to breed 120 exotic species in Britain, including substitute foodplants and descriptions of stages. Systematic section refers to 1,400 species. Does not deal with the Mulberry Silkworm (*Bombyx mori*), q.v. Leaflet No. 3. 165 pp., 26 figs., 26 pl. (2 col.). **Price each : 30s. 0d.**

THE BULLETIN OF

THE AMATEUR ENTOMOLOGIST'S SOCIETY

(World List abbreviation : Bull. amat. Ent. Soc.)

Past numbers of the Bulletin contain a wealth of detail on aspects of breeding insects, collecting methods, making equipment, introductions to the less well-known Orders and reports of collecting in the British Isles and abroad. Much of this information is invaluable to new members and back volumes are available at the prices set out below. Each volume is complete with cover and index. Individual parts may also be purchased for Vols. 22 onwards.

Vol. 7 (1946 to 1948)	...	...	...	...	...	...	...	...	21s. 0d.
Annual volumes 8 (1949) to 24 (1965) per vol.	...	...	...	...	...	...	...	...	10s. 0d.
or for any two volumes	...	...	...	...	...	...	...	...	15s. 0d.
Annual volumes 25 (1966) onwards per vol.	...	...	...	...	...	...	...	...	25s. 0d.
Individual issues published in vols 22-24	...	...	...	...	...	...	each	...	4s. 0d.
Individual issues published vols 25 onwards	...	...	...	...	...	...	each	...	7s. 0d.

Silver Jubilee Number contains contributions by Honorary Members and past Presidents : The First 25 Years; Studying the Commoner Insects; Butterfly Botany; Communication Among Social Insects; Some Observations on Taxonomy; Distribution, Range and the British Fauna. 18pp. **2s. 0d.**

Special Issue, August 1965 contains "A Guide to and Local List of Insects in North-west Cornwall" by G. D. Trebilcock, and "Insect Migration", a review by C. B. Williams. 80pp. 6 maps. **8s. 0d.**

These publications are obtainable from AES Publications Agent, 137 Gleneldon Road, Streatham, London S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

LEAFLETS

Numbers not included are out-of-print or replaced by others.

	Price each
3. Rearing Silkworms. (The Mulberry Silkmoth). 4pp., 2 figs.	1s. 0d.
4. Collecting Sawflies. 12pp., (incl. 2pl.), 26 figs.	2s. 0d.
5. Collecting Flies (Diptera). 8pp., 1 fig., 8pl.	4s. 0d.
6. Collecting Beetles associated with Stored Food Products. 9pp., 6 figs., 3pl.	3s. 0d.
7. Some Improved Devices for Rearing Hymenoptera. 7pp., 3 figs.	2s. 0d.
9. Collecting Caddises. 5pp., 4pl.	2s. 0d.
10. Experiments with Bees. 12pp., 3 figs.	2s. 0d.
13. Collecting Microlepidoptera. 4pp., 1 fig.	1s. 0d.
14. Setting Microlepidoptera. 4pp., 5 figs.	1s. 0d.
15. Collecting Het-Bugs (Hemiptera-Heteroptera). 12pp., (incl. 2pl.), 5 figs.	3s. 0d.
18. Collecting Clearwings. 12pp., (incl. 2pl.), 4 figs.	2s. 0d.
20. Preserving Caterpillars. 14pp. (incl. 6pl.), 9 figs.	3s. 0d.
21. Collecting Psocoptera. 4pp., 10 figs.	1s. 0d.
22. Collecting Lacewings. 9pp., 8 figs., 5pl.	3s. 0d.
24. Entomology of Bird Pellets. 8pp., 4pl., 1 map.	2s. 0d.
25. Collecting Bumble Bees. 20pp., 83 figs.	5s. 0d.
26. Collecting Collembola. 6pp., 4 figs.	2s. 0d.
27. A Study of the Insects Living on the Wayfaring Tree. 20pp., 4 figs., 1 diagram.	3s. 0d.
28. Killing, Setting and Storing Butterflies and Moths. 13pp., 10 figs.	3s. 0d.

PAMPHLETS

4. Label List of British Macrolepidoptera. 32pp.	4s. 0d.
5. Check List of British Macrolepidoptera. 32pp.	1s. 8d.
6. Label List of British Butterflies. 2pp.	8d.
7. Directory of Natural History Societies. 155pp. published 1948, of considerable historical importance.	12s. 0d.
7a. First Supplement to Directory. 44pp. published 1949.	3s. 0d.
10. Glossary for the Young Lepidopterist. 6pp., 2 figs.	1s. 0d.
11. Label list of the Butterflies of North, Western and Southern Europe. Set in 10pt Times type.	8s. 0d.

Other Leaflets are in preparation

These publications are obtainable from AES Publications Agent, 137 Gleneldon Road, Streatham, London S.W.16, England. Do **not** send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.

THE AMATEUR ENTOMOLOGISTS' SOCIETY
ANNUAL EXHIBITION, 1967

SATURDAY, 7th OCTOBER

from 2 p.m. to 5.30 p.m.

HUGH MYDDELTON SECONDARY SCHOOL,
Corporation Row, London, E.C.1

ADMISSION FREE

EXHIBITS. The Hall will be open from 11.30 a.m. for receipt of exhibits. Bring along your specimens (any Order, living or set), equipment, apparatus, photographs, drawings, etc. If you require a large space, notify the Meetings Secretary in advance. Please label exhibits clearly.

DEMONSTRATIONS. Members will demonstrate setting of insects of several Orders.

GROUPS. Members of Groups who have been corresponding will be able to meet for discussion.

SURPLUS TABLE. If Members have spare ova, larvae, imagines, equipment, books, etc., for sale or exchange, bring them along labelled with name, price or exchange wants. No charge for use of this table.

ENTOMOLOGICAL TRADERS will be in attendance.

Light Refreshments will be available

Offers of help and enquiries to Hon. Meetings Secretary, B. F. Skinner, 85 Elder Road West Norwood, S.E.27. GIPsy Hill 0057.

BRING YOUR FRIENDS AND AN EXHIBIT !

To get there: Farringdon Station (Underground) connects with most main stations, and numerous buses serve the area. Cars may be parked in permitted areas of the School grounds.

Notice is hereby given that neither the Amateur Entomologists' Society nor the London County Council can accept any liability for damage to vehicles or property which are left in these grounds



VOL. 26

No. 277

•

NOVEMBER, 1967



**THE BULLETIN
OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

World List abbreviation : Bull. amat. Ent. Soc.

**EDITED by H. V. DANKS, B.Sc., A.R.C.S.,
F.R.E.S.**



OF GENERAL INTEREST

Let's Look at Forestry

A fascinating book on this absorbing subject. Describing the uses of timber, work of the forester, saw-mill processes, etc. Fully illustrated. Ivor Ewer. 9s. 6d. net.

Warne's Zig-Zag Books

Exceptional colour reproduction can be found in these four novel pull out format books. 48 colour studies of outstanding clarity plus notes. Quick, reliable reference. **Alpine Flowers 1 and 2: Fungi: Minerals.** 6s. 6d. net each.

Observer's Series

Pocket reference books that are little gold mines of information. Ideal for all naturalists for easy reference. Recently revised **POND LIFE** by John Clegg. 6s. net each.

The Wayside & Woodland Series

Standard works of reference renowned in the Naturalist World. Covering all branches of Natural History. Prices from 16s. net to 65s. net.

FREDERICK WARNE

1-4 Bedford Court, London, W.C.2.

BUTTERFLIES AND MOTHS

WORLDWIDE SELECTION OF PAPERED LEPIDOPTERA

Price List from:—

DOUGLAS E. DODWELL
28 SUMMERLEAZE PARK
YEOVIL, SOMERSET

AES NOTICE — where to write

Membership applications and first subscriptions to:

D. E. Dodwell, 28 Summerleaze Park, Yeovil, Somerset. Yeovil 3928.

Changes of address and non-arrival of Bulletins to:

P. Taylor, 18 Old Manor Drive, Isleworth, Middlesex.

Advertisers and for Prospectus of Society and Application forms to:

R. D. Hilliard, 18 Golf Close, Stanmore, Middlesex. GRImdsyke 0460.

Offers to lead field meetings, etc. to:

C. B. Pratt, 1 West Ham Lane, London, E.15

Manuscripts, drawings and books for review to:

H. V. Danks, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berkshire.

Subscription renewals (25/- per annum, 12/6 under 18 years) to:

B. R. Stallwood, 17 Claremont Avenue, Sunbury-on-Thames, Middlesex. Sunbury 2687.

Youth matters to:

H. J. Berman, St Ivo School, St Ives, Hunts.

Offers of help, queries, etc. to:

P. W. Cribb, 355 Hounslow Road, Hanworth, Feltham, Middlesex. FELtham 3099.

Annual exhibition matters to:

B. F. Skinner, 85 Elder Road, West Norwood, London, S.E.27. GIPsy Hill 0057.

Worldwide Butterflies Ltd.

Our new address is:

Over Compton, Sherborne, Dorset

Our new showroom is:

21, Brighton Square, Brighton, Sussex

L. CHRISTIE

**137, GLENELDON ROAD,
STREATHAM, LONDON, SW16**

(Postal Business only)

*New and Used
Entomological Equipment*

BEE RESEARCH ASSOCIATION

Woodside House, Chalfont Heights,
Gerrards Cross, Bucks.

F O R A L L I N F O R M A T I O N O N B E E S

E. W. CLASSEY LTD.

353 Hanworth Road, Hampton, Mddx

Entomological Literature

CATALOGUES ON REQUEST

The Amateur Entomologists' Society

Published August, 1966

PAMPHLET No. 11

A Label List of the Butterflies of North, Western & Southern Europe

Compiled by P. W. CRIBB

Listing 403 species and subspecies with up-to-date nomenclature and older synonyms. Suitable as a Label or Check List. Printed on white Bond paper, set in 10pt. Times type. Size 8 x 10in. Price 8/- per copy, postage extra at cost

From A.E.S. PUBLICATIONS AGENT,
137 Gleneldon Road, Streatham, London, S.W.16, England

Do NOT send any money with your order. An invoice will be sent with the publication

THE BULLETIN OF THE AMATEUR ENTOMOLOGIST'S SOCIETY

(World List abbreviation : Bull. amat. Ent. Soc.)

Past numbers of the Bulletin contain a wealth of detail on aspects of breeding insects, collecting methods, making equipment, introductions to the less well-known Orders and reports of collecting in the British Isles and abroad. Much of this information is invaluable to new members and back volumes are available at the prices set out below. Each volume is complete with cover and index. Individual parts may also be purchased for Vols. 22 onwards.

Vol. 7 (1946 to 1948)	21s. 0d.
Annual volumes 8 (1949) to 24 (1965) per vol.	10s. 0d.
or for any two volumes	15s. 0d.
Annual volumes 25 (1966) onwards per vol.	25s. 0d.
Individual issues published in vols 22-24 each	4s. 0d.
Individual issues published vols 25 onwards each	7s. 0d.

Silver Jubilee Number contains contributions by Honorary Members and past Presidents : The First 25 Years; Studying the Commoner Insects; Butterfly Botany; Communication Among Social Insects; Some Observations on Taxonomy; Distribution, Range and the British Fauna. 18pp. 2s. 0d.

Special Issue, August 1965 contains "A Guide to and Local List of Insects in North-west Cornwall" by G. D. Trebilcock, and "Insect Migration", a review by C. B. Williams. 80pp. 6 maps. 8s. 0d.

These publications are obtainable from AES Publications Agent, 137 Gleneldon Road, Streatham, London S.W.16, England. Do not send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.



EDITORIAL

The contents of this issue illustrate the gradual change in the character of the *Bulletin* that has taken place over the past few years: a change towards the longer articles which are possible in issues now much larger than they were prior to 1963.

In some respects this is a good thing: information in these longer articles will doubtless be found to have value for future reference beyond its initial usefulness. On the other hand the corresponding relative shortage of smaller articles is in striking contrast with the pre-1963 issues. Perhaps this is a natural development in the history of a publication such as ours. I would, however, urge Members not to hesitate to write in short notes or letters on any topic, for it is these which help towards a balanced magazine, and—by enabling many different subjects to be included in each issue—stimulate the immediate interest of readers of the *Bulletin*.

H. V. Danks (2907).

ADVISORY PANEL

Address change (omitted in error from the last published list of Advisers)

J. C. FELTON (Adviser on Aculeata) now at 'Beechcroft', 20 Gore Court Road, Sittingbourne, Kent.

COLLECTING NOTES
NOVEMBER 1967

The Smaller Moths

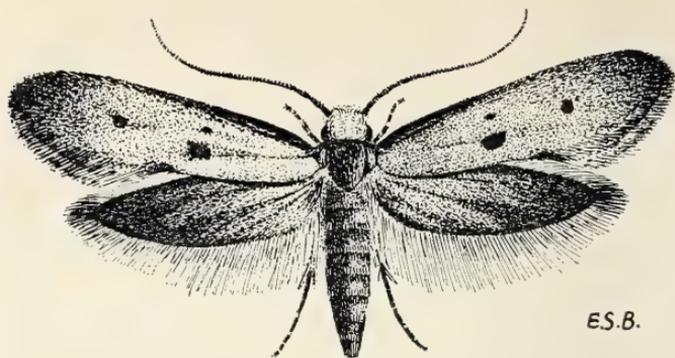
Tinea trinotella Thunb. (*lapella* Huebn.). Mr Bradford writes: "The head of this species is ochreous yellow. The forewings are of a yellowish straw colour, sprinkled with dark fuscous scales. The wings darken a bit towards the apex. There are three conspicuous darker spots, the largest one towards the inner margin. The hindwings are a greyish straw colour.

"I have bred numbers from birds' nests collected during the winter. This is the easiest way of getting perfect specimens for your collection. It is quite amazing, sometimes, the number you get from a couple of nests. I have also got *T. palescentella* Staint. from the same nest as *T. lapella*.

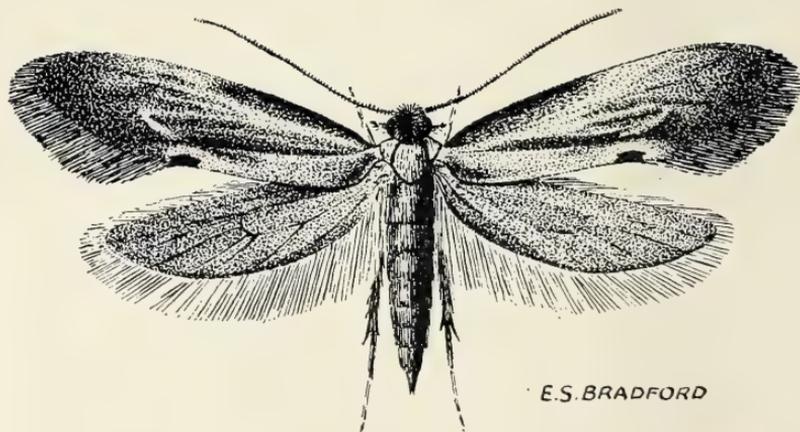
"The imago is on the wing from June till August." The August moths are a second brood. The spring moths sometimes emerge earlier than Mr Bradford's; some I bred last year came out between 2nd and 4th May.

Tinea semifulvella Haw. Mr Bradford's note reads as follows: "I have taken this moth on tree trunks at Farnborough and here at Borehamwood, Hertfordshire. The head is a coppery rust colour. The forewings are coppery rust, paler and yellowish towards the middle, with a darker streak on the inner costal edge and a black spot on the dorsum. The hindwings are darkish grey.

"I have not bred this, but according to literature it feeds on wool and can be found in birds' nests. The imago



Tinea trinotella Thunb.



Tinea semifulvella Haw.

flies in June and July.”

The entomologist should be inured to ridicule; so he need have no inhibitions about bird's-nesting in January. Besides the two species Mr Bradford has illustrated, Ford in his *Guide to the Smaller British Lepidoptera* enumerates five nidicolous species, namely *Monopis rusticella* Huebn. (probably the commonest of the group), *M. ferruginella* Huebn., *M. crocicapitella* Clem., *M. monachella* Huebn. and *Tinea piercella* Bentinck,

which is reputed to favour nests in holes in trees; a friend once gave me the old tits' (*Parus* spp.) nests from his nesting-boxes, but all I bred was *Endrosis sarcitrella* Linn. (*lactella* Schiff.)—a species, like Mr Bradford's *T. pallescentella*, not attributed to birds' nests by Ford. Nests presumably were the ancestral home of all the clothes moths. Nests constructed of moss, feathers, hair or wool—a Hedge-sparrow's (*Prunella modularis* Linn.) nest, for example—are almost

always productive, but I have drawn blank with Blackbirds' and Thrushes' (*Turdus* spp.) nests. I have bred *T. trinotella* even from a flimsy White-throat's (*Sylvia* sp.) nest. The larvae pupate in the nest and there is no need to enclose them until the imagines are due to emerge.

Several species of Nepticulids also offer field-work early in the winter. *Dechtiria argyropeza* Zell. feeds in the leaves of Aspen (*Populus tremula* Linn.). At first the larva mines the stalk but later debouches into the leaf itself, making a fan-shaped mine which widens as the larva works away from the base. It stays in the leaf after this has fallen, and the sector of the leaf ahead of the mine remains green, contrasting sharply with its yellow or black surroundings: thus leaves containing larvae are easy to find. Throw them into a large flowerpot containing an inch or two of earth and pebbles, cover it with a slice out of an old nylon stocking and place it in a sheltered spot in the garden. You may then forget about them until the beginning of May; I bred a series last year using this method, and the imagines began to emerge on the 9th of that month. Another batch in leaves which I wrapped in 'Kleenex' tissues failed miserably. How does this larva preserve for itself a green and succulent supply of food when the rest of the leaf turns colour? Apparently the withering of the leaves is a positive act on the part of the tree: it is caused, not by the failure of the supply of sap, but by the infusion of a killer substance by means of which the tree deliberately rids itself of its now unwanted foliage. *Argyropeza*'s mine intercepts the supply of this substance, and so its larder is preserved.

Two species of Nepticulid overwinter as pupae in their mines. *Fomoria septembrella* Staint. feeds in the leaves of St John's Wort (*Hyper-*

cum spp.) and is common almost everywhere; the open parts of woods are favourite habitats. The other species, *Dechtiria agrimoniae* Frey (*agrimoniella* H.-S.), seems to be confined to the North Downs in Surrey and Kent where, however, it is abundant. Its larvae feed in the leaves of Common Agrimony (*Agrimonia eupatoria* Linn.), often many to a leaf, and the pupae can be seen by holding them up to the light. In my experience the moths do not emerge until mid-June, rather later than the dates given by Meyrick (1928) and by Ford.

Both these species can be kept over winter by putting the mined leaves in a seed-box containing a little earth, and placing it in the garden. A lid is needed to prevent the leaves from blowing away; in order to ensure free ventilation, I raise the lid by placing it on slabs of wood and then weight it down with a brick. I occasionally remove the lid for a spell in calm, rainy days to give the leaves a good soaking. The same method may be used for overwintering leaves mined by the Lithocolletidae.

A. M. Emmet (1379).

REFERENCES

- FORD, L. T. (1949). *A Guide to the Smaller British Lepidoptera*. South London Ent. and Nat. Hist. Soc., London.
MEYRICK, E. (1928). *A Revised Handbook of British Lepidoptera*. Watkins and Doncaster, London.

The Hymenoptera Aculeata

In these notes for November 1966 (*Bull. amat. Ent. Soc.*, **25**: 114-6), I dealt with the British species of the Eumeninae, solitary members of the social-wasp family Vespidae. I gave there a key to genera, and now take up my promise to extend this to species, at least for the genera *Odynerus*, *Pseudepipona* and *Symmorphus*. The genus *Ancistrocerus* must await a further article.

Key to Species of the Genus *Odynerus*
Latreille

1. Head gradually narrowing behind the eyes in dorsal view. Spaces between the punctures of the mesonotum dull from the fine surface sculpturing. Male either with a spine each on cheek and mid-coxa, or with the mid-femur modified. Female with clypeus deeply emarginate as in the male (*Odynerus* s.str.) 2.
- Head swollen behind the eyes. Mesonotum shining between the punctures. Male with cheek, mid-coxa and mid-femur unmodified. Female (though not male) with clypeus only weakly emarginate (*Gymnomerus* Bluthgen)
laevipes (Shuckard).
2. Males 3.
- Females 6.
3. Mid-femur flattened and with two emarginations posteriorly so that it appears three-toothed. Cheek and mid-coxa simple 4.
- Mid-femur simple. Cheek and mid-coxa each with a ventrally directed spine 5.
4. Mid-femur with the central process between the two emarginations truncate apically. Internal mark on hind tibia black or dark reddish-brown. Head with long black hairs. Gastral bands yellow
spinipes (Linn.)
- Mid-femur with central process rounded apically. Internal mark on hind tibia light reddish-brown. Head with hairs white and short. Gastral bands yellowish-white
melanocephalus (Gmelin).
5. Spine on the cheek reddish-brown. Propodeum with two small lateral yellow spots. Six gastral yellow bands
reniformis (Gmelin).
- Spine on the cheek black. Propodeum unmarked. Five gastral yellow bands
simillimus (Morawitz).

6. Clypeus and metanotum without yellow markings 7.
- Clypeus with either a basal yellow band or a pair of lateral yellow spots. Metanotum with a yellow spot 8.
7. Gastral bands yellow. Scape and pedicel of antenna black beneath. Tarsi darkened basally and externally
spinipes (Linn.).
- Gastral bands yellowish-white. Scape and pedicel reddish-brown beneath. Tarsi reddish-brown
melanocephalus (Gmelin).
8. Clypeus with basal yellow band. Propodeum with large lateral yellow spots. Gastral bands yellow, expanded laterally
reniformis (Gmelin).
- Clypeus with two basal yellow spots. Propodeum unmarked. Gastral bands yellowish-white, linear
simillimus (Morawitz).

Key to Species of the Genus *Pseudepipona*
Saussure

1. Propodeum with an erect, tooth-like process dorso-laterally beneath the lateral margin of the metanotum. Predominant colour of tegula reddish-brown. Basal gastral segment black with an apical yellow band (*Euodynerus* Bluthgen)
quadrifasciatus (Fab.)
- Propodeum without such an erect lamina, but with a very faint indication of a transverse carina at about two thirds the height of the median carina. Predominant colour of tegula yellow. Basal gastral segment black marked with reddish-brown laterally and with an apical yellow band. (*Pseudepipona* s.str.)
herrichii Saussure.

Key to Species of the Genus *Symmorphus*
Wesmael

1. Males 2.
- Females 5.

2. Scape of antenna yellow-marked anteriorly. Hind tibia yellow with or without black internally and apically. 4 or 5 gastral yellow bands 3.
 — Scape black anteriorly. Hind tibia black, only ringed with yellow basally. 3 gastral yellow bands on tergites 1, 2 and 4 4.
3. Pronotal angles not produced, slightly receding. Hind tibia entirely yellow. Hind tarsus with basal 3 segments yellow, segments 4 and 5 darkened
 *crassicornis* (Panzer).
- Pronotal angles produced. Hind tibia yellow externally, black internally and apically. Hind tarsus with basal two segments yellowish-red, apical three segments darkened
 *elegans* (Wesmael).
4. The dorsal part of the mesothoracic episternum with punctures of two sizes, becoming very coarsely punctured posteriorly. Hind tarsus with the first segment yellowish-red
 *sinuatissimus* Richards.
- Dorsal part of mesothoracic episternum with a few punctures only of the larger size. Hind tarsus with first segment dark
 *bifasciatus* (Linn.).
5. Pronotal angles either rounded or markedly produced. Hind tibia either reddish-brown or yellow with black internally and apically. At least four gastral yellow bands 6.
 — Pronotal angles transverse. Hind tibia black ringed with yellow basally. Three gastral bands on tergites 1, 2 and 4 7.
6. Pronotal angles rounded. Hind tibia reddish-brown. Scape of antenna black anteriorly
 *crassicornis* (Panzer).
- Pronotal angles produced. Hind tibia yellow with black internally and apically. Scape yellow anteriorly
 *elegans* (Wesmael).
7. Dorsal part of mesothoracic episternum with two series of punctures. Mesothoracic epimeron with large punctures set closer than their width. Hind tarsus with the first segment reddish-brown *sinuatissimus* Richards.
- Dorsal part of mesothoracic episternum smooth and shining with very few medium-sized punctures. Mesothoracic epimeron smooth with a few scattered punctures. Hind tarsus with the first segment darkened
 *bifasciatus* (Linn.).

In the keys above I have used a rather conservative nomenclature as discussed in my previous article. I leave to a future article a key to the species of *Ancistrocerus* Wesmael, and hope to include also some notes on the distribution and habits of the various species.

I should at this stage like to acknowledge the help and encouragement given by Prof. O. W. Richards of Imperial College, London, during the work leading to the production of these keys, and in particular for access to his collection.

24.7.67. J. C. Felton (3740).

SCOTTISH ENTOMOLOGY 1966

Introduction

This year I am very pleased to include two new Orders in my report. Thanks to the co-operation of Jonathan Cooter, one of our most active Junior Members, and Brian Morrison, we now have considerably increased the scope of this article with some information on the Coleoptera and Tricoptera. I have also been able to make a list of the papers on Scottish entomology which can be found in British journals. This should

be extremely useful to those who might wish to pursue a particular subject in more detail than can be normally tackled in our own *Bulletin*.

I would still like to hear from someone who could contribute something about the 'other Orders' for these reports—particularly the more 'popular' groups like the Odonata, Hymenoptera, Diptera and Orthoptera. Anyone who has collected in Scotland this year (1967) I would urge to contribute to the 1967 report. I would also like to remind everyone else that any information on aspects of Scottish Entomology is always required and very much appreciated.

Once again I would like to thank Dr C. W. N. Holmes, Messrs R. A. French (and the Rothamsted Experimental Station), D. C. Hulme, J. Cooter, B. Morrison and E. Pickard, the Meteorological Office, and others who have helped in a smaller way.

Activities

At the time of writing, no field meetings have yet been arranged, but it is hoped that at least two outings will have taken place by the time this article is in print. A visit to the Loch Tummel/Kinloch Rannoch area in June might be a profitable outing while St Abbs Head on the East Coast of Scotland in July would probably be more convenient for those Members who stay in Edinburgh and the east coast. I will send out an invitation to all Scottish Members some time before the proposed date. Any suggestions for field meetings would be welcome.

A Butterfly Book

There has never been a book on the butterflies of Scotland and those on British Butterflies give a very inadequate coverage of the species and forms found north of the border. Most collectors who come north cannot fail to notice the striking

differences between our forms and the better known British types. Yet they rarely get more than a mention in even the standard reference books on our fauna. There is therefore a need for a small book on the butterflies of Scotland which would be comprehensive, up to date, accurate and inexpensive. It is here that a group of amateurs could work together to produce something concrete which would be of value as a reference work on our butterflies. I propose to collect information on the butterflies of Scotland and will send a card to each Member in Scotland which I would like him to complete and return. It would be most helpful if Members in other parts of the country who have collected in Scotland would get in touch with me and I will in turn send one of these cards to be completed. It is essential for the success of a venture such as this that 100% co-operation is received and I trust the generosity of our Members in this respect.

Weather

The year began very cold with snow and rain continuing through February until the 28th on which date improvement began to show. Early in March the wintry showers returned and it wasn't until the end of April that spring weather arrived. May was an average month weather-wise but with many heavy showers, though the month ended with a warm spell continuing into June with a temperature of 25 degrees here in Perthshire. The second half of June and July brought changeable weather, but with a fair share of sunshine. Apart from one day in the middle of the month and the last few days, August was miserably wet and September continued likewise though there was a warm spell towards the end. October was dry. *Table I* shows the relevant temperatures, rainfall and other records for 1966.

Table 1. The figures refer to all Scotland.
Temperature in degrees Centigrade.

	Air Temperature						% of Average	
	Highest Max.	Lowest Min.	Difference from Average				Rainfl.	Sunhrs.
			Max.	Min.	Mean	Rain Days		
January	12.2	-10.7	-0.8	0.0	-0.4	-6	51	63
February	12.8	- 8.0	-0.6	0.4	-0.1	+1	139	43
March	13.9	- 5.0	0.6	0.8	0.7	-1	60	107
April	19.4	- 6.7	-2.6	-1.4	-2.0	-3	81	91
May	23.6	- 3.5	-0.1	-0.5	-0.3	+2	131	106
June	24.4	1.7	0.0	1.4	0.7	+3	175	62
July	27.1	2.9	0.6	-1.3	-1.0	0	65	119
August	21.7	1.1	-1.4	-1.3	-1.3	-2	97	106
September	21.7	2.2	0.0	0.4	0.4	-2	89	78
October	16.7	- 3.4	-0.5	-0.8	-0.6	0	88	95

Lepidoptera—*Rhopalocera*

Records for the year are shown in Table 2. Scotland North refers to the area north of the Caledonian Canal, and Scotland South to the part south

of that line.

Perhaps the most significant occurrence in an otherwise very ordinary year was the massive immigration of the Nymphalidae—particularly of

Table 2.
Flight periods in weeks.

	Scotland North				Scotland South			
	first rcd.	last rcd.	flight period 1966	flight period 1965	first rcd.	last rcd.	flight period 1966	flight period 1965
PIERIDAE								
<i>Pieris brassicae</i> Linn.	—	—	—	15	20.6	24.8	8	—
<i>Pieris rapae</i> Linn. Gen. 1	—	—	—	—	16.5	(12.6)	—	11
Gen. 2	—	—	—	—	11.7	24.8	5	—
<i>Pieris napi</i> Linn. Gen. 1	—	—	—	16	23.5	30.8	13	16
<i>Anthocharis cardamines</i> Linn.	—	—	—	—	12.6	—	—	—
LYCAENIDAE								
<i>Callophrys rubi</i> Linn.	—	—	—	—	28.5	(29.5)	—	2
<i>Lycaena phlaeas</i> Linn.	—	—	—	—	12.6	22.8	9	—
<i>Polyommatus icarus</i> Rott.	—	—	—	3	1.7	25.8	6	8
<i>Aricia allous artaxerxes</i> Fab.	—	—	—	—	—	'early Sept.'	—	—
NYMPHALIDAE								
<i>Vanessa atalanta</i> Linn.	11.6	25.9	13	17	12.6	—	—	—
<i>Vanessa cardui</i> Linn.	12.5	25.9	13	—	11.6	20.8	10	—
<i>Aglais urticae</i> Linn.	16.4	25.9	—	—	15.4	25.8	—	—
<i>Clossiana selene</i> Schiff.	—	—	—	4	14.7	—	—	—
<i>Mesoacidalia charlotta</i> Haw.	19.7	27.8	2	—	14.7	—	—	—
SATYRIDAE								
<i>Eribia aethiops</i> Esp.	17.8	—	—	3	—	—	—	—
<i>Hipparchia semele</i> Linn.	—	—	—	—	23.7	—	—	—
<i>Maniola jurtina</i> Linn.	14.7	17.8	2	7	6.7	26.8	7	8
<i>Coenonympha pamphilus</i> Linn.	—	—	—	8	12.6	5.9	11	13
<i>Coenonympha tullia</i> Muell.	5.7	17.7	2	—	—	—	—	4

Vanessa cardui Linn. (Painted Lady). I had heard about arrivals in the south of England in May, but it was on 11th June that I saw the first specimens at North Berwick on the east coast. There were about half a dozen of these butterflies flying in a northerly direction and keeping very much to the coast. The next day a friend observed 'dozens' of *V. cardui* near St Andrews (Fife) some miles north and on the 21st of the same month I saw my very first specimen here in Dunblane. Though this is early for Scottish records of migrating *V. cardui*, it was observed by Mr J. L. Campbell on the Isle of Canna one month before—on 6th May! There is evidence too that these butterflies laid eggs, the adults from which emerged in the summer. I took one very fresh specimen on 12th August here in Dunblane which may well have been the offspring of that first specimen in June.

Though the records in the table are a bit sparse, it will be seen that the flight periods of all the species which can be calculated with any accuracy were shorter in 1966 than in 1965. *Polyommatus icarus* Rott. (Common Blue) was reduced from eight to six weeks of flight and *Coenonympha pamphilus* Linn. (Small Heath) which is usually a consistent species as far as emergence is concerned was cut from thirteen to eleven weeks. These records, I think, give a fair indication of the difference between the two years.

I have no record of any unusual varieties which were taken in 1966, but it seemed to be a year in which albinism in *Maniola jurtina* Linn. (Meadow Brown) was particularly prevalent. It has been suggested that these unusual white or light patches in that species are caused by dampness affecting the pupae, but this has yet to be confirmed. It might in fact turn out to be brought on by an infection to which the butterfly is particularly

susceptible—rather like the common cold in *Homo sapiens* Linn.

I found the second generation of *Pieris napi* Linn. (Green-veined White) much more common than in previous years. The second generation of this butterfly wanders much more than the spring brood and is, in fact, sometimes so widespread as to make it difficult to collect a good series. However conditions seemed to favour greater numbers in 1966.

The species of the *napi* group of the genus *Pieris* (*napi*, *bryoniae* Ochs., *nesis* Fruhst., *melete* Men., etc.) are particularly susceptible to environmental change which has not only led to a large number of specific and sub-specific forms developing, but has also led to a situation where a distinct species is hidden within the generally accepted form. For example, there is at the moment great confusion about the races of *P. napi* and those of the recently separated *Pieris bryoniae*, though much has been cleared up by the paper of Warren (1961). It has been found that all but one of the American types belong to *P. bryoniae* and not *P. napi* as was originally supposed. I must say at the outset that I have no real evidence to prove my case, but for some time now I have had doubts about the identity of the Scottish form of *P. napi*. Consider first that the species of *P. napi* and *P. bryoniae* are so variable that the marking on the wings are no real guide to identification. We find very light *P. bryoniae* and very dark *P. napi*. In Scotland the male appears to be dimorphic in the first generation, one form resembling the 'normal' generation first specimens with faint or no apical spot on the upperside forewings, while the other is barely distinguishable from the 'normal' second generation males having a very distinct apical spot. There are few intermediates. Even the female tends to show this dimorphism with a normal lighter form and an extremely

generously scaled variety which is dusky or even yellow in the ground colour. These occur too frequently to be aberrant, though such dimorphism in a species would not be sufficient to throw doubt upon its identity, but, coupled with the facts that—the first very dark specimens do not emerge until about three weeks after the normal specimens have been fully out; they overlap into the second brood in most years and then disappear; and that *P. napi* is far less common in the second brood than the first—it might be possible that the dark males and dusky or yellow females belong to a single brooded species or a very distinct form of *P. napi*. Fig. 1 shows the emergence times of the various broods and forms in Perthshire. Now, I repeat that I have no other evidence for this— anatomical or genetical—but it would be worth looking into.

MAY JUNE JULY AUG. SEPT.

Fig. 1. Emergence times of the two forms of *Pieris napi* Linn. in a normal year.
 solid line=typical double brooded *P. napi*.
 broken line=dark, (?) single brooded, form.

I would be interested to hear from anyone who has knowledge of *Pieris napi* and its forms in Scotland. Perhaps we have had *P. bryoniae* under our nose for years in the same way that *Aricia allous* Huebn. has existed under the name of *agestis artaxerxes* Fab. (The Brown Argus). Warren used the androconial scales of the male to separate the species and forms of the genus *Pieris*, and if anyone has a strong microscope and would be willing to help with this problem, I would be pleased to send him specimens for inspection.

Lepidoptera—Heterocera

Due to some complications which were not anticipated this important

section of our fauna will get only a brief mention here. It is hoped that next year this position will be changed.

The massive immigrations of *Plusia gamma* Linn. (Silver-Y Moth) which were in evidence throughout Scotland as in other parts of the country were probably the most significant occurrences in the year. The first record of *Plusia gamma* in 1966 which I have was on 3rd May by J. L. Campbell on the Island of Canna when two specimens were taken. The records there built up to a maximum on 31st May/1st June when these two nights produced forty-four specimens. The second wave built up to a maximum between 18th and 28th September when a total of 147 were recorded on the nine nights. The last record on Canna was on 23rd October.

Commander Harper's records at Newtonmore endorsed Mr Campbell's observations, but D. C. Hulme at Durness had even more striking results with a maximum of some 'thousands' of specimens on 31st May.

Mr Hulme's records were continued at Muir of Ord, Inverness-shire, where about one hundred specimens were recorded between 3rd and 11th September. The last record there was on 30th October. Fig. 2 shows the composite picture of the immigration of *Plusia gamma* in Scotland last year.

Other immigrant records were as follows:

Caradrinidae

Eurois occulta Linn.—10th and 13th August.

Apamea ypsilon Borkh.—8th June until 21st October.

Laphygma exigua Huebn.—8th June until 1st September; four on 14th June.

Geometridae

Nycterosea obstipata Fab.—22nd September.

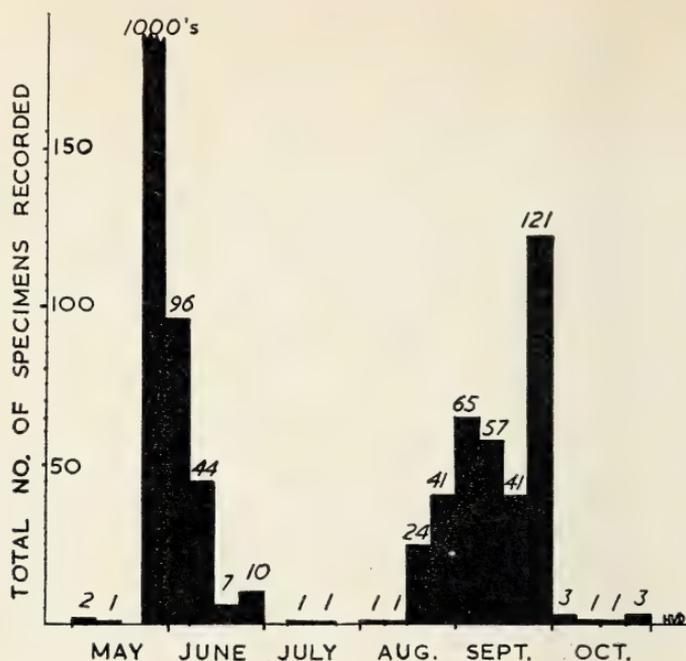


Fig. 2. Total number of *Plusia gamma* Linn. recorded at Canna, Durness, Newtonmore and Muir of Ord during 1966, by quarter months.

Pyralidae

Nomophila noctuella Schiff.—14th June until 28th September; 12 on 22nd September.

20.3.67. George Thomson (3689).

REFERENCE

WARREN, B. C. S. (1961). *Ent. Tidskr.*, 82: 121-48 (Stockholm). The Androconial Scales and their Bearing on the Question of Speciation in the Genus *Pieris* (Lepidoptera).

[To be continued in *Bull. amat. Ent. Soc.*, 27 (278), with sections on the Coleoptera and Trichoptera.]

BREEDING FOR REINFORCEMENT OF SPECIES

Mr P. R. Grey, writing in the May *Bulletin*, wonders whether the views expressed in my article, warning against breeding for reinforcement of species (*Bull. amat. Ent. Soc.*, 25: 126), are based on "definite evidence" or theory. I am not aware of any experiments carried out on the reinforcement of species—and this would be a

more involved undertaking than many Members appear to appreciate—but what I have said is based on what any biology student at school must know (not to mention many others!), the theory of evolution by natural selection of inherited characters (or "survival of the fittest")—nothing more elaborate than that. But Mr Grey's allusion to "survival of the fittest" is out of place, for he appears to be talking about the inheritance of acquired characters—a theory long discredited. Although it is no doubt true that most larvae reared in captivity are not kept under the most favourable conditions, it is clear that the point of rearing and releasing them is that one removes, or at least greatly reduces natural selection. Suppose that by some chance a captive breeding stock became better-adapted to rather unfavourable conditions in captivity, however. These insects would now be adapted to these conditions, and correspondingly still less well adapted to the

'wild' conditions, so that, if anything, they would show still poorer survival when released.

Mr Grey asks whether the species is *necessarily* weakened by being bred in captivity. If one accepts the normally-accepted theory of evolution by natural selection, the answer must definitely be 'yes', for it is the intensive natural selection which allows only those individuals which are best-adapted (and which will therefore produce the best-adapted offspring) to survive; to reduce selection is to allow the species to weaken, in terms of survival in the wild.

But this is where Mr D. Corke (also writing in the *May Bulletin*) comes in. He is in fact not arguing with my theory at all, so his reference to my "misunderstood genetics" is a little puzzling. What he says is that any weakening which does occur in the few captivity-bred generations just wouldn't notice. This is a valid point, and I should certainly stress that nobody in his right mind would pretend that, say, *one or two* captivity-bred generations were *necessarily* *detectably* weaker than the wild stock. But we need to know much more about this before attempting to interfere with the wild populations in the way proposed. Mr Corke's figures are pure speculation, and presumably completely unfounded—he doesn't indicate otherwise—but let us take his argument at its face value. [To be fair, not completely unfounded and giving a clear representation from such data as we have at present—Ed.]. He says that breeding one or two generations of butterflies for release will *hardly* (my italics) affect the genetics of the population at all. Well, if the wild population is already on the decline, what is the use of releasing "hardly"-weakened stock to "reinforce" them? One thing is clear: if you don't *know why* a wild population is declining you are in no position to adapt your captive

stock to resist the adverse pressure. Why not find the cause of the decline and remove it? Surely the only sound policy?

Mr Corke advocates reinforcing wild populations that have suffered disasters, but it is interesting that he doesn't say anything about the more steady decline in insect populations, which is what most of the 'breeders' appear to wish to tackle.

If a population suffers from a spell of bad weather, it will undoubtedly recover, unless it cannot adapt to a long-term climatic change (in which case there is nothing we can do to prevent extinction). After all, we have had about every extreme of weather imaginable for this country, even during this century, and each species *has* had year-to-year population fluctuations, sometimes on a large scale, yet each is still with us. Misuse of a farmer's chemical spray is given as another example of a population disaster which could justify "reinforcement." Well, rather more to the point, if we entomologists don't wake up soon and do something to prevent such disasters from occurring, we shan't have any wild populations to reinforce. So why spend time on measures of unproved and (to put it politely) theoretically dubious value when you could be working with others in the appropriate organisations to remove the cause of the population disasters? And the same goes for "reinforcement" of populations in general decline.

It has been put to me, by one Member, that, rather than condemn population "reinforcement," one should seek the co-operation of 'breeders' in various parts of the country with a view to carrying out more or less controlled experiments, in several parts of the country, to examine the effects of "reinforcement" on the wild populations, presumably with a view to extending the

practice. The difficulties in such a proposition are enormous: I cannot see how meaningful controls can be worked, as no two populations, or even parts of one population, are necessarily subject to the same changes in external factors, and any such experiments must extend over an indefinite, very long period (a human lifetime is peanuts in evolutionary terms), for if a population is "hardly" affected by "reinforcement", any effects may not show for a very long time—and so it goes on; and yet one could have spent that time working to remove, or perhaps more realistically, to restrict, the main cause of the population decline, which is presumably the destruction of habitats and the dispersal of harmful chemicals by Man.

Let's not waste energy now in outbursts against "Victorian era collectors", but concentrate on working through our naturalists' organisations—both local and national—for an intensive study of our insect populations, together with a concerted attempt to save our fauna, flora, and their habitats. If we fail in this there will be no wild populations to "reinforce", let alone collect from, and there would eventually be no suitable habitats on which even to attempt re-introduction from our breeding stocks. If we are too late now to prevent this situation we have only ourselves to blame. There is no short cut to conservation: we must find out what are the stresses on our insect populations and work to remove or restrict them. Would you settle for less?

9.7.67. P. A. Goddard (2206).

what we are doing in this respect because of the still exceedingly scanty information which has accumulated on the ecology of the species which interest us.

It may be difficult to see what harm can come from the reinforcement of a local population, temporarily depleted from a cause such as trampling of the habitat, when otherwise the colony in question might be destroyed entirely: though the purist might argue that things should be left exactly as they are and if the colony disappears then that is the natural result of all the factors to which it has been exposed.

As to the wholesale release of insects by the 'breeders' referred to in the article above, this is a much more serious question, and one where the majority of people, and ecologists in particular, would probably incline to the following view: that if in doubt leave well alone and study the population thoroughly before contemplating action. Any such study is an immense undertaking, and I personally fear that (as things stand at present) our knowledge of insect populations will not grow fast enough to enable us to combat the effects on the countryside of man's 'civilisation'. Economic considerations—if of any importance—*always* at the moment take precedence over aesthetic ones. It is therefore more than ever essential, as Mr Goddard has indicated, that *everyone* with any interest at all in these matters should actively support the local and national conservation bodies concerned with these sort of considerations.—*Editor.*]



THE STUDY OF SPIDERS

Part VI

In my previous article in this series I said that I would tell you about the

[The advisability of the 'putting down' of laboratory-reared insects to reinforce wild populations (always of Lepidoptera) has long been a point of controversy amongst entomologists: and we are indeed in the position—as Mr Goddard says—of not knowing

crab spiders, or Thomisidae, which are very different from the lively Salticidae. The crab spiders are the slowest-moving of all spiders, and for this reason are easy to capture; but this is offset by the fact that a good many of our thirty-eight species are rarities, or at least restricted in distribution.

In an article such as this it is, of course, quite impossible for me to describe all of them; such an interesting group can well deserve a book to itself. I shall start with the species which are the commonest and therefore likely to come your way during your first season.

The genus *Xysticus*, which has twelve species, is rather confusing to the novice, as so many of the species are superficially very similar in appearance. All the spiders of this genus are prettily marked with brownish or greyish spots or stripes arranged in patterns on a cream or tan background, and some of the species are of reasonably large size. The commonest of all the crab spiders is *Xysticus cristatus* Clerck (6-7 mm), which commonly turns up in long grass, though I have sometimes beaten it from the lower branches of trees, and I have also found it hibernating under bark in winter. It shows a distinct preference for wooded areas, though not necessarily only large woods; parkland with well-spaced trees is a favourite habitat, while our school grounds always produced specimens whenever I looked for it.

Xysticus lanio C.L.Koch (6-7 mm) is a somewhat similar spider which is more or less restricted to heather patches in heathy country. It is also much more reddish-brown in colouring than its relatives. Some authorities say that it occurs in the lower branches of trees, but I have never found it myself in such situations.

Quite the most beautiful of the *Xysticus* species is *Xysticus ulmi* Hahn (5-7 mm). The spider is a rarity

which is found only in marshy or swampy situations, and Wicken Fen is a noted locality for it. I have found it on almost every occasion when I have visited Wicken, in every case finding it among the coarse grass-tufts, where it is very well camouflaged by its rich chocolate-brown colouring, which exactly matches the colour of the peat. The edges of the abdomen are quite a bright yellow, which blends equally well with the pale straw colour of the bases of the grass-stems. Knowing how rare this spider is, I have never forgotten the thrill of first finding it, since when I have found it every year in various stages from young to adult. I have never found it anywhere else but at Wicken.

A larger example of this genus which may come your way is a denizen of sandy areas, and is, appropriately enough, known as *Xysticus sabulosus* Hahn (8-9 mm). Larger than the species previously described, it is equally efficient at camouflaging itself, as its body colouring matches its sandy environment.

A closely-related genus is *Philodromus*, which contains nine species. The commonest one is *Philodromus aureolus* Clerck (5-7 mm), which is easily distinguished by the presence of iridescent hairs on the abdomen, giving it a metallic, shiny appearance. Another very closely-related spider is *Philodromus dispar* Walck. (4-5mm). This is another common *Philodromus* species, but it is more abundant in the southern part of the country. This is one of the species which exhibits sexual dimorphism, which is another way of saying that the male and the female are different in appearance and colouring. The female is a pale biscuit-colour, with a cream-coloured wedge-shaped folium, which is occasionally bordered with darker spots. The male, on the other hand, is a dark brown all over, with a deeper blackish-brown folium on the

abdomen. There are also a few short iridescent hairs.

Another very pretty spider is *Philodromus histrio* Latr. (6-7 mm) which, like *Xysticus lanio*, is more or less confined to heathery localities. Although rare, it is widespread, and a systematic search of heather clumps is not unlikely to go unrewarded for long.

All these spiders inhabit long grass and low vegetation, where they lurk in wait for their prey. Like Salticids, the Thomisidae do not spin webs; while Salticids actively pursue their prey by leaps and bounds, crab spiders are content to lead a more leisurely existence, and bide their time until their prey comes to them! Protected by their similarity to their background, they are invisible as they sit motionless among the stems of low-growing plants, and it is very difficult to see them at all until they start moving.

An interesting point is that while collecting during the winter months I have frequently found species of both *Philodromus* and *Xysticus* hibernating under bark four or five feet above ground level. This would seem to imply that these spiders—or at least some of them—tend to move upwards to find a more sheltered position to enable them to withstand the rigours of the English winter.

Oxyptila is a genus of smaller crab spiders averaging from 3 to 6 mm, which mainly inhabit moss and ground-level vegetation, though here again I have found two species of this genus under bark about three or four feet above the ground. This was, however, not in winter but in mid-spring in the daytime, which leads me to suspect that these spiders may be nocturnal in habit, seeking their prey after dark, when they would descend into the undergrowth. These spiders are very sluggish and are easily captured. Only one species can be called common; this is *Oxyptila trux*

Blackwall (4-5 mm), which is pale brown in colour with broken black or dark brown markings. The legs are pale yellow and do not bear the darker stripes and spots which characterise the other eight members of the genus.

No description of the Thomisids would be complete without mention of three of our most attractive spiders. *Diaea dorsata* Fab. (6-7 mm) is a vivid translucent green all over, except for the brilliant chrome yellow abdomen, bearing a light brown dorsal folium. This is one of the largest in the group, and is said to be found more frequently in the South than elsewhere; although alleged to be scarce in the northern and midland counties, I have taken this species in Salcey Forest in Northamptonshire. This was a first record for the county, but subsequent intensive searches have so far failed to reveal any further specimens.

Beating the lower branches of young oak saplings (*Quercus* spp.), preferably along the edges of rides or clearings in large woods, is the method most likely to yield this species. The date when my specimen was found was 16th May 1965, so I presume that the middle of May is about the best time to look for it. I guarantee that the first time you find this beautiful spider will be a thrill you will never forget.

Misumena vatia Clerck (10-11 mm) is best known for its ability to change colour to match its surroundings, rather like the chameleon. Sunny meadowland and hedgerows are the best places to look for it, and to find it you should look among the blooms of Gorse (*Ulex europaeus* Linn.), Broom (*Sarothamus scoparius* (Linn.) Koch), Ragwort (*Senecio jacobaea* Linn.), and Mullein (*Verbascum thapsus* Linn.).

Interesting experiments can be easily carried out with this species. If found on a white flower the body

colouring will be white. Place the spider on a yellow bloom, and within a couple of days the spider will be yellow. It is noteworthy that *Misumenavatia* is found only on white or yellow flowers, and if removed from one to the other will automatically adapt itself so as to blend with the new background. This process takes anything from 48 to 72 hours.

What, you may ask, happens if this spider is placed on a blue or a pink flower? It just walks off them!

Thomisus onustus Walck. (6-7 mm) is impossible to mistake for any other member of the group—that is, if you are lucky enough to find it! It is one of the rarest of the Thomisids, which is a great pity, as it is an exceedingly beautiful spider. It has a very characteristic triangular-shaped abdomen, and can be either white or pink in colour. It has been recorded only from the southern counties, where it normally prefers heathery localities and stays among the heather blooms lying in wait for its prey.

Last but not least in this exciting group we have two spiders very similar in appearance, which are found exclusively among grass clumps. The spiders are *Tibellus oblongus* Walck. (10 mm) and its more local relative *Tibellus maritimus* Menge (10 mm). Both species have narrow elongated straw-coloured bodies, which blend imperceptibly among the pale yellow bases of the grass-stems, along which they sit or walk lengthways in a characteristic attitude with the first two pairs of legs extended forward and the last two pairs backward. In this way they are very difficult to see, but once they have been disturbed they can move with surprising rapidity, and are certainly the fastest-moving of the Thomisids. In both species the abdomen bears dark brown longitudinal stripes but the second-named species can be distinguished from its commoner relative by a row of dark brown spots

situated laterally along the outermost of the central stripes. Both species affect damp, marshy situations, and I have found both of them at Wicken, though *Tibellus oblongus* is certainly the commoner of the two.

Finally mention must be made of a species very closely related to *Tibellus*: this is *Thanatus striatus* C.L.Koch (4-5 mm). I found this for the first time this year in May at Wicken. The male has never yet been found in this country, and even the females are extremely hard to come by. The spider is unmistakable, and is light yellowish brown with a sharply-defined pattern of dark brown markings and black hairs along the sides. The legs, too, are closely covered with black hairs.

It is certainly odd that females have turned up at reasonable intervals since 1845 but that no males have been discovered. It is a well known fact that in many species of spiders females seem to occur in greater abundance, but even so, allowing for this trend, one finds such a phenomenon hard to understand, since spiders, unlike aphids, are not parthenogenetic!

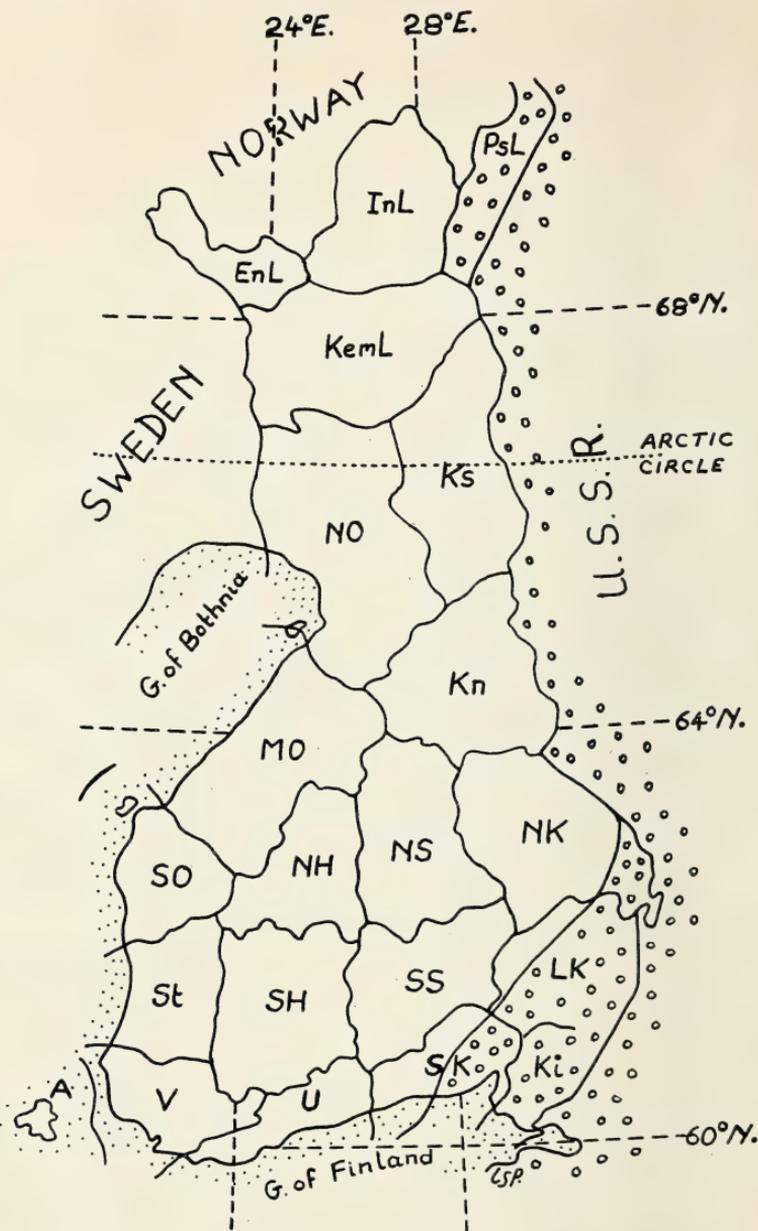
Although a good many members of this group will take some finding, the diligent search which you will need to conduct will be very rewarding and will provide you with material for many months' study. It is likely that species of this family will come to your notice rather later than sooner, but do not let this deter you: you will appreciate them all the more!

Good hunting!

Joy O. I. Spoczynska,
F.R.E.S., F.Z.S. (751).

DISTRIBUTION OF FINNISH INSECTS—I: BUTTERFLIES Part One

The distribution of insects is a



The natural historical divisions of Finland.

Key: (Names as far as possible in English)

A Ahvenanmaa (Aland)

V Finland proper

U Uusimaa

SK South-Karjala

Ki Karjala isthmus

St Satakunta

SH South-Hame

SS South-Savo

LK Laatokan Karjala

SO South-Ostrobothnia

NH North-Hame

NS North-Savo

NK North-Karjala

MO Middle-Ostrobothnia

Kn Kainuu

NO North-Ostrobothnia

Ks Kuusamo

KemL Kemi Lapland

EnL Enontekio Lapland

InL Inari Lapland

PsL Petsamo Lapland

facet of entomology with which we become concerned from the time we try to identify our first insect by means of a handbook. Reliable information on the distribution of British species, if not on the factors controlling their range, is not these days hard to come by. In Finland however, the fauna is considerably less well documented and there are far fewer individuals helping in one way or another to fill the gaps. Most pocket-books are written in Finnish and are not generally available in Britain. Thus, I thought that I might usefully pass on to other Members my own notes made from information available 'on the spot'.

It is interesting to note that, notwithstanding its northerly situation, Finland has provided habitats for approximately 105 species of butterflies. Some of these, of course, are immigrants, whilst the distribution of certain other species is somewhat obscure. The total number of different species recorded from the Northern countries in general appears to be in the region of 130, though again this

figure is somewhat flexible.

It is generally accepted that butterfly species become increasingly less numerous the farther north we go. That this broad principle applies in Finland can be seen from *Graph 1*, in which the areas marked on the map have been arranged into what, for want of another term, I have called "Latitude Blocks", the blocks or bands roughly approximating to lines of Latitude. (p.123).

Families Satyridae, Nymphalidae and Papilionidae

In designating species I have adhered to Gullander's system (see ref.), his book being the most recent publication (1959) for the identification of butterflies. Where a different specific name has been employed by Pulkkinen (1956), this is indicated in the notes. *Tables 1, 2, and 3* present a summarised version of the general distribution of species according to Gullander and Pulkkinen. Where only one author has established the presence of a species in a particular area, this is indicated by a question-mark.

Table 1. Distribution in the Satyridae

	A	V	D	SK	Ki	St	SH	SS	LK	SO	NH	NS	NK	MO	Kn	NO	Ks	Kem	L	EnL	InL
<i>C. pamphilus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>C. tullia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>E. ligea</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	?	x
<i>E. embla</i>	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>P. petropolitana</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-
<i>O. jutta</i>	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-
<i>A. hyperanthus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-
<i>C. iphis</i>	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-
<i>P. maera</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-
<i>P. aegeria</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-
<i>P. megera</i>	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>M. jurtina</i>	x	x	x	x	x	x	x	x	x	x	-	-	x	x	-	-	-	-	-	-	-
<i>H. semele</i>	x	x	x	x	x	x	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-
<i>H. Lycaon</i>	x	x	x	x	x	-	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. achine</i>	-	x	x	x	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>E. euryale</i>	-	-	-	-	-	-	-	-	x	-	-	-	x	-	-	-	-	-	-	-	-
<i>C. hero</i>	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>C. arcania</i>	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>E. pandrose</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x
<i>E. disa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x
<i>O. norna</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x
<i>O. bore</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x	x
<i>E. medusa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total in area :	11	15	15	15	14	12	13	13	14	12	10	10	12	10	8	9	9	10	10	8	9
Total in block :				17				15				13		10		10		10			9

Table 2. Distribution in the Nymphalidae

	A	V	J	SK	KI	St	SH	SS	LK	SO	NH	NS	NK	MO	Kn	NO	Ks	Kenn L	EnL	InL
<i>A. aglaia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. eunomia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. selene</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. euphrosyne</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. sifanica</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. urticae</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>N. antiopa</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>V. cardui</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. freija</i>	?	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>A. frigga</i>	?	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>M. athalia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	?	x	x
<i>V. atalanta</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	?	-
<i>L. populi</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-
<i>N. polychloros</i>	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>P. c-album</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	-	-
<i>A. lathonia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	-	-
<i>A. ino</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	-	-
<i>E. maturna</i>	-	x	x	x	x	x	x	x	x	x	x	x	x	-	x	-	-	-	-	-
<i>A. paphia</i>	x	x	x	x	x	x	x	x	x	-	-	x	x	x	-	-	-	-	-	-
<i>A. cydippe</i>	x	x	x	x	x	x	x	x	x	x	-	-	x	x	-	-	-	-	-	-
<i>N. io</i>	x	x	x	x	x	x	x	x	x	x	-	-	x	-	-	-	-	-	-	-
<i>A. amathusia</i>	-	x	x	x	-	x	x	x	x	-	-	x	x	-	-	-	-	-	-	-
<i>A. niobe</i>	x	x	x	x	x	x	x	x	x	x	x	-	x	-	-	-	-	-	-	-
<i>P. vau-album</i>	-	-	x	x	?	-	x	x	-	-	x	x	-	-	-	-	-	-	-	-
<i>A. laodice</i>	-	x	x	x	?	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-
<i>E. aurinia</i>	-	x	x	x	-	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-
<i>M. dictynna</i>	-	?	?	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>M. cinxia</i>	x	x	-	x	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>N. xanthomelas</i>	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>A. Iris</i>	?	x	x	x	?	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-
<i>A. thore</i>	-	-	-	-	-	-	-	-	x	-	-	-	-	?	-	-	-	-	x	x
<i>A. polaris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x
<i>A. chariclea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x
<i>E. iduna</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x
<i>A. pales</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	x
<i>A. improba</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	x	-
Total in area:	23	29	29	27	25	24	25	25	24	20	19	20	23	18	17	16	11	18	18	16
Total in block:			30				28				24			19		16		18		18

Table 3. Distribution in the Papilionidae

<i>P. machaon</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>P. apollo</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x	-	-	-	-	-
<i>P. mnemosyne</i>	x	x	x	x	x	x	x	-	x	-	-	-	-	-	-	-	-	-	-	-
Total in area:	3	3	3	3	3	3	3	2	3	2	2	2	2	1	2	1	1	1	1	1
Total in block:			3				3				2			2		1		1		1

It will be noted that species are listed in the tables in the following fashion:

Generally-distributed species.

Species occurring in southern areas.

Species with 'patchy' distribution.

Fam. Satyridae

Pararge aegeria Linn.

ssp. *egerides* Stgr.

Lasiommata megera Linn.

L. petropolitana Fab.

(=*hieria* Fab.)

Habitat

Conif. and decid. woods.

Rare in open dry places.

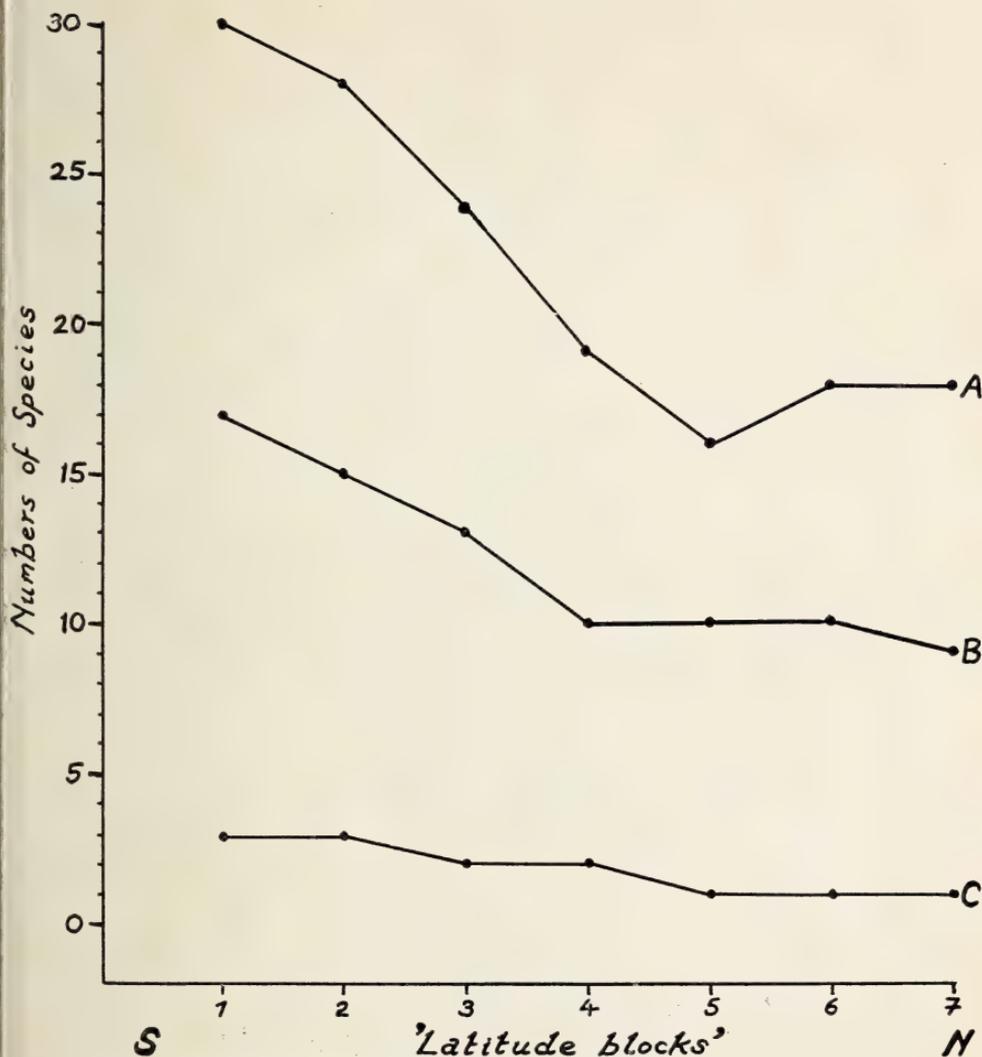
Dry, rocky and wooded country.

On wing

June-Jul

June-Jul

May-Jun



Graph 1: South-North decline in numbers of different species.

- A: Nymphalidae (36 species).
- B: Satyridae (23 species).
- C: Papilionidae (3 species).

- Latitude blocks
- 1: A V U SK Ki
 - 2: St SH SS LK
 - 3: SO NH NS NK
 - 4: MO Kn
 - 5: NO Ks
 - 6: KemL
 - 7: EnL InL

<i>L. maera</i> Linn.	Meadows and woods.	Jun-Aug
<i>Lopinga achine</i> Scop.	Shady woods.	Jun-Jul
<i>Erebia pandrose</i> Bkh.		
ssp. <i>lappona</i> Thnbg.	Fells in birch zone.	Jun-Jul
<i>E. medusa</i> Schiff.		
ssp. <i>polaris</i> Stgr.	Rare on fells and river meadows.	Jul-Aug
<i>E. embla</i> Thnbg.	Backwoods and marshes.	Jun-Jul

<i>E. disa</i> Thnbg.	Birch-zone marshes.	Jun-Jul
<i>E. euryale</i> Esp.	(Nowadays behind the border).	Jul-Aug
ssp. <i>euryaloides</i> Tngstr.	Woodlands.	
<i>E. ligea</i> Linn.	Woods and road verges.	Jul-Aug
and ssp. <i>petsamoensis</i> Lgbl.	In birch zone.	
<i>Oeneis jutta</i> Hb.	Pine-swamps. 2 yr life-cycle.	Jun-Jul
<i>O. norna</i> Thnbg.	Both dry and damp country.	Jun-Jul
<i>O. bore</i> Schn.	Rare in fell heathlands and grassy river beaches.	Jun-Jul
<i>Hipparchia semele</i> Linn.	Dry country.	Jul-Aug
<i>Aphantopus hyperanthus</i> Linn.	Meadows and woods.	Jul-Aug
<i>Maniola jurtina</i> Linn.	Meadows and woods.	Jul-Aug
<i>Hyponephele lycaon</i> Rott.	Dry country (prob. already ext.)	July
<i>Coenonympha hero</i> Linn.	Damp meadows and woods. (Nowadays behind the border).	Jun-Jul
<i>C. iphis</i> Schiff.	Damp beach- and woodland-meadows.	Jun-Jul
<i>C. arcania</i> Linn.	Meadows and decid. woods. (Nowadays behind the border).	Jun-Aug
<i>C. pamphilus</i> Linn.	Meadowland.	Jun-Aug
<i>C. tullia</i> Mull. (= <i>tiphon</i> Rott.)	Open swamps and damp meadows.	Jun-Aug
ssp. <i>isis</i> Thnbg.		
ssp. <i>muonioensis</i> Lgbl.	Northern ssp.	
Fam. Nymphalidae		
<i>Argynnis paphia</i> Linn.	Woodland meadows.	Jul-Aug
<i>A. lathonia</i> Linn.	Fields and woods.	1st: May-Jun 2nd: Aug-Sep
<i>A. aglaia</i> Linn.	Meadows and woodlands.	Jul-Aug
<i>A. cydippe</i> Linn.	Meadows and woodlands.	Jul-Aug
<i>A. niobe</i> Linn.	Wooded country.	Jul-Aug
<i>A. laodice</i> Pall.	Rare, in meadows.	Jul-Aug
<i>A. ino</i> Rott.	Damp meadows.	Jul-Aug
<i>A. eunomia</i> Esp. (= <i>aphirape</i> Hb.)		
ssp. <i>ossianus</i> Hbst.	Marshes.	Jun-Jul
<i>A. selene</i> Schiff.	Meadowland.	1st: Jun-Jul
and ssp. <i>bela</i> Stgr.	Northern ssp.	2nd: Aug
<i>A. euphrosyne</i> Linn.	Swamps and meadows; partial to <i>Ledum palustre</i> flowers.	Jun-Jul
—ssp. <i>lapponica</i> Esp.	Northern ssp.	
—ssp. <i>septentrionalis</i> Nordstr.	Lappish ssp.	
<i>A. freija</i> Thnbg.	Swampland.	In south: May In north: Jun-Jul
<i>A. polaris</i> Boisd.	Rare, on fell-slopes.	Jun-Jul
<i>A. chariclea</i> Schneid.	Rare, on fell-heaths.	Jun-Jul
<i>A. thore</i> Hb.	Stream-copses.	July
—ssp. <i>scandinavica</i> Rygge.	Northern ssp.	
—ssp. <i>carelia</i> Valle.	In NK and LK.	
<i>A. amathusia</i> Esp.		
—ssp. <i>rossica</i> Hemm.	Copse-meadows.	Jul-Aug

<i>A. frigga</i> Thnbg. and ssp. <i>australis</i> Lgbl.	Marshes. Southern ssp.	Jun-Jul
<i>A. improba</i> Btlr. —ssp. <i>improbula</i> Bryk.	Rare, on fell-heaths.	July
<i>A. pales</i> Schiff. —ssp. <i>lapponica</i> Stgr.	Fell-lands.	July
<i>A. sifanica</i> Gr-gr. —ssp. <i>aquilonaris</i> Stich. (= <i>A. pales arsilache</i> Esp.)	Damp country.	Jul-Aug
<i>Euphydryas iduna</i> Dalm. <i>E. matura</i> Linn. —ssp. <i>staudingeri</i> Wnuk.	In birch-zone. Woodland meadows.	July Jun-Jul
<i>E. aurinia</i> Rott. <i>Melitaea cinxia</i> Linn. (<i>M. didyma</i> Esp.)	Meadows. Meadows. Found only once : 15.7.36 Impilahti, in LK.)	June Jun-Jul
<i>M. dictynna</i> Esp. <i>M. athalia</i> Rott. —ssp. <i>lachares</i> Fruhst. —ssp. <i>scandinavica</i> Stgr.	Damp woodland meadows. Meadows. Southern ssp. Northern ssp.	Jun-Jul Jun-Jul
<i>Polygonia c-album</i> Linn. <i>P. vau-album</i> Schiff. <i>Aglais urticae</i> Linn. and ssp. <i>polaris</i> Stgr.	Wood borders and gardens. Accid. eastern immigrant. Cultivated areas.	May-Sep May-Sep May-Sep
<i>Nymphalis polychloros</i> Linn.	Northern ssp. Rare, in cultivated areas.	May-Jun Aug-Sep
<i>N. xanthomelas</i> Esp.	Eastern immigrant. Hibernates (Gullander).	May Jul-Aug
<i>N. antiopa</i> Linn.	Decid. woods and borders.	May-Jun Aug-Sep
<i>N. io</i> Linn.	Generally accidental immig. except to A. Hibernates.	May Jul-Sep
<i>Vanessa cardui</i> Linn.	Accidental immigrant. Does not hibernate.	Jun-Aug
<i>V. atalanta</i> Linn.	Accidental immigrant.	Occ: Jun Aug-Sep
<i>Limenitis populi</i> Linn. <i>Apatura iris</i> Linn.	Wood borders, highways. Rare, in decid. woods.	July July
Fam. Papilionidae		
<i>Papilio machaon</i> Linn.	Meadows, wood borders, river banks, lake shores.	Jun-Aug
<i>Parnassius apollo</i> Linn.	Rocky country, especially lake shores.	Jun-Aug
—ssp. <i>fennoscandicus</i> Bryk. —ssp. <i>finmarchicus</i> Rotsch. —ssp. <i>carelius</i> Bryk.	South-western ssp. U. Eastern ssp.	
<i>P. mnemosyne</i> Linn. —ssp. <i>ugrofennica</i> Bryk. —ssp. <i>perkele</i> Bryk. —ssp. <i>karjala</i> Bryk.	Copse-meadows. A. U. Eastern ssp.	Jun-Jul

The distribution of insects in Finland is of interest because they inhabit a country with one third of its length lying beyond the Arctic circle. Because of its great length from north to south, variations in climate are quite large. Mean annual temperatures vary from $+5^{\circ}\text{C}$. in Ahvenanmaa (A) and the southern part of Finland proper (V), to -1°C . in Enontekiö Lapland and the western part of Inari Lapland (EnL-InL). The aggregate effective temperature (i.e., the total of all temperatures in excess of $+5^{\circ}\text{C}$.) in the growing season is about 1150°C . in South Finland, 900°C . in Central Finland and $700-800^{\circ}\text{C}$. within the Arctic circle. The amount of insolation is fairly even over the whole country because of the long, light period in the north during the summer.

Forests and peat-lands (marshes, bogs, etc.) occupy most of the total land area, arable land constituting only about 8%. There are also some 60,000 lakes. Altitudes vary from sea level to over 1,000 metres above sea level. The vegetation consists very largely of Pine-, Spruce-, and Birch-dominant forests (*Pinus*, *Picea*, and *Betula*), with wooded or bare swamps, and in the far north, grassland and tundra communities petering out into barren fells.

These, and other factors, influence butterfly populations, in conjunction with which much work remains to be undertaken. A glance at the above charts indicates that imagines are for the most part on the wing during June, July and August, and that double broods are a rare feature of annual cycles. Indeed, many of the Northern Satyrid species have a two-year life-cycle. I shall be writing more about these, however, after I have been in Lapland this summer.

Part two of this article will cover the remaining families, viz. Lycaenidae, Pieridae and Hesperidae. *Hame-*

aris lucina Linn. (fam. Riodinidae) is not represented.

28.3.67. Leigh Plester (2968).

REFERENCES

- GULLANDER, B. (1959). *Pohjolan paivaperhoset* (The Northern Butterflies). Otava.
 PULKKINEN, E. (1956). *Perhoskirja* (The Butterfly book). WSOY, Helsinki.
 SEPPANEN, E. (1954). *Animalia Fennica 8: Suomen suurperhostoukkien ravintokasvit* (Foodplants of the caterpillars of the Larger Lepidoptera). WSOY, Helsinki.

REARING THE MADAGASCAN FLYING STICK INSECT

Rearing procedure for the Madagascan Flying Stick Insect (*Sipyloidea sipyilus* Brunn.) is the same as mentioned in my other article (*Bull. amat. Ent. Soc.*, 26: 48-50). I do not advise a complete beginner to start with this species, however, as I paid the price for doing so. I bought two dozen ova and eagerly waited for them to hatch. A few months passed by, and four hatched and grew to reach adult size, while the remaining twenty ova did not hatch.

As this species does not pair I was certain of obtaining some ova from my four adults. Another point to bear in mind is that the temperature should be 65-70 degrees Fahrenheit to rear them successfully. I was rearing mine at 40-45 degrees and, this too I think added to the low numbers hatching.

If you think you can rear this species, I would try as it is totally different from the Indian and Corsican species (*Carausius morosus* Br. and *Clonopsis gallica* Charp.).

The ova are oval shaped and are a mottled brown and black. They are found attached to the foodplant and on the sides of the rearing cage. A very important point to bear in mind at this stage is not to plug the mouth of the jar in which the foodplant is stood with cotton wool: use newspaper or a piece of card, because otherwise the young nymphs on

hatching will get entangled in the cotton wool strands and be unable to get free. Also do not pull the eggs away from where they are laid or the nymphs will not have any rough surface to grip when they hatch: instead cut around the eggs.

Adults lay several hundred eggs and these take about eight to ten months to hatch. On hatching the young nymphs are light green in colour, and feed on Bramble (*Rubus fruticosus* agg.) or Rose (*Rosa* spp.) leaves. They grow quickly and with each skin-change their wings slowly develop.

They take six months to reach the adult stage, and what beautiful insects the adults are— $3\frac{1}{4}$ inches long, but if you include their extra long antennae they measure $5\frac{1}{2}$ inches overall.

Describing the adult insect is quite difficult: the general colouring is a brownish pink in the older insects and a greenish white in the nearly full-fledged insect.

Their wings are a true pink and are concealed under camouflaged sheaths, the antennae and legs are very long and thin appearing to be almost colourless at a glance. Wingspan is about four inches, from wing tip to wing tip.

The adult in flight is quite remarkable, and when renewing the food-plant keep a sharp lookout in case one decides to take a short glide across the room.

20.5.67. R. Johnson (3488J).



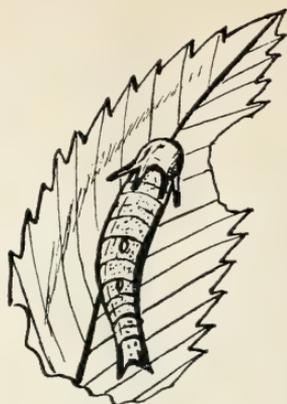
BREEDING THE PASHA WITH FOUR TAILS, *CHARAXES* *JASIUS*

One of the most exciting moments of a trip to the Cote d'Azur was the first sight of Europe's most exotic butterfly, *Charaxes jasius* Linn. The Genus *Charaxes* is an Indian/African one but *C. jasius* has established

itself along the European Mediterranean littoral and the islands, wherever its food plant, *Arbutus unedo* Linn. (Strawberry Tree) grows. It has spread further afield turning up well in from the coastal areas and on the Atlantic side in Portugal. We had travelled from our headquarters at Fayence in Var down through Grasse to the densely wooded ground of the Esterel and spent some time searching the Strawberry Trees growing thickly alongside the road. It was not until we discovered a large fig tree thick with ripe and rotting figs that we saw the butterfly. Several were whirling about the tree and alighting on the figs to feed on the juices. Since that time it has been an ambition of mine to breed the insect from the egg and study its life cycle. Attempts at obtaining livestock were unsuccessful but in September 1966 Fernando Carvalho, a Member living in Lisbon, wrote to me "I had not seen this butterfly in my area (Cimbres) and its foodplant does not apparently grow here. However this summer I saw several specimens flying around a fig tree in a place which I had considered to be unproductive for butterfly collecting. Searching in a pine wood not far off I discovered a lot of Strawberry trees. I captured four butterflies—I killed one perfect male and kept the others, a male and two females, alive in a cage, feeding them on a solution of sugar and honey with a potted foodplant; I tried hand pairing without success. However in the pine wood I found several eggs and two or three young larvae. The eggs are laid singly on the upperside of a leaf and not more than three or four to a plant. The larvae, when hatching, eat the egg shell and then spin a silk pad which secures them to the leaf. I am not sure if the larvae hibernate or keep feeding slowly through the winter but I think they hibernate as the winters here are very cold with frequent snow. In

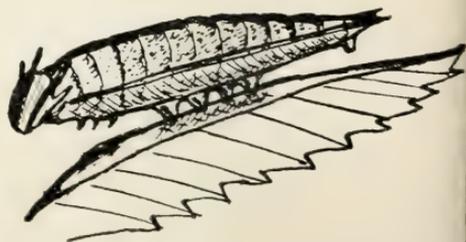
Algarve (South Portugal) they may possibly keep feeding because the temperatures stay high even in the winter".

Mr Carvalho sent me twelve small larvae and one egg, which hatched in transit. This larva had not eaten its egg-shell and shrivelled up and died without attempting to feed. These surviving larvae I placed on fresh leaves of *Arbutus unedo* from a tree I had planted in the garden some three years earlier (in anticipation). This was on 5th October. There was some inequality in the size of the larvae, four being in the second instar, eight in the first. I took them up to the AES Exhibition on 15th and Mr W. L. Coleridge undertook the raising of the eight smaller larvae some of which were now in their second instar, while I kept the other four. I fed these in my living room on sprigs of *Arbutus* set in sand in a temperature which varied little day or night from 60°F. Lighting was daylight and normal electric lighting from dark until about eleven each evening. The feeding habits were very similar to those of other Apaturids which I have observed. Feeding is sporadic and occurs during the evening and early morning. During the periods of feeding it is intensive and the leaves are eaten from the edge towards the mid-rib as with *Apatura iris* Linn. (Purple Emperor). At all stages the larva has a silken pad at its resting place on the lamina of a leaf and when in position on this it holds itself solely by the eight false legs so that the head and fore part and the tail end and anal claspers are raised above the leaf giving the larva a most unrealistic look. It remains rigid when disturbed but will twitch if touched. In shedding its skin it again acts like *A. iris* and the first break in the skin occurs on the underside near the head as the larva forces itself forward on the pad. As the larva begins to leave the old skin the head is forced



Larva ~ 3rd instar.

backwards and with a jerk the skin behind the head (the neck) is broken and the larva crawls out of its old skin with the four horned mask still in position on its head. Quick shakes of the head dislodge this mask which comes off intact. After a rest the larva turns round and devours its old skin and shed gut before it starts to feed again. Unlike *A. iris* the larva has the four horns in all instars. When full fed my larvae were $2\frac{1}{2}$ " long and 3" when extended feeding. At this stage the larva crawls on the underside of a leaf (after using silk to secure the petiole to the stem) and with its head to the tip of the leaf it makes its final silk mat. Then turning towards the stem it grips the pad and commences to pupate. This took three days with my specimens, the first from 18th to 21st November. On the day that my first larva pupated, the first butterfly of those bred by Coleridge emerged. My first emerged



Larva 4th instar ~
resting

on 12 December at 4.30 p.m. having turned black that morning. The final pupa emerged on 25th December. Taking the ova to have been laid just before Mr Carvalho found them, my specimens kept at 60°F took nearly three months to maturity while those of Coleridge at 70°F took just over two months. This shortened life cycle has an obvious result in the size of the imagines (See Table 1).

	Wingspan tip to tip	
	Male	Female
At 70°F	2 $\frac{3}{4}$ "	3 $\frac{1}{4}$ "
At 60°F	3 $\frac{1}{2}$ "	4"

Table 1. Average size of emerging *Charaxes jasius* at different rearing temperatures.

In area ratios the lower temperature specimens are at least 1/3 larger and when put beside the others they look huge. In the wild it is noticeable that the spring specimens are much larger than the summer ones and this difference of 10°F is an indication of how critical temperatures controlling metabolism are in some cases. This may account for the small size of imagines obtained when some of our butterflies are bred in captivity in cages where the temperature levels must be much higher than normally prevailing in the wild state. The Peacock (*Inachis io* Linn.) is one such example.

I.2.67. P. W. Cribb (2270).

LEPIDOPTERA IN THE YORKSHIRE DALES, 1966

Between July 18th and July 30th 1966 the St Ivo Entomological and Natural History Society went on a collecting expedition to the Yorkshire Dales. Youth Hostels were used for accommodation at night, five hostels being visited during the holiday. Apart from two coach journeys, all travelling was done on foot and so equipment had necessarily to be light and easily carried in rucksacks. Weather conditions were fairly

favourable for the first week, with sunny periods, but they deteriorated in the second, becoming much cooler and wetter.

Since there was clearly a good deal of travelling to do, collecting gear had to be kept to the minimum. For the lepidopterist this posed several problems. Instead of using the conventional killing-bottle, I used a syrette for every specimen caught, injecting oxalic acid into the abdomen. This method was found to be equally effective with species ranging in size from *Aglais urticae* Linn. (Small Tortoiseshell) to *Scopula ternata* Shrank (Smoky Wave). One advantage was that it allowed specimens to be papered on the spot. Cellulose acetate papers were used, with data written on the side, and the papered specimens were kept in two plastic boxes.

Three nets were taken, a kite net for the main collecting, a spring-steel net for use while walking between hostels, and a sweep net. Several tubes and small plastic boxes were carried for larvae and pupae. The most productive piece of equipment, however, was the light-trap invented by Mr Northfield of Cambridge. This was a light and portable trap which used a 200 watt tungsten-filament bulb, run off a light-socket in the Hostel.

It consisted of an inverted round shallow metal tin, attached to a funnel below by two pieces of meccano, leading into a nylon net bag with crumpled paper inside to provide a resting place for the moths. The net bag was held on to the funnel by elastic sewn into the bag round the top and then hooked into the bolts attaching the meccano to the funnel. A vane was fixed to the funnel so that moths flying around the top would strike the vane and drop into the bag. A hole was made in the top of the tin and a light-socket screwed in. The bulb fitted into this. Finally a hook

was fixed to the top so that the trap could be easily suspended, usually from a branch.

The lamp and trap survived several nights of heavy rain and strong winds, and only one bulb was used for the whole expedition although a spare had been brought along. The bulbs were carried in a sponge-lined tin slung under the rucksack, whilst the rest of the trap came to pieces and fitted inside the rucksack.

Very little trouble was experienced in getting permission to run the trap. A fitting with a cord was attached so that the bulb in the hostel could still be turned on and off whilst the light was running outside. The trap was in fact found to be a most useful piece of equipment, especially as daytime catches of butterflies and moths were very small.

The trap was used on the night of July 18th (to the morning of 19th) at Burley Wood Head, at Dacre Banks on July 20th, Linton on 21st and 22nd, Kettlewell on 24th and 25th, Malham on 27th and 28th and at Stainforth on 29th. In all but one case, when the trap was run in a yard, it was always run near trees and bushes—these seldom, however, obscured the light from the surrounding areas.

Butterflies

Butterflies were extremely scarce, only three species being seen on the wing. Bad weather was perhaps the main factor in the second week but this does not account for the general scarcity of butterflies throughout the Yorkshire Dales trip. Species observed were:

Coenonympha pamphilus Linn. (Small Heath). Observed in two localities. One specimen was seen on the moors between Burley and Dacre Banks, but the species was observed in greater numbers in Bastow Wood, near Linton, on July 22nd.

Aglais urticae Linn. (Small Tortoiseshell). Fairly widespread but not very common, except along the river bank

at Linton, where a larva about to pupate was found as well as specimens on the wing. One was taken by the roadside near Brimham Rocks on July 20th, while another was caught in Bastow Wood on 22nd.

Pieris rapae Linn. (Small White). One larva taken by sweeping near Kettlewell.

Aricia agestis Schiff. (Brown Argus). Found only once as a small colony in Bastow Wood confined to a small patch of grass at the north end of the wood. Most specimens examined were very worn.

Moths

The moths noted were as follows:
Lycophotia varia Vill. (True Lover's Knot). One in the light-trap at Burley.

Diarsia mendica Fab. (Ingrailed Clay). One specimen of the smaller moorland form taken in the light-trap at Linton.

Ochrolepura plecta Linn. (Flame Shoulder). Several in the trap at Malham and Stainforth.

Noctua pronuba Linn. (Large Yellow Underwing). Common, especially at Malham and Dacre Banks. One was taken by day at Malham Cove.

Cerapteryx graminis Linn. (Antler Moth). Fairly common especially at Malham and Dacre Banks. One female at Malham Cove in the daytime.

Leucania pallens Linn. (Common Wainscot). One in the trap at Burley.

Apamea monoglypha Hufn. (Dark Arches). Widespread and often common, and taken in the light-trap at all hostels. At Kettlewell two melanic specimens of this species were taken while at Linton a near-melanic specimen came to the trap.

Apamea furva ssp. *britannica* Cockayne (Confused). One at Burley in the trap.

Procus spp. A number came to light at several hostels, but the condition of some makes the identification of the species difficult. *P. latruncula* Haw. (Tawny Marbled Minor) occurred at several places and at Stainforth the

dark form ab. *aeruginis* Edel. and Gams was taken.

Caradrina clavipalpis Scop. (Pale Mottled Willow). One male at light at Linton.

Gortyna micacea Esp. (Rosy Ear). A larva of this moth was found under a stone by the roadside near Brimham Rocks on July 20th. It soon pupated and the moth emerged on August 10th.

Plusia chrysitis Linn. (Burnished Brass). Common at light at most hostels.

? *pulchrina* Huebn. (Beautiful Golden Y). Common at most hostels.

? *gamma* Linn. (Silver Y). One or two taken at light and seen in the daytime.

Hypena proboscidalis Linn. (Common Snout). Fairly common where there were plenty of stinging nettles nearby, as a Linton and Stainsforth. Also one at the light-trap at Stainsforth on July 29th.

Scopula ternata Schrank (Smoky Wave). One at dusk by the roadside near Ilkley Moor on July 18th.

Xanthorhoe munitata Huebn. (Red Northern Carpet). One specimen at the trap at Linton.

X. montanata Schiff. (Silver-ground Carpet). Fairly common; taken at Linton by the roadside at dusk and in the daytime at Malham Cove, and also in the light-trap at Malham.

Colostygia didymata Linn. (Small Twin-spot Carpet). Common at dusk along the roadside at Linton. Males were more common than the smaller and paler females.

Euphyia bilineata Linn. (Yellow Shell). Fairly common especially at Malham Cove and Bastow Wood: the specimens taken were darker than those found in Sussex.

Lygris pyraliata Schiff. (Barred Straw Chevron). Fairly common at most places. Taken at light, and in the daytime at Malham Cove and Bastow Wood.

... *prunata* (Phoenix). One in the trap

at Linton.

L. populata Linn. (Northern Spinach). Several taken, one on the moorland near Brimham Rocks.

Abraxas grossulariata Linn. (Magpie). Two specimens at Linton.

Campaea margaritata Linn. (Light Emerald). One in the trap at Burley.

Opisthograptis luteolata Linn. (Brimstone Moth). Several at light.

Hepialus fusconebulosa Deg. (Map-winged Swift). Found fairly commonly on Ilkley Moor flying at dusk, but very difficult to catch.

R. Dransfield (3492J).



JUNIOR NEWS SECTION

I am so glad so many of you enjoyed having a try at the May Quiz: it was a pity that more of you did not actually send in your entries as all those who scored high enough points were awarded a prize.

Here are the people who scored the highest grades in the May quiz.

Robert Johnson (3488J), 18, of Luton, Beds., who received one of the 1952 *Bulletins*.

14 year old M. R. Wilson (4011J), of Thornton Heath, Surrey, who received a Black Hairstreak Butterfly.

A Narrow Bordered Bee Hawk-moth went to 16-year-old P. N. Rispin (4000J), of Stretford, Manchester.

Edward Preston (4086J), 12, of Romford, Essex, wanted some Indian Stick Insects.

One of the 1952 *Bulletins* went to Nicholas Cook (3962J), 15, of Berkhamsted, Herts., and another went to 17-year-old David Shaw (4114J), of Hillingdon, Middx.

Some livestock of the Eyed Hawk-moth was promised to Barbara Brant of Ealing, London. I do hope they arrived alright in the end.

Robert Kemp (4005J), of 18 Bath Rd, Dartford, Kent, writes to us about

T.I.E.G. camp he went to at Whitsun in the New Forest, Hants.

"...I am writing about the T.I.E.G. New Forest Camping trip.

"As it is a very long subject to write on, I am only going to tell you the best things about it, so here goes.

"27th May 1967—Having all arrived at Brockenhurst Station we collected all our provisions for a few days, then made our way to the camp site which was situated on a boggy heath called Black Knole, and pitched our tents on whatever dry land we could find.

"The morning was rather dull and wet and seemed to put us off but like all budding entomologists we talked of our captures and breeding methods. This of course kept us amused until mid afternoon when a blue line appeared on the horizon, which turned out to be a very hot and sunny afternoon. So at our first opportunity we went out collecting, not in a group, but on our own.

"At night we amused ourselves until about nine o'clock by listening to a radio which we all enjoyed, before going out collecting again for moths—this time with Rob Dransfield's blacklight whilst others went treacling. This of course lasted until we at last got to bed, drenched by the swampy atmosphere of the whole place. This was really a typical day for us all.

"In mid-week we went on a visit to an area of the New Forest near Beaulieu where the Pearl Bordered Fritillary flew quite commonly across the sunny sides of the woods and heaths. The Green Hairstreak also flew but not quite so commonly. Brimstones were very plentiful, and we seemed to see them everywhere.

"The most enjoyable trip was made near the end of the week to the Isle of Wight, where the most localised of our fritillaries flies. We did indeed find this species having been tipped off by a collector in the Forest, but only took one male because of its

rarity.

"I think we all had a great time and caught many species of Lepidoptera and also other insects of great interest.

List of Butterflies caught in the New Forest Whitsun 1967

Pieridae

Brimstone (*Gonepteryx rhamni* Linn.), Small White (*Pieris rapae* Linn.), Large White (*P. brassicae* Linn.), Green-veined White (*P. napi* Linn.), Orange Tip (*Anthocaris cardamines* Linn.).

Nymphalidae

Small Pearl-bordered Fritillary (*Argynnis selene* Schiff.), Pearl-bordered Fritillary (*Argynnis euphrosyne* Linn.), Small Tortoiseshell (*Aglais urticae* Linn.), Red Admiral (*Vanessa atalanta* Linn.).

Riodinidae

Duke of Burgundy Fritillary (*Hamearis lucina* Linn.).

Lycaenidae

Common Blue (*Polyommatus icarus* Rott.), Holly Blue (*Celastrina argiolus* Linn.), Green Hairstreak (*Callophrys rubi* Linn.), Small Copper (*Lycaena phlaeas* Linn.).

Hesperiidae

Dingy Skipper (*Erynnis tages* Linn.), Grizzled Skipper (*Pyrgus malvae* Linn.).

Satyridae

Speckled Wood (*Pararge aegeria* Linn.), Wall (*Pararge megera* Linn.), Small Heath (*Coenonympha pamphilus* Linn.).

"In the Isle of Wight we caught the Glanville Fritillary (*Melitaea cinxia* Linn.), Adonis Blue (*Lysandra bellargus* Rott.), Dingy and Grizzled Skippers, Speckled Wood, all three whites, Red Admiral, Common Blue, Large Skipper (*Ochlodes venata* Br. and Grey) and Green Hairstreak. The most difficult of all the species caught in the Isle of Wight was obviously the Glanville Fritillary for to get it we had to go through a field and even a wire fence. We did all enjoy the

camp to the full except for a few unfortunate people who had to go home in mid week.

"There is so much to tell you but it really would be too much writing so I have only told you the best things."

Very many thanks for your most interesting report.

Roger Payne, of 27 Medway Grove, Kings Norton, Birmingham 30, wonders whether anyone has noticed the scarcity of *Aglais urticae* and *Vanessa cardui* this year. "I have seen a total of three Small Tortoiseshells and no Painted Ladies," he writes, "and I have just spent a week in the Pembrokeshire National Park. Red Admirals seem to be scarce too, though I saw a fair number in Pembrokeshire. It seems to be a good year for Satyrids: Speckled Woods, Meadow Browns, Ringlets and Hedge Browns all seem to be abundant in suitable places and Graylings are often the commonest butterflies in Pembrokeshire. I caught a Ringlet ab. *caeca* near Alcester on 27th July. A few days earlier I went to the Wyre Forest near Bewdley and while walking along one of the rides took a swipe at a Speckled Wood. I missed it, but in my net I found a perfect female Purple Hairstreak, so there's luck for you!"

Mini-Game hunting on the Continent

With the very much appreciated help of kind friends St. Ivo School Entomology and Natural History Society, of St. Ives, Huntingdon, were once again able to make their annual safari in search of wild life. The area selected this year was a valley in the Massif Central, a mountain range in Auvergne, southern central France, where the group hoped to add some of the rarer northern and some of the commoner southern insects and spiders to their collections as well as adding various continental species of other small animals to their live collection at school.

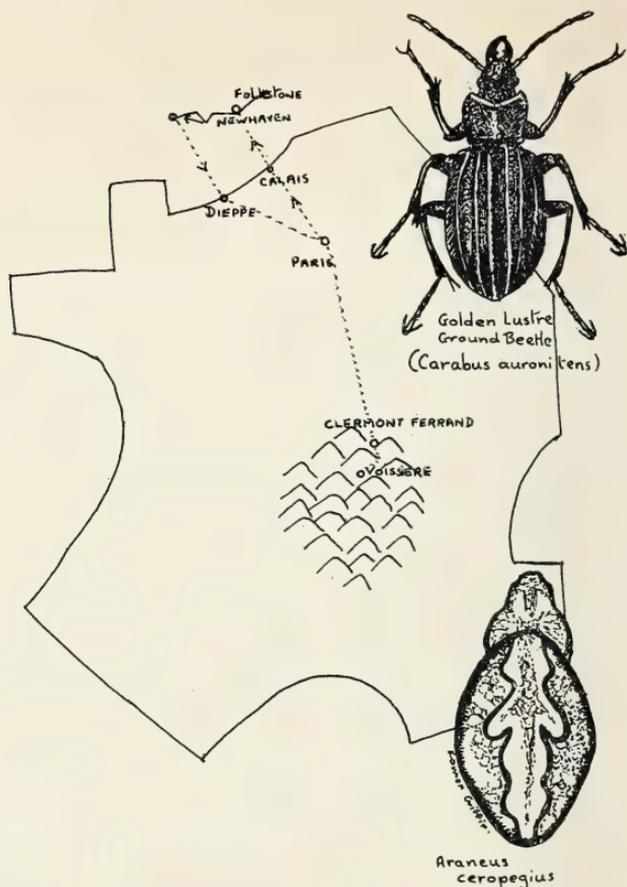
The expedition travelled by train, bus and of course on foot, and were equipped with climbing boots, rucksacks, etc. Everything had to be light and easily portable, including the special cages, Oxford Mammal Traps and the unfortunately little-used Moth light-trap.

After one night at Alfriston Youth Hostel in Sussex on 9th July and a day collecting and exploring the Sussex Downs the party crossed the Channel by the night ferry to spend two days in Paris seeing all the sights. Accommodation was in the luxurious United Nations Hostel. The night train from Paris arrived at 6 a.m. in Clermont Ferrand, home of Michelin tyres and the largest town in the Auvergne, and the party was whisked away by coach 3000ft up into the mountains. The bus passed the Puy de Dome, famous for the Tour de France cycle race. This is a volcanic peak and is only one of many which give the region its breathtaking mountain beauty.

The next eight days were spent in the tiny hamlet of Voissière at the most hospitable of Youth Hostels a mile or so up the valley from Lake Chambon with its black volcanic beach. Voissière valley is framed by high peaks overshadowed by the Pic de Sancy (5,600 ft), and by steep cliffs. St Nectaire Cheese is made in the area and the commonest sound is the music of the cow bells.

The plentiful supply of waters which cascade or just ooze everywhere from the volcanic and granite rocks encourages the most luxurious growth of alpine flowers you could ever see. These carpet the floors of the valleys and the plateaux above the tree line, and are all fed on by gorgeous insects.

Each day the boys and girls explored a different part of the valley seeking the beautiful insects and spiders which abounded everywhere in this naturalists' Aladdin's



cave. There were many different leaf beetles gleaming like jewels and longhorns and chafers, including the Mountain Green Chafer *Gnorimus nobilis* Linn., and the French Bee Beetle *Trichius zonatus* Germ., were everywhere. Among the large Ground beetles the Gold Lustre Beetle (*Carabus auronitens* Baudet-Lafarge) turned up as the prize of the lot. It really is a beauty being reddish green with a rich gold lustre.

Many interesting grasshoppers and crickets turned up including some very large bush crickets which did their best to eat their captors.

Butterflies were rather plentiful but nothing of any real consequence seems to have turned up. Black Veined Whites *Aporia crataegi* Linn. and Pearl Grass Butterflies *Coenonympha arcania* Linn. were very

common, but I will have to give you a comprehensive list of both butterflies and spiders found in the Voissiere valley next time. One spider of interest which was particularly plentiful was the pear-shaped garden spider, the coffee brown and black with cream marked *Araneus ceropegius* Walck. This spider has only been found in Britain once and that was in 1853.

The woods were either beech with the odd wild cherry, or pine, with the ever present wild strawberries to taste. Amphibians were quite plentiful around the lake and in the woods but apart from a few frogs which may be rare all the others proved to be the same species which were once common in Britain, although all belonged to the larger European varieties. No really serious work was

carried in trapping mammals but one interesting specimen did turn up—a black masked European Wood Dormouse in our trap on the first night.

While in the region we also did a little tourist stuff like visiting the nearby spa of Mont Doré where we went up the oldest funicular railway in the world (I rode on it so I should know) and saw hosts of people walking around in funny woolly boiler suits with pixie hoods on. We also marched in the gruelling heat to Murol castle which was romantic or gruesome whichever you prefer and we also saw the 14th of July parade at Lac Chambon.

Although snow caps the highest peaks in the Auvergne the temperature stays way up in the 80's.

The expedition arrived home on 21st July somewhat tired but it is hoped having profited from its minisafari.

Lastly are there any young entomologists in Wales and the West? (No comments from you old 'uns please).

H. J. Berman (2941A).

REVIEW

The Penguin Dictionary of Natural History, by Richard and Masie Fitter. pp. 348. Illus. a few text figs. Penguin Books, Ltd., Harmondsworth, Middlesex, 1967. Price 8/6d.

This book sets out to meet the present lack of a pocket-sized work of reference suitable for use by the layman interested in the countryside, by the naturalist, and by the aspiring student of biology who may wish to know more about the natural history of Britain.

To this end there are included in the main section of the dictionary all the English names in general currency of organisms in this country, together

with various terms useful to the student of natural history in general. A separate index of species gives scientific names under genera and indicates where reference to them must be made in the main body of the dictionary.

When one considers how widely the fringes of biological science spread into everyday life, it is clear that the authors have set themselves no mean task: and it is therefore inevitable that omissions and mistakes will occur. Such a compilation as this suffers from the disadvantage that it accumulates as its legacy the careless wording and omissions of its compilers' original reference books. It can never be better than them, and is usually worse. However, with a few exceptions, the authors here have discharged their responsibilities carefully, and what emerges is a little volume that is pleasingly informative.

It is mainly in the attempt to remain concise while explaining terms used in the difficult fields of biological study that imperfections and omissions occur. To take some random examples, there is no mention of the immense importance of aerial dispersal of populations of insects such as aphids; "Insight" is defined as "In animal behaviour, the apprehension of relations (W. H. Thorpe)", without any further comment to assist the non-biologist to appreciate the significance of this definition in relation to the background of behavioural science; some of the explanation of evolutionary theory under various headings suffers from a certain ambiguity because of attempts at abbreviation; but despite a lack of clarity on some general topics the standard of the very many entries remains high. Here anyone can find out the full name and relationships of an animal or plant species, and it is good to see a fair number of entries devoted to the vocabulary of the rapidly growing

science of ecology.

This dictionary of natural history, at the very reasonable price of 8/6d., will find a place on the bookshelf of many a naturalist, whether he is only casually interested in the countryside or is a serious student of natural history. H.V.D.

LETTERS TO THE EDITOR

Sir,—I feel that remarks made by Mr Goddard (*Bull. amat. Ent. Soc.*, 26: 40-2) and other conservationists regarding the 'deleterious effect' of moth traps on insect populations should immediately be challenged.

There is not, as yet, (nor, I think, ever will be) a case where it has been proved that the drop in numbers of an insect population is directly due to trapping. I do agree, as do most ecologists, however, that running an 'm.v.' trap in the centre of a rarity's breeding ground could easily affect a species that bred in a very limited area. There is, on the other hand, well documented proof that ultra-violet light of sufficient strength, i.e., within perhaps twenty-five yards of an 'm.v.' trap, inhibits oviposition by moths, hence a garden in which there is an 'm.v.' trap will be deficient in larvae.

There can be no objection to a collector running a trap in his garden, if only to grace his collection with a few scarce species: he obtains enjoyment and experience from his hobby. It is only when he kills the whole of the night's catch that his action becomes immoral and he widens the ecological effect of trapping.

An ordinary 80-watt lamp certainly may catch 'more than enough' moths in sheltered areas of the South of England, but take for example South Westmorland, where I am running a trap at present. I caught exactly twenty-seven moths between January 1st and March 15th this year (1967),

running the trap each night. In my case at least I thought it worthwhile to step up catches by modifying the lamp envelope, even though the effect in increasing numbers caught is only of the order of five per cent or so.

I thought my article made it clear that a bare filament should be run only when covered with a beaker or boiling-tube. Short-wave ultra-violet which causes sunburn and retinal damage does not, of course, penetrate glass although the relatively harmless 'u.v.' of longer wavelength does so and it is this largely that 'attracts' the insects.

Finally, any ecology textbook records that natural populations of organisms undergo immense fluctuations and successions (e.g., E.B. Ford's '*Butterflies*', p. 268)—is it not perhaps this and/or the oviposition inhibition by incident light from street-lamps, windows or an 'm.v.' lamp which is affecting Mr Goddard's autumn weed-feeders, or to take a more sinister line, is it DDT 'fall-out' in food-chains (q.v., *Scientific American* March 1967)? Certainly Mr Goddard's 'm.v.' lamp is having a vastly over-rated effect.

G. S. Robinson (3911J).

REFERENCES

- FORD, E. B. (1945). *Butterflies*. Collins, London.
WOODWELL, G. M. (1967). *Sci. Am.*, 216: 24-31.
Toxic Substances and Ecological Cycles.

Sir,—Whilst on a field trip with the Worcester Naturalists' Club I was very interested to note a rather unusual mating pair of butterflies. The female was a Small White (*Pieris rapae* Linn.) and the male a Green-veined White (*P. napi* Linn.). I was unfortunately unable to take this pair to see if any ova would result and if so whether the hybrid would be fertile. I was unable to find a reference to this cross and would be very pleased if any Member could enlighten me on either of the questions raised. 22.7.67. M. R. Young (3759J).

A MINE OF INFORMATION

Some of the more important items to be found in some earlier volumes of the AES Bulletin are given below. These volumes are a good investment. Why not order some from the Publications Agent for your bookshelves? **Two complete volumes** may be had for only 15/-d.!

Vol. 8. Killing agents; making setting boards; degreasing agents; breeding six species of butterfly; breeding cages; collecting in S. Africa; collecting Psocoptera; Clearwings; Death's Head Hawkmoth.

Vol. 9. Setting, labelling and quick-drying insects; breeding Clouded Yellow and Large Tortoiseshell butterflies; collecting in industrial areas; Hawkmoths of S. Africa; Psocoptera; the Empididae; Mites associated with insects; varieties of Ringlet butterfly (with plate); notes on the Vestal and Gem moths; the Purple Emperor.

Vol. 10. A practical puparium; storage of collections; killing bottles; breeding *Loepa katinka*; wing patterns in tropical butterflies; collecting in Switzerland; problems of local variation in butterflies; breeding mantids; Psychidae; Ladybirds; Dragonflies.

Vol. 11. Collecting Centipedes and Millipedes; collecting and identifying Bumble Bees; preserving larvae; British midges; Scientific methods in Entomology; breeding the Swallowtail butterfly; winter coleoptera; Psychidae.

Vol. 12. Collecting Collembola; Stick insects in Devon; larval food range experiments; Marsh Fritillary in Cumberland; Caddis flies; apparatus for drawing insects; wintering Saturnids; Coleoptera of Woolmer Bog; British Social wasps; Virus diseases of caterpillars; insects of Coal Mines; Scientific methods; collecting the Large Heath.

Vol. 13. Collecting Dung beetles; Spiders; Insects in coal mines; monthly collecting hints for Lepidoptera; treatment of virus disease in larvae; notes on Wainscots, moth migration, Bean aphids, Hover flies; wintering pupae; pupa cages; Elephant Hawk—a study.

Volumes Nos. 8 to 24 are available at 10s. 0d. per copy, or 15s. 0d. for any two; Volumes 25 onwards at 25s. 0d. per copy; obtainable from the AES Publications Agent:—

L. CHRISTIE
137 Gleneldon Road
Streatham, LONDON, S.W.16

(Do not send remittance with your order as an invoice will be sent with the publications and will include the correct postal charge.)

TEEN INTERNATIONAL ENTOMOLOGY GROUP

- QUARTERLY NEWSLETTER
- WANTS AND EXCHANGES SECTION
- WORLD MEMBERSHIP
- CAMPS AND DAY TRIPS
- FREE MEMBERSHIP
- ALL EDITING AND ORGANISATION DONE BY TEENAGE MEMBERS

Please send **S.A.E.** to:

ROB DRANSFIELD
T.I.E.G. BRITISH REG. ED.
3 ERRINGHAM ROAD
SHOREHAM-BY-SEA, SUSSEX, BN4 5NQ

The London Natural History Society

This Society has sections covering all aspects of natural history and in particular, entomology. Lectures and field meetings are arranged and research work carried out. Papers on entomological subjects are prepared by members and published in the Society's journal, "The London Naturalist". The Society has a library housed at Ealing Public Library.

*Further details may
be obtained from:*

The General
Secretary,
Mrs L. M. P. SMALL,
13 Woodfield Cres.,
Ealing, W.5

THE BUTTERFLY FARM LTD.

(Founded in 1894)

BILSINGTON, ASHFORD, KENT

Telephone: Hamstreet 513

Our comprehensive service is rapidly extending and we can supply many world species of butterflies, moths and other insects—living, set or papered. Also all apparatus, equipment, books, and other biological needs of entomologists. We cater for collectors, schools, and research workers. Visitors are welcome (please be sure to telephone for an appointment)—there is no charge this year.

Many items are on display and a visit is most rewarding.

THE AES PROSPECTUS

CONTAINING FULL DETAILS will be sent to anyone interested

Please apply, enclosing 8d. stamp, to:

Hon. Advertising Secretary, AES

18 GOLF CLOSE, STANMORE, MIDDLESEX

The Entomologist's Record and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription - 35s. post free

Write for specimen copy to F. W. Byers, 59, Gurney Court Road, St. Albans, Herts., enclosing 5/-. This amount will be taken into account in the first year's subscription.

EXOTIC INSECTS

Below are a selection of exotic insects, etc. from my extensive stock

LEPIDOPTERA

Papilio paris	5/-	Prepona chromus	6/-
ganesa	5/-	laertes	6/-
evan	5/-	demophon	6/-
gyas	3/6	antimache	6/-
x'enocles	2/6	Polygrapha cyanea	5/-
fuscus canopus	5/-	Catagramma cynosura	4/-
delanadrei	10/-	pastaza	4/-
oribazus	6/-	cajetani	2/6
bromius	4/6	aegina	2/6
phorcas	4/6	hystaspes	2/6
dardanus	4/6	Napocles jucunda	5/-
thoas cinyrus	3/6	Morpho deidemia brisius	7/6
torquatus	4/-	menelaus heubneri	7/-
serville	5/-	hecuba	15/-
harmodius	2/6	didius	10/-
dolicoon	3/-	catenarius	5/-
telesilaus	3/-	laertes	6/-
zagreus	15/-	Urania ripheus	6/6
aristeus	5/-	leilus	4/6
isidorus	4/-	Gonepteryx menippe	2/6
Ornithoptera aecus, pair	13/6	Catopsilia philia	1/6
aecus kayagua, pr	11/6	argante	1/-
urvillianus, pair	70/-	urina	1/6
brookiana, male	30/-	Calligo illioneus	6/6

COLEOPTERA

Odontolabis cuvera, male	7/6	Catoxantha purpurea	3/6
siva, pair	9/-	Ctenoceles coeus, each	17/6
Cladognathus giraffa, male	7/6		and 22/6
Acrocinus longimanus, pair	25/-	Xylotreupes gideon	3/6
Helicopris dominus, pair	35/-	Baladeva walkeri	12/6

MISCELLANEOUS INSECTS, ETC.

South American Cicada, wing span 4" to 5", each	5/-
Giant Siamese Water Bug, 3", each	7/6
Giant South American Damselflies (Zygoptera), wing span 8" approx, each	7/6
Paraguyan Bird Eating Spider, legs folded, each	10/-
Giant Siamese Black Jungle Scorpions, average length 5"	17/6
Peruvian Whip Scorpions, each	17/6

LIVING COCOONS

Attacus edwardsi, 8/6 each. Antheraea mylitta, 8/6 each
Philosamia cynthia canningi, 2/6 each

Please Note.—All specimens offered are unset and in papers. Prices per each unless otherwise stated. Postage extra: 1/- on orders under £1; over post free
Mail Order Only

R. N. BAXTER

**16 BECTIVE ROAD, FOREST GATE, LONDON, E.7,
ENGLAND**

1969-70

①

