

THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARE, B.SC., F.E.S., F.R.S.E.	JAS. E. COLLIN, F.E.S.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.	H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	J. R. le B. TOMLIN, M.A., F.E.S.
	GEORGE WHEELER, M.A., F.E.S.

and
HENRY J. TURNER, F.E.S.,

Editorial Secretary.

VOL. XXVII.

JANUARY TO DECEMBER, 1915.

PRICE 10s. 6d.

Special Index (with every reference), 1s. 6d.

237882 LONDON:

ELLIOT STOCK, 7, Paternoster Row, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,
11, Carlstrasse, N.W.

PREFACE TO VOL. XXVII.

OTHER thoughts and other pursuits have rightly commandeered the opportunities of many students of Entomology during the past season ; still the study goes on and we are much indebted to those who have helped to fill our pages.

Ere another Christmas greets us may there be peace to crown the honour we cherish so dearly.

With kindly greetings to all our readers, and with the best of thanks to all our contributors, we look hopefully to the coming year with its many possibilities.

HY. J. TURNER.

SPECIAL INDEX.

By T. HUDSON BEARE, B.Sc., F.R.S.E., F.E.S. (Coleoptera); J. E. COLLIN, F.E.S. (Diptera); and H. J. TURNER, F.E.S. (Hemiptera, Hymenoptera, Lepidoptera, etc).

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

ACARINA.

	PAGE
coryli, Eriophyes	23
dispar, Eriophyes	286
Eriophyes	21
foreli, Antennophorus	184
linterius, Tetranychus	215
pubescens, Antennophorus	184
triradiatus, Eriophyes	286

ARANEINA.

aviculare, Mygale	188
conicola, Cyclosa	282
Thomisidæ	184
vatia, Misumena	184

COLEOPTERA.

Aegosoma scabricorne	257
Agabus nebulosus	88
paludosus	88
Agrilus viridis	216
Alophus triguttatus	88
Amara acuminata	88
anthobia	87
lucida	87
Anchomenes piceus	87
viduus	87
Anisodactylus binotatus	88
Anthriscus	200
Apatophyes caspica	257
Aphodius niger	216
Apion hydrolapathei	88
marchicum	88
subulatum	88
Aromia moschata	213
Arrhaphypterus shelkovnikovi	257
Athous rhombus	284
Bembidium adustum	94
anglicanum	94
argenteolum	94
assimile	88
5-striatum	94
fluviatile	94
fumigatum	94
lunatum	94
nigricorne	94
prasinum	94
schuppeli	94
stomoides	94

	PAGE
testaceum	94
Blethisa multipunctata	87
Brosicus cephalotus	184
Bruchus chinensis (pectinicornis)	140
*pusillus var. seminarius	138
Calosoma sycophanta	187
Campylus linearis	140
Carabidæ	87
Carabus arvensis	87
auratus	187
nemoralis	140
Carcinops minima	88
Cassida equestris	213
flaveola	88
Cetoniidæ	186
Chlaenius nigricornis	87
Chrysomela banksi	88
Cicindela sublacerata	257
Claviger testaceus	206
Clytus arietis	216
Coccinella bipunctata	284
Colembus confluens	88
Ceolorrhina mutica	186
Colydium elongatum	216
Crepidodera ventralis	88
Criocephalus ferus	88
Cryphalus abietis	138
Dromius nigriventris	88
Dytiscidæ	88
Dytiscus circumcinctus	187
marginalis	199, 213
Elater miniatus	216
sanguinolentus	216, 237
Eryx ater	213
*Euthia formicetorum	138
*Gabrius primigenius	21
Geotrupes stercorarius	212
Grammoptera præusta	216
**Haltica britteni	21
ericeti	21
Harpalus ruficornis	184
Helophorine	137
**Helophorus championi	233
strigifrons	233
Hispidus atra	188
**Homalota exillima	235
Hydrophilidæ	88
Hydrophilus profanifugus	257
flavipes	257

	PAGE
Hydroporus flavipes	88
lituratus	88
nigrita	88
umbrosus	88
*Hypophloeus linearis	262
Jubodella dilatocollis	257
Lacon murinus	184
Lagria hirta	184
Lamprophorus tenebrosus	120
Lampyrus noctiluca	213
Lathrobium quadratum	88
terminatum	88
Leistotrophus murinus	88
Leptinotarsa decemlineata	184
Leptura scutellata	216
Luciola italica	187
Mantura rustica	88
Meloe proscarabaeus	88
Melolontha vulgaris	184
Meotica exiliformis	281
exilis	281
Meotica	235
Merimna atræa	120
Mesosa nubila	216
Micraspis 16-punctata	187
Morica planata	188
Notiophilus 4-punctatus	187
Ochthebius bicolor	88
Ocytus olens	184
Otiorhynchus atroapterus	88
sulcatus	184
Paracymus nigroeneus	88
Phædon armoracæ	88
Philonthus agilis	88
micans	88
nigrita	88
splendens	88
Phyllidrus coarctatus	88
Phyllotreta atra	88
nigripes	88
Pterostichus madidus	184, 213
minor	87
vernalis	87
Quedius fulgidus	88
maurorufus	88
scintillans	88
Rhagium inquisitor	284
Rhantus grapii	88
Rhynchites minutus	88
Rhyncephora	88
Seymus arcuatus	232, 284
Silpha opaca	88
Sitones cambrius	88
Staphylinidæ	88, 200
Staphylinus cæsareus	88
Stenus pallitarsis	88
picipennis	88
Stigmodera conspicillata	120
cyanura	120
Stomis pumicatus	87
Strophosomus faber	88
Suboccinella 24-punctata	88
Telephorinæ	72, 214
Timarcha tenebricosa	213
Tomicus bidens	262

COLLEMBOLA.

	PAGE
albinos, Cyphoderus	184
viridis, Sminthurus	184

CRUSTACEA.

diaphanus, Branchippus	284
hoffmannseggii, Platyarthrus	184
Platyarthrus	183
quadranguli, Ceriodaphnia	184
rectangula, Alona	184
schöbli, Platyarthrus	17
serrulatus, Cyclops	184
sphaericus, Chydorus	184
strenuus, Cyclops	184
tardus, Lucasius	17

DIPTERA.

Agromyza	233
*bialorussica, Mycetophila	185
blattoides, Enigmatias	45
Bombylius	254
Borboridæ	139
brassicæ, Chortophila	186
corvina, Musca	140, 214
cylindrica, Leptogaster	184
domestica, Musca	138, 233
*eriphthalma, Lasiops	236
Ephyridæ	139
fasciatus, Promachus	93
*flavicauda, Trichonta	185
flavipennis, Tephritis	57
genisticola, Perrisia	287
heraclei, Acidia	186
*hirtipes, Trichocera	20
*hortensis, Culex	185
keilini, Plastosciaria	281
*ligulata, Exechia	185
lubbocki, Platyphora	45
*membranacea, Exechia	185
morsitans, Glossina	283
*mutatus, Trichopticus	236
myrmecophilus, Ceratopogon	72
Nemotelus	282
Nycteribia	141
*pallescens, Eccoptomera	236
parietina, Tephritis	57
**pernitida, Plastosciaria	185
proboscidea, Tephritis	57
Promachus	140
rosaciella, Rhabdophaga	286
salicis, Rhabdophaga	287
salicis, Rhabdophaga	286
sisymbrii, Dasyneura	286
Stratiomyidæ	282
*subfusca, Trichonta	185
Symphoromyia	234
*tarnanii, Rhymosia	185
Tipulidæ	233
Trypetidæ	57
*vernalis, Trichonta	185
violæ, Ceidomyia, Urocystis	286
virens, Agromyza	234

HYMENOPTERA.

	PAGE		PAGE
abdominalis, <i>Camponotus</i>	.. 23	lævinodis, <i>Myrmica</i>	54, 260, 266
aceris, <i>Phyllotoma</i>	283	lupidarius, <i>Bombus</i>	216
Aculeata	145	<i>Lasius</i> = <i>Donistorpea</i>	205, 206, 207
agrorum, <i>Bombus</i>	184	<i>ligniperdus</i> , <i>Camponotus</i> ..	260
albibrabris, <i>Crabro</i>	45	<i>lobicornis</i> , <i>Myrmica</i>	260, 265, 266
aliena, <i>Lasius</i>	54, 207	<i>longiclava</i> , <i>Apterotrix</i> ..	262
<i>Andrena</i>	234	<i>lucidus</i> (<i>rufescens subsp.</i>), <i>Polyergus</i>	260
<i>Anergates</i>	206	<i>lucorum</i> , <i>Bombus</i>	184
aspidioti, <i>Aphidencyrthus</i> ..	262	<i>maculatus</i> , <i>Camponotus</i> ..	221, 222
aterima, <i>Phymatocera</i>	145, 148, 149	<i>meridionalis</i> , <i>Bothryonomymex</i>	.. 17
<i>atratus</i> , <i>Anergates</i>	260	<i>microgyna</i> , <i>Formica</i>	260
<i>barbarus</i> , <i>Messor</i>	17	<i>mixto-umbratus</i> , <i>Donistorpea</i>	.. 207
<i>batesii</i> , <i>Cardiocondyla</i> ..	260	<i>Mymaridae</i>	72, 90
<i>becki</i> (<i>maculatus ab.</i>), <i>Camponotus</i>	222	<i>Myrmoturba</i>	222
<i>Bombus</i>	35	<i>niger</i> , <i>Lasius</i> 54, 184, 205, 206, 207	207
<i>Braconidae</i>	262	<i>nigra</i> (<i>batesii var.</i>), <i>Cardiocondyla</i>	260
<i>brevicornis</i> , <i>Hylæus</i>	283	<i>nitidulus</i> , <i>Formicoxenus</i> ..	72
<i>britannicus</i> , <i>Coccophagus</i> ..	262	<i>noctilio</i> , <i>Sirex</i>	23, 93
<i>britannicus</i> (<i>aspidioti var.</i>), <i>Aphidencyrthus</i> ..	262	<i>obturator</i> , <i>Leptothorax</i> ..	260
<i>cæspitum</i> , <i>Tetramorium</i> ..	53	<i>Odynerus</i>	45, 90
<i>callosus</i> , <i>Odynerus</i>	184	<i>Ophioninae</i> (<i>Ichneumonidae</i>)	46, 90
<i>cameroni</i> , <i>Anochetus</i>	237	<i>Opiinae</i>	234
<i>centuncularis</i> , <i>Megachile</i> ..	213	<i>pagana</i> , <i>Arge</i>	45
<i>communis</i> , <i>Prosopis</i>	92	<i>pallidula</i> , <i>Pheidole</i>	16
<i>conspicuus</i> (<i>maculatus subsp.</i>),	222	<i>persuasoria</i> , <i>Rhyssa</i>	93, 23
<i>Camponotus</i>	222	<i>Phyllotoma</i>	283
<i>derhamellus</i> , <i>Bombus</i>	184	<i>Phymatocera</i> 145, 146, 147, 148, 149	149
<i>Dimorphopteryx</i>	234	<i>picea</i> , <i>Formica</i>	45, 213
<i>Donistorpea</i>	205, 206, 207	<i>picea</i> (<i>aquia var.</i>) (<i>fulvum subsp.</i>),	260
<i>Dufourea</i>	283	<i>Stenamma</i>	117
<i>erraticum</i> , <i>Tapinoma</i>	16	<i>popovici</i> , <i>Tetramorium</i>	187, 188
<i>ervi</i> , <i>Aphidius</i>	263	<i>pratensis</i> , <i>Formica</i>	286
<i>exsecta</i> , <i>Formica</i>	260	<i>radicis</i> , <i>Aphilothrix</i>	286
<i>flavus</i> , <i>Lasius</i> 55, 184, 205, 206, 207	260	<i>ramuli</i> , <i>Andricus</i>	145
<i>floricola</i> , <i>Monomorium</i> ..	184	<i>ribesii</i> , <i>Nematus</i>	265, 266
<i>fodiens</i> , <i>Colletes</i>	120, 214, 236	<i>rubra</i> , <i>Myrmica</i>	72, 138, 187, 213, 214, 238
<i>foetens</i> , <i>Megaoponera</i>	237, 238	<i>rufescens</i> , <i>Polyergus</i>	260
<i>Formicidae</i>	117	<i>rufibarbis</i> , <i>Formica</i>	260
<i>frenchi</i> , <i>Tetramorium</i>	260	<i>ruginodis</i> , <i>Myrmica</i>	260
<i>fugax</i> , <i>Solenopsis</i>	207	<i>rugulosa</i> , <i>Myrmica</i>	238, 239, 259, 260
<i>fuliginosa</i> , <i>Donistorpea</i> ..	260	<i>sanguinea</i> , <i>Formica</i>	205, 258, 260, 265, 266
<i>fulvum</i> , <i>Stenamma</i>	53, 238	<i>scabrinodis</i> , <i>Myrmica</i>	260, 265, 266
<i>fusca</i> , <i>Formica</i>	93	<i>*scheneki</i> , <i>Myrmica</i>	265, 266
<i>germanica</i> , <i>Vespa</i>	283	<i>sertifer</i> , <i>Pteronotus</i>	260
<i>gigas</i> , <i>Sirex</i>	145	<i>simillimum</i> , <i>Tetramorium</i>	.. 184
<i>graniticola</i> , <i>Myrmecina</i> ..	184	<i>terrestris</i> , <i>Bombus</i>	260
<i>grossulariæ</i> , <i>Emphytus</i> ..	283	<i>tuberum</i> , <i>Leptothorax</i> ..	145, 146, 148
<i>gwynana</i> , <i>Andrena</i>	266	<i>Trichiosoma</i>	46
<i>Halictoides</i>	262	<i>truncicola</i> , <i>Formica</i>	205, 206, 207
<i>Halictus</i>	184	<i>tydei</i> , <i>Ammophila</i>	115
<i>*hartigii</i> , <i>Conopachys</i> ..	113	<i>umbratus</i> , <i>Lasius</i>	16
<i>hyalinata</i> , <i>Prosopis</i>	46, 90	<i>Vespidæ</i>	87, 115
<i>Ichneumon</i>	237	<i>viaticus</i> , <i>Myrmecocystus</i> ..	260
<i>Ichneumonidae</i> (<i>Ophioninae</i>)	260	<i>vulgaris</i> , <i>Vespa</i>	260
<i>inflata</i> , <i>Cremastogaster</i> ..	260	<i>westwoodi</i> , <i>Stenamma</i> ..	260
<i>inquilina</i> , <i>Epipheidole</i> ..	260	<i>williamsi</i> (<i>maculatus var.</i>), <i>Camponotus</i> ..	222
<i>instabilis</i> , <i>Azteca</i>	213		
<i>instigator</i> , <i>Pimpla</i>	117		
<i>joffrei</i> , <i>Tetramorium</i> ..	23		
<i>juveneus</i> , <i>Sirex</i>	237		
<i>labialis</i> , <i>Andrena</i>	283		
<i>hevigatus</i> , <i>Halictus</i>			

LEPIDOPTERA.

abbreviata, <i>Eupithecia</i>	286
abencerragus = <i>baton</i>	204

	PAGE
abietaria, Boarmia ..	78, 121, 172
Ablabia	100
abrasana, Sciaphila ..	101, 144
abruptaria, Hemerophila ..	2, 95
acaciæ, Nordmannia 28, 36, 39, 83,	84, 85, 157, 158
acamas, Spindasis, Aphnæus ..	62
Acentropus	134
aceris, Apatela	2
acetosæ, Nepticula	68
achatinella, Nyctegretes	19
achilleæ, Anthrocera	93
achine, Pararge	106
Acrolopus	134
Acronicta	263
actæa, Satyrus	84
acteon, Thymelicus 81, 172, 173, 190	
adippe, Argynnis 30, 67, 71, 78,	83, 105, 171, 172, 190, 218, 279, 285
admetus, Hirsutina 37, 38, 40, 83,	84
adonis = thetis	
adrasta (mæra <i>ab.</i>), Pararge ..	177
adusta, Hadenæ, Eurois 75, 77, 274	
ægeria, Pararge 15, 25, 30, 71, 73,	73, 79, 105, 126, 130, 131, 143,
171, 172, 183, 187, 192,	
Ægeriidae (Sesiidae) 43, 119, 202,	203, 235
ægidion (argyrognomon <i>var.</i>),	
Plebeius	164, 166
ægon (argus), Plebeius 29, 37, 58,	71, 74, 105, 122, 123, 124,
125, 172, 173, 217, 218, 219,	273
ællo, Oeneis	22
*æratana, Lipoptycha	95, 118
ærealis, Botys	224
æscularia, Anisopteryx	168
æsculi = pyrmon	
æsculi, Strymon (Thecla) ..	262, 282
æstiva (duponcheli <i>var.</i>), Leptosia 38	
æthiops, Erebia 30, 51, 59, 66, 162	
ætinis, Calymnia	78
affinitata, Perizoma, Emmelesia 51,	76
agatbina, Agrotis	75
Ageronia	97, 98, 154
agestis = medon	4, 204, 305
aglaia, Argynnis 6, 36, 67, 71, 73,	76, 83, 105, 141, 164, 171, 176,
267, 285	
Agriades	283
agrippina, Thymania	141
Agrotidae	249
ajax, Papilio	186
albana (variegana <i>ab.</i>), Peronea ..	94
albianthemella, Coleophora ..	235
albicans (coridon <i>var.</i>), Agriades	189, 279, 280
albicillata, Mesoleuca 7, 76, 170, 172	
albicolon, Mamestra	75, 78
albicosta, Coleophora	50
albifrontella, Elachista	50
albipuncta, Leucania	272
albipunctata, Eupithecia	142
*alboconspersana (conspersana,	
<i>ab.</i>), Cnephasia	118

	PAGE
*albo-octomaculana (octomacu-	
lana <i>ab.</i>), Cnephasia ..	102, 118
albulata, Emmelesia	3
alceæ, Erynnis	39, 77, 79, 177
alcella (tessarana), Chrosis ..	183
alctas, Everes	38
alchemillata, Perizoma	51
alciphron, Loweia, Chrysophanus	28, 29, 35, 58, 66, 80, 82, 108,
128, 175, 213	
alcippus (chrysippus <i>var.</i>), Danais 62	
alcyone, Satyrus 59, 84, 98, 125,	275, 276
alecto, Erebia 27, 30, 136, 156, 158	
alecto, Theretra	257
alexandriæ, Ornithoptera	236
alexanor, Papilio	84
alexis = icarus	28, 29, 79
algæ, Bryophila	123
allardi, Scolitantides	204
alniella, Lithocolletis	232
alnifoliella, Lithocolletis	49
alpella, Cerostoma	68
alpina (medon <i>var.</i>), Aricia ..	224
alpinalis, Botys	225
alsines, Caradrina	272
alternana, Sciaphila	100
althææ, Erynnis 39, 40, 79, 83, 177	
alticola, Hepialus	123
alticolana, Cnephasia	100
Alucitides (Pterophorina) ..	69, 274
alveus, Hesperia	166, 224
amandus, Polyommatus 15, 16, 37	
39, 59, 83, 104, 128, 156, 160,	200, 201, 202, 267
amasina (trux <i>ab.</i>), Agrotis 192, 193	
amathusia, Brenthis ..30, 66, 105	
ambigua, Caradrina	272
ambigualis, Scoparia	50
Amblypodia	136
amenophis = evanida	129, 268
Amorphinæ	227
amphidamas, Loweia 14, 28, 29,	58, 65, 104, 156, 157, 160,
161	
amphinome, Peridroma	154
Anaphora	134
Anaphorinæ	135, 136
anellus (bipunctanus), Melisso-	
blaptæ	19
angulifasciella, Nepticula	68
angulifera, Samia	21
angustana, Euxanthis	183
angustea, Eudoria	173
anomala, Stilbia	78, 143
anteros, Aricia	37
Anthocharide	67
Anthrocera (Zygacna) 22, 29, 43,	72, 205, 216
Anthroceridæ (Zygenidæ) 22, 29,	43, 74, 134
anthyllidis, Anthrocera	22, 93
antico-obsoleta (icarus <i>ab.</i>), Poly-	
ommatus	24
antico-striata (icarus <i>ab.</i>), Polyom-	
mmatus	24

	PAGE		PAGE
antioqua, Euvanessa	25, 35, 40, 59,	assimilis (exulis <i>ab.</i>), Crymodes	143
antiqua, Orgyia	.. .. 2, 231,	asteria, Melitea	.. .. 14
Apaturidi	.. .. 157, 158,	asterias, Papilio	119, 184, 186
Aphantopus	.. .. 153	astrarche = medon	23, 80, 125, 176
Aphomia	.. .. 230	atalanta, Pyrameis	20, 22, 39, 59,
apiforme, Aegeria, Trochilium	.. 177	78, 93, 120, 123, 126, 129, 139,	172, 173, 176, 214, 231, 236,
apollo, Parnassius	29, 30, 58, 66,	252, 263, 273,	285
84, 105, 107, 108, 123, 161,	162, 200, 201, 222,	atalanta (<i>in error</i>) = cardui	.. 23
267	182	athalia, Melitea	.. 39, 40, 59, 278
aplana, Depressaria	.. .. 94	atomalis, Scoparia	.. .. 183
aprilina, Agriopsis	.. .. 168, 225	atomaria, Ematurga	49, 50, 76, 95,
arbuscula, Eriogaster	.. .. 182	170, 219	
arbutella, Euchromia	.. .. 30, 39, 59,	atra (<i>in error</i>) = atrata	.. .. 171
arcania, Coenonympha	66, 83, 104, 105, 106,	atra = hellerella	
123	160, 200, 201, 202,	atrata (charophyllata), Odezia	3,
arcas, Lycæna	14, 26, 29, 106, 157,	171, 187	
268	202	atropos, Manduca	.. 20, 33, 187
Arctiidae	.. .. 43	augur, Noctua	.. .. 1
Arctiinæ	.. .. 78	aurago, Ochria	.. .. 285
arcuata = melanotoxa	.. .. 49	aurantiaria, Hibernia	.. .. 144
arcuosa, Petilampæ	.. .. 98	aurea (chrysitis, <i>ab.</i>), Plusia	.. .. 123
arenella, Depressaria	.. .. 141	aureatella, Micropteryx	.. .. 50
arete, Ageronia	.. .. 154	aurelia, Melitea	15, 28, 103, 104,
arete (hyperantus <i>ab.</i>), Aphantopus	141	156, 278	
arethusa, Ageronia	.. .. 100, 102	auriflua = similis	
argentana, Cnephasia, Argyroptera,	100, 102	aurinia, Melitea	13, 25, 26, 29, 45,
Nephodesme	.. .. 164, 166	70, 82, 158, 159, 169, 174, 225	
argentana, Aphelia	.. .. 211	aurita, Endrosa	.. .. 154
argentata (pseudargiolus <i>ab.</i>),	.. .. 69	aurivillius (electra <i>ab.</i>), Colias	.. .. 188
Celastrina	.. .. 38, 40, 83, 137,	aurolimbata, Orgyia	.. .. 123
argentina, Coleophora	.. .. 275	ausonia (belia <i>var.</i>), Anthocharis	27, 81
argiades, Everes	141, 159, 160, 189,	27, 81	
271	211, 220, 231, 263,	autumnaria, Eugonia	.. 47, 48, 230
argillacea, Dianthocia	.. .. 271	aversata, Acidalia	.. .. 171, 172
argiolus, Celastrina	2, 25, 35, 59,	avis, Callophrys	.. .. 277
78, 79, 129, 130, 131, 132, 143,	169, 170, 171, 172, 174, 176,	azagra (thesites <i>ab.</i>), Agriades	.. 176
189, 190, 191, 204, 207, 210,	211, 220, 231, 263,	bachmanni, Libythea	.. .. 119
274	67	badiata, Anticlea	.. .. 49, 188
argus = ægon	.. .. 225	badiella, Depressaria	.. .. 182
Argynnidae	.. .. 100	baja, Noctua	.. .. 1
argyrognomon, Plebeius	45, 58, 71,	balcanica (semiargus <i>var.</i>), Poly-	75
164, 166, 213, 223, 224,	225	ommatus	.. .. 35
Argyroptera	.. .. 154	balcanica - intermedia (semiargus	.. .. 35
arinome, Peridroma	.. .. 5, 6, 35, 58, 83,	<i>var.</i>), Polygonatus	.. .. 35
arion, Lycæna	123, 189, 217, 237, 258, 282,	Baoris	.. .. 269
283	211, 220, 231, 263,	barrettii (luteago <i>var.</i>), Dianthocia	1, 5, 6, 22, 46, 69, 70, 271
arizonensis (pseudargiolus <i>ab.</i>),	211	basijuneta (icarus <i>ab.</i>), Polygonatus	.. .. 24
Celastrina	.. .. 35, 37	basilinea, Apamea	.. .. 4, 170
armoricana, Hesperia	.. .. 134	batis, Thyatira	.. .. 3, 6, 78
Arotrura	.. .. 127, 280	baton, Scolitantides	14, 37, 79, 175, 204
arragonensis (coridon <i>var.</i>), Agri-	224, 263	baton = abencerragus	.. .. 204
ades	.. .. 224, 263	bavius, Scolitantides	.. 39, 40
arsilache (pales <i>var.</i>), Brenthis	30,	baxteri (gueneei <i>ab.</i>), Luperina	.. 276
107, 139, 158, 164, 166, 214,	224, 263	belemia, Anthocharis	.. 62, 129
224, 263	71, 220	belgiaria, Scodiona	.. .. 76
artaxerxes (medon <i>var.</i>), Aricia	71, 220	belia = crameri	27, 36, 37, 39, 61,
aruncella, Micropteryx	.. .. 49	61, 62, 66, 79, 80, 81, 120,	159, 175, 187, 204
arundinis, Nonagria	.. .. 143	belia <i>in error</i> = tagis	.. .. 79
ashworthii, Agrotis	.. 23, 285	bellargus = thetis	
asinalis, Botys	.. .. 6	bellatrix, Aphnaeus	.. .. 62
asinana, Cnephasia	.. .. 51, 182, 183		
aspersana, Peronea	.. .. 123		
asperaria, Gnophos	.. .. 2, 172		
assimilata, Eupithecia	.. .. 2, 172		

	PAGE		PAGE
bellezina (<i>tagis var.</i>), <i>Anthocharis</i>		<i>buoliana</i> , <i>Evetria</i>	276
	79, 80, 120	<i>burdigalensis</i> (<i>machaon ab.</i>),	
<i>bellidice</i> (<i>daplidice var.</i>), <i>Pontia</i> 79, 80		<i>Papilio</i>	25, 266
<i>bellus</i> (<i>quercus ab.</i>), <i>Bithys</i> 36, 143, 188		<i>ca-ca</i> (<i>hyperantus ab.</i>), <i>Aphan-</i>	
<i>bembeciformis</i> = <i>crabroniformis</i>		<i>topus</i>	73, 141, 143
<i>bergmanniana</i> , <i>Tortrix</i>	68	<i>cærulea</i> (<i>icarus</i>), <i>Polyommatus</i> ..	46
<i>berisalensis</i> (<i>deione var.</i>), <i>Melita</i>		<i>cæruleocephala</i> , <i>Diloba</i>	7
	14, 28, 159	<i>cæruleopunctata</i> (<i>phleas ab.</i>),	
<i>betula</i> , <i>Ornix</i>	50	<i>Rumicia</i>	70
<i>betule</i> , <i>Ruralis</i> 31, 58, 143, 172, 188		<i>ca-siata</i> , <i>Entephria</i>	51, 76, 166
<i>betularia</i> , <i>Amphidasis</i> .. 2, 3, 112		<i>caia</i> , <i>Arctia</i>	74, 78, 141, 142
<i>biareuata</i> (<i>icarus ab.</i>), <i>Polyommatus</i> 24		<i>c-album</i> , <i>Polygonia</i> 23, 27, 28, 73,	
<i>bicolorana</i> (<i>quercana</i>), <i>Hylophila</i> 3		139, 157, 158, 231, 286	
<i>bicolorata</i> , <i>Melanthia</i>	96	<i>caledoniana</i> , <i>Peronea</i>	52
<i>bicoloria</i> , <i>Miana</i>	75, 172	<i>calida</i> (<i>medon var.</i>), <i>Aricia</i> 176, 189	
<i>bicuspis</i> , <i>Dicranura</i>	74	<i>californica</i> , <i>Synchlœ</i>	119
<i>bidentata</i> , <i>Odontopera</i> 23, 24, 76,		<i>callidice</i> , <i>Pentia</i>	66, 166, 167
109, 113, 114, 170		<i>Callimorpha</i>	134, 137
<i>bieti</i> (<i>hyperantus var.</i>), <i>Aphantopus</i> 141		<i>calodactyla</i> (<i>zetterstedtii</i>), <i>Frede-</i>	
<i>bifida</i> , <i>Dicranura</i>	74	<i>ricina</i>	182
<i>bilinea</i> (<i>trigrammica ab.</i>), <i>Gram-</i>		<i>callunæ</i> (<i>quercus var.</i>), <i>Lasiocampa</i>	
<i>mesia</i>	4	.. .. .	74, 216
<i>bilineata</i> , <i>Campptogramma</i> , <i>Laren-</i>		<i>calthella</i> , <i>Micropteryx</i>	50
<i>tia</i>	76, 123, 170, 183	<i>cambrica</i> (<i>cambriacata</i>), <i>Acidalia</i> ,	
<i>bilunaria</i> (<i>illumaria</i>), <i>Selenia</i> 2, 188		<i>Venusia</i>	51, 76, 143
<i>bimaculata</i> , <i>Bapta</i>	43	<i>camelina</i> , <i>Lophopteryx</i>	74
<i>binaria</i> (<i>hamula</i>), <i>Drepana</i>	3	<i>camilla</i> , <i>Limenitis</i>	81, 157
<i>biocellata</i> , <i>Nacaduba</i>	93	<i>cana</i> , <i>Catoptria</i>	144, 183
<i>bipuncta</i> (<i>ægon ab.</i>), <i>Plebeius</i> .. 122		<i>caniola</i> , <i>Lithosia</i>	271
<i>bipunctana</i> , <i>Argyroptero</i>	182	<i>canna</i> , <i>Nonagria</i>	143
<i>bipunctatus</i> = <i>anellus</i>		<i>capsincola</i> , <i>Dianthœcia</i>	78, 271
<i>bipunctaria</i> , <i>Ortholitha</i> , <i>Eubolia</i>		<i>capsophila</i> (<i>carpophaga var.</i>),	
6, 7, 76, 123		<i>Dianthœcia</i>	23, 190, 271
<i>bipunctidactyla</i> , <i>Adkinia</i> .. 144, 182		<i>Caradrina</i>	272
<i>biscutana</i> , <i>Eucosma</i>	182	<i>cardamines</i> , <i>Eachlœ</i> 2, 24, 25, 29,	
<i>bisetata</i> , <i>Acidalia</i>	172	37, 58, 59, 70, 73, 78, 79, 80,	
<i>bisontella</i> , <i>Ochsenheimeria</i> .. 52		95, 104, 130, 131, 139, 170,	
<i>bistortata</i> , <i>Tephrosia</i>	49	175, 187, 191, 251, 263, 286	
<i>biundularia</i> , <i>Tephrosia</i>	168	<i>cardui</i> , <i>Pyrameis</i> 5, 22, 23, 59, 62,	
<i>buchiery</i> (<i>cyllarus ab.</i>), <i>Nomiades</i> 27		78, 79, 93, 119, 123, 125, 126,	
<i>blandiata</i> , <i>Perizoma</i>	50	129, 173, 174, 176, 188, 231,	
<i>bleuesi</i> (<i>dorilis var.</i>), <i>Loweia</i> .. 14		251, 263, 273	
<i>blomeri</i> , <i>Asthena</i>	76, 171	<i>carpinata</i> (<i>lobulata</i>), <i>Lobophora</i>	
<i>boticus</i> , <i>Lampides</i> 13, 40, 123,		49, 76, 286	
125, 126, 127, 129, 159, 175,		<i>carpini</i> = <i>pavonia</i>	
189, 278		<i>carpophaga</i> , <i>Dianthœcia</i> 23, 190, 271	
<i>boleti</i> , <i>Scardia</i>	93	<i>carthami</i> , <i>Hesperia</i>	81, 177
<i>bombyliformis</i> = <i>tityus</i>		<i>casaeus</i> (<i>ægon var.</i>), <i>Plebeius</i> 122,	
<i>bondii</i> , <i>Tapinostola</i>	143	123, 124	
<i>borbonica</i> , <i>Baoris</i>	269	<i>cassandra</i> (<i>polyxena var.</i>), <i>Thais</i>	
<i>boreata</i> , <i>Cheimatobia</i>	52, 280	.. .. .	36, 81
<i>bradyporina</i> (<i>leporina ab.</i>), <i>Acron-</i>		<i>cassiope</i> (<i>epiphron var.</i>), <i>Erebia</i> 30, 158	
<i>icta</i>	170	<i>casta</i> , <i>Fumea</i>	78
<i>brassicæ</i> , <i>Mamestra</i>	78, 183	<i>castanea</i> , <i>Noctua</i>	75
<i>brassicæ</i> , <i>Pieris</i> 22, 25, 32, 33, 34,		<i>castigana</i> , <i>Eupithecia</i>	50, 142
58, 79, 80, 111, 142, 170, 172,		<i>castilanus</i> , <i>Hepialus</i>	123
175, 183, 187, 191, 231, 273		<i>castrensis</i> , <i>Malacosoma</i>	123, 216
<i>brevicauda</i> , <i>Papilio</i>	186	<i>Catastieta</i>	45, 72, 214
<i>brevilinea</i> , <i>Leucania</i>	143	<i>Catocalæ</i>	235
<i>briseis</i> , <i>Satyrus</i> .. 40, 85, 127, 159		<i>Catonephele</i>	227, 283
<i>brockella</i> , <i>Argyresthia</i>	50, 182	<i>celerio</i> , <i>Hippotion</i>	188
<i>brumata</i> , <i>Cheimatobia</i>	144	<i>celtis</i> , <i>Libythea</i>	25, 84, 85
<i>brunnea</i> , <i>Noctua</i>	1, 75	<i>cembra</i> , <i>Scoparia</i>	6, 52, 170, 173
<i>bryonia</i> (<i>napi var.</i>), <i>Pieris</i> .. 220		<i>centaureata</i> = <i>oblongata</i>	
<i>bucephala</i> , <i>Pygaera</i>	2, 231	<i>centifoliella</i> , <i>Nepticula</i>	69

	PAGE		PAGE
centripuncta (tiliæ <i>ab.</i>), Mimas ..	142	Cænonympha	66, 152, 153, 156, 204
centum-notata (truncata <i>ab.</i>),		cognata, Eupithecia ..	142
Cidaria	23	Coleophora	135, 235
cerisyi, Thais	37, 40	Coleophoridae	144
ceronus (thetis <i>var.</i>), Agriades	28,	Colias	34, 72, 187
66, 170		Coliidae	67
Cerostoma	68	colquhounana, Nephodesme	100, 102
certata, Eucosmia	43	comes, Triphæna	51
cervantes (tages <i>var.</i>), Nisoniades	177	comma, Leucania	171
cervinata, Ortholitha, Eubolia	4, 78	comma, Urbicola	6, 123, 139
cerymica, Plectzia	140	communana, Sciaphila ..	100, 101
cespitalis, Herbula (Pyrausta)	50, 182	complanata, Lithosia	78
cespitis, Luperina	20, 78	complanella, Tischeria	50
ceto, Erebia	66, 155	complanula, Lithosia	263
chærophyllata = atrata		compta, Dianthœcia	123
chamanica (loëwii <i>var.</i>), Plebeius	65	concinata, Dysstroma	178, 179,
chamomilla, Cucullia	95	180, 181	
Charaxes	137	concomitella, Lithosia	227
charliona, Anthocharis	129, 204	confertata (pullata <i>var.</i>), Gnophos	123
charlotta (aglaia <i>ab.</i>), Argynnis ..	76	confusa (johnstoni <i>var.</i>), Acræa ..	237
chi, Pola	24, 52, 75, 231, 286	confusalis, Nola	78
chilo, Acræa	72	conjugella, Argyresthia	50
chlorodippe (adippe <i>var.</i>), Argynnis	279	consersa = nana	
christi, Erebia	27, 107, 158	consersana, Cnephasia	100, 102, 118
chrysantheana, Cnephasia	100,	conspersella, Swanmerdamia ..	182
101, 102		constrictata = distinctata	
chrysippus, Danais	62, 129	contaminana, Teras	182
chrysitaria (penningeraria <i>ab.</i>), Eur-		contaminei, Anthrocera	22
ranthus	123	contaminellus, Crambus	19
chrysis, Plusia	123, 170	contiguaria, Acidalia, Ptychopoda	23, 142
chrysocephala (geryon <i>var.</i>), Adscita	164	23, 142	
chrysomellus, Zezias	63	conversaria (repandata <i>var.</i>),	
Chrysophanidæ	65, 128	Boarmia	6, 24, 70, 283, 284
Chrysophanus	66, 67	convolvuli, Agrius	21, 74, 260, 272
chrysotheca, Euproctis	286	conwayana, Argyrotoxa	50
chrysothème, Colias	58	Coptotriche	135
Cidaria	96	cordula, Satyrus	66, 84
Cigaritis	205	coretas, Everses	159, 266, 275
cinerea, Agrotis	4	coridon, Agriades	23, 24, 30, 46,
cinerea (pseudargiolus <i>ab.</i>), Celas-		58, 65, 67, 70, 71, 85, 86, 95,	
trina	211, 276	96, 127, 131, 133, 141, 142,	
cinxia, Melitæa	36, 80, 271, 273	143, 164, 173, 187, 189, 210,	
circe (proserpina), Satyrus	156	220, 221, 224, 231, 279, 280,	
circe, Satyrus	36, 84, 156, 157,	283, 284	
158, 161, 162, 267		coronata, Eupithecia, Chryso-	
circellaris, Amathes	75	clystis	3, 78
cirrana (variegana <i>ab.</i>), Peronea ..	94	coronillella, Anacampsis	280
citraria = ochrearia		corticea, Agrotis, Euxoa	75, 194, 282
citrata = immanata, Dysstroma	52,	corydonis (coridon <i>ab.</i>), Agriades	224
76, 78, 96, 178, 179, 180, 181,	198	corylata, Cidaria	49
citronia (cardamines <i>var.</i>), Euchloë	104	coryli, Demas	77
cladiella (thrasonella <i>var.</i>), Gly-		coryli, Lithocolletis	232
phipteryx	151	cosmophorana, Coccyx	144
clathrata, Chiasmia	78, 123	Cossidæ	43
cleodippe (adippe <i>var.</i>), Argynnis ..	279	costajuncta (ægon <i>ab.</i>), Plebeius ..	122
cleodoxa (adippe <i>var.</i>), Argynnis	105, 190, 279	costajuncta (icarus <i>ab.</i>), Polyo-	
105, 190, 279		matus	24
cleopatra, Gonepteryx	25, 40, 58,	costajuncta (medon <i>ab.</i>), Aricia ..	220
59, 79, 80, 175		costajuncta (thetis <i>ab.</i>), Agriades ..	218
climene (synclimene), Epinephele	156	costalis, Pyralis	2
clytie (ilia <i>var.</i>), Apatura	21, 157,	costosa, Depressaria	183
158, 161, 162, 267		crabroniformis (bembeciformis),	
Cnephasia (Sciaphila) 99, 100, 101, 144		Trochilum	74
c-nigrum, Noctua	75, 77	cracæa, Toxocampa	5
Codonia	123	Crambus	19, 20, 123, 231

	PAGE		PAGE
cramerella, Lithocolletis	49	deserticola, Melitæa	62
crameri (belia), Anthocharis 27, 36,		desfontainii, Melitæa	72, 176
37, 39, 61, 62, 66, 79, 80, 81,		designata, Coremia 50, 51, 52, 169	169
120, 159, 175, 187, 204	204	Deuterocopus	277
cratægata, Rumia	286	dia, Brenthis	28, 30
cratægi, Aporia .. 37, 80, 175, 204		diana, Simaethis, Allonyma ..	182
cratægi, Trichiura	7, 286	Dianthœcia	141, 271
crenana, Phleodes	182	Dicranuridæ	74
crepuscularia, Tephrosia	286	dictæoides, Pheosia, Notodonta 74,	77
cretacea (ægon var.), Plebeius 217,	218	dictynna, Melitæa 29, 59, 104, 105,	
eribrellum, Hesperia	102	156, 216	
eribrum, Myelophila	2	didyma, Melitæa 39, 59, 104, 125,	
crystalalis, Nola	4	126, 204, 216	
croatica, Macroglossa	36	didymata, Melenydris	51, 76
crocealis, Ebulea	7	diffinis, Calymnia	78
croceus = edusa		diffinis, Gelechia	68
cruciana, Hypermezia	182	dilutaria = interjectaria	
cruciferarum = maculipennis ..		dilutata, Oporabia	52
cucubali, Dianthœcia	50, 123	disco-elongata (ægon ab.), Plebeius	122
cucullatella, Nola	2, 286	Discophora	227
culmellus, Crambus	51, 182	Dismorphia	22
cuneiger (dispar ab.), Chrysopha-		dispar, Chrysophanus	212, 282
nus	212	dissimilis, Mamestra	78
curius, Leptocircus	285	distinctaria (constrictata), Eupi-	
cursoria, Agrotis	197	thœcia	144
curtsellus, Prays	68	ditrapezium, Noctua	1
Cybdelis	285	divisa (scabiosa ab.), Anthrocera	123
Cyclogramma	263	dominula, Callimorpha	143
cygnipennella, Elachista	183	donzelii, Aricia	158, 159
cyllarus, Nomiades, Glaucopsyche		dorilis, Loweia 14, 15, 30, 36, 66,	
25, 27, 28, 80, 82, 103, 143,		107, 128	
174, 176, 204, 218, 267	267	dorus, Ctenonympha 83, 124, 125, 177	
cyntia, Melitæa	158	dotata, Larentia	123
cytisaria = pruinata		doubledayaria (betularia var.),	
dablii, Noctua	75	Amphidasis	2, 3
damon, Polyommatus 30, 59, 65, 67	67	Drepanulidæ	43, 74
damone, Euchloë	58, 139, 141	dromedarius, Notodonta	74, 274
daphne, Brenthis	36, 39, 83	dryas, Enodia, Satyrus .. 30, 38,	40
daplidice, Pontia 28, 35, 58, 61,		dubitalis (pyralella), Scoparia 50,	183
66, 79, 80, 81, 103, 124, 125,		dubitana, Eupoecilia	94
126, 127, 159, 175, 187, 286	286	dubitata, Scotosia	272
Daptoneura	214	duplaris, Palimpsestis, Cymato-	
darwiniana (arcania var.), Ceno-		phora	3, 7, 51
nympha	30, 66, 106	duponcheli, Leptosia 37, 38, 40,	80
dealbata = lineata		Dysstroma	181
decolorata = flavofasciata		Earias	205
decrepitalis, Pionea	50	echo (psendargiolus ab.), Celastrina	211
defoliaria, Hibernia 143, 144, 280,	284	edda, Erebia	155
deione, Melitæa 14, 28, 82, 83,		edusa, Colias 4, 22, 24, 25, 35, 36,	
159, 176, 204, 277	277	39, 58, 62, 63, 67, 71, 78, 79,	
deleta (lacticolor) (grossulariata		124, 125, 126, 127, 129, 175,	
ab.), Abraxas	24, 142	188, 204, 208, 215, 231, 273	
Delias	22	egea, Polygonia	36, 79, 82, 84
delius, Parnassius 15, 27, 30, 58,		egerides (ageria var.), Pararge 15,	
66, 107, 108, 158, 159, 163,		25, 30, 187, 192	
266, 267		egialea, Acræa	93
demodocus, Papilio	188	Elachista	232
demolion, Papilio	90	electra, Colias	188
dentina, Hadena, Mamestra 123,		eleus (phleas var.), Rumicia ..	142
170, 183		elinguaria, Crocallis	2, 172, 284
deplana, Lithosia	284	ellena, Satyrus	204
derasa, Habrosyne, Thyatira 3,	78	elongella, Gracilaria	182
derivana, Cnephasia	100	elpenor, Eumorpha	20, 272
derivata, Anticlea	78	elymi, Tapinostola	75
descombesi, Delias	140	emarginata, Acidalia	7

	PAGE		PAGE
Emmelesia	76	fabriciana (oxyacanthella), Sime-	
encedon, Acrea	139	this	151, 183
Endrosa	154	fagella, Chimabache	68, 168
Epinephele 31, 152, 153, 154, 155,		fagi, Stauropus	130
156, 204		faginella, Lithocolletis	50
epiphron, Erebia 30, 31, 122, 155,		falcataria, Drepana	50, 74
217, 219, 225, 226		falloui, Anthocharis	204
epistygne, Erebia	78, 79, 80	farinosa, Gonepteryx	38
equitella, Glyphipteryx	151	fascelina, Dasychira	270, 271
erate, Colias	58, 71	fasciata, Arctia	122
Erebia 26, 27, 30, 66, 108, 152,		fasciuncula, Miana	51, 171, 183
153, 155, 156, 158, 160, 163,		fatma, Scelitantes	204, 205
226		fausta, Teracolus	62
Erebiinae	67	februa, Ageronia	98, 154
ericetaria (plumaria), Selidosema		feisthamelii (podalirius var.), Pa-	
219, 271		pilio	125, 126, 127, 204
ericetella, Gelechia	49	fenestrella, Thyris, Endrosis	123,
eriphyle, Erebia .. 15, 107, 108,	158	183, 190	
eris (niobe var.), Argynnis	177	ferchaultella, Luffia	282
eros, Polyommatus 45, 90, 158,		ferrugalis, Pionea	52
159, 164, 187, 213		ferrugana, Peronea	52
Erycinidae = Riodinidae	278	ferrugata, Coremia .. 49, 136, 169,	170
Erynnis	39	fervida (trux var.), Agrotis	197
escheri, Polyommatus 59, 83, 176,		festiva = primulae, Noctua.	
188, 189, 213, 236, 262,	283	festuca, Plusia	170
Euchloë	139	fibulella, Adela	144, 170
eucrate (sao ab.), Powellia	123	fidia, Satyrus .. 85, 126, 127,	205
eudora-mauretana, Epinephele ..	204	filipendulae, Anthocharis .. 4, 22,	
eudora = lycaon		120, 131, 164, 183, 224, 284,	287
Eudoria (Scoparia) 165, 172, 173,	278	fimbria, Triphaena .. 2, 6, 46,	144
eumedon, Arctia	22, 59, 224	firmata, Thera	78
euonymellus (padi), Hyponomeuta	20	fischeriella, Glyphipteryx	183
eupheme, Zegris	58, 143, 175	fisonii (betulae ab.), Rurialis	31
euphemus, Lycaena 26, 29, 58, 105,		fissipuncta, Dyschorista	286
106, 162, 200, 201,	202	flammealis, Endotricha .. 172,	183
eupheno = crameri (belia)	204	flava (linea) (thaumas), Adopaea	
euphenoides, Euchloë 25, 59, 80,		6, 39, 59, 73, 171,	177
143, 175		flavescens (quadripunctaria ab.),	
euphorbiae, Celerio, Deilephila,		Callimorpha	272
Hyles	34, 257	flavicincta, Polia	272
euphorbiae-mauretana, Celerio ..	205	flavicinctata, Larentia, Entephria	
euphrosyne, Brenthis 29, 66, 73,		142, 224	
81, 103, 105, 130, 142, 166,		flavicornis, Polyploca	49
169, 188, 191, 285,	286	flavidior (simplicia var.), Antho-	
Eupithecia 42, 43, 119, 135, 141,		charis	27, 66, 82
142, 227, 228,	276	flavifrontella, Borkhausenia	68
euryale, Erebia 30, 59, 66, 158,	223	flaviolaria, Acidalia 164, 166,	223
eurybia (hippotochē var.), Heodes		flavofasciata, Erebia 16, 107, 108,	
107, 167		164, 165	
eurymedon, Papilio	186	flavofasciata (decolorata), Perizoma	
eurytheme, Colias, Eurymus	119	78, 271	
evanida, Pyrgus, Hesperia	64	florella, Catopsilia	129
evanida (amenophis), Hesperia 64,		fluctuata, Xanthorhōe, Melanippe	
65, 129, 268,	270	170, 183, 187,	271
evias, Erebia 82, 105, 121, 122,		fowleri (coridon ab.), Agriades	173
160, 177		fontis, Bomolocha	78
exanthemaria, Cabera	272	forficalis, Pionea	172
exclamationis, Euxoa, Agrotis 4,		francillonana, Lozopera	226
183, 196, 197,	198	fraterna (arundinis ab.), Nonagria	143
exiguata, Eupithecia	2, 78	fraxinata (innotata), Eupithecia	
exoleta, Calocampa	75, 77	2, 119, 142	
extensaria, Eupithecia	143	frequentella, Scoparia	51
extrema (minus ab.), Cupido		fritilla, Ageronia	98
24, 70		fritillum, Hesperia	278
exulans, Anthrocera 70, 93, 168,	287	fulgurita, Eribomorpha	21
exulis, Crymodes	143		

	PAGE		PAGE
fuliginaria, Parascotia	72	gozora (pseudargiolus <i>var.</i>), Celas-	
fuliginosa, Phragmatobia .. 50, 74,	78	trina	211
fulva, Tapinostola	52	gracilis, Taniocampa	2
fulvago, Mellinia	142, 285	graminis, Chæreas	51, 78
fumata, Acidalia	51, 76	grandis, Stenoptilia	275
fumida (pseudargiolus <i>ab.</i>), Celas-		grisealis, Zanclognatha	171
strina	211	grisearia (mucidaria <i>ab.</i>), Gnophos	123
fusca, Pygmaena	225	grossulariata, Abraxas 23, 24, 51,	
fusca, Salebria	51	70, 94, 114, 142, 143	
fusca (neurica <i>ab.</i>), Nonagria	142	grunus, Habrodias	12
fuscata (abruptaria <i>ab.</i>), Hemero-		guadarramensis (aurolimbata <i>ab.</i>),	
phila	95	Orgyia	123
fuscadinella, Coleophora	183	gueneei, Apamea, Luperina 276, 278	
fuscconebulosa (velleda), Hepialus		gutta, Plusia	123, 190
74, 78		hamana, Xanthosetia	183
fuscoviridella, Glyphipteryx	151	hamula = binaria	3
furcata (sordidata), Hydrimena		harrisii, Halisidota	227
51, 76		harrisoni, Ithysia	139
fureatellus, Crambus	224	hastata, Eulype	50, 191
furva, Mamestra	23	hastiana, Peronea	285
galactina (compta <i>ab.</i>), Dianthœcia	123	haworthiata (isogrammaria), Eu-	
galactodactyla, Porritia	4	pithecia	2
galathea, Melanargia 6, 28, 39, 71,		haworthii, Celæna	52, 75
71, 74, 83, 131, 171, 217, 267		Hebomoia	275
galiata, Xanthorhœ, Larentia 6,		hecta, Hepialus	50, 78
78, 95, 123, 271		helice (edusa <i>var.</i>), Colias 24, 62,	
gallii, Celerio	141	127, 188	
gamma, Plusia 123, 170, 174, 190,	231	hellerella (atra), Blastodaena	50
Gegenes	269	helvola (rufina), Amathes	75
gemina, Apamea	51	hepatariella, Depressaria	182
gemmana (nievana <i>var.</i>), Grapho-		Hepialidæ	43, 74
litha	182	hera = quadripunctaria	4
gemnaria, Boarmia 5, 170, 172, 284		heracleana, Depressaria	49
gemmiferana, Grapholitha (Laspey-		hermione = syriaca	36
resia)	23	hermione, Satyrus 36, 59, 66, 84,	
geniculeus, Crambus	231	98, 275, 276	
geniste, Hadena	4	heroldella, Swammerdamia	50
**genitulana, Cnephasia (Sciaphila)		Hesperia	129
95, 100, 102, 118		hesperica (sephyrus <i>var.</i>), Plebeius	
gentiana, Penthina	23	72, 143, 176	
geoffrella, Harpella	170	Hesperiidæ 71, 82, 133, 135, 137, 177	
Geometra	75	Heterocera	177
Geometridæ .. 40, 43, 170, 177, 229		hexadactyla, Orneodes	169
geryon, Adscita .. 74, 164, 220, 224		hiera, Pararge	26
gigas (loewii <i>ab.</i>), Lycæna	129	Hipparchia	276
givago, Mellinia	142	hippia, Eronia	135
gilvaria, Aspilates	7, 173	hippocastanaria, Pachygnemia	78
glabraris = jubata		hippocrepidis, Anthrocera	22, 95
glacialis (alecto <i>var.</i>), Erebia 27,		hippomedusa (medusa <i>var.</i>), Erebia 66	
30, 136, 156, 158		hippothœ, Chrysophanus, Heodes	
glandifera = muralis		14, 29, 58, 65, 67, 107, 123,	
glareosa, Noctua	75	128, 167, 223	
glauca, Hadena	75, 169	hirtaria, Lycia, Biston 24, 76, 139,	
glauca, Cilix	74, 123, 190	187, 286	
glaucinaria, Gnophos	224	hispanica (hylas <i>var.</i>), Polyommatus??	
glauconome, Pontia	62, 129	.. ..	143
glyphica, Euclidia	4	hispidaria, Nyssia	24, 285
Gnophos	165	hispidus, Heliophobus	273
goante, Erebia	168	hispulla (jurtina <i>var.</i>), Epinephele	
gonodactyla, Platyptilia .. 2, 51, 223		30, 123, 125, 153, 154, 190	
goossensata (minutata), Eupithecia 51		holli (borbonica <i>var.</i>), Baoris	269
gordius (ulciphron <i>var.</i>), Loweia		holmiana, Dictyopteryx	144
26, 29, 66, 80, 82, 108, 128, 175, 213		holosericata, Ptychopoda	6
gorge, Erebia 15, 30, 66, 158, 168		homerus, Pupilio	119, 186
gothica, Taniocampa	49, 187	hortuellus, Crambus	50, 183

	PAGE		
Homoptera	275	infusata (marginaria <i>ab.</i>), Hiber-	
humuli, Hepialus	170, 183	nia	76
huntera, Pyraucis	188	innotata, Eupithecia	119, 142
hutchinsoni (c-album <i>var.</i>), Poly-		innuba (pronuba <i>ab.</i>), Triphaena ..	272
gonia	23	ino, Brenthis	29, 108, 156
Hyades	236	inquinatellus, Crambus	51
hyale, Collis 25, 37, 40, 58, 71, 72,		insubrica (arcania <i>ab.</i>), Cœnonym-	
79, 127, 175, 200, 204, 258	258	pha	104, 105, 108
Hybernia	76	interjectana, Cnephasia, Scisiphila	
hybridalis = noctuella		interjectaria (dilutaria), Ptycho-	
hybridus, Smerinthus	95, 275, 276	podæ, Acidalia	78
Hydriomena	118	intermedia (ægeria <i>ab.</i>), Pararge	
Hydroecia	278	25, 105, 270	
hyemana, Tortricodes, Nephodes		intermedia (ocellaris <i>ab.</i>), Meliinia	142
100, 102		intermedia (pseudargiolus <i>ab.</i>),	
hylas, Polyommatus	30, 59, 63,	Celastrina	211
66, 143, 176, 216		interrogationis, Plusia	51, 75
hyperantus, Aphantopus 6, 29, 30,		io, Vanessa 6, 25, 27, 73, 92, 123,	
31, 32, 71, 73, 74, 141, 143	171, 183, 217	130, 172, 173, 191, 231,	
hypericana, Catoptria	182	iolas, Lycæna	28, 161, 204, 267
hypochiona (ægon <i>var.</i>), Plebeius	219	iota, Plusia	51
Hyponephele	156	iphioides, Cœnonympha	124, 177
Hyponomeuta	230	iphis, Cœnonympha	166, 167
iberica (aurinia <i>var.</i>), Melitæa ..	174	iris, Apatura 21, 30, 59, 157, 158,	
ibipennella, Coleophora	68	159, 161, 162, 163, 172, 263,	
icarus (alexis), Polyommatus 20,		267, 268	
21, 22, 23, 24, 28, 29, 37, 39,		isis (pales), Brenthis	166
45, 46, 51, 59, 63, 70, 71, 73,		isogrammata = haworthiata	
79, 95, 125, 141, 142, 143, 164,		jacobææ, Hipocrita, Euchelia 4, 94,	
169, 170, 171, 172, 173, 176,		143, 183, 191	
183, 187, 189, 191, 216, 218,		janira = jurtina	
219, 220, 223, 224, 231, 263,		janthina, Triphaena	2, 51, 172
271, 273, 284, 286		jasius, Charaxes	143, 174
ictericana, Sphaleroptera	100, 102	johnstoni, Arœa	237, 278
ida, Epinephele	125, 126, 152,	julata (glabraria), Cleora	172
154, 155, 156		juncicolella, Coleophora	182
ilia, Apatura 21, 59, 83, 157, 158,		jurtina (janira), Epinephele 2, 30,	
161, 162, 267		36, 51, 59, 71, 78, 94, 98, 123,	
iliades (ilia <i>var.</i>), Apatura	21	125, 127, 152, 153, 154, 156,	
ilicifolia, Gastropacha, Epicnaptera		183, 190, 216, 217, 218, 219,	
24, 45		231, 258, 271, 273, 284, 286, 287	
ilicis, Nordmannia 28, 36, 39, 83,		karsandra, Zizera, Zizeeria 129, 269	
157, 262		kenricki, Morphotenaris	236
illumaria = bilunaria	2, 188	kirbyi (kirbyi), Oiketeticus	21, 93
illustris, Automeris	21	kleemanella, Lithocolletis	50
initaria, Leptomeris, Acidalia ..	7	kühniella, Ephestia	94, 263
immanata = citrata		lacertinaria, Drepana	74
immorata, Leptomeris, Acidalia ..	142	lachesis, Melanargia 125, 127, 143, 177	
impluviata, Hydriomena	50, 76, 169	lactearia, Iodis	2, 171
impura, Leucania	2	lacticolor = deleta	
inæqualis (coridon <i>ab.</i>), Agriades		lacunaria, Sericoris	182, 183
24, 85, 86, 96, 142		l-album, Polygonia	35
incanaria = virgularia, Ptychopoda,		lancealis, Perinephele	123
Acidalia	143, 170	lanceolata (hyperantus <i>ab.</i>),	
incerta, Tieniocampa	49	Aphantopus	141, 143
incertana (subjectana), Cnephasia,		lanestris, Eriogaster	168
Scisiphila	100	lapella, Tinea	50
inclara (medon <i>ab.</i>), Aricia	220	lapidata, Phibalapteryx	52
indecis, Epanthera	187	lappona, Erebia	27, 66, 168
indigata, Eupithecia	78	laponaria, Nyssia	187, 286
ines, Melanargia	143, 177, 204	laricella, Coleophora	182
infecta, Agrotis	194	lariciata, Eupithecia 3, 50, 78, 119	
infradiata (phlæas <i>ab.</i>), Rumicra 70		larissa, Melanargia	40
		larydas, Lycænesthes	236
		Lasiocampa	205

	PAGE		PAGE
Lasiocampide	43	lunosa, Omphaloscelis ..	75, 77
latenai (dentina <i>ab.</i>), Hadena ..	123	lupulina, Hepialus ..	50, 169, 183
lathonia, Issoria	28, 30, 176	lurideola, Lithosia ..	172
lathyri (sinapis <i>var.</i>), Leptosia ..	28	lutarella, Lithosia ..	19
latruncula, Miana	274	lutea (flavago), Citria, Xanthia ..	285
lavandule, Anthrocera	174, 177	luteago, Dianthecia 1, 5, 6, 22, 46,	69, 70, 271
lefebvrei, Erebia	275	lutearia, Cioeene	164, 224
lefebvrii, Gegeres	269	lutealis, Pionea	52
Lemonia	205	luteata, Asthena	50
lenticulosa (trux <i>ab.</i>), Agrotis ..	192,	luteolata, Opisthograptis ..	50
	193, 197	lutosa, Calamia	231
lentiginosella, Gelechia	68	lutulenta, Epunda	75
leporina, Aconicta	74, 95, 170, 173	Lycæna	204
Leptosia	37	Lycænesthes	47, 277
lesbia, Colias	187	Lycænidæ 16, 47, 63, 66, 67, 79,	136, 262, 277
Leucania	228	Lycænopis	276
leucographa, Pachnobia	75	lycaon, Epinephele, Hyponephele	59, 125, 127, 152, 155, 156
leucomelas (galathea <i>ab.</i>), Abraxas	83	lychnidis (pistacina), Amathes ..	75
leucophaea, Pachetra	3, 4	lycidas (hylas <i>var.</i>), Polyommatus	?? 143
leucophaearia, Hibernia	213, 285	lycidas (sephyrus <i>var.</i>), Plebeius	27, 72, 90, 143, 176
levana, Araschnia 13, 14, 23, 26,	59, 106, 107, 108, 109, 139,	lycoa, Acnea	278
	171, 267	Lymantriidæ	43
libelluloides, Leptocircus	285	lysimon, Zizera, Zizeeria	62, 129
lichenaria, Cleora	78, 286	machaon, Papilio 13, 14, 15, 25,	27, 30, 35, 58, 67, 79, 80, 126,
lichenea, Epunda	70, 75		159, 174, 175, 204, 222, 258,
lichenella, Solenobia	188		266, 267, 285
ligea, Erebia	66	macilentia, Amathes	75, 77
ligniperda, Cossus	2, 74	macularia, Venilia	4
ligustri, Craniophora	272	maculipennis (cruciferarum), Flu-	tella 20, 49, 50, 68, 183
ligustri, Sphinx	95, 183	mæra, Paucage 30, 37, 40, 45, 59,	89, 126, 177
limitata, Ortholitha, Eubolia ..	172	magnifica, Citheronia	21
linariata, Eupithecia	78	maia, Hemileuca	274
linea = flava .. .. .	.. .. .	malva, Hesperia 23, 35, 36, 37, 79,	82, 143, 190, 191, 267, 278
lineago (ocellaris <i>ab.</i>), Mellinia ..	142	manni, Pieris	45, 220, 275, 276
linearia, Codona, Ephyra	190	manto, Erebia 15, 26, 27, 30, 66,	225
lineata (dealbata), Scoria	3	margaritaria, Metrocampa ..	2, 51
linneella, Chrysoelysta	68	margaritellus, Crambus	51, 182
literana, Tortrix	130	marginaria, Hibernia 49, 76, 285,	286
litorosa, Miana	75, 78	marginata, Lomaspilis	50, 169
lithargyria, Leucania	171	marginata (pseudargiolus <i>ab.</i>),	Celastrina 211
Lithosia	74	marginopunctata (promutata), Aci-	dalia 78
Lithosiidæ	226	marginopunctata, Leptomeris ..	143
Lithosiinæ	43	marmoræa, Gelechia	183
litura, Amathes	219	marmorinaria (leucophaearia <i>var.</i>),	Hibernia 265
liturata, Semiothisa	171, 219	Marmorte	156
livia, Virachola	63, 129, 269	martini, Scolitantides	204
livornica, Phryxus	207	masseyi (egon <i>var.</i>), Plebeius 217,	218
loewii, Plebeius	63, 64, 65, 129	mathewi (dorus <i>var.</i>), Cononympha	124, 125
logiana, Sciaphila	100	mathias, Chapra	129, 268, 269
lonicæ, Anthrocera	22, 74, 171	matura, Cerigo	7, 20
lowei (luteago <i>ab.</i>), Dianthecia ..	271	maturna, Melitea	15, 66, 107
loti, Amathes	75, 77, 286	maura, Mania, Mormo	2, 22, 172
loudeti, Enterpia	277		
lubricipeda, Spilosoma	112, 170, 231		
lucernea, Agrotis	23, 120, 214		
lucia (pseudargiolus <i>ab.</i>), Celas-	trina 211		
lucina, Hamearis 4, 59, 73, 130,	131, 191		
lugens (cyllarus <i>ab.</i>), Glaucopsyche	104		
lunaria, Selenia	21		
lunigera, Agrotis 23, 192, 193, 194,	195, 196, 197, 198, 199, 247,		
	248, 249, 251, 272		

	PAGE		PAGE
mauretana, Celerio	205	mixtana, Peronea	52
mauretana, Epinephele	204	mnemosyne, Parnassius 66, 104,	106, 227
media, Basiothia	188	mnestra, Erebia	158
medio-lugens (megæra <i>ab.</i>), Pararge	271	monacha, Psilura .. 46, 70, 78,	286
medesicaste (rumina <i>var.</i>), Thais	80	moneta, Plusia	91
medon (astrarche) (agestis), Aricia		monodactyla, Emmelina	2
4, 23, 70, 71, 73, 80, 125,		monoglypha (polyodon), Xylophasia	
176, 189, 204, 205, 217, 219,		6, 51, 75,	183
220, 221, 224, 273		montana (semiargus <i>var.</i>), Poly-	
medusa, Erebia	66, 105	ommatus	31
megæra, Pararge 25, 30, 73, 79,		montanata, Xanthorhœ, Larentia	
171, 172, 173, 174, 177, 191,		50, 76, 77, 123, 170,	223
200, 217, 231, 252, 270,	286	mori, Bombyx	133, 136, 228
mehadiensis (athalia <i>var.</i>), Melitæa		morpheus, Caradrina	272
39, 40		morpheus, Heteropterus .. 29, 35,	107
melampus, Erebia 66, 164, 166,		mucidaria, Gnophos	123
224, 225		multistrigaria, Malenydris, Larentia	
melanina (pncebe <i>var.</i>), Melitæa ..	189	2, 49, 78,	286
melanops, Glaucopsyche 27, 79, 80,		munda, Tæniocampa	286
105, 123, 189		mundana, Nudaria	74
melano σ xa (arcuata) (icarus <i>ab.</i>),		muralis (glandifera), Bryophila ..	78
Polyommatus	24, 263	murana, Scoparia	51
melas, Erebia	136	muscaformis (philanthiformis),	
meleager, Polyommatus 40, 59, 84,	85	Aegeria	183
melibœus (alciphron <i>ab.</i>), Loweia	35	muscalella, Incurvaria	50
meliloti, Anthropera	72	myopæformis, Aegeria, Sesia	2
Melitæa	116, 215, 277	myrmidone, Colias	58
mellonella, Galleria	183	myrochracearia, Anarta	123
melotis, Hesperia	278	mytillellus, Crambus	123
memnon, Caligo	234, 236	myrtilli, Anarta	51, 78
mendica, Spilosoma, Diaphora 3,		Myscelia	283
4, 78, 192,	286	nævana, Grapholitha, Rhopobota	
menephron, Psiligramma	21	182, 275	
menthastri, Spilosoma 94, 170,		nana (consersa), Diantheccia 6,	
183, 231		23, 141,	271
menyanthidis, Pharetra 75, 169, 188		nanata, Eupithecia 6, 51, 78, 119,	172
mercuriana, Pampusia	182	napæa (pales <i>ab.</i>), Brenthis 159,	
meridionalis (eupheme <i>var.</i>), Zeg-		166, 268	
gris	143, 175	napææ (napi <i>var.</i>), Pieris	38, 39
merope (aurinia <i>var.</i>), Melitæa		napella (napi <i>ab.</i>), Pieris	122
158, 159,	225	napi, Pieris 22, 25, 38, 39, 58, 80,	
merularia (leucophæaria <i>var.</i>),		122, 131, 169, 170, 175, 183,	
Hibernia	285	191, 218, 219, 220, 231, 285,	286
metallicus, Nemotois	134	narica, Epinephele.. 152, 155,	156
Mataporia	22	neapolisata (fluctuata <i>ab.</i>), Xan-	
meticulosa, Phlogophora .. 77, 78,	183	thorhœ	187
mi, Euclidia	4, 49	nebulella, Homoesoma	172
Miana	135	nebulosa, Aplecta	24, 112, 282
microdactyla, Leioptilus	23	neglecta (castanea <i>var.</i>), Noctua ..	75
Micropterygide	43	neglecta (pseudargiolus <i>ab.</i>), Cela-	
miegii (virgaureæ <i>ab.</i>), Heodes ..	190	trina	210
miniata, Miltochrista .. 7, 77,	272	nelamus (epiphron <i>ab.</i>), Erebia ..	225
minimellus, Nemotois	51	nelvai, Satyrus	204
minus, Cupido 24, 25, 26, 28,		Nemorina	123
29, 70, 74, 79, 80, 82, 143,	173	Nephodesme	100, 102
ministrana, Tortrix	50	nerii, Daphnis	133
minor (hyperantus <i>ab.</i>), Aphanto-		nerine, Erebia	107, 155
pus	141	nervosa, Depressaria	52
minorana, Cnephasia, Sciaphila ..	100	Nessæa	227
minutata = goossensata		neurica, Nonagra	142
minutissimus (coridon <i>ab.</i>), Ag-		neustria, Malacosoma 7, 78, 216,	286
riades	24	nicellii, Lithocolletis	232
misella, Tinea	68, 183	nictitans, Hydrobia 51, 172,	278
misippus, Hypolimnas	188	nig (pseudargiolus <i>var.</i>), Celastrina	211
mitterbacheriana, Ancyliis	50		

	PAGE		PAGE
nigra, Aporphyla	77, 78	obsoleta (icarus <i>ab.</i>), Polyommatus	24, 45, 142, 187
nigra (bidentata <i>ab.</i>), Odontopera	23, 24	obsoleta (minimus <i>ab.</i>), Cupido	24, 70
nigra (hippotoë <i>ab.</i>), Heodes ..	167	obsoleta (phleas <i>ab.</i>), Rumicia ..	70
**nigra (lariciata <i>ab.</i>), Eupithecia	119	obsoleta (smaragdaria <i>ab.</i>), Eu-	
nigra (orion <i>ab.</i>), Scolitantides ..	175	chloris	70
nigra (pseudargiolus <i>var.</i>), Celas-		obsoletana, Cnephasia, Sciaphila	100
trina	211	occitanica (phœbe <i>var.</i>), Melitæa	176
nigrescens (pseudargiolus <i>var.</i>),		occulta, Apleta	75
Celastrina	211	ocellaris, Mellinia, Xanthia	142, 285
nigricans, Agrotis	75, 188	ocellata, Mesoleuca	51
nigricans, Dorylus	93	ocellatus, Smerinthus 23, 46, 141,	
nigricomella, Bucculatrix	50	246, 257	
nigrocostata (grossulariata <i>ab.</i>),		ocellatus (hyperantus <i>ab.</i>), Aphan-	
Abraxas	94, 143	topus	141
nigromaculana, Grapholitha ..	183	ocellina, Agrotis	164, 224
nigromaculata (phleas <i>ab.</i>), Rumi-		ochracea, Gortyna	272
cia	125	ochracearia (mucidaria <i>var.</i>), Gno-	
nigrosarsata (grossulariata <i>ab.</i>),		phos	123
Abraxas	23, 94, 142, 143	ochreaia (citraria), Aspilates ..	231
nimbella, Homœosoma	183	Ochsenheimeria	137
niobe, Argynnis	92, 164, 177	octomaculana, Cnephasia, Scia-	
Nisoniades	134	pbila	100, 101, 102, 118
nitidita, Acidalia	123	oculea = secalis	
nitidella, Argyresthia	183	œdipus, Cœnonympha	15
nivescens (hylas <i>var.</i>), Polyomma-		œme, Erebia 29, 30, 66, 266, 267	267
tus	176	Æneis	153
Noctua	7, 205	Ogyris	274
Noctue	70, 75, 170	oleracea, Hadena, Noctua 183, 194,	
noctuella (hybridalis), Nomophila	231	196, 250	
Noctuide 134, 135, 136, 227, 228,		olivata, Amœbe	51, 52, 143
275, 278		olivalis, Pionea	51
Nonagria	228	*oliveri (nanata <i>ab.</i>), Eupithecia	119
no-trodamus, Gegendes	268, 269	olivierella, Dasycera, (Ecophora ..	170
Notocrypta	278	olivina (trux <i>ab.</i>), Agrotis 192, 193,	
Notodontide	43, 74	196, 248	
nouna, Calicharis	204	onopordi, Syrichthus	204
nubeculosa, Asteroscopus	286	operosa, Smerinthus	275, 276
Nubila	156	Oporabia	118, 138
nubilana, Nephodesme	100, 102	optilete, Vacciniina	158, 168
numida, Syrichthus	204	or, Cymatophora	74
nupta, Catoeala	2, 272	orbicularia, Codona, Ephyra ..	190
nurag, Epinephele	152, 153, 154	orbitulus, Latorina 158, 187, 213,	
nymphæata, Hydrocampa	183	225, 263	
obeliscata (variata), Thera 52, 91		Oreades = Satyrus	156
oberthûri (pyrenaica <i>var.</i>), Latio-		orientalis, Erynnis	36, 37, 39
ima	263	orion, Scolitantides 13, 14, 16, 25,	
obidana, Ageronia	98	128, 160, 175, 200, 201, 266, 283	
obliterata, Euchœa	169	orion (scabiosæ <i>ab.</i>), Anthrocera ..	123
oblongata (centaureata), Eupithecia		ormenus, Papilio	33
2, 172, 207		ornatella, Phycis	183
obscura, Agrotis	75	Ornithoptera	134, 185
obscuraria (obscurata), Gnophos 5,		osiris = sebrus	
76, 78, 173, 272		osseana, Apbelia	182, 223
obscurella, Elachista	50, 232	osseana, Cnephasia, Ablabia, Ne-	
obscurissima (castigata <i>ab.</i>), Eu-		phodesme, Sciaphila	100, 102
pithecia	142	oxyacanthæ, Myselia	286
obsoleta (coridon <i>ab.</i>), Agriades 24,		oxyacanthella = fabriciana	183
70, 127		padi (euonymellus), Hyponomeuta	20
obsoleta (corticea <i>ab.</i>), Euxoa,		palemon (panisens), Cyclopides ..	23
Agrotis	282	paleno, Colias 15, 30, 58, 72, 108,	
obsoleta (epiphron <i>ab.</i>), Erebia ..	226	157, 158, 159, 167, 168, 225, 267	
obsoleta (hyperantus <i>ab.</i>), Aphan-		palarica, Erebia	121, 122, 274
topus	74, 141	pales, Brenthis 30, 66, 107, 108,	

	PAGE		PAGE
113, 139, 158, 159, 163, 164,		pharte, Erebia	30, 158
166, 167, 168, 214, 216, 223,		phegea, Syntomis	22, 263
224, 263, 268		pheretes, Albulina	22, 66, 166, 223
pallescens (ilia ab.), Apatura ..	21	phicomone, Colias .. 67, 107, 164,	223
pallescentella, Tinea	68, 69	philanthiformis = muscæformis	
pallida (aegeria ab.), Pararge ..	30	phlæas, Rumicia 23, 35, 36, 45, 46,	
pallida (edusa ab.), Colias ..	62, 175	58, 66, 70, 79, 82, 83, 92, 108,	
pallida (pamphilus ab.), Cæno-		125, 142, 169, 170, 171, 173,	
nympha	70, 127	175, 183, 190, 191, 220, 221,	
paludata, Carsia	144	231, 270, 286	
palustris (trifolii var.), Anthrocea		phœbe, Melitæa 59, 104, 125, 159,	
	22, 263	176, 189	
pamphilus, Cænonympha 24, 25,		phœnicola, Oenides	187
51, 70, 71, 79, 91, 127, 143,		Phyciodes	215
169, 170, 171, 172, 173, 174,		piasus, Lycæna	262
175, 177, 187, 188, 191, 218,		picata, Euphyia	78
219, 221, 287		Pieridæ .. 11, 27, 33, 34, 67, 68	
pandora, Dryas 13, 36, 59, 127,		Pierinæ	214
143, 159, 177		Pieris	66
paniscus = palæmon		pilosella = purpuralis	
panoptes (baton var.), Scolitantides	175	pinastri, Dipterygia	2
pantarioides, Abraxas	95	pinellus, Crambus	52
paphia, Dryas 6, 30, 35, 39, 59, 67,		pinguinella, Gelechia	68
71, 78, 108, 132, 139, 159, 171,		pini, Dendrolimus	275
172, 218, 231, 274		piniriaria, Bupalus, Fidonia 3, 50,	
paphia, Antheræa	21	78, 91, 94, 95, 143, 216, 219	
Papilio .. 34, 119, 134, 156, 284		pinicolana, Evetria	276
Papilionidæ .. 11, 32, 33, 34, 67, 135		piniperda, Panolis	78
paradisea, Ormithoptera	236	pisî, Mamestra, Hadenæ	78
paraliana, Cnephasia, Sciaphila ..	100	pistacina = lychnidis	
Pararge	66, 156	pityata (asperaria var.), Gnophos	123
parenthesella, Cerostoma	68	pityocampa, Thaumatopea 87,	
parisiensis (coridon ab.), Agriades		116, 208, 209	
	24, 142	plagiata, Anaitis	286
Parnassius	215, 283	plagicolella, Nepticula	232
parthenias, Brephos	142, 168	plantaginis, Nemeophila 71, 74, 263	
parthenie, Melitæa	25, 30, 158	platensis, Oiketicus	187
parvidactyla, Oxyptilus	6	plecta, Noetua	75, 183
pascuana, Cnephasia, Sciaphila		plexippus, Danaïda	19
	100, 101	plumaria = ericetaria	
pasiphaë, Epinephele 81, 123, 152,		plumbana, Lipoptycha	118
154, 155, 156, 174, 177		plumbaria, Ortholitha .. 51, 78, 123	
pasivana, Cnephasia, Sciaphila ..	100	plumbata (bicolorata ab.), Meso-	
pastinum, Toxocampa	75	leuca, Melanthia	96
pasyphe = pasiphaë		plumbellus, Hyponomeuta	272
pavonia, Saturnia 49, 74, 78, 95,		plumella, Rebelia	275
120, 169, 286		Plusia	276
pedavia, Phigalia	46, 285	pluto (alecto var.), Erebia	27
peletieraria, Cleogene	275	pluto (glucialis var.), Erebia	156
pendularia, Zonosoma	140, 141	podalirius, Papilio 13, 25, 37, 79,	
penkleriana, Grapholitha	182	80, 125, 126, 127, 174, 175,	
pennigeraria, Eurantbus	123	204, 266	
penziana, Cnephasia, Sciaphila		podana, Cocecia	68
	100, 102	pollux (lappena ab.), Erebia 27, 66	
peribolata, Eubolia	272	polychloros, Eugonia 27, 59, 172, 176	
Peridromia	154	polyommata, Tricopteryx, Lobo-	
perla, Bryophilæ	2, 51, 172	phora	188
perlellus, Crambus	183, 249	polyodon = monoglyphæ	
Pero	277	polytes, Papilio	72
persica (icarus ab.), Polyommatus	45	polyxena, Thais	36, 81, 187
persicarie, Mamestra	78	*pomedaxana, Pœcilochroma 95, 118	
petiverana, Tirumala	9, 12	pomonella, Carpocapsa	184
petiverella, Dichrorampha	183	populata, Lygris	51, 76, 78
petraria, Lozogramma, Phasianæ,		populeti, Teneocampa	75, 286
Panagra	2, 49, 123, 183	populi, Amorpha, Sinerinthus 2,	

	PAGE		PAGE
23, 24, 46, 74, 95, 135, 141,	142, 226,	punctularia, Tephrosia ..	169, 170
populi, <i>Limnitis</i> 59, 156, 157,	159, 160, 161, 162, 163,	purdeyi, Retinia ..	19
populi, <i>Pœcilocampa</i> ..	77, 286	purpuralis (<i>pilosellæ</i>), <i>Anthrocera</i>	164, 166, 224
populi-ocellatus, <i>Smerinthus</i> ..	226	purpuralis, <i>Pyrausta</i>	172, 173, 182
porcellus, <i>Theretra</i> ..	20, 179	purpurella, <i>Eriocrania</i> ..	49, 68
porima (<i>levana var.</i>), <i>Araschnia</i>	106	pusaria, <i>Cabera</i> ..	50, 169
poseidon, <i>Hirsutina</i> ..	38	pusillata, <i>Eupithecia</i> ..	3
postico-apicalis (<i>icarus ab.</i>), <i>Poly-</i>		puta, <i>Agrotis</i> ..	4, 77, 272
ommatus ..	24	putrescens, <i>Leucania</i> ..	272
potatoria, <i>Cosmotriche</i> 74, 191, 216		putris, <i>Axylia</i> ..	2
prasina, <i>Aplecta</i> ..	75	pygmaæta, <i>Eupithecia</i> ..	50, 142
prasinana, <i>Hylophila</i> ..	3, 74, 188	pygmaeella, <i>Argyresthia</i> ..	50
pratana = <i>osseana</i>		pygmaæla (<i>lutarella var.</i>), <i>Lithosia</i>	19
pretiosa, <i>Lycæna</i> ..	135	pylades, <i>Papilio</i> ..	284
prieuri, <i>Satyrus</i> ..	204	pyralella = <i>dubitalis</i> ..	
primulæ (<i>festiva</i>), <i>Noctua</i> 1, 51, 75, 164		Pyralides ..	20
pratellus, <i>Crambus</i> ..	50, 182, 183	pyramidea, <i>Amphipyra</i> ..	22
procellata, <i>Melanthia</i> ..	43	pyrenaella, <i>Oreopsyche</i> ..	20, 21
processionea, <i>Thaumatopea</i> 86, 87, 116		pyrenaica, <i>Latiiorina</i> 263, 275, 283	
procida (<i>galathea var.</i>), <i>Melan-</i>		pyrenaica (<i>epiphron var.</i>), <i>Erebia</i>	122
argia ..	28	pyri, <i>Saturnia</i> ..	21, 177
profundana, <i>Pœcilochroma</i> 95, 118		pyrina (<i>æsculi</i>), <i>Zeuzera</i> ..	2, 7
promethea, <i>Samia</i> ..	21	Pyroniæ ..	156
promutata = <i>marginepunctata</i> ..		pyrrhula (<i>manto ab.</i>), <i>Erebia</i> 26, 27, 30	
pronoë, <i>Erebia</i> ..	155, 215	pythonissata (<i>citrata var.</i>), <i>Dys-</i>	179, 181
pronuba, <i>Tænioicampa</i> 51, 75, 211, 272		stroma ..	123
pronusana, <i>Tortrix</i> ..	68, 94	quadra, <i>Oenistis</i> ..	170
prorsa (<i>levana var.</i>), <i>Araschnia</i> 26,		quadrifasciaria, <i>Ortholitha</i> ..	170
29, 106, 107, 108, 109, 139, 267		quadripunctaria (<i>hera</i>), <i>Callimorpha</i>	4, 190, 272
prosapiaria, <i>Ellopiæ</i> 78, 123, 144		quadripunctata, <i>Caradrina</i> 52, 272	
proserpina = <i>circe</i> ..	156	quadripunctella, <i>Lampronia</i> ..	50
protea, <i>Hadena</i> ..	75	quercana = <i>bicolorana</i>	
proto, <i>Pyrgus</i> , <i>Muschampia</i> , <i>Sy-</i>		quercifolia, <i>Eutricha</i> ..	286
richtus 102, 103, 123, 159, 294		quercifoliella, <i>Lithocolletis</i> ..	49
protodice, <i>Pieris</i> ..	119	quercus, <i>Bithys</i> 35, 36, 58, 72, 78,	
provincialis (<i>aurinia var.</i>), <i>Melitæa</i>	82	83, 84, 143, 172, 188	
proximella, <i>Gelechia</i> ..	50, 182	quercus, <i>Lasiocampa</i> 74, 216, 270	
pruinata (<i>eytisaria</i>), <i>Pseudoterpna</i>		quesnellii (<i>pseudargiolus ab.</i>),	
6, 78		<i>Celastrina</i> ..	211
prunalis, <i>Scopula</i> ..	51, 183	radiata (<i>grossulariata ab.</i>), <i>Abraxas</i>	70
prunata, <i>Lygris</i> ..	78	radiata (<i>phlæas ab.</i>), <i>Rumiccia</i> ..	70
pruni, <i>Strymon</i> ..	143, 188, 267	radiatella, <i>Cerostoma</i> ..	49, 52, 68
pseudargiolus (<i>argiolus var.</i>),		ramella, <i>Grapholitha</i> ..	182
<i>Celastrina</i> ..	210, 211	rapæ, <i>Pieris</i> 25, 62, 66, 79, 80,	
pseudora (<i>pseudargiolus ab.</i>), <i>Celas-</i>		129, 170, 175, 183, 184, 218,	
trina ..	111	231, 251, 275, 276	
pseudopretella, <i>Borkhausenia</i> 113, 183		raphani (<i>daplidice ab.</i>), <i>Pontia</i> ..	175
psi, <i>Triana</i> ..	216, 263, 274	rectangulata, <i>Eupithecia</i> ..	2, 7, 274
Psodos ..	225	remutaria, <i>Acidalia</i> ..	50
Psychide ..	43, 93, 144	repandata, <i>Boarmia</i> 2, 6, 22, 23,	
psyttalea, <i>Amauris</i> ..	93	24, 46, 51, 69, 70, 95, 183, 283, 284	
Pterophori ..	20	reticulata (<i>saponariae</i>), <i>Neuria</i> 21,	
Pterophorina = <i>Alucitidæ</i> ..		45, 75	
pudibunda, <i>Dasychira</i> ..	78	retinella, <i>Argyresthia</i> ..	182
pulebellata, <i>Eupithecia</i> ..	6, 78	retrojuncta (<i>argus = ægon ab.</i>),	
pulcherimella, <i>Depressaria</i> ..	182	<i>Plebeius</i> ..	122
pulehrina, <i>Plusia</i> ..	4, 7, 51, 170	retrosagittata (<i>argus = ægon ab.</i>),	
pulata, <i>Gnophos</i> ..	123	<i>Plebeius</i> ..	122
pulveraria, <i>Numeria</i> ..	24, 284	rhaea, <i>Lycæna</i> ..	262
pulverulenta, <i>Tænioicampa</i>	49	rhamni, <i>Gonepteryx</i> 22, 25, 27, 38,	
pumilata, <i>Eupithecia</i> ..	5, 183	58, 59, 79, 80, 130, 131, 172,	
punctalis, <i>Stenia</i> ..	183	175, 191, 251, 272, 273, 284, 286	
puncta (<i>thetis ab.</i>), <i>Agriades</i> 164, 189		rhododendralis, <i>Pyrausta</i> ..	225

	PAGE		PAGE
rhyminus, <i>Lycæna</i>	135	scabiosata, <i>Eupithecia</i>	4
ribeana, <i>Pandemis</i>	68	schalleriana, <i>Peronea</i>	52, 182
ridens, <i>Asphalia</i>	286	schmidtii (pblæas <i>ab.</i>), <i>Rumiccia</i>	45
Riodinidæ (<i>Erycinidæ</i>)	278	schulziana, <i>Mixodia</i>	94, 182
ripæ, <i>Agrotis</i>	75	Sciaphila = <i>Cnephasia</i> .. .. .	.. .. .
ripartii (admetus <i>var.</i>), <i>Hirsutina</i>	38	scipio, <i>Erebia</i>	155
roboraria, <i>Boarmia</i>	171	scolopacina, <i>Nylophasia</i>	188
roboris, <i>Læospis</i>	84, 85, 189	Scoparia = <i>Eudoria</i> 165, 172, 173,	278
robsoni (nebulosa <i>ab.</i>), <i>Aplecta</i> 24,	282, 283, 284	sebrus (osiris), <i>Cupido</i> 37, 38, 39,	40, 83, 103, 159, 160, 176, 213, 267
roepstorffii, <i>Hebomoia</i>	186	secalis (oculea), <i>Apamea</i>	52, 172
roundoui (escheri <i>var.</i>), <i>Polyommatus</i>	188	segetum, <i>Agrotis</i> 77, 196, 197, 198	275
rosina (deione <i>ab.</i>), <i>Melitæa</i>	277	segregatus, <i>Dendrolimus</i>	51
rossica (dominula <i>ab.</i>), <i>Callimorpha</i>	143	selasellus, <i>Crambus</i>	6, 15, 29, 50, 59,
rossi (manni <i>var.</i>), <i>Pieris</i>	220, 275	selene, <i>Brenthis</i> 6, 15, 29, 50, 59,	66, 73, 105, 143, 170, 188, 191,
rostralis, <i>Hypena</i>	2	268, 285	.. .. .
roxelana, <i>Pararge</i>	36, 40	sellasia, <i>Ageronia</i>	98
roystonensis (coridon <i>ab.</i>), <i>Agriades</i>	85, 86, 96	semele, <i>Hipparchia</i> , <i>Satyrus</i> 6, 36,	59, 73, 77, 84, 98, 172, 173,
ruberata, <i>Hypsipetes</i>	76	204, 217, 219, 221, 271, 273, 287	.. .. .
rubi, <i>Callophrys</i> 4, 6, 35, 49, 73,	78, 79, 169, 175, 191, 213, 273	semi-allous (medon <i>ab.</i>), <i>Aricia</i>	23
rubi, <i>Macrothylacia</i> 74, 77, 78, 169,	263	semiargus, <i>Polyommatus</i> 29, 31,	35, 82, 160, 164, 176
rubi, <i>Noctua</i>	77, 272	semifulvella, <i>Tinea</i>	50
rubidata, <i>Anticlea</i>	78	semipurpurella, <i>Eriocrania</i> 49, 68	.. .. .
rubicella, <i>Lampronia</i>	50	semirubella, <i>Salebria</i> , <i>Ilithyria</i>	143
rubiginæa, <i>Dasyampa</i>	143	semispilotella (weaverella <i>ab.</i>),	.. .. .
rubricosa, <i>Pachnobia</i>	2, 49, 78	Monopsis	277
rufescens (neurica <i>ab.</i>), <i>Nonagria</i>	142	semisyngrapha (coridon <i>ab.</i>), <i>Agriades</i>	24, 70, 71, 139, 142, 187,
rufina = helvola	49	220, 284	.. .. .
rufocinerea, <i>Eluchista</i>	78,	semitestacella, <i>Argyresthia</i>	52
rumicis, <i>Phaetra</i> , <i>Aconicta</i> 169,	231	semi-vedræ (medon <i>ab.</i>), <i>Aricia</i>	220
rumina, <i>Thais</i>	80, 143, 175, 204	senectella, <i>Gelechia</i>	51
Ruralidæ	22, 276	sephyrus, <i>Plebeius</i> 27, 72, 90, 143,	176
russata = truncata	23	septembrella, <i>Nepticula</i>	231
russula = sannio	50, 277	sesamus, <i>Precis</i>	188
rusticella, <i>Monopsis</i>	50, 277	Sesiidæ = <i>Egeriidæ</i> .. .. .	.. .. .
rutilans (dispar <i>var.</i>), <i>Chryso-</i>	212	sibiricus, <i>Dendrolimus</i>	275
phanus	186	sibylla, <i>Limenitis</i>	172, 218
rutulus, <i>Papilio</i>	122	sidæ, <i>Hesperia</i> 35, 37, 39, 81, 82	.. .. .
sagittata (ægon) (<i>argus</i>), <i>Plebeius</i>	49	siderata (siterata) (<i>psitticata</i>),	.. .. .
salicata, <i>Malenydris</i>	74, 169	Cidaria	52, 78
salicis (rumicis <i>ab.</i>), <i>Phaetra</i> 74,	219	silaceata, <i>Eustroma</i> , <i>Cidaria</i> 7,	49
salmacis (medon <i>var.</i>), <i>Aricia</i> 73,	183	similana, <i>Eucosma</i>	182
sambucalis, <i>Ebulea</i>	172	similis (auriflua), <i>Porthesia</i> 7,	172
sanguinalis, <i>Pyrausta</i>	143	similis (medon <i>ab.</i>), <i>Aricia</i>	219
sanguinella (semirubella <i>ab.</i>), <i>Sale-</i>	50, 74, 188	simpliciana, <i>Dichrorampha</i>	68
bria, <i>Ilithyia</i>	123, 177	simpliciana, <i>Dichrorampha</i>	22, 27, 28,
sannio (russula), <i>Diacrisia</i> 50,	188	66, 82, 103, 159, 267	.. .. .
sao, <i>Powellia</i>	123, 177	sinapis, <i>Leptosia</i> 1, 6, 23, 25, 28,	37, 58, 79, 80, 175, 190, 191,
saonaridæ = reticulata	22	217	.. .. .
sarpedon, <i>Anthrocera</i>	23, 118	sinuana, <i>Nephodesme</i> , <i>Cnephasia</i>	100, 102
saturnana, <i>Dichrorampha</i>	43	sinuella, <i>Homœosoma</i>	183
Saturniidæ	49, 50	smaragdaria, <i>Euchloris</i>	70
satyrata, <i>Eupithecia</i>	67, 73, 98	smeathmanniana, <i>Conchylis</i>	170
Satyridæ	66, 107,	Smerinthus	95, 246
satyriion, <i>Cononympha</i> 66, 107,	164, 166, 167, 168, 224, 225	sobrinata, <i>Eupithecia</i>	78
Satyrus	98, 152, 156, 204, 276	sociata, <i>Xanthorhœ</i> 49, 164, 170,	263
saucia, <i>Peridroma</i> , <i>Agrotis</i> 77, 78,	194, 272	sociella, <i>Aphomia</i>	5, 230
194, 272	97, 98	solandriana, <i>Epiblema</i> , <i>Pædisca</i> ,	68, 94, 182
saurites, <i>Ageronia</i>	123	Solenobia	188
scabiose, <i>Anthrocera</i>	123		

	PAGE		PAGE
solidaginis, <i>Calocampa</i>	75	taraxaci, <i>Caradrina</i>	272
Somabrachys	205	tecta, <i>Agrotis</i>	276
sorbi, <i>Lithocolletis</i>	50	telicanus, <i>Raywardia</i> , <i>Lampides</i> , <i>Tarucus</i> .. 13, 107, 108, 129, 279	
sordidata = <i>furcata</i>		templi, <i>Dasypolia</i>	75
sororeulella, <i>Gelechia</i>	50	Tenaris	236, 277
sparganii, <i>Nonagria</i>	143	tenebrata, <i>Heliaca</i>	3
sparsata, <i>Collix</i>	43	tengstroemi, <i>Lycæna</i>	135
spartiata, <i>Chesias</i>	286	tenuiata, <i>Eupithecia</i>	78
Sphingidæ	228	Tephrosia	131
spini, <i>Klugia</i>	38, 40, 83, 175	Teracolus	62, 283
spinolella, <i>Lithocolletis</i>	50	terranea (<i>trux ab.</i>), <i>Agrotis</i>	192, 193, 196, 197, 248, 250
stabilis, <i>Tæniocampa</i>	49, 196, 286	terrella, <i>Bryotropha</i> , <i>Gelechia</i>	50, 183
stagnata, <i>Nymphula</i>	51	ternelensis (<i>urticæ var.</i>), <i>Aglais</i>	176
statices, <i>Ad-cita</i>	74, 271	tessarana = <i>alcella</i>	
statilinus, <i>Satyros</i> .. 59, 125, 126,	127	tessellum, <i>Hesperia</i>	102
stellatarum, <i>Sesia</i>	74, 78	testaceolata (<i>bilineata var.</i>), <i>Camp-</i> <i>toqramma</i>	123, 286
stigmatica, <i>Noctua</i>	75	testata, <i>Lygris</i>	52, 76
striana, <i>Orthotenia</i>	144	Thanaos	228
striata (<i>coridon ab.</i>), <i>Agriades</i>	24	thauamas = <i>flava</i>	
striata (<i>icarus ab.</i>), <i>Polyommatus</i>	24	Thecla (<i>Lycæna</i>)	135
striata (<i>thetis ab.</i>), <i>Agriades</i>	70	theophrastus (?), <i>Tarucus</i>	123, 129, 278, 279
strigata, <i>Hemithea</i>	171	thersites, <i>Agriades</i> .. 36, 37, 39, 43, 72, 143, 176	
strigilis, <i>Miana</i>	171	Thestor	205
strigillaria, <i>Perconia</i> , <i>Aspilates</i>	76	thetis (<i>bellargus</i>) (<i>adonis</i>), <i>Agriades</i> 3, 4, 22, 24, 28, 30, 37, 38, 40, 58, 65, 66, 70, 71, 82, 164, 170, 173, 176, 187, 189, 191, 204, 218, 221, 231, 263, 283, 285	
strigula, <i>Agrotis</i> .. 5, 51, 74, 75		thompsoni (<i>nebulosa var.</i>), <i>Aplecta</i> 282, 283, 284	
stygne, <i>Erebina</i> .. 66, 106, 121, 122,	274	thore, <i>Brenthis</i> .. 29, 30, 104, 105, 106, 108, 158, 161	
suavis (<i>coridon ab.</i>), <i>Agriades</i>	141	thrasonella, <i>Glyphipteryx</i>	151
subfulvata, <i>Eupithecia</i> .. 2, 6, 51, 78,	142	tiliæ, <i>Mimas</i>	2, 78, 142
subjectana, <i>Cnephasia</i> , <i>Sciaphila</i> 100, 101, 102		tiliæ, <i>Nepticula</i>	232
subnotata, <i>Eupithecia</i>	284	Tineidæ	76
subobsoleta (<i>icarus ab.</i>), <i>Polyom-</i> <i>matus</i>	24	tiphon, <i>Cænonympha</i> .. 15, 26, 29, 51, 66, 74, 105, 106, 143, 160, 200, 201, 202, 217, 219, 268	
subochreata (<i>pendularia ab.</i>), <i>Zono-</i> <i>soma</i>	140	tipuliformis, <i>Ægeria</i>	74
subpurpurella, <i>Eriocrania</i>	49	Tisiphonæ	156
subroseata (<i>pendularia ab.</i>), <i>Zono-</i> <i>soma</i>	140, 141	tisiphonæ = <i>pluto</i>	156
subsequa, <i>Triphaena</i>	272	titbonus, <i>Epinephele</i> , <i>Pyronia</i> .. 13, 30, 77, 84, 123, 124, 127, 152, 155, 156, 162, 171, 173, 271,	273
subsericeata, <i>Ptychopoda</i> , <i>Acidalia</i> 4, 78		tityus (<i>bombyliformis</i>), <i>Hæmaris</i> 20, 169	
substrigilis, <i>Oxyambulyx</i>	21	Tortrices	20
succenturiata, <i>Eupithecia</i>	78	Tortricidæ	95, 99, 100, 118
sudetica, <i>Scoparia</i>	223	transalpina (<i>dorilis var.</i>), <i>Lowea</i>	15
suffumata, <i>Lampropteryx</i>	49, 169	Transalpiniformes	22
suffusa, <i>Agrotis</i>	272	transcaspicæ (<i>megæra var.</i>), <i>Par-</i> <i>arge</i>	25
suffusa (<i>gilvago ab.</i>), <i>Mellina</i>	142	trapezina, <i>Calymnia</i>	75
suspecta, <i>Dyschorista</i> , <i>Orthosia</i> .. 7, 75		tremulæ (<i>populi var.</i>), <i>Limenitis</i> 160, 161	
syllius, <i>Melanargia</i> .. 80, 82, 143, 174		trepida, <i>Peridea</i> , <i>Notodonta</i>	277
sylvanus, <i>Angiades</i> .. 73, 192, 219		triangulum, <i>Noctua</i>	1, 75
sylvata (<i>ulmata</i>), <i>Abraxas</i> .. 76, 95, 171, 287		tridens, <i>Triæna</i> , <i>Acroneicta</i> .. 7, 216, 263, 274, 277	
sylvinus, <i>Hepialus</i>	28		
synclimene = <i>climene</i>	36		
syngrapha (<i>corydon ab.</i>), <i>Agriades</i>	284		
syriaca, <i>Satyros</i> .. 36, 98, 276			
syriaca (<i>larissa var.</i>), <i>Melanargia</i>	40		
syringaria, <i>Hygrochroa</i>	78		
syringella, <i>Gracilaria</i>	50		
tæniata, <i>Perizoma</i>	51, 143		
Tæniocampa	277		
tages, <i>Nisoniades</i> .. 7, 73, 177, 191			
tagis, <i>Anthocharis</i> .. 79, 80, 120			
tanaceti, <i>Dichrorampha</i>	95, 118		
taras (<i>malvæ ab.</i>), <i>Hesperia</i> .. 23, 36, 267			

	PAGE		PAGE
trifolii, Anthrocera	3, 22, 71, 131,	valesina (paphia var.), Dryas	172, 218
	263, 271, 287	Vanessidi	73
trifolii, Mamestra	277	varia, Melitæa	158
trifolii, Pachygastris	188, 272, 286	variata, Thera	91
trigeminana, Ehiphiphora	94, 183	variata = obeliscata	
trigeminata, Ptychopoda	78	variegata, Peronea	52, 94
trigrammica, Grammosia	4	varleyata (grossulariata ab.), Ab- raxas	142
trilinea = trigrammica		vauaria, Thamnonoma	172
trimaculella, Nepticula	232	vedræ (medon ab.), Aricia	219
tripes (gorge var.), Erebia	15, 168	velleda = fusconebulosa	
triparella, Gelechia	49	venosata, Eupithecia	78
tripartita, Habrostola	7, 50 51	verbasci, Cucullia	78, 208
triphasia, Habrostola	2	vernaria, Geometra	286
tripuncta, Teracolus	62	versicolora, Dimorpha, Endromis	286
tripunctata, Pseuderesia	12	viburnana, Tortrix	51
tristata, Xanthorhoë	49, 50, 76	vidua (hyperantus ab.), Aphantopus	141
tristellus, Crambus	51	villicia, Arctia	4, 78, 142, 271
tritici, Agrotis	70, 75, 77	villosella, Pachythelia	284
trivia, Melitæa	36, 39	viminalis, Bombycia, Cleocera	7, 52
trochilus, Chilades	39, 269	vinula, Dicranura	74, 120, 141,
Troides	185		177, 183
troilus, Papilio	186	violacea (pseudargiolus ab.), Celas- trina	211
truncata (russata), Dysstroma,		viretata, Tricopteryx, Lobophora	78, 131
Cidaria	23, 51, 96, 172, 178, 179,	virgaureæ, Heodes	58, 65, 105, 108,
	180, 181		128, 190, 213
trux, Agrotis	192, 193, 194, 195,	virgaureana, Cnephasia, Sciaphila	100, 102
	196, 197, 198, 199, 247, 248,	virgularia (incanaria), Ptychopoda	143, 170
	249, 250	viridana, Tortrix	68, 188, 211
tulbaghia, Meneris	71	viridaria, Prothymnia, Phyto- metra	49, 78
turfosana, Olethreutes	274	viridata, Nemoria	271
turnus, Papilio	186	vitellina, Leucania	143, 272
turritis (cardamines var.), Euchloë	139	vittella, Cerostoma	50
tuttodactyla, Marasmarcha	275	vulgata, Eupithecia	142, 169, 172
tyndarus, Erebia	30, 66, 107, 164	wahlbomiana, Cnephasia, Scia- phila	100, 101, 134, 144
	166, 168, 225	w-album, Strymon	30, 73
typica, Mania	2, 78	warringtonellus, Crambus	183
ulmata = sylvata		weaverella, Monopis	277
umbelaria, Acidalia	224	wolfenbergeri (matura var.), Melitæa	15, 66, 107
umbra, Characlea	75, 95, 183	wollastoni (brassicæ var.), Pieris	273
umbratica, Plusia	183	Xanthiæ	75
umbrosa, Noctua	51, 75, 272	xanthographa, Noctua	51, 75
unangulata, Xanthorhoë, Melan- ippe	4	xanthomelas, Eugonia	35
uncana, Ancylopera	50	Xylina	227
undulata, Eucosmia	76	xylostæana, Cacoëcia	68
unguicella, Ancylopera	50	xylostella, Cerostoma	232
unguicula, Drepana	130	ypsilon, Agrotis	77
**unicolor (innotata ab.), Eupi- thecia	119	Ypthima	136
unicolor (satyrion var.), Cæno- nympha	164, 166, 224	zelleri, Baoris	268, 269
unidentaria, Coremia	50, 136, 272	zetterstedtii = calodactyla	
unifasciana, Tortrix	52	ziezac, Notodonta	183, 274
unimaculella, Eriocrania	49, 68	zonaria, Ithysia, Nyssia	139, 233
unipuncta, Cryphus, Leucania	214	Zonosoma	92, 227
unipuncta (ægon) (argus), Plebeius	122	Zygæna = Anthrocera	29, 72, 205
urania (thetis ab.), Agriades	218	Zygænidæ = Anthroceridæ	22, 43, 134
urticæ, Aglais	20, 27, 52, 59, 66,	Zizeeria (Zizera)	277
	73, 87, 123, 172, 173, 176, 183,	Zizera = Zizeeria	277
	219, 226, 231, 251, 286, 287		
urticana, Sericoris	183		
urticata, Eurhypha	183		
vaccinii, Orrhodia	75		
vadesiana, Olethreutes	274		

	PAGE
MYRIAPODA.	
Lithobius	183

NEUROPTERA.

aleurodifformis, Coniopteryx, Semi- dalis	241, 244, 245, 247
Aleuropteryginæ	243, 246
Aleuropteryx	246
annæ, Parasemidalis	245
Ascalaphus	21, 22, 254
coa, Neuroptera	187
Coniopterygidæ	241, 242
Coniopteryginæ	242, 243
Coniopteryx	243, 247
Conwentzia	243
Conwentziinæ	243
Corydalis (<i>Cordiceps in error</i>)	187
*cryptoneuris, Conwentzia	185, 213, 241, 242, 243, 246
curtisiana, Coniopteryx, Semidalis	242, 243, 244, 245, 247
flava, Chrysopa	213, 283
fuscipennis, Parasemidalis	245
grammatica, Chloroperla	45
Helicoconis	246
hyalinus, Coniopteryx	241, 242
libelluloides, Palpares	254
*livida, Pterodela	229, 230
læwi, Aleuropteryx	245
lucifugus, Leucotermes	16
lutea, Helicoconis	245
obscurus, Coniopteryx	241
parvulus = tineiformis	241, 247
pedicularia, Pterodela	229, 230
perla, Chrysopa	263
phalænoides, Drepanopteryx	93
pineticola, Conwentzia	185, 241, 242, 243, 246
Psocidæ	229, 237
psociformis, Coniopteryx	241, 242, 243, 246
Pterodela	229
pygmæus, Coniopteryx	241, 242, 243, 244, 246
quercus, Pterodela	229, 230
Raphidia	138
Semidalis	243, 244
tetensi (<i>pineticola var.</i>), Conwent- zia	241
tineiformis (<i>parvulus</i>), Coniopteryx	241, 243, 244, 246, 247
venosa, Chloroperla	45

ODONATA.

andromache, Anax	36
Cordulegaster	236
depressa, Libellula	36
eponina, Cclithemis	184
pratense (<i>hafniense</i>), Brachytron	36
puella, Agrion	213
Thaumatoneura	235

ORTHOPTERA.

	PAGE
ætolica, Forficula	252
adspersus, Thisoicetrus	254
albicornis, Stauronotus	255
albifrons, Decticus	93, 253, 256
alliaceus, Parapleurus	252
amplipennis, Isophya	258
anatolicus, Stauronotus	254, 255
angustipennis, Ecanthus	137
apricarius, Stauroderus	258
assimilis, Platycleis	253, 256
auricularia, Forficula	187, 251, 253, 258
azureus, Sphingonotus	253
bicolor, Stauroderus	184, 252, 253, 258
bilobus, Tmethis	254
bioculata, Sphodromantis	253
bipunctata, Anechura	251
bipunctatus, Tettix	252, 253
Blattidæ	22
brachyptera, Bolivaria	253
brachyptera, Pyrgomorpha	253, 254
brevicollis, Stauronotus	255
burdigalensis, Gryllus	252, 257, 258
cærulans, Sphingonotus	253
cærulescens, Edipoda	253, 256
campestris, Gryllus	258
cantans, Locusta	255
caudata, Locusta	255, 258
chabrieri, Olynthoscelis	253
cognatus, Stauroderus	253
dalmaticus, Olynthoscelis	253
Decticus	93, 255, 256
Deinacrida	71
dorsatus, Thisoicetrus	253
Ephippigera	258
Gampsocleis	256
gibbosus, Dericorys	254
gratiosa = salina	256
grisea, Platycleis	253, 256
griseo-aptera, Olynthoscelis	253, 256
Gryllotalpa	257
gryllotalpa, Gryllotalpa	256, 257
heydeni, Nemobius	252
indistincta, Edipoda	256
indistincta, Olynthoscelis	253
intermedius, Decticus	93
italicus, Caloptenus	254
insubricus, Acrotylus	253
kaznakovi, Forficula	252
königi, Podisma	252
kraussi, Stauronotus	255
lateralis, Gryllodes	257
laticauda, Leptophyes	252
Leptophyes	251
lesnei, Forficula	200
littoralis, Olynthoscelis	253
Locusta	255, 256
maroccanus, Stauronotus	254, 255
meridionalis, Paratettix	253
minor, Labia	253, 257
mlokosiewiczzi, Edaleus	253
Neoxabea	261
nigricornis, Ecanthus	137

	PAGE
nigrofasciatus, <i>Cedaleus</i>	253
niveus, <i>Cecanthus</i>	137
<i>Cecanthus</i>	261
<i>Olynthoscelis</i>	252, 258
patruelis, <i>Acrotylus</i>	256
pellucens, <i>Cecanthus</i>	257
petersi, <i>Hetrodes</i>	23, 93
<i>Platycleis</i>	256, 258
plorans, <i>Eupreponemius</i>	253
<i>Podisma</i>	252
<i>Pœcilimon</i>	253, 255
pomerantsevi, <i>Forficula</i>	257
<i>Psalidæ</i>	281
religiosa, <i>Mantis</i>	184, 253
riparia, <i>Labidura</i>	257
roseipennis, <i>Dericorys</i>	254
salina (gratiosa), <i>Cedipoda</i>	253, 256
saussurei, <i>Nemobius</i>	253, 257
schochii, <i>Cedipoda</i>	254
simplex, <i>Stauroderus</i>	253
sordida, <i>Paradrymadusa</i>	256
<i>Stauronotus</i>	255
stephaniana, <i>Prosopis</i>	253
stridulus, <i>Psophus</i>	254
tergestina, <i>Epacronia</i>	256
tesselatus, <i>Decticus</i> , <i>Platycleis</i>	93
thalassina, <i>Epacronia</i>	256, 257
tibialis, <i>Platypterna</i>	256
tomis, <i>Forficula</i>	252
transylvaticus, <i>Olynthoscelis</i>	253
truchmana, <i>Arcyptera</i>	254
turanicus, <i>Cecanthus</i>	257
turrita, <i>Acrida</i>	256
ussuriensis, <i>Gampsocleis</i>	256
variabilis, <i>Celes</i>	254
variegatus, <i>Tridactylus</i>	256
verrucivorus, <i>Decticus</i>	93, 258
viridissima, <i>Locusta</i>	255, 256, 258
viridulus, <i>Omocestus</i>	258
vittata, <i>Platycleis</i>	253

RYNCHOPHORA.

albicans, <i>Idiocerus</i>	335
**alienus, <i>Aphis</i>	54
<i>Aleurodes</i> , <i>Aleyodes</i>	130, 215, 232
<i>Aneurus</i>	67
<i>Aphidæ</i>	52, 282
avenius, <i>Aneuris</i>	67
burriana, <i>Rustovelia</i>	257
buxtoni, <i>Rectinasus</i>	16
carrotæ, <i>Aphis</i>	54
<i>Cicada</i>	95
<i>Coccus</i>	141
<i>Corixa</i>	257

	PAGE
corni, <i>Anœcia</i>	52
**donistorpei, <i>Trama</i>	52
<i>Fairmairia</i>	283
<i>Forda</i>	53, 54
**formicarium, <i>Macrosiphum</i>	55
furcata, <i>Forda</i>	53
**fusco-cæruleus (albicans <i>ab.</i>), <i>Idiocerus</i>	235
**gahani, <i>Pseudococcus</i>	213
grandicollis, <i>Mononyx</i>	236
**hexagona, <i>Forda</i>	53
<i>Homoptera</i>	235
lævis (tuberculatus), <i>Aneuris</i>	67, 68
lanigera, <i>Eriosoma</i>	184
**leontodoniella, <i>Aphis</i>	52, 54
<i>Leucaspis</i>	45, 90
limitatum, <i>Brachyarthrum</i>	251
<i>Macrosiphum</i>	52
maidisradieis, <i>Aphis</i>	52
**mali, <i>Zygina</i>	235
<i>Parafairmairia</i>	283
pini, <i>Chermes</i>	187
prasina, <i>Palomena</i>	186
*reaumuri, <i>Pachypappa</i>	139
rotunda, <i>Forda</i>	16
*rubicundus, <i>Lygus</i>	43
*saturata, <i>Limotettix</i>	235
**scabripennis, <i>Megophthalmus</i>	235
**sphagni, <i>Pseudococcus</i>	213
**subferruginea, <i>Psylla</i>	235
subterranea, <i>Aphis</i>	54, 55
ulmi, <i>Lepidosaphes</i>	262
**thenii, <i>Deltocephalus</i>	235
<i>Trama</i>	53
troglydites, <i>Trama</i>	53
tuberculatus (lævis), <i>Aneuris</i>	67
viridana, <i>Forda</i>	54

SIPHONAPTERA.

pectinipes, <i>Stephanocircus</i>	138
---	-----

THYSANOPTERA.

obscuripennis, <i>Haplothrips</i>	299
**tamicola, <i>Euthrips</i>	21

THYSANURA.

<i>Campodea</i> (idæ)	183, 184, 262
wasmanni, <i>Lepisma</i>	16, 17

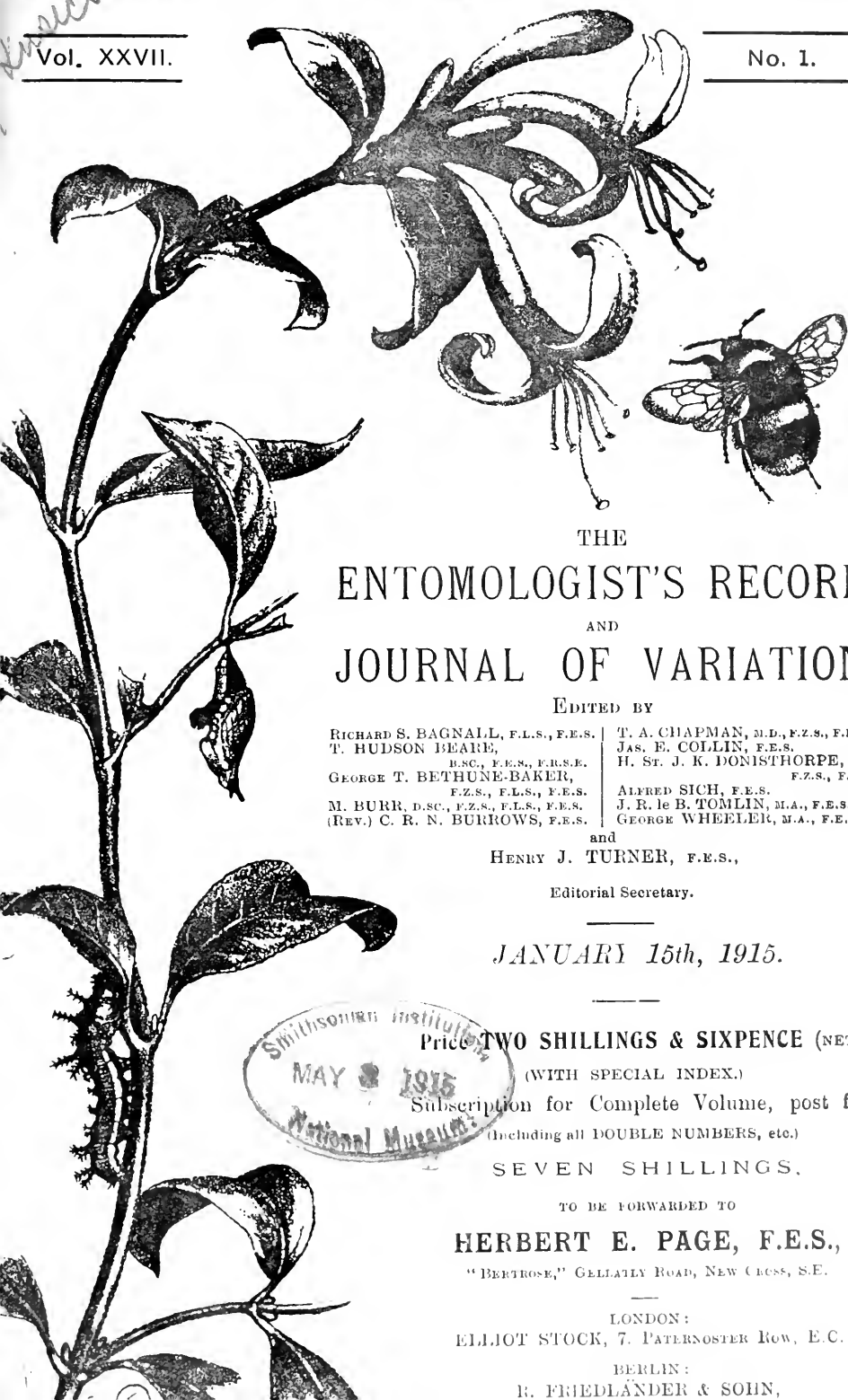
TRICHOPTERA.

<i>Trichoptera</i>	144
--------------------------	-----

CORRIGENDA, ETC.

(Most of the errors in the spelling of scientific names have been corrected in the Special Index.)

page	2,	line	14,	insert <i>pyrina</i> before <i>aesculi</i> .
..	21,	..	45, etc.,	for <i>pyraenella</i> read <i>pyrenaella</i> .
..	23,	..	5,	for <i>atalanta</i> read <i>cardui</i> .
..	37,	..	16,	insert a comma after "river."
..	37,	..	41,	insert "last" after "which."
..	37,	..	53,	insert "there" after "found."
..	39,	..	36,	insert a comma after "clubs."
..	51,	..	48,	for <i>didyma</i> read <i>didymata</i> .
..	64,	etc.,		for <i>lowei</i> read <i>lowei</i> .
..	66,	line	2,	for <i>matura</i> read <i>matura</i> .
..	79,	..	37 & 50,	for <i>belia</i> read <i>tagis</i> .
..	123,	..	16,	for <i>Polyommatus</i> read <i>Lampides</i> .
..	143,	..	33,	after <i>hylas</i> insert "and <i>Plebeius sephyrus</i> ."
..	143,	..	34,	for <i>hispanica</i> read <i>hesperica</i> .
..	170,	..	8,	read " <i>Dasycera (Oecophora) olivierella</i> ."
..	171,	..	35,	for <i>atra</i> read <i>atrata</i> .
..	187,	..	12,	for <i>Cordiceps</i> read <i>Corydalis</i> .
..	219,	..	20,	for <i>litura</i> read <i>liturata</i> .
..	223,	..	17,	for <i>Cnephasia</i> read <i>Aphelia</i> .
..	241,	..	4,	for "Mr. Lachlan" read "Mr. MacLachlan."
..	256,	..	38,	before <i>griseo-aptera</i> put <i>Olynthocelis</i> .
..	286,	..	21,	for <i>Andridus</i> read <i>Andricus</i> .
..	286,	..	22,	for <i>Asphilobia</i> put <i>Aphilotrix</i> .



THE
ENTOMOLOGIST'S RECORD
 AND
JOURNAL OF VARIATION

EDITED BY

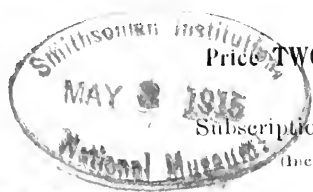
RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARE, B.N.C., F.E.S., F.R.S.E.	JAS. E. COLLIN, F.E.S.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.	H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	J. R. le B. TOMLIN, M.A., F.E.S.
	GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

JANUARY 15th, 1915.



Price TWO SHILLINGS & SIXPENCE (NET).

(WITH SPECIAL INDEX.)

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera.—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.* "Varieties and aberrations of *Noctua* from Dorchester."—*H. H. Corbett, M.R.C.S.* "The frenulum of the British species of *Smerinthus*."—*G. C. Grißler, F.Z.S., F.E.S.* "*Eudryas ste-johannis*."—*A. Radcliffe Grote, M.A.* "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.* "Larvæ."—*Rev. G. M. A. Hewitt, M.A.* "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.* "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.* "Pupa hunting in October."—*J. W. Tutt, F.E.S.* "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Riding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.* "The Lepidoptera of Swansea."—*Major R. B. Robertson.* "*Caradrina ambigua* in the Isle of Wight."—*A. J. Hodges.* "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.* "*Orrhodia erythrocephala* ab. *glabra* from Devonshire and comparison with *O. vaccini*."—*Dr. W. S. Riding, F.E.S.* "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.* "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Mase, F.E.S.* "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.* "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.* "Coleoptera at Ipswich."—*Claude Morley, F.E.S.* "Notes on *Bombus visurgis*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.* "The Lepidoptera of Grèsy-sur-Aix."—*J. W. Tutt, F.E.S.* "*Apatura iris*."—*Rev. G. M. A. Hewitt.* "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.* "Glances of American Entomology."—*J. W. Tutt, F.E.S.* "The Genus *Smerinthus*."—*A. Bacot.* "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.* "Wing structure."—*J. Alston Moffatt.* "On the development of sex in social insects."—*J. W. Tutt, F.E.S.* "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.* "Habits and variation of *Lithosia litarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.* "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.* "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.* "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.* "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.* "Varieties of *Argynnis selene* (with plate).—*S. G. C. Russell, F.E.S.* "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.* "*Zygana minos* and its varieties."—*J. W. Tutt, F.E.S.* "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.* Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7s 6d per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

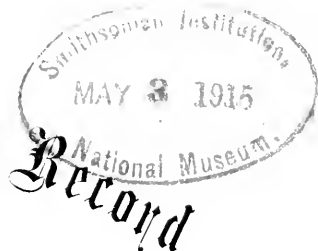
LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE,
TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

The Entomologist's



Record

AND

JOURNAL OF VARIATION.

VOL. XXVII. No. 1.

JANUARY 15TH, 1915.

Lepidopterological Notes for 1914.

By RUSSELL JAMES.

At our editor's request, I have with some amount of trouble put together the following collecting notes on the past season. I have difficulty amidst the great happenings of the present in casting my thoughts from war news, back to the peaceful days of early summer, when the capture of *Dianthoecia luteajo* var. *barrettii*, on the beach near Bude, or *Leptosia (Leucophasia) sinapis* in the home counties seemed matters of more importance than at the present moment. Still perhaps those of us, who by reason of age or responsibilities (or as in my case both) are prevented from taking active part in the war, are the better fitted for doing our share in things at home, if we obtain what measure of relaxation we can in continuing our innocent hobby.

I had intended taking my proper holiday on the West Coast of Wales—country quite new to me—but this fell through on the outbreak of war. I found it impossible to leave my business, which for a time was thoroughly disorganised, and when things partially settled into more normal ways, the holiday time had passed. So my collecting notes are limited to odd days and home work, but yet may be of interest to beginners.

The year has certainly been a marvellous one from the weather point of view, and although treacle has failed, and no rarities have come my way, the abundance that I augured from the day spent in Surrey on May 15th, when *L. sinapis* was so plentiful (*Ent. Rec.*, Vol. XXVI., p. 144), has been realised in my subsequent experiences.

With a small son coming along and showing extraordinary enthusiasm, I have had the pleasure of running over some old haunts, and one of the first of these was Hampstead Heath, where, after a lapse of many years, we spent two evenings. Considering its limited space, its proximity to London, and the trampling the heath gets by holiday crowds every week-end, it is quite remarkable the number of species that maintain their ground.

The dwarf sallow there, partly protected by the shelter of large birch trees, still carries on a precarious existence, and on these shrubs, and on the brambles and birches, most of the larvæ were obtained. The numbers were very considerable, and the commonest were certainly those of *Noctua angur*, closely followed by *N. triangulum*. *N. baja*, *N. brunnea*, *N. festiva*, and *N. ditrapezium* all occurred in small

numbers, and seven fat *Triphaena fimbria* taken by my boy for the first time caused great joy. Other larvæ taken were those of *T. janthina*, *Naenia typica*, *Leucania impura*, and *Boarmia repandata*. Occasional *Taenioampa gracilis*, *Selenia illunaria*, and *Panagra petriaria* were netted, but *Pachnobia rubricosa* and *Larentia multistri-garia*—two of the old time species—have apparently gone for ever.

Really there is quite a considerable amount of interesting work to be done almost in London itself. In my own garden (five miles from Charing Cross) we have been collecting assiduously, and the number and interest of the species taken is quite remarkable, especially for a boy beginner. There are plenty of large species, such as *Amorpha populi*, *Mimas tiliae*, and *Cossus ligniperda*, which last abounds in an ash tree and pupates in the rotten part of a neighbouring fence, *Zenuzera aesculi*, *Phalera bucephala*, and *Catocala nupta* (in numbers), and the violent wriggling of a full-fed larva of the latter species caused great amusement to its finder, the third, and by no means the least ardent entomologist of the family, aged just five. The butterfly of the year in the garden has undoubtedly been *Celastrina (Cyamiris) argyolus*—both broods plentiful. In fact, in July, it was no uncommon thing to see several at once over an ivy covered fence, which ivy affords the principal beating in the garden, and I may say gets fairly well worked—perhaps twenty times a day on an average. This ivy and the fences produce wonderful things, and I generally have an array of full boxes awaiting my inspection when I arrive home in the evening.

Among the captures of the year in this way and at light, the following are the most interesting for such a locality:—*Aejeria (Sesia) myopaeiformis*, *Myelophila cribrum*, *Nola cucullatella*, *Bryophila perla*, *Emmelina (Pterophorus) monodactyla*, *Platyptilia gonodactyla*, *Hypena rostralis*, *Pyralis costalis*, *Eupithecia crignata*, *E. assimillata*, *E. subfulvata*, *E. oblongata (centaureata)*, *E. haworthiata (isogrammata)*, *E. frasinata*, *E. rectangulata* (black vars.), *Metrocampa margaritaria*, *Iodis lactearia*, *Crocallis elinguaris*, *Habrostola triplasia*, *Pipterygia pinastri*, *Axyilia putris*, *Apatela aceris*, *Amphidasis betularia* var. *doubledayaria* and intermediates, *Hemerophila abruptaria* and chocolate var., and many others. *Mania maura* has this year turned up in numbers. Every evening in late July they flew round commonly at dusk and were found in sheds, in the house, and on fences, and several butterflies have re-appeared after many years' absence, notably *Epinephle jurtina (janira)* and *Euchloë cardamines*.

In August larvæ of *Eupithecia assimillata* and *Habrostola triplasia* ate some ornamental hops to shreds, and, of course, *Orygia antiqua* larvæ have been in evidence. An interesting sembling experience with this last species occurred in September. I had been breeding a fresh series in a sleeve, and thought all the pupæ were removed. One, however, which remained proved to be a female. Its presence was indicated by a swarm of males in the garden, round the old sleeve, and these continued in great numbers for two whole days. They appeared fairly early in the morning and continued until nearly sunset practically without any interval. The children netted and boxed great numbers (which were afterwards liberated), but still the supply continued undiminished, until on the third day a male also emerging inside the sleeve: the attraction ceased. The only parallel in point of numbers I have seen, was in the case of a ♀ *A. betularia*, three years

ago, also in the garden. This attracted vast numbers of males for three nights, once twenty-three being on the cage together. This experience was especially interesting, as it enabled me to realise the advance of var. *doubledayaria* since my last attempt at sémbling with the species—in 1895. On that occasion I took 77 males, all strictly typical. In 1911 the captures showed only 16 per cent. typical, 78 per cent. *doubledayaria*, and 12 per cent. decidedly intermediate, an extraordinary change in sixteen years.

The same reason that has led to renewed research in the garden has prompted occasional visits to the private woods in the district, especially Bishop's Wood, edging the Highgate Golf Course. The wood, I fear, is in danger, as several plots have already been bought and cleared for private houses, but at present, when standing near the 11th tee, which is some 50 yards inside the Wood, it is inconceivable that such a place should exist within five miles of Charing Cross.

In front is the open and rising ground of the Golf Course, shutting out all signs of building except where Lane's farm hides the Great North Road, and behind and around one might be in the depths of Surrey or Sussex—the wood retaining all its primitive beauty, and in early summer being carpeted with bluebells. Such species as *Thyatira batis*, *Habrosyne* (*Gonophora*) *derasa*, *Drepana binaria* (*hamula*), *Hylophila* (*Halias*) *prasinana*, *H. quercana*, *Cymatophora duplaris*, *Spilosoma mendica* and many others still survive, and on the neighbouring golf course *Odesia* (*Tanagra*) *atrata* (*chaerophyllata*), *Emmelesia albulata*, and *Heliaca tenebrata* occur, the latter in some numbers.

A morning, May 17th, spent at Brentwood, was devoted more to spring flowers than to insects, but the extreme forwardness of the season was noticeable. *Eupithecia coronata* was taken from its favourite haunt—the trunks of Spanish chestnut. The spruce furs produced a few *E. larivata* and *E. pusillata*—both nearly over. *Bupalus piniaria* was already out, and plenty of common Geometers. There can be no connection between *E. coronata* and Spanish chestnut, yet nearly all the specimens I have taken at Brentwood from time to time have used these trunks as resting places.

The earliness of the season was still more marked during a stormy week-end spent at Wye, on June 6th and 7th, and we entirely missed *Pachetra leucophaea*, which had been more plentiful than usual seven to fourteen days earlier. *Agriales thetis* also was apparently over, as the only specimen seen was one male, worn to shreds. The ground at the foot of the chalk pit has been burned since my last visit and it was feared that *Scoria lineata* (*dealbata*) had been badly injured. I was pleased, therefore, to find it had survived, and although in diminished numbers still reasonably plentiful. It would be a thousand pities if this local and beautiful species were exterminated here, and it should be treated very tenderly for some years to come.

There has been a remarkable increase in *Anthrocera trifolii*. In place of the odd specimens I have been accustomed to take here, the whole hillside was swarming with them. Even during the rain they could be seen in hundreds all over the grass and the trefoil blossoms, and some lovely confluent vars. were taken. I particularly regretted that *P. leucophaea* was over, as never before at Wye have I seen so many moths on sugar, although it was the only time this year that I found it any good at all. Always hitherto I have had the ill-luck to

strike bright moonlight, or east winds, and my series of *P. leucophaea* must have cost me a considerable amount per head in railway fares alone. From hordes of *Agrotis exclamatoris* we picked out two fine *A. cinerea* (one a female), two very large *A. puta*, several *Hadena genistae*, and *Grammesia trigammica* (*trilinea*) var. *bilinea*, but very little else of interest.

The question of the attractiveness and otherwise of treacle is very mysterious, especially as regards individual species and a curious instance occurred this night. On every previous occasion I have found the commonest species on treacle at Wye, to be *G. trigammica* and *Apamea basilinea* (*exclamatoris* being scarcely out before). On this occasion among the crowds of moths on the posts there was not a single *basilinea*, although the species was flying over the grass in some numbers both at dusk and later; *G. trigammica* on the other hand was in quite its normal numbers. I have frequently noticed how certain species vary from night to night, quite out of proportion to the total numbers on the sugar, but never remember so marked an instance of this before. At dusk we failed to find *Eupithecia scabiosata*, (usually in fair numbers), but in its place took a very nice lot of *Acidalia subsericeata*, and on the way home at night took a dozen and a half well fed *Eubolia cervinaria* larvæ, from an isolated plant of mallow which has never yet failed to produce the species.

The weather was all against day-work, and the woods at the top of the downs were unpleasantly wet. In the course of a good long tramp, however, we took a very beautiful series of *Aricia melon* (*agrestis*)—just out and settling on the grass in quantities—*Plusia pulcherrima* at rest. *Nola cristulalis*, *Melanippe unangulata*, *Spilosoma mendica* and many common things that rejoiced the heart of my small companion. A visit to a distant wood for "wild Columbines" and larvæ of *Porritia galactodactyla* was very successful as regards the flowers, but curiously enough the leaves of the burdock, usually riddled to shreds by those larvæ, were quite untouched. We had no sun to induce the day-fliers and so my promises of *Hammaris* (*Nemobius*) *lucina*, *Callophrys rubi*, *Euclydia mi*, *E. glyphica*, etc., were almost unfulfilled.

This being so, I endeavoured to make good, by utilising the school "mid-term holiday" (June 15), for a day in the old Folkestone Warren. As I have found on other occasions, things there are altogether later than at Wye. *Agriades thetis*, which was apparently over there, was still flying and with picking over, many good specimens were found. *Hippocrita* (*Euchelia*) *jacobaeae* was also still in evidence and *E. glyphica* was in great numbers and fresh. *E. mi* was rather scarce, but to my surprise there were considerable numbers of *Venilia macularia*, all in beautiful condition. This species was already well out at Brentwood on May 17th. Several belated *C. rubi* occurred but the greatest enthusiasm was aroused by the sight and capture of two fine *Arctia rillica* on the wing. I think there is no other British insect that looks so gorgeous on the wing. It quite puts its fellow "tigers," even *Callimorpha quadripunctaria* (*hera*), and *Colias edusa* in the shade. *Anthrocera filipendulae* was just coming out, but did not appear to be in quite the usual numbers, very few cocoons and larvæ being seen. I remember a day twenty years ago, when one could scarcely move without treading on them. Strawberries and cream (unexpectedly discovered by the Warren "Halt") put the cap on an extremely enjoyable day amongst

brightly coloured insects and flowers. The yellow horned-poppies and the masses of bugloss in the Warren are magnificent.

At the beginning of July I revisited for a few days another old haunt (this time alone)—the “*arion*” ground near Bude.

It is a long time since I have been there, and my main objective was a “bred” series of *Torocampa cruceae*. I have seen them there in immense numbers on the wing and at heather blossom, but the best of the captured specimens lack the rich bloom of those freshly emerged.

I was nearly too late, and most of the larvæ were full fed. There are few things more fascinating to me than searching for larvæ by night, especially in such a situation as *Torocampa cruceae* haunts—right down by a rocky beach at the foot of immense cliffs. I planned my evenings to work at dusk on another beach for *Dianthoecia luteago* var. *barrettii*, and there being no way round the foot, I had to descend the cliff path in the dark. Having prospected the ground in the daytime, and located the foodplant, I arrived about 11 p.m., and succeeded in getting enough on the first evening to breed a good series.

Subsequent visits only added a few, and had I been a week later I doubt if any would have been left feeding. Judging by the appearance of the foodplants, however, they had evidently been in great numbers, as in some places the plants were reduced to mere skeletons. Passing from one beach to the other, the way leads along a sunken lane across the top of the headland, with high gorse and heather-clad banks. Both these plants were covered with moths, the most plentiful being *Eupithecia pumilata* and *Agrotis strigula*, both in great numbers.

There were also quite a fair lot of *Aphomia sociella*, *Boarmia gemmaria*, and *Ginophos obscuraria* about the gorse, and many common Noctuids about the heather, but the queerest experience of the night was with a butterfly—*Pyrameis cardui*.

Each night I saw *P. cardui* very conspicuously at rest on the gorse along this lane, and was interested to note that certain bushes were favoured night after night, probably by the same individuals. On the last night as I passed along to the *cruceae* ground at 10.30 p.m. there were three *P. cardui* at intervals of about twenty yards. Upon my return two hours later I looked for them and found the first one gone. The second was where I had left it, but what was my astonishment at finding the third one paired, doubtless with the missing first specimen.

There is no possibility of error in this fact, as in each case the particular position of the specimen was known to me exactly from observation of previous nights. *Cardui*'s habit of flying late into the dusk is familiar to me, but even assuming that my strong light had unsettled them at 10.30, such a proceeding as this is, as far as I know, quite without parallel. It would be interesting to hear if others have had a similar experience.

The weather was very unpropitious for butterflies, as whenever the sun shone it blew hard, and when it ceased to blow it rained. The exception, however, that proved the rule, came on the last morning, when, although the sun only got half through, it was so warm and still that butterflies flew freely. I had heard bad reports of *Lycaena arion*, and it was therefore gratifying to find it on this last day at least as plentiful, if not more so, than on the only other occasion I had previously seen it—in early July, 1901. After a lapse of thirteen

years it seems to have maintained its numbers well, and to be spread over a large area. At this comparatively late date many were in surprisingly fine condition, and I could not resist taking a few picked specimens, although I had not intended doing so. I must confess to a great love for butterflies, and revelled in the abundance seen on this last morning. *Melanargia galathea*, *Hipparchia semele*, and *Adopaea flava* (*linea*), with the *Lycæna arion* abounded all over the hillsides, and in the valleys *Aphantopus hyperantus* swarmed. *Dryas* (*Argynnis*) *paphia* and *A. aglaia* were just starting, the former on the brambles in the valley and the latter on the hillsides; *Brenthis selene* also was still hanging on, and even belated *Callophrys rubi*. In 1901 I took this latter species in good condition at this date, together with first brood *Leptosia* (*Leucophasia*) *sinapis*, although *H. semele* and *A. aglaia* were already well out. One immense mass of *Vanessa io* larvæ proved from the few I took to be nearly all ichneumonated. Every one pupated, but the pupa cases only contained a mass of ichneumon cocoons.

The weather was little better for night than day work, but nevertheless, a few *Dianthocia* var. *barrettii* and *D. nana* (*conspersa*) were netted at dusk, both going over. Larvæ also of the latter were taken from the sea-campion in various stages of growth. While *D. nana* (*conspersa*) were netted at any part of the cliff where the *Silene* grew, the var. *barrettii* were all taken actually on the beach itself, where the plant grew in some quantity amongst the shingle, just above high water mark.

Treacle, tried on two occasions, once in the wood and once on the cliffs, proved a failure, although on the cliffs some numbers of *Xylophasia monoglypha* were attracted. There was nothing else except one *Triphaena fimbria* and two *Scoparia cembrae*, and the wood produced nothing but one *Thyatira batis* and a few ordinary *Boarmia repandata*. A magnificent var. *conversaria* of the latter was seen on a head of *Eupatorium* on the beach whilst larva hunting, and quietly allowed itself to be boxed. Larvæ of *Eupithecia pulchellata* were everywhere in the foxgloves, but nearly all ichneumonated, and a few Geometers were netted and kicked up in the day time, such as *Melanippe galiata*, *Pseudoterpsa pruinata* (*cytisaria*), *Eupithecia nanata* and *E. subfulvata*, but nothing of much interest. On my way down I broke my journey at Bristol, and spent a few hours after *Ptychopoda* (*Acidalia*) *holosericata*. Clifton was my only guide as to its whereabouts, but there is no mistaking the spot and I found it very speedily. Many were worn, but it was in the greatest abundance, and a series was picked out. I got very wet as it rained all the time, and the only other insects seen were occasional *Eubolia bipunctaria*, *Oxyptilus parvidactyla*, and *Botys asinalis*. It is remarkable how the species sticks to one bank only of the ravine where it occurs. Not a single specimen occurred on the other side, which I tried first, but the welcome sound of another beating-stick giving me the hint and saved me much time.

The only other trip I had, was with my boy to Betchworth on August 13th for *Urbicula comma*.

As with others, this year, we found the butterfly in more than its usual numbers—not only on the steep hillsides, but also over the long grass and scabious blossom at the foot of the downs. In some of the hollows *Vanessa io* was in great numbers, and three specimens were

netted of *Nisoniales tages*—two just out, and obviously of a second brood. *Aspilates gilvaria* was commoner than I have ever before seen it, but *Eubolia bipunctaria* was decidedly scarce. A *Noctua* flying from flower to flower in the sun proved to be *Cerigo matura*, a habit I have never before noticed in this species.*

Through late June and July, we had rooms at a farm near Ongar, but although I spent many of my evenings there, travelling to town each day, I had little time for Entomology. A very casual survey of the district was promising and the following is a list of the more interesting species noted; *Trichiura crataegi* (larvæ), *Mitochrista* (*Calligenia*) *miniata*, *Zeuzera pyrina* (*aesculi*) (very rare in my experience away from London), *Cymatophora duplaris*, *Plusia pulchrina*, *Triacna* (*Acrionicta*) *tridens*, *Orthosia suspecta*, *Cleoceris riminalis*, *Petilampa* (*Tapinostola*) *arcuosa*, *Habrostola tripartita*, *Cidaria silaceata*, *Eupithecia rectangularata* (black form), *Acidalia emarginata*, *A. imitaria*, *Mesoleuca* (*Melanthia*) *albicillata* and *Ehulea crocealis*.

Diloba caeruleocephala and *Malacosoma* (*Bombyx*) *neustria* larvæ were abundant, and never before have I seen so many *Porthesia similis* (*auriflua*) both in larval and perfect states. Treacle was as usual an utter failure, and the greatest attractions proved to be the grasses and sedges by the roadside and the American willow-herb in the woods. There is a most attractive-looking treacling ground in Ongar Park Wood, and I shall hope in other years to work the district more thoroughly.

The war stopped all other work, and although I had intended compensating myself for the loss of a holiday by taking several odd week-end trips, the anxieties of the August and September campaign drove the inclination away, and I have done nothing since. Perhaps during the continuation of the war, this will be a general effect and lepidoptera consequently get a much-needed rest. If this be so, when all is finished, and we settle down again, we shall be able to claim for our own particular study, a definite good out of all the evil; and more especially so, as we have had a year of more than usual plenty as a starting-point.

“Notes on the Taxonomic Value of the Genital Armature in Lepidoptera.”

By F. N. PIERCE, F.E.S.

The following critical remarks have been suggested by a paper under the above title which appeared in Part ii. of this year's *Transactions of the Entomological Society of London*, from the pen of Mr. G. T. Bethune-Baker.

The author's name is so well known amongst entomologists that any article by him carries great weight, and when I read the title “Notes on the Taxonomic value of Genital Armature in Lepidoptera,” I looked forward with much pleasant expectation to the perusal of the text. Alas! I cannot say that my expectations were realised, and letters received from correspondents interested in genitalia revealed the fact that they too found themselves unable either to understand the

* I noticed this habit some years ago on the railway banks at Thomastown, near Waterford.—H.J.T.

article or to make anything of the plates which accompany it. They confessed that they were completely mystified and had given up the attempt in despair. These facts have induced me to make the following critical suggestions, in the hope that they may assist future writers on this most important branch of entomological study in making their communications such as can be more easily understood by the student.

With the avowed and modest object of Mr. Bethune-Baker's paper I have, of course, no quarrel. Although perhaps it is a little belated to set out to prove the long established fact that genitalic differences in lepidoptera have both specific and generic value. One of my correspondents wrote that it was hardly worth while going through so much to get so little.

The points I wish to deal with concern rather those matters which make the paper so difficult, or even well nigh impossible, to follow, and are these: (i) The use of photographs for the plates; (ii) the profile method of mounting the genitalia; and (iii) the employment of unrecognised names and descriptive phrases for the various parts and organs.

(i) First, I am convinced that photography is far from being a happy method of depicting the structure of the genital organs. It is one thing to see the mount through the microscope and quite another to see the reproduction in the photograph. A photograph, while from one point of view showing too much, *i.e.*, parts that have no particular significance, from another point of view conceals far more than it reveals. Even in the best photographs the superimposed masses give such a confused picture that the organs cannot be discerned, whilst many important features do not appear at all. The result is that only a very small percentage of the parts described in the text can be made out with any degree of certainty in the plate, and when, as in the article before me, an unscientific printer, whose only idea is apparently to fill up a blank space, has used every possible variation in the position of the figures, and when, moreover, the figures appear without titles, the student has to add sleight of hand to his other qualifications, for he must keep the book open at three places, whilst he twists in all directions in order to get the figure the right way up. From the point of view of instructive value there is no comparison between a photograph and a drawing. The latter reveals to the student what the master's eye can see, and whilst obscuring and unimportant parts can be omitted it is possible to present with clearness every feature and organ that is of characteristic and distinctive value. With a drawing it is possible to follow the descriptions of the text, with a photograph this can only be done in part, and that with the greatest difficulty.

(ii) In the second place I would suggest that while the method of mounting the genitalia so as to give a side view is occasionally necessary, in most cases the ventral view discloses the organs in a far more comprehensible manner. It is only necessary to lay the abdomen on its back and then turn back the enclosing valve to allow the student to see right into the genital cavity, with all the organs visible and the paired organs systematically arranged. A glance at the object thus mounted will reveal what it would take a very long study of the side-way mount to discover, and much more that the latter method could never show.

(iii) In the third place, I do most earnestly deprecate the employ-

ment of unrecognised names and descriptive phrases for the various organs. It is quite impossible for even those who have had considerable apprenticeship in the study of the genitalia to recognise what organs are thus referred to. The want of uniformity in our terminology is at once unnecessary and the cause of hopeless confusion, not only to the student but also to the advanced worker.

In this article before me I find that the names employed are for the most part not generally accepted, or they are recognised names used to denote quite other parts than they commonly signify, indeed one can only hazard a very uncertain guess as to the organs to which they refer. I select the following for comment. *The Claspers* fairly obviously denote the valve. *The Tegumen* apparently denotes only the dorsal part of the whole organ to which the name rightly belongs, but it also appears to include the uncus, which in the article is only obscurely alluded to. *The Girdle* one must conclude is used for the remainder (by far the larger part) of the tegumen. When, however, we come not only to an upper and lower girdle, but also to an inner and outer one, I confess I have to give it up. *The Falces* can only stand for the gnathos when the two arms of this organ are widely separated. *The Dorsum and Dorsal Bridge* one judged to be the uncus. *The Curtain* is a puzzle, but may denote the socii, whilst the *Lateral Cheeks* is a descriptive expression that does not seem to help much. *The Fulcrum* evidently represents the sacculi when projecting ventrally and fused together, that is to say the furca. In addition to the use of such unrecognised names, I find forwards and backwards, front and rear, employed with the opposite of their usual significance, forwards here denoting towards the tail of the insect, backwards towards the head! Sternite and tergite occur freely regardless of the fact that no settlement has yet been attained as to what organs constitute these pieces, whilst, perhaps wisely, the question as to which segment of the body they belong is ignored. The expression, "the end segment of the abdomen proper," leaves me wondering.

Now with such a terminology it is not a matter of surprise that the student is left baffled and in despair. What can he be expected to make of this on page 316? "The girdle is erect, expanding suddenly forwards below the tegumen, which is funnel shaped, deeply excavated in front with the dorsum terminating in a blunt point. Whilst the lower part is bifid, also terminating in blunt points, below these are the falces, broad and strong, suddenly curved upwards near the tips with one or two sharp teeth near the bend; the apices of the lower part of the tegumen are furnished plentifully with bristles, but the dorsum very sparingly." Or of this again on page 320. "The general outline to end of section." Or suppose he attempts to compare the figure of *Trumala petiverana*, No. 25, with the description on page 323, he can only conclude that the figure has been wrongly numbered.

Now all this incomprehensible confusion is not only sad but unnecessary. Dr. McDonough, in the *Canadian Entomologist* for June, 1911, has given us a list of names which rightly belong to the different parts under the law of priority. These names are now in common use amongst workers, and I have given a list of them and others with full explanations in "The Genitalia of the Geometridæ." If only writers would adopt accepted names the progress of our study would be immensely facilitated, whilst much that is now incomprehensible to

the student would become plain. The present want of uniformity in the terminology brings the whole study of the genitalia into discredit, and daunts the hearts of many would-be students.

In making the above critical remarks I am moved only in the hope and wish that better things are coming.

“Notes on the Taxonomic Value of the Genital Armature in Lepidoptera.” A Reply.

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

Mr. Pierce's criticism of a paper of mine is interesting as a case of special pleading for his own views to be generally adopted. I fear, however, that he and I look at things from different points of view and I think I know that he is not likely to come to my point of view, whilst with my very long experience in this section of morphology, backed up as it is by some of the ablest insect anatomists on the Continent, I am not at all likely to accept his statements.

Mr. Pierce says, “it is a little belated to set out to prove the long established fact that genitalic differences in lepidoptera have both specific and generic value.” My critic's statement is true as regards many lepidopterists, but he is evidently ignorant of the fact that many do not at all believe in them and that among them will be found systematists who are really eminent to-day. This is, moreover, proved to some extent by the small number of subscribers to his volume, *viz.* 132, which number includes 20 copies to two publishers which have been counted as twenty subscribers. I will now consider his criticisms in his own order.

(i.) Photography. Mr. Pierce's criticism that superimposed masses give a confused picture is true: “that the organs cannot be discerned” is entirely incorrect, whilst “many important features do not appear at all” is generally speaking equally incorrect, though of course in some figures where I have wanted to bring out certain particulars it may be true that I have let them disappear in the reproduction. The real point of the photograph, however, is that it shows all the organs (under ordinary circumstances) in their proper proportion, in their proper place, and in their natural position if the profile view is taken. The drawing shows, as Mr. Pierce himself practically says “what the master's eye sees,” or rather what he wants his readers to see. Mr. Pierce's own drawings convict him absolutely. Look at his books and they show in the plates the gradual change and formation of his opinions, he emphasises his views in the view he gives his readers in the figures. We see *what Mr. Pierce's hand* has brought prominently into view, such a prominence would not be given by photography and does not exist in the object. All the parts are co-ordinated together, and their relativity is shewn in a photograph, while it is quite decidedly absent in Mr. Pierce's drawings by hand. From the point of view of scientific value there is certainly no comparison between a photograph and a drawing.

(ii.) “The profile position.” I had no intention of ever attacking Mr. Pierce's method, feeling that every man must work on his own lines—some years ago, I think, before his book on the *Noctuae* was published, I wrote to him pointing out the value of the profile view

and the disadvantages of the vertical spread position, but my letter was not acknowledged. I am now of course obliged to defend myself and in doing so I must ask my critic to forgive me when I say that I wholly and entirely differ from him in his view. For my own investigations I make both profile and vertical preparations and in cases of necessity I make opaque objects, when I want to see all the muscular parts, either in spirit or in balsam, but for the edification of others who know less than I do, I have no doubt whatever that the profile is the view that ought to be shewn. It is the natural position, the *only* position in which the various organs are to be seen co-ordinated together as the insect uses them and as they lie together quiescent in the natural condition. If it is necessary to show some of the more inaccessible organs, they are much better shown by taking off one of the clasps and still showing them in profile. This is a question that I have discussed with some of the most able continental insect morphologists and it is a satisfaction, at least to me, to know that they agree with me absolutely on the point.

(iii.) Mr. Pierce says "I do most earnestly deprecate the employment of unrecognised names and descriptive phrases." As to descriptive phrases my critic does not believe in descriptions at all. He does not describe, he trusts to his figures and in these figures his readers only see what he wants them to see. I consider a careful description is necessary, and with a photograph accompanying them no mistake *need* be made. I emphasise the word *need* as I have to refer to this again.

Now as to unrecognised names, it would have been better had he said "names that I do not recognise" because he simply means that he desires to insist on his own terminology being generally adopted. *Clasps*, for instance have been in use before Mr. Pierce had begun to work and even before I had begun to work on this subject, and are used regularly in most British periodicals.

Valvae or *valves* as used by Gosse are restricted to the *Papilionidae* and some *Pieridae*, but as I am writing an article on the *Tegumen* and on the *Valves*, I leave argument alone on these two words, as this rejoinder would run to too great length, suffice it to say that I do use the word 'tegumen' for what Dr. White so carefully described, *viz.*, the dorsal part only of the organ that I subdivided with the name 'cingula' or 'girdle' years ago.

The *Falces* is again a name given by me some years ago, and I think has considerable precedence to my critic's "gnathos."

The *Dorsum* is too well-known a name to need comment.

The *Dorsal Bridge* is a descriptive phrase that I should have thought would have carried its own meaning even to a tyro.

Curtain and Lateral Cheeks are also descriptive phrases in precisely the same category.

The *Fulcrum* I admit is a slip for the *Furca* named some years ago by me.

Most assuredly forwards and backwards have no reference to the head of the insect. Does Mr. Pierce really intimate that he would suggest that it is correct to say that the aedeagus is emitted backwards? It reminds me of the Turco-Grecian war, when the Greek commander issued the notable order for his troops to advance to the rear.

This brings me to the baffled despair of Mr. Pierce and his correspondents, where he refers to my descriptions on pages 316-320 and 323. (*Trans. Ent. Soc. Lond.*, 1914).

Habrodias grunus on p. 316. Had the figure (sharp in outline and simple in detail) been referred to, it is quite incomprehensible to me that any one could fail to follow the two—but then Mr. Pierce does not like descriptions.

Pseuderesia tripunctata on page 320. "The general outline to the end of the section." "The general outline" is the beginning of my description—"to the end of the section" are Mr. Pierce's words to define the paragraph he refers to—I cannot for a moment imagine that Mr. Pierce did not refer to the figure 14 on Plate LIX., and yet had he done so I really cannot see how anyone with any knowledge of these organs could fail to follow the descriptions and the figure, and here I may say that the fine lateral *curtain* (a word complained of), is palpable in the figure, and I submit is a most useful and understandable word.

Figure 25. *Tirumala petiverana* is, I admit, much less easy to follow on account of the dark masses, but nevertheless the description can be followed with the figure and is correct, but it is necessary to be careful to locate correctly the various parts.

I venture to suggest that any confusion that exists does not rest in the descriptions and figures, and that much of my critic's protest is because I do not adopt his terminology, and because I do not agree with his methods of work.

In reference to the article by my friend Dr. McDonnough I should say that Mr. Pierce himself adopts what he wishes from that paper, and ignores what he wishes; for instance, I believe that Zander's *ringwall* has been renamed by Mr. Pierce the *Juxta* or the *Anellus* or it may be a combination of both, but I must admit that I find it very difficult to be certain as to what is what in the many new names given by him, for we have no "figure key" given, and there are no real descriptions of the species, so that one has to try and fix the location of a name to an organ with much uncertainty, because there is no perspective in a flattened and distorted object as it appears on the plate. Again, Mr. Pierce's use of "penis" and "ædæagus" is quite contrary both to Dr. McDonnough's and Zander's use and also contrary to general custom; both of the observers use the word "penis" for the middle tube containing the ductus ejaculatorius, and I am satisfied that this is the general custom, Zander called the outside cover, which is sometimes a tube and sometimes not a tube the "penis pouch"—this Mr. Pierce ignores. The word "ædæagus" has long been in use I believe among Coleopterists and has by them been referred to as the whole organ and I should say that that signification has been very generally accepted; it appears to me that the word "penis" cannot properly be used, as it is by Mr. Pierce. In conclusion I would say that I regret that I have had to traverse considerably my critics statements. I should not have called in question any of his work willingly, but his criticisms on me have compelled it. Critiques sometimes are necessary, certainly necessary where there are errors that will not be acknowledged, but in cases such as this, where it is very largely a question of opinion and where one observer is merely advocating the adoption of

his own terminology and his own method of work, they seem to me to be rather subversive to the advancement of science than otherwise.

Every observer must work on his own lines and his work must stand or fall on its own merit. I hope in our next number to insert an article on the "Tegumen" of White and the "Valvæ" of Gosse.

Notes on Swiss Rhopalocera. III.

By the late Mr. A. J. FISON.

(Communicated by Miss L. M. FISON.)

Extracts from letters addressed to and kindly lent by the Rev. George Wheeler.

1900.

1. LOCALITIES FOR *Raywardia telicanus*, Lang.

"Clarens, April 24th, 1900.

"After receiving your note I tried to get the address of the two ladies who caught my *telicanus* in 1894. They are now near Brussels; but a letter from them does not tell all one would like to know about their catch.

They caught the butterfly on the road between Trois Torrents and Morgins, close to the inn, which is at a corner of the road above Trois Torrents. I remember they told me it was 'with a crowd of other Blues.'

"As to the date they can only say that it was in June or July. As I see Kane gives no locality for *telicanus* in this country, to know where one was found is at least interesting."

N.B.—I took several specimens of this butterfly at Charpigny, St. Triphon, Vaud, early in September, 1913. It has evidently been taken there before, as Mr. Wheeler tells me 'such rarities as *telicanus*, *boeticus*, and *paudora*, have all been taken at Charpigny.'—L. M. FISON.

2. *Epinephele tithonus*, L.

"Clarens, March 22nd, 1900.

"I have a note of 6 large Heaths—*tithonus*—taken at Charpigny, on August 4th, 1890 . . . I only remember the 'large heath' there in summer."

3. *Papilio machaon*, L., etc.

"Clarens, May 5th, 1900.

"The day after we were at Charpigny I saw there (but could not catch it) a very dark *machaon*. It was chasing another of much lighter colour, so I could compare its hue well. A few minutes later I took a *P. podalirius* as white as any I have, but it had lost some of its wing. I must look out for others. On Saturday I went to Payerne and the Broye Valley to look for *lvrana*, but found no trace of it. It might possibly haunt the other, warmer side of the valley. . . .

"I found *aurinia* at Charpigny—a very dry place for it, but one year it abounded there."

1901.

4. *Scolitantides orion*, Pallas, etc.

"Clarens, May 27th, 1901.

Last Monday I went to Martigny by early train. As it was too

early to look for *lerana* I walked to Fully, and from 8.30 to 9.30 a.m. caught 21 *orion*, besides one *baton* and a 'small copper.' At times I had two *orion* in my net at once. I got so many because I paid little attention to the flat meadow, but took up a station by the rock (say ten yards from the path) where they were flying like bees, on the vines and plants. Perhaps one should look for *orion* at Bovernier in a similar place.* Crossing the valley I hunted its S. edge to Martigny, and all under En Chemin, but saw nothing of *lerana*. From the top I looked down on La Valette and its so-called lake. . . .

"Have seen no darker vars. of *machaon* at Charpigny, but have caught several which approach it, with lighter coloured eyes near tails."

5. *Melitica deione*, Hb., var. *berisalensis*, Fav.

"Clarens, May 28th, 1901.

"Have been to-day to Martigny, and in the meadows below (E. of) Plan Cerisier. I got 13 *berisalensis* and a few other flies."

6. *Lycæna arcas*, Rott., etc.

"Clarens, June 11th, 1901.

"Do you remember my speaking to you once of a big marsh about one mile west of Attelens, which I wished to explore? To-day I went there, chiefly to look for flowers near by. I also thought I would look for *arcas*, though as *it is said* to be found *only* in July, I had little idea of seeing it. I got easily down to the marsh through a wood of fine beeches, having followed a road, or track, from near Les Tuilières (S. Joigny). In the centre of the marshy part (near its few alders) I soon saw two or three undoubted *arcas*—very perfect specimens I also saw one *hippotoë* The sun was not out long. I hope to go to Thuisis on Monday, and if I should find *asteria* near there should I send you some? Probably they would be abundant."

7. LOCALITIES FOR *Lycæna arcas*, Rott., AND *Lowia amphidamas*, Esp.

"Clarens, June 12th, 1901.

"I went by the Baumaroche Funiculaire to Chardonne yesterday, and climbed to La Tuilière farm. There is a good road from the N.E. or E. corner of Chardonne village—steep at first—up to La Tuilière. At La Tuilière I descended about 100 yards and took a rough country road S. and then E. of it, leading straight on through woods and scrub, with endless chances of wild strawberries in the clearings. Beyond Attelens and its Church there was a wood of tall beech. In the grass below I only found one path, and returned the same way. The marshy part of short grass was narrow, and by the few alders in its centre I found *arcas* and the *Sanguisorba*, on which it feeds

"To-day I took seven *arcas* at En Saumont, say 200 yards beyond the Measured (lugeing) Mile and the Jump. This small spot is below the road, before it reaches a little wood. It is a very limited spot, and I only saw the seven *arcas* I caught. A mile further on, on the road, I caught a lovely little Copper, with fine purple lines near the edges of both upper wings, and very yellow below, which I hope may be *dorilis* var. *bleuesi*."†

* See end of notes.

† (N.B.—It is *amphidamas*. I have seen it.—G.W.)

8. BUTTERFLIES AROUND COIRE AND DAVOS.

“Coire, July 4th, 1901.

“I must tell you how I have been getting on in these parts and at Davos as to butterflies. The weather has not been good, and there was snow at Davos when I left at 7.40 yesterday morning. I had two capital days there—June 27th and July 2nd—in the Dischmatal. On the first day I took 12 *matura*,* and on the second 26, also a few *selene*, and *criphyle*, the marks on underside hindwing, in one case or more, being much like *manto*. I may have seven or eight, if they all travel well to Charpigny.

“In the Flunela valley, on July 28th, amongst a lot of *gorge* were two var. *triopes*. Here yesterday I looked for *aurelia*, and took six. I also caught a very tattered and old fly, which looks greatly like *oedipus* by its spots, but the colour of underside hindwings is gone after all the late rains. *P. delius* I found twice, and some *palaeno*, though the sun was in at the best spot I hope to be in the Grisons all the summer This season, at Charpigny, I only took one dark *machaon* before leaving, but nearly one-half I caught inclined that way, with yellower tail spots than most.”

8. *Coenonympha tiphon*, Rott.

“Pontresina. July 22nd, 1901.

“On the whole I have been successful. My visit to Utznach, near the Lake of Zurich, was not on a good day, however, by waiting one and a half hours in the marsh I captured four fine *tiphon*.”

(N.B.—As the information on the remainder of this post-card, describing expeditions at Pontresina, Weesen, Brusio, Bernina Pass, and Le Prese, is identical with Mr. Fison's notes on these places already published (*Ent. Record*, vol. xxvi., pp. 228 and 242) it is unnecessary to communicate it again here.—L.M.F.)

9. MISCELLANEOUS.

“Charpigny, November 29th, 1901.

“For days I have been working here to get my flies in better order. Going through some this morning I find a statement in *Kane* as to var. *egerides* (Wood Argus) which I cannot think correct, and you might like to note it. He says, ‘the ♀ has fewer and smaller spots, much faded in colour, and apex of forewing not so pointed.’ I underline the part I doubt from an examination of my set. It seems to me the ♀ has larger spots, and usually more.

“I should like some day to show you again the *derilis* I got from Davos and Fexthal. Very black on upperside, and a bright, light yellow ground below, with small, handsome series of spots. They are much like the fine fly you said was a southern form of *transalpina* ♀, only they are not so finely coloured

“I have a ‘Blue’ taken at Pontresina, July 19th, 1901 (where there are a lot of low marshy meadows) that I cannot name, unless it is *amandus*. The dark apical border is not very deep, though the rays are fairly pronounced. On underside are no spots. Underside it would do well for *amandus*, only in Lang, on hindwing, the inner circle of large spots is evenly placed, while in mine it is distinctly wavy. The

* i.e., var. *wolfensbergeri*.—L.M.F.

ground colour on underside is distinctly grey. The blue on upperside is rather dark. After reading Kane, I think it is really *amandus*, although there are only the slightest traces of peacock eyes. Spots are very round and ringed—the discoidal spots are *curved*, not *angular* as in Lang and Kane. Mine differs a little from one you gave me, the rays are less clear.

"I have recovered my 9th *flavofasciata*. It is a damaged ♀, but as a ♀ is valuable."

N.B.—With reference to localities for *orion*, it may be of interest to mention here that I found it at Charpigny on June 2nd this summer (1914). I wondered whether Mr. Fison had tried to introduce it by bringing larvæ from the Southern Alps. However, Mr. Wheeler tells me he does not think my uncle "deliberately brought *orion* larvæ to Charpigny. He may possibly have brought ova in plants of *Sedum* from Branson, or more probably from south of the Alps Charpigny is quite ideal for *orion*, and it might get there from Branson as easily as *amandus* from Vernayaz.—L.M.F.

SCIENTIFIC NOTES AND OBSERVATIONS.

RESTING ATTITUDE OF THE LYCENIDÆ.—Mr. F. W. Frohawk has recently called attention to the fact that the sleeping attitude of the *Lycenidæ* is with the head upwards, and that although they take up their position in the early evening with head downward, they turn round on the approach of darkness. It is suggested that in the preliminary position the butterfly is safer from a fatal attack by birds, while when no necessity for such position arises, as in the dark, the natural position is assumed.

NOTES ON COLLECTING, Etc.

MYRMECOPHILOUS ARTHROPODA FROM ALGERIA.—I give below a list of Arthropoda taken in ants' nests in Algeria* in April, 1913. The phenomenon of myrmecophily is so interesting, and has been so little studied in most parts of the world, that, though a hurried visit prevents the possibility of making biological observations on ant guests, yet this bare list is perhaps worth publishing. At Hammam Meskoutine the bristle-tail *Lepisma wasmanni*, Moniez, was found in a nest of *Myrmecocystus riatensis* in the hard clay of a pathway. A nest of *Tapinoma erraticum* harboured an Aphid which Prof. Theobald has described as new under the name *Forda rotunda*. A week later we found a number of myrmecophilous creatures at Lambèse, in the region of the high and arid plateau. Nests of *Pheidole pallidula* were tenanted by a new genus and species of Aphid (*Rectinasus burtoni*,† Theobald). In one case such an ants' nest was found under the same stone as a colony of the "white ant," *Leucotermes lucifugus*. This was, however, apparently not a case of association, but rather due to accident. The Aphid in question was often extremely abundant; several hundred might be seen covering any rootlet which happened to cross the cavities within the nest. The same species of Aphid was also found in a nest of

* *Ent. Rec.*, xxvi., p. 63. "Notes on Tunisian and Algerian Insects."

† *Entom.*, xlvii., p. 28, 2 figs., "Two new Myrmecophilous Aphides from Algeria."

Bothryomyrmex meridionalis, which was also tenanted by the Isopod *Platyarthrus schöbli* and numbers of a Coccid which Prof. R. Newstead has so far been unable to determine. A nest of *Messor barbarus* sheltered the Thysanuran *Lepisma wasmanni* and the two woodlice (Isopoda) *P. schöbli* and *Lucasius tardus*, both of them in abundance. All these nests at Lambèse were found under large loose stones. At El Kantara a colony of *Messor barbarus*, under a rock, harboured at least fifteen *Lepisma wasmanni*.

I am indebted to Mr. Robert Gurney for a good deal of the material and for determining the Isopods. The Rev. F. D. Morice identified the ants, Prof. F. V. Theobald described the Aphids, Prof. G. H. Carpenter named the Thysanura, and Prof. Nils Holmgren the Termite. Prof. R. Newstead was good enough to take charge of the Coccid.—P. A. Buxton (F.E.S.), Fairhill, Tonbridge.

CURRENT NOTES AND SHORT NOTICES.

Pressure on our space often curtails our column of "Current Notes" and defers many interesting items until they are hardly "current." This is occasionally somewhat unfortunate.

The only son of Mr. Donisthorpe has been given a Commission; he is attached to the Intelligence Corps and left for the front in December.

The two sons of Mr. C. J. Gahan, Keeper of the British Museum (Natural History), are serving at the front.

Dr. Chapman's nephew and Mr. T. W. Halls's two sons passed through the terrible bayonet charges with the London Scottish quite unscathed, although the younger of the latter has since been wounded by a shell, but we are pleased to hear only slightly.

A son of Dr. Longstaff, F.E.S., is serving in the artillery in France.

A nephew of Mr. R. S. Mitford, C.B., F.E.S., was granted the D.S.O. and the French Cross of the Legion of Honour for distinguished service in the Field.

Captain P. A. Cardew, till recently a regular attendant at the meetings of the South London Entomological Society, has been for some time on the lines of communication in France.

The Staff of the Entomological Department at S. Kensington is well to the fore in this mighty struggle. Out of the 23 members of the staff no less than 12 are actively engaged in the war. Mr. E. E. Austin is a Captain in the Artists, 28th Co. of London, Mr. N. D. Riley is a Lieutenant in the Army Service Corps, and Mr. K. G. Blair is in the 4th Battalion of the Seaforth Highlanders. This is 3 out of the 10 Assistant Keepers. From the 12 Attendants no less than 9 are away, *viz*:—Messrs. H. G. Herring and H. Stringer in the Surrey Yeomanry, Messrs. C. Hill, J. Gabriel, H. F. Mugford, C. A. Cockley and M. W. Stanley in the Civil Service Corps, and Messrs. W. E. Phillips and F. Barnett, in the Army Service Corps. Mr. D. H. Gotch, of the Imperial Bureau of Entomology, is also in the Artists Corps. In addition we understand that Sir G. F. Hampson is a special constable and that Messrs. J. H. Durrant, G. Meade-Walde, F. W. Edwards, and F. Laing are connected with ambulance corps.

Mr. R. S. Bagnall has two brothers serving, Mr. C. L. Bagnall is a Captain in the Durham Light Infantry Territorials and is attached to

the Service Brigade, while Mr. W. A. Bagnall is a Captain in the Durham Light Infantry. Under these circumstances Mr. Bagnall has been compelled to leave Oxford and take up his old duties in Sunderland.

In the terrible calamity which happened to the steamship "Empress of Ireland," Entomology lost a splendid worker in the death of Mr. H. H. Lyman, who with his wife was coming to Europe. Only the night before his fatal voyage he was present at a meeting of the Royal Society in Montreal. An account of his life and work has been promised.

The Nominations for Officers and Council of the Entomological Society of London for the ensuing session, 1915-16, are as follows:—*President*: The Hon. N. C. Rothschild, M.A., F.Z.S. *Treasurer*: Albert Hugh Jones. *Secretaries*: Commander James J. Walker, M.A., R.N., F.L.S., and The Rev. George Wheeler, M.A., F.Z.S. *Librarian*: George Charles Champion, A.L.S. *Council*: George T. Bethune-Baker, F.L.S., F.Z.S., E. A. Butler, B.A., B.Sc., E. A. Cockayne, M.A., M.D., M.R.C.P., J. E. Collin, F.Z.S., H. Eltringham, M.A., D.Sc., F.Z.S., C. J. Gahan, M.A., E. Ernest Green, G. B. Longstaff, M.A., M.D., G. Meade-Waldo, M.A., G. W. Nicholson, M.A., M.D., H. Rowland-Brown, M.A., A. E. Tonge.

The List of Members nominated for the Officers and Council of the South London Entomological and Natural History Society for the ensuing session, 1915-16, is as follows:—*President*: B. H. Smith, B.A., F.E.S. *Vice-Presidents*: A. E. Gibbs, F.L.S., F.E.S., and A. E. Tonge, F.E.S. *Treasurer*: T. W. Hall, F.E.S. *Librarian*: A. W. Dods. *Curator*: W. West (Greenwich). *Editor of Proceedings*: Edward Step, F.L.S. *Hon. Secretaries*: Stanley Edwards, F.L.S., F.E.S., F.Z.S., and Henry J. Turner, F.E.S. *Council*: R. Adkin, F.E.S., S. R. Ashby, F.E.S., J. Platt Barrett, F.E.S., Dr. T. A. Chapman, F.Z.S., B. S. Curwen, W. J. Kaye, F. E. S., D. R. Morford, N. D. Riley, F.E.S., and W. G. Sheldon, F.E.S.

Now that magazines and other publications no longer arrive from the Continent of Europe, there is much less entomological doing to chronicle in our Current Notes.

In the September magazines the following items may be of interest.

(1) A summary of the Destructive Insects of New Jersey given in the *Canadian Entomologist* gives the following table.

	No. of species.	No. of destructive species.	Percentage of destructive species.
Coleoptera ...	3092	50	1.6
Lepidoptera ...	2120	58	2.7
Hymenoptera ...	1980	9	0.4
Diptera ...	1661	28	1.6
Hemiptera ...	504	8	1.5
Homoptera ...	479	28	5.8
Orthoptera ...	154	5	3.2

The insects considered destructive are those against which measures of control must at some time or other be directed.

(2) In the *Scottish Naturalist*, Mr. Percy H. Grimshaw, after a lapse of several years, has resumed his articles on "Diptera Scotica" and deals with the species which appear to have been recorded from the area of Scotland comprised in the Western Isles.

(3) In the *Entomologist*, Mr. W. G. Sheldon has commenced an interesting account of an "Expedition in Search of Russian Butterflies," giving the results of a long holiday spent by Mr. A. H. Jones and himself mainly at Sarepta, some three hundred miles from the mouth of the Volga.

(4) To the same magazine the Rev. J. W. Metcalfe, who is collaborating with Mr. F. N. Pierce in the study of the genitalia of the British Tortrices, contributed an article on some of our local *Crambi*. He reports that *Lithosia lutarella* var. *pygmacola*, *Crambus contaminellus*, *Nyctegretes achatinella*, *Melissoblastes anellus* (*bipunctatus*), *Retinia purdyi*, etc., were easily obtainable, by those who knew their peculiar habits, in their old Deal habitats.

(5) Mr. J. R. le B. Tomlin, in the *Ent. Mo. Mag.*, contributed a list with a few notes of the 343 species of Coleoptera taken by him at Cloghane, Co. Kerry, during a short visit in the spring.

(6) To the same magazine Commander J. J. Walker is contributing a very comprehensive article on the Geographical Distribution of *Danaida plexippus* and its recent migrations.

Mr. Bagnall writes, "The war has affected me in other ways. As you know I was writing the volume on Thysanoptera for *Das Tierreich* and had hoped to send the MS. for the first part to Berlin in April, 1915, whilst I had intended to set aside this winter for the preparation of a Monograph of the Tertiary Thysanoptera—chiefly based on a large and unique collection of Thrips preserved in Baltic amber—to be published in Königsberg (!) Now my opportunities for research will be very much curtailed, but I feel that I am beginning to get the Order (Thysanoptera) into a better working condition, and I think of shortly publishing a Catalogue of the World's Species, with an Index of generic names used to the end of 1914, and a Bibliography. This would form at any rate a basis to work on."

A Year's Scientific Work in Yorkshire, being the Yorkshire Naturalists Union's Fifty-second Annual Report, is always interesting reading. It consists of some 20 pages of matter. The reports of the secretaries of the various sections take up by far the greater part of the account. The Vertebrate Section has detailed notes from the four Ridings of Yorkshire, from the Wild Birds Protection Committee and from the Mammals, Reptiles, etc., Committee, including accounts of the watching at Hornsea Mere, Spurn and Bempton. The Conchological Section has notes from the various Ridings and from the Marine Biological Committee. The Entomological Section has reports on Lepidoptera, Coleoptera, Hymenoptera, Diptera and Hemiptera, Neuroptera and Orthoptera, and Arachnida. In the Botanical Section are Notes on the Flora, Reports of the Botanical Survey Committee of the Bryological Committee, of the Mycological Committee and Notes on the Algæ. The Geological Section contains notes on the practical work which has been carried out in a number of specified localities, Report of the Jurassic Flora Committee, Report of the Glacial Committee and Report of the Coast Erosion Committee. There is also a Report from the Committee dealing with Micro-Botany and Micro-Zoology. The official organ of the Union is the *Naturalist*, in which accounts of much of the individual work of members of the Union are recorded month by month. It would seem from this report that the Union, which has less than 400 members, must have few

non-workers. The sectionising of the Union into small groups of workers seems to be conducive to good results and gives an opportunity for each and all to take a definite part in some special investigation or join in some scientific study for the advancement of knowledge.

In the October Magazines the following items are more or less interesting.

(1) In the *Canadian Entomologist*, is announced the death of Dr. William Saunders, one of the founders of the Entomological Society of Ontario, at the ripe age of 79. For many years after his retirement from his business as a druggist, in 1886, he had been Director of the Experimental Farms of the Dominion.

(2) In the *Scottish Naturalist*, Mr. Wm. Evans commenced an account of the Lepidoptera (moths) captured at Scottish lighthouses mainly in the Forth area. Fully 6,000 moths, of which 4,000 were from the Isle of May lighthouse alone, have been sent to him. On one night in July no less than 400 specimens of 30 species were secured, on another in September, 1913, 357 specimens of 11 species were sent to him from Killantringan. It is interesting to note that several examples of *Aglais urticae* and one each of *Pyrameis atalanta* and *Polyommatus icarus* were included among the insects forwarded. Among the Noctuids were examples of two which are always considered very rare so far north, viz., *Luperina cespitis* and *Cerigo matura*.

(3) The Rev. W. F. Johnson contributed some interesting observations on infrequent species of Lepidoptera in Ireland to the *Irish Naturalist*. *Aglais urticae* commenced hibernation in the latter half of July. A specimen of *Manduca atropos* was sent to him by the Rev. J. Jennings on June 24th. Both *Eumorphia elpenor* and *Thevetra porcellus* were sent to him from Donegal. *Hemaris tityus* (*bombyliformis*) was taken in Armagh. A nest of the larvae of *Hyponomeuta eunymellus* (*padi*) was met with at Newcastle, Co. Down. The larvæ of *Plutella cruciferarum* occurred only too plentifully on cabbage at Poyntzpass.

(4) In the *Ent. Mo. Mag.* Dr. Chapman gave a note on the Pyrenaean Psychid *Oreopsyche pyrenaella*, with a plate of larval structures.

(5) In the same number Mr. C. G. R. Waters gave a list with localities of the *Pyralides*, *Pterophori*, *Crambi*, and *Tortrices* taken at Oxford and the adjoining country from Chinnor to Wantage.

(6) In the same number Mr. T. W. Kirkpatrick contributed a List of Marlborough Diptera and has included a species new to the British list, viz., *Trichoceera hirtipes*, and Mr. J. R. Collin adds a further note on the status of the species.

(7) In the *Entomologist*, Mr. Percy C. Reid by his account of a visit to Shetland, recalls to mind the various visits which were, during the latter part of the century, an annual feature of the Retrospects in our magazines. Most of the special species and local forms appear to have turned up in more or less quantity.

The Smithsonian Institution, Washington, the authorities of the United States National Museum, have sent us the following recent publications:—*Lepidoptera of the Yale-Dominican Expedition of 1913*, by Harrison G. Dyar. *Orthoptera of the Yale-Dominican Expedition of 1913*, by A. N. Caudell. *Hymenoptera of the Yale-Peruvian Expedition of 1911*, by P. R. Myers. (Addendum). *New Species and Genera of Lepidoptera from Mexico*, by Harrison G. Dyar. *New N. American*

Bees of the genus Andrena, by H. L. Viereck and F. D. A. Cockerell. *Vespaoid and Sphecoïd Hymenoptera collected in Guatemala by W. P. Cockerell*, by S. A. Robwer. The same criticism does for all. It is a great pity that so many of the descriptions of new species are isolated. Comparisons with and references to allied species are mostly conspicuous by their absence, and many of the descriptions must be useless to the student except with a deal of unnecessarily caused trouble.

The magazines for November contain the following articles of general interest.

(1) In the *Scottish Naturalist* are two records of the occurrence of *Agrilus concoloruli*, one taken at the lighthouse at North Unst, Shetland, on August 28th, 1914, and the other taken at the Isle of May light.

(2) Mr. Norman H. Joy, in the *Ent. Mo. Mag.*, announced the discovery of a Coleopteron new to Britain, *Gabrius primigenius*, taken in sphagnum near Bradfield, of which several specimens were obtained by Mr. Tomlin and himself. Mr. David Sharp described a species of *Haltica*, *H. britteni* as new to science. It appears to be no rarity in Scotland, where it occurs on *Erica* with a closely allied species *H. ericeti*, with which it has hitherto been mixed. Mr. R. S. Bagnall described a species of Thysanoptera new to science, *Euthrips tamicola*. It was taken on flowers of Black Bryony (*Tamus communis*) at Yarnton, Oxon, and subsequently in other localities in Berks.

(3) In the *Entomologist*, Mr. H. Rowland-Brown gave an account of a collecting tour of three weeks in the Dauphiny Alps.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—August 13th.—EXHIBIT OF EXOTIC SATURNIDS AND SPHINGIDS.—Mr. Edwards, the large Saturniids *Antheraea paphia*, *Automeris illustris*, *Citheronia magnifica*, *Samia angulifera*, *S. promethea*, the Sphingids *Orgyambulyx substriqilis* and *Psilogramma menephron*, and *Erihomorpha fulgurita*. PINK VARIATION IN *N. RETICULATA*, ETC.—Mr. Newman, the pink form of *Neuria reticulata* from the coast of Co. Cork, and two forms of the pupa of *Selenia lunaria*, the chocolate coloured hibernating form and the bright green second brood form. A PSYCHID LARVA.—Mr. A. E. Gibbs, a large Psychid larva (*Eketicus kirbyi*) which fed on sweet lemon. VARIATION IN EUROPEAN APATURIDS.—Mr. Curwen, fine series of *Apatura iris*, *A. ilia* with ab. *elytic*, ab. *iliades*, ab. *palescens*, etc., from Samoussy near Laon. THE WILLOW MITE, ETC.—Mr. C. B. Williams, living larva of *Saturnia pyri* from Syria, and reported finding a mite, *Eriophyes*, in the willow galls exhibited at the last meeting. EGGS OF ASCALAPHUS.—Mr. Main, a living pupa of *S. pyri* from Lugano and eggs of *Ascalaphus* from S. France. THE PSYCHID, OREOPSYCHE PYRAENELLA.—Dr. Chapman, the cases of a Psychid, *Oreopsyche pyraenella*, from Gavarnie, Pyrenees, and gave notes on the life-history of the species. The ♂ moults twice at pupation, the ♀ only once.

August 27th.—ABERRATIONS OF *P. ICARUS*.—Mr. T. W. Hall, aberrations of *Polyommatus icarus* from Hertford and Folkestone, including radiated underside, dwarf, brilliant blue ♀, bleached ♂, etc., specimens. O. PYRAENELLA.—Dr. Chapman, the Psychid *Oreopsyche pyraenella* with examples of the larval skins moulted at pupation. ALIEN

INSECTS IMPORTED WITH SUGAR.—Mr. Main, insects found in baskets of cane sugar from Java, including Coleoptera, *Blattidae*, a cricket, etc. ABERRATIONS OF *P. ICARUS*.—Mr. Neave, blue ♀ aberrations of *Polyommatus icarus* from Otford 1st brood and Chipstead 2nd brood. EXOTIC BUTTERFLIES.—Mr. Edwards, examples of the genera of Rhopalocera, *Delias*, *Metaporis* and *Dismorphia*. DISCUSSION ON THE HABIT OF RETURNING TO THE SAME PLACE.—A discussion took place as to the habit of some species of Lepidoptera to return again and again to the same spot, *Mania maura*, *Gonepteryx rhamni*, *Amphipyra pyramidea*, etc., being instanced.

September 10th.—SWISS LEPIDOPTERA.—Mr. Ashdown exhibited lepidoptera taken by him in June and July at Lugano and Zermatt, including *Eneis aello*, *Anthocharis simplonia*, *Aricia eumedon*, *Albulina pheretes*, *Syntomis phegea*, etc. LARVÆ OF ASCALAPHUS.—Mr. H. Main, larvæ of an *Ascalaphus* just hatched sitting with open jaws for prey. ABERRATIONS OF RURALIDÆ.—Mr. Turner, *Agriades thetis* ♂ with very dark underside, and a ♂ *Polyommatus icarus* with much intensified submarginal dark spots on the underside. ABERRATIONS OF *M. BRASSICÆ*.—Mr. B. S. Williams, a black suffused *Manestra brassicæ*, and one with pale ground and aberrant stigmata. EXHIBIT OF ANTHROCERIDS.—Mr. Curwen, species of *Anthrocera* taken by him recently, and suggested a future discussion on the genus.

September 24th.—LANTERN SLIDES.—Exhibition of lantern slides by Messrs. B. S. Williams and Dennis. VARIATION IN *P. NAPI*.—Mr. Newman, bred series of *Pieris napi* from Cork and Sligo with yellow suffused and black suffused aberrations, one of the latter having a complete transverse black band on forewings. AUTUMN APPEARANCES.—Reports were made on the occurrence of *C. edusa*, *P. atalanta*, *P. cardui*, etc. Only stray specimens had been seen of *C. edusa*, while the other two species were common.

October 8th.—Dr. Salisbury gave a lecture on the "Flora of the Seashore," with a long series of lantern illustrations.

October 22nd.—DISCUSSION ON THE ANTHROCERIDÆ (ZYGAENIDÆ).—The evening was set apart for an exhibition and discussion of the genus *Anthrocera*, introduced by Mr. B. S. Curwen. Mr. Curwen exhibited a collection of Palearctic *Anthrocera* consisting of some 26 species and forms. Dr. E. A. Cockayne, the series of *A. hippocrepidis* from the late J. W. Tutt's collection, with various series of *A. filipendulæ*, *A. trifolii*, *A. palustris*, and *A. loniceræ*. Mr. F. H. Stallman, early and late races of *A. trifolii*, *A. filipendulæ*, etc., Mr. Buckstone, similar series with a suggested hybrid series *trifolii* × *filipendulæ*. Dr. Chapman, a drawer of European *Anthrocera* captured during the last few years, including *A. anthyllidis*, *A. contaminæ*, *A. sarpedon*, etc. Mr. Hy. J. Turner, series from many localities, mainly of the five- and six-spotted species of the *Transalpiniformes* group. Mr. L. W. Newman, series of bred *Anthrocera* species. Mr. Page, long series of British Anthrocera, with a parallel series of *A. hippocrepidis* taken at the same time and place as the late Mr. Tutt's series. Papers and notes on the above exhibits were read and communicated by Messrs. Curwen, Cockayne, P. A. Buxton, Turner, R. Adkin, and others. VARIETIES AND HYBRIDS EXHIBITED.—Mr. Newman exhibited long varied series of *Dianthoecia barrettii*, bred from Co. Cork and S. Devon, bred series of *Boarmia repandata* from the Wye Valley and

from N. Cornwall, and a series of the rare hybrid *populi* × *ocellatus*. Mr. Tonge, the same hybrid and a *Rumicia phlacas* from Deal, with the red submarginal band on the hindwing quite wanting.

November 12th.—HIBERNATING *P. ATALANTA*.—Mr. Sich reported having seen a *Pyrameis atalanta* in Holborn on that day, November 12th. AN IMMIGRANT ANT COLONY.—Mr. H. Moore, a small colony of the ant *Camponotus adominalis*, found in a banana from W. Indies. A HAZEL GALL-MITE.—Mr. Step, abnormal catkins of hazel from Mickleham, probably due to the attack of the gall-mite *Eriophyes coryli*. A GYNANDROMORPH OF *A. CORIDON*.—Mr. Hall, a gynandromorphous specimen of *Agriades coridon*, essentially a female, but with patches of blue scales and androconia on the right forewing. FRENCH LEPIDOPTERA.—Mr. Curwen, a number of species of Geometer taken in France.

December 14th.—NEW MEMBER.—Mr. W. Schmassmann, F.E.S., was elected a member. PAPER.—Mr. W. J. Lucas read a Paper on the "British Long-horned Grasshoppers," and illustrated his remarks with a long series of lantern slides depicting the various species. THE GIANT SAWFLIES OF GREAT BRITAIN AND THEIR LARGE PARASITE.—Mr. A. E. Gibbs exhibited the two large species of British sawflies, *Sirex noctilio* and *Sirex juvenis* with their parasite *Rhyssa persuasoria*, and gave details of their life-histories and distribution. He said that both species were found at St. Albans or in the neighbourhood, and that the parasite had also been taken there but was probably rare. ORTHOPTERA.—Mr. H. Moore, a number of species of exotic long-horned grasshoppers. Mr. Step, an apterous form of a long-horned grasshopper from South Africa—*Hetrodes petersi* female. He believed that both sexes were apterous.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—October.—This was the opening meeting of the Society. EXHIBITS OF THE SEASON'S WORK.—Mr. F. N. Pierce showed *Cyclopides palaemon* (*paniscus*) from Northants and a large number of *Micro-lepidoptera* including *Grapholitha* (*Laspeyresia*) *gemmiferana*, *Penthina gentiana*, and *Leioptilus microdactylus* from Devon, and *Dichrorampha saturnana*. Mr. A. W. Hughes brought a long series of *Polygonia c-album* including var. *hutchinsoni*, and *Araschnia levana* from Herefordshire; he reported that the latter butterfly seemed to be establishing itself there. By the same member, a long series of *Aricia medon* (*astrarche*), including var. *semi-allous* from Silverdale. Mr. Buckley had a fine series of *Odontopera bidentata* var. *nigra* from Birmingham, also the local form of the same species from Urmston, varied series of *Agrotis ashworthii* and *Boarmia repandata* from North Wales, *Dianthoecia nana* from Anglesey, and *D. capsophila*, pale forms, from Eastbourne. Mr. B. Tait, Jnr., had three large cases containing the results of his holiday in South Devon, these included *Leptosia sinapis*, *Hesperia malvae* var. *taras*, *Cidaria truncata* (*russata*), and var. *centum-notata*, and varieties of *Polyommatus icarus*. From Penmaenmawr he showed the following taken at heather bloom:—*Agrotis lunigera*, *A. lucerneae*, *A. ashworthii*, and *Mamestra furra*: he had also found *Acidalia contiguaria*, and for the first time captured wild the local melanic form of *Boarmia repandata*. And from Huddersfield he showed a very fine lot of varieties of *Abraaxas grossulariata* which included a grand series of ab. *nigro-sparsata* and one remarkable specimen having the left side wings black with a few marginal streaks on the hind-wing, while the wings on the right side were typical. Dr. J. Cotton brought a fine specimen of *Manduca atropos* captured at light

at Knowsley early in October. Mr. R. Wilding showed fine series of a number of Rhopalocera from the New Forest, Silverdale and Ireland; noteworthy among these was a fine row of Irish females of *Polyommatus icarus*. Mr. W. Mansbridge brought a long bred series of *Aplecta nebulosa*, the progeny of Delamere parents; these included the local type form, var. *robsoni*, and a scarce leaden grey variation, also a short series of *Abraças grossulariata* from Huyton of which a number were ab. *lacticolor*, dark *Polia chi* from Hebden Bridge and *Odontopera bidentata* var. *nigra* from wild larvæ beaten on Simonswood Moss, in which locality, although of rare occurrence, it appears to be increasing.

LONDON NATURAL HISTORY SOCIETY.—April 21st, 1914.—ASYMMETRICAL N. PULVERARIA.—Mr. Bernard Cooper exhibited a fine asymmetrical specimen of *Numeria pulveraria*, bred in March, 1914, from New Forest ova. The band was obsolete on the right forewing.

May 19th.—MELANIC L. HIRTARIA.—Mr. A. W. Mera, on behalf of Mr. B. S. Williams, a melanic specimen of *Lycia (Biston) hirtaria*, bred at Finchley from wild pupæ. HYBRIDS.—Mr. A. J. Willsden, the reciprocal hybrids of *Lycia hirtaria* and *Nyssia hispidaria*.

June 2nd.—BRED C. EDUSA AB. HELICE.—Mr. J. Riches *Colias edusa* var. *helice*, bred from Eastbourne ova.

September 1st.—ABERRATIONS AND GYNANDROMORPHS.—Mr. H. B. Williams, a short series of *Euchloë cardamines*, bred in May, 1914, including a ♂ with extra spot below the discoidal spot, underside. A long series of *Polyommatus icarus*, taken in June at Boxhill and Banstead Downs, showing strong tendency to obsolescence in the underside spotting; also two gynandromorphous specimens of *Amorpha populi*, bred on August 2nd, from June ova. ABERRATIONS OF C. MINIMUS.—Mr. W. E. King, specimens of *Cupido minimus* with ab. *obsoleta* and ab. *extrema*, from Horsley. THE SEASON 1914.—Mr. Williams read some notes on the season's collecting.

October 6th.—VARIETIES OF B. REPANDATA.—Mr. F. H. Heath, a fine series of *Boarmia repandata* from Lynton, including ab. *conversaria*. VARIETIES OF P. ICARUS, ETC.—Mr. C. H. Williams, *Polyommatus icarus* from Ireland; also an ab. *obsoleta* ♂ and an ab. *antico-striata*, Tutt. Mr. W. E. King, a series of *P. icarus* taken at Horsley this year, including ab. *striata*, ab. *obsoleta*, ab. *antico-obsoleta*, ab. *subobsoleta*, ab. *postico-apicalis*, ab. *costajuncta*, ab. *melanotoxa*, etc. Mr. L. W. Newman, a gynandromorphous *P. icarus* having right forewing ♀, remainder ♂ except one red ♀ lunule on each hindwing; another chiefly ♀ but having small ♂ patches; also a gynandromorphous *Agriades thetis*, chiefly ♀, but with a splash of ♂ colour along the costa of the right forewing; *Agriades coridon* ab. *minutissimus*; and a series of *Gastropacha ilicifolia* bred from a ♀ taken at Cannoch Chase by Mr. G. B. Oliver in 1913. Mr. H. B. Williams a long series of *Agriades coridon* taken in August, 1914, in North Herts, including long series of ab. *semisyngrapha*, Tutt, ab. *inaequalis*, Tutt, ab. *parisiensis*, Gerh., and fine series of ab. *obsoleta* and ab. *striata*, undersides ♂ and ♀; a ♀ of the colour of *Coenonympha pamphilus*, and a ♀ with bluish suffusion over the greater part of the underside of the right hindwing; also a series of *P. icarus* from the same place, including fine blue ♀s and ab. *melanotoxa*, ab. *biarvnata*, ab. *basijuncta*, ab. *costajuncta*, and forms combining ab. *melanotoxa*, ab. *costajuncta*, and ab. *basijuncta*; also ab. *antico-striata*, four extreme ab. *subobsoleta*, Tutt, and two ab. *obsoleta*, Clark, and other interesting forms.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stiek, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8s.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.I.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

NEW SEASON'S INSECTS NOW READY.

Finest stock of grand bred and caught insects I have ever had to offer, condition and setting perfection, prices low; on approval with pleasure. Following are a few special things:—Dominula var. Rossica, 4/-; Pruni, 2/6; Alpina, 3/-; Barrettii (Irish), bred, 10/-; Barrettii (Devon), bred, 8/-; P. napi, Irish bred fine forms of ♀, heavily marked and yellow, 2/6; good forms, 1/-; Icarus (Irish), grand picked vars. of ♀, 2/-; Semele (Irish), grand picked vars. 1/6; D. galii (Cornwall), bred, 6/-; all above at per each.

Icarus (Irish), fine lot of 12 ♀s, every one different, 8/- the doz.; P. napi (Irish), fine series of 12, all bred and very varied, 5/- the doz.

Write for full lists. A grand stock of healthy pupæ including many rare and local.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
Lepidopterological Notes for 1914. <i>Russell James</i>	1
“Notes on the Taxonomic Value of the Genital Armature in Lepidoptera,” <i>F. N. Pierce, F.E.S.</i>	7
“Notes on the Taxonomic Value of the Genital Armature in Lepidoptera.” A Reply. <i>G. T. Bethune-Baker, F.L.S., F.E.S.</i>	10
NOTES ON SWISS RHOPALOCERA. III. The late <i>A. J. Fison</i>	13
SCIENTIFIC NOTES AND OBSERVATIONS:—Resting Attitude of the Lycaenidæ	16
NOTES ON COLLECTING:—Myrmecophilous Arthropoda from Algeria, <i>P. A. Buxton, F.E.S.</i>	16
CURRENT NOTES AND SHORT NOTICES	17
SOCIETIES:—The South London Entomological and Natural History Society. The Lancashire and Cheshire Entomological Society. London Natural History Society	21
SPECIAL INDEX	i-xxii
CORRECTIONS, ETC.	xxiii
TITLE PAGE.	

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Dr. Cockayne, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, A. Dalglish, G. T. Bethune-Baker, H. E. Page, A. J. Fison, J. A. Simes, C. P. Pickett, W. G. Sheldon, Miss Lilian Fison, etc., with Reports of Societies and Reviews.

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

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

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

EDUCATION IN SWITZERLAND.

INTERNATIONAL COLLEGE, STAEFA, LAKE OF ZÜRICH.

WE GUARANTEE a pupil of fair abilities to master thoroughly FRENCH and GERMAN in ONE year.

Rapid preparation for all University and Polytechnikum entrance exams.

80% successes in the last five years.

Country life, sports, boating, tennis, skiing, skating, etc.

Prospectus on demand.

Head-master:

P. A. H. MUSCHAMP, B.A., F.E.S.

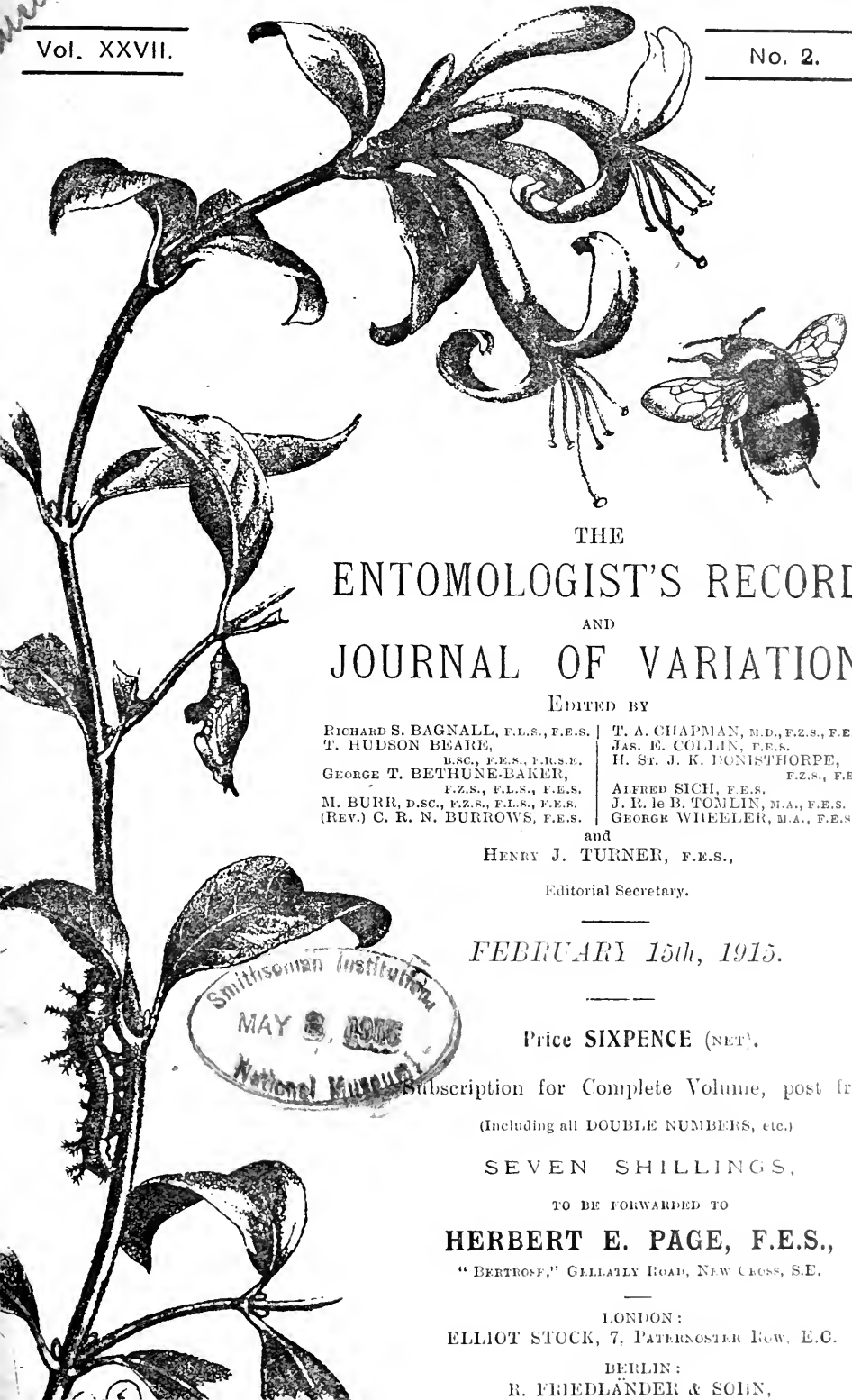
LEONARD TATCHELL & Co., Breeders and Collectors of
British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
:: IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.



THE
 ENTOMOLOGIST'S RECORD
 AND
 JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.M.	JAS. E. COLLIN, F.E.S.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.	H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	J. R. le B. TOMLIN, M.A., F.E.S.
	GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

FEBRUARY 15th, 1915.

Price SIXPENCE (NET).

Subscription for Complete Volume, post free
 (including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,
 "BERTHOFF," GELLYATLY ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,



Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera.—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.* "Varieties and aberrations of Noctuae from Doncaster."—*H. H. Corbett, M.R.C.S.* "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.* "Eudryas ste-johannis."—*A. Radcliffe Grote, M.A.* "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.* "Larvæ."—*Rev. G. M. A. Hewitt, M.A.* "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.* "Generic Names in the Noctuidæ."—*Pror. A. R. Grote, M.A.* "Pupa hunting in October."—*J. W. Tutt, F.E.S.* "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Ridding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.* "The Lepidoptera of Swansea."—*Major R. B. Robertson.* "Caradrina ambigua in the Isle of Wight."—*A. J. Hodges.* "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.* "Orrhodia erythrocephala ab. glabra from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Ridding, F.E.S.* "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.* "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Maze, F.E.S.* "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.* "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.* "Coleoptera at Ipswich."—*Claude Morley, F.E.S.* "Notes on *Bombus visurgiae*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.* "The Lepidoptera of Grévy-sur-Aix."—*J. W. Tutt, F.E.S.* "Apatura iris."—*Rev. G. M. A. Hewitt.* "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.* "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.* "The Genus *Smerinthus*."—*A. Bacot.* "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.* "Wing structure."—*J. Alton Moffatt.* "On the development of sex in social insects."—*J. W. Tutt, F.E.S.* "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.* "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.* "On the gradual disappearance of *Lepidoptera* from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.* "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.* "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.* "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.* "Varieties of *Argynnis selene* (with plate).—*S. G. C. Russell, F.E.S.* "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.* "Zygæna minos and its varieties."—*J. W. Tutt, F.E.S.* "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.* Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7½ per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets
 etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE;
 TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Notes on Swiss Rhopalocera. IV.

By the late A. J. FISON.

(Communicated by Miss L. M. Fison.)

Extract from his letters to, and kindly lent by, the Rev. G. Wheeler.

1902.

1. MONTE BRÉ, NEAR LUGANO.

"Lugano, April 16th, 1902.

"Am just back from Monte Bré, near Gandria, where I took the following:—Six *Libythea celtis* (three very old), one *Cupido minima*, one *Nomiales cyllarus*, *Papilio machaon* and *Papilio podalirius*, three *Gonepteryx rhamni*, *Vanessa io*, two *Euranyassa antiopa*, five *Celastrina argyolus*, *Leptosia sinapis*, *Pieris brassicae*, *Pieris rapae*, *Pieris napi*, *Colias hyale*, *Colias edusa*, *Coenonympha pamphilus*, and one *Pararge aegeria*, southern form.*

"Of course, the first is the best catch. I must have seen a dozen settling on the young oak or other trees; they were not very hard to catch. On Monday next I hope to go on for a week to Pension Righetta, Madonna del Sasso, above Locarno. I forgot to say that there were lots of *Euchloë cardamines*, but no *Euchloë euphenoides*, or *Gonepteryx cleopatra*. . . ."

2. LUGANO.

"Clarens, May 5th, 1902.

"I came back last Tuesday, having had very bad and cloudy weather; only two-and-a-half days really fine and fit for insect hunting. Except the *Libythea celtis*, I only got of any importance *Scilitantides orion*, and the southern form of *Pararge aegeria*.

"I must except, however, my last butterfly caught, which is a very handsome, dark variety of *Pararge megera*. On all the wings the dark lines and margins are broad and strong; not much of the yellow is seen. This gives it an appearance quite different from the type. The pupilled eyes are well developed, and at the apex of forewing there is a second tiny white pupilled eye.† . . . It was too wet to go to the marshes at Locarno."

3. CHARPIGNY AND PLAN CERISIER.

"Charpigny, June 12th, 1902.

"One has lost so much time lately through wet. Like you, I have got one or two good ♀ *cyllarus* this season—one with blue on it. . . . Here I have found some of the dark vars. of *Papilio machaon*,‡ and took two. I also took a fine *Melitaea aurinia* on the rock about a week ago. One day (the only outing lately) I found no *berisalensis* at Plan Cerisier, but took a fine *orion* by the little chapel due S. of it. I fancy *parthonic* must be flying here now."

* N.B.—What form is this? Not the type, I suppose? Is var. *egerides*, Stgr., the usual form in Switzerland?—L.M.F. *Egerid-s* is the usual form in Switzerland north of the Alps, except in the Jura, where *intermedia* is general. The Lugano form is rather tawny *intermedia*.—G.W.

† N.B.—Is this Mr. Fison's ab. *transcaespica*, Stgr., from Losone, near Lugano?—L.M.F. Yes.—G.W.

‡ Are these var. *burdigalensis*, Trimoulet?—L.M.F.

4. WEESEN.

"Weesen, Walensee, June 20th, 1902.

"I must tell you how I got two perfect specimens of *Araschnia lerana* var. *prorsa* yesterday near here. Both were in a sunny, narrow ravine up which the road climbs to Thalalp See over Filzbach. The first was with some *Cupido minima* on some garbage in the road, and I got it at once. It was in a spot where all trees (firs and beeches) had been cut, and nettles were abundant. I waited 45 minutes, but saw no more. Only a good number of 'Wood Argus.' 'Orange Tips' and 'Green-veined whites' were abundant. Going on, I soon entered the Thalalp cow-pastures by a gate, and at once a second var. *prorsa* got up (probably also from the wet path), and I got it directly. At that height near by were a great many *Pararge hiera*, but I could see no nettles there. Later I went further up the path, and again there was a good, sunny gorge with nettles abundant, and the same butterflies, but no var. *prorsa*. This was close to the lake level of, say, 1,150 metres. The first I got was at about 950 metres. Returning, I went over the best (S.) side of the Weesen Marsh, but only saw two or three *Melitaea aurinia*. No *Coenonympha tiphon*, *Lycaena euphemus*, or *L. arcas*. Men I spoke to say everything here is at least three weeks late this season. To-day I was again in a part near the fine Obersee where nettles and beeches grew, but there was no sun and no butterflies. This ought to be a good district for var. *prorsa*. . . . Weesen is not such a desirable centre as Bex. . . ."

(Cf. note on *Araschnia lerana* in *Ent. Record*, vol. xxvi., p. 242.)

5. *Araschnia lerana*, L.

"Clarens. June 28th, 1902.

"Am glad to know where you are that I may correct mistakes in my last p.c. It was *Araschnia lerana*, and not var. *prorsa*, that I caught. A second day in the little Kupfernaseruns gorge I got two more, and in the Murgthal a third couple. Of these, four were on the roads or paths, one on nettles, and one on grass, with few nettles or beeches anywhere about, and rather high. All were caught as high as the one in the cow-pastures. Both valleys were cool and faced North. No doubt things are very late on the high pastures. . . . I have only seen four or five *Erebia* yet. . . . I should add that my *lerana* have much golden-brown colour about them, and are not so black as var. *prorsa* would be. All are perfect. I possibly saw two others, but not near."

6. *Erebia manto*, Esp., var. *pyrrhula*, Frey., etc.

"Charpigny, August 8th, 1902.

"You will, I know, be interested to hear that I have had what I believe is an undoubted catch of *Erebia manto* var. *pyrrhula*: and on the Dent du Midi too (W. corner). I can pretty well see one spot from the window (Mr. Fison's sitting-room at Charpigny), i.e., Anthémoz, S. of Champéry, where I first got them on the 29th July, and there again (and further S. of it too) on 6th inst. To-day I have been comparing these with the six in my drawer, which you said were no doubt var. *pyrrhula*. They are quite as small (some I fancy smaller), and have forewings quite as pointed and angular. The forewings spots vary much; one or two have largish black spots in oval

patches; generally, I think the band is in long, narrow patches; sometimes it is reduced to two or three *small* chestnut patches. In some the colour on underside hindwing is very faint; but in half or more I note a tiny spot of colour three-fifths of the way across the wing (two-fifths from body, and two-fifths from top of ring), which is noted by Frey as found in var. *pyrrhula*. This spot I cannot find in my ♂ *manto* or in my six *pyrrhula*, but it corresponds with the bright yellow blotch in my ♀ *manto*, where it forms part of an irregular line of yellow spots. This is interesting. Lacking this spot, my six could scarcely be from the Dent du Midi, as I thought at first. I hoped I had twenty, but to-day I found twelve is nearer; two or three are ♀s. I wish I had stopped to get more. I found them in long grass between, or amongst, forest, at say, 5,000ft. The first were 150ft. from Anthémoz cow-chalets. Much higher up (7,000ft), under the Dent du Midi rocks, I got six *Erebia alecto* var. *glacialis*; three of which, I find now, are var. *pluto*. I had a great catch of *Rusticus sephyrus* var. *lycidas* going to Simplon. Got many small *Erebia* in Laquinthal, but would not be sure I had *Erebia christi*. As I left Simplon, on the 21st, I met Chanoine Favre and a naturalist arriving. He thought I probably had *christi*, but could not see my specimens. The fortnight at Champéry was very pleasant. I got several *Erebia lappona* ab. *pollux* under the Dent du Midi, and one *Parnassius delius* at Barmaz. I may try the Rochers de Naye for *manto*. Will you not try for var. *pyrrhula* at Anthémoz, S. of Champéry, and at same level more to S., opposite Bonaveau?"

1903.

1. BUTTERFLIES IN MARCH, 1903.

"Clarens, March 23rd, 1903.

"Last Saturday, at Salvan, I saw a white butterfly of some rather quick-flying sort, but failed to get it. On Monday (22nd) I saw a fine *Papilio machaon* at Massongex, near Bex. Yesterday, another was playing round La Tête at Charpigny. I also saw there, two or three *Pieridae*, a *Polyommia c-album*, and a *Eugonia polychloros*, beside lots of *Aglais urticae*, and *Giopepteryx rhanni*. It must be very early for 'swallow-tails.' On Saturday we also saw a *Vanessa io*."

2. SIERRE.

"May 7th, 1903.

"I suppose the fly you call *melanops** is a var. of *Nomiades cyllarus* and probably a ♀. To-day I have caught many *Nomiades cyllarus* in the meadows along E. edge of Pfywald towards Illgraben; several are dark ♀s, but I cannot recognise a *melanops*. One has a lovely double stroke of blue V from forewing near to the centre, and a less clear blue stroke below on lower wing, both upperside. The rest is dark. Most of the *Nomiades cyllarus* are small, especially two ♀s. I also got, nearer Illgraben, a lovely fly with a most conspicuous circular spot near apex forewing, upperside, and touching costa, which reminds me much of the *Anthocharis belia* var. *ausonia* you once had to compare with mine.† The irregular white spots, hindwing underside, are

* Mr. Elwes reports *melanops* from Sion, but no other specimen is known. Mr. Fison's insects are *cyllarus* ab. *blanchieri*.—G.W.

† *A. simplonia* var. *flavidior*.—G.W.

pearly-white. The discoidal spot does not touch costa upperside, but nearly touches a comma-like spot above it, which also lies below the costal edge. The costal edge, from this upper long spot towards body, is powdered (rather pointed), at regular intervals. The white line along centre of lower side, so clear in *Anthocharis simplonia*, is excessively faint. I never saw the like, I believe, in my *simplonia*. The points on the costal edge are more numerous along underside forewing in which the *marvellously exact circle* is reproduced on a pale green ground. It touches costa above, and is bounded by a descending black mark on innerside; a second black mark is a little nearer body with the green between them. The discal spot on underside has a slight white line in its centre. The rays are very bright green of lighter colour. I note the season is so late that the grass has not grown at all; small gentians abound.

"I got one *Pontia daplidice*, but no *simplonia*, 12-20 *Leptosia sinapis* ab. *lathyri*, yesterday at Niouc; none of type here. Many *Breuthis dia*, *Polygonia e-album*, four or five *Cupido minima* (only), and one lovely ♀ "blue" with colour of *Agriades thetis* ab. ♀ *ceronus*, which I fancy must be *Polyommatus icarus (alexis)*.

"Several *cyllarus* are very small, especially one or two ♀s. Only about three ♂s are large in size. . . . Little at Niouc and beyond yesterday, except *Issoria lathonia* and *Leptosia sinapis* ab. *lathyri*.

"Rather warmer just now, and nightingales have sung last three days."

3. *Lycæna iolas*, Ochs.; *Lowia (Chrysophanus) amphidamas*, Esp., etc.

"Bex, June 25th, 1903.

"Have been a good deal in the Valais lately. . . . At Lugano, in three weeks, I did not get so much as in April or August last year in the same parts. *Melitæa aurelia* abounded, but I only saw three *Melanarctia galatæa* var. *proclia* out. It was cold and wet at times, and a late season.

"Whilst here I have got a lot of *Lowia (Chrysophanus) alciphron* var. *gordius* at Vernayaz and La Bâtiaz, and about nine *Melitæa devione* var. *berisalensis*.

"At Sierre, on the 20th, I got four *Lycæna iolas* in 40 minutes, when the sun went in. On the 23rd I could find none there at the same time, although the day was perfect, but returning about 1 p.m. I saw and took a ♀. I had expected a great haul. Between, I went up to Niouc, but found nothing. On the 18th, at Caux, I took 48 *Lowia (Chrysophanus) amphidamas** in about two hours, and two more yesterday. To-day, at Charpigny, I got eight *Nordmannia (Thecla) ilicis*, and two *N. (Thecla) acaciæ*. These all just N. of the tower. . . ."

4. TRAMELAN.

"Tavannes, June 30th, 1903.

"You may like to hear how I have succeeded here. . . . I have just returned from exploring the valley of the Trame from Fuet to Tramelan. In the valley of hay, and a few fields under Fuet, I could find no trace of the 'Tourbières,' spoken of by the country

* See end of notes.

folk. All was now hay-ground, but near the cross-roads I got four *Chrysophanus hippothoë*. In the next part—a very narrow gorge—I got *Lowcia amphidamas* as it flew up from the nettles and rough stuff which lined the tiny torrent. No more about there, but I got another old fellow, as I came to a wider part, and had to climb up S. to see if there was any shelter from a coming storm. This part, though it faced W., was the best butterfly ground I have yet seen. It gave me one good *Chrysophanus hippothoë* and one *Cupido minima*, whilst *Plebeius argus*, *Polyommatus icarus (alexis)* (old), *Erbia oeme* (old), *Euchloë cardamines* (old), and battered *Brenthis euphrasque* were abundant. I got a good *Brenthis selene* too, and saw a bad *Melitaea aurinia*. I found shelter at the Orange railway halt, which would be an excellent point to train to, and then walk to Tramelan. Of that part, the first half mile from the narrow gorge to a large mill pond seemed to me the most likely ground of any for *Lowcia amphidamas*. I am sure I should have got some there earlier in the day, but now all was too wet and sunless. I see by the state here of the butterflies I caught in good condition with *amphidamas* at Caux and Villars, that it is at least a fortnight too late for Tramelan now; almost everything seems past. *P. icarus (alexis)* is rare, and the only common 'blue' is *Polyommatus semiargus*. I have seen no 'Burnets' (*Anthroceridae*, *Zygaenidae*). *Aphantopus hyperantus* is common, and the hawthorn, but nothing else. All round Tramelan there is little or nothing except hayfields, as here, and around all Jura vilages."

5. MISCELLANEOUS.

"Weesen, July 17th, 1903.

"A few lines to tell you how I have got on lately.

"At Wassen I stayed five days, but could not find *Brenthis thore*. Indeed, I did not know where to look for it, and the weather was soon too cold. This induced me to go S. to Faïdo for six days. There I got lots of *Lowcia (Chrysophanus) alciphron* var. *gordius*, and some well-marked ♀ *Parnassius apollo*. Amongst these I was much interested in an aberration with yellow spots, underside especially fine. Unfortunately, of the four I got, only one was not old, but I caught a good intermediate fly. One day, three miles from Locarno, I got (on mud in the road), four specimens of a fine new 'Skipper,' new to me. Upperside black, with a Greek ε or s on upper edge of forewing, underside with yellow lozenges in black rings. A very pretty insect. Could it be the one you said flies at Giubiasco? The last day at Faïdo, going out with a little American girl, she caught an old butterfly, which I soon decided must be *Brenthis thore*. This was in a cool forest clearing. Next day I came here. On Wednesday, in Weesen Marsh, I got sixteen *Lycæna arcas*, sixteen *Lycæna euphemus* (rather old), seven *Coenonympha tiphon*, and four old *Brenthis ino*. Yesterday I went to a little shaded ravine with an unpronounceable name (above Filsbach)† to look for var. *prorsa*, saw none, but in the nettles soon got two *Brenthis thore*, and later two more: lots of *Melitaea dictynna* flying with them made great confusion.

* This was, as Mr. Fison supposed, *Heteropterus morpheus*. It was the first Swiss record for over 50 years.—G.W.

† Kupfermuseruns—an equivalent of "Brazenose," I suppose.—G.W.

Lunched. Saw nothing at all higher up, and almost thought of returning without seeing the Thalalpsee, when I got a second *M. thore*, and soon found there were lots about on a fairly clear, sunny part over (east of) the path. For half-an-hour I had an active time, whenever the sun came out. By 3 p.m. it was too shady and cool, but in all I came back with 20 *thore*. About one-half are rather old, but a few are splendid. Five or six *Brenthis amathusia* flew with them."

5. CHAMPÉRY.

"August 4th, 1903.

"The cold and wet thus far have greatly hindered me. One day, on the sunny corner of an old moraine, one mile beyond Barmaz, I found 12 or 13 *Brenthis pales*, but no var. *arsilache*. It was very cold. Yesterday, at 1,800 m., behind Croix de Culet, I got a ♀ *Epinephèle jurtina*, which looks more like var. *hispulla* than any I took south of the Alps. To-day I have had a grand time at Anthémoz, but of my fourteen *Brenthis pales* most are ♀, and I fear none are var. *arsilache*. When near returning, about 2 p.m., I went into a dry gully half a mile south of Anthémoz, and I think I never found a better place for small *Erebia*. I got about fourteen *Erebia pharte* (some few old), three or four *Erebia epiphron* var. *cassiope*, *Erebia tyndarus* and a large variety of it, two *Erebia gorge*, six very small *Erebia manto* var. *pyrrhula*, two *Brenthis pales*, four *Coenonymphe arcania* var. *darwiniana*, *Erebia eurycle*, possibly a small *Erebia oeme*, and one or two other things. . . . I hope it may prove a permanent place for *Erebia pharte*. I have not seen *Colias palaeno*, *Parnassius delius*, or *Erebia alecto* var. *glacialis*. I have got two *Chattendenia (Thecla) w-album*, and I saw a fine *Apatura iris* on Sunday."

6. CHAMPÉRY TO CHARPIGNY.

"Charpigny, August 22nd, 1903.

"Was able to do but little after you left, but on Tuesday afternoon I went to the zigzags at Barmaz. I got rather a good yellow *Parnassius apollo*, and two bad intermediate ones, like the one you caught. There were a few very small *Agriades coridon*. On Thursday I walked to Charpigny and found so many butterflies on the way, it took me seven hours. Below Trois Torrents I got three tiny *Lowcia (Chryso-phannus) dorilis*, but very old, plenty larger at cross-ways on old road, and one fairly true *Epinephèle jurtina* var. *hispulla*. *Hirsutiua damon* had disappeared, except one ♀. From Collombex to the Rhone, *Enodia dryas* abounded, and in the alder scrub over the Rhone Bridge I was surprised to find crowds of fine 'Wood Argus'* (some dark and some lighter) and *Aphantopus hyperantus*, the last rather old, but I got one fresh (very small) specimen. Near Trois Torrents too, I had taken a tiny *Polyommatus hylas*. At Charpigny yesterday butterflies were more numerous than any day I have been there this year, all of common kinds, *Erebia aethops*, *Enodia dryas*, *Epinephèle tithonus*, *Pararge megera*, *Polyommatus hylas* (one very small), *Agriades coridon*, *Agriades thetis (bellargus)*, *Brenthis dia*, *Melitaea parthenie*, *Issoria lathonia*, *Dryas paphia*, *Argynnis adippe*, one fine and one very old *Papilio machaon*, and one *Pararge maera*.

* Does Mr. Fison mean the *egerides* form of *Pararge aegeria*?—L.M.F. Yes, probably also ab. *pallida*.—G.W.

“On Thursday, on the straight Collombex road, I took two small Mazarine Blues—*Polyommatus semiargus*: one seemed a true var. *montana*. I could not see *Ruralis betulae* in the vines at Charpigny; I fancy it is early for it there.”

7. LONDON.

“September 1st, 1903.

“If you go to Charpigny do look at the aberration of *Ruralis betulae** to which you have given my name. I think it is the one of two similar which I caught S. of Brigue by a chapel W. or S.W. of Napoleon's Bridge. I do not remember ever getting a var. at Charpigny. Have you not mistaken the locality? I am trying here to see some *Erebia epiphron*, type form, as it would be interesting to know if the fly I took on the Dent du Midi is it. I saw Mr. Kirby at the South Kensington Museum, but the drawer full of *Erebia epiphron* and vars. which he showed me was so arranged that I could not be quite sure which was the line of *epiphron* types. Mine is much like one I took for a type, but it has no spots on underside as the South Kensington specimen had. . . . Few of my summer captures are yet set, except those from Champéry.”

What are the Tegumen and Valvæ in the Armature of the Lepidoptera?

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

Quite oblivious of the fact that he himself has divided up more than one organ that formerly had an “omnibus” name, Mr. Pierce takes me to task for dividing up the large organ called, by Buchanan White, the *Tegumen*, and for not adopting the use of the term *Uncus*. Some years ago, finding out the need of designations for different parts of the tegumen, I called the hind ring of this organ, with especial reference to the sternite, the *Cingula* or “girdle,” and I have never used, and do not propose to use, the word “uncus” for the dorsal part of the tegumen, as it is merely a synonym for Dr. White's “tegumen”; that is to say, using it as Mr. Pierce uses it, it is nothing more than a synonym. To prove this we have only to refer to Dr. White's description of it and to his figures. He devotes nearly two pages of the *Trans. Linn. Soc.*, 1877, Zoology, vol. I., pp. 360-362, to this one organ, and he takes as his type for figuring and description in detail *Epinephela* (or, as we should now call it, *Aphantopus hyperantus*). The following is an extract:—

“Viewed from above, the tegumen is oval-acuminate in outline, but truncate at the base; the basal half is ovately spherical; and the acuminate apex is somewhat terete, and curved slightly downwards. Nearly halfway between the base and apex a slender, curved, spine-like lobe (which will hereafter be termed the side lobe) is given off on each side, and curves downwards, inwards, and backwards, so that it is not very well seen from above (plate lv., fig. 3, undissected, and fig. 8, dissected out).”

This figure is simply the “uncus” of Gosse as applied to *hyper-*

* Ab. ♀ *pisoni*. *Butterflies of Switzerland*, p. 47.—G. WHEELER.

‘♀ yellow band instead of orange.’—L.M.F.

antus, there cannot be two opinions about it, it is so definite. Dr. White's name therefore has the priority and must be adhered to.

The description is then continued by the author, viewed from the side and viewed from below, and in each case he gives a figure of the part dissected out as well as an outline figure in profile, which latter will naturally not meet with Mr. Pierce's approval because he prefers an artificial view of the genitalia to that which always obtains in nature. Buchanan White only once mentions the fact that the tegumen encircles the abdomen, when, on page 358, he says, "the tegumen, though most largely developed in the dorsal arc (the tergite) of the segment, is continued as a chitinous ring round the ventral arc (or sternite)"; and then he gives a diagrammatic view of it.

It is quite evident that his whole mind, descriptions, and all his really important figures were bent on and depict the dorsal part, and that the term "tegumen" must take precedence over the term "uncus" for the dorsal armature rather than for the armature in the sternite section of the abdomen, which I named the "girdle" in 1905 (*Trans. Ent. Soc.*, p. 290); whilst in 1910 I adopted its Latin equivalent *Cingula*, so as to bring it into line with other scientific appellations. In 1905 I also called White's "side lobes" *Falces*, with the same object in view, these are, I suppose what Mr. Pierce now calls the "socii."

Mr. Gosse, in dealing with the "clasping organs of the *Papilionidae*" (*Trans. Linn. Soc., Zool.*, vol. ii., p. 274), evidently feels that he is over-riding Dr. White's previously given name, for he says in reference to the uncus, "the word *tegumen* adopted by Dr. White, seems hardly appropriate for this spinous, often wiry, point, which is certainly in no sense a cover." It must be admitted that even in *hyperantus*, the tegumen is not really a cover at all, but to the author who gave the name, it appeared as a cover, and from Mr. Gosse's own admission the two names "cover" the same dorsal organ, therefore the term "tegumen" has priority and I hope will be generally used in the future. So far as I am concerned I shall continue to use Dr. White's name for the dorsal area that he so specifically described and figured, which includes the "uncus" of Gosse. I drew attention to this as long ago as 1890 (*Trans. Ent. Soc. Lond.*, 1891, p. 3). At the same time I would point out that I have acted in accordance with well acknowledged precedent (as a reviser) in sectioning off a portion and giving it the name of *Cingula* or "girdle." In some families the sternite and tergite parts of the *Cingula* are almost separated by an articulation. With Dr. White's very definite and accurate description and equally definite figures, there is no question at all in my mind that the term *tegumen* must be used for the dorsal portion of the armature and that the term *uncus* must sink to it.

I must now consider Mr. Pierce's use of the term *Valvae* or "valves," a word that first came into what we might call "modern usage" with Mr. Gosse's elaborate and beautifully illustrated paper on these organs in the *Papilionidae* (*Trans. Linn. Soc. Lond.*, 1882, p. 265, *et seq.*). Herold, in 1815, uses the German word "Klappe" or valve, for that organ which we still call the valve in *Pieris brassicae*. This is the very first definite appellation (perhaps) for a defined portion of the male armature, a portion that was confirmed by Gosse, with a reference to Herold, showing that he recognised the organ in the Pierine as

homologous to that in the Papilionine. I believe Gosse to have been absolutely right in this, I have considerable acquaintance with these organs in both families and I agree entirely with his identification. The term *Valvae* or valves must therefore be restricted to this special part in the *Papilionidae*, and in a section of the *Pieridae*, for the *Valva* or valve is not the same organ as the *Harpago* of White.

After describing the valves Gosse goes on to describe another organ lying within the valve, which he designates as the *Harpe* (Gr. ἀρπη, a grappling iron), and he stated that he considered he was justified in so doing because the valve and the harpe united represented Dr. White's *harpago* in other Rhopalocera. I would remind my readers that Gosse was a very accurate and exact observer, that he was making these designations with full knowledge of what had already been done, and that he was writing with the intention of Revision in these organs.

He then described the *Harpe*, thinking that the valve with the harpe were homologues of White's *Harpago*. In 1911 my friend Dr. McDunnough pointed out that he did not consider Gosse was correct in this conclusion, as he thought the *Harpago* was a simple valve rather than a fusion of harpe and valve (*Ent. News*, 1911, p. 187). I quite agree with Dr. McDunnough in considering that the harpago is not a fusion of the harpe and valve, but I am afraid I strongly disagree with the supposition that the harpago is a simple valve. I am convinced, in my own mind, that the harpago is a more fully developed harpe, and that the term *Harpago* must stand, also that the term *Valva* must stand, and further, I see no reason why *Harpe* should not remain in usage also, for it is so different in the *Papilionidae* from the ordinary *Harpago* that it would be a mistake to sink it.

To prove this point it is necessary for me to make some reference to these organs in the *Papilionidae*. Some years ago I was uncertain of some of Gosse's points; it was necessary, therefore, to prepare various "mounts" to enable me to clear them up, and I made fresh microscopic slides in different positions, and some of the profile slides I prepared by carefully lifting off one valve and mounting the remains; this method left behind all the organs except the one valve with most, but not all, of the harpe adhering to it. This proved to me what I had already observed, *viz.*, that the harpe is a continuous part of the whole armature, but that the valve (being possibly in this family a later development) would come right away, leaving merely a slight tearing of the exterior chitin, whereas the *Harpe* was fractured at a point, about a fifth within the valve, the broken portion being quite continuous with the basal part of the *Cingula*. I prepared several species in this way and all proved this one point, that the valve would come right off, leaving merely a rough abrasion on the exterior, but that the harpe would be fractured from the main internal structure; in one case, *P. ormenus*, there is a very shallow external sort of socket at the base of the cingula, wherein the basal extremity of the valve fitted and from which it has come away with the slightest abrasion, but the harpe is broken off (*a definite fracture*) from the structural stem. This shows that the valve is wholly external, and, I think, is clear evidence of a later development than the harpe, which is a continuous part of the skeleton, if I may use the expression.

The name valve, being first given to *P. brassicae*, it is advisable to see whether there is any homology between these organs in the two

families. If we compare the genus *Colias* with *Papilio*, we should be immediately impressed with the similarity of structure of the tegumen and the cingula with the curious development of the proximal tergite, which in both seems to form a sort of additional "cover," to use Dr. White's expression; the valves are small and different, and are really akin to the harpagones. If, however, we turn to *Pieris brassicæ* and its allies, it will be seen that the dorsal section of the armature is less similar, but that the large valves are quite extraordinarily similar, whilst to the furca is attached a longitudinal, short hornlike sclerite that might well be the initial stages of the Papilionid harpe. Gosse, however, seeing the homology, examined various Pierids, and in some found the harpe as quite a distinct organ within the valve.

These observations point very conclusively to the correctness of both Gosse's and my statements that the valves in the *Papilionidae* and in the *Pieridae* are certainly homologous, and I assume this as a fact. This brings us to the decision as to the use of the name "valve." It was first used colloquially in 1815 for *P. brassicæ* ♂.

It was used again by Burmeister in 1832 colloquially for *D. euphorbiæ*. De Haan then used it in 1842 for the *Papilionidae*, again colloquially. Gosse comes next (so far as I have been able to trace), with his memoir already referred to, but, and this is important, he comes in with full knowledge of earlier literature, referring specifically to it, and acting definitely as a reviser. This revision (of terms) cannot be overridden to-day with the historical facts as they are. Let me summarise them in a sentence or two.

"Valves" were first used by Herold in 1815 for *Pieris brassicæ*. The word was then used indiscriminately for a period.

Gosse then as first reviser fixes the word "valves" to the *Papilionidae* and a section of the *Pieridae*, referring pointedly to the homology of the two sets of organs in the two families, this action, therefore, cannot be annulled.

We are thus left to provide a term for the clasps of other families, and this had been done by Buchanan White, who gave the term *Harpago*, plural *Harpagones*, to these structures; this is one of the first scientific appellations given to these organs, and it has precedence over others inasmuch as the valvae and the harpagones are not the same. We thus arrive at the conclusion that:—

White's terms *Tegumen*, as applied to the dorsal armature, and *Harpago*, as applied to the lateral ventral armature, must stand, that the term *Valvae*, or valves, and the term *Harpe* must stand, as applied to the *Papilionidae* and some *Pieridae*; and the term *Uncus*, of Gosse, if used at all, can only be used for the terminal segment of the group it is referred to, but in view of Dr. White's very clear description and figures, it ought to be dropped as a synonym of the term tegumen. It may appear that I am a little dogmatic in this article, but I am obliged to be so, for with a recent author practically claiming that his designations shall be unreservedly adopted, a little dogmatism is absolutely necessary if future nomenclature is to be put on a right basis.

N.B.—Since writing the above, my friend, the Rev. F. D. Morice, has called my attention to a work published in Switzerland in 1820 by J. J. Hegetschweiler, "Dissertatio inaug. zootom. de Insectorum genitalibus," and also to an appendix on the same subject by Kirby

and Spence in their well-known work, in which certain scientific designations are applied to definite parts.

I have not yet seen the former work, but it appears that in 1826 Kirby and Spence quite definitely applied the term "Prehensores" to the organs in the genus *Bombus* that are homologues of the "Harpago" of White.

I may have to make further reference to both these works at a later date.—G.T.B.-B.

Collecting at Constantinople in 1914.

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

Spring began early at Constantinople this year and on my first expedition to Kiathané, on March 23rd, I found *Papilio machaon*, *Callophrys rubi*, *Pumilia phlaeas*, *Celastrina argiolus*, *Colias edusa*, and the "whites" including *Pontia daplidice* well out. The promise of March was well maintained till the end of May, but the first half of June was very rainy and wild along the Bosphorus and after July 24th my collecting came to rather an abrupt end. I was able during the season to add quite a number of species to the Constantinople list, all on the limestone, often near chalk beyond Tuzla, on the Southern coast of the Ismid Constantinople peninsula, a warm, sheltered region, dry and hilly, with a good deal of scrub-wood and well sheltered from the Bosphorus draught. As in my last notes, I will deal separately with my collecting on the European and Asiatic sides of the Bosphorus.

EUROPEAN SIDE.

My first day, March 23rd, has already been mentioned; I may add that on that day I found that the Kiathané ground was uncomfortably near a rifle range and that caution must be exercised in visiting it. I worked it on April 30th and again twice in the first half of May, finding *P. semiargus* rarer than in previous years, though I took one magnificent large male of the form *balkanica*, or better *balkanica-intermedia*, differing from the former as described by Tutt in having faint traces of the orange lunules on the underside of the hindwings. "Skippers" were rare as they have been elsewhere near Constantinople this year. Still I took a couple of fresh *Hesperia malvae*, not a common species at all near Constantinople, on May 4th, and as many *Hesperia armoricana*. *Hesperia sidae* was uncommon despite the abundance of *Potentilla*.

After this date I confined myself to the Asiatic side till June, when I paid a series of visits to the Belgrade Forest hoping to improve my series of *Heteropterus morpheus*, *Lycaena arion*, and *Bithys quercus*, and to come across either *Polygonia l-album* or *Eugonia sauthomelas* which I have always hoped to find near Constantinople. In this I was disappointed as I was in my search for *Euranessa antiopa* larvae. I found an excellent locality for *Heteropterus morpheus*, between Yenikeui and Therapia and near Therapia took a few fine *Lycaena arion*, but the bad weather of June soon spoiled these two species.

Lowia alciphron var. *meliboeus* was local, but the males were the worse for wear by June 11th, the date of my first visit to Belgrade Forest this year. The Argynnids were advanced, *Dryas paphia* and

D. pandora well out by June 11th with plenty of *Brethsis daphne*, and, less commonly *Argynnis aglaia*. Of the "skippers," I may note *Erynnis orientalis* which occurred everywhere singly from the beginning of May till after mid June, and a fine *Hesperia malvae* ab. *taras* taken in mid June, a very late date it would seem for so southerly a locality, though I am bound to admit that I have never seen this species near Constantinople in April. *Bithys quercus* was well out, despite the early June rains, at the end of June, and of a series of fourteen specimens, four males and ten females taken then, six ♀s were more or less of the ab. *bellis*. All were large specimens, though smaller than those which I have seen from Cyprus.

Pararge roeclana was commoner than in the previous year, and the Satyrids, *Satyrus circe*, *S. hermione* (*syriaca*) and *Hipparchia semele* very numerous with the common Theclids, *Nordmannia ilicis* and *N. acaciae*, though I am afraid I neglected the latter species. I paid two visits to Kütchük-Tchekmedjé and on the first, April 25th, took a short series of *Anthocharis belia* but little else. Odonata were in great evidence that day, *Libellula depressa* and *Brachytron pratense* (*hafnense*) abounding. I may add that I took the handsome *Anax andromache* ♀ in the Belgrade Forest in June. The specimen had just seized a large ♀ *Epinephele jurtina*. On my second visit to Kütchük-Tchekmedjé on July 25th, I took a few specimens of the second brood of *Erynnis orientalis* with various common things and noted frequency of rather worn *Macroglossa croatica*. I did not come across *Agriades* (*Polyommatus*) *thersites*. After this I had no collecting save for a quarter of an hour in the Club Garden at Constantinople, where I took a couple of *Polygonia egea*, a species which is not uncommon at Constantinople but which one generally finds on ruined towers, high up on old walls and in similar inaccessible places. When you do see it at Constantinople within reach of you it is generally in the middle of a crowded street where butterfly nets are not carried.

ASIATIC SIDE.

I worked the Gyök-su localities in April, finding *Thais polyrena* var. *cassandra* decidedly local and uncommon, and making few observations of interest save an attempt at coupling between a male *Loreia dorilis*, and a female *Rumiccia phlacas*. I watched the insects for upwards of five minutes. The female *phlacas* kept running along the blades of short grass which covered the spot, followed by the male *dorilis*, and from time to time stopping, with wings extended and fanning, only to move away as soon as *dorilis* approached and touched her. I was watching this courtship with intense interest when a vagrant specimen of *Colias edusa* disturbed the pair; *dorilis* rose and nearly fell a victim to a dragonfly, I think an immature *Libellula depressa*, which made a swoop at him and effectually frightened him off.

Larvæ of *Melitaea trivialis* were common here as at Kiathané, but most of the larger ones which I took home proved to be stung. The larvæ were not too easy to rear, requiring a constant supply of fresh mullein leaves. On some plants of mullein I found as many as half-a-dozen larvæ of *M. trivialis* which always seemed to me very conspicuous.

I took *Melitaea cinxia* at Yakadjik on April 19th, I think my notes have unfortunately been left with my collections in good hands at

Constantinople, and with it a torn specimen of *Hesperia armoricanus*, many rather large *Leptosia sinapis*, and not much else. I visited Yakadjik again on May 11th, and found *Aporia crataegi* well out quite a fortnight earlier than in 1911, and also took *Erynnis orientalis*, and *Polyommatus amandus*, damaged *Agriades (P.) thersites*, and one or two other things.

But my best work on the Asiatic side was done further away from Constantinople. In the first week of May I paid a visit to the limestone country round Dil Iskelessi, about 33 miles from Constantinople. To reach this place, a little station on the Anatolian Railway between Constantinople and Ismid, it was necessary to leave Haidar Pasha Station at about 8 a.m., reaching Dil Iskelessi at 10.30. The return train, which it was necessary to catch, reached Dil at about 2.35 p.m., so that one had about four hours' collecting, for all the ground was productive the moment one left the station enclosure. It was mostly down-land with patches of cultivation, plenty of ilex scrub and arbutus in places, and by the little river orchards and very unkempt gardens. The people, all Turks save for the inevitable Greek fisherman, were loutish and I think harmless, though I never ventured in close country more than four hundred or five hundred yards from the railway where there were many workmen and a few engineers of the Baghdad Railway Company. Here I made a number of interesting additions to my Constantinople list. In May *Thais cerisyi*, of which I saw but failed to catch a large and unmistakable specimen; *Colias hyale*, of which I caught a single very fresh specimen, and saw another which gave me much exercise; *Leptosia duponcheli*, for which I was already a trifle late in the beginning of May, but which was here decidedly commoner than *L. sinapis*; *Cupido sebrus (osiris)* which occurred sparingly in a grassy valley between two patches of scrub wood, and fine large specimens of *Agriades (P.) thetis (bellargus)*, much larger with paler undersides and less strongly chequered fringes than a series I took at Ventnor early in September, 1913. I took one magnificent underside aberration of *A. thetis*, which I hope one day to figure. Lycaenids were not numerous but I took a good many species, including with those recorded above, *A. thersites* one or two blue suffused females, worn *Scolitantides baton*, *Polyommatus amandus*, *P. icarus*, but not *P. semiargus*. *Plebeius argus (aegon)* did not seem to occur on the limestone, but only on a strip of alluvial soil on the railway bank near the bridge. While butterflies were by no means common, there were a great many species in evidence, including, as well as the usual Constantinople insects, *Pararge maera*, *Hesperia sidar*, *H. malvae*, very large and handsome *Euchloe cardamines*, *Anthocharis belia* and *Iphiclidés podalirius*, which I have never found very common round the Turkish capital. I tried to find the foodplant of *L. duponcheli* and came to the conclusion that it was a species of *Lathyrus*, with reddish-purple flowers which grew amid the scrub and on the edges of the very ill kept fields hard by. On three occasions I saw females after flying in the usual aimless fluttering fashion of *Leptosia* above the plant, settle thereon, walk about and make a flexing movement of the abdomen but try as I would I could not find the ova. My efforts to find the foodplant of *Aricia anteros* were also unsuccessful. This species was not so common this year at Constantinople. It is generally abundant.

I did not visit this interesting locality in June. On July 7th, I found what I take to be *Hirsutina abductus*, but answering the des-

cription of the Albarracin form given by M. C. Oberthür, in vol. iv. of *Lep. Comparée*, and in some cases showing an approach as far as the underside is concerned to the form *ripartii*, which I have often taken in Syria. All the ♀s showed more or less the reddish ante-marginal lunules on the upperside of the hindwings, which I have noted in Syrian females of *H. poseidon*, but have never seen in Syrian *ripartii*. This insect was not uncommon and I secured a fair series. On the same day I took a very wasted specimen of *Klugia spini*, the first I have taken in the Constantinople region, and half-a-dozen *L. duponcheli*, g.a. *aestiva*, two of which were very yellowish-white indeed. One or two fresh *C. sebrus (osiris)* were taken here, a second brood no doubt, and two or three *A. thetis*. I much wondered whether these were the last survivors of the first or the first comers of the second brood. Large specimens of *C. rhamni* were noted but I took none, which I now regret as they might have proved to be *C. farinosa*. I was, however, much bothered by a policeman, fat and obsequious who followed me everywhere for some time, puffing and dripping, and urged me to repair to a café where I was, I suppose, to "stand" him some refreshment. I had in the end to give the creature a box of cheap cigarettes to rid myself of him. His prompt disappearance on receiving the "back-sheesh" suggested that his fears of some menace to my safety from hypothetical bad characters which, he averred, had prompted him to accompany me on a broiling day were invented, and that he had really been inspired either by thirst or greed.

Mrs. R. Whittall, who with her young family, visited Dil Iskelessi on a yacht in May and again in mid-July, took there in addition to my additions to the local list, a fine male of *Everes argiades* differing very much from my *E. alcetas*, taken in 1912 at Yalova, and a small but beautifully fresh *Enodia dryas*, the latter an interesting record, and I think the first of recent date for Western Asia Minor.

I paid a brief visit to Gyök-su on May 25th, and on that day took a very large and characteristic *P. napi* of the summer form *napaeae*. As *P. napi* g.a. *napaeae* occurred with fresh and fairly typical specimens in the Belgrade Forest in early June, and a good *napaeae* fell to my net on St. Nicolas' islet in the Sea of Marmora, on May 30th, I should like to get the experiences of those who have collected in spring and early summer in S. Europe. Have they taken the two forms together in early summer? I doubt the Belgrade Forest *napi* taken in June having been first brood specimens. *P. napi* was getting worn at Gyök-su in early April, and I am therefore inclined to believe that the vernal form occurs with *napaeae* in early summer, later emergencies being very marked *napaeae*, and only *napaeae*.

In some ways my most interesting collecting was done during a brief, all too brief, yachting trip on the coast beyond Pendik. Pendik, like Kartal and Yakadjik, is on a grey limestone formation covered on the higher ground by schists and sandstone. Beyond Pendik and between it and Tuzla one finds a sandy coastal strip stretching for many miles with outcrops of limestone, and of what appears to be a red conglomerate. Vegetation here is richer than on the dry and treeless hill slopes though there are few trees. On this trip on May 29th-31st, I had a good many hours' collecting in delightful weather on two days. On the first I spent the whole morning near Mavri, a pretty little bay some five miles beyond Pendik, and there took several

Cupido sebrus, including one minute ♀, the first *Melanargia galathea* and *Nordmannia ilicis*, and many common things, including *Adopaea flava*, which was well out at this early date for it. In this afternoon I visited St. Nicolas' islet and there took a passable *Hesperia sidae*, the *P. napi* g.a. *napacae* already recorded, *Anthocharis belia*, fresh *Pyrameis atalanta*, not a common insect at Constantinople this year, some very fresh and fine *Colias edusa*, which seemed to be the first examples of the 2nd brood and a number of Geometrids, some of which I sent to Mr. L. B. Prout for determination. Next day I went further along the coast, and at a place which I will for the present call X, lest some German or Austrian professional descends upon it, found butterflies really abundant on what I should be inclined to call "steppe" country, dry and decidedly sandy, with scattered trees and as a rule sparse undergrowth. Here I found my prize of the year, *Scotitantides barinus* in fair numbers, though few indeed of the males were at all worth capturing. The females were often in beautiful condition and I greatly admired the contrast between the glossy blackish-brown upper-side, with its relief of orange lunules near the anal angle of the posterior wings and deep blue powdering on the wing-bases, and the deep dove-grey underside with its full orange band. The butterfly flew rather low, fairly rapidly and seemed to be less given to the habit of darting about in circles than other "blues" which I know, but was perfectly capable of dodging and turning very suddenly and sharply when threatened by the net. It evidently loved dry, sunny, and sandy spots, including those where, to judge from the vegetation, there was much salt in the sand, and seemed partial to thyme flowers. With *S. barinus* I took occasional specimens of *A. thersites*, mostly going over, *P. amandus* already on the wane, *H. sidae*, *Erymnis orientalis* and on a large mallow plant a female *Erymnis* so much darker, with the underside so much more distinctly marked and the upper-side so much less greenish in general tone than *E. orientalis*, that I am strongly of opinion that it is *E. althacae*. Frankly I do not know the last named insect save from figures and specimens in the Museum at South Kensington, but to judge from these figures and specimens it might possibly be mistaken by a collector, who did know the difference in the shape of the antennal clubs for *E. alceae*. But I cannot imagine the possibility of any *E. orientalis* that I have taken being confused for a moment with *E. alceae*, while the female specimen I have described did certainly bear some resemblance to it at first sight. With these interesting insects were hosts of fine *A. flava* of both sexes, worn *P. icarus*, *M. didyma*, *M. tricia* going over, some huge *C. edusa*, larger and finer than any I have yet taken, *A. belia* and occasional *N. acaciae*. I hoped to find *Chilades trochilus* on this favoured spot but failed. After five hours' collecting I returned to a repast in which whitebait and fresh red mullet were a leading, and, as the newspapers say, a popular feature. Next day the weather broke: floods, thunderstorms, and wind descended on the Sea of Marmora and I was back in Constantinople. On June 6th I visited the Beikos woods opposite the Belgrade Forest hoping to get *M. athalia* var. *mehadiensis*, but not one did I see. The woods were dripping wet and save for a few very fresh and fine *Dryas paphia*, *Brenthis daphne*, and the ordinary woodland insects, such as *N. ilicis* and *Coccyonympha arcana* I saw nothing flying. On July 16th I went on another yachting trip, this time to

the white cliffs of Ayasma between Tuzla and Dil Iskelessi. Here I took a couple of *Cupido sebrus*, and quite a good series of *H. admetus*. A good female of *Pararge roxelana* taken in an orchard near the shrine from which Ayasma (Agiasma) derives its name, and one or two *P. maera* were also among my captures. I may note that Mrs. Whittall took a single *S. barius* near here in May. My search for *Polyommatus meleager* on Prinkipo Island at the end of June was a complete failure. I was too late I expect, that is if *P. meleager* is still to be found there.

THE SOUTHERN MARMORA.

During a yachting cruise in June, Mrs. Whittall brought back a fine series of *Melanargia larissa* closely approaching var. *syrjaca* from Artaki on the south coast of the Sea of Marmora, and several fine specimens of *Hipparchia briseis* with *Euranessa antiopa* from Marmora Island, *Melitaea athalia* var. *mehadiensis* from woods on the south coast of the Gulf of Ismid, and *Lampides boeticus* from near Yalova. She also received a very fine specimen of *Gonepteryx cleopatra* from Smyrna.

To my Constantinople list must now be added the following species: —(?) *Erynnis althaeae*, *Klugia spini*, *Ereves argiades*, *Cupido sebrus*, *Agriades thetis*, *Hirsutina admetus*, *Scolitantides barius*, *Thais cerisyi*, *Leptosia duponcheli*, *Cotias hyale*, *Euodia dryas*, and *Hipparchia briseis*, specimens of the latter having been taken, so Mrs. R. Whittall tells me, near Dil Iskelessi. Should I return to Constantinople I hope to make a few more additions to the local list in happier years.

Notes on the Taxonomic Value of the Genital Armature in Lepidoptera.

By the REV. C. E. N. BURROWS, F.E.S.

I myself executed (with one exception) the preliminary drawings for all the figures in Mr. Pierce's *Genitalia of the Geometridae*. These drawings were made by Camera Lucida, with the same apparatus and the same Microscope objective throughout the series. Mr. Pierce and I, in continuous consultation, completed the drawings. I passed his ink drawings, with one exception, where we disagreed as to the obscure details of an exceptionally complicated species.

All this is to be read in the Preface to Mr. Pierce's Book.

I share, therefore, with Mr. Pierce, Mr. Bethune-Baker's somewhat severe condemnation, in the January Number of the *Entomologist's Record*, of these same figures. I am quite sure that Mr. Bethune-Baker did not mean to write harshly or unkindly, and I trust that he and those who read this will acquit me of the smallest wish to be harsh or unkind.

I very earnestly deprecate the suggestion that we have drawn "what he wants his readers to see," or "what does not exist in the object," and further that our drawings depict "a flattened and distorted object." To the latter quotation I might retort "Tu quoque." I will return to this subject.

The proof of our honesty is in every collector's hand. To have published fictitious drawings would surely have been foolishness of the worst kind.

My mounts, many hundreds in number, are entirely at the disposal of anyone who cares to travel down to Mucking to examine them, and I have no doubt but Mr. Pierce will, with equal pleasure, say the same. More than this I am willing (within reasonable limits of course) to mount for any one who wishes it, any Geometrid genitalia which may be called in question, on condition that at least two males and one female be sent; in order that I may have an opportunity of making apparent, the superiority of the Vertical over the Profile-position. Again, I have no doubt but, Mr. Pierce will be equally willing to do the same. Or, I will submit such mounts to Mr. Tonge, Mr. Noad Clark, or other Photographic expert (if such there be) that he may make a photograph free from bias. Or again, I will submit a set of selected mounts for examination by any Entomological Society.

I do not think that I can do more than this to prove my own conviction as to the *honesty* of the figures in question.

As I am thus drawn into this controversy, I may, perhaps be allowed to place on record my own opinion upon some of the points in question, taking such in the order followed by Mr. Bethune-Baker.

1. *Photography.* I notice that this method of reproduction is not preferred by all scientists. In the *Transactions and Proceedings of the Entomological Society of London, 1912-13*, I find (excluding colour plates, plates of imagines, landscapes, etc.), 50 drawings to 20 photographs. In those for 1913-14, 15 drawings to 13 photographs, and in the current Volume, 13 drawings to 30 photographs, making for the period covered, 78 drawings to 75 photographs. It may be said that these plates represent the views of but very few individuals, but there stands the fact. I remember that our dear old friend J. W. Tutt, just before his fatal illness, having before him the completed photographic plates of my series of *Hydræcias*, deliberately called in the aid of a hand artist to produce understandable pictures. My own objections to the Photographic method of illustration are:—

(1) That each figure represents a single individual, perfect or imperfect.

(2) That it is necessary to flatten unduly (squash) the specimen to be photographed.

(3) That it is not possible to make a detail picture of thick chitin and thin integument with the same exposure. One or other must be sacrificed unless the object be unduly thinned or "squashed."

I emphasize the flattening of the specimen, which is necessary to secure, as far as possible, that all the object shall be in the focal plane and thin enough to agree with the focal depth, of even the best of microscope objectives.

(4) That it is true that superposition of several organs does obscure the true structure. I can produce a mount in which it would be quite possible to have, in the profile 12, separate surfaces at least.

2. *The profile position.* How Mr. Bethune-Baker can claim this at the more natural position I cannot imagine. Is it natural for a Lepidopteron to have its final segments pressed flat with a fold all along the dorsal and ventral centres? The *Natural position* (in life I presume) depends entirely upon the point of view of the observer, and upon the conditions. If I look upon the side, it is true that I get a profile view, but the parts are not squeezed together. If

I look vertically I get a vertical view. In any case, when the organs are in use, *the genitalia are open—not shut.*

Again, what advantage does the profile view give? It shows the contour of the *valves**, a side (and strictly limited) view of the *tegumen** with its ring formation crushed (or often broken) and the *penis**. All these points are equally or better shown by the vertical position, and a great deal more. For Mr. Pierce and I have pointed out that the valves, tegumen, and penis are not the "be all and end all" of the matter, but that there are other structures hitherto neglected which belong neither to *valve*, *tegumen*, or *penis*. These structures arising from the central area of the genitalia, between the valves, are entirely concealed by the profile position, though they must be of the greatest interest and importance. Reference to Petersen's Monograph upon "The Genus *Eupithecia*" (*Iris*, Band. xxii., 1909) will illustrate my meaning.

In all his drawings of the single valves *in profile* position, the organs, which belong to the central area of the genitalia, are shown as though part of the valve. The reason is plain. The imaginal abdomen is cylindrical, but the two final segments are practically hemi-cylindrical. In the profile mount the dorsal half cylinder must be flattened, while the approximately *flat* ventral surface must be either "bulged" or crumpled up. The suggestion that the examination of the central area in the profile specimens may be attained by the mutilation of the object, I cannot accept as scientific. Dissection is all very well, and necessary, but it will not, in the present case, help the observation of the organs in "a natural position."

I do not wish to seem to undervalue the profile view. We get it during the preparation of the object. Nor do I despise the profile mount, which is very useful. But I do earnestly uphold the vertical as showing more, and therefore more useful.

And I further assert that the profile method of mounting is more worthy of a beginner than of a competent scientist. It is vastly more easy and more speedy. It requires less care, less patience. I would undertake to instruct, any but the clumsiest youth, to prepare a passable profile mount, in half-an-hour. I could mount thus as fast as hand and eye could work. But it is not thus Science works. Witness, for instance, the long patience of the Chemist, the Astronomer, the Physicist, etc.

In this matter I personally entirely disagree with "some of the most able Continental insect Morphologists." Mr. Pierce and I cannot be ignorant that "Systemists who are really eminent to-day do not believe in the Study of the Genitalia" as an aid to their work.

* I use these terms advisedly.

Valve. Mr. Bethune-Baker accepts the authority of Dr. McDunnough, so do I, here. Dr. McDunnough affirms that this term has been used from *before the year 1815*, and gives the authorities. Amongst these is Burmeister, who applied the term, as does Mr. Pierce. "Clasper" seems to have come in with Scudder, 1870.

Tegumen. Reference to G. Buchanman White's paper and diagram (*Trans. Linn. Soc.*, ser. 2, Zool., vol. I., plate 55; figures 10, 11, 12) prove that he meant by this term the whole circle or ring, except the "saccus," which, in his dried specimens, he could not set.

Penis. "The greater includes the less."

Surely there can be no objection to an Author who corrects his previous mistakes?

So much the worse for them, I say! But I take it that Mr. Bethune-Baker is on our side, if he were not he would scarcely be wasting time upon a useless job.

This investigation appeals naturally, at present, to a limited number of Entomologists. Is it not quite possible that the two Publishers expected to dispose of the twenty copies of Mr. Pierce's book?

May I, in conclusion, suggest to Mr. Bethune-Baker that he mount, in his profile position, specimens of, *e.g.*, an *Eupithecia*, *Melanippe procellata*, *Eucosmia certata*, *Collie sparsata*, or *Bapta bimaculata*—photograph them, and publish the result with *his* explanation.

CURRENT NOTES AND SHORT NOTICES.

The December Magazines contain the following:—

In the *Ent. Mo. Mag.* Mr. E. A. Butler announces an addition to the British List of Hemiptera, *Lygus rubicundus*, taken by Mr. H. F. Fryer by sweeping in a ditch of mixed herbage in Cambridgeshire.

On January 20th, the Annual Meeting of the Entomological Society of London took place. Mr. G. T. Bethune-Baker, F.L.S., the President, for the past two years, completed his term of office and read the Annual Address. The subject was "The Development of Claspings Organs in Insects," and was illustrated with a very large number of lantern slides, some 90 or more of which have been reproduced on twelve half-tone plates, to be issued with the Transactions. Commencing with the consideration of the characteristics of the genitalia of the Thysanura, the address went on to discuss these organs in the Orthoptera, the Odonata, the Trichoptera and the Coleoptera. The Lepidoptera Heterocera were next dealt with, the *Micropterygidae*, the *Hepialidae*, the *Cossidae*, the *Anthroceridae* (*Zygaenidae*), the *Psychidae*, the *Aegeriidae*, the *Drepanulidae*, the *Lithosiinae*, the *Arctiinae*, and the *Notodontidae*, in more or less detail. The *Lymantriidae*, the *Lasiocampidae*, and the *Saturniidae*, came next with a few *Geometridae*. Consideration was then given to the various families of the Diptera, a few Hymenoptera and one or two species of ant. This paper will be a very useful introduction to a study of the ancillary appendages of other orders in comparison with those of the Lepidoptera, illustrated as it will be by twelve plates, with figures nearly all in profile and thus more useful to the ordinary worker, who wants readily and easily to grasp the significance of the various developments of those organs.

The last issue of the "Transactions of the Entomological Society of London" contains but four papers. (1) Description of South American Micro-Lepidoptera, by Edward Meyrick, B.A., F.E.S.; (2) A contribution to the Life-History of *Agriades thesites*, by T. A. Chapman, M.D., illustrated by twenty-eight plates, two of which are coloured; (3) On a new form of seasonal (and heterogeneitic) dimorphism in *Agriades thesites*, by T. A. Chapman, M.D., with one plate; and (4) Notes on the Taxonomic value of Genital Armature in Lepidoptera, by G. T. Bethune-Baker, F.L.S., with eleven plates. In addition there are 32 pages of interesting matter concerning the exhibits and discussions which took place at the ordinary meetings of the Society.

Mr. H. S. Fremlin, F.E.S., is engaged under the military authorities in training sanitary officials to attend the expeditionary force in France. Some hundreds have already passed through his hands. He recently received his promotion to Major.

Lieutenant H. F. Stoneham, F.E.S., has recently come home wounded, but is, we hear, rapidly recovering.

Dr. Malcolm Burr has recently accepted an appointment in Russia, where he has numerous friends. His knowledge of the Russian language will be of great service to him when he takes up his duties there. The British Museum (Natural History) has acquired Dr. Burr's well-known and rich collection of the Dermaptera. There are somewhere about 120 or more type specimens and a large number of co-types. The whole collection contains a gross total of some 800 species and is a valuable addition to the South Kensington Museum.

We understand that arrangements have been made by the Lepidoptera Committee of the London Natural History Society for a member of the Committee to attend at Salisbury House at 6.30 p.m. on meeting nights (1st and 3rd Tuesdays in each month, except July and August) for the purpose of giving advice and assistance to young entomologists, whether members of the Society or not.

The "Verrall" Supper took place on January 19th at the Holborn Restaurant as usual. Some hundred guests assembled from 6.30 onward in the "Entomological Salon," and old friends met old friends, and new friends were welcomed in the conversazione which preceded the repast. Shortly after eight o'clock supper was served. Among those who were present were the following:—

R. Adkin, H. E. Andrewes, S. R. Ashby, F. Balfour-Browne, E. C. Bedwell, G. Bethell, G. T. Bethune-Baker, F. Bouskell, H. Britten, Dr. Burr, D. A. J. Buxton, P. A. Buxton, A. Cant, Prof. J. W. Carr, G. C. Champion, R. J. Champion, Dr. T. A. Chapman, F. Noad Clarke, J. E. Collin, Joseph Collins, W. C. Crawley, Bruce F. Cummings, B. G. Curwen, F. B. Carr, Dr. Dixey, A. W. Dods, H. Donisthorpe, J. H. Durrant, F. W. Edwards, Stanley Edwards, E. A. Elliott, H. Willoughby Ellis, Dr. Eltringham, Dr. Fremlin, G. E. Frisby, F. W. Frohawk, J. C. F. Fryer, C. J. Gahan, Lachlan Gibb, A. E. Gibbs, E. E. Green, H. M. Hallett, A. H. Hamm, B. S. Harwood, P. Harwood, Prof. Image, O. E. Janson, O. J. Janson, F. B. Jennings, A. H. Jones, Dr. K. Jordan, T. W. Kirkpatrick, Dr. G. B. Longstaff, W. J. Lucas, R. W. Lloyd, H. Main, G. Meade-Waldo, A. W. Mera, Rev. F. D. Morice, Claude Morley, F. Merrifield, S. A. Neave, C. Nicholson, W. North, Prof. G. Okajima, G. T. Porritt, Prof. E. B. Poulton, R. M. Prideaux, Hon. N. C. Rothschild, Hon. W. Rothschild, H. A. Saunders, W. Schmassmann, A. J. Scolliek, H. Scott, W. E. Sharp, Dr. J. Shiraki, V. E. Shaw, W. G. Sheldon, A. Sich, E. A. Smith, E. Step, Rev. J. E. Tarbat, Rev. C. F. Thornewill, J. le B. Tomlin, A. E. Tonge, H. J. Turner, Comm. J. J. Walker, F. C. Woodforde, L. H. Bonaparte Wyse, Rev. Waterston.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October 7th.*—ELECTION OF FELLOWS.—Dr. Leslie C. Coleman, D.Sc., Dept. of Agriculture, Banga-

lore, Mysore, India, and the Rev. Frederic S. F. Jannings, Warmsworth Rectory, Doncaster, were elected Fellows of the Society. ABNORMAL NEURATION IN MELITAEAE AURINIA.—Mr. O. E. Janson exhibited an abnormal specimen of *Melitaea aurinia*, taken in Kent, in which six of the nervures were almost symmetrically deficient on either side. CHLOROPERLA VENOSA, STPH., AND C. GRAMMATICA, PODA.—Mr. G. T. Porritt exhibited a series of *C. venosa*, Stph., taken by Prof. Carr and Mr. Mottram in the river Trent near Nottingham; also a series of *C. grammatica*, Poda, for comparison. ABNORMAL HYMENOPTERON, ETC.—The Rev. F. D. Morice exhibited a specimen of *Crabro* (*Lindcinus*) *abilabris*, F., ♀, with abnormal ocelli; also a photograph, from nature, of eggs *in situ*, laid in a rose-stem in a double row by Vallisneri's "Mosca dei Rosai," *Arge pagana*, exactly as in the author's original figure. GYNANDROMORPHOUS PLEBEIUS ARGYROGNOMON, ETC., FROM SWITZERLAND.—The Rev. G. Wheeler exhibited a gynandromorphous specimen of *Plebeius argyrognomon* taken by him in the Val Maggia on July 13th this year, also an extreme example of *ab. persica* of *Polyommatus icarus* taken on the marshes at Altmatt, on July 11th, and a ♂ of *Pararge maera* with symmetrical deeply concave costa of both forewings, taken on the Via Mala on July 17th; also a well-marked series of *Pieris manni* from Vernayaz, taken on July 5th this year. RUMICIA PHLÆAS, ETC., FROM NORTH KENT.—Mr. Prideaux brought for exhibition a very perfect example of *Rumicia phlaeas ab. schmidtii*, of a pale yellow colour; also a ♂ *Polyommatus icarus ab. obsoleta*, and some very blue ♀s of the latter species, all taken in the neighbourhood of Brasted, N. Kent. PLATYPHORA LUBBOCKI, VERRALL, AND AENIGMATIAS BLATTOIDES, MEINERT, ONE SPECIES.—Mr. Donisthorpe exhibited specimens of *Platyphora lubbocki*, Verrall, and *Aenigmatias blattoides*, Meinert, which he had reared in a nest of *Formica picea*, Nyl., taken in the New Forest in July last. He pointed out that he believed he had proved that these two flies were the ♂ and ♀ of the same species. NOTEWORTHY LEPIDOPTERA.—Mr. L. W. Newman exhibited:—(1) A curious gynandromorphic *Polyommatus icarus*, the right fore-wing being ♀ and the remaining three wings ♂ except for one orange lunule on each of the hindwings. (2) A curious Zygænid of doubtful species, being small and having four spots only. (3) A short series of *Epicnaptera ilicifolia*, bred from the wild ♀ taken May, 1913, at Cannock Chase by Mr. Oliver. (4) A pair of beautiful *Neuria saponariae* from the Cork coast, the ground-colour being a rich pink instead of the usual yellowish colour. The following papers were read:—"Contributions to the Life-History of *Polyommatus eros*," by T. A. Chapman, M.D., F.Z.S., F.E.S. "Parthenogenesis in Worker-bees at the Cape," by R. W. Jack, F.E.S. "Description of New Species of *Catantia*," by W. F. H. Rosenberg, F.E.S. "Revision of the Species of the Genus *Odynerus* (Hymenoptera) occurring in the Ethiopian Region," by G. Meade-Waldo, M.A., F.E.S. "Some Remarks on the Coccid Genus *Leucaspis*, with Descriptions of two New species," by E. Ernest Green, F.E.S.

October 21st.—Messrs. L. D. Cleave, Dept. of Science and Agriculture, Georgetown, British Guiana, and J. R. Menon, B.A., Trichur, Cochin State, South India, were elected Fellows of the Society. The death was announced of Mr. William Warren, M.A., F.E.S. ABNORMAL ANTHROCERIDS.—Dr. T. A. Chapman exhibited three abnormal specimens of Anthrocerids, and read notes. VARIATION IN DIANTHÆCIA

BARRETTII AND BOARMIA REPANDATA.—Mr. L. W. Newmān exhibited a long and varied series of *Dianthocia barrettii*, bred from wild larvæ collected in Co. Cork, and from dug pupæ from S. Devon. **HYBRID AMORPHA POPULI AND SMERINTHUS OCELLATUS.**—Mr. A. E. Tonge exhibited a specimen of the hybrid *A. populi* ♂ × *S. ocellatus* ♀, bred *ab ovo*, which emerged September 11th, 1914. Mr. Tonge said he was informed that this was the first larva from the crossing which had hatched normally. **ABERRANT RUMICIA PHLEAS.**—Mr. Tonge also exhibited a specimen of *R. phleas*, taken on Deal Sandhills in September, 1914, without the red marginal band on the hindwings. **STYLOPISED SAND-WASP.**—Mr. G. Meade-Waldo exhibited a stylopised specimen of the Sand-wasp, *Ammophila tydei*, Guill., from South Africa. **SOUTH EUROPEAN BUTTERFLIES.**—Mr. E. B. Ashby exhibited some South European butterflies, chiefly from the south of France. **XANTHIC PSILURA MONACHA.**—Mr. Rippon exhibited a variety of *P. monacha*, which, as far as he had been able to ascertain, had not been previously recorded. The variation consists in the body being banded with black and *yellow* instead of black and *crimson*. **TRIPHENA FIMBRIA.**—Mr. Rippon also exhibited five specimens of *Triphaena fimbria*, bred from Panber Forest larvæ. **SOUTH RUSSIAN HETEROCERA.**—Mr. A. H. Jones exhibited a number of moths from Sarepta, and read notes. **LYCENIDS SHOWING SOME DEGREE OF GYNANDROMORPHISM.**—Dr. E. A. Cockayne exhibited:—(a) Thirty-eight gynandromorphous *Agriades coridon* from Royston. (b) Two ♀s of *A. coridon*, from Royston, showing streaks of blue. Neither showed any signs of androconia. (c) One gynandromorphous *Polyommatus icarus* (Co. Clare, 1914), predominantly female *ab. caerulea*, but with streaks of male colour on the right forewing and both hindwings. The following paper was read:—"On Hawaiian *Ophioninae* (Hymenoptera, Fam. *Ichneumonidae*)," by R. C. L. Perkins, M.A., D.Sc., F.E.S.

REVIEWS AND NOTICES OF BOOKS.

SOME SOUTH INDIAN INSECTS AND OTHER ANIMALS OF IMPORTANCE CONSIDERED SPECIALLY FROM AN ECONOMIC POINT OF VIEW. By T. Bainbrigge Fletcher, R.N., F.L.S., etc., Imperial Entomologist to the Government of India. Published in Madras. Price 9s.—The author of this handsome work is an old correspondent of the *Entomologist's Record*, and probably known to many readers as a valued contributor to our knowledge of the "Plumes." The present book is one of those large and comprehensive works on the Fauna which the Governments of India have for a long time been bringing out. Mr. Bainbrigge Fletcher was for some years and until 1912 Government Entomologist in Madras. Had it not been for his appointment in that year to the post of Imperial Entomologist to the Government of India the publication of the present work on South Indian Insects would have been deferred for some years, pending a more thorough investigation into the life-histories of those insects of greater economic importance. Much of the necessary material having been accumulated, however, it was considered better to issue it now, as a basis for further work, rather than defer it for a possibly indefinite period.

There are 50 coloured plates, mainly the work of native talent, and no less than 440 text figures, many of them composite, showing the various metamorphic stages of the life-histories. There are of course chapters on General Structure of Insects, Classification and Nomenclature, and Metamorphosis. But probably the reader will be more interested in the chapters which give large selections of facts from the Indian fauna bearing on the more modern aspects of Entomology, the Means of Defence in Insects, Communication amongst Insects, Tropisms (response to stimulus of light, temperature, gravity, air, etc.), Insects and Plants, Symbiosis and Parasitism, and the Balance of Life. Several further chapters treat in detail with the subject of Insect Pests, Control of such Pests both of the Growing Crops and of Stored Products. A chapter on Household Pests naturally leads to others on Insects and Disease, Beneficial and Useful Insects. Probably what is unusual in a book on Entomology is to find a chapter on Some other Animals, which deals with enemies of crops in all classes of animals, from the elephant to the snake, and even the fish. The last half of the volume, the more profusely illustrated portion, deals with the insects of all orders of commoner occurrence and whose control is of more or less importance to the agriculturist. Although written primarily for residents in India, there is much in the volume which should ensure a wider circulation, and we congratulate the author on the all-round excellence, not only in the method of presentation and on the value of the matter selected, but also for the illustration and general mechanical get-up.—H.J.T.

THE GENITALIA OF THE GEOMETRIDÆ OF THE BRITISH ISLES, by F. N. Pierce, F.E.S. (110 pp., 48 plates, with 450 figs.). Price 10s., post free, from the author.—[Concluded.] The term "Furca" has been previously applied to the structure formed by the fusion of the two extensions from the base of the valva, and called the "Sacculi" by Mr. Pierce. In the *Transactions of the Entomological Society of London* for 1910, Mr. G. T. Bethune-Baker published a "Revision of the African species of the *Lycaenesthes* group of the *Lycaenidae*." On page 6, in a key to a figure for the description of Genitalia, we read "e. Furca; consisting of two arms from a common base in the harpagones, the support to the penis." There are ten plates of figures of ancillary appendages attached to this paper, many of which show very plainly a structure similar to that of *Ennomos autumnaria* given in plate iv. Hence, although Mr. Bethune-Baker did not name the processes (Sacculi of Pierce), he named the structure formed by their anastomosis as the "Furca." Possibly, since he, Mr. Bethune-Baker, had up to that time largely confined his investigations to the *Lycaenidae*, he was not aware that in the Geometers the Furca was represented by two quite separate processes. Hence Mr. Bethune-Baker is the author of the term "Furca," June, 1910.

The consideration of these two papers and the careful examination of the plates of figures of genitalia there given, brings us to another point, which was strongly suggested by the study of the above-mentioned slides and numerous slides of profiles, and that is that diagrammatic figures are not sufficient, and especially if those figures be of the structures "cut" and "spread." By all means let us have the diagrams, but only as an elucidation of the photographs. Granted that the photograph gives too much or not enough, these defects can

always be rectified by a diagram. However clever the draughtsman may be he "sees" into his sketch a personal bias, and often omits what would modify the impression which his drawing produced, or emphasises too greatly points with which he is obsessed at the time. How can one get an idea of the use or purpose of the various structures by a "cut and spread" method *only*? While many of the small appended structures can be portrayed better as to shape and origin by this method, one must have a profile to see the relative positions of parts when naturally arranged. Take the "furca" for example. One can get no idea what the use of this structure is in *E. autumnaria* from plate iv., one can only see the shape, points of origin and relation to the harpes (harpagones). But if one looks at the profile views, say on plate v., attached to Mr. Bethune-Baker's paper, one can at once see how strongly the inference is that the Furca is a support to the penis. We want profiles, we want photographs, and we want diagrams, but the diagram must be what it is in all branches of science, a biassed illustration of particular points, either as to shape or relative position, to elucidate points of study, not to be the final result of the study.

The author dealing with the ♂ and ♀ structures naturally gives us the classificatory results to which they appear to him to point, without, we imagine, in any way wishing to controvert the principle so well expressed by our late Editor, when he wrote in 1909 (*Ent. Record*, vol. xxi., p. 92), "Of course a satisfactory classification must take account of all characters, not only of one instar, but throughout the whole life cycle. These appendages, however, present nearly as large a group of characters as those usually used in making classifications . . . so that the addition to the usual material for classification of a knowledge of these organs is rather doubling our resources than adding one item to them."

When one comes to consider the vast amount of patient work involved, the intricate care in manipulation to secure that the preparations may be readily comparable, and the time which all this involves, one can scarcely express sufficiently the admiration felt.

It can be truly said of this work that it is another "land-mark in the advance of a more complete knowledge of our British Lepidoptera," and as the British fauna, although limited in species, is typical of almost all the Palæarctic genera, these new facts accumulated and classified, must have an influence far greater than in the area which the book nominally deals with.

We had almost forgotten that an early announcement of the volume coupled the name of one of our colleagues, the Rev. C. R. N. Burrows, with that of the author. It may be said that it was Mr. Burrows' own wish that his name should not appear on the title-page with that of the titular author, but we know that the investigation has been a joint one. Independent preparations have been made with every species, subsequent comparisons always carried out, with further investigation and comparison if thought necessary, and discussion on every point of apparent divergence. In fact, Mr. Burrows has equally shared with Mr. Pierce the work of investigation, but the author has made himself alone responsible for the facts and opinions as they are put before the public.—H.J.T.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8d.; 2 in., 10d.; 2½ in., 1/-; 3½ in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By MALCOLM BURR, D.Sc., F.Z.S., F.I.S., F.E.S., &c.

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
Notes on Swiss Rhopalocera. IV. The late <i>A. J. Fison</i>	25
What are the Tegumen and Valvæ in the Armature of the Lepidoptera, <i>G. T. Bethune-Baker, F.L.S., F.Z.S., F.E.S.</i>	31
Collecting in Constantinople in 1914, <i>P. P. Graves, F.E.S.</i>	36
"Notes on the Taxonomic Value of the Genital Armature in Lepidoptera," <i>Rev. C. R. N. Burroes, F.E.S.</i>	40
CURRENT NOTES AND SHORT NOTICES	43
SOCIETIES :—Entomological Society of London	44
REVIEWS AND NOTICES OF BOOKS	46

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Dr. Cockayne, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, A. Dalglish, G. T. Bethune-Baker, H. E. Page, A. J. Fison, J. A. Simes, C. P. Pickett, W. G. Sheldon, P. H. Muschamp, Dr. Reverdin, Miss Lilian Fison, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The Entomologist, vols. 20-30, 1887-1897 (11 years) } £3 10s. 0d.
 " " " vols. 39-46, 1906-1913 (7 years) }
 Entomologist's Record, &c., vols. 1-25. Price, £5 0s. 0d.
 Practical Hints for the Field Lepidopterist, Tutt, 2 vols. 7s. 6d.
 Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
 British Noctuxæ and their Varieties, Tutt, 4 vols. 16s. 6d.
 British Moths. Tutt, 2s. Moths of Brit. Isles (South), Vols. 1 & 2. 10s.
 British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
 Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
 British Butterflies, Tutt (Gill & Son). 3s. 6d.
 Lepidopterist's Calendar, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the Widów of the late J. ALDERSON. Apply :—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TATCHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
 :: IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

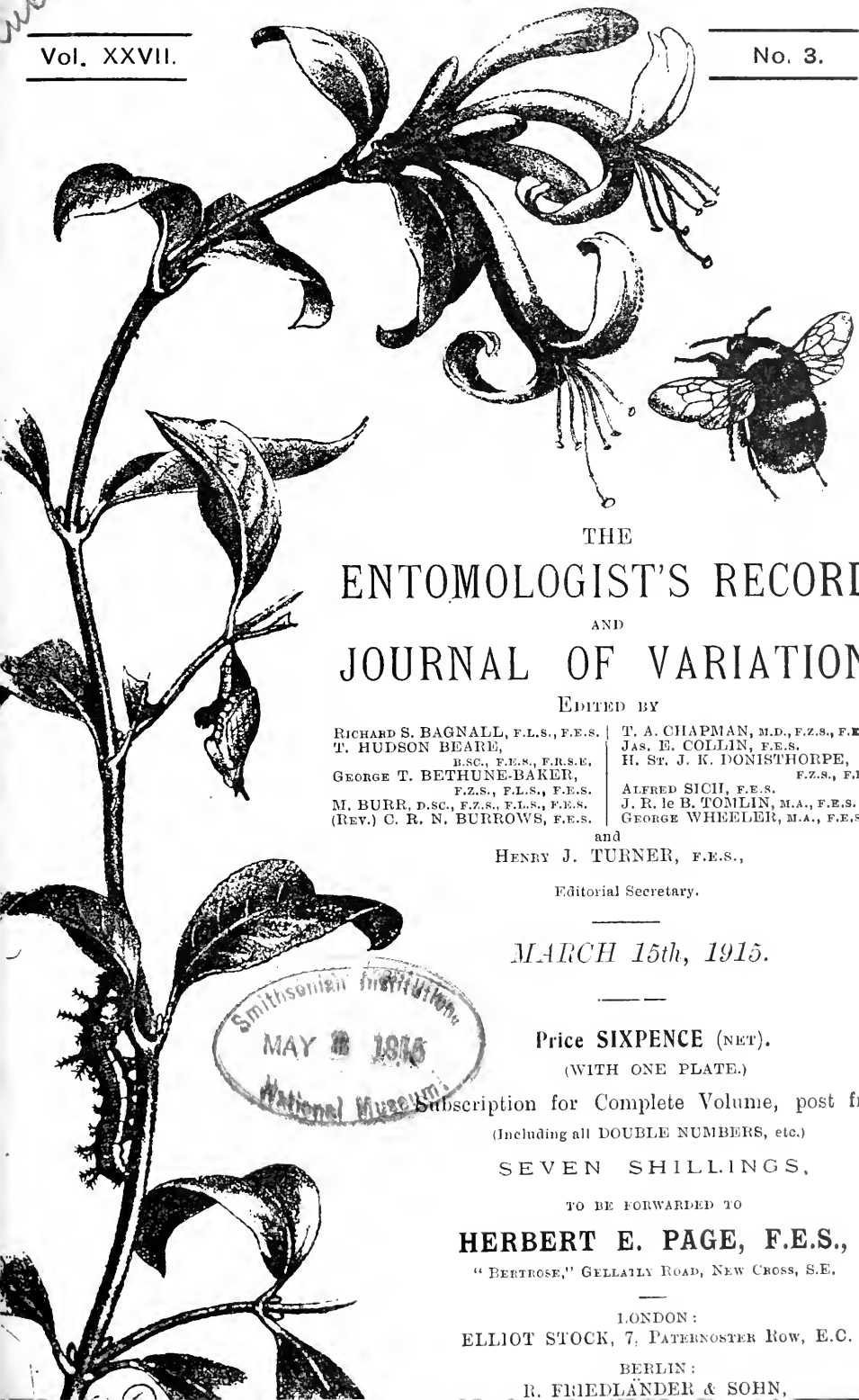
Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.

Subscriptions for Vol. XXVII. are now due.

Vol. XXVII.

No. 3.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARD, B.Sc., F.E.S., F.R.S.E.	JAS. E. COLLIN, F.E.S.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.	H. ST. J. K. DONISTHORPE, F.Z.S., F.E.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	J. R. le B. TOMLIN, M.A., F.E.S.
	GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

MARCH 15th, 1915.

Price SIXPENCE (NET).
(WITH ONE PLATE.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

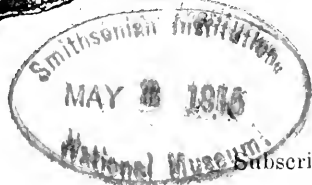
"BERTHOSE," GELLAILY ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,



Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The titles of some of the articles, are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera."—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.*, "Varieties and aberrations of Noctua from Doncaster."—*H. H. Corbett, M.R.C.S.*, "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.*, "*Eudryas sta-johannis*."—*A. Radcliffe Grote, M.A.*, "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.*, "Larvæ."—*Rev. G. M. A. Hewitt, M.A.*, "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.*, "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.*, "Pupa hunting in October."—*J. W. Tutt, F.E.S.*, "Polygamy and Polyandry in Moths."—"The nature of certain insect colours."—*W. S. Ridling, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.*, "The Lepidoptera of Swansea."—*Major R. B. Robertson.*, "*Caradrina ambigua* in the Isle of Wight."—*A. J. Hodges.*, "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.*, "*Orrhodia erythrocephala ab. glabra* from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Ridling, F.E.S.*, "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.*, "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Muz, F.E.S.*, "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.*, "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.*, "Coleoptera at Ipswich."—*Claude Morley, F.E.S.*, "Notes on *Bombus visurgie*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.*, "The Lepidoptera of Grévy-sur-Aix."—*J. W. Tutt, F.E.S.*, "*Apatura iris*."—*Rev. G. M. A. Hewitt*, "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*J. A. Chapman, M.D., F.E.S.*, "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.*, "The Genus *Smerinthus*."—*A. Bacot.*, "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.*, "Wing structure."—*J. Alston Moffatt.*, "On the development of sex in social insects."—*J. W. Tutt, F.E.S.*, "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.*, "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.*, "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fern, F.E.S.*, "A hunt for *Neuroterus aprillinus*."—*T. A. Chapman, M.D., F.E.S.*, "On the development of pigment in *Nemeobius lucina*."—*P. J. Buckell, M.B.*, "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.*, "Varieties of *Argynnis selene* (with plate).—*S. G. C. Russell, F.E.S.*, "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.*, "*Zygena minos* and its varieties."—*J. W. Tutt, F.E.S.*, "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.*, Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7/6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

**H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.**

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE,
TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

The Season 1914 near Pollokshields, etc.

By ANDREW ADIE DALGLISH, F.E.S.

Though we had exceptionally long spells of fine weather during the past season, and the year as a whole might be considered a very fine one, it was, however, spoiled to a great extent for collecting purposes by the prevalence of cold biting winds which would spring up in the evenings, even after a long fine day of brilliant sunshine.

The Saturday afternoons fared little better, as on many occasions the wind was blowing half a gale. Under these conditions one was forced to seek the most sheltered corners in the deepest glens, or some secluded spot in the thickest woods, but even there the searching winds had found its way, and little or nothing could be beaten from foliage, or found at rest on the rocks or tree trunks.

The spring was very cold and early insects scarce. *Phigalia pedaria* was out on February 23rd, when I took a ♂ and ♀ at Johnstone, and on the same date found hibernated specimens of *Depressaria heracleana* and *Cerostoma radiatella*, both under loose bark. *Hybernia marginaria* occurred at the same place on March 7th, and *Polyphoca glaricornis* on the 21st. On the 28th a couple of *Malenydris multi-strigaria* were taken at rest near Milngavie.

I spent three days at Arrochar, from April 11th to 13th, but the weather was very stormy with cold steety showers. Insects were difficult to obtain. Four fine specimens of *Tephrosia histortata* were taken from the larch, but owing to the high wind blowing, these were obtained from crevices low down on the trunks and exposed roots. A couple of *Lobophora carpinata* were found in the same manner, and a single *Depressaria aronella* was netted. I tried sugaring one evening, but with little success, a very few *Taeniocampa pulverulenta*, *T. gothica*, *T. incerta*, *T. stabilis*, and *Pachnobia rubricosa*, being the total to visit the patches. *Eriocrania unimaculella* and *E. semipurpurella* were common at Milngavie on the 18th; and a few *E. purpurella* and *Anticlea badiata* at Johnstone on the 26th.

May 9th. *Eriocrania subpurpurella* was taken from oaks at Johnstone where *Lithocolletis quercifoliella* was abundant. On the 16th an afternoon on the Gourock Hills, did not produce much, a single ♀ *Saturnia paronia* was found at rest on the heather, *Ematurga atomaria* was abundant, but *Eupithecia satyrata* was only beginning to emerge. *Plutella cruciferarum*, and *Elachista rufocinerea* were fairly common. The 19th being a holiday, I travelled to Luss, Loch Lomond, and found insects becoming more plentiful, *Callophrys rabi* was in fair numbers and in fine condition, but difficult to capture owing to the rough nature of the ground. The other species taken were, *Cidaria corylata*, *Eustroma silaceata*, *Lampropteryx suffumata*, *Lozogramma petrararia*, *Coremia ferrugata*, *Xanthorhoe tristata*, *X. sociata*, *Lithocolletis cramerella*, *L. alnifoliella*, *Micropteryx aruncella*, and *Glechia triparella*, while single specimens of *Euclidia mi*, and *Prothymnia viridaria* turned up. On the 26th I was again on the Gourock Hills, but it was blowing a gale, and all the insects I obtained were taken by creeping along the lea side of a wall. I however managed to gather in, by boxing them from the wall, several *Malenydris salicata*, and a fair number of *Eupithecia satyrata*. *Glechia ericetella* was common, and several nice

MARCH 15TH, 1915.

♀s of *Ematurga atomaria* were obtained in the same manner. In a wood at the foot of the hill *Micropteryx aureatella* and *Gracilaria syringella* were boxed.

June 3rd. *Hepialus hecta* made an early appearance at Johnstone. A single *Eupithecia lariciata* was dislodged from a fir, and shortly after two fine black varieties of *E. castigata* were taken, and single specimens of *Monopis rusticella* and *Elachista albifrontella*. On the 10th, at Johnstone, *Bupalus piniaria*, *Crambus pratellus* and *Scoparia ambigualis* were very common, while *Lithocolletis faginella*, *Lampronia rubiella*, *Incurraria muscallella* and *Elachista obscurella* were also taken.

An evening at Crookston on the 11th produced two fine specimens of *Eupithecia pygmaea*, a single *Tinea lapella*, while *Opisthograptis luteolata*, *Xanthorhoe montanata*, *Hepialus lupulina*, *Argyresthia pygmaella*, and *Plutella cruciferarum* were common. On the 12th I was again at Luss, and this being an exceptionally fine day insects were very plentiful. A couple of fair *Pionea decrepitalis* were boxed on the hillside. Fine specimens of *Acidalia remutaria*, *Lomaspilis marginata*, *Coremia designata*, *Cabera pusaria*, *Asthena luteata*, *Eulype hastata*, *Micropteryx calthella*, *Tortrix (Eulia) ministrana*, *Aucylis unguicella*, *A. unca*, and *A. mitterbacheriana*, while single specimens of *Phragmatobia fuliginosa*, *Swammerdamia heroldella* and *Incurraria muscallella* were taken. Two specimens of *Drepana falcataria* were dislodged from a birch, and both captured, one in the finest condition, the other a mere rag. *Crambus hortuellus* was very abundant in the old slate quarries, and *Argynnis selene* was found settling down in the late afternoon, when five or six specimens could be taken in groups at the one time on clumps of brackens, and dwarf shallows. A fine specimen of *Xanthorhoe montanata* was boxed with the band on the wings almost obsolete; and a single *Diacrisia sannio (russula)* was chased and captured, but received its liberty again owing to its tattered condition. On the 15th at Crookston *Bucculatrix nigricornella*, *Ornie betulae*, *Coleophora albicosta*, *Chrysoclista atra*,* *Argyrotoxa conwayana*, and *Lampronia quadripunctella* were obtained: while after dusk *Dianthocia cucubali*, *Abrostola tripartita* and *Petilampa arcuosa* were captured. On the 17th, at Milngavie, *Hydriomena impluviata* was abundant on the alders on the banks of the Allander, the majority of the specimens being black. *Eupithecia satyrata*, *Coremia unidentaria*, *Lithocolletis kleemannella*, and *Cabera pusaria* were abundant, while specimens of *Cerostoma rittella* and *Lithocolletis spinolella* were boxed. On the 18th at Johnstone, *Scoparia dubitalis* was abundant and variable, *Argyresthia conjugella*, *Gelechia terrella* and *G. proximella* were taken along with a few *Lithocolletis sorbi*. At Whistlefield on the 20th, amid a downpour of rain, I boxed from tree trunks a few *Tischeria complanella*, *Argyresthia brockeella* and *Tinea semifulvella*, while *Scoparia ambigualis* was very common. During the one short blink of sunshine a single *Pyrausta cespitalis* appeared. On the 27th I again visited Whistlefield with the hope of taking *Perizoma blandiata*, but this was another afternoon when the wind rose to half a gale, and only a single specimen, which was actually blown into the net, was taken. *Xanthorhoe tristata* was still in good condition and a single *Gelechia soroculella* was taken.

* Now known as *Blastodacna hellerella*.—A.S.

July 3rd. I had a whole day at Irvine; and this being a fine, warm day, insects were again abundant. A number of *Lycaena icarus* were taken with the object of obtaining aberrations, and in this I was very fortunate in taking two nice forms of undersides, and a female with prominent pale blue-grey discal spots on the forewings. *Coenonympha pamphilus*, *Nymphula stagnata*, *Ortholitha plumbaria*, *Salebria fusca*, *Gelechia senectella*, *Perizoma alchemillata*, and *Platyptilia gonodactyla* were also taken. Single types of *Agrotis strigula* and *Miana fasciuncula* were caught on the wing in the afternoon.

A visit to Brodiek, Arran, from July 9th to 17th, produced something better in the insect way. *Epinephele jurtina* (*janira*) was in magnificent condition, several ♂s with two well-developed spots on the underside of the hindwings being obtained, while another with the left forewing bleached was captured. A single but poor *Coenonympha tiphon* was caught on the moor. About a dozen *Plusia interrogationis* fell to the net one forenoon, along with several *Agrotis strigula* and a couple of *Anarta myrtilli*. A number of *Palimpestis duplaris* were shaken from birch. A single and large *Abraxas grossulariata* was taken far up the hillside, I have never taken this species in a similar situation in Clydesdale before. *Vernisia cambrica* was fairly common in the birch glen on the old Lamdash Road; here they seemed to prefer the smooth barks of two or three large beech-trees, over a dozen being taken from a single trunk one forenoon. I generally find this species on the light-coloured bark of the birch. Several *Cidaria truncata*, *Entephria caesiata*, *Mesoleuca ocellata*, *Lygria populata* (dark), *Metrocampa margaritaria*, *Boarmia repandata*, *Coremia designata*, *Eupithecia nanata*, and *E. goossensiata* (*minutata*) were also captured in this locality. *Crambus margaritellus* was common in Glen Cloy, where also a few *C. inquinatellus* were taken; the latter along with *C. selasellus*, which I found in fair numbers, but very local, on the grass behind the shore, is new to Clydesdale. *C. culmellus* was flying on the moor in countless thousands, and *C. tristellus* was just making its appearance. *Scoparia frequentella* was taken from tree-trunks, and a few *S. murana* were boxed from the walls on the shore road. A single *Bryophila perla* (a very scarce insect in Clydesdale) was taken from a rock far up Glen Cloy. Several *Acidalia fumata*, *Tortrix riburnana*, *Salebria fusca*, and *Nemotois minimellus* were also obtained there. Collecting in the evenings resulted in several *Plusia pulchra*, *P. iota*, *Abrostola tripartita*, *Triphaena pronuba*, *Noctua primulae* (*festiva*), *Apamea gemina*, *Xylophasia monoglypha* (dark), *Noctua umbrosa*, *Perizoma alchemillata*, *P. affinitata*, *Eupithecia subfulcata*, *Pionea olivalis*, and *P. prunalis* being captured.

August 1st saw me again at Whistlefield. *Erebia aethiops* was out in abundance, but I only obtained ♂s. Working up the bed of a burn, I took *Amoebis olivata* in fair quantity, but the capture of the afternoon was two fine *Perizoma taeniata*, another species new to Clydesdale. *Malenydris didyma* was very common, as also *Hydriomena furcata*.

My holidays were spent at Glen Sluain near Strachur, Loch Fyne from August 19th to the 25th, and collecting was almost entirely confined to the evenings with the net only. Several *Charaeeas graminis*, *Hydroecia nictitans*, *Triphaena ianthina*, *T. comes*, *Noctua sautoyrapha*,

and a single *Bombycia riminalis* were taken from the ragwort, where also *Apamea secalis* (*oenlea*) and *Caradrina quadripunctata* were common. *Amoeba olivata* was abundant in the glens but in very poor condition, *Lygria testata*, was common on the moors, and two or three *Coremia designata* of a very small form were taken, but the insect of the locality at this time of the year is certainly *Cidaria immanata*, which occurred all over the district and exhibited an almost endless range of variation. *Polia chi* was taken from the walls, *Peronea caledoniana* and *P. aspersana* were common, *Scoparia cembrae*, *Pionea lutealis*, *Argyresthia semitesacella* and a single *Pionea ferrugalis*, and a few *Crambus pinellus* were taken.

September 5th. I had an afternoon at Irvine. A single *Aglais urticae* was found on a thistle. *Thera obeliscata* (*variata*) was disturbed in some numbers from the pines in fine condition and very variable. Several *Depressaria nervosa* and *Peronea schalleriana* were taken. On September 8th *Peronea variegata* and single *Tortrix unifasciana* and *Ochsenheimeria bisontella* were boxed from a fence in Pollokshields. On the 12th I tried to obtain a few *Phibalapteryx lapidata* on the Lanarkshire Hills, but rain coming on just at the time of flight, I was forced to abandon my search and make for the station. Only a single specimen was obtained, along with a few *Tapinostola fulva* and *Celaena haworthii*.

October 3rd. *Thera obeliscata* (*variata*) was still to be taken in good condition at Johnstone. On the 24th, an afternoon at Whistlefield produced *Oporabia dilutata* in some numbers. Several *Cerostoma radiatella* and a single *Cidaria siderata* were shaken from foliage, and a single *Peronea mirtana* was netted on the hillside.

November 7th. A fine afternoon at Milngavie, where over a dozen *Chaematobia boreata* were taken, *Cerostoma radiatella* and *Peronea ferrugana* were common, and two dark ♀s of *Oporabia dilutata* were obtained from oak. And on the 21st, though it was a frosty afternoon, *C. boreata* and *C. radiatella* could still be taken there.

New Myrmecophilous Aphides.

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

The following are descriptions of some new species of *Aphidae* found in ants' nests. With the exception of two (*Aphis leontodoniella* and a *Macrosiphum*) they were collected by Mr. Donisthore, and found amongst the large number of Myrmecophilous plant-lice that he has sent me. This collection also included several unknown stages of some previously described species and enabled me to trace the complete life-cycle of some, notably of *Anoecia corni*, Fabricius, which is a serious pest to wheat and other cereals, as well as grass, in parts of Europe, and which seems to be one of the commonest Myrmecophilous species, the ants appearing to look after the oviparous females and the eggs just as they do those of *Aphis maidisradicis*, Forbes, in America.

TRAMA DONISTHORPEI, nov. sp.

Apterous viviparous female. Head, thorax, antennæ, and legs dark; abdomen

paler with dark lateral spots and dusky cross-bars, broken posteriorly by a median pale line. Antennæ of six segments, the two first segments nearly equal in length, but the basal one wider, the third the longest, about as long as the fourth and fifth, the fourth shorter than the fifth, fifth and sixth equal; the third has twelve sensoria on the apical two-thirds, the fourth five to six sensoria, the fifth three and a large sub-apical one, the sixth three basally, then a group of three small ones, and then two close to the large one beneath the "nail," which has one small one; hairs long as in *troglydites*, "nail" longer than in the latter. Eyes large, black. Body hairy. Head hairy with a marked median suture. Segments of the thorax markedly distinct, especially the pronotum. Cauda short, rounded, with rather long hairs. Cornicles slightly elevated, with large circular openings. Proboscis long, reaching well beyond the third coxæ, apex dark. The hind tarsus much more than half the length of the hind tibia; both are very hairy, but the hairs are scantier on the tibia; posterior trochanters large. A distinct stemma above each eye, the latter with a distinct ocellar process.

Length. 3mm.

Locality. Blackgang Chine, Isle of Wight, 26 viii. 1913 (Donisthorpe).

Observations. Found in an ant's nest (*Tetramorium caespitum*).

I think that this insect must be placed in *Trama*. It differs from *T. troglydites*, first in general colour, secondly in the marked antennæ, and thirdly in the hind tarsus. The marked ocellar process below the eyes is very characteristic. It may be pointed out here that I have always found a minute basal segment to the long hind tarsus in *troglydites* as well as in this species.

FORDA HEXAGONA, NOV. SP.

Apterous viviparous female. Globular in form, somewhat flattened behind. Head flat and broad, slightly rounded at the sides; the integument prominently marked with hexagonal sculpturing, which also passes on to the pronotum, a few short curved hairs in front. Antennæ of five segments, rather more than $\frac{3}{4}$ the length of body: basal segment much broader and a little shorter than the second, which is cylindrical; third segment the longest, about as long as the fourth and fifth together; fourth swollen towards the apex where there is a single sensorium; fifth a little longer than the fourth, with a prominent blunt nail, one large and four small sensoria at its base; the third to fifth segments with a few markedly capitate hairs, only slightly so on the two basal segments. Eyes small but prominent, black. Rostrum reaching to the base of the third pair of legs. Legs and antennæ appear darker than the body, the legs with scanty hairs. Cauda very dark, with numerous short, pale hairs.

Length, 1.5mm.; breadth 1mm.

Locality. Whitsand Bay, Cornwall, iv. 1909 (Donisthorpe).

Observations. I have only seen one specimen found in the nest of *Formica fusca*. It had been preserved in alcohol so I cannot give its colour. The marked hexagonal sculpturing separates it from the other species of *Forda*.

FORDA FURCATA, NOV. SP.

Apterous viviparous female. Pearly to creamy-white; domed; segments marked; legs pallid, tarsi dusky. Antennæ pallid, but darkened at the tips; rostrum pale, brown on the last segment, broad, reaching past the second pair of legs; vertex broad, slightly rounded. Antennæ moderately long, of five segments; the first two small, about equal in size; the third the longest, as long as fourth and fifth together, showing a slight constriction near the apex; the fourth slightly longer than the second, the fifth nearly twice as long as the fourth, all the segments with rather long simple hairs; the fourth with a single sub-apical sensorium, the fifth with one large and several small sensoria just below the short "nail." Eyes very small, reddish, represented by 3 ocelli. Legs rather short, with dark tarsi, with numerous rather stiff hairs on all the segments. Hairs on the head both

simple and *furcate*; on the body some are more broadly expanded apically, others slightly capitate; cauda pale, rounded, with four long pale hairs and some median shorter ones, notched at the sides, and from each notch arises a long hair.

Length. 1.5mm. to 2mm.

Locality. Sandown, Isle of Wight, 24 viii. 1908 (Donisthorpe).

Notes. Described from two ♀s taken in the nest of *Myrmica laevinodis*. It can at once be told by the form of the hairs. The antennal structure certainly places it in *Forda*, and approaches that of *F. viridana*, Buckton. The siphon openings are quite level with the body.

APHIS ALIENUS, NOV. SP.

Apterous viviparous female. Bright emerald green. Eyes large, dark. Antennæ shorter than the body, of six segments, the fifth dusky at the apex and all the sixth; first segment broader and slightly longer than the second; the third longer and narrower than the second; but often not quite as long as the fifth; the fourth about one-third the length of the third, and about equal to the length of the first two; fifth slightly longer than the third, up to the long "nail," about as long as the fourth; the first and second slightly darker than the third and base of the fourth; the fourth and fifth markedly imbricated, the third on the apical half only; edges serrated, a few scattered hairs on all the segments. Proboscis dark at base and apex, reaching to the third coxa. Prothoracic ring with blunt lateral processes. Abdomen with one lateral blunt papilla on each side, between the second and third pairs of legs and another between the cornicles and cauda. Cornicles rather short, black, thick, expanded basally, marked with dotted lines instead of true imbrication, about as long as the cauda, which is dusky especially at the apex. Legs moderately long, especially the hind pair, the tarsi and apices of the tibiæ dusky; femora with a few hairs; tibiæ with many; last tarsal with serrated edges and markedly imbricated. A large, marked papilla on each side of the cauda, between it and the cornicles. Penultimate segment of the rostrum swollen.

Length. 1mm. to 1.3mm.

Locality. Seaton, South Devon, 2 viii. 1912 (Donisthorpe); Whit-sand Bay, Cornwall.

Observations. Found in the nests of *Lasius alienus*.

It is one of the smallest Aphides I have seen. It approaches Walker's *Aphis subterranea*, but can at once be told by having antennæ composed of five, not six, segments in the apterous female; the cornicles are also relatively longer and of different shape being much expanded basally, they are also black whilst in *subterranea*, they are only black at the tips. The antennæ and legs are also thinner than in Walker's species. Nor is it Koch's *Aphis carrotæ*, which Buckton and others take to be *subterranea*, for Koch's species has a dark head and dark cauda and also antennæ of six segments and shorter cornicles. I have not found alate of *Aphis carrotæ*, but judging from the apteræ it is distinct from *subterranea* and the one I describe here.

APHIS LEONTODONIELLA, NOV. SP.

Apterous viviparous female. Very pale yellowish-green all over. Eyes large, deep black, edged with red. Head with a depression on each side, raised in the centre, with numerous longish pale hairs. Antennæ pallid, thin, half the length of the body, of six segments, the basal one large and broad, the second narrower and slightly shorter, the third long, but not as long as the sixth; the fourth rather more than half the length of the third, the fifth slightly shorter to nearly as long as the fourth, longer than the basal part of the sixth, which has a very long thin "nail"; all segments with prominent long thin pale hairs; a sensorium near apex of fifth and some faint ones at the base of the "nail," which is markedly striate and serrated at the edges. A distinct large rounded process on each side of the pronotum and five smaller ones on each side of the abdomen, which has very small,

blunt spine-like processes all around and some longer hairs. Cauda pale, rounded, with minute, dense, blunt spines and longer hairs. Anal plate rounded and similarly adorned. Cornicles very pale, moderately long, showing faint imbrication and fine serrated edges. Legs, including the unguis, very pale, hairy, with the apex of the tibiæ projecting on one side in a short, sharp process. Proboscis pallid, reaching beyond the third coxæ.

Length. 1·8mm.

The *nymph* is very similar but the cornicles are slightly longer; the wing pads are pallid and semitransparent.

Locality. Wye, 27 x. 1911 (Theobald).

Observations. Found in the nest of *Lasius flavus* and also feeding on dandelion roots. I found many apteræ in both situations, but when I searched for them some ten days later, none could be found; as the nymphs were appearing on the 27th, probably they had all become winged and fled. It is possibly the ground form of some other described species, but I have named it provisionally. The ants were watched "milking" the females whilst they were sucking the sap from the dandelion roots.

MACROSIPHUM FORMICARIUM, nov. sp.

Alate viviparous female. Head dark brown. Antennæ much longer than the body; basal segment brown, much longer than the second, which is pale, rest of antenna dark brown, except just the base of the third; third segment a little longer than fourth, with about 20 sensoria over about two-thirds of its length; fourth segment longer than fifth, which has a large sub-apical sensorium; hairs scanty, rather long and stiff. Eyes black. Proboscis pale, black at the apex, reaching to the second coxæ. Thorax dark. Abdomen pale with dark lateral spots from which arise longish hairs from distinct tubercles; over the rest of the abdomen also arise straight stiff hairs from pale tubercles. Cornicles very long, cylindrical, slightly swollen at the base, dark, except just at the base, reticulate for the greater part of their length, markedly imbricated near the base, which is unadorned. Cauda large, bluntly lanceolate, pale with three large pale hairs on each side and two median sub-apical ones. Legs moderately long, pale yellowish-green with dark areas at the apices of the femora and tibiæ and dark tarsi; rather long, stiff hairs on the femora and tibiæ. Wings ample, with brown veins, pale brown stigma and pale insertions.

Length, 2·3mm; *wing expanse,* 7mm.

Locality. Lundy Island, 9 vi. 1913 (Donisthorpe).

Observations. Described from a single specimen taken by Mr. Donisthorpe in a nest of *Lasius flavus*. The cornicles are very long, and peculiar in that they are reticulate over nearly their whole length; the stiff hairs on the body are also characteristic. As the specimen had been for some time in spirit, it is not possible to give the actual coloration. Koch describes an underground *Macrosiphum* as *Siphonophora subterranea*, but this species has shorter cornicles and a black cauda.

I have received two other species of *Macrosiphum* from ants nests, but both too damaged to describe. One was an apterous female of a uniform pale colour, with black eyes; long, thin, straight, imbricated pale cornicles; cauda long, uniform and pale. Tarsi dusky. Length, 2·3mm. Taken by Donisthorpe in a nest of *Lasius niger* at Rossbeigh, Co. Kerry, in June, 1902.

The other was sent to me by Mr. Britten, taken "in ants' nest at Great Salkeld, Penrith."

I think these are the only records of this genus being found in ants' nests.

A Reply to the Rev. C. R. N. Burrows, F.E.S.

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

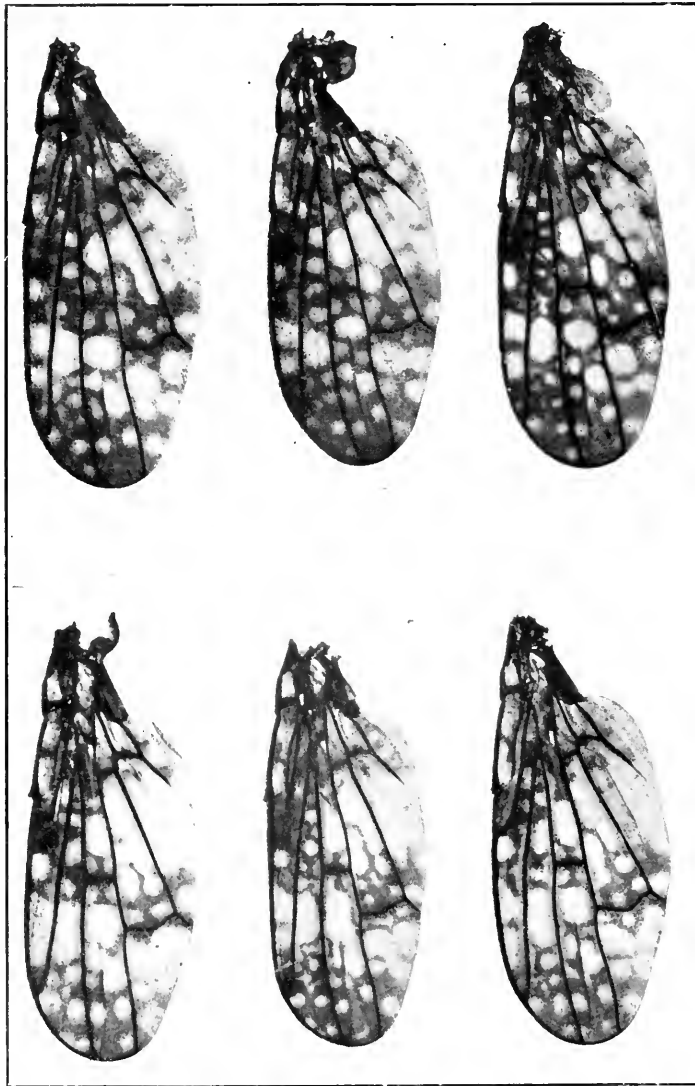
I am unfeignedly sorry that my friend and brother editor should think that I have called in question his honesty, or Mr. Pierce's either, I can quite truly assure both that no such motive ever entered my thoughts. The latter gentleman attacked my method of work and my method of illustration, and if I carried my defence into the opposing camp I do not think there is just cause for complaint, but in so doing I certainly have impugned no one's honesty of purpose.

"What the master's eye can see" is Mr. Pierce's own expression—the full sentence reads thus:—

"The latter (a drawing) reveals to the student what the master's eye can see, and whilst obscuring and *unimportant parts can be omitted*, it is possible to present with clearness every feature and organ that is of characteristic and distinctive value."

That sentence is quite conclusive justification for my conclusions as regards this particular point. There are one or two things that Mr. Burrows refers to that I had better further elaborate, and explain. He evidently thinks that I prepare my "mounts" quite flat in the profile position, though I should have thought that every one, who looked over my papers and read my arguments, would have understood that such was not the case; all my preparations are mounted in as deep cells as possible, with the cover glass laid over them so as only just to keep them in position. In this method the natural position is accurately maintained, and it is possible to examine the whole cavity within, and as I stated at first the correlation of all the parts is before the observer. I have been fortunate enough to get some specimens mounted thus "in coitu," in cases where I have been able to kill them suddenly before separation, and so have been able to compare the actual position in use with the position at rest—the two positions are natural as in life. To obtain the natural vertical position would involve the genitalia, being mounted edgeways in such deep cells, that generally speaking the venter would be out of focus when examining the dorsum, and in addition to this it would be impossible to mount the majority of insects thus without using considerable pressure and thus distorting the organs. Mr. Burrows will no doubt bear in mind in the future that I never do and never have used any pressure to my profiles, and that therefore they are truly in their natural positions as at rest. He must, I think admit that the flat spread position, which I say is distorted, can never be assumed in nature.

Mr. Burrows says I accept the authority of Dr. McDunnough. I nowhere said so, and in one special point I expressly disagreed with him. I quoted him as being accepted by Mr. Pierce, and then went on to show that he accepted him where it was convenient and ignored him in other cases. With these exceptions my previous article covers, I think, all the material points raised by my brother editor, and in closing I will only say one word which is to express again my sincere regret that he should think for a moment that I called in question either his or Mr. Pierce's honesty of purpose, on the contrary, I rather pointed out the latter's thorough openness in showing us so plainly by his drawings how his opinions were materialising.



WING-MARRINGS OF *TEPHRIS FLAVIPENNIS*, LW.

Photo, J. E. Collins.

Variation in the wing-markings of *Tephritis (Oxyna) flavipennis*, Lw. (With plate.)

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

The Dipterous family *Trypetidae*, to which the above species belongs, is composed of Acalyptrate Muscids with, in the majority of cases, prettily mottled or banded wings; the shape and disposition of these wing-markings constituting specific, and to a certain extent, generic characters. Many of the species live in the larval stages in the flower-heads, or stems, or in galls on the stems or roots of *Compositae*: others live in the seeds, or fruit, or mine the leaves, of various plants. The imagines in many cases are never found far away from their food-plant, and are often sporadic in their appearance, so that a species which for many years may have been considered a great rarity suddenly turns up in considerable numbers; this has been the case so far as my experience goes with the species under discussion, *T. flavipennis*: over forty years collecting by the late Mr. Verrall produced only two specimens, but in June and July, 1904 and 1911, Mr. C. G. Lamb of Cambridge found the species in a very limited area in the parish of St. Merryn (Cornwall) and could have taken any number of specimens; he called my attention to the great variation displayed in the wing-markings of his long series, and very kindly placed the specimens unreservedly at my disposal for purposes of study. Owing to the great use made of characters in the wing-markings for distinguishing species, the publication of a few photographs taken by my friend Mr. Hugh Main, showing, to a certain extent, the amount of variation in Mr. Lamb's specimens, may not be without scientific interest.

T. flavipennis, Lw., so closely resembles two other British species, *parietina*, Lw., and *proboscidea*, Lw., that Loew in his monumental work *Die Europäischen Bohrfliegen* (1862) expressed a doubt as to whether they were not really all varieties of one species; he, however, overlooked the important character of an extra pair of dorso-central bristles on the thorax of *flavipennis*, making three pairs in all, while *parietina* and *proboscidea* have only two pairs of such bristles. The larva of *T. flavipennis* lives in galls on the root-stock of *Achillea millefolium*.

T. parietina, L., has rather smaller eyes and consequently larger cheeks than *flavipennis*, and the proportion of depth to length of head is more equal, while the proboscis is not quite so long. On the wings the crossveins are rather closer, and the triangle of hyaline spots having its base on the costa is not so directly over the crossvein closing the discal cell, but slightly beyond it. I have not yet seen a British specimen, but as the larvæ live in the stems of *Artemisia vulgaris*, a common British plant,; the record as British is probably correct.

T. proboscidea, Lw., has more the wings of *parietina* and the head of *flavipennis*, but in addition to the one pair of black incurved lower fronto-orbital bristles, there are 1-2 pairs of quite small, whitish, incurved bristles that are absent in the other two species; moreover *proboscidea* normally has only two pairs of scutellar bristles, while the other two species normally have four. The larvæ live singly in galls on the root-stock of *Chrysanthemum leucanthemum*.

The Plate is self-explanatory, the top left hand figure showing a specimen with the pale markings abnormally extensive, those below this and on the right showing a gradual restriction of these pale

markings. Loew figured a still darker form in his photograph of a female wing on Plate xvi. of his work quoted above.

Gynandromorphs and Sex.

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

In the *Entomologist's Record*, vol. xxiii., page 215, was a Current Note on "Gynandromorphous Macro-Lepidoptera," giving a list of references to a series of articles in which were catalogued all the gynandromorphous specimens known, with details of their individual characteristics.

We have recently gone through the first four series of these records with a view to test the value of a general statement which has been made sometimes, *viz.*, that as a rule the right side was male and the left side female.

The references are all to species of the Rhopalocera of the Palearctic Fauna. Those gynandromorphous examples whose sexes were mixed, and indefinite as to sex division, have been omitted.

[*Illustrierte Wochenschrift für Entomologie*, vol. i., 1896; vol. ii., 1897; vol. iii., 1898; and *Berliner Entomologische Zeitschrift*, vol. xlix., 1904.]

- Papilio machaon*, right side ♂ = 3, left side ♂ = 1.
Parnassius apollo, right side ♂ = 2, left side ♂ = 1.
Parnassius delius, right side ♂ = 6, left side ♂ = 3.
Pieris brassicae, right side ♂ = 1, left side ♂ = 2.
Pieris napi, right side ♂ = 2, left side ♂ = 5.
Pontia daplidice, right side ♂ = 4, left side ♂ = 3.
Euchloë cardamines, right side ♂ = 7, left side ♂ = 11.
Euchloë damone, right side ♂ = 1, left side ♂ = 0.
Leptosia sinapis, right side ♂ = 0, left side ♂ = 1.
Zegris epheme, right side ♂ = 0, left side ♂ = 1.
Colias chrysotheme, right side ♂ = 1, left side ♂ = 0.
Colias erate, right side ♂ = 1, left side ♂ = 0.
Colias hyale right, side ♂ = 3, left side ♂ = 0.
Colias edusa, right side ♂ = 3, left side ♂ = 5.
Colias palaeno, right side ♂ = 1, left side ♂ = 2.
Colias myrmidone, right side ♂ = 0, left side ♂ = 1.
Gonepteryx rhamni, right side ♂ = 18, left side ♂ = 16.
Gonepteryx cleopatra, right side ♂ = 12, left side ♂ = 9.
Bithys quercus, right side ♂ = 1, left side ♂ = 0.
Ruralis betulae, right side ♂ = 1, left side ♂ = 0.
Rumiccia phlaeas, right side ♂ = 0, left side ♂ = 1.
Heodes virgaureae, left side ♂ = 3, left side ♂ = 0.
Chrysophanus hippothoë, right side ♂ = 0, left side ♂ = 1.
Lowia aleiphron, right side ♂ = 0, left side ♂ = 1.
Lowia amphidamas, right side ♂ = 6, left side ♂ = 2.
Lycæna arion, right side ♂ = 1, left side ♂ = 0.
Lycæna ephemerus right side ♂ = 0, left side ♂ = 1.
Agrïades thetis, right side ♂ = 3, left side ♂ = 2.
Agrïades coridon, right side ♂ = 2, left side ♂ = 0.
Plebeius argus (ægon), right side ♂ = 1, left side ♂ = 4.
Plebeius argyrognomon, right side ♂ = 3, left side ♂ = 0.

- Celastrina argiolus*, right side ♂ = 0, left side ♂ = 1.
Polyommatus icarus, right side ♂ = 12, left side ♂ = 9.
Polyommatus hylas, right side ♂ = 1, left side ♂ = 1.
Polyommatus meleager, right side ♂ = 1, left side ♂ = 2.
Polyommatus escheri, right side ♂ = 1, left side ♂ = 0.
Polyommatus amandus, right side ♂ = 1, left side ♂ = 2.
Aricia eumedon, right side ♂ = 1, left side ♂ = 0.
Hirsutina damon, right side ♂ = 0, left side ♂ = 1.
Hamearis lucina, right side ♂ = 1, left side ♂ = 1.
Araschnia levana, right side ♂ = 1, left side ♂ = 1.
Dryas paphia, right side ♂ = 18, left side ♂ = 20.
Dryas pandora, right side ♂ = 1, left side ♂ = 0.
Pyrameis cardui, right side ♂ = 0, left side ♂ = 1.
Pyrameis atalanta, right side ♂ = 1, left side ♂ = 1.
Engonia polychloros, right side ♂ = 0, left side ♂ = 1.
Euranessa antiopa, right side ♂ = 6, left side ♂ = 4.
Aglais urticae, right side ♂ = 0, left side ♂ = 1.
Brenthis selene, right side ♂ = 0, left side ♂ = 1.
Melitaea didyma, right side ♂ = 1, left side ♂ = 0.
Melitaea phoebe, right side ♂ = 1, left side ♂ = 0.
Melitaea athalia, right side ♂ = 1, left side ♂ = 0.
Melitaea dictynna, right side ♂ = 0, left side ♂ = 1.
Limenitis populi, right side ♂ = 9, left side ♂ = 6.
Apatura iris, right side ♂ = 1, left side ♂ = 1.
Apatura ilia, right side ♂ = 2, left side ♂ = 5.
Epinephele lycaon, right side ♂ = 0, left side ♂ = 2.
Epinephele jurtina, right side ♂ = 7, left side ♂ = 0.
Erebia aethiops, right side ♂ = 1, left side ♂ = 1.
Erebia euryale, right side ♂ = 0, left side ♂ = 2.
Hipparchia semele, right side ♂ = 1, left side ♂ = 0.
Pararge maera, right side ♂ = 0, left side ♂ = 2.
Hipparchia statilinus, right side ♂ = 0, left side ♂ = 1.
Satyrus hermione, right side ♂ = 0, left side ♂ = 2.
Satyrus alcyone, right side ♂ = 1, left side ♂ = 0.
Coenonympha arcania, right side ♂ = 0, left side ♂ = 2.
Adopaea flava, right side ♂ = 1, left side ♂ = 0.

Summing up these we find that out of 302 examples of recorded gynandromorphic specimens of European Rhopalocera, we have 157 cases in which the ♂ secondary sexual characters predominate on the right side, and 145 cases in which they predominate on the left side, that is, approximately the same numbers, so that these figures give no support to the statement that in gynandromorphic specimens the right side of the insect is usually predominantly male. The figures for individual species give the same indication, *Dryas paphia*, 18 to 20; *Polyommatus icarus*, 12 to 9; *Gonepteryx rhamni*, 18 to 16, etc.

Certain species seem very prone to the phenomenon of gynandromorphism. Both *Gonepteryx rhamni* and *G. cleopatra*: *Dryas paphia*, but not the closely allied *D. pandora*: *Euchloë cardamines*, but not *E. euphenoides*, of which no specimen was recorded; *Polyommatus icarus*, but none of the rest of the "blues"; *Limenitis populi* and perhaps *Apatura ilia*. The remainder of the species show but very slight tendency to this aberration.

A large number of gynandromorphs of the Heterocera are catalogued in the lists referred to, but no summary has been made. Casual inspection of odd chapters have supported the contentions (1) that no predominance exists in the side of the insect which assumes the male secondary sexual characters, and (2) that the number of each sex in a species is approximately the same.

A "Priority" Note.

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

On the last page of the December number of the *Ent. Record* we find the following observation:—"As the term 'falces' was introduced so long ago as 1905, it *has priority* over the term 'gnathos,' *which will fall*" !! (The italics and notes of exclamation are mine.) I express no opinion as to the greater suitability of one term or the other, but the implication contained in this phrase that the Law of Priority has any reference whatever to the names of anatomical sections, or indeed to anything at all except classification, cannot be too soon exposed or too emphatically contradicted, especially since the same monstrous doctrine seems to be accepted, and almost taken for granted, in the subsequent papers on the same subject by Mr. Bethune-Baker and the Rev. C. R. N. Burrows. Fortunately not even the maddest of Priority fanatics has yet succeeded in reducing us to this condition of helplessness, and we are still absolutely at liberty to choose the most suitable and descriptive nomenclature in all such cases, without giving a thought to the question which was the first in use. In point of fact it is quite unlikely that the first name used will in most cases meet with general acceptance, since later nomenclature generally means further research, and the wisdom of yesterday will often be the ignorance of to-morrow. At the same time there are two principles which should (in my opinion at least) be generally recognised: first, a word used in any branch of science by one author to designate a particular object, or part of an object (*e.g.*, "*scaphium*"), should not be available for use by another author to designate some other object, or some other part of the same object, in the same branch of science; and secondly, an author changing his nomenclature should be expected to draw attention to, and explain, the change, in such a way as to leave no doubt as to his meaning in the minds of his readers. A general regard for these two principles will obviate any probability of misunderstanding, without dragging the hateful Priority question into matters for which it was never intended, and where it could only become a bar to any rational progress even more effectively than it has already done in the domain of Classification.

The Butterflies of Lower Egypt.

By COLONEL N. MANDERS, D.D.M.S. EGYPT, F.E.S.

I had intended to publish nothing on the above subject until I had completed my tour of service in Egypt, but tenure of appointment is so uncertain in these troublous times that I think it better to put on record the few observations I have made, and if opportunity occurs to extend them afterwards.

The most useful paper I know on Egyptian butterflies is one

published by Mr. P. P. Graves in the *Entomologist's Record*, 1904, and these notes may be regarded as supplementary to that paper. Mr. Graves is in Cairo at the time of writing, having had an exciting and trying time in getting out of Constantinople at the declaration of war. We hope to forget our labours for the moment in a jaunt into the desert for the few but interesting insects that occur there. Egypt is sufficiently well known to make any remarks on the country superfluous; but one scarcely realises, until one actually sees it, the extraordinary proximity of the most fertile land probably in the globe with the most sterile; the dividing line is most strongly drawn, a yard even separating the two; the cause, of course, being the fertile alluvium brought down by the annual Nile flood. This makes it difficult to say, in many cases, what are actually desert species and what not, particularly among the Hymenoptera, as, owing to their powers of flight, they spread from cultivated districts far into the desert, being attracted at certain seasons of the year by the flora that grows in the bottom of the valleys, which meander far into the hills and which debouch on to the desert plains in close proximity to the Nile's overflow. Dragonflies also are extraordinarily wandering creatures; though found usually in the neighbourhood of water, they occur miles from it in the very heart of the desert, and some butterflies whose larvæ feed on garden plants, by means I do not attempt to explain, have thrown off their usual habits and have become entirely denizens of the desert. *Pontia daplidice* is one of these; on the continent of Europe, so far as I have observed it, this may be regarded almost as a garden insect, but I was surprised to find that the only locality, except for an occasional stray specimen, was the desert ravines miles away from cultivation of any kind. In Egypt it is a scarce insect, and the only two specimens I have taken were a pair at Wadi Hof, on March 8th, 1914. They were flying about some dried-up grass at the bottom of the ravine, which, even at this early period of the year, was very hot, and the vegetation already becoming desiccated with the heat.

Anthocharis belia, a butterfly I have not yet met with here, is also an entirely desert species.

The appearance of butterflies in Egypt, more especially those of the desert, is very largely dependent on the rains which usually fall in the winter months. These are very capricious, occasionally, perhaps once in fifteen or twenty years, there is such a heavy downfall, that the Wadis become raging torrents, banks and roads are washed away, and considerable damage is done to property.

On the other hand, no rain or a few drops only may fall for two or three years, and the average at Cairo is but a little more than an inch.

Last year, 1913-1914, the rains almost entirely failed and consequently the desert plants, which are entirely dependent on them for their spring and early summer growth, scarcely flowered at all and put forth a very scanty leaf, the result being that all through the year the desert flora was by no means in evidence. Butterflies are likewise affected by the climate. In what stage the desert butterflies pass the hot dry summer months I am unable to say, it probably varies with the species, but there is little doubt that if the winter rains fail the species emerge in very diminished numbers, and it is quite possible that under these circumstances the earlier stages take more than a

single year for their completion. My first year in Egypt fell on a lean year and consequently some species such as *Anthocharis belia* and *Melitaea deserticola*, which I might reasonably have expected to meet with, failed to put in an appearance.

Many butterflies, such as *Pyrameis cardui* and *Zizeeria lysimon*, have a succession of broods throughout the year if the seasons should be favourable. In the intense heat of summer and in the cold weather their numbers decrease or tend to disappear.

Some butterflies have a succession of broods, perhaps two or three, or a prolonged emergence in the spring from February until the end of April. *Anthocharis belemia*, for instance, is on the wing for almost six weeks in March-April, and then disappears until November or December when it becomes common again in its special localities. I have found no great difference in the underside in the spring and autumn broods. *Pontia glauconome* occurs in the same way; my dates are March 8th, April 22nd, and single specimens in December. It is strictly a desert insect, the larva feeding on *Capparis speciosa*.

It is with diffidence but with conviction that I record the genus *Teracolus* in Egypt; on April 13th in Wadi Hof near Helouan a butterfly flew past me, and which I failed to catch, but recognized as *Teracolus (Idmais) fausta* from a full acquaintance with its South Indian form *T. tripuncta*. In the heat of the day it is an extremely fast flier, but in the early morning before the sun is well up, it can be approached fairly easily, and this applies to many tropical and subtropical butterflies. There is no reason why it should not occur in Egypt, as it is fairly common in certain parts of Syria and in all probability in the Wadis of the Sinai peninsula.

Another butterfly I record for the first time in Egypt is *Spindasis (Aphnaeus) acamas*, a female specimen of which was captured in October, 1913, in the desert beyond Heliopolis, by Mr. Adair, of the Egyptian Agricultural Department. I tried for it unsuccessfully this year, and possibly it was a straggler. I took it many years ago at Suakin, during the campaign, and these were described by Mr. A. G. Butler as a new species, to which he gave the name *A. bellatrix*, to commemorate the circumstances under which they were taken. The type is in the British Museum. No doubt they are a geographical race of this variable insect. The specimens I took in the Punjab are very much paler.

Danais chrysippus is a common insect and of the dark African type; I was shown by Dr. Gough, of the Agricultural Department, a specimen of the form *alrippus*, the first, I believe, recorded in Lower Egypt. I am told that this form is not uncommon in the Fayum, where I have had no opportunity of collecting. This form has not been recorded south of Assouan.

Colias edusa flies in March, April and May, when towards the end of the month it disappears till autumn, then it gradually increases in numbers till the spring, when it is at its maximum. A lucerne field in April reminds one very much of an August day in England in an *edusa* year. The fields are alive with this striking insect and with *Pieris rapae* and *Pyrameis cardui*. The *helice* form of the female, or rather that named *pallida* by Tutt, is not uncommon, and I thought I had caught a record with the measurement of 62mm., until shortly after I read that Mr. Frohawk had bred one in England measuring 67mm.

My largest *edusa* female is 57mm. Among the *Lycaenidae* I may refer to *Plebeius (Lycaena) loewii* as being one of the most interesting. The male is of a most brilliant hue, reminding one of *hylas*. The female is dimorphic. In other countries than Egypt it is brown with white spots; in Egypt this form is very exceptional and I only know of one specimen. The usual form might be described as of a bright blue, rather duller than the male, but perhaps more correctly as brown covered almost completely with blue scales; the brown is almost confined to an ill-defined suffusion extending from the cell to the costa of the forewing, giving the insect an almost smudged appearance even in perfect specimens. It bears the same relation to the brown form as the blue form of the female *icarus* usual in Ireland does to the normal form in England. It is very local and only found near the foodplant, around which it flutters. The males are somewhat pugnacious, and are rather difficult to obtain in good condition. The only locality I know of near Cairo is the Mokattam Hills, where it is not uncommon in April in a space about a quarter of a mile long and about a hundred yards broad; it might therefore be easily exterminated.

A few other specimens have been noted in other parts of the Arabian desert. The foodplant is *Astragalus förskalei*, and in the female's method of oviposition we have a remarkable instance of how an instinct devoted to one purpose evidently assists the preservation of the species in another way.

After apparently aimless fluttering round a bush, she finally settles on one of the larger branches and walks down it into the centre of the plant, and selecting a leaf-bud which is quite low down and scarcely visible, deposits her egg close by its side. In what stage the hot weather is passed I am unable to say definitely, but the advantage of laying her eggs low down in the centre of the bush is threefold. The young leaves which bud in the late winter or spring, first start from the lower stems; by placing them in a sheltered position they are protected from the fierce hot winds which blow with great persistence throughout the summer; and thirdly, and quite inadvertently, they are protected from the camels, which in spite of the formidable thorns browse down the plant almost to the ground when the scanty forage in the desert becomes still further reduced by the summer heats.

It may be of interest to note that when finding a place in which to oviposit the female rotates the hindwings in the manner so noticeable in many species of the males of the *Lycaenidae* when at rest after a flight, and which has been presumed to be, and probably is, a stridulating process. Excitement is no doubt the stimulus in this case.

Virachola livia is one of those interesting butterflies in which the sexes are differently coloured; in this case the male is a bright copper and the female brown with a bluish suffusion. I have seen no trace of red in any of the numerous females I have examined, and infer that the brighter colour of the male is a later development. In coloration and habits it recalls very vividly to my mind *Zezius chrysomallus*, so frequent in old days in the neighbourhood of Colombo. The males fly vigorously round flowering shrubs in the full sunshine and the females are rather more secluded in their habits, but they do not, in any way, seek concealment, and the brighter colour of the male is probably an indication of greater and more active vigour. The larva feeds, as do other species of the genus, in the interior of pomegranates,

and does considerable damage to the crop in Egypt, and is indeed classed as a noxious insect. In other countries it is usually considered a somewhat scarce butterfly.

A butterfly very rarely taken in Egypt is *Hesperia (Pyrgus) evanida*, Butler. I have already made mention of this in the *Entomologist's Monthly Magazine* of last year but cannot give the reference and have mislaid the notes I sent on the subject. [Vol. L. (xxv.), p. 174.—H.J.T.]

I may say here that it is an entirely desert insect, and is, so far as I have observed, single-brooded in April. It is extremely difficult to catch as it has a rapid zigzag flight close to the ground, and is almost impossible to see in the flare of the desert. It settles with closed wings always on the ground and is very hard to make out amongst the rocks and sandy soil it always frequents. I have never found it far away from *Convolvulus lanatus* which I have no doubt is the foodplant. I may mention the curious fact that this plant has two sets of leaves, those grown in the spring being long, and those in early summer narrow and short.

NOTE.—Bingham's description of the male of *Plebeius lowei*, *Butterflies in India*, vol. 2, p. 343, probably taken from Beluchistan specimens, is decidedly different from Egyptian specimens; how far either agree with Zeller's original description I am for the time being unable to say.—N. M.

NOTE.—Bingham, *Butt. Ind.*, vol. ii., p. 343 (1907), *Lycaena loewii*, Zell.

♂ *Upperside*.—A beautiful purplish-blue, changing in certain lights to deep blue; veins of both fore- and hindwings jet-black, outwardly very conspicuous.

Forewing: Costa very slenderly, termen from apex to tornus much more broadly and evenly, black.

Hindwing: Costa broadly, termen a little more narrowly and dorsum broadly dusky black; posteriorly the blue ground-colour between the conspicuous black veins terminates in each interspace in an intense black spot, that contrasts strongly with the duller black on the terminal margin; cutwardly these black spots are separated from an anteciliary intense black line by a slender edging of bluish-white scales. Cilia of both fore- and hindwings white, with their basal halves dusky black.

♂ *Underside*.—Brownish-grey.

Forewing: A prominent discocellular, transverse, white encircled black spot; a transverse discal row of six comparatively black spots, edged very slenderly on the inner side, very broadly on the outer side with snow-white, the anterior five spots of the row placed in a slight curve, the upper four round, the lower spot larger, oval and obliquely placed; the lowest posterior spot of the row also large, elongate, sometimes composed of two geminate spots placed vertically under and out of line of the curve formed by the anterior five; these are followed by a broad, transverse, post-discal blackish-brown band, a terminal, catenulated transverse white band, each link of which is centered with a dusky black spot and an anteciliary, very prominent, somewhat lunular black line.

Hindwing: A transverse subbasal series of four black spots, a transverse discocellular spot and a discal series of six similar spots,

the anterior five of which are placed in a semicircular curve, vertically below which the posterior spot, which is sometimes double and geminate, is posited out of line of the curve formed by the anterior five. All these spots encircled with white, which on the outer side of the discal series of spots entirely replaces the ground-colour up to the terminal margin. On the white area are superposed a transverse, post-discal, highly curved series of connected black lunules, a sub-terminal series of black spots, one in each interspace, and an anteciliary slender black line; the posterior two spots of the subterminal row are inwardly edged with bright ochraceous and sprinkled with metallic blue scales.

Antennæ black, the club touched with white apically and the shaft ringed with the same colour; head, thorax, and abdomen black, with a little blue pubescence; beneath, the palpi, thorax and abdomen white.

Var. *chamanica*, Moore, J.A.S.B. (1884), p. 23.

The ♂ is slightly paler blue on the upperside, on the underside the markings, though small, are precisely as in *L. loweia*.—H.J.T.

NOTE.—Zeller "List of the Lepidoptera collected by Prof. Dr. Loew in Turkey and Asia," *Isis*, 1847, p. 9.

Lycaena loweii, n.sp. (Zell.).—Alis supra ♂ lætissime azureis, ♀ fuscis, maculis posteriorum tribus aurantiaco marginatis; subtus griseis punctis ocellaribus distinctis, fascia posteriorum marginali dimidia aurantiaca, maculis duabus nigris coeruleo argentatis.

Zeller, in his notes, says, "The uppersides of the wings of the male have a deeper and more brilliant blue than has *L. adonis*: the margin is very narrow black; the black scaling on the veins does not extend far from the margin; on the hindwings there are traces of blackish spots between the veins along the hind margin. Fringes brownish, at the apex of the forewings whitish.

The undersides of the males powdered light gray."—H.J.T.

Addendum to Mr. A. J. Fison's Note on *Loweia* (*Chrysophanus*) *amphidamas*, Frey.

By LILIAN M. FISON.

Loweia (*Chrysophanus*) *amphidamas* has apparently become scarce at Caux latterly. A visit to and beyond Caux on May 31st, 1913, resulted in nothing, and two more in early June, 1914, proved equally fruitless. I hope other collectors may have been more successful in their quest of this pretty butterfly.

One may say, in fact, that an outstanding feature of my two seasons' collecting—1913 and 1914—in several parts of Switzerland and Savoy—at least, as far as my experience goes—was the remarkable scarcity of "Coppers." Indeed, the only time I found any *Chrysophanidae* in anything approaching profusion was in the valley of the Arve at Chamonix, June 12th-21st, 1913, where *Heodes* (*Chrysophanus*) *virganreæ* was swarming with *Chrysophanus hippothoë*, chiefly over fields of rye, the ♀s easily out-numbering the ♂s. Both races were large, and, being quite fresh, one was able to secure a nice series.

At Grindelwald, July 22nd-August 7th, 1914, these species were only very fairly common, even on the (sunny) slopes of the Faulhorn, behind Grindelwald, where *Agriades coridon*, *Hirsutina damon*, *Polyom-*

matus pheretes, *Brenthis pales*, *B. euphrosyne*, *B. selene*, *B. amathusia*, *Melitaea cynthia*, *M. matura* var. *wolfensbergeri*, *Pontia callidice*, *Coenonympha arcania* var. *darriniana*, *C. satyriion*, *Aglais urticae*, *Pieris rapae*, with various forms of *Erebia*, many of which, alas! still need identification, owing to necessity decreeing they must be left behind in Switzerland, swarmed always on higher rhododendron covered slopes right up to the summit, some 8,000ft.—and in fields equally beloved of butterflies around the Upper and Lower Glaciers, and in the valley of the Lütschine.

Loewia (Chrysophanus) dorilis ♂ I found *once* in fields between Baugy and Vevey La Tour, August 18th, 1914; although there were a few ♀s at Charpigny during both seasons.

Loewia (Chrysophanus) alciphron var. *gordius* was never really plentiful, even at Vernayaz or around La Batiatz; and *Rumicia phlaeas* I saw not at all! male nor female.

The seasons were, however, wet and sunless, except, perhaps, mid-June and part of August, 1914; as, I believe, was the preceding one, 1912.

One feels inclined to think that want of sun tends to produce scarcity to a more marked degree in *particularly* bright-coloured races, such as *Chrysophanus*, than in darker ones, such as the genus *Erebia*, species of which were numerous in some places, viz., *aethiops* and *melampus* from Villars-Bretaye, and at Grindelwald, July, 1914; *oeme* and *manto* (not so common) above Upper Grindelwald Glacier; *tyndarus*, *lappona* (with ab. *pollux*), *gorge*, and *stygne* on Faulhorn, August 1st, 1914; *medusa* and var. *hippomedusa* between Bex and Charpigny, May-June, 1913-14; *oeme* on Dent du Midi with *ceto*, *liqea*, and higher, *euryale*, July, 1914; *ceto* (perhaps not very abundant) at Zermatt, June, 1914, etc.; *Satyrus hermione* swarming with *S. cordula* all June and July, both years, at Charpigny, and in vineyards above Martigny; most forms of the genus *Pararge* (Charpigny, Lac Champex, Grindelwald, etc.); *Coenonympha*, most forms at several places, including the rarer *tiphon*, W. of St. Triphon Marsh, etc., and in lighter-coloured races as the genus *Pieris*, usual forms of which were plentiful everywhere, except *daphidice*, *Anthocharis belia* var. *simplonia*, smaller race than some, but not quite alpine, nearly profuse at Zermatt in early June, 1914; and var. *glavidior* fairly common along the banks of the Gryonne (near Bex), 1914—odd specimens spreading to the Charpigny rock, May, 1913, and *Parnassius apollo*, at many places most abundant (Finhaut, Champéry, Grindelwald, etc.), although neither *delius* nor *mnemosyne* came under my notice.

This opinion is strengthened from the fact that on my return to England, at the end of August, 1914, *Rumicia phlaeas* was swarming to mid-September on the Surrey Downs between Guildford and Newlands Corner, the summer having been an exceptionally dry one! Of course, *Rumicia phlaeas* is admittedly a commoner species in England than in Switzerland. It must, therefore, be with reservation that one argues—although one does argue it—that the theory of the sun tending to produce brilliant forms, and lack of it only dark, or lighter ones, holds good in this case. Especially, when, on the other hand, such highly-coloured butterflies as certain species of *Lycaenidae*: *Agriades thetis* (*bellargus*), including ab. ♀ *ceronus*, *Polyommatus hylas*,

Agriades coridon, *Hirsutina damon*: of *Argynniidae*: *Argynnis adippe*, *Argynnis aglaia*, *Dryas paphia*: of *Coliadae*: *Colias edusa*, *Colias phicomone*: of *Papilionidae*: *Papilio machaon*: and perhaps a few others, were, if not always plentiful everywhere, at least, quite fairly common in places (Charpigny and district; Orsières to Lac Champex; Val d'Entremonts) in 1913; if less so in 1914, except at Grindelwald, July, 1914, where many of these species were most abundant.

One doubts, however, if any theory holds good invariably without exception, although at times, there may be, and probably is—as perhaps in this case—“something in it.”

If this theory be true, and one infers that *it may* be, then an interesting question arises from the preceding, viz:—*Why should sunless seasons produce a scarcer race of Chrysophanids, than of darker butterflies: Erebiinae, Satyridae: of lighter ones: Pieridae, Anthrocharidae: and still more of highly-coloured flies such as the species of Lycaenidae, Argynniidae, Coliadae, Papilionidae, cited above as examples?* It is obvious, of course, that damp and want of sun affect all races of Rhopalocera more or less; but it would be interesting to know *why* they should affect some, to so far greater an extent than others.

Being as yet somewhat inexperienced, I unfortunately neglected to hunt particularly for “foodplants” in the several localities where I found my “Coppers.” This I now regret, as the presence of food in abundance or otherwise must have some sort of effect on a race of butterflies. At one spot, however, near Chamonix, I noticed common sorrel (*Rumex acetosa*) and golden rod (*Solidago virgaurea*) growing in the rye-fields which appeared such acceptable localities for *hippotoë* and *virgaureae*.

However, even were there a scarcity of foodplants—as there may have been—which would account for the meagre race of Chrysophanids, one has still to trace the cause of the absence of food before considering the matter closed. The cause, obviously, is climate. If sunless, damp, cold weather affects the *flora* of a district, as it admittedly does, and did in 1913-1914 (e.g., absence of fruit in the Rhone valley in 1913, owing to a sharp frost in April, lateness of hay in 1914, particularly in higher valleys, owing to a vast amount of snow, disease amongst vines and potatoes owing to damp at Charpigny, etc.), then also in their turn the *fauna* dependent on the *flora* for their existence, must also be affected. Thus, indirectly, a sunless season would account for a scarcity in a race of butterflies as it appeared to do (at least, as far as my experience goes) in the genus *Chrysophanus*, in 1913-14, which fact leads one to suppose, as stated above, that “Coppers” are dependent on sun for their existence to a more marked degree than certain species, belonging to darker or lighter genera than *Chrysophanus*.

SCIENTIFIC NOTES AND OBSERVATIONS.

HEMIPTERA.—In the January number of the *Ent. Mo. Mag.* Dr. Bergroth shows that there are two British species of the genus *Aneurus*: *A. laevis*, Fab. (= *tuberculatus*, Mjob.), and *A. arenius*, Duf. (*laevis* of some authors). He states that *arenius* seems to be common in England, but that the true *laevis* is a very much rarer insect, recording specimens taken by Mr. Champion near Woking and others

in the Power collection in the British Museum, taken by the late George Norman, the specimens being without locality label, but presumably taken in Scotland. I have examined examples of both sexes of the insect I recorded as *A. laevis* from Chopwell, Co. Durham, where it occurred in great numbers, and find that it is the true *Aeneurus laevis*, and therefore helps to corroborate the Scotch record.—RICHARD S. BAGNALL (F.E.S.), Hylton, nr. Sunderland.

NOTES ON COLLECTING, Etc.

SEASONAL NOTES.—It is a pleasure to have to record that the last season was certainly an improvement on that of 1912 or 1913 from a micro-entomological point of view. One feature was certainly the abundance of that usually common species *Plutella maculipennis* (*cruciferarum*). This is one of those very widely distributed species, occurring even within the Arctic circle. It would be interesting to obtain a list of its foodplants, probably all belonging to the cruciferous order, and to discover whether the larva would eat *Tropeolum* like some of the *Pieridae*. One of the first species usually noted in the year is *Chimabache fagella*, and this was abundant on the tree trunks at Richmond, Surrey, very pale specimens being rare. On April 2nd, at Wimbledon, *Eriocrania minimaella* was in fine condition and plentiful, while *E. purpurella* and *E. semipurpurella* were scarce. The newly-awakened larvæ of *Coleophora ibipennella* were common on the birches. On April 26th a darkly marked *Tinea pallescens* was taken in the house. In May larvæ of three species of *Cerostoma*, *C. radiatella*, *C. parenthesesella*, and *C. alpella*, occurred on oak at Richmond, where the larvæ of *Tortrix viridana*, *Pandemis ribeana* and *Cacoecia xylosteana* were doing a certain amount of damage. Here, also, two larvæ of *Epiblema solandriana*, and one of *Cacoecia podana*, were taken off birch. In the same place, on June 8th, while sheltering from a heavy shower, I saw, for the first time, a living specimen of *Borkhausenia flavifrontella*. It was resting on a birch stem. The common *Gelechia diffinis* was abundant in June in places where sorrel grew in the turf. *Chrysoclista linneella* was out unusually early this year in the Avenue at Chiswick. It was a surprise to take, on June 17th, two *Prays curtisellus* off a small oak tree in the garden, for though there are some quite large ashes in Chiswick, this species has hitherto escaped observation here. So has also *Dichrorampha simpliciana*, but this occurred this year in July on a plant of *Artemisia vulgaris*, which has been allowed to grow in the garden. A few hours were spent at Whitstable, June 25th; my bag was one pupa off rose and one larva of *Gelechia lentiginosella* off *Genista tinctoria*, this yielded a very dark specimen and the rose pupa *Tortrix bergmanniana*! *Gelechia pinguinella* was out on poplar trunks at Barnes at the end of July, and later I found larvæ of *Nepticula acetosæ* on the common, a locality in which I had not noticed them previously. On August 28th, *Tinea miscella* was recorded for Chiswick for the first time. On May 30th a worn ♀ *Tortrix pronubana* occurred at Chiswick, and some larvæ taken off a bay tree in August produced this species. Many others were observed on the wing, the last on October 18th. At Wendover, September 27th, the mines of *Nepticula angulifasciella* were found in leaves of rose in the hedges, at the same

time, *N. centifoliella* was mining the garden roses in Chiswick. A week or so later the larvæ of *Coleophora argentula* were gathered from yarrow heads on the cliffs near Brighton. As usual, the year's proceedings were wound up with the capture of *Tinea pallescentella*, but it was rather late, being December 14th, and the moth occurred on a lime trunk in a road instead of, as usual, in the house.—ALFRED SICH (F.E.S.), Corney House, Chiswick. *January 25th, 1915.*

CURRENT NOTES AND SHORT NOTICES.

We learn that Mr. C. C. Best Gardner, F.E.S., has entered the Admiralty Aeroplane Service.

When last heard of Mr. K. G. Blair, F.E.S., was in No. 1 Convalescent Hospital at Boulogne.

Mr. P. P. Graves, F.E.S., is now in Cairo, having with some difficulty succeeded in getting away from Constantinople.

Lieutenant Colonel Manders, R.A.M.C., has been for some time in Egypt with the British forces.

Dr. Burr, who is taking up an appointment in Russia, writes from Stockholm. He says: "I am stopping here for a day en route for Petrograd, and find it strange to be in a neutral country. The hereditary fear of Russia inclines the Swedes, it seems, to sympathise with Germany, though ready to listen to reasonable discussion of pros and cons. I have enquired for news of enemy-entomologists and am informed that Dr. Horn is at the front somewhere as a Regimental Doctor; Dr. Speiser, who came to the Brussels and Oxford Congresses, is a Doctor of a regiment of field artillery, he was in the advance through Belgium, Aerschot, the Aisne and Ypres, and then moved on to Poland."

The volume of *British Lepidoptera* left unfinished by the late Mr. J. W. Tutt at his decease has now been finished, and is being delivered to the subscribers. It is vol. xi. of the *British Lepidoptera* or vol. iv. of *British Butterflies*. We hope in a subsequent issue to publish a full review of this important work.

It will be remembered that previous to his turning his attention to the British butterflies, Mr. Tutt had in vol. v. of *British Lepidoptera* dealt with about half the species comprised in the family *Alucitides* (*Pterophorina*). We have been unable to find among Mr. Tutt's papers any material relating to the second half of this family, although there must have been a considerable amount of MS. already accumulated with the view of completion. Dr. Chapman has an amount of microscopical and life-history matter relating to the remaining species, which would no doubt be at the disposal of any one who would take up the task of completing the section. The difficulty is, of course, to find the student who has time, enthusiasm, and opportunity to complete the monograph in the style of our lost friend, as the Rev. G. Wheeler has so ably and successfully done in the recently published vol. xi. with the British *Lycanids*.

SOCIETIES.

LONDON NATURAL HISTORY SOCIETY.—*October 20th, 1914.*—
DIANTHÆCIA LUTEAGO VAR. BARRETTII, AND BOARMIA REPANDATA, BRED.—

Mr. L. W. Newman, a series of var. *barrettii* bred from wild larvæ and pupæ from Co. Cork, and from South Devon, the specimens being very varied, and a few showing tendencies to melanism. Also a very varied series of *B. repandata* including melanic specimens, very pale forms, and ab. *conversaria*, all from wild larvæ taken in April in the Wye Valley. VARIETIES OF *PSILURA MONACHA*.—Mr. A. W. Mera, a series of *P. monacha*, bred from ova received from Middlesborough, the original parents coming from Ringwood and North Kent. The specimens varied from typical to black, the ♂s showing a stronger tendency to melanism than the ♀s. AGRIADES CORIDON FROM HERTS.—Dr. E. A. Cockayne, a series of *A. coridon* from Herts, 1914, including a very fine ab. *semisyngropha* and five fine ab. *obsoleta* forms. ABRAXAS GROSSULARIATA VARS.—Mr. V. E. Shaw, five very dark *A. grossulariata* bred in 1914, from some 2,000 North London larvæ; also a fine ab. *radiata* from Eltham. Mr. W. E. King, a fine series of varieties bred from North London, 1914. IRISH INSECTS.—Mr. L. A. E. Sabine, a fine variety of *Melitaea aurinia* from Co. Sligo, also a remarkable *Polyommatus icarus* having forewings and body ♂, hindwings ♀, on superficial appearance. Dr. Cockayne having examined the specimen with a microscope, said that though only a low power was available, he thought he could detect androconia showing that the specimen was gynandromorphous. EUCHLORIS SMARAGDARIA BRED.—Mr. J. Riches, a series of *E. smaragdaria* bred in 1914, including ab. *obsoleta*, Burrows. EUCILOË CARDAMINES PUPE.—Mr. H. B. Williams, two pupæ of *E. cardamines*, one green and the other ochreous, both of which pupated on the same day, in the same box.

November 3rd, 1914.—EXHIBITION OF SMALL BUTTERFLIES.—Dr. E. A. Cockayne, four extremely suffused forms of *Rumicia phlaeas* from Japan, much darker than any English specimens. Mr. W. E. King, *Aricia medon* from Wendover, including an immense ♀, obsolete undersides, and one partly striated, also *Cupido minimus* from Horsley, including ab. *obsoleta* and ab. *extrema*. Mr. H. B. Williams, four *Aricia medon* showing obsolescence in the underside spotting, ab. *striata* underside of *Agriades thetis*, five specimens of *Coenonympha pamphilus* ab. *pallida*, Tutt, from Herts, *Rumicia phlaeas* ab. *infra-radiata*, Tutt, two ab. *radiata*, Tutt, ab. *obsoleta*, Tutt, and an ab. *caeruleopunctata*, Std., with pallid patches on the forewings, from Wimbledon, also a ♂ of the same species with left forewing almost entirely white, from Herts. IRISH INSECTS.—Mr. L. A. E. Sabine, a store box of *Noctuae* from Co. Sligo, 1914, including a remarkably fine series of *Agrotis tritici*, and a fine form of *Epunda lichenea*. BOARMIA REPANDATA FROM LONDON.—Mr. A. W. Mera, comparative series showing the marked darkening that has taken place in the general facies of this species in the London district during the last 30 years.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—November 4th.—Mr. Alleyne Leechman, M.A., F.L.S., F.C.S., of Corpus Christi College, Oxford, and St. Hubert's, Main Street, Georgetown, British Guiana; Dr. T. Miyaké, the Agricultural College, Tokyo Imperial University, Komaba, Tokyo, Japan; and Mr. George W. Murray, Dirimu Estate, Binaturi River, Daru, Papua, were elected Fellows of the Society. REPLY TO THE DECLARATION OF THE GERMAN PROFESSORS.—On the motion of the President, a Resolution was unanimously passed associating the Society with the Reply published in the *Times* to the Declaration of certain German Professors on the respon-

sibility of Great Britain for the War. INVITATION TO ENTOMOLOGISTS OF THE ALLIED NATIONS.—The Rev. F. D. MORICE then proposed the following resolution:—"That all members of recognised Entomological Societies in the countries of our Allies, residing in or visiting this Country, be invited during the continuance of the War to attend the Ordinary and Annual Meetings of the Society, and to make use of the Society's Library, in the same manner as though they were themselves Ordinary Fellows, except as to the right of voting." This was seconded by Dr. Burr, and carried unanimously.

ISOLATED COLONIES OF ANTHROCERA (ZYGENA) TRIFOLII, AND PARASEMIA PLANTAGINIS.—Commander Walker exhibited, on behalf of Dr. R. C. L. Perkins, specimens of *A. trifolii* and *P. plantaginis* showing the effects of isolation. WINGED "WETA."—Commander Walker also exhibited, on behalf of Mr. Morris N. Watt, of New Zealand, a photograph of a "Weta" (*Deinacrida* sp.) fully winged, the species being usually apterous. COLIAS ERATE AND HYBRIDS.—Mr. A. H. Jones exhibited a series of *Colias erate*, from Sarepta, and its supposed hybrids with *C. hyale* and *C. edusa*.

MENERIS TULBAGHIA AND SCARLET FLOWERS.—Dr. G. B. Longstaff exhibited a fine series of *Meneris tulbaghia*, L., a large and handsome Satyrine butterfly having much the appearance and habits of a Nymphaline. He said that Trimen called attention to the decided liking of *tulbaghia* for red flowers, mentioning *Nerine*, *Haemanthus antholyza* and *Disa cornuta*. The Rev. G. Wheeler said that amongst the old records of *Aricia melton* var. *artaxerxes*, two entomologists published observations on the fondness of this insect for blue flowers. Prof. Poulton observed that the fondness of certain Pierids for yellow flowers might be accounted for on cryptic grounds, and further mentioned Prof. Meldola's observations that in some cases of British butterflies where the ♀ carried the ♂ in flight when paired, the ♀ was the more brightly coloured. The Rev. G. Wheeler said that he had paid a good deal of attention to this point for some years, and that the result of his experience was that in the Lycaenids the ♂ always carried the ♀, while in other families, except the *Hesperiidae*, none of which he had ever seen in flight when paired, the ♀ carried the ♂. Speaking from memory, he could say with certainty that this was the case on the one hand with *Plebeius argus* (*aegon*), *P. argyrognomon*, *Polyommatus icarus*, *Agriades coridon*, and *A. thetis*, and on the other with *Dryas paphia*, *Argynnis adippe*, *A. aglaia*, *Pararge aegeria*, *Epinephele jurtina*, *Aphantopus hyperantus*, *Coenonympha pamphilus*, *Melanargia galathea*, and the common Pierids. What had specially struck him was that he had never seen a single exception to the rule. He suggested that it was rather a matter of weight than of colour, the ♀ being generally smaller than the ♂ among the Lycaenids, whilst in other families it was usually the larger, often conspicuously so. Mr. H. J. Turner said that in all cases he had noticed the ♀ carried the ♂, but that he had never seen paired Lycaenids in flight. The President entirely endorsed Mr. Wheeler's observations as to the Lycaenids, having seen the ♀ of various species carried by the ♂. With regard to colour forming an attraction to the ♀, Dr. Cockayne commented on the fact that at Royston, where the ♂ *A. coridon* was so scarce that every specimen was surrounded by half-a-dozen ♀s, the ♀s also pursued specimens of ab. *semi-syngrapha*, which is common there, and whose blue colour renders it conspicuous and causes an approach to the ♂ in appearance. THE PROPORTION OF THE FEMALE FORMS OF PAPILIO

POLYTES IN NORTH KANARA.—Prof. Poulton read a letter on this subject, written June 27th, 1914, by Mr. T. R. Bell from Karwar, N. Kanara, in Bombay Presidency. THE MALE AND FEMALE OF *ACRÆA CHILO* OBSERVED IN COITŪ.—Prof. Poulton said that he had received a letter dated October 6th, 1914, from Rev. K. St. Aubyn Rogers at Sagalla, near Voi, British East Africa, giving confirmation of Neave's discovery (*Ent. Mo. Mag.*, 1909, p. 171). MALES OF *CERATOPOGON MYRMECOPHILUS* AND *FORMICOXENUS NITIDULUS* ON THE HILLOCK OF *FORMICA RUFA* NEAR BOURNEMOUTH.—Prof. Poulton exhibited specimens and read a note contributed by Mr. A. H. Hamim. NEW SPECIES OF RHOPALOCERA.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited specimens to illustrate a paper, by Messrs. Joicey and Rosenberg, on new species of *Catantacta*. The following papers were read:—"Notes on the Life-History of *Plebeius sephyrus* var. *lycidas*," by T. A. Chapman, M.D., F.Z.S., F.E.S.; "Note on the Manubrium of the ninth sternite in the male earwig," by Malcolm Burr, M.A., D.Sc., F.E.S., etc.; "The Opisthomeres and the Gonapophyses in the Dermaptera," by the same. "On the Male Genital Armature of the Dermaptera," Part I-III, by the same.

November 18th.—Messrs. Harry George Champion, B.A., c/o U.S. Dept. of Agriculture, Entomological Bureau, Washington, U.S.A.; J. J. Lister, St. John's College, Cambridge, and Merton House, Grantchester; and Rev. James Waterston, B.D., B.Sc., 22, Blandford Road, Bedford Park, W., were elected Fellows of the Society. The President announced that the Royal Society had awarded the Darwin Medal to Prof. E. B. Poulton, a former President of the Entomological Society. ANTHROCERA MELILOTI AND PARASCOTIA FULIGINARIA FROM CAMBERLEY.—Mr. E. E. Green exhibited two specimens of an *Anthrocera* (*Zygaena*) from Camberley, taken August 20th, 1914, which appeared to be *A. meliloti*; also a specimen of the rare Hyphenid *Parascotia fuliginaria* taken at light at Camberley, July 21st, 1914. The President said that he should have named the specimens *meliloti* without hesitation, and Mr. Jones concurred. A REMARKABLE COLIAD.—Mr. E. B. Ashby exhibited, on behalf of Mr. Dickinson, a few butterflies from Hinterzarten in the Black Forest and from Pontresina. Amongst them was a ♀ *Colias*, which was regarded by the exhibitor as an aberration of *C. palaeno*. The Rev. G. Wheeler expressed the opinion that the latter was a hybrid between *C. palaeno* and *C. hyale*. It was afterwards pointed out by Mr. Hy. J. Turner that the antennæ were different, one resembling those of *C. palaeno*, the other those of *C. hyale*. PARASITE IMPRISONED IN THE COCOON OF ITS HOST.—Mr. Prideaux brought for exhibition a cocoon of *Bombyx quercus* with the dead, shrivelled larva inside, together with the empty puparium of a dipterous parasite, which, with the wings unexpanded, lay beside it, imprisoned within the cocoon of its host. BUTTERFLIES FROM CENTRAL SPAIN.—Mr. Simes exhibited a series of *Agriades thersites*, *Plebeius sephyrus* var. *hesperica*, and *Melitaea desfontainii* from Albarracin, taken in the end of May and the beginning of June, 1914. The following papers were read:—"A Revision of the Mexican and Central American *Telephorinae* (Fam. *Telephoridae*) with Descriptions of New Species," by George Charles Champion, A.L.S., F.Z.S., F.E.S. "Descriptions of two New Genera and New Species of *Myrmaridae* from Tasmania," by Chas. O. Waterhouse, I.S.O., F.E.S.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8s.; 2 in., 10d.; 2½ in., 1/-; 3½ in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidæ*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
The Season 1914 near Pollokshields, etc., <i>A. A. Dalglish, F.E.S.</i>	49
New Myrmecophilous Aphides, <i>Fred. A. Theobald, M.A., F.E.S.</i>	52
A Reply to the Rev. C. R. N. Burrows, <i>F.E.S.</i> , <i>G. T. Bethune-Baker, F.Z.S.</i> , <i>F.L.S., F.E.S.</i>	56
Variation in the wing-markings of <i>Tephritis flavipennis</i> , <i>J. E. Collin, F.Z.S.</i> , <i>F.E.S.</i> (With plate)	57
Gynandromorphs and Sex, <i>Hy. J. Turner, F.E.S.</i>	58
A "Priority" Note, <i>G. Wheeler, M.A., F.Z.S., F.E.S.</i>	60
The Butterflies of Lower Egypt, <i>Col. N. Manders, D.D.M.S. Egypt, F.E.S.</i> ..	60
Addendum to Mr. A. J. Fison's Note on <i>Loweia (Chrysophanus) amphidamus</i> , <i>Lilian F. Fison</i>	65
SCIENTIFIC NOTES AND OBSERVATIONS:—Hemiptera, <i>R. S. Bagnall, F.E.S.</i>	67
NOTES ON COLLECTING:—Seasonal Notes, <i>A. Sich, F.E.S.</i>	68
CURRENT NOTES AND SHORT NOTICES	69
SOCIETIES:—London Natural History Society; Entomological Society of London..	69

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Dr. Cockayne, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, G. T. Bethune-Baker, H. E. Page, A. J. Fison, J. A. Simes, C. P. Pickett, W. G. Sheldon, P. H. Muschamp, Dr. Reverdin, Dr. Burr, A. Tetley, Parkinson Curtis, H. B. Williams, C. J. Bird, F. N. Pierce, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The Entomologist, vols. 20-30, 1887-1897 (11 years) £3 10s. 0d.
 " " " vols. 39-46, 1906-1913 (7 years)
- Entomologist's Record, &c., vols. 1-25. Price, £5 0s. 0d.
- Practical Hints for the Field Lepidopterist, Tutt, 2 vols. 7s. 6d.
- Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
- British Noctuae and their Varieties, Tutt, 4 vols. 16s. 6d.
- British Moths, Tutt, 2s. Moths of Brit. Isles (South), Vols. 1 & 2. 10s.
- British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
- Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
- British Butterflies, Tutt (Gill & Son). 3s. 6d.
- Lepidopterist's Calender, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the WIDOW of the late J. ALDERSON. Apply:—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TATCHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVAE & PUPAE,
 :: IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

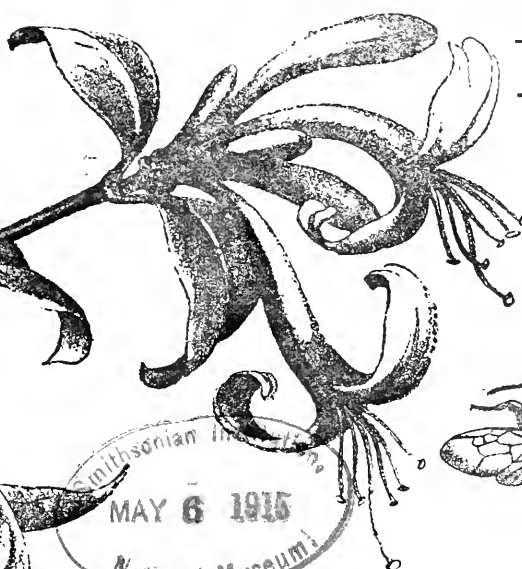
Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.

Subscriptions for Vol. XXVII. are now due.

Vol. XXVII.

No. 4.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.	JAS. E. COLLIN, F.E.S.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.	H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	J. R. le B. TOMLIN, M.A., F.E.S.
	GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

APRIL 15th, 1915.

Price SIXPENCE (NET),

Subscription for Complete Volume, post free

(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTHOSE," GELLATLY ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera."—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radeliffe Grote, M.A.*, "Varieties and aberrations of Noctua from Doncaster."—*H. H. Corbett, M.R.C.S.*, "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.*, "*Eudryas stæ-johannis*."—*A. Radeliffe Grote, M.A.*, "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.*, "Larvæ."—*Rev. G. M. A. Hewitt, M.A.*, "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.*, "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.*, "Pupa hunting in October."—*J. W. Tutt, F.E.S.*, "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Biding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.*, "The Lepidoptera of Swansea."—*Major R. B. Robertson*, "Caradrina ambigua in the Isle of Wight."—*A. J. Hodges*, "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.*, "Orrhodia erythrocephala ab. glabra from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Biding, F.E.S.*, "Notes on Caradrina ambigua and *C. superstes*."—*J. W. Tutt, F.E.S.*, "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella*" (with plate).—*W. P. Blackburne Maze, F.E.S.*, "Apterous females and Winter Emergence"—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.*, "Collecting Noctuidæ by Lake Erie."—*A. Radeliffe Grote, M.A.*, "Coleoptera at Ipswich."—*Claude Morley, F.E.S.*, "Notes on *Bombus visurigea*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.*, "The Lepidoptera of Grèsy-sur-Aix."—*J. W. Tutt, F.E.S.*, "*Apatura iris*."—*Rev. G. M. A. Hewitt*, "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.*, "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.*, "The Genus *Smerinthus*."—*A. Bacot*, "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.*, "Wing structure."—*J. Atison Moffatt*, "On the development of sex in social insects."—*J. W. Tutt, F.E.S.*, "The British representatives of the Genus Caradrina."—*L. B. Prout, F.E.S.*, "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.*, "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.*, "A hunt for *Neuroterus aprillinus*."—*T. A. Chapman, M.D., F.E.S.*, "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.*, "The Macro-Lepidoptera of Keswick."—*H. A. Beadle*, "Varieties of *Argynnis selene*" (with plate).—*S. G. C. Russell, F.E.S.*, "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.*, "*Zygæna minos* and its varieties."—*J. W. Tutt, F.E.S.*, "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.*, Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7/6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

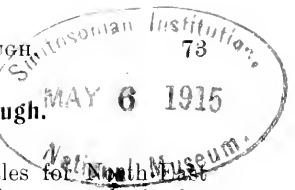
By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE,
 TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.



Lepidoptera round about Scarborough.

By A. S. TETLEY, M.A., F.E.S.

It is just thirteen years since I left Mid-Wales for North Yorkshire, leaving a district almost unknown to the entomologist for one that has, at least in the past, been very much better worked. Glancing through my note books I feel prompted to set forth some of the more interesting records therein, in the hope that their perusal may encourage other lepidopterists to visit our country-side and help in its fuller exploration.

The hinterland of Scarborough falls into three natural divisions—the North York Moors, which come close up to the town on the north and west, the Vale of Pickering, which runs east and west and approaches the coast just to the south of the town, and the Yorkshire Wolds, which bound that vale on the south. The moors and the valley are in the great Jurassic Belt, which runs from Dorset north-east to Cleveland. The rocks in the main belong to the Oolitic Limestone. The wolds, on the other hand, are part of the chalk measures. The Vale of Pickering is a broad alluvial plain, bounded on its eastern extremity by the marsh or “carr” land in the neighbourhood of Seamer, some three miles north of Scarborough. On the north side of the valley a number of little dales run up with the moors, nine or ten of them in some seventeen or eighteen miles. Well wooded and well watered, and sheltered from cold winds, these dales afford the best hunting ground in the district. Next to them I place certain parts of the wolds, and last in productiveness, but perhaps first in the interest of their fauna, the high moors.

The butterflies are very poorly represented in the neighbourhood of Scarborough, but as one goes west towards Pickering, or south on the Wolds, they become far more numerous in individuals, if not in species. *Angiades sylvarum* and *Nisoniades tages* are generally distributed, and *Adopaea itara* is locally abundant on the Wolds. Of the blues I have taken only *Polyommatus icarus* and *Aricia medon*, which swarms on the Wolds and near Pickering, where I have taken a specimen very near to var. *salmacis*. *Callophrys rubi* is a moorland butterfly here, its larva feeding on bilberry. I once saw hundreds of *C. rubi* at the head of Beedale, resting on stunted mountain-ash trees growing among the heather. *Chattendenia (Edwardsia) w-album* occurs in Sleightholmdale, to the west of Pickering, and *Hamearis lucina* I have found in two localities, near Pickering and Helmsley respectively. *Euchloe cardamines*, very scarce near Scarborough, is common at Thornton Dale and further west. In all the dales *Brenthis ephrosyne* and *B. selene* occur, the latter much the commoner and extending higher than its congener. *Argynnis aglaia* is generally distributed on the moors and wolds and in the dales. Of the *Vanessidi*, *Vanessa io* is very rare. I have seen it once only, in Langdale in the spring of 1912. *Aglais urticae* is common, the two *Pyramenids* occur frequently, and of *Polygonia c-album* I have seen specimens taken at Helmsley. Among the *Satyridae* I have not so far discovered either *Pararge aegeria* or *P. megera*. *Hipparchia semele* used to be taken on the Castle Hill in Scarborough, and is on the wolds and near Pickering. *Aphantopus (Enodia) hyperantus* is locally abundant, with ab. *cacca* and ab.

APRIL 15TH, 1915.

obsoleta. *Coccyomypha tiphon* is our most interesting local butterfly. I have found it in two places on the moors, and searched for it, so far without success, at May Moss, where it has been recorded. A full description of one of these localities, with figures of the butterfly, is to be seen in Mr. Rowland-Brown's monograph in Fascicule VII. of Oberthür's *Études de Lépidoptérologie comparée*. Last of all, *Melanargia galathea* was really abundant in 1914 near Cowlam on the Wolds. I turned it up there in 1902; this must be, I think, its most northerly habitat in the British Isles.

I have not mentioned species of general distribution or others like *Plebeius aegon* and *Cupido minimus*, which have been recorded here and probably only want working for to be found again.

Of the hawk moths, *Amorpha populi* is our only resident species, and it occurs everywhere in and around the town. *Agrius conroleuli* and *Sesia* (*Macroglossa*) *stellatarum* turn up in numbers now and then, generally on the cliffs and sea-front. My clearwing records are two only: *Egeria* (*Sesia*) *tipuliformis* and *Trochilium crabroniformis* (*bembeciformis*); doubtless the fault is mine. The latter is common all over the town wherever *Populus nigra* has been planted. I took a dozen and a half in three or four bright mornings last July from a small group of poplar trees in the Valley. Our *Anthrocoridae* are interesting because of the large forms of *A. loniceræ* which can be got in any quantity at various places along the cliffs, north and south of the town. *Adscita geryon* is common on Haugh Rigg near Pickering and also at Sledmere, and *A. statice* in the marshes east of Seamer.

Hylophila prasinana is frequent; *Nola strigula* rarer in Raincliff Woods than formerly. *Nudaria mundana* is common generally, but I have not seen a single member of the genus *Lithosia*. On the moors one gets *Diacrista sannio*, *Parasemia* (*Nemophila*) *plantaginis*, and *Phragmatobia* (*Spilosoma*) *fuliginosa*, as well as *Macrothylacia rubi*, *Lasiocampa quercus* var. *callunæ*, and *Saturnia paronia*. All except the first are common. The cocoons of *P. fuliginosa* are easy to find in the spring, spun up in the heather tops. The three last-named are really abundant, especially on the wide stretches of untouched moorland between Newton Dale and the sea. *Arctia caia* is locally common and *Cosmotriche* (*Odonestis*) *potatoria* I have never found myself, though larvæ were once brought to me. *Leucoma salicis* turned up once in a friend's garden. I have other solitary records equally difficult of explanation.

All the *Hepialidae* are here, *H. vellela* in swarms on the moors and hillsides, and in every variety. *Cossus ligniperda* I once took sitting on an ash tree; it is fairly general.

Among the *Drepanulidae*, *D. lacertinaria* occurs at the edge of the moorland above the town and *D. falcataria* in the woods with *Cilia glauca*. Scarborough was at one time noted as a locality for *Dicranura bicuspis*. I have found *D. bijida* and *D. rinula*, but so far not the other. We get several *Notodontidae*, of course chiefly as larvæ, though I have taken *Lophopteryx camelinæ*, *Notodonta dictæoides*, and *N. dromedarius* as imagines. There are certain groups of small aspens and birches here and there on the moors where one can be almost sure of getting larvæ of the commoner *Dicranuridae* and *Notodontidae*, as well as *Acronicta leporina*, *Cymatophora or*, and other things.

Year in, year out, I have sugared a line of oak-trees that crown an ancient entrenchment on the edge of the moors overlooking the town, a spot from which one can (or one could) see all the lights of the two bays, the glitter of the Spa, and far away the twinkling white and red of Flamborough. I have taken close on 90 species of *Noctuae* there, most of them common enough, but now and again there comes a prize among the host of *Triphaena pronuba* and *Xylophasia monoglypha*. The latter occurs in great variety, with a goodly proportion of all-black forms. One year *Agrotis obscura* turned up in some numbers. *Neuria reticulata* can always be counted on, though it is never common. *Agrotis* (*Lycophotia*) *strigula*, abundant at heather bloom, also comes to sugar, contrary to Barrett's experience. We get a large proportion of the genus *Noctua*—*N. castanea* var. *neglecta*, *N. baia*, *N. glareosa* (some lovely forms), *N. triangulum*, *N. c-nigrum*, *N. stigmatica*, *N. brunnea*, *N. dahlia*, *N. festiva*, *N. umbrosa*, *N. plecta*, and *N. xanthographa*. *Dyschorista suspecta* is common at intervals. In 1911 autumn sugaring was very productive. There were literally thousands of *Amathes* (*Anchocelis*) *helvola* (*rufina*) of every shade of colour, and *A. litura* and *Amathes* (*Mellinia*) *circellaris* were just as abundant. *Amathes* (*Orthosia*) *macilenta* and *A. lota*, *Amathes* (*Anchocelis*) *lychnidis* (*pistacina*) and *Omphaloscelis lunosa* (both generally scarce here), the two common *Xanthiae*, *Calymnia trapezina* and *Hadena protea* were all there, and as these species began to go off, *Orrhodia raccinii* and big *Calocampa evoleta* took their place.

Another good sugaring ground is a small patch of sandhills some three miles south of Bridlington, at the point where once stood the village of Auburn. *Tapinostola clyni* is there, to be taken best at its sits, after dark, on its food-plant. I have found there also *Mamestra albicollis*, *Agrotis corticea*, *A. tritici*, *A. nigricans* and *A. ripae*, *Miana bicoloria* and *M. literosa*, *Neuria reticulata* and *Chariclea umbra*, some in very large numbers.

Heather bloom is worth working in August. Recently I have found *Agrotis agathina* not uncommon, and *Calocampa solidaginis* in two or three restricted localities. This is the best way to take *Noctua dahlia* and *N. castanea* var. *neglecta*. Other *Noctuae* worthy of mention are *Epanda luteolata* and *E. lichenea*, the latter on walls and rocks along the coast, *Aplecta prasina* and *A. occulta* (once only), *Polia chi* (abundant and with little variation), *Dasyptilia templi* (rare), *Troscampa pastinum* (on the cliffs, at Sledmere, Pickering and elsewhere), *Viminia menganthidis*, *Hadena glauca* and *H. adusta* (all on the moors), and *Celaena haworthii* (abundant in the "moss" beyond the Falcon Inn on the Whitby Road).

Of the swallow-frequenting *Noctuae*, the best is *Pachnobia leucographa*, which is to be got in Raincliff Woods. In 1902 it was fairly common. *Taenioctampa populeti* one can find as larvae, but I have never been able to work the shallows in its neighbourhood.

I must not forget *Plusia interrogationis*, best obtained in the larval stage. But I recall one evening when, hurrying across the high moors to Ravenscar Station, I found quite a number of the moths at rest on ling and easily boxed. I know of no swifter flier on a bright sunny day.

For the *Geometrae* the best hunting grounds are the dales, and, close to Scarborough, Raincliff Woods. In the early months the

three *Hyberniæ* are common; of *H. marginaria* a large percentage are var. *infuscata*. In April *Lobophora carpinata* is locally abundant on birch trunks and gives some pretty forms. In the early summer months the woods are well worth working for *Asthena blomeri*, *Venusia cambrica*, *Odontoptera bidentata* (with numerous dark forms), *Abraxas sylvata*, three *Emmelesiæ* (*E. affinitata* is very common), *Hypsipetes ruberata* and *H. impluviata*, *Mesolenca (Melanithia) albicillata*, and the like. The two pests are *Xanthorhœ (Melanippæ) montanata* and *Malenydris (Larentia) didymata*. *Campptogramma bilineata* is nowhere common around Scarborough. I have taken it on Seamer Carr, where pretty banded forms occur.

The moors afford certain species in great abundance and variety, such as *Ematurga atomaria*, *Entephria (Larentia) carsiata*, *Hypsipetes furcata (sordidata)*, *Lygria (Cidaria) populata* and *L. testata*. Rarer are *Perconia (Aspilates) strigillaria* (Seamer and Hackness Moors), *Scodiona belgaria* and *Xanthorhœ (Melanippæ) tristata*. The pine woods are good for *Cidaria immanata* besides the ordinary pine feeding species. In August, 1903, I took this species in great numbers and extraordinary variety. Twice *Eucosmia undulata* has fallen to the net in a pine wood above Beedale, one specimen in each of two successive years. But a much stranger record is a single *Biston hirtaria* ♂, ten years ago, in Raincliff Woods, which I have worked very thoroughly without a second occurrence. Another moorland species, generally on the lower slopes, is *Acidalia fumata*. Mid-June to the end of July is the best time for working moors with their pine and larch plantations. One can combine moors, plantations and dales quite easily in a day's excursion, going up, let us say, Beedale to its head, working east or west across the moors, and coming down another dale to the railway, or through Raincliff Woods to Scarborough. In the latter half of July Cayton Bay ought to be visited for *Gnophos obscuraria*, which hides by day in holes and cracks in the boulder clay. *Ortholitha (Eubolia) bipunctaria* flies there at the same time. The cliffs are a good hunting ground, and I think it very likely that some of our lost records will be found there again.

I hope at a later date to deal with the other groups (except the *Tincida*). If any lepidopterist decides to come here, I shall be only too glad to place my knowledge at his disposal and, if he so wish, to act as his guide.

Aberrations of *Argynnis aglaia* and some other Notes from the Minehead District.

By J. F. BIRD.

Last season I had the extreme good fortune to capture two splendid aberrations of *Argynnis aglaia*: (1) a ♂ example of ab. *charlotta* on June 29th, and (2) a magnificent white ♀ on July 4th. I can find nothing exactly like the latter described in the magazines. Of the aberrations of this species mentioned, the nearest approach is the "silvery-white" specimen formerly in the Clark collection, which realised £7 10s. at Stevens' (*vide Ent.*, vol. xlii., p. 319), but judging from the illustration of that insect in South's *Butterflies of the British Isles* (pl. 61, fig. 3), my specimen is, in every respect vastly superior. The ground colour is white, slightly tinged with cream; the hind-

wings the same except for a small area towards the costal margin, which is slightly suffused with pale tawny; the thorax, the cloudings at the base of the wings and along the costa of the forewings are a beautiful greenish-grey, while the spots are intensely black. Altogether it is a grand specimen, and as I regarded it before capture while, with outspread wings, it imbibed the sweets from blackberry-blossom, I must confess I suffered from certain nervous tremors, so afraid was I that I should miss it. To get within striking distance I had to force my way through a deep ditch densely overgrown with brambles, but the capture of so beautiful an insect amply recompensed me for the numerous scratches received.

Satyrus semele.—During the last two seasons I have sought for aberrations of this abundant species. In both sexes the variation of the marbling on the underside is considerable, as is also the extent and brightness of the orange-tawny areas on the upperside. Many, also, have additional "blind" spots on the forewing, between the two apical ocelli. I have also taken one of each sex without any ocellus on the upperside of the hindwings, and also a ♂ with only one, the upper, apical ocellus on the underside of the forewings.

Epinephela tithonus is another butterfly, abundant in this district, which varies a good deal in the number of ocelli present on both the upper- and undersides. I have taken several interesting specimens with from one to three spots on the forewings, and up to as many as four spots on the upperside of the hindwings. These also vary in the size of the spots.

Xanthorhoë montanata.—On June 3rd, 1913, my wife netted a most uncommon and beautiful form of this species. The forewings are pure white and, beyond the central fascia, the basal patch, and a row of minute spots faintly visible on the extreme edge, are perfectly devoid of any further markings or cloudings whatever. The central fascia is wide, greyish, and distinctly and broadly edged on each side with deep black; central spot elongate and conspicuous. Hindwings, also, pure white with a light-grey central band, broadly edged with black, running from the costa almost to the inner margin. Cilia on fore- and hindwings almost immaculate, the chequering only visible on careful examination. So much does the specimen differ from the type that I thought, when I first saw it, that something new had been captured. I ought to mention that it is a ♀.

In 1913, treacling, during September and October, was very productive, although no great variety of species turned up. The four kinds which were easily first in abundance were *Agrotis segetum*, which showed considerable variation, *Peridroma saucia*, also variable, *Aporophylla nigra* and *Phlogophora meticulosa*, the last a perfect pest. Other insects attracted that autumn were *Agrotis ypsilon* (common), *Noctua c-nigrum*, *N. rubi*, *Omphaloscelis lunosa*, *Amathes lota*, *A. macilenta* and *Calocampa exoleta*. In 1914, treacling was practically a failure. *A. segetum*, *A. ypsilon* and *P. saucia* failed to make any appearance whatever, while only two *A. nigra* were seen. Often there would be no lepidopterous visitors at all to the treacled patches, and on the most attractive nights only half-a-dozen moths or so would turn up!

At light we have taken, amongst other things, *Miltochrista miniata*, *Demas coryli*, *Poecilocampa populi*, *Macrothylacia rubi* (♀ s), *Phosia dictaeoides*, *Agrotis puta*, *A. tritici*, *Eurois adusta*, *Luperina (Tholera)*

vespitis ♂ (also a ♀ netted at dusk), *Mamestra albicollis*, *M. dissimilis*, *Miana literosa*, *Pachnobia rubricosa*, *Petitampana arcuosa*, *Stilbia anomala* (also netted at dusk), *Calymnia diffinis*, *Cleora lichenaria*, *Pachygnemina hippocastanaria*, *Anticlea rubidata*, *A. derivata*, *Malenydris multistrigaria*, *Cidaria siderata* (and at ivy-blossom), *Eupithecia venosata*, *E. linariata*, *E. succenturiata*, and *E. sobrinata*.

Of other lepidoptera my father and I have met with in this district during the last two seasons, the following are perhaps the most interesting: *Colias edusa* (occurred sparingly during August, 1913), *Euchloë cardamines* (a fresh-looking ♂ as late as June 29th, 1914), *Celastrina argiolus* (earliest record, April 30th, 1914), *Bithys quercus*, *Callophrys rubi* (May 19th-July 15th, 1914), *Pyramis cardui* (fairly common in 1914), *Dryas paphia*, *A. adippe*, *Mimus tiliae*, *Sesia (Macroglossa) stellatarum*, *Hepialus hectus*, *H. fuscocnebulosa* (reledda), *H. syrinus*, *Nola confusalis*, *Lithosia complana*, *Arctia villica*, *Spilosoma mendica*, *Lymantria monacha*, *Saturnia paronia*, *Habrosyne detersa*, *Thyatira battis*, *Charaxes graninis*, *Calymnia affinis*, *Bryophila glandifera*, *Anarta myrtilli*, *Prothymia viridaria*, *Bomolocha fontis*, *Hygrochroa syringaria*, *Ellopija prosoparia*, *Guophos obscurata*, *Bupalus piniaria*, *Chiasmia clathrata*, *Boarmia abietaria*, *Acidalia trigeminata*, *A. interjectaria* (dilutaria), *A. marginipunctata* (promutata), *A. subsericeata*, *Xanthorhoë galiata*, *Cidaria immanata*, *Lygria prunata*, *L. populata*, *Euphygia picata*, *Thera firmata*, *Ortholitha cerninata*, *O. plumbaria*, *Lobophora rivetata*, *Eupithecia pulchellata*, *E. subfulvata*, *E. nanata*, *E. lariciata*, *E. indigata*, *E. exignata*, *E. tenniata*, and *Chloroclystis coronata*.

I am afraid we have not paid much attention to larvæ, but, amongst others, we have met with the following: *Callophrys rubi*, *Celastrina argiolus*, *Pyramis atalanta*, *Epinephela jurtina*, *Arctia caia*, *A. villica*, *Phragmatobia fuliginosa*, *Lymantria monacha* (elm), *Dasychira pudibunda* (walnut and *Berberis*), *Fumea casta* (from one case, attached to a grass stem, I bred an apterous ♀ parasitic fly in July, 1913), *Malacosoma neustria*, *Macrothylacia rubi* (swarms), *Saturnia paronia* (common on heather), *Aconicta rumicis*, *Peridroma saucia* (pupæ), *Mamestra (Hadena) pisi*, *Mamestra persicariae*, *Dianthoecia capsincola*, *Aprophyla nigra* (heather), *Phlogophora meticulosa* (mentioned because it is such a pest and even takes the place of *M. brassicae* in our cabbages), *Panolis pini-perda*, *Naenia typica*, *Cucullia verbasci* (mullein), *Anarta myrtilli*, *Pseudoterpnia pruinata* (gorse), *Perizoma flavofasciata* (decolorata) abundant in the flowers of white campion), *Lobophora rivetata* (buds of ivy-blossom), *Ortholitha cerninata* (mallow), and *Eupithecia linariata* (toadflax).

The Season of 1914 in South Provence.

By HERBERT L. EARL, F.E.S.

The following account of butterfly-collecting cannot claim to be an exploration, as I have broken no fresh ground, but as the period covers the whole season from the beginning of April almost to the outbreak of the war, it may offer some features of interest for collectors.

My first object was *Erebia epistygne*, and acting on Mr. Wheeler's advice to be early in the field, my wife and I made Aix-en-Provence our base from April 6th to the 25th. Then followed ten days at Avignon, from which centre we worked Pont du Gard. May 4th to

the 14th saw us on the Riviera, and the latter half of the month was passed at Nice. A fortnight at St. Martin Vésubie took us back almost to winter, then came ten days in the milder climate of Annot, and on June 23rd began four weeks at Digne, which brought the season to a close. In 1911, I had worked Digne from May 16th to June 12th, and I was much interested in picking up the season there where I had left it.

With the exception of the fortnight at St. Martin Vésubie, the weather was excellent throughout, bright hot summer from the very first, and at Digne the afternoon thunderstorm, which seems a feature in the day's weather, never interfered with the morning's work. During the whole of the sunny stay at Nice, masses of clouds brooded over the Maritime Alps, and when we trained up to St. Martin we simply went under them and into an English April at its worst, and the change was equally great when we came on to Digne and the July of South France. On the whole the season was decidedly early.

On April 6th we passed streams of *Pieris brassicae* and *P. rapae* along the embankments and cultivated fields, as our train did its twelve miles an hour from Marseilles towards Aix, and on the 7th I began work round Cæsar's Tower in quest of *E. epistygne*. The mistral was blowing strongly, but I managed to put up four fresh specimens; a single *Glaucopsyche melanops*, and two very fresh *Gonepteryx cleopatra* were the only other signs of life on this barren and arid hill. Lower down *Anthocharis belia* and *Pontia daplidice* var. *bellidice*, were beginning to appear, also *Colias edusa*, *Pararge megera* and *P. aegeria*, *Gonepteryx rhamni* and *Euchloë carlavines*. There is a great charm to my mind in early collecting in Provence. There is no bewildering profusion of insects, but everything is fresh and worth looking at, and there is the hourly interest of seeing new species emerge, and the feeling that one is adding five weeks to the English collecting year.

The wind was still too strong for *Erebia epistygne* on the 8th, but *Leptostia sinapis*, *Colias hyale*, and *Papilio podalirius* appeared. The 9th was a calm day at last, and a good series of *E. epistygne* resulted, males and females almost equally divided. The only *Lycænidae* about were *G. melanops* and *Scolitantides baton*, the latter the smallest butterfly I have ever seen, much less than the average size of *Cupido minimus*. On the 11th we tried another hill, the Gallifet estate, for *Anthocharis belia* var. *bellezina*, but nothing appeared except *L. sinapis* and *G. melanops*, the latter not abundant, but spread evenly over the district, all males in fine condition. Lower down I also took *Erynnis altheae* and *E. alceae*, and a very fine dark form of *Rumicia phleas*. Several *Polygonia egea* were seen, settled on walls, but in very bad repair.

Of hibernated species, *Pyrameis cardui* was everywhere in force, and continued so throughout the summer. I had already noticed *Papilio machaon*, *Hesperia malvae*, *Coenonympha pamphilus*, *Polyommatus icarus* (*alericus*), *Celastrina argiolus* and *Callophrys rubi*, or 31 species up to April 11th.

On returning from a useless search over the Gallifet ground on the 13th, I noticed some small whites on the high road, and found them to be *Anthocharis belia* var. *bellezina*, though I could not trace them to any likely breeding ground, but on the next day, passing the open gate of an abandoned oliveyard, I noticed three small butterflies just inside, and arrested them on suspicion. They proved to be var. *bellezina*,

Leptosia duponcheli, and *G. melanops*. It was such a plainly desirable neighbourhood that we spent the whole day there, and indeed several days, patrolling the delightfully neglected terraces in a space of less than two acres. The result of the day was nine var. *bellezina*, five *L. duponcheli*, and several *G. melanops*, *Euchloë euphenoides*, and *Melitaea cinxia*.

April 15th was the best day of the whole month. Twenty-six species were on the wing, including a good number of *A. belia*, *P. daplidice* var. *bellidice*, *P. brassicae*, very large, with *P. rapae* and *P. napi*, *L. sinapis* and *L. duponcheli*, the latter nearly all males, a few *P. podalirius*, and *P. machaon* drying its wings, and when *G. cleopatra* sailed in about ten o'clock, attended by *G. rhawni*, *E. euphenoides* and *E. cardamines*, the effect was a brave show of brightness and colour. *E. epistygne* had now entirely disappeared from Caesar's Tower Hill, but could still be taken, strange to say, in good condition in a deserted stone quarry at the level of the plain. Why are these quarries, with nothing apparently but grass and stone, so often the pick of the district? The following week saw little development, except that *tilauropsyche cyllarus* was relieving *G. melanops*, *L. duponcheli* disappeared, and *Pararge maera* and *Melanargia syllius* were seen.

On the 27th we trained from our new headquarters, Avignon, to Remoulins, and walked on to Pont du Gard, to which I was kindly directed by Mr. Rowland-Brown. It was a fine opportunity for combining the study of ancient masonry and modern Rhopalocera, and a day to be remembered. While crossing the bridge an excited young German called my attention to a shoal of big fish, three or four pounds in weight, and possibly char from the red underneath; he was clearly an angler, and distressed, as I was myself, at seeing such grand fish swimming about with no one to attend to them. Over the bridge we came to a public notice board with three lines, "défense de fuiner," "défense de chasser," and lastly, "défense d'entrer;" taking this as a permit, we entered, but found little within except groups of *C. minimus* and a few *Aricia melon* (*astrarche*). The really productive ground was a sandy waste between the only private house (a staring villa with pompous gates) and the restaurant. Here *Thais medesicaste* was out in splendid form, with almost everything seen at Aix, except *E. epistygne* and var. *bellezina*. Up to the 27th I had taken or noticed forty-two species.

The 28th was spent at Orange, not with the idea of collecting, but of viewing the Roman triumphal arch and amphitheatre, and of course we climbed the hill close to the town where stand the remains of the little fort of William III., destroyed by orders of Louis XIV. This hill was literally fluttering with *A. belia* and *E. euphenoides* and the Pierids, in fact I never saw so many of the first two in one spot. The local goats were evidently not allowed among the flowers of this charming spot.

On the 30th, at Arles, when walking round the Arena, besides three black bulls, fated to be baited (*à mort*) to make a Provençal holiday on the following Sunday, I noticed *P. brassicae* in numbers around the chicory and mallows growing in the joints of the stone work.

After five days interval, May day saw us again at Pont du Gard. Six species had emerged, *Aporia crataegi*, *Lowcia alciphron* var. *gordius*,

Limenitis camilla, *Pontia daplidice*, *A. belia* var. *ausonia*, and last and least, a single specimen of *Hesperia sidae*. I had no idea of seeing *H. sidae*, and merely netted it to welcome the first *Hesperia carthami* of the season. (This is why a beginner who catches everything within his radius of action, takes the prize of the day.) My earliest date for its appearance in 1911 was May 8th. This, of course, took us to the same place next day, when careful search resulted in two more *H. sidae*. *Limenitis camilla* was now very common over a very limited area of ground. Speaking of *L. camilla*, this species accompanied me on the wing for six months, during an extended tour in 1911. It began at Carqueiranne on April 25th, became very common at Plan du Pont till the middle of May, and emerged at Digne in June: on the 18th of that month it began at Martigny, flew during July, and finally on my return from a mountain campaign at Simplon and Saas Fée, a second brood, feeble in size and numbers, was flitting about on the cliff walk near Vernayaz until September 12th.

Arriving at Costebelle, May 4th, the manager met us with the announcement that he was closing the hotel on the 7th, a thing he might have told us before, as half a day was wasted in hunting up new quarters. The hotel season at Hyères seems to be closing earlier than in former years, and we were only able to find accommodation for a week, because an invalid was too ill to be moved, and so kept the hotel open. At Costebelle I had the pleasure of meeting Mr. G. H. Gurney, and we agreed to beat up the quarters of *H. sidae* on the 6th, at the place where I had taken my one specimen three years before. Of course, I fondly imagine this spot is my own corner, but it is probably well known to every resident and visiting collector at Hyères. *H. sidae* kept the appointment, and we each returned with a fair series in mint condition. They were extremely active in flight, and it was hopeless to pursue them on the wing, fortunately they were much given to alighting on a yellow hawk-weed and the white cistus, with wings outspread. The only other skipper was *Thymelicus acteon*. A single worn *Thais polyxena* var. *cassandra* fell to me, and my wife found a splendid variety of the large form of *Brenthis ephrosyne*, fresh from the chrysalis. The spaces between the nervures towards the base of the upper wings are filled in with black, much more so on the right wing than on the left.

On the 7th, following Mr. Gurney's instructions, I took *Epinephele pasiphaë* near the cemetery. The 8th was a typical Rhone Valley day, cloudless, as we trudged along the hot walk to Plan du Pont; then the sun went in, and nothing could be done. On the 10th we found the ridge which divides Plan du Pont from Hyères flying the red flag, and rifle practice in full swing, so we gave *H. sidae* a day off, and found *E. pasiphaë* swarming up the hillside to within a yard of the top; here it ceased abruptly, as it requires a hot southward slope. It was not in evidence flying on the ground, but two or three could be put up out of every prickly shrub as we brushed against them. They were all in perfect form, females nearly as abundant as the males, and a collector of the "destroyer class" could easily have taken three hundred in a day.

At La Valette, on the 12th, I noticed two *H. sidae* in separate localities, one or two *E. pasiphaë* in a stone-quarry, also *Agriades*

adonis, or *bellargus*, or *thetis*, or whatever new flag that harassed insect may be flying.

The 14th was spent in moving on to Nice, and a visit next day to the Vallon Obscur once more revealed a single *H. sidae*. The place struck me as combining all possible objections in a collecting ground; it is too populous, too shut in and damp, and except at the bottom of the gorge, fenced in and unworkable, and lastly, very little to be seen. The Vallon des Fleurs was equally free from flowers and butterflies, and a walk up the stony Montboron resulted in *Melanargia syllius* alone.

On the 19th, braving the clouds which lay low on the horizon over the Maritime Alps, we left a perfect day at Nice, and trained up to La Vésubie for the day. Half-way up we ran under the clouds and a violent thunderstorm burst upon us just as we arrived, and lasted until the arrival of our returning train; half-way down, we cleared the clouds, and found Nice in perfect sunshine, and were told it had been so all day. The "Côte d'Azur" is a real thing. Two days later we again made the attempt and were rewarded by a fine day. A walk of five miles to La Mescla was more remarkable for romantic scenery than for Lepidoptera. The Gorge was narrow, only space enough at the bottom for the torrent, the rail, and our road: the sides, of smooth slaty rock, rose in some places over a thousand feet, sometimes sheer, at others overhanging the road, which tunnelled through it. *Melitaea deione* and *L. alciphron* var. *gordius* were out, and *Polygonia egea* was not uncommon on the rock face. On the 28th we took the mountain tram up to St. Martin Vésubie. This was of course very early for an altitude of 3,000 feet, and the thermometer dropped from 74° at Nice to 45° degrees in the bedroom, but I wished to begin the season over again, and compare types of the Alpes Maritimes with insects taken at Aix and Pont du Gard, also I did not wish to be at Digne until about June 20th, and was well content to mark time in a new country. The weather or climate was Swiss at its worst; bright sun in the early morning, then a gathering cloud on the head of an evil neighbouring peak (Malvoisin it should have been named), that overspread the whole sky and wiped out the whole of every noon and afternoon for collecting, then a clearance, and bright sun from 5 to 7 p.m. More vexatious weather for a collector could not well be imagined. We arrived in sleet, and after two days tried a morning on the Boréon road. Few specimens were about, though there was a fair number of species, a dark and large form of *Rumicia phlaeas*, *Erebia erias*, *Polyommatus semiarctus*, by far the commonest blue, *G. cyllarus*, *C. minimus*, and a number of *Hesperidae* of the *malvae* group, which always remind me of the dictum of that authority who says, "the more elucidation of this genus, the greater the darkness," also a welcome reminder of the Rhone Valley in the shape of *Anthocharis simplonia*. I think the latter, ab. *flavidior*, must have been unusually common in 1913, as I came upon a cleared space in a fir wood where it was abundant, indeed the only white, and almost the only species: it ranged from *flavidior*, with the yellow predominating on the under side, to a form in which the lower wings were almost entirely covered with dark green. June 1st was a fairly good morning above Venanson, for the first time groups of "blues" appeared on the road, *Agriades thetis* (*adonis*), *G. cyllarus*, and *C. minimus*, also *Melitaea aurinia* var. *provincialis*, and

M. deione. I was glad to take five *Erynnis altheae* in a corner of a bank on the way up, large and just out, also *Coenonympha arcania*, the only specimen seen in the district, but it made up for its scarcity by its size, being 42 mm. in expanse. The land is very much enclosed and fenced off, and where open, the goats had utterly destroyed all flowers, and often pulled up the plants by the roots.

From very bad the weather now became daily worse, and on the 12th we travelled down in pouring rain to Annot, where ten days were spent in exploring a most interesting district, though I felt I was leaving just as it was beginning to be productive. We had now dropped 265 metres, leaving the rigorous June of St. Martin, and butterfly life was everywhere more in evidence. On the 13th a very large form of *Polyommatus amanda* appeared, contrary to its custom, on a dry hillside, together with *Lycaena arion* and *Cupido sebrus*. On the 16th I took a small Theclid flying over a stunted sloe bush, and which I identified as *Nordmannia acaciae*; it was very fresh, and had a dark purple sheen in the sunlight. Next day I again took *N. acaciae*, and for several days I found one at the same spot and nowhere else; the district was not more than four yards by two. On the 19th *Brethtis daphne*, *Argynnis aglaia*, and *A. adippe* were flying, and *Nordmannia ilicis* and *Klugia spini*, and a small breed of *Polyommatus escheri* were to be taken on the privet.

While working for *N. acaciae* we were hailed by a farmer, on whose land we were walking, not to order us off, but to insist on our accepting a tin of large strawberries, just picked, with the flavour of the sun upon them. Annot is a pleasant district for collecting and I hope to visit it again.

On the 23rd we travelled down to Digne. Though only 110 metres lower, it was like stepping from spring into the hottest summer. The first afternoon was devoted to a visit to a little gorge leading from the Eaux Chaudes road, which I had seen crowded with *Erebus argiades* and *C. sebrus* on the *Genista* in 1911. Just as we emerged from that alley with the strange device, "Rue de Paradis," *Apatura ilia* was taken, flying along the road, almost the only one I saw. At the entrance to the gorge was a group of privet bushes in blossom, swarming with *K. spini* and *N. ilicis*. I never saw any of the family in such profusion, except *Bithys quercus* in the New Forest in 1888. Next to these in abundance came *Brethtis daphne* and *Melanargia galathea*, with a sprinkling of *ab. leucomelas*. *C. arcania* was abundant and past its best. Among the *K. spini* I took a variety in which the light streak underside is enlarged to a broad band.

On the 25th I worked the flats by the river on the Eaux Chaudes for *Hirsutina admetus*, but the lavender was not yet in full bloom. *Coenonympha dorus* appeared on the 26th on the Les Dourbes road; this insect has a peculiar partiality for hot dry places, without water or vegetation; *Rumiccia phlaeas*, too, was found on sand too hot to touch, it seemed to prefer the Brusquet road, which I consider the one barren region out of Digne. That part of the Dourbes road which I will call the "narrow," was difficult of approach, a steep rock on the left, on the right a farmhouse, and a big mongrel left in charge, who held the road against all comers and flew at us each time we passed, and waited for us till we returned. The French were invariably kind and courteous to us, but their dogs never understood what I said to them, and took me

for a "maudit Teuton." The Satyrids began on the 27th with *Satyrus hermione*, beautifully iridescent and large, quite putting into the shade its humble relative—*S. aleyone* of Martigny and Brigne. The latter always settled upon the bare road like *Hipparchia semele*, giving chance after chance to take it, even alighting upon my clothes, while *S. hermione* never left the wooded gorges, and preferred the tree trunks. Thus far I had only seen three *Papilio alexanor*, and was told that a local innkeeper was exterminating the larvæ in its best district, so it seems in a fair way to be stamped out.

On July 2nd I took a single *Hirsutina admetus* on a half-opened lavender blossom, also *Satyrus circe* and *Lacosopsis roboris*. The heat was now intense, butterflies were flying at 6 a.m., and soon after ten o'clock they nearly all ceased flying, and took shelter under the trees. I noted that in the great heat of September, 1911, at Martigny, they reappeared about four in the afternoon, when the sun had set behind the mountains, and flew on till six. On the Dourbes Road the crop had been gathered from a large cherry tree, leaving single fruit here and there, bursting and rotting in the sun, and whenever we passed, a score or more of *S. circe*, *S. hermione*, and very large *H. semele* would fly out, to return as soon as we had left. The new brood of *P. egea* appeared on the 4th, and on revisiting the *roboris* spot I was fortunate enough to take five, three being females in fine condition, also three *N. acaciae*, which I did not expect, on some dwarf sloes on the same ground. *Parnassius apollo* were very common, I counted eighteen at once, soaring up the slope, and those that I sampled were larger than the specimens from the Rhone Valley. A single *Satyrus actaea* was caught on the 7th. *S. cordula* had been well out for ten days, very fine and large. No *H. admetus* had appeared since the one taken on the 2nd, but on the 5th they emerged on the flat opposite the Eaux Chaudes, and I took nine at rest on lavender on a cloudy afternoon. On the 10th, at Les Dourbes, I turned up some very large *Bithys quercus*, *Epinephele tithonus*, and a female *S. circe*, measuring 87mm., also a fine series of *S. hermione*. Returning, we crossed the valley and came up on to the Eaux Chaudes road, where my wife called me to look at a new butterfly. She does not herself collect, but from experience I never fail to hurry to the spot when any novelty arrests her attention. On the top twig of a high bramble overhanging the road I could see against the sky the unfamiliar outline of the upper-wing of *Libythea celtis*. It was quite inaccessible, but after many attempts I threw some dust over it, and it flew lower down and into my net. It was evidently fresh out that morning. No others were visible, and a long wait at the spot was in vain, but when I passed the place two hours later, there was *L. celtis* on the same twig. I have often noticed this demand and supply habit in butterflies: the loss is not repaired while you wait, but if you pass over the place the next day there is another. "Uno avulso, non deficit alter." One of the greatest moments of pleasure for a collector is to see and take for the first time a species which he has only seen in books or museum collections. I took eight *L. celtis* in all at different dates on the same bramble on the same twig. Then came a violent hailstorm, with the afternoon thunder, which knocked the blossom, already pink, to pieces, and I never saw *L. celtis* again.

The 13th saw the first *Polyommatus melaeager* on the Dourbes road,

and on the 14th *Satyrus nidia* was taken opposite the depressing bathing place of the Eaux Chaudes. A hot tramp to St. Benoît along the right bank of the Bléone resulted in several male *P. melceger*, one *S. nidia*, and my first and last *S. briseis*. The next few days saw nothing fresh to report. I have often noticed that a single specimen appears, as the advanced guard of a species, and not another is seen for a week or more, when the main body come on. I had come to Digne especially to get the Satyrids, and a few other species, and I had taken them all, with *L. celtis*, *L. roboris*, and *N. araciæ* besides. My last note, written on the day of our arrival home, reads curiously in the light of recent events: "20th, Digne to Grenoble; 21st, Grenoble to Paris; 22nd, Paris to London; 23rd, Austrian ultimatum to Servia. Where shall I collect in 1915?"

SCIENTIFIC NOTES AND OBSERVATIONS.

AGRIADES CORIDON AB. ROYSTONENSIS, PICKETT.—In *The Entomologist's Record*, vol. xxvi., p. 275, appears an article by Mr. C. P. Pickett, in which an asymmetrical form of *A. coridon* is described under the varietal name "*roystonensis*." It will probably obviate considerable confusion in the future if Mr. Pickett will more precisely indicate which forms are included under this name. In Mr. Pickett's first paper (*Ent. Rec.*, xxvi., p. 59) he refers to the exhibition of a specimen of *A. coridon* by Mr. Newman at the South London Entomological and Natural History Society, "a ♀ specimen with asymmetrical wings, the smaller pair dusted with blue" (*ibid*, p. 25), and subsequently refers to the capture by himself and others of other specimens. These, he says, have "one side more or less dusted strongly with blue," and as they are "similar" to Mr. Newman's specimen one may assume that all have one pair of wings dusted with blue, and this pair smaller than the other. On page 60 Mr. Pickett says, "I . . . can now total 43 females of this form, and have also seen a lovely asymmetrical male."

There the matter remained until the publication of Dr. Cockayne's masterly examination of these forms in the *Ent. Rec.*, xxvi., 221, in which, before describing specimens in detail, he says, "Last year . . . a considerable number of specimens were taken, which had the wings on one side smaller than the other and a variable amount of blue scaling on the small side. Mr. Pickett recorded 43 examples in his paper in the *Ent. Rec.*, xxvi., p. 59, and doubtless more had been captured. The form has received the name ab. *inequalis*."

In my own notes, p. 272, I also referred to these forms as "ab. *inequalis*, Tutt," as I had previously done in describing Mr. Pickett's exhibit at the London Natural History Society (p. 212). Mr. Pickett corrected me (p. 260) though, as his name was not then published, and the specimens appear to come within Mr. Tutt's description (*Nat. Hist. Brit. Butts.*, iv., 30, I do not think I was in error. In any case, if I sinned, I feel that I sinned in good company.

Mr. Pickett says, in his recent paper, that Tutt "surely meant the usual form where the blue was either streaked or splashed on one side more than the other." This may be so, as no specimen similar to any of the "*roystonensis*" is mentioned by Tutt, and one is therefore almost

justified in assuming that no such specimens had come to his notice. His description, however, in addition to repeating the description from his *British Butterflies* (1896, p. 167), quoted by Mr. Pickett, says, "Irregularity in the blue *scaling* is a not uncommon feature, specimens with one or even all, the wings irregularly and asymmetrically marked with blue scales, are frequently observed," which is surely wide enough to cover the present form, even if that form was not present to the writer's mind.

However this may be, Dr. Cockayne has clearly proved these Royston specimens to be distinct from what we formerly knew as *inequalis*, in *structure*, apart altogether from *marking*, and this may or may not justify Mr. Pickett's action in applying a varietal name. This depends upon whether a form which differs from the normal in possessing sexual characters of the other sex, is properly called an "aberration," and is a question I do not feel competent to discuss. Tutt admits (*Nat. Hist. of the Brit. Butts.*, iv., 13) a suspicion that his *inequalis* are gynandromorphic in some degree, though it does not appear that he ever investigated them microscopically.

I do not wish to use the columns of the *Ent. Rec.* for the purpose of criticising the work of a fellow-worker (the paper would be more appreciated by the general entomological public if others exercised the same discretion), but I should like Mr. Pickett to give us a detailed description of ab. *roystonensis*, and particularly to say if the name includes:—

(a) The male specimen referred to in the *Ent. Rec.*, xxvi., p. 60.

(b) Specimens with the blue scaling on the *larger* side. (One was recently exhibited by Dr. Cockayne at a meeting of the London Natural History Society.)

(c) The small *symmetrical* specimen with blue scaling on all four wings (*Ent. Rec.*, xxvi., p. 275).

(d) The asymmetrical forms with *no* blue scaling. (*Ibid.*)

(e) The specimens I recorded (*ibid.*, p. 272) in which there are "blue sprinkled" areas, though the wings are symmetrical as far as size is concerned.

If Mr. Pickett will clear up these points the specialist of the future will at any rate know what he has to deal with, and not have to guess at the meaning of the name. At present one is referred from one paper to another, but arrives at no conclusion.—HAROLD B. WILLIAMS, 82, Filey Avenue, Stoke Newington, N.

NOTES ON COLLECTING, Etc.

THAUMATOPEA PROCESSIONEA, L. (PROCESSIONARY MOTH).—On our arrival at Pallanza, Lago Maggiore, February 11th, 1914, we came across a band of Processionary caterpillars, evidently going out, or returning from, feeding. They formed a line the shape of a right-angle across the path in the garden of Hotel Castagnola (south aspect). It was then about 2.30 p.m.—sunny, but cold, and snow lay in patches in the shade.

The next morning, which was damp and showery, we again saw a few—possibly the end of another "procession." At the moment it was fine, although it rained shortly afterwards.

The vegetation in the garden itself was distinctly tropical—but, as

far as one can remember, there was a clump of large trees, possibly oaks (*Quercus*), at the entrance.

I see Kirby gives May and June as the regular months when *T. processionea* feeds (*Butterflies and Moths of Europe*), so conclude February must be very early for it. He also gives night as its feeding-time—but the hour, on this date, was about 2.30 p.m.

It may possibly have been the next species described *Thaummatopoea pityocampa*, W.V. (p. 143), but the description of the larvæ agrees rather with the former than with the latter species.

“*Thaummatopoea (Cnethocampa) processionea*, L.—Larvæ is bluish-black on back, and whitish on sides, with two small reddish-yellow or grey warts on each segment.”

“*Thaummatopoea pityocampa*, W.V.—Larva is bluish-black above, with a brownish-yellow transverse projection on each segment, and whitish beneath.” (Cf. p. 142, *Butterflies and Moths of Europe*, W. F. Kirby.)—LILIAN M. FISON, Southcote, Guildford.

HIBERNATION IN A CHURCH.—One Sunday during the morning-service in October last (1914), my father, Mr. J. H. Fison, observed an *Aglais (Vanessa) urticae* on a north window in St. Mary's Church, Guildford. This morning—Sunday, February 21st—I observed one on a south window of the same Church, which by the way dates back to the Conquest, and conclude from this that it was the same insect which had spent the winter there.

The sun was shining brightly, and the window caught the full force of a warmer mid-day sun than we have had for weeks, probably bringing the butterfly out. It seemed a very robust insect and fluttered energetically to escape into the sunshine outside, evidently not understanding why a window-pane should be transparent and yet the barrier that it unfortunately so effectively proved.—ID.

HIBERNATION OF *VESPA VULGARIS* ♀.—A “Queen Wasp” was found by my mother, hibernating behind a picture-frame, a few days before Christmas. She states it seemed attached to the wall by some sort of thread, after the manner of some pupæ. I do not suppose there is anything unusual in this fact—but as a locality for hibernation it is at least interesting.—ID.

RECORDS OF COLEOPTERA FOR SOUTH WALES DISTRICT.—During April, 1914, I was staying at St. David's, Pembrokeshire, at the extremity of West Wales. The country lies wide open. There are great stretches of rough moorland, large tracts of marsh, and a highly indented cliff line, with a small area of sand-burrows in one of the larger bays. The district is, I think, certainly a fine hunting ground for the collecting of beetles. The most productive localities discovered by me were a big stretch of marshland known as Dowrog Moss, a similar but smaller area round Trefeithan Pool, and the boggy bed of the river Alan, known as Merry Vale. The following notes of species taken in this little known district may be of interest.

CARABIDÆ.—*Carabus arvensis* occurred on the moorland, but was scarce: *Blithisa multipunctata* occurred on Dowrog Moss and at Trefeithan; *Chlaenius nigricornis*, *Stomis pumicatus*, *Pterostichus vernalis* and *P. minor*, all on Dowrog Moss. *Anchomenus viduus* was abundant at Dowrog and Trefeithan; *A. picus* far less numerous; *Amara anthobia* was common on the burrows along with *A. lucida*: *Amara*

acuminata, *Bembidium assimile*, *Dromius nigrirentis*: *Anisodactylus binotatus* occurred on the cliff line.

DYTISCIDÆ.—*Agabus paludosus* was common and far more numerous than *A. nebulosus*; *Hydroporus flavipes* abundant at Trefeithan; *H. nigrita* common; *H. umbrosus*, *H. lituratus*, *Coelambus confluentis*, *Ithantus grapii*.

HYDROPHILIDÆ.—Among the *Hydrophilidae* were taken *Philhydrus coarctatus*, *Ochthebius bicolor* and a single *Paracymus nigroaeneus*. Within the last two years I have found this last species in three widely separated localities in S. Wales.

STAPHYLINIDÆ.—*Philonthus splendens*, *P. nigrita*, *P. agilis*, *P. micans*, *Quedius fulgidus*, *Q. maurorufus*, *Q. scintillans*, *Staphylinus caesareus*, *Leistrotrophus murinus*, *Lathrobium quadratum* and *L. terminatum*. *Stenus pallitarsis* and *S. picipennis*, were abundant in Merry Vale.

RHYNCOPHORA.—*Apion marchicum*, *A. subulatum* and *A. hydro-lapathi*, *Rhynchites minutus*, *Strophosomus faber*, *Otiorhynchus atroapterus*, *Alophus triguttatus* was common in one meadow, and several specimens of *Sitones cambrius* were taken on St. David's Common.

OTHER GROUPS.—*Silpha opaca*, *Carcinops minima*, *Suboccinella 24-punctata*, *Chrysomela banksi*, *Phyllotreta nigripes* and *P. atra*, *Mantura rustica*, *Crepidodera centralis*, *Phaedon armoraciae*, *Cassida flavicola*: *Meloe proscarabeus* was very common on the cliffs.

It may be of interest to add that last August I found a specimen of *Criocephalus fesus* at Camberley.—J. W. ALLEN, 266, Willesden Lane, N.W.

CURRENT NOTES AND SHORT NOTICES.

His numerous English friends will be interested to hear that A. N. Avinov has been serving with the Red Cross in Poland, and has been through some exciting experiences in Lodz and elsewhere. He was in that town during the early part of the winter, when it was entirely surrounded by the enemy; he narrowly escaped being killed by a bomb dropped from a Taube, while he was admiring its graceful evolutions over the very prominent Red Cross flag that was intended to protect the hospital. For a long time the town was entirely cut off and the small garrison saw the enemy gradually closing in on them from every side; A. N. Avinov witnessed the terrific fighting when the Germans attacked in mass, in entire confidence of victory, only to be defeated and driven back with appalling slaughter by the splendid Russian troops, after five hours desperate battle. Shortly after that the town was relieved, and the twenty-five thousand wounded safely removed to a more secure shelter.

On another occasion he was in a Red Cross train without an engine, when the enemy began firing upon them; the doctors and nurses were obliged to get out on to the line, put their shoulders to the coach, and actually push it down the line; by these means they succeeded after tremendous efforts in getting their train full of wounded out of range of the enemy's guns.

A. N. Avinov is now back in Petrograd, where he has recently read two very interesting papers, one on the subdivision of the Palæarctic Region, based solely upon the Rhopalocera, the other upon the

zoogeographical relations of Tibet. In the former he brings the Mediterranean Province right through the plains of Turkestan to the foothills of the great mountains of Central Asia, and includes only Morocco and Algeria, and Tunis in the African portion of the Region; the Turkestan Province he confines to the north western portion of the great mountain system. Tibet is a well-defined province itself, with highly characteristic physical and faunistic features. The manuscript of one important paper, with a number of illustrations, was on its way to England, through the post, when the war broke out, and the precious parcel has disappeared in Germany. the unfortunate author is now engaged in re-writing the paper, which includes the results of his adventurous journey from India through the Himalayas and Kashgar into Russian Turkestan.—M.B.

Russian Entomologists are doing well by their country. A prominent young Economic Entomologist, L. L. Kumberg, has fallen on the field of honour.

Colonel A. N. Kaznakov, the genial and distinguished Director of the Caucasus Museum, Tiflis, commanded a regiment of Caucasian Cossacks in the autumn, and received three bullet wounds; fortunately he is recovering, and is now anxious to return to the front. V. M. Isaev, a well known Embryologist, who was an officer in the Reserves, has been called to one of the Siberian Infantry regiments.

V. V. Barovsky, the Coleopterist has a staff appointment, and D. N. Borodin, also a Coleopterist, has a commission in an Ural Cossack Regiment, and has received two decorations for distinguished conduct in the field.

A. I. Kiritchenko, Lepidopterist, is serving in the Medical Corps. A. V. Martynov, the well-known Trichopterist, author of many important works on that group, is a Reserve Officer in the Artillery. D. A. Smirnov, Entomologist at the Imperial Demesne at Margab (Transcaspia), is an officer in the Turkestan Army, now serving in the Caucasus. J. P. Bazilevsky, a young Coleopterist, has recently returned from the front.—M.B.

Dr. Burr writes from Petrograd: "I attended a meeting of the Russian Entomological Society the other day, and had a very warm welcome. A few days previously I attended a very interesting meeting of the Biogeographical Commission of the Imperial Geographical Society, and was elected a member. This makes me a Corresponding Member of the Geographical Society. Our Hon. F.E.S., A. P. Semenov-Tian-Shansky, is President."

The Spring Meeting of the South-Eastern Union of Scientific Societies will be held on Saturday, April 24th, when a visit will be made to the Zoological Gardens, Regents Park. We will remind our readers that the Insect House in the gardens is a sight not to be missed in the summer, and no doubt at the present time there are plenty of insects well worth viewing. Tickets including admission, tea, guide-book, etc., can be obtained by all members of affiliated societies at 2/6 each, from the Hon. Excursion Secretary, H. Norman Gray, 331, Commercial Road, London, E.

Mr. W. Bowater, F.E.S., of Birmingham, is a Lieutenant in the R.A.M.C., and has just gone to the front. During his training in camp he spent some of his spare time at night in writing up some entomological notes, which we shall publish later on.

On Thursday, April 22nd, the South London Entomological and Natural History Society will hold its usual spring exhibition devoted to objects of all orders other than Lepidoptera. Friends and visitors are cordially invited to bring exhibits. This somewhat recent innovation has, on the two previous occasions on which it has been held, been a marked success, and must be a gratification to the Hon. Curator, Mr. W. West of Greenwich, at whose suggestion it was first held. The exhibition will be held at the Society's Rooms, Hibernia Chambers, adjoining London Bridge, South, and will commence at eight o'clock.

We are preparing a Bibliography of books and articles in magazines in which the sexual apparatus of the Lepidoptera are discussed, figured, or form an integral part of the subject dealt with, and should be pleased to have our attention called to anything published previous to the classical contributions of Buchanan White and P. H. Gosse, in 1876 and 1882 respectively.

Parts iii. and iv. of the *Transactions of the Entomological Society of London* for 1914, issued in February, 1915, contain the following papers:—(1) A Reprint of Panzer's "Jurinean Genera of Hymenoptera with a translation, introduction and bibliographical and critical notes," by the Rev. F. D. Morice and J. Hartley Durrant. A most important paper from a priority point of view. (2) "New species of *Lepidoptera-Heterocera* from S.-E. Brazil," by E. Dukinfield Jones. (3) "Notes on the Life-history of *Papilio demolion*," by Margaret E. Fountaine, with a coloured plate. (4) "Some remarks on the Coccid genus *Leucaspis*, with descriptions of two new species," by E. Ernest Green, with two plates. (5) "Contributions to the Life-history of *Polyommatus eros*," with sixteen plates (two coloured), by Dr. T. A. Chapman. (6) "A contribution to the Life-history of *Plebeius sephyrus* var. *lycidas*," with six plates (one coloured), by Dr. T. A. Chapman. (7) "A Revision of the genus *Odynerus* (*Hymenoptera*) occurring in the Ethiopian Region," with one plate, by Geoffrey Meade-Waldo. (8) "On Hawaiian *Ophiuinae* (*Ichneumonidae*)," by R. C. L. Perkins. (9) "Descriptions of two new genera and new species of *Mymaridae* from Tasmania," with a plate, by Messrs. Chas. O. Waterhouse and F. Enock. (10) Forty-eight pages of the Proceedings of the meetings.

The Société lépidoptérologique de Genève is one of the most virile of the smaller societies of the Continent. The annual *Bulletin* issued by the Society is more than a return for the small subscription paid by the members. The matter contained in its pages is of the highest order, and to say that the plates, at least four in each issue, are the work of M. Culot, is to say that they are as nearly perfection as is possible. A notice recently to hand says that the Officers and Council for the ensuing year are as follows:—*President*, M. J. Jullien; *Vice-president*, Dr. J. L. Reverdin; *Treasurer*, M. H. Gallay; *Secretaries*, M.M. M. Reboussin and J. Mongenet; *Council*, M.M. J. Culot, Ch. Blachier, and Dr. A. Pictet. Members pay a subscription of 12 francs, while those who live outside the canton (foreign members) pay only 8 francs. We can strongly urge our readers to belong to this society, the address of the Treasurer is Pinchat, Geneva, Switzerland.

We wish to again remind our readers that Mr. F. N. Pierce and the Rev. C. W. Metcalfe are working hard at the genitalia of the British Tortrices, and would be glad of any material which can be spared. A single preparation of a species is quite insufficient, as with the small

species so much verification is needed. Another great difficulty has cropped up, and that is the numbers of specimens of these "smaller fry" which have been *mingled* with a body from somewhere. Such specimens of course are worse than useless. Already three new British species have been described through the labours of these two enthusiastic workers, and a letter lying before us refers to others. All honour to those whose earnest endeavour is to add to the sum total of human knowledge, and although we sometimes may seem to criticise what is achieved, we cannot but admire the steady and sound advance which has been made.

We have received the announcement that the long promised Monograph of British Ants will shortly be published. All who know the patiently careful work of the author, our colleague Mr. Horace Donisthorpe, will be assured that the volume will be most reliable in all its details. For many years past Mr. Donisthorpe has been collecting a mass of material, partly from his own detailed observation and partly from facts imparted to him by means of his close correspondence with all the foremost workers, students, and authorities of the world, so that every verification of facts attainable has been made. There will be accounts of all British species, including the original descriptions, full literature references, synonymy, life-histories, world distribution, and references to closely allied species which may possibly occur in Britain. Slavery, colony-founding, and the general economy of ant-life will be dealt with at length from the author's long personal observation and experiments, and compared with the opinions and observations of continental and American authorities. The book will comprise some 350 pages, 8vo., and will be illustrated by over a hundred illustrations. We would urge all who are the least bit interested in these marvellously human little insects to send in their names to the subscription list, since such a work necessitates considerable expenditure, and cannot be published at the present time without the assurance to the author of adequate support.

It was with much regret that we saw the disappearance of the City of London Entomological Society, as such, and its absorption into the much larger North London Natural History Society, to form the London Natural History Society, with a very extended range of study, even embracing archaeology. For twenty-three years the old Society had issued its Transactions, and although always small in compass they contained records of the meetings showing steady, earnest work and study, and in addition at least one very valuable paper each year, which was generally worth more than the small circulation which the volume must have had. The last part of the Transactions issued, that for the years 1912-13, has been lying on the table for some time, and is in no whit behind that of its predecessors. It contains seven plates illustrative of a paper by Dr. Chapman, "Some Lycenid Notes, with a discussion of the Segmentation of the abdomen in Lepidoptera." Mr. L. B. Prout contributed a very valuable paper entitled, "Notes on *Thera variata*, Schiff., and *L. obeliscata*, Hb." Dr. E. A. Cockayne, who is in the chair of the new combined society for the present year, contributed a paper, "Notes on *Bupalus piniarius*, L." Mr. H. B. Williams has an article entitled, "Notes on *Cocconympha pamphilus*." Mr. Chas. Nicholson and Mr. P. H. Tautz respectively contribute, "*Plusia moneta*, Treit., in Britain," and "Notes on the Lepidoptera of

the Pinner District." In addition there are the Reports of the various meetings which took place during the two years, and among the matters reported, which were of greater interest, were an exhibition and discussion of *Lumicia phlavas*, a discussion of the Mendelian Inheritance of Wing-markings, the variation in *Vanessa io*, Oporabias and Hybrids, Discussion on the genus *Zonosoma*, and the Annual Addresses by the President, Mr. A. W. Mera, which contain a summary of Lepidopterology for the respective years. The volume can be obtained from the Secretary of the new society, Hall 20, Salisbury House, Finsbury Circus, London, E.C.

Mr. J. Bondroit, the Belgian coleopterist, who was wounded at Ramscapele, is now invalided from the army through kidney trouble caused, as he quaintly puts it, "by taking too many baths in the Yser with all my clothes on." He is now in Paris, and is engaged in drawing insects, and would possibly be glad to hear from correspondents.

The *Journal of Entomology and Zoology* formerly the *Pomona Journal of Entomology*, of Claremont, California, becomes increasingly interesting with each quarterly part. It is always fully illustrated with diagrams, drawings and photographs. In the December number we find (1) An account of the Pseudoscorpions of the Claremont-Laguna Region. (2) Some points in the Nervous System of a large Deep Water Crab. (3) The Starfish of Laguna Beach. (4) An account of the Summer School at Laguna Beach, where much investigation in all orders is carried on by the students, with several photographs of the neighbourhood. (5) Much other matter relating to marine life.

Will the Third Entomological Congress be held in Vienna this year? We read in the November number of the *Ent. News*, a long note from the *General Secretary*, Dr. F. Maidl and the *President*, Prof. A. Handlirsch, giving full details as to tickets and general arrangements as to meetings, exhibitions and excursions. In the last arrangements there is proposed a visit to the Adriatic coast.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*December 2nd.*—Prof. Laneere, of Brussels, was elected to the Honorary Fellowship vacant by the resignation (and subsequent death) of Dr. August Weismann. Prof. Poulton read a letter showing the circumstances under which Dr. Weismann had been persuaded to sign the declaration of the German Professors. The President announced that he had nominated the following Fellows to act as auditors: *On the Council*: Messrs. S. Edwards, G. Meade-Waldo, and H. Rowland-Brown. *Not on the Council*: Messrs. R. W. Lloyd, Hy. J. Turner, and C. O. Waterhouse. COLORATION OF DESERT HYMENOPTERA.—The Rev. F. D. Morice exhibited a few Hymenoptera of various groups from Egypt, Algeria, etc., showing the silvery pubescence and pale colours frequently characteristic of desert insects. Also a lantern slide showing the seventh ventral segment in *Proscopia communis* ♂. DARK ABERRATION OF ARGYNNIS NIOBE.—Mr. H. J. Turner exhibited a striking aberration of an *Argynnis niobe* with symmetrically coalescent dark markings on the upperside and the silvery spots on the underside hindwing forming a triple basal blotch and marginal streaks. PREY OF AN AFRICAN ASILID.—Mr. S. A. Neave exhibited a large series of

insects, 1326 in all, forming the prey of a common Asilid *Promachus fasciatus*. A SCARCE BRITISH NEUROPTERON.—Mr. W. J. Lucas exhibited a specimen of *Drepanopteryx phalaenoides*, Linn. (*Nat. Ord. Neuroptera*), taken about the end of July, 1914, by Mr. E. A. C. Stowell, B.A., at Bexhill. A MOVEABLE MICROSCOPIC STAGE.—Dr. H. Eltringham exhibited a little machine of his own invention consisting of a mechanical stage specially adapted for the microscopical examination of pinned insects, and so contrived as to admit of the insect on its pin being turned completely round on both a vertical and horizontal axis, without its departing from the centre of the field or the focal plane. AN AUSTRALIAN LYCENID LARVA RESEMBLING THE FLOWER OF THE "WATTLE," ON WHICH IT FEEDS.—Prof. Poulton exhibited the flowers of an *Acacia*, probably *A. baileyana*, F. v. Muell., together with a female Lycenid, *Nacaluba biocellata*, Feld., and the pupa case from which it had emerged. The likeness, mainly due to the long yellow hairs with which the larva was clothed, was increased by its attitude, the body being rather strongly curved. DR. G. D. H. CARPENTER'S OBSERVATION OF THE EPIGAMIC USE OF ITS ANAL BRUSHES BY THE MALE AMAURIS PSYTTALEA, PLÖTZ. Prof. Poulton read a note on this subject, from a letter written to him, July 23rd, 1914, from Kome Island in the N.W. of the Victoria Nyanza. DR. G. D. H. CARPENTER'S OBSERVATIONS ON DORYLUS NIGRICANS, ILLIG., IN DAMEA AND BUGALLA ISLANDS.—Prof. Poulton read a record of observations from the same letter as that quoted in the preceding note on *A. cydalea*, giving Dr. Carpenter's further conclusions as to the habits of the driver ants of these islands in the N.W. of the Victoria Nyanza. The following paper was read:—"Further Observations on the Structure of the Scent-organs in certain Brush-bearing Male Butterflies," by H. Eltringham, M.A., D.Sc., F.E.S.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —December 10th.—NEW MEMBERS.—Mr. W. Schmassmann, F.E.S., was elected a member. PAPER.—Mr. W. J. Lucas read a paper "The British Long-horned Grasshoppers" and showed a large number of lantern slides in illustration. EXOTIC LONG-HORNED GRASSHOPPERS.—Mr. H. Moore, a drawer of *Decticinae*, long-horned grasshoppers, containing *Decticus albifrons*, *D. intermedius*, *D. tessellatus*, *D. verrucivorus*, etc. Mr. Step, a long-horned grasshopper, *Heterodes petersi*, female, from S. Africa, both sexes were said to be apterous. Mr. A. E. Gibbs referred to the two large British sawflies, *Sirex gigas* and *S. noctilia*, and exhibited their large parasite *Rhyssia persuasoria* from the neighbourhood of Berkhamstead. He also read notes on the species referred to. CORRECTION.—In the report for November 12th last, *Pyramis atalanta* should be *Pyramis cardui*.

January 11th, 1915.—TERATOLOGICAL EXAMPLES.—Dr. Chapman exhibited an *Anthrocerus cecilians* with six wings, an *A. anthyllidis* with three tarsi on the left mesothoracic leg, and an *A. achilleae* with symmetrical wing notches. PUPAL HABITATIONS.—Dr. Chapman also showed exotic lattice-work cocoons, probably Syntomid or Lithosiid, and pupal burrows of *Scardia boloti*, showing the trap-door closing the cocoon proper. Mr. Moore, cases of *Psychidae* from the Island of Rhodes, cases of *Oeceticus kirbyi* from Antigua, etc. Mr. R. Adkin, various cocoons of British species of Lepidoptera. PAPER.—Mr. Adkin then read a paper entitled "Some Pupal Habitations." A FIELD-

MEETING NEARLY 300 YEARS AGO.—Mr. Sich, read an extract from the "Flora of Middlesex," Trimen and Dyer, 1869, giving an account of a natural history field meeting which took place in 1629 to Hampstead Heath.

January 28th, 1915.—ANNUAL MEETING.—The Balance Sheet and the Report of the Council were read and adopted. The President read his address dealing with the position and work of the Society during the past year, and with general entomology during the same period. The usual votes of thanks were passed. ELECTIONS.—The Officers and Council for the session 1915-16, were then elected. ORDINARY MEETING.—EXAMPLES OF VARIATION IN BRITISH LEPIDOPTERA.—Mr. Buckstone exhibited a bred series of *Bupalus piniaria* showing much variation; aberrations of *Hippocrita jacobaeae*, smoky, streaked with pink, and entirely smoky hindwings; and *Spilosoma menthastris*, which on emergence had a pink flush which was evanescent. A FOOD PEST.—Mr. Edwards, living specimens of *Ephesia kühniella* with pupæ and cocoons. ABERRATIONS OF A. GROSSULARIATA.—Mr. G. T. Porritt, a fine series of ab. *nigrocostata* and ab. *nigrosparsata* of *Abraças grossulariata*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—November 16th.—NEW MEMBER.—Dr. W. J. Fordham, The Villa, Bubwith, near Selby. REPORTS OF FIELD OBSERVATIONS.—The subject for the evening entitled "The most interesting Field Observations made during the last Season" gave rise to a discussion which was entered into by most of the members present. THE GENUS *Bembidium* (Coleoptera) and made descriptive remarks upon the occurrence and peculiarities of each species, particularly mentioning the following, viz.—*Bembidium 5-striatum*, *B. fumigatum*, *B. schuppeli*, *B. nigricorne*, *B. stomoides*, *B. lunatum*, *B. testaceum*, *B. anglicanum*, *B. fluriatile*, *B. prasinum*, *B. adustum* and *B. argenteolum*. VARIETIES OF BRITISH LEPIDOPTERA. Mr. A. W. Hughes exhibited a yellow variety of *Euchelia jacobaeae*, a series of *Epinephele jurtina* (*janira*) including an example with strongly pupillate spots on the upperside of the hindwings, also a specimen of *Agriopis aprilina* taken at sugar on the Crosby sand-hills. MICRO-LEPIDOPTERA.—Mr. W. Mansbridge, the following micro-lepidoptera, viz.—*Tortrix pronubana*, bred from larvæ found in the palm house in one of the Birmingham parks by Mr. W. Bowater; the caterpillars were doing great damage to the acacias in the house. *Peronea variegana* with vars. *albana* and *cirrana* bred from Wavertree larvæ; *Micobia schulziana*, a series from Delamere Forest where it was plentiful though not previously on record for the locality; *Paedisca solandriana*, selected varieties from Huddersfield and Hebden Bridge, W. Yorks.; *Ephippiphora trigeminana* from the sand-hills at Crosby, very small specimens; and a fine series of *Eupoecilia dubitana*, light and dark forms from the same locality.

December 21st.—ANNUAL MEETING.—NEW MEMBERS.—Messrs. Vincent Fogarty, 56, Bolton Road, Ewood, Blackburn; and Wm. Buckley, 59, Roseneath Road, Urmston, nr. Manchester. THE ELECTION OF OFFICERS.—The usual business of an annual meeting was transacted and the following members were elected as officers and council for the ensuing year, viz.:—*President*: Prof. R. Newstead, M.A., F.R.S. *Vice-Presidents*: R. Wilding; J. Cotton, M.R.C.S., etc.; J. R. le B. Tomlin, M.A., F.E.S.; H. R. Sweeting, M.A. *Hon. Treasurer*: J. Cotton.

Librarian: F. N. Pierce. *Hon. Secretary*: Wm. Mansbridge, F.E.S. *Council*: L. West; P. F. Tinne, M.A.; S. P. Doudney; Wm. Webster; R. S. Bagnall, F.L.S., F.E.S.; Chas. Frederick Burne; J. W. Ellis, M.B., Ch.B., F.E.S.; Arnold W. Hughes; J. Collins. *ANNUAL ADDRESS*.—The retiring president, Mr. R. Wilding, read his address, in which he reviewed the entomological events of the past year in an able and interesting manner. *SPECIES OF TORTRICES NEW TO BRITAIN*.—Mr. F. N. Pierce exhibited and described the hitherto unrecognised species of *Tortricidae* as follows, *viz.*:—*Cnephasia genitalana*, found in various collections mixed with other species of the genus. Hab. Essex and Kent. *Pocillochroma pomedaviana*, an apple feeder, until now considered to be a variety of *P. profundana*. Hab. Devon and Herefordshire. *Lipoptycha acratana*, for some time represented only by a single specimen in his collection, but lately found in Threlfall's series of *Dichrorampha tanacetii*. These have all been distinguished through examination of the genitalia and full descriptions are published in the *Ent. Mo. Mag.* for January 1915. *BRITISH LEPIDOPTERA*.—Mr. W. A. Tyerman showed a fine series of *Sphinx ligustri*, most of which had laid over until the second year before emerging; a fine and long series of *Xanthorhoe (Melanippe) galiata* from Ainsdale; the ova were deposited in September by a very late female; also from Ainsdale, *Acrionicta leporina*, *Cucullia chamomillae*, and *Chariclea umbra*. *AN INDIAN CICADA*.—Mr. Wm. Webster, a large species of Cicada from India.

THE NORTH LONDON NATURAL HISTORY SOCIETY.—*December 1st, 1914*. *GYNANDROMORPHS EXHIBITED*.—Mr. A. W. Mera, a mixed gynandromorph of *Saturnia carpini*, right side predominantly ♂, but with large ♀ patches, antennæ intermediate, and a regularly halved gynandromorph of *Boarmia repandata*, left side ♀, right ♂. Mr. V. E. Shaw, an *Amorpha populi*, bred June 10th, 1909, left side ♂, right ♀, antennæ, genitalia, and wing markings, the line of division along the centre of the body being clearly defined. Dr. E. A. Cockayne, *Polygonmatus icarus*, a symmetrical gynandromorph with upperside predominantly ♂, underside predominantly ♀, another of the same species predominantly ♀, but with streaks of ♂ colour on right forewing and both hindwings. Androconia were numerous on the male areas and the genitalia externally purely ♂; four gynandromorphous *A. populi* all showing mixture of ♂ and ♀ parts in their external genitalia, three were predominantly ♀ in their internal organs, having ovaries but no testes, the other was predominantly ♂; a *Smerinthus* *hyb. hybridus* ♂; two gynandromorphs of *Anthrocera hippocrepidis* (doubtful); a heterochroic gynandromorph of *Hemerophila abruptaria*, right side ♂ ab. *fuscata*, left side ♀ typical; a heterochroic gynandromorph of *Abraeus sylvata (ulmata)*, right side ♂ ab. *pantarioides* (?), left side ♀ typical; 37 gynandromorphous *Agriades coridon* with one side smaller than the other, and having blue scales and androconia on the smaller side, one with blue scales and androconia on both sides, two with streaks of ♂ colour; also drawings of dissections of gynandromorphous lepidoptera of various species. Mr. H. B. Williams, a regularly halved gynandromorph of *Fidonia piniaria*, left side, ♀, right ♂, a ♀ *Ematurga atomaria* with wing coloration of the ♂, a ♀ *Euchloë cardamines* with a splash of ♂ colour on underside of left forewing, a regularly halved gynandromorph of *Amorpha populi*, left side ♀, right ♂, a mixed gynandro-

morph of the same species, left wings and antennæ ♀, right antennæ and (apparently) wings intermediate, body apparently ♂, also specimens of *Agriades coridon* ab. *inaequalis*, Tutt, and ab. *roystonensis*, Pickett. Dr. Cockayne delivered an instructive and interesting address on "Gynandromorphism." CIDADIA SPECIES FROM SCOTLAND.—Mr. L. B. Prout, series of *Cidaria truncata* and *C. immanata* from a Scotch locality, showing considerable variation.

December 15th, 1914.—Mr. L. B. Prout, a short series of *Melanthia bicolorata* bred from Forbes ova, showing an interesting modification of the *plumbata* form of variation, the forewing being largely infuscated, but with parts, in particular a broad subterminal line, remaining white, while the hindwing showed infuscation in the terminal region only. The following officers were elected for the session 1915:—*President*: Dr. E. A. Cockayne, M.A., M.D., F.E.S. *Vice Presidents*: Mr. A. Bacot; Rev. C. R. N. Burrows; Dr. T. A. Chapman; Messrs. M. Greenwood; F. J. Hanbury; A. W. Mera; L. B. Prout; and R. W. Robbins. *Trustees*: Messrs. A. W. Mera; C. S. Nicholson; and L. B. Prout. *Librarians*: Messrs. W. E. Glegg, and A. E. Mera. *Curators*: Messrs. S. Austin; C. S. Nicholson; A. J. Willsden. *President of Research Section*: Mr. E. B. Bishop. *Treasurer*: Mr. F. G. Dill. *Secretaries*: Messrs. J. Ross, and H. B. Williams. *Council*: Messrs. F. B. Cross; L. B. Hall; L. W. Newman; H. E. Stevenson; and H. Worsley Wood.

O B I T U A R Y .

Major Henry H. Lyman, M.A., R.C.I., F.R.G.S., F.E.S., etc.

By the appalling disaster that befell the steamship "Empress of Ireland" in the River St. Lawrence, last May, Canada lost one of her leading entomologists.

Born in 1854, he in very early life developed a taste for entomology, and in 1875 joined the Montreal Branch of the Entomological Society of Ontario, and always took the liveliest interest, not only in the success of the branch, but also in the parent society, which a couple of years ago celebrated its fiftieth anniversary.

His splendid collection, with his library, has been bequeathed to the McGill University, with a sufficient endowment fund to cover expenses in maintaining it, and it is to be accessible to all students of entomology.

In his mercantile life he was a most busy man, but had always time to give any information willingly to any entomologist, this, with his genial disposition, endeared him to all who had the privilege of working with him.

His military career ended in 1885, when he retired from the Royal Scots of Canada with the rank of Major.

He was a strong Imperialist, and was one of the deputation which waited on Lord Salisbury in 1886 begging for an Imperial Conference for the whole of the British Empire. This conference was called and held the next year. He also strongly advocated Imperial preferential trade within the Empire, and that Canada should bear her share for Imperial defence.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidæ*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).

Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
Lepidoptera round about Scarborough, <i>A. S. Tetley, M.A., F.E.S.</i>	73
Aberrations of <i>Argynnis aglaia</i> and some other Notes from the Minehead District, <i>J. F. Bird</i>	76
The Season of 1914 in South Provence, <i>Herbert S. Earl, F.E.S.</i>	78
SCIENTIFIC NOTES AND OBSERVATIONS :— <i>Agriades coridon</i> ab. <i>roystonensis</i> , <i>Pickett, Harold B. Williams</i>	85
NOTES ON COLLECTING :— <i>Thaumatopæa processionea</i> , <i>Lilian M. Fison</i> ; Hibernation in a church, <i>Id.</i> ; Hibernation of <i>Vespa vulgaris</i> , <i>Id.</i> ; Records of Coleoptera for S. Wales district, <i>J. W. Allen</i>	86
CURRENT NOTES AND SHORT NOTICES	88
SOCIETIES	92
OBITUARY :— <i>Henry H. Lyman</i>	96

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Dr. Cockayne, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, G. T. Bethune-Baker, H. E. Page, A. J. Fison, J. A. Simes, C. P. Pickett, W. G. Sheldon, P. H. Muschamp, Dr. Reverdin, Dr. Burr, A. Tetley, Parkinson Curtis, H. B. Williams, W. Bowater, F. N. Pierce, H. L. Earl, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The Entomologist, vols. 20-30, 1887-1897 (11 years) £3 10s. 0d.
 " " vols. 39-46, 1906-1913 (7 years) " " "
 Entomologist's Record, &c., vols. 1-25. Price, £5 0s. 0d.
 Practical Hints for the Field Lepidopterist, Tutt, 2 vols. 7s. 6d.
 Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
 British Moths, Tutt, 2s. Moths of Brit. Isles (South), Vol. 2. 5s.
 British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
 Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
 Lepidopterist's Calender, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the WIDOW of the late J. ALDERSON. Apply :—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TATCHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
 :: IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

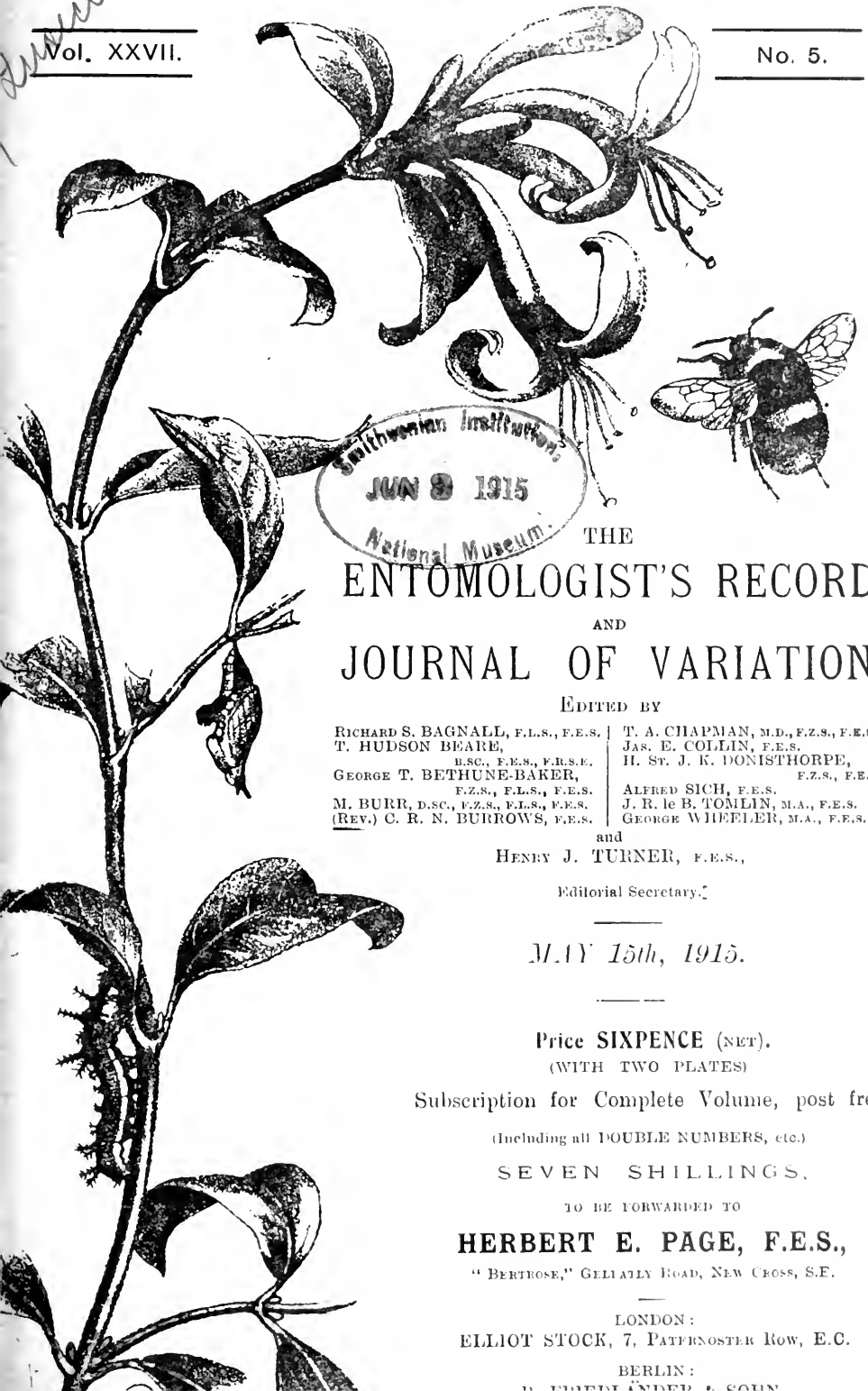
Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.

Subscriptions for Vol. XXVII. are now overdue.

Vol. XXVII.

No. 5.



Smithsonian Institution
JUN 8 1915
National Museum

THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
T. HUDSON BEARE,
B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER,
F.Z.S., F.L.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.
H. ST. J. K. DONISTHORPE,
F.Z.S., F.E.S.
ALFRED SICH, F.E.S.
J. R. le B. TOMLIN, M.A., F.E.S.
GEORGE WHEELER, M.A., F.E.S.

and
HENRY J. TURNER, F.E.S.,

Editorial Secretary.

MAY 15th, 1915.

Price SIXPENCE (NET).
(WITH TWO PLATES)

Subscription for Complete Volume, post free
(including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,
"BERTHOSE," GELIATLY ROAD, NEW CROSS, S.E.

LONDON:
ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:
D. ERDMANN & SOHN

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera."—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radeliff Grote, M.A.* "Varieties and aberrations of Noctuæ from Doncaster."—*H. H. Corbett, M.R.C.S.* "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S.*, *F.E.S.* "*Eudryas stæ-johannis*."—*A. Radeliff Grote, M.A.* "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.* "Larvæ."—*Rev. G. M. A. Hewitt, M.A.* "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.* "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.* "Pupa hunting in October."—*J. W. Tutt, F.E.S.* "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Ridding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.* "The Lepidoptera of Swansea."—*Major R. B. Robertson.* "*Caradrina ambigua* in the Isle of Wight."—*A. J. Hodges.* "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.* "*Orrhoidea erythrocephala ab. glabra* from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Ridding, F.E.S.* "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.* "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella*" (with plate).—*W. P. Blackburne Macc, F.E.S.* "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.* "Collecting Noctuide by Lake Erie."—*A. Radeliff Grote, M.A.* "Coleoptera at Ipswich."—*Claude Morley, F.E.S.* "Notes on *Bombus visurgie*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.* "The Lepidoptera of Grèsy-sur-Aix."—*J. W. Tutt, F.E.S.* "*Apatura iris*."—*Rev. G. M. A. Hewitt* "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*I. A. Chapman, M.D., F.E.S.* "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.* "The Genus *Smerinthus*."—*A. Bacot.* "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.* "Wing structure."—*J. Aiston Moffatt.* "On the development of sex in social insects."—*J. W. Tutt, F.E.S.* "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.* "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.* "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.* "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.* "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.* "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.* "Varieties of *Argynnis selene*" (with plate).—*S. G. C. Russell, F.E.S.* "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.* "*Zygæna minos* and its varieties."—*J. W. Tutt, F.E.S.* "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.* Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7/6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets
 etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

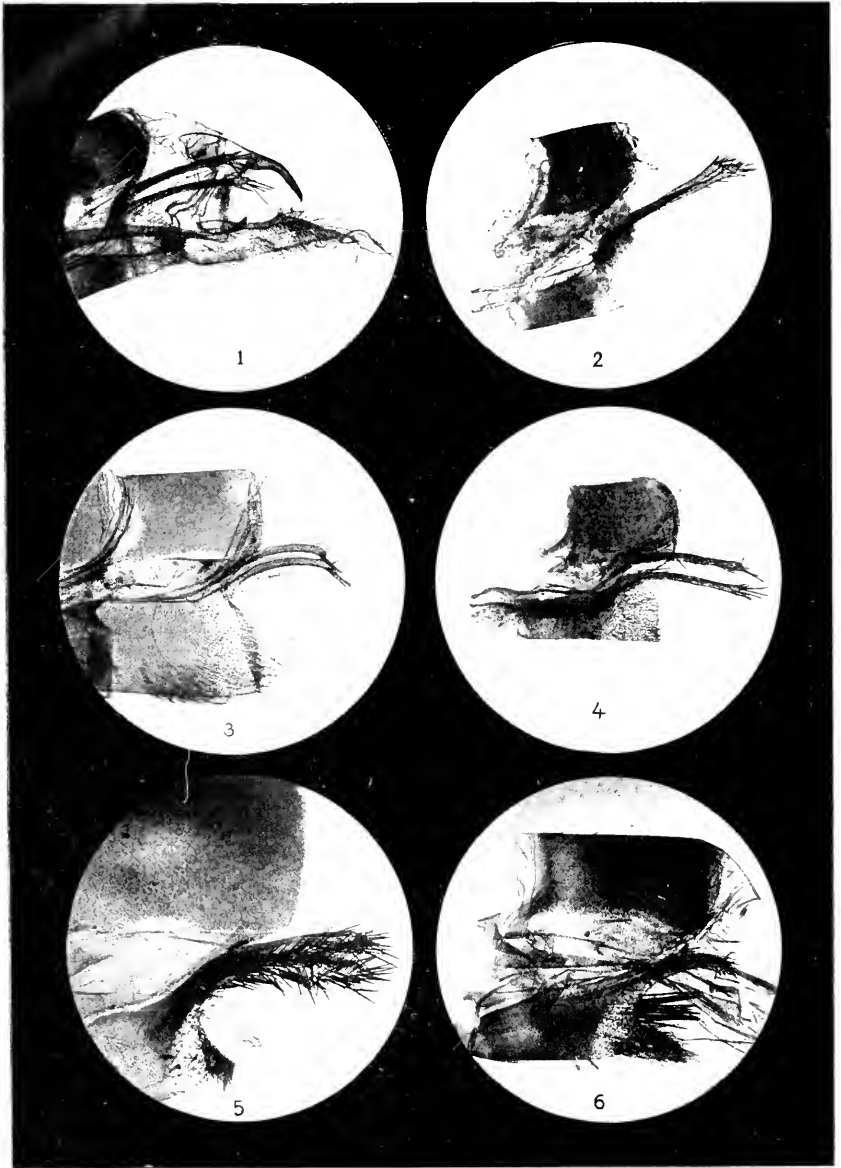
By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
 TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.



AGERONIA SPS. AN UNKNOWN ORGAN.

Photo. J. L. Reverdin.

A hitherto unknown organ in the Ancillary Appendages of the Lepidoptera (*Ageronia* sps.). (*With plate.*)

By DR. J. L. REVERDIN (Geneva).

(Translated by P. H. Muschamp, F.E.S.)

Among some mounts that M. Fruhstorfer had begged me to make to facilitate his studies, was one of the ♂ genitalia of an *Ageronia*, and I was surprised to find in this butterfly an organ unknown to me. M. Fruhstorfer has since then kindly handed me the abdomens of 26 species of this genus, and in all I have found the same organ; it belongs exclusively to the ♂.

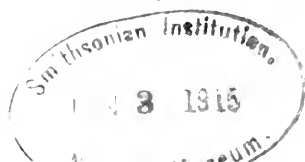
Here is a description of this organ: It is placed in the last section of the abdomen and is formed of a chitinous rod of varying length and springs from the upper-posterior angle of the 8th abdominal sternite. The form and curve of this rigid rod would appear to be constant; it bears at its extremity thick pointed chitinous spiculæ, varying in different species, and all along the rest of it fine hairs and a certain number of spiculæ, which in certain species are more abundant than in others. The rods are very long in certain species, shorter in others; they are rectilineal or slightly curved, generally strongly concave at foot, their extremity is often clubbed, sometimes imperceptibly; the upper border of the sternite seems to be thickened; it is both extended with the wand to its source and prolonged on its proximal side to a point considerably beyond the sternite (figs. 2 and 4).

When the genitalia are completely sheathed by the abdomen, the extremity of the rods extends beyond that of the abdomen, and in dry specimens these rods are easily broken off or deprived of their spiculæ; among the abdomens, which I received from M. Fruhstorfer, such accidents had been rather frequent.

Each species of the genus *Ageronia* possesses these organs and of a form peculiar to the species. The accompanying figures show the different types of rods, and it will be seen that the diagnosis of a species might be established by an examination of the rods alone. I must confess that I possess only one specimen each of many species, but those of which I have several specimens (four specimens apiece of five species, and two of several others), the form of the rods may be said to be constant, any slight difference in the mounts being due to a difference in their orientation. As I just observed, the spiculæ are liable to be broken off, but it is always easy to ascertain their true number by counting the little circles in the surface of the rods, for these are the points of insertion of the detached spiculæ. The examples of which I have had photographs made are naturally those which seemed to me to be most nearly intact. The spiculæ are generally densest at the extremity of the rods, but in certain species, e.g., *A. saurites* (fig. 5), they are dense throughout the whole length. The spiculæ terminate in pin points (figs. 5 and 6) or in lance-heads (figs. 1, 2, 3, and 4); and in some of the other species, the distal border of the sternite, below the spot where the rod is inserted, is furnished more or less abundantly with long, heavy spiculæ.

This peculiar *Ageronia* organ has not escaped observation; Godman

MAY 15TH, 1915.



and Salvin mention it but give no details other than* "There are two rods attached to the upper edge of the ventral portion of the terminal segment of the abdomen."

To sum up: This organ is peculiar to the ♂ and displays distinct characteristics in all the different species I have examined.

My colleague M. Jullien discovered an organ in certain *Satyridae*. This organ, called by Fruhstorfer "Jullienische Organ," is composed of thick, chitinous, very darkly coloured rods with dentated or pointed extremities; these rods are inserted in the last abdominal tergite (not the sternite); they are found in *Satyrus alcyone*, *S. hermione*, *S. syriaca*, and *S. semele*, and in *Epinephele jurtina*, in which latter there is one instead of three or more rods on either side; but this one rod is really formed by the soldering together of several into one multidentated rod. In *S. hermione* and *S. alcyone* the insertion is made in a sort of wing detached from the lateral parts of the tergite, whereas in *E. jurtina* it is made on the slight prolongation of the somewhat flattened exterior angle of this sternite.

The analogy is evident if not close; it is true that the points of insertion and the dimensions of the rods are very different in *Satyrus* and in *Ageronia*. There is, however, analogy enough to cause us to suspect that their functions are similar.

Dampf thinks that Jullien's organs are scent organs, but Jullien himself believes them to be of a tactile order, and the latter hypothesis seems more in keeping with their constitution; it is hard to see how these thick rods can disperse a volatile substance.

A third solution of the problem suggests itself to me. I have read a remark by Fritz Müller incorporated in Dr. G. B. Longstaff's work.† "Just as the *Ageronia*, four species of which I had an opportunity of observing in some numbers during the past summer, only make the remarkable crackling sound on the wing and during the courtship, so also, in all probability, butterflies equipped with brands, tufts, etc., only distribute their scent under the same circumstances." May we not deduce that this crackling sound is caused by the friction of the spiculæ against other parts of the genitalia, and that the Jullien organ has the same function, the action being modified by their situation; it would seem almost as though the motionless organ of *Ageronia* were rubbed by the mobile valves, whereas the mobile spiculæ of the Jullien organ in *Satyrus* rub against the valves or uncus; the way in which the Jullien organ is inserted leads us to suppose that it can be moved at will. I submit my hypothesis to the numerous and clever English observers, and to the Swiss field-workers; they will perhaps tell me if *E. jurtina* and *S. alcyone* perform on the castanets as *Ageronia* does in order to charm its lady mate.

EXPLANATION OF PLATE II.

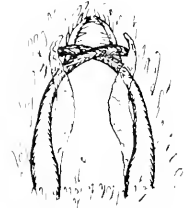
- Fig. 1. *Ageronia februa*, ♂, genitalia and Godman-and-Salvin organ.
 Fig. 2. *Ageronia arete*, ♂, 8th abdominal segment.
 Fig. 3. *Ageronia obidana*, ♂, 7th and 8th abdominal segments.
 Fig. 4. *Ageronia fritillo*, ♂, 8th abdominal segment.
 Fig. 5. *Ageronia saurites*, ♂, 8th abdominal segment.
 Fig. 6. *Ageronia sellasia*, ♂, 8th abdominal segment.

* "Biologia Centrali-Americana." *Insecta Lepidoptera Rhopalocera*, by F. D. Godman and D. Salvin. Vol. i., p. 268.

† *Butterfly-hunting in many Lands*. George B. Longstaff. p. 616.



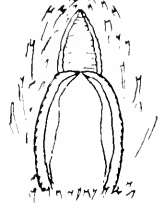
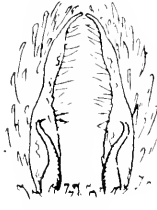
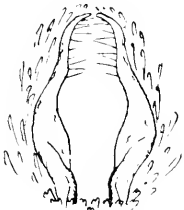
Ictericana: Chrysanthearia Communana. Pascuana.



Octomaculana.

Virgaureana.

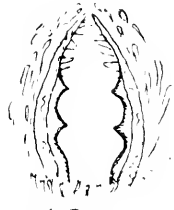
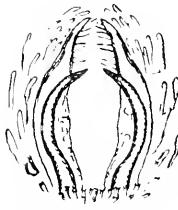
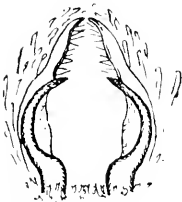
Genitalana



Conspersana.

Subjectana.

Sinuana.



Persiana.

Colquhounana

Nubilana.

DIAGNOSTIC DETAILS IN THE GENITALIA OF THE GENUS *CNEPHASIA*.
Del. J. W. Metcalfe.

An easy method of identifying the species of the genus *Cnephasia* = *Sciaphila* (Tortricidæ). (*With plate.*)

By F. N. PIERCE, F.E.S., and the Rev. J. W. METCALFE, F.E.S.

The *Sciaphilas*, as they are generally termed, have long presented such insurmountable difficulties to collectors that they have practically given up the genus in despair, and have placed such specimens as they have received from correspondents in their cabinets under the name sent rather than attempt to settle their identity for themselves. That this state of affairs is general is evident from the mixed series forwarded for examination from many collections. Here the study of the genitalia steps in, and separating the specimens with indisputable accuracy removes the problem from the sphere of individual opinion.

Entomologists, when in future setting their captures, would do well to open the valve as far as possible whilst the insects are still on the boards, and thus make subsequent examination a simple matter.

In order first of all to discover how many British species the group contained it was necessary to make microscopical mounts of many named specimens and unnamed varieties. This having been done it was not a very difficult matter to determine to which species each form belonged. Having thus obtained reliable examples of all the British species, the question as to whether a simpler and less destructive method could not be devised for determining the species by means of the genitalia, since collectors not unnaturally object to the breaking up of each specimen, in order to discover to what species it belongs. With this end in view a thorough examination was made of dried but unmounted examples of all the species, using the already mounted examples as a guide. The method of working is as follows:—

Run a knife across a piece of flat cork, and then pencil the slit so that it may be readily found. Next, by pushing the head of the pin (holding the point by the forceps) into the slit, the insect is held securely with the ventral surface of the abdomen in position for examination under the microscope. Having brought the genitalia into focus and arranged a bull's eye condenser so as to illuminate brilliantly the part, remove by means of a small sable brush (W. and N., No. 00) sufficient scales to expose the junction of the valve. At first it will probably be found necessary to lay bare both valves, but when the eye gets accustomed to the appearance the merest touch is sufficient to determine the species. With the aid of the drawings, herewith given, of the genitalia as thus seen with the scales removed, no one should have the smallest difficulty in naming his male captures. Once having located the males, but little further trouble should be experienced in mating the females.

The different species are subject to great variation in wing markings, but perhaps the most difficult to determine superficially are those which tend towards albinism, the markings almost entirely disappearing, and we are left with a chalky white specimen and nothing to guide us as to its species except the shape of the wing, which is so variable as to be absolutely useless. The examination of the genitalia, however, at once determines the question.

Before describing the distinguishing features of the genitalia in each case, attention must be drawn to certain difficulties in the nomenclature.

Following Meyrick's *Tortricidae*, published by Wytzman, which I have found of the utmost value in nomenclature, we read, p. 44.

Genus *Cnephasia*, Curtis.

- CNEPHASIA, Curt., 1826, type *pascuana*, Hüb.
 ABLABIA, Hüb., 1816, type *osseana*, Scopoli.
 NEPHODESME, Hüb., 1816, type *penziana*, Thunb.
 SCIAPHILA, Treit., 1829, type *wahlbomiana*, L.
 ARGYROPTERA, Dup., 1834, type *argentana*, Clerk.

The whole group falls naturally in accordance with the genitalia into two sections:—

- (a) The CNEPHASIA (Curt., 1826) group type *pascuana*.
 (b) The NEPHODESME (Hüb., 1816) group type *penziana*.

In this division (a) would contain of the British species *Cnephasia octomaculana*, *C. conspersana*, *C. chrysantheana*, *C. pascuana*, *C. virgaureana*, *C. genitalana*, *C. subjectana*, and *Sphaleroptera ictericana*. (b) would contain *Nepholesme penziana*, *N. colquhouniana*, *N. sinuana*, *N. nubilana*, with *Ablabia osseana*, *Argyroptera argentana*, and *Tortricodes hyemana*.

The generic name SCIAPHILA, Treit., 1829, of which *wahlbomiana* is the type, must fall, not only on the ground of priority, but also because the type *wahlbomiana* does not, as we shall presently show, represent any particular species.

What then is *wahlbomiana*? As early as 1873, in the *Entomologist's Annual*, p. 50, O. Hofmann quotes Heinemann's opinion that *incertana* (*subjectana*) *wahlbomiana*, *communiana*, *alticolana*, *minorana*, and *virgaureana*, are simply varieties of the Linnean *wahlbomiana*. "The *wahlbomiana* group as it can scarcely be rightly described as composed of one species." Heinemann. Vol. ii., p. 58. *Ent. Ann.*, p. 68.

Hofmann, *Entomologist's Annual*, 1873, p. 53, writes:—" *Wahlbomiana*, *communiana*, *alticolana*, *virgaureana*, *derivana*, and *paraliana*, seem all to be only different forms of a single species, which shows an extraordinary tendency to vary even in the larval state, as will be pointed out further on."

Mr. Meyrick (*in litt.* 18 : 12 : 24) writes:—" *Wahlbomiana*. In my opinion this name is not applicable to any species, having probably been originally a confused jumble of several. But its use on the continent is certainly for the species we call (in my opinion correctly) *virgaureana*, though not infrequently authors still mix up other species with it. I think you may neglect it."

Kennel, *Zoologia Palæarktischen Tortriciden*, Stuttgart, 1908, figures the genitalia of *wahlbomiana*. The figure is, however, not good enough to decide whether it represents *chrysantheana*, *pascuana*, *octomaculana*, or *communiana*, but there is sufficient detail to say that it is certainly not *virgaureana*. Kennel includes under CNEPHASIA, *wahlbomiana*, *alticolana*, *virgaureana*, *derivana* = *paraliana*, *chrysantheana*, Dup. = *chrysantheana*, H.-S. = *assinana*, Hw. (Wood, fig. 1,000) = *alternana*, Wilk., *pasivana* (rect. *pascuana*), Hb. = *pasivana*, H.-S. = *obsoletana*, Stpb. (Wood, fig. 1,003), *logiana* (Wood, fig. 1,002) = *interjectana* (Wood, fig. 1,001).

This list includes all given by Heinemann except *incertana* and its var. *minorana*, which he evidently rejects because of the retractile

ovipositor of the female, and *communana*, which Kennel and Hofmann evidently consider a good species.

Mr. A. Thurnall, in a letter to Mr. Mansbridge, 26 : 1 : 15, writes:— "*Wahlbomiana* I never could make out. It appears to me that this name has been used (in this country at all events) as a sort of entomological scrap-heap on which to pitch all dubious specimens of this difficult genus!! The late Mr. Ragonot told me once (*in litt.*) that the species was a good one and not unlike *subjectana*."

Bankes, *Ent. Mo. Mag.*, 1906, p. 84, writes of "the various forms included by Rebel under the all embracing term *wahlbomiana*."

From the above it is evident that *wahlbomiana* is a hotch-potch, a group of species to which any dubious specimen can be relegated. It must be left to those versed in the law of priority to state a case as to what should be done with the name!

Another difficult point is: What is *abrasana*? It has not been possible to obtain specimens for examination, and the only definite particulars to hand are contained in an article by Prof. O. Hofmann, *Entomologist's Annual*, 1873, p. 50, where he describes the female as possessing a long ovipositor. As this long ovipositor only occurs among our British species in *subjectana*, it follows that *abrasana* could only be confounded with this last named species. Mr. Meyrick writes, "my specimens (British) are only ♀. I see no reason why they should not be unicolorous females of *pascuana*, and this is probable. Kennel does not figure the male genitalia, and therefore probably had also only females, though he does not explicitly say so."

Mr. Thurnall writes, "With regard to *abrasana* I never saw but two, and these seemed to me simply small melanic specimens of *chrysantheana* such as I have bred (with the type) and captured."

Barrett, *Lep. Brit. Isles*, vol. x., p. 271, places it next to *subjectana* and describes it, "Forewings short and broad, uniform dark olive grey." His figure is a unicolorous olive-brown. He says, "A very rare species in this country, and one of which next to nothing is known."

All other collectors appealed to report that they do not possess specimens, and the probable conclusion is that in Britain no such species exists.

In conclusion, a few remarks on the distinguishing features on the genitalia as figured may be of use.

In section (a), the CNEPHASIA group, the important feature to note is the position of the blackish extremity of the sacculus. In this group the four species, *chrysantheana*, *octomaculana*, *communana*, and *pascuana*, are the only ones which will present any difficulty.

In *chrysantheana* the extremity of the sacculus is seen on the edge of the margin of the valva, *well towards the tip*. If it appears *towards the centre*, the specimen must be either *communana*, *pascuana*, or *octomaculana*.

In *communana* the edge of the sacculus is very straight, the point turning sharply inwards at the middle. The long narrow wings are a useful guide, and if in addition it be known that the insect was captured at the end of May or in early June, this fact provides further confirmation.

In *pascuana* the margin of the sacculus is more curved and the extremity emerges at the middle, with rather more of its length free from the valva.

In *octomaculana* the point appears slightly beyond the middle, but not so near the tip as in *chrysantheana*. This species possesses, in addition to the albino form, var. *albo-octomaculana*, a slatey-grey form, which might be confused with *chrysantheana*, but if the position of the end of the sacculus be kept in mind no difficulty should be experienced. It should also be noted that there is a northern form of *conspersana*, which bears a striking resemblance to *octomaculana*, but of course the resemblance does not extend to the genitalia.

Virgaureana presents but little difficulty, the small point of the sacculus at the extreme end of the squared valva determining it at once. When the points are very long and cross each other, the collector recognises the new species *genitalana*.

In *conspersana* and *subjectana* the point of the sacculus is not as a rule visible, but there is not much chance of confusing these two species with each other.

In *ictericana*, which might well be confused with the albino forms of other species, the point of the sacculus is large, black, and very low down towards the base of the valva.

In section (b), the NERPHODESMÆ group, no difficulty will be found in separating by the wing markings *argentana*, *osseana*, and *hyemana*.

In *penziana* the sacculus is slightly more robust and rather more curved than in *colquhounana*, but the difference is very small.

In *sinuana*, which is really the only species over which trouble may arise, the long transparent amber coloured sacculus at once separates the male, and the flattened appearance of the floricornus ovipositor the female, from the species in section (a).

In *nubilana* the twice angled margin of the sacculus is at once decisive.

It will thus be seen that any two species liable to be mixed up in the wing markings can be separated readily by the genitalia, whereas in those species where the genitalia in unmounted examples appear to run rather close, the wing parts lend assistance to their determination.

[If any difficulty is experienced Mr. Pierce will be pleased to examine and report on any series of specimens that may be submitted to him at "The Elms, Dingle, Liverpool."—H.J.T.]

A Contribution to the Life-history of *Pyrgus proto*.

By. W. G. SHELDON, F.E.S.

On May 15th, last year, I found the larvæ of a Hesperid commonly on a species of *Phlomis*, since identified as *P. herba-renti*, at Novorossisk, and later in the month the same larvæ were locally abundant at Sarepta, on this plant.

At the time I presumed they were either *Hesperia cribrellum*, or *H. tessellum*, both of which species are known to feed upon *Phlomis*, but, as they did not pupate until after these were on the wing, I could only conclude that they would produce some other species.

The larvæ attained their full growth at the end of May, and then formed a chamber in which to pupate, either by spinning together the edges of a leaf of their food-plant, or by forming with silk a pocket in the gauze of the sleeve in which they were kept. In this chamber they remained unchanged for a period of several weeks, for the majority of them had certainly not pupated on my return to England on July 5th.

The first imago, which proved to be *Pyrgus proto*, appeared on July 13th, and individuals kept on emerging at intervals until September 12th.

So little is known of the earlier stages of many European butterflies that I am not aware if it is usual for the larvæ of Hesperids to remain after attaining their full size a considerable period without pupating, but it seems difficult to assign a reason for this habit in a species that attains the perfect state in the middle of the summer.

The time of emergence of *P. proto* seems to be much later in South-East Russia than it is in Spain, and the state of the vegetation does not apparently account for this. At Algeciras, in 1908, I took a specimen in April, and at Albarracin, the altitude of which is about 4,000 feet, the species flies at the end of June and throughout July. It must be borne in mind that Novorossisk is at the sea level, and Sarepta is below it, and at both of these places the vegetation would be far more advanced when *P. proto* emerges than is the case when it is out in its Spanish localities.

I should mention that there can be no doubt as to the identity of my Russian specimens, Mr. Rayward having made preparations of the genitalia of both these and Spanish examples, and finding them identical. *Phlomis herba-venti* is a Spanish as well as a Russian plant.

The following is a rough description made of the larva in the last instar, with the aid of a lens.

Length when stretched out 22mm. ; the head is black and hirsute ; the second segment glabrous and flesh-coloured with darker brown markings ; the colour of the remainder of the segments appears grey, in consequence of the whole area being thickly covered with white tubercles, which almost hide the dark ground colour. Many of these tubercles had a white spine. Down the centre of the dorsal area runs a thin indistinct black line, caused by the white tubercles being less in number along its length. In the subdorsal area there is a small orange tubercle on each segment. The spiracular region is lighter than the subdorsal ; the spiracles are orange coloured outlined with black, and are not conspicuous ; above them, but in the spiracular region, is a row of not conspicuous dark markings ; the prolegs are amber coloured.

The larva spins together the edges of a leaf of its food-plant, and lives in the chamber so formed during the day, feeding at night.

Notes on the Swiss Rhopalocera. V.

By the late A. J. FISON.

(Communicated by Miss L. M. FISON.)

Extracts from letters to, and kindly lent by, the Rev. George Wheeler.

1904.

1. SION AND MONTANA.

“ Grand Hotel, Sion, May 17th, 1904.

“ I have now been here four weeks. On Saturday I got my first *Brenthis euphrosyne* and the two first *Anthocharis simplouia* I have seen (high up). Have seen no *Pontia daplidice* yet, which surprises me. Yesterday, going up to Montana from Grange, I got lots of *Melitaea aurelia*, above Olon hamlet (say 600 feet above the valley). *Glaucopsyche cyllarus* was in crowds as everywhere. All the ♀ s were of the black or dark brown kind,* and some were very large. *Cupido sebrus* abounds, but altogether I have not found much yet this season . . . I may

try Fusio and then Davos again, towards the end of June I hope to be in the Val Bregaglia part of July at least."

[* Is this dark ♀ an intermediate form, approaching ab. *lugens*, Caradja. "Almost without eye-spots, hindwing upperside ♂ darker in tint, ♀ very dark." Wheeler, *Butterflies of Switzerland*.—L. M. Fison.]

2. SION.

"Grand Hotel, Sion, May 20th, 1904.

"To-day I went down to your place for *Melitaea aurelia* and found a good many there. They often seem very dark. I got four ♀s, and two of them had *lighter* rows of spots. I was most surprised to find four beautiful, and undoubted, *Polyommatus amandus* at the same spot, by the thin alder wood, about 40 yards south of the *char* road. I hunted about for more, but saw none. At a further wood I got three *Melitaea dictynna*, and two or three *Melitaea aurelia*. This afternoon I got two more *aurelia*, about one mile east of Sion, by the high road after crossing the rickety planks of the aqueduct bridge. Nearer south, just below Tourbillon on the north, I was surprised to find a ♀ *Parnassius mnemosyne* in a meadow. Near by, on a dry hill, I took about six *Melitaea didyma*, and twenty-one on Tuesday afternoon (*e.g.*, May 18th) in the same place. I saw also two *Melitaea phoebe* there.

"This is a capital district for *Euchloë cardamines* ab. *citronia*, and I should think a better place than Charpigny."

3. *Loweia (Chrysophanus) amphidamas*, Esp.

"Grand Hotel, Bex, May 30th, 1904.

"I had to go to Caux this morning, so went on to the spot for *Loweia (Chrysophanus) amphidamas*, which I reached about 9.45. I caught one at once. Then *down* by path below last chalet but one on right, to the Torrent, where there were *lots* (I caught about twenty) *till the sun came out more clearly at 11.30*, when they all disappeared! At 12 p.m. I prepared to go, when more *light clouds brought them out*, and at 12.30 I departed with a catch of 26. A few were washed and some chipped."

[This detail may go to disprove the suggestion in my note on this species *Ent. Record*, vol. xxvii., p. 65), that *amphidamas* (together with other "coppers"), is more dependent on sun than some other species for its existence. I am afraid, as each time (three visits—one on May 31st, and two in early June) we did not reach its haunt before 11 a.m., it was a case of the "late bird losing the worm!" and *absence of sun*, rather than the opposite, which brought the butterflies out, at any rate as regards *L. amphidamas*, if not other Chrysophanids.—L.M.F.]

4. FAIDO.

"Hotel Angelo, Faido, June 11th, 1904.

"You will, I think, be interested to know that this morning, when the sun came out for an hour, I at once caught a fine *Brenthis thore*, on the cool, south side of the torrent, below Faido. Almost my next capture, on the same open bit of grass, was a fine *Coenonympha arcania* var. *insubrica*, but I saw no more. Going up the new *char* road in the same wood, about half or three-quarters of a mile, I reached the only long bit of clearing (just past a waterfall) where I got my *B.*

thore last July. Several were about, and I had a total of five before rain drove me down. This clearing is a good spot for them no doubt, and it gives room for a chase. *B. thore* flies in a jerkey way in straight, even lines, a little like the 'White Admiral.' I expect they are to be had in this clearing every June. I also got *Erebia medusa*, *Brenthis euphrosyne*, *Brenthis selene* (one), *Brenthis amathusia*, *Melitaea dirtynna* (one very good), *Chrysopa virgaureae*, *Plebeius argus (aegon)*, and *Pararge aegeria*. [Probably ab. *intermedia*, Tutt.—L.M.F.]

"Yesterday, on the hot north terraces of grass over Faïdo, when the sun at last came out for ten minutes, I at once caught one *Argynnis aglaia* and one *Argynnis adippe* var. *cleodora*, also *Parnassius apollo*.

"P.S.—On the Weesen marshes I found the best places for *Lyraena euphemus* were beside the railway (the Filzbach footpath), but for *Coenonympha tiphon* near its further side, South or South-East of its centre."

5. WEESEN, ETC.

(Although some of the matter in this and succeeding letters is identical with that already published in the *Ent. Record* (vol. xxvi., pp. 228 and 242), I am communicating it again, in the first place, for its many extra details, and in the second, for the original observant personality which pervades it, and indeed all Mr. Fison's correspondence, entomological or otherwise.—LILIAN M. FISON.)

"Hotel Speer, Weesen, June 24th, 1904.

"I have too much to say to-day, for one of my usual post cards.

"First, did I ever write you about the day's hunt I had (May 24th) up from Bramois to Vex, looking for *Glaucopsyche (Nomia) melanops*. A very fine day, but scarce a butterfly on all that part, though every second plant in most places was thyme. The thyme, however, was so young I did not recognise it at first, though the scent was very strong. The leaves were not their usual colour, and not a trace of flower or bud, in even the hottest parts. Would it not be very strange if a fly that fed on a plant should appear when it was so little grown? The entire absence of any blues there was remarkable. I got four *Erebia erias* in the cool bottom of gorge by Hermitage (opposite).

"At Faïdo I got *Brenthis thore* at once: five, the first day's hunt (a cool day) in the best clearing south of Faïdo. A second day the clearing seemed deserted, but I found six more going about at the same level (some 300 feet up). It was a hotter day. I got my twelfth and last *thore* higher up the forest the day before I left, as I returned from a rather fruitless higher alpine walk. They were in good condition.

"As to yellow 'Apollos' I only got one with the lowest spot yellow. At Lavorgo there were no fine ♀ 'Apollos' about. Indeed it seemed too early for that place.

"Although I soon got a fine *Coenonympha arcania* var. *insubrica* in the cool, south forest meadows at Faïdo, I scarcely found another as fine; but still, of the seven to ten I may have, they all have the white band much reduced, and I hope they are true. I was there from the 10th to the 16th (June), when I went to Arth Goldau till last Wednesday (June 25th).

"At Arth-Goldau I got *Coenonympha tiphon* (eight on 16th), at the end of Lowerzee Lake, but found a better place for them later, close to Arth Goldau. This was just east of it, at the very lowest western

corner of the Rock Slide. In the first, cool woods were lots of *Pararge aethina*, and in the bits of sloping, wet ground, I got, one afternoon, a dozen *C. tiphon*, and there or in open meadows more west (under rocks), three very fine *Lycaena ephemerus*, though I could see no trace of their food-plant.

"On the Rigi (Staffelhöhe) I was interested in some *Coenonympha arcania* var. *darwiniana*, in which the females have a very white, clearly defined fringe, or edging, at apex of underside forewing. It may be that all have more or less of this edging, but I went up a second time to get more (I brought down forty), though I see the edging is only a real creamy-white in the ♀s; and got one specimen without any spots on white band of under wings. This must be rare.

"On Wednesday I came here (Weesen), but I got little that afternoon in the marsh on account of the wind: two *Lycaena arca*, six or seven *Coenonympha tiphon*, and one bad *Lycaena ephemerus*. Yesterday (23rd) I got up to the gorge leading to the Thalalpsee in two and a quarter hours (10 a.m.), just as the sun came in to it. Last year I got my thirty-eight *Brenthis thore* there, on July 16th and 18th, so you may fancy my surprise at finding two *B. thore* at once, and soon a third. I did not see many besides, but near the top were a few, and I got eight in all—generally in good condition. As I was hoping to find *Araschnia levana*, this was a little disappointing; and fewer flies of any sort seemed about. However, whilst taking comfort from some cherries at the cow pasture fountain, higher up, I saw a yellow creature alight about eight yards off, and going to see, soon had a fine *A. levana*, and directly after a second. This was at 11.45 or 12. Of course I hunted, and by 1.30 had ten. I had then worked up to the top of the gully, where I got the last on a thyme flower. Most were settling on a tall, two foot, yellow *Senecio* (Ragwort), which was as common as the nettles, on which I saw none. One was on a white parsley-like flower, one was on the path, and one I took as it flew. About 2 p.m., as I returned, I began again to catch them near the pass top, but I missed one. I also got a few *Brenthis thore* there. Below, the gorge was then in the shade. My total catch was, thirteen *Araschnia levana*, eight *Brenthis thore*, four *Parnassius memosyne* (near top), two *Erebia stygna* (by fountain at top), and a few minor things.

"Of the *levana*, three were damaged. I have no book but yours with me (*i.e.*, *Butterflies of Switzerland*, by George Wheeler, M.A.), also some notes from Kane. By these I find the upperside (as I read it, of *prorsa*) should have a good deal of white. My thirteen have no white except two or three roundish spots, like pin-heads, on each wing, upperside, hindwings have also each two small marks, *not pure white* as the roundish spots of upper wings. Except the black or ground colour all the wings, upperside, are tawny-yellow in their larger markings. This looks like ab. *porina*. The broad tawny band, hindwing, upperside (from anal angle to apex), has four large black spots on it—three quite round I caught *levana* here from June 18th-25th, 1902. They were darker than those taken yesterday. In this thirteen there must be several ♀s."

6. SERTIGTHAL.

"Davos Platz, July 11th, 1904.

"Have just been up the Sertigthal to the rhododendron end of the pastures (to the Dörfli). I was surprised to find so little, and

evidently because it is *late*. I saw four *Parnassius delius* and took two; one *Parnassius apollo*. No sign of *Melitaea matura* (var. *wolfensbergi*), saw a *Colias phicomone*, and another 'yellow.' The rhododendron there was past, and nothing about it except a lot of *Erebia tyndarus*. I did, however, get about nine *Erebia eriophyle*, though rather old ones. They were on moist banks where *Adiantum* and other big-leaved things grow just as in the Dischmathal. *Icodes* (*Chrysophanus*) *hippochō* var. *eurybia* was pretty good; also *Coenonympha satyrion* and *Lowia* (*Chrysophanus*) *doivilis*. No good 'blues.' Evidently one should go higher than the Thals. I shall try to do so, and may go on to Pontresina. I hope to go up the Dischmathal to-morrow. Very fine and hot to-day, until a little storm at 3.30."

7. LOCALITIES FOR HETEROPTERUS MORPHEUS, PALLAS, ETC.

"Hotel Steinbok, Pontresina, July 21st, 1904.

"I send a second post-card, in case my first to Fusio misses you. From Reazzino walk towards Locarno. First you go near the Quarries. Then comes a sort of farm with open grass in front. There I saw one or two *Heteropterus morpheus* in the road. The spring may be 100 yards further. It flows across the road or track, and has tall rushes round. That was where I got four At this hotel are two ardent collectors. They got a *Lampides* (*Raywardia*) *telicanns* two or three days ago, near Celerina. I could see no trace of *Erebia flavofasciata* yesterday on the Schafberg, though I went far about. At Davos the peasants said everything was three weeks early. I expect butterflies are very irregular. I hope you will have a fine time, but the heat of Bellinzona ought to be an experience to remember."

8. PONTRESINA.

"July 30th, 1904.

"A Professor, of Berlin, has taken *Erebia flavofasciata* here this year, from July 1st-15th. Not in my place, but between the first Schafberg Restaurant and Languard Alp ditto. 200 yards from restaurant, in a ravine, and in a further (south) ravine below path, and just before it, on an even steep grass shoulder, with a good guide's path up. This last is above the horizontal path. A friend will ask if he has found *Erebia christi*; I suppose from your account on a path above Languard Alp Restaurant, which the natives use. The Professor says *Erebia nerine* is to be had at top of the Laquinthal (under Piz), beyond first or second snow. This must be the north side of the valley, and high. Some collectors say here that hotter weather and more butterflies will come in August, but may we expect *Parnassius delius* and *Parnassius apollo* again?, which are now very few and old? Also, will *Brenthis pales* var. *arslache* return? It is past now, but I got nine or ten (some very old) along edge of the Celerina woods, towards Pontresina. I have got five, twelve, and ten on three days, but most are old. I hope to go down for two or three nights to Murg, or Weesen. I go to look for *Araschnia levana* var. *prorsa*, but return here. Hoffmann gives as the two summer forms of *Araschnia levana* exactly the two distinct forms I got last year and this. Lang does not agree with my forms at all well, unless it be

* I took twenty *P. delius* in excellent condition on August 9th, 1914, in less than half an hour in the Suvretta Thal near the cow-hut at the gate way of the path.—H.J.T.

one darker fly. I have two ♀ *Parnassius delius* (unless one is *Parnassius apollo*) with three red spots by discoidal spot. *Brenthis ino* abounds, though now old, and *Brenthis pales*. Very few flies of any kind on high parts as near the Tscherva scherva glacier and hut. No *Colias palaeno* to be seen. I got two old *Brenthis thore* to-day in Rosegthal at the end in glades. They have been taken there all July. I cannot find *Erebia eriphyle* there."

9. ARASCHNIA LEVANA VAR. PRORSA, L., ETC.

"Hotel Speer, Weesen, August 3rd, 1904.

"I came down here yesterday to look for var. *prorsa* in the Murgthal, and have just returned. There was scarcely any sun. Under the wood, on a tiny ridge, where avalanche *débris* lies about, I got one. Then a second after a long chase, and when the sun came out for a few minutes, four more. More sun produced no more there for a long time, but on going down (150 feet) to the warm, bare path and fountain, I got four at once, making my total ten. I fear all are a little spoilt, and would have been better a week ago. All (except one) have double *white* spots on centre of upperside forewing, and a long white bar across hindwing, also a few small white spots besides. All the rest upperside is black with a few bright brown dashes. In one (perhaps a ♀) the patches are yellow or creamy. I think I have now the three forms portrayed by Hoffmann, for I do not think this is the form of which I took six last year. It is larger, and the white spots are larger, but I will read Hoffmann again when I return to Pontresina. This form flies like small 'White Admirals,' and greatly resembles them. Before leaving Pontresina I heard that the German Professor (who perhaps collects for the Berlin Museum) got fifteen *Erebia flavofasciata* this year, and his companion forty. The forty were given away to Mr. W. Rothschild, who has been at Campfer. At this rate the persistent 'pot-hunters' will certainly clear the place, which is *too* easy to get at. Happily there are scores of similar mountains about, with gullies that look likely places for it. I hear of a place called Guarda above Sûs, as a great place for plants and insects. Scarcely anything was on the wing to-day, except *Dryas paphia* and some *Erebiae*. Rain came on at 2 p.m. Certainly the 'Murgthal-place' for *Araschnia levana* is easy to reach—one good hour up from Murg. I may go there again to-morrow if fine."

10. STAMPA.

"Hotel Speer, Weesen, August 31st, 1904.

"I came here yesterday after two weeks at Stampa, in the Val Bregaglia. Of course it was too late for much there, but ♀ 'coppers' were very common, and *Chrysophanus (Heodes) virgaureae* a brighter yellow tint (uppersides and perhaps undersides too) even than those I got at Pontresina. I have many, but scarcely any from either place are *quite* fresh. I also got two or three dark and rather interesting *Rumiccia phlaeas*, one with blue ante-marginal spots. I got three ♀ *Loweia (Chrysophanus) alciphron* var. *gordius*, but saw no ♂ s, and only two ♂ s of *H. virgaureae*. My great catch at Stampa was three *Lampides telicanns*. The first two in about an hour, on August 17th. Then last Sunday—the 28th—close to the same spot, another was on the path, and I knocked it over with my hat—as fine a fly as the others. only

minus one tail. You may like to know the spot was about half a mile west of Stampa, beyond the hamlet of Cultura; one found by the rough bridge, and the two just beyond, in clearings of alder scrub. That was a good place too for 'Coppers.' Stampa seems well placed. Promontogno is too hot and shut in, but I should like to hunt earlier in the lovely little Val Bondasca above it. I have come here to look for var. *prosa*, but it has turned out too wet. I shall probably stay a few days."

Notes on breeding *Odonotera bidentata*.

By W. BOWATER, LIEUT. R.A.M.C.T., F.E.S.

In 1909 I commenced breeding *Odonotera bidentata*, and have continued till the present time. My main object was to discover the method of the heredity of the melanic form of this species. It was found to be Medelian; the melanic form being a simple dominant, and the type form the recessive. Full details have been recorded.* Since then the experiment has produced still more evidence to confirm this.

I have bred from ova	...	...	2300	specimens.
Ditto from larvæ	...	...	350	"
Imagines captured or exchanged	...	...	700	"
Total in cabinet			...	...
			3350	

I have now about 650 pupæ.

During the experiment over 200 pairings have been made, and 71 families have reached maturity. This does not represent the mortality due to disease. Many families were given away, or exchanged, or destroyed.

Copious notes on every detail of the life-history have been made, and may on analysis be found useful for publication at a future date. This specially refers to microscopical details. Throughout the experiment scrupulous care has been taken to keep each family separate, for in the study of heredity this is absolutely essential, a *sine qua non*. Departure from this rule has led at times to some confusion, and apparently conflicting evidence. I would earnestly appeal to all breeders of Lepidoptera to keep families separate, and so labelled that material would be formed from which valuable evidence might be obtained bearing on some of the vexed questions of heredity, especially as to the heredity of *small* characteristics, anatomical, physiological, and even psychological. The following details are observations made on the specimens used in the experiment and on them only.

1. *Pairing*.—This usually occurs soon after emergence, and in several cases even before the wings were quite dry. In some cases, however, 24 hours elapsed before copulation. In three cases fruitful pairing occurred between ♀s emerged 4-7 days and fresh ♂s. Copulation almost invariably occurs between 8 p.m. and 11 p.m. The ♀ in almost every case holding on to the lid of the box or cage, and the ♂ hanging pendulous without foothold. Separation occurs in the early hours of the morning. In one case only copulation began at

* 1. *Trans. Brit. Assoc.*, 1913.

2. *Journal of Genetics*, vol. iii., no. 4, April 1914, pp. 299-315.

10 a.m. and ended at 3 p.m. Fruitful pairings have frequently occurred in temperatures of 40°F.-50°F.; and in several cases at 33°F.

2. *Ovulation*.—Unimpregnated ♀s almost invariably deposit ova 5-12 days after emergence. An impregnated ♀ usually deposits about 100 ova during the night following impregnation, and repeats the process within the next 24 hours. A large chip pill box was used for ovulation, and most ♀s were satisfied to lay their ova on its sides or lid, but some preferred the small twigs which were always placed in the box. The ♀s were usually killed as soon as 100 ova were laid, in order to retain them in good condition, but if allowed to live in some cases 400-500 ova were deposited, and in one case 585 were noted. In gauze cages, the gauze was commonly used as a place for oviposition. Glass also often served.

Both sexes accepted moistened lump sugar as refreshment in the intervals of their marital duties.

3. *Ova*.—Pale yellow when laid; if fertile, becoming bronze in 3-8 days, according to temperature. Hatching occurs in 15-34 days, according to temperature. In ordinary April and May weather 22 days. The bronze colour deepens and becomes dusky 36-24 hours before hatching. Ova were kept in glass topped tin boxes. Hatching is usually spread over 2-5 days. Introduction of even a single leaf before hatching is fatal to the ova, presumably this is due to the moisture.

4. *Larva on hatching* take no further notice of the egg-shell, but are very active, and walk round ceaselessly till they find a pabulum. Of one batch, which after hatching was forgotten for 72 hours, nearly all were found to be alive. The larvæ were kept in glass topped tin boxes for the first few days, or even few weeks, of their existence. If direct sunlight is prevented from falling on the boxes the mortality is extremely low. Throughout the experiment, of all the larvæ which hatched less than 5% died from disease.

5. *Length of larval life*.—In the single case where forcing was tried, hatching to cocoon formation occupied 41-54 days. Under apparently natural conditions the shortest was May 3rd-June 20th.

Much depends on the foodplant.

6. *Food-plant*.—Privet, especially the evergreen variety, and apple, are the best food-plants. They promote more rapid growth in the larvæ than ivy, pear, plum, willow, birch, hawthorn, *Prunus pissardii*, willow, poplar, travellers' joy, which also form useful food-plants. Broom produced but very slow growth, but all lived.

7. *Cages*.—In addition to

(a) *Ordinary breeding cages*, especially that special variety which each collector has evolved for his own use, and secretly considers the best on earth.

(b) *Biscuit tins*, half-size, were found to be most useful, giving a minimum of trouble, occupying so little space, and cheap, and above all healthy, as might hardly be expected, and, moreover, repeated

experiment proved that larvæ fed up much more rapidly in these tins than in any other form of breeding cage.

The floor of the tin is covered with one inch of moss fibre, *slightly* damp, with a piece of paper on top, leaving a margin, and the twigs of privet or apple laid on top.

Although it is necessary to open them at least every 48 hours, one or two minutes suffices to change the food, and the mortality was not above 3%, including some weak families. Ten to 35 larvæ pupated in each tin, and in many cases mortality was nil, the larvæ being put in when half grown.

(c) *Sleeving*.—Ova, or very young larvæ, were sleeved on privet and apple. Mortality less than 2%, except from parasites. As rate of growth in the various families and within a family is so variable, frequent watching is necessary in order to remove full fed larvæ to material suitable for pupation.

8. *Colour of Larvæ*.—It was interesting to note the variation of colour due to environment, as proved in Professor Poulton's classical experiments. The red of *Prunus pissardii* twigs, the beautiful green of apple shoots, the gray brown or black of apple twigs, and the brown of moss fibre, were all faithfully imitated.

9. *Habits of Larvæ*.—They feed only at night, eating voraciously and moving actively. Characteristic "stick" habits by day. Not only a general feeder, but enjoys a mixed diet, or after feeding for weeks on one food-plant readily changes to another. Occasionally cannibalism has been suspected, but never actually observed, and certainly does not occur if food supply is plentiful. It is very probable that various characteristics and habits of larvæ run in families, and efforts have been made to collect evidence on this point.

10. *Pupation*.—Larvæ prefer moss fibre to any thing else in my experience. It should be sieved to remove dust and very fine particles. If cokenut fibre is used many imagines are strangled and fail to emerge from cocoons. Although dead leaves always littered the cage floor, larvæ used them for pupation in only about ten out of over 2500 observed cases.

11. *Cocoon* is made of granules of moss fibre, and is lined by a loose meshed network of strong, thick strands of silk. The cocoons are usually collected in bunches, but I have never found two pupæ in one cocoon. If a larva has no available material for cocoon, it spins a slight net of fine closely meshed silk. If left late in a sleeve, frass is utilised in forming the cocoon.

12. *Pupa*.—Larval skin is shed in 3-5 days after the cocoon is formed. The pupa moves if touched at any time throughout the winter. If kept indoors, even in a non-heated room, emergence of the imago occurs frequently in December, January, and February, especially of the melanic form. In this observation I am supported by several entomological friends. Curiously enough

13. *Forcing* during the autumn does not hasten the emergence.

Pupæ have been kept at 65-78° F. for ten weeks in autumn and they emerged no sooner than the rest of the family left in a cold room.

14. *Emergence* has been repeatedly noted in January and February when the thermometer in the cage stood at 33° F. In one instance only a pupa forced its way half out of its cocoon five days before the imago emerged. Normally dehiscence occurs inside the cocoon. In cases where exit is impossible the ♀ deposits ova in the cocoon.

Emergence almost always occurs between 7 and 11 p.m. Growth of wings occupies 15-20 minutes, and the moths are able to retain their hold on vertical glass.

15. *Habits of imagines*.—During day very sluggish, resting with the wings flat, with the upper hiding the lower, hiding in corners, and if possible touching a leaf, label, or another moth.

In the evening and during the night they rest with wings upright over the back.

Females can be handled with impunity, and lose condition but little if allowed to live a week in cage or pill-box.

16. *Variation*.—When freshly emerged some of the imagines are surprisingly handsome. In the *type* form, variation extends from the palest yellow, buff, orange, fawn, grey, golden brown, up to dark brown with heavier markings.

Within the *melanic* form variation occurs in the intensity, and exact tint of the blackness, and in some cases a large central patch of brown occurs on the forewings, and at times this is sharply defined and quite light in colour.

The melanic form is, however, quite sharply defined from the darkest of the type forms by the fact that in every melanic the abdomen and legs are black, and never is this so in the type. Thus even cripples can be distinguished. The thoracic hairs in the melanic are often lighter than in the type.

A non-entomological eye can distinguish between the two forms in almost every case; and not one of all my specimens could be called intermediate, thus differing from *A. betularia*, *S. lubricipeda*, *A. nebulosa*, etc.

Some specimens are scantily-scaled and these are often rather handsome.

Males are on the average slightly smaller and darker than the corresponding females. This applies to all forms and varieties.

In a "Journal of Variation," I feel that more prominence should be given to this part of the subject, and trust for an opportunity to dilate on this when I see my specimens again.

17. *Gynandromorphism*.—Only one specimen showed signs of this, the left half being apparently ♂, and the right half ♀. I hope to publish microscopical details later.

18. *Inbreeding* was sustained well as shown in diagrams.

19. *Sanitation*.—I am assured that the frequent sterilisation by boiling of cages and boxes and sleeves was essential in this breeding

experiment; and lack of this precaution is a common cause of failure in similar ventures.

20. *Parasites*.—Of these (i.) *Borkhausenia pseudospretella* was the most harmful. In spite of carefully baking the mossfibre used, loss was caused each year by the larvæ of this moth eating the *bidentata* pupæ. The only consolation was afforded by remarkable cases of assembling displayed by the parasite.

(ii.) Four cases of *Ichneumon* appeared.

(iii.) Of the coleoptera a cannibal species slaughtered fifteen larvæ and pupæ in two sleeves.

(iv.) *Earwigs* are under my suspicion, but several prolonged attempts to persuade them when under observation, to devour larvæ or soft pupæ failed.

(v.) *Mice* accounted for 300 pupæ in 1912-13, but fortunately did not break the generations.

21. *Labelling*.—Every cage or box was labelled inside and out. The orthodox method was used; thus:—

10·4 = family derived from the 4th pairing in 1910.

13·34 = „ „ „ „ 34th „ „ 1913.

(See diagrams).

22. *Double Brood*.—Family 13·20 consists of about 100 members, which fed as larvæ during May, June, July, 1913, the last to pupate going down on July 31st. Although kept in a cold room, a few imagines emerged in December, and on January 8th. 1914, two emerged and paired. The resultant ova, Family 14·2, were divided into:—

(i.) Batch A, kept in a room at 45°F-55°F. They hatched on February 1st, and the larvæ were incubated at 65°F. They pupated (about 50) from March 12th-28th. Pupæ were forced in a friend's greenhouse and imagines emerged in July. Two paired July 20th and the resultant ova, 15·1, hatched August 10th. My wife, although absolutely inexperienced in entomology, rose to the occasion, and took charge of these (and of all my other specimens) from this date. The larvæ were kept in an ordinary room, fed on apple and privet and about 50 safely pupated September 12th-October 3rd, thus completing the double brood.

(ii.) Batch B ova of 14·2 were left in the cold room. They did not hatch till February 22nd, the temperature then being 44°F. During the next few weeks they lived in 42°F-53°F. On April 2nd they were sleeved in the garden, survived several nights frosts and pupated out of doors in the first twelve days of May.

Although still left out of doors, some of the imagines appeared in the first three weeks in September. Two emerged October 9th and paired. Resultant ova, 15·2, brought indoors, and kept in a living room. They hatched November 6th, and fed on evergreen privet, pupated in the last week of January and first week of February, 1915.

Thus *bidentata* can with care, be made to withstand various disadvantages of parentage and environment.

23. *Breeding black forms*.—Finally, with regard to the statement

heard at times that the melanic form of *bidentata* does not "breed true," the explanation is that in this species blackness is dominant, not recessive as in *A. grossulariata*.

A recessive character is easy to get pure and "breed true," and a dominant character is difficult. Our domestic sheep forms a good example:—whiteness is recessive, and blackness dominant.

To put it in a practical way for the benefit of those entomologists (probably still numerous) who have not had opportunity or inclination to study Mendelism:—

All TYPE *bidentata* (whether their parents were both type, one type and one black, or both black) are exactly alike as regards their powers of transmitting colour to their offspring.

MELANIC specimens all look exactly alike, but really consist of two sorts, differing in powers of transmitting colour:—

- A. Pure melanic. (homozygous).
- B. Impure melanic. (heterozygous).

Therefore,

1. Type \times type always produces offspring all types.
2. Type \times melanic produces either
 - i. offspring all melanic.
 - or ii. offspring 50% melanic, 50% type.
3. Melanic \times melanic produces either
 - i. offspring all melanic.
 - ii. offspring 75% melanic, 25% type.

In 2 i. the melanic parent must have been A.

" 2 ii. " " " " " " B.

The melanic specimens of families 2 i. and 2 ii. are all B.

In 3 i. although all look alike, there are two possibilities:—

If both parents were A, the offspring are all A.

If one parent was A, and one B, then the offspring are 50% A and 50% B (although they all look alike).

In 3 ii. the parents must have been both B. Of the melanic specimens (75%), $\frac{1}{3}$ are A, and $\frac{2}{3}$ B.

Thus to get a pure black strain is very difficult, because A cannot be distinguished by the eye from B, but attention to the above points will help.

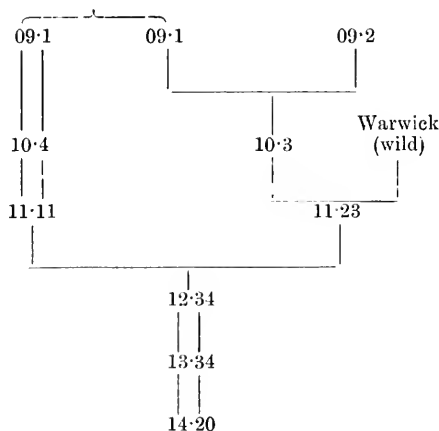
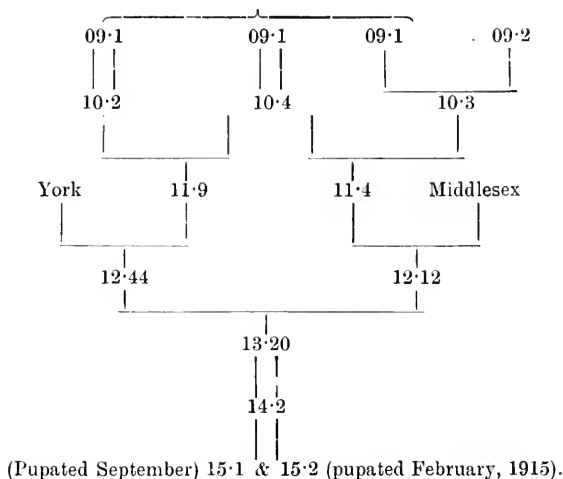
A common experience is as follows:—A black specimen is taken and deposits ova. Larvæ carefully reared, and the following year imagines appear, either 50% or all black. In either case, two blacks are chosen; paired and larvæ reared. Next year imagines are 75% black and 25% type.

(The type are really pure although parents black, so time spent in breeding from them is wasted).

Two black are chosen, and here is the difficulty. There are twice as many B's as A's, so the chances of picking two A's is less than the chance of picking A and B, or two B's, and thus often to the chagrin of the breeder aiming at a "pure," strain, types again appear.

Still, as I have shown, definite rules govern the heredity of melanism, and mongrelisation is only apparent not real.

[I wish to acknowledge with thanks the courtesy of Messrs. Mosely of Birmingham, G. T. Porritt, Parkin, and A. Horne, who have given me valuable advice and helped in other ways.]



SCIENTIFIC NOTES AND OBSERVATIONS.

HIBERNATION OF VESPA VULGARIS.—Having a warm corner in my heart for the British *Vespidæ* I was particularly interested in Miss Fison's note on p.87 under the above heading. It is not a rare thing I believe to find queen wasps hibernating behind pictures, but they are usually attached to the *picture*, not to the *wall*. It is not clear how the thread referred to secured the wasp to the wall; if it were in the form of a loop over the thorax or abdomen in the manner of the thread in the case of the pupæ of Pierid and other butterflies, then I should think it was spun by a spider after the wasp had become thoroughly torpid. Since queen wasps fold up their legs and wings beneath the abdomen and thorax and cling to the support only by their jaws, the specimen in question must have gripped a small irregularity in the plaster of the wall by that means, or possibly, a

strand of spider's web already there. If Miss Fison can elicit more definite information on these points it would be useful.—C. NICHOLSON (F.E.S.), 35, The Avenue, Hale End, Chingford, Essex.

THAUMATOPAEA PITYOCAMPA.—The larvæ Miss Fison saw (*Ent. Rec.*, xxvii., p. 86) in the road at Pallanza, on February 11th, were certainly not *processionea* but *pityocampa*. The larvæ of the latter hatch in autumn, make their great nests in the pine trees, and are full-fed in early spring, they then leave the trees and "process" across country roads or anywhere, to find a place in which to spin their cocoons and pupate. They enter some cavity together and spin their cocoons in a mass. They do "process" on the trees from their nests to the feeding places, but only leave the trees and march on the ground when ready to pupate. *Pityocampa* feeds on pines, and in its southern habitats feeds all the winter. On the other hand *processionea* feeds on deciduous trees, usually oaks. The small larvæ may be found, in beautifully radiating groups, on oak leaves, not very long after these have fully expanded in the spring, but they still have nearly all their growth and feeding to do, and are not full-fed till well on in the summer. The life histories of both species are well-known, and the discrimination between them when found as larvæ is easy, but the facts do not seem to be familiar to everyone.—T. A. CHAPMAN (M.D.), Betula, Reigate. April, 1915.

CURRENT NOTES AND SHORT NOTICES.

The earnest sympathies of all our readers will go out to Professor E. B. Poulton, F.R.S., of the Hope Museum, for the loss of his son, Lieutenant R. W. Poulton-Palmer, killed in action in France. Lieutenant Poulton took the name of Palmer two years ago when he inherited the fortune of his uncle, a director of the great biscuit factory at Reading. He was a well known athlete and had taken part in many first-class and international matches.

Those entomologists who were present at the South London Entomological Society to hear Dr. Dixey's paper on "Seasonal Dimorphism" had a treat. It was an admirable and lucid statement of the phenomena by the author at his best, and was fully illustrated by diagrams and a valuable series of appropriate slides. Those members of the Society who were unable to be present will enjoy reading this paper *when* it is printed.

The word *when* in the last paragraph calls attention to a grievance which not only authors of papers, read at our various societies, have, but which is also shared by the audience, the members unfortunately unable to be present, and often by science itself. An extreme instance may be quoted. On February 12th, 1914, our colleague, the Rev. G. Wheeler, read a very valuable paper on the "Genus *Melitæa*" at a London Society, and yet owing to the customary routine this paper has not yet been published.

This is in no way intended to signalise any individual society; similar delays occur in most of them. A paper read early in the official year rarely gets printed until well over twelve months after, and it may, by that time, be somewhat out of date. Having appreciated the delay, and its effects on the progress of our knowledge, how can it be avoided? There seem but two ways to get over the difficulty, either the societies

must have more frequent issues of their proceedings, a much more costly arrangement than the present annual issue, or the magazines must step in and publish the papers, when the societies would lose the advertisement and credit. Of course the whole difficulty is one of pounds, shillings and pence. No society can exist unless the subscription is very moderate, and every society must proclaim its work to the world and advertise itself by a publication. This latter is costly and usually falls largely on the shoulders of a few more enthusiastic members. There is always the necessity for the most rigid economy in the finances of a society which would be quite impossible did publication of papers occur every few months. Is it worth the while for these smaller societies to cripple their resource and so restrict their usefulness by struggling to publish papers? Some papers in these lesser publications are naturally very limited in their application and perhaps, from a scientific point of view, not worth printing, while others are of more or less permanent value and their restricted circulation is not only a loss to the advancement of science if so published, but, even may be completely hidden away, as was for so many years the now famous paper of Mendel on Heredity. Every new serial publication adds to the difficulty of the future student; at the present time it is well nigh impossible for any individual worker by himself to make a complete search in a question which for the time being he is dealing with. On the other hand each member of a society feels that he is hardly dealt with if he has nothing in return for his subscription, nothing permanent to remind him of his many pleasant hours of social concourse with his fellow enthusiasts. Such are some of the points in a difficulty that one sees.

Professor Forel has recently described three new species of ant from South Africa, under the following names, *Tetramorium joffrei*, *T. frenchi*, and *T. popovici*.—H.D.

The Growth and Organization of Applied Entomology in the United States is the title of a Reprint from the *Journal of Economic Entomology*, by P. J. Parrott. He shows that the great feature of the past quarter of a century was "the rise of the entomological expert with his official connections, and of organizations of workers engaged in the promotion of agriculture" and that this movement "has exerted a profound influence on the aims and success of this branch of science" in the country. The development of Entomology, he shows, to be largely utilitarian, induced by the continued application to legislatures for assistance in coping with the overwhelming insect depredations and by the inability of individuals to deal unaided with the trouble. The history of state-aid in applied Entomology in the States is sketched, and reference is made to such eminent pioneers as Harris, Fitch and Riley. The Budget for 1913-14 provided no less than 752,210 dollars for this purpose in connection with agriculture. The author concludes with a plea for greater opportunities for experimental work, which the insistent demands of present arrangements in economic work do not permit to be sufficiently undertaken.

For many years we have been accustomed to go through the catalogues of second-hand books, not only with the object of finding a bargain or a desideratum, but for the interesting comments of the compiler on a large number of items. These remarks are not only often very instructive from a historical, literary and scientific point of

view, but they are frequently most amusing and even witty in their comment. The war even has had an effect upon the fertile brains of these would-be instructors, for from a catalogue recently to hand we cull the following caustic items. "BECKER (LEON) *Les Arachnides de Belgique*." "Since the publication of the above work Belgium has been overrun by the enormous migration of a gigantic blood-sucking spider, *Kulturia vastatrix*, Treits., with falces of a noxiousness hitherto unknown to naturalists. Although in their new habitat these *Arachnida* have approximated to the trap-door spiders, their expulsion and extermination is only a matter of time." "BENEDEN (PIERRE JOSEPH), LOUVAIN, *Animal Parasites and Messmates*." "Like Belgium in general, Louvain in particular is suffering from the unexpected arrival of vermin of a very low type, which are unlikely to survive the freshening winds of spring." "LAMBILLION (L. J. L.) *Histoire Naturelle de Moeurs de tous les Papillons de Belgique*." "The complete devastation by the savages of so much of the low-lying area of Belgium may very possibly lead to some of the species here described becoming extinct." "HAECKEL (ERNST), *Report of the Siphonophorae, etc.*" "This is the man who, with Dr. Eucken, put forth, with his tongue in his cheek, the lying statement, that the French invaded Belgium before his own countrymen did." And so forth.

Among the more interesting matter in the January magazines are the following. The *Canadian Entomologist*:—(1) F. H. Wolley Dod continues his valuable contribution to our knowledge of the Lepidoptera of Alberta; he deals in this chapter with further Noctuid species. (2) L. W. Swett continues his Revision of the genus *Hydriomena*: the group with long palpi is under consideration at present. (3) The first of what purports to be a very useful series of articles on the educational side, entitled "Popular and Economic Entomology," is published. This instalment deals with "Some Inhabitants of a Land Plain in June," using as a text the locality Aweme, Manitoba, and the date June 20th. The *Scottish Naturalist*:—(1) Frank Balfour Browne contributes the first portion of an account of the Aquatic Coleoptera of the Outer Hebrides, dealing with the general characteristics and limits of the area and methods of collection, record and study involved. The *Entomologist's Monthly Magazine*:—(1) F. N. Pierce and the Rev. J. W. Metcalfe describe three new species of *Tortricidae*, discovered in working through the genitalia of the British representatives of the group. The species are *Cnephasia genitalana*, hitherto stated to have been mixed in collections and confused with *C. conspersana*. Of the latter species the authors also announce and describe an aberration, *viz.*, *ab. albo-conspersana*, and of *Cnephasia octomaculana* they also describe a new aberration, *ab. albo-octomaculana*, both aberrations are forms which might possibly be confounded with the new species. (2) *Pocillochroma pomedaevana*, described from series bred by Mr. E. Studd, at Oxtou, Devon, and hitherto considered as a form of *P. profundana* upon the authority of Mr. E. R. Banks. It has been bred for a number of years from old apple trees. (3) *Lipoptycha aeratana* has been confused hitherto with series of *Dicrorampha* (*Lipoptycha*) *plumbana* and *D. saturnana*, or even among series of *D. tanacetii*. The *Entomologist*:—(1) J. W. Harrison contributes an article "On the Hybrids of the genus *Oporabia* with some notes on its 'Micro-

genes.'” (2) L. B. Prout announces and describes the following new melanic aberrations of species of *Eupithecia*. *E. nanata* ab. *oliveri*, bred by Mr. Oliver from Warwickshire; *E. lariciata* ab. *nigra*, captured in the same district by Mr. Oliver; *E. immotata* ab. *unicolor*, bred second-brood small dark form from Durham. (3) Notes on the Larval and Pupal Stages in some of the *Sesiidae*=*Aegeriidae*, by Col. R. H. Rattray.

The following are the more important articles in the *Entomological News* for the latter half of 1914. (1) An account of the life and work of “J. Brackenridge Clemens,” who, it will be remembered, was the friend and correspondent of Stainton, and who, with the latter, took considerable interest in the Micro-lepidoptera of the United States. Clemens was in fact the “father” of the study of the smaller moths in America. (2) An account of “Butterfly-collecting in Mojave County, Arizona,” by J. R. Haskins, of Los Angeles, describes the district in an interesting manner and gives notes on the chief species and forms found, including *Pyrameis cardui*, *Synchlœ californica*, *Pieris protodice*, *Libythea bachmanni*, *Colias eurytheme*, *Papilio asterias*, etc. (3) “The origin of Oligotropism in Bees,” by John H. Lovell. (4) Dr. Phillip P. Calvert continues his “Studies on Costa Rica Odonata,” dealing with the “Waterfall Dwellers” in this contribution. There is one plate. (5) Messrs. E. M. Swainson and Henry Skinner describe a larva of the rare Jamaican *Papilio*, *P. homerus*, and figure it. (6) John Werner Franzen gives a list, with notes, on “Minnesota Butterflies,” mainly from his own observations. (7) Harry B. Weiss goes into the subject of the introduction and spread of injurious insects, in an article entitled “Insects found on Nursery Stock imported into New Jersey during 1913.” More than half the imported stock was from Belgium, and the rest largely from Holland. A list of the insects met with is given with the host plant of each species. (8) John H. Lovell enters into a discussion on the question “Why do Honey-bees discriminate against black?” He gives the curious facts that, “Of a flock of twelve chickens running in a bee-yard seven black ones were stung to death, while five light coloured ones escaped uninjured. A white dog ran among the bee-hives without attracting much attention, while at the same time a black dog was furiously assailed by the bees.” “A black and white cow, tethered about forty feet from an apiary, was one afternoon attacked and badly stung by bees. On examination it was found that the black spots had five or six stings to one on the white.” “A black felt hat will be literally decorated with stings, while a gray hat will not get a single sting.” (9) B. W. Evermann reports from the San Joaquin Valley, California, on the abundance of *Pyrameis cardui* in April, 1914. He says, “As we drove through the fields of yellow mustard these beautiful butterflies flew up in front and on either side of us literally *by their thousands*. There must have been millions of them, they were everywhere in the fields.” (10) H. A. Allard describes a series of experiments he has made on the subject of “Locust Stridulations.”

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—February 3rd, 1915.—

ELECTION OF FELLOW.—Mr. Adam Charles Smith, of Horton, Mornington Road, Woodford Green. NOMINATION OF VICE-PRESIDENTS.—The President announced that he had appointed Mr. G. T. Bethune-Baker, Mr. E. Ernest Green, and Dr. G. B. Longstaff to act as Vice-Presidents for the current session. SOUTH EUROPEAN RHOPALOCERA.—Mr. E. B. Ashby exhibited some Ruralids from Southern Europe, including specimens from Digne, le Vernet, and La Granja. A GIANT GLOW-WORM.—Mr. E. E. Green exhibited specimens of the giant glow-worm of Ceylon (*Lamprophorus tenebrosus*), and its male—a large firefly. AN INGENIOUS DEVICE.—Dr. H. Eltringham exhibited an instrument made to his instructions by the Cambridge Scientific Instrument Company, for cutting paraffin blocks perfectly square preparatory to placing them on the microtome. THE LIFE-HISTORY OF AGROTIS LUCERNEA.—Mr. Lupton communicated notes on this species at Torquay. THE HABITS OF THE AUSTRALIAN BUPRESTID "FIRE-BEETLE," *MERIMNA ATRAEA*, LAP. ET GORY.—Prof. Poulton exhibited specimens of the above-named beetle and read notes. THE AUSTRALIAN BUPRESTID BEETLES *STIGMODERA CONSPICILLATA*, WHITE, AND *S. CYANURA*, HOPE, PROVED TO BE FEMALE AND MALE OF THE SAME SPECIES.—Prof. Poulton exhibited the male and female of *S. conspiciata*. The two sexes had been bred by Mr. H. M. Giles from the same food-plant, *Melaleuca* sp., and had also been captured by him *in coitu*. THE AFRICAN ANT *MEGAPONERA FOETENS*, F., AND ITS RAIDS UPON TERMITES.—Prof. Poulton said that he had recently received notes upon the habits of this ant from three different observers. BUTTERFLIES FROM BIAK.—Mr. Talbot exhibited on behalf of Mr. J. Joicey a number of new forms of Lepidoptera from Biak, the largest of the Schouten Islands to the north of New Guinea. The following paper was read:—"New Butterflies and a Moth from Biak," by J. J. Joicey, F.L.S., F.E.S., and A. Noakes, F.E.S.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

February 11th.—NEW MEMBERS.—MESSRS. E. J. Bunnett, M.A., of Forest Hill, and Gordon Fryer, of Twickenham, were elected members. NEW RECORDS RE *PYRAMEIS ATALANTA*.—Mr. L. W. Newman communicated a long record of the results of the October pairing of *Pyrameis atalanta*, and of his unsuccessful attempt to keep the fertile females alive through the winter. He felt conscious that we were almost entirely dependent upon immigration for our supply of this species. Mr. Frohawk said that *P. atalanta* was on the wing all the winter in suitable weather in the Scilly Isles. Mr. Barrett said that it occurred similarly in Sicily all the winter. COCOON STRUCTURE.—Mr. R. Adkin exhibited photographs, highly magnified, of the silken thread construction of the cocoons of *Saturnia pavonia*, *Anthrocera filipendulae* and *Dicranura vinula*. LANTERN SLIDES.—Mr. Frohawk showed a large number of lantern slides of birds, and gave an address incorporating his own observations on the Scilly Isles.

CORRECTION.—An unpardonable error has crept into the last number of the magazine for which the author of the paper is not responsible. On page 79 *Anthocharis belia* var. *bellezina* should of course be *Anthocharis tagis* var. *bellezina*.—H.J.T.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8s.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS, &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic).
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
A hitherto unknown organ in the Ancillary Appendages of the Lepidoptera (<i>Agerona</i> sps.), <i>Dr. J. L. Reverdin</i> (with plate)	97
An easy method of identifying the species of the genus <i>Cnephasia</i> (Tortricidæ), <i>F. N. Pierce, F.E.S.</i> , and <i>Rev. J. W. Metcalfe, F.E.S.</i> (with plate)	99
Notes on the Swiss Rhopalocera. V., <i>the late A. J. Fison</i>	103
Notes on breeding <i>Odontopera bidentata</i> , <i>W. Bowater, F.E.S.</i>	109
SCIENTIFIC NOTES AND OBSERVATIONS :—Hibernation of <i>Vespa vulgaris</i> , <i>C. Nicholson, F.E.S.</i> ; <i>Thaumatopœa pityocampa</i> , <i>Dr. T. A. Chapman</i>	115
CURRENT NOTES AND SHORT NOTICES	116
SOCIETIES :—The Entomological Society of London; The South London Entomological Society	119
CORRECTION	120

Communications have been received or have been promised from *Dr. Chapman, Dr. Verity, Dr. Cockayne, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrop, G. T. Bethune-Baker, H. E. Page, A. J. Fison, J. A. Simes, C. P. Pickett, P. P. Graves, P. H. Muschamp, Dr. Burr, A. Tetley, Parkinson Curtis, H. B. Williams, H. L. Earl, etc.*, with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The *Entomologist*, vols. 20-30, 1887-1897 (11 years) £3 10s. Od.
- " " vols. 39-46, 1906-1913 (7 years) " " "
- Entomologist's Record, &c.*, vols. 1-25. Price, £5 0s. Od.
- Practical Hints for the Field Lepidopterist*, Tutt, 2 vols. 7s. 6d.
- Stainton's Manual of Butterflies and Moths*, vol. 1. 2s. 6d.
- British Moths*, Tutt, 2s. *Moths of Brit. Isles (South)*, Vol. 2. 5s.
- British Lepidoptera*, Tutt, vols. 1-5. The 5 vols. for £3 0s. Od.
- Natural History of the Brit. Butterflies and Moths*, Ed. Newman, 2 vols. 17s. 6d.
- Lepidopterist's Calender*, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the WIDOW of the late J. ALDERSON. Apply :—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TATCHELL & Co., Breeders and Collectors of
British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
: : IMAGINES, LIFE-HISTORIES; AND APPARATUS. : :

Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers, Cabinets in good condition. Full particulars on application.

Subscriptions for Vol. XXVII. are now overdue.

Vol. XXVII.

No. 6.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
T. HUDSON BEARE,
B.Sc., F.E.S., F.R.S.E.
GEORGE T. BETHUNE-BAKER,
F.Z.S., F.L.S., F.E.S.
M. BURR, B.Sc., F.Z.S., F.L.S., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
JAS. E. COLLIN, F.E.S.
H. ST. J. K. DONISTHORPE,
F.Z.S., F.E.S.
ALFRED SICH, F.E.S.
J. R. le B. TOMLIN, M.A., F.E.S.
GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

JUNE 15th, 1915.

Price SIXPENCE (NET).

Subscription for Complete Volume, post free
(including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"Pterose," GILLATY ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER Row, E.C.

BERLIN:

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera."—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.* "Varieties and aberrations of Noctue from Doncaster."—*H. H. Corbett, M.R.C.S.* "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.* "Eudryas stæ-johannis."—*A. Radcliffe Grote, M.A.* "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.* "Larvæ."—*Rev. G. M. A. Hewitt, M.A.* "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.* "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.* "Pupa hunting in October."—*J. W. Tutt, F.E.S.* "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Ridgely, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.* "The Lepidoptera of Swansea."—*Major R. B. Robertson.* "Caradrina ambigua in the Isle of Wight."—*A. J. Hodges.* "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.* "Orrhodia erythrocephala ab. glabra from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Ridgely, F.E.S.* "Notes on Caradrina ambigua and *C. superstes*."—*J. W. Tutt, F.E.S.* "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphonia sociata* (with plate).—*W. P. Blackburne Mzr, F.E.S.* "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.* "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.* "Coleoptera at Ipswich."—*Claude Morley, F.E.S.* "Notes on *Bombus visurige*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.* "The Lepidoptera of Grésy-sur-Aix."—*J. W. Tutt, F.E.S.* "Apatura iris."—*Rev. G. M. A. Hewitt* "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.* "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.* "The Genus *Smerinthus*."—*A. Bacot.* "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.* "Wing structure."—*J. Alston Moffatt.* "On the development of sex in social insects."—*J. W. Tutt, F.E.S.* "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.* "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.* "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.* "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.* "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.* "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.* "Varieties of *Argynnis selene*" (with plate).—*S. G. C. Russell, F.E.S.* "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.* "*Zygena minos* and its varieties."—*J. W. Tutt, F.E.S.* "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.* Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7 6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Pajares.

By P. H. MUSCHAMP, F.E.S.

On July 13th, 1914, the proprietor of *The Record* and myself stepped out of the train at the little station of Pajares after a long but rather amusing journey down from Paris. Pajares is a village in the Asturian Cantabrians, on the watershed between the provinces of Leon and Oviedo; it is 1364 metres above the sea level. This place is known to entomologists as being the haunt of *Erebia palarica*, the largest and one of the most beautiful of its genus, a species found by Dr. Chapman in 1904, and not retaken since then. The mean expanse of wing of those he took is between 59mm. and 60mm., a 10mm. greater expanse than *E. evias*, the giant among Swiss Erebias. Its upper surface strongly resembles that of *evias*, but the band on the underside of its hindwings is abundantly distinct from those of either *evias* or *stygne*: its male genitalia are very close indeed to the genitalia of *stygne*, although the shoulder of the clasp is bolder in the two specimens which I have sacrificed to the microscope. The ova would seem to be quite distinct according to Mr. Powell's notes on material received from Dr. Chapman. Wishing to be in a position to examine the genitalia of a number of *palarica*, and unsatisfied with those which Dr. Chapman so generously sent me 10 years ago, I was right glad to join Mr. Page in a *palarica* hunt. Right glad were we two to have been able to get away from our homes so early in the summer, and it was with hearts as joyous as the sun was bright that we reached the station of Pajares an hour or two after sunrise. The village of Pajares was invisible from the station, but we had Dr. Chapman's letter with us which directed us to a "tienda" or village shop, where we were to find rooms over a pigsty! Inquiries of the stationmaster elicited no information respecting the proprietor of said pigsty, but a pale-faced consumptive youth soon put us on what we supposed to be the right track. He led us to the village, showed us the "tienda" in which he himself was a guest, and we took a room over the pigsty facing the "tienda"—the dependance of this "hotel!" We have since heard from Dr. Chapman that we should have stopped one station before getting to Pajares and sampled the pigsties there. It would seem then to be a speciality of inns in this neighbourhood to have their guest-chambers in close proximity to the "habillés de soie," a compliment I was to learn to "properly appreciate" a few days later when our unshutable door was pushed open in the middle of the night and two "gentlemen" entered the room, and with many grunts began to investigate my friend's valise, and, as my shouts neither disturbed the grunter's activity nor my friend's slumbers, I was obliged to tumble out of bed and drive them downstairs to their own flat: we had paid for ours and I wanted no other sleeping companion than Mr. Page, besides, their conduct in nosing about his valise was absolutely indiscreet—well, after all they were Spanish pigs, and discretion is a flower that does not often grow in Spain. It is just possible that these useful animals considered that we were not paying enough for our board and thus had no right to our lodging. If this were so, there was some excuse for them. In addition to our share of the sty we were fed and excellently fed, better, I expect, than even our neighbours

JUNE 15TH, 1915.

themselves were; for us many an innocent trout gave up its little life, for us were slain fatted lambs—we were even invited to view the slaying—for us came beef from afar, for us one of our dear neighbours uttered its last squeal, for us many and mysterious vegetables were culled; fruit indeed, was very rare, but after each meal we were regaled with black coffee and our hosts pet liqueur—and for this we were expected to pay a sum equivalent to 4s. a day. It was hardly ruinous. Our host fed—I cannot say ate—with us, his wife and daughters served us with the viands that themselves had erst prepared. The fair daughters of the house did our washing and deemed the labour to be one of pure love; why not? water is plentiful and women's work too cheap to be taken into consideration! The air was glorious, the view fine—only—a very big only—we were too late for *palarica*—much too late, as not even one ragged specimen was taken! Oh reader, follow our example, learn the lingo in your leisure moments, master the host of irregular verbs and the subjunctive of the regular verb with its three imperfects and its future and go to Pajares, but go there at least a fortnight earlier than we did! The only *Erebias* we took at Pajares were a few worn *erias*, some fresh *stygne* and a half-a-dozen very fine *epiphron* var. *pyrenaica*, much larger than those from the Pyrenees.

At Pajares we found few other butterflies worthy of note except *L. argus* var. *casaiicus*, which we were destined to find more abundantly at Brañuelas. *Casaiicus* ♂ varies principally in size, the largest of a series of 500 which I have, has an expanse of 31½mm., and the smallest rather less than 20mm., the orange-peacock spots on upperside of hind-wings varying in number from five to zero, about 50 per cent. of mine have these orange spots, but this is far too large a proportion, as I naturally selected my specimens. The ♀ varies more than the ♂ in size, breadth of orange and of white bands, and in the eye-spots of undersides. Among my underside abs. are *retrosagittata*, *retrojuncta*, *sagittata*, *costa-juncta*, *discoelongata*, and *unipuncta*. I believe that the first mentioned has not yet been noted among the *argus*, though fairly common in other "blues," and of the last mentioned a single specimen is cited by Tutt as an extreme rarity which owes its name to Mousley. Of *unipuncta* I have no less than 26 specimens, seven of which are ♂ and nineteen ♀. An extreme form of Mousley's butterfly is one having not one, but two basal eyespots; of this I find two specimens, one ♂ and one ♀, in my series, and propose for them the Convoisier name *bipuncta* (nov. ab.). The orange bands of the uppersides are sometimes very broad and sometimes disappear; generally speaking the larger the butterfly, the broader the bands. The *casaiicus* taken at Pajares are generally smaller than those from Brañuelas; it is, however, vain to break *casaiicus* up, as Tutt does, into several forms, butterflies of extreme sizes and breadths of band being found flying together. On the heather on which we found this pretty insect I also had the good fortune to take two splendidly black-spotted specimens of *P. napi* ♀, one of 50mm. and the other, a *napella*, of 23mm. wing expanse; the great black spots extend to the margin of the wing. Here, too, I boxed two fresh specimens of *Arctia fasciata*, one ♂ and one ♀; the latter laid a large number of eggs, which hatched out before I left Spain and were fed on all kinds of food during a very

long voyage home; these were all doing well when I left Switzerland for England in January. When I returned here in the middle of April, I found that but a few were alive and flourishing, the rest having died. I shall not easily forget feeding them on August 20th; I sprang out of the train and gathered a few dandelion leaves growing on the lines. The attention of some French veterans was attracted by my strange conduct, and they approached with fixed bayonets to see what I was up to. As they saw my handful of leaves they at once concluded that I was going to make myself a salad, and were very sympathetic. Three days later I fed them in a meadow near the station of Ambérieu, and, made lively by the sun, about 100 of them escaped and gave me a fine hunt. Fortunately, the train made a very long halt there.

Few butterflies other than those I have mentioned were taken at Pajares. A single *L. arion*, a few *Tarucus theophrastus*, flying with *Polygonatus boeticus* over a mixed barley and pea field close to the *casaiens* heather patch, some *P. apollo* on the slopes of a gorge, and a single specimen on the heights, a sprinkling of *Chrysophanus hippothoe*, single specimens of *Glaucopsyche melanops*, *Muschampia proto*, and *Powellia sao* var. *eucrate*, got into my net. *Cœkonymphe arcania* was to be found on all the hillsides. *Epinephele jurtina* ab. *hispulla* was abundant in all the meadows, and I took a few *E. tithonus* and a single *E. pasiphaë* on the border of a copse. *Urbicula comma* was going over. The nettles and thistles, there were large patches of both, were peopled with *io*, *urticae*, *atalanta*, and *cardui* larvæ.

A few moths came to the light of our acetylene lamp in the pigsty, and others were met with while in the field. I have set the following:—*Ortholitha plumbaria* (dark), *O. bipunctaria*, *Eurranthus pennigeraria* var. *chrysitaria*, *Hepialus alticola*, *H. castilanus*, *Perinephele lancealis*, *Acidalia nitidata*, *Larentia montanata*, *J. galiata*, *L. dotata*, *L. bilineata* var. *testaceolata*, *Phasiacne petrarica*, *P. clathrata* (dark), *Orygia aurolimbata* var. *guadarramensis*, *Guophos asperaria* and var. *pityata*, *G. uncidaria* and var. *ochracearia* and ab. *grisearia*, *G. pullata* and var. *confertata*, *Ellopiæ prosapiaria*, *Nemoria* sp., *Codonia* sp., *Plusia chrysitis* ab. *aurea*, *P. gutta*, *P. gamma*, *Cilix glaucatus*, *Anartia myrochræaria*, *Anthrocera scabiosæ* and ab. *divisa* and var. *orion*, *Thyris fenestrella*, *Malacosoma castrensis* var., *Enistis quadra*, *Bryophila algæ* (dark var.), *Mamestra dentina* ab. *latenai*, *Dianthocia cucubali*, and *D. compta* var. *galactina*. The *galactina* is especially interesting as, so far as I know, it has not been taken yet on the Continent of Europe. At all events the authors do not give it as having been taken anywhere on the mainland, its habitat being given as Sicily.

The moths that some people are still pleased to call micros I have not yet had time to work through, but they were fairly plentiful on the "maquis" of the hillsides round Pajares. The *Crambus* that seemed to be most abundant was *C. mytilellus*.

A further account of our work in Spain I now leave to the able pen of Mrs. Page, who joined us when we left the pigsties.



In the Cantabrians. August, 1914.

By ROSA E. PAGE, B. A.

“O blest seclusion from a jarring world
Which he thus occupied enjoys.”—COWPER.

“That is my highest joy, that I am beyond the reach and press of the world.”
—Luffmann's *Quiet Days in Spain*.

How true the above quotations were to prove I little dreamt when I left England towards the end of July to join Mr. Page and Mr. Muschamp in Spain. I found them both very disappointed with their fortnight's work at Pajares, where there seemed to be practically nothing to do, entomologically speaking. We therefore decided to make a move to Brañuelas, a village on the direct line to Coruña, and right among the Montañas de Leon. Reaching Leon about 10 p.m., we supped at the Station Fonda and procured a few hours sleep in the *dépandance*, picking up the Madrid-Coruña train at 4 a.m.

The journey from Leon to Coruña was most delightful, and showed us quite a new type of scenery. The reddish-brown soil glowed with ruddy hues as a magnificent sunrise gradually lit it up, the Montañas de Leon forming a low line along the distant horizon and standing out in much darker lines from the lighter tints of the *campo*. As the train crawled slowly westward we passed village after village of sundried bricks (a composition of mud and straw), the exact tint of the soil, with here and there trees of a variety of poplar, the branches of which had been lopped in such a manner as to leave a regular series of tufts from base to crown.

Arriving at Brañuelas, we found there was no accommodation for visitors except at the Cantina of Román Fidalgo opposite the station, a very dirty place, with food “en suite,” but the beds a little better than one might have expected. The village itself is not so dirty as those we passed through in the Albarracin Sierras, but water is a rare commodity and sanitation non-existent. The old village, about ten minutes' walk, is still more primitive, and quite impossible.

We found the rock here a carboniferous one, as at Pajares, and the rounded hills of only slight elevation covered with various species of heather and two or three varieties of a large-flowered *Erodium*, which gave us hopes of finding *Cocconympha dorus* var. *matheui*. On July 31st we followed the waters of the valley from their head, working the marshes on both banks. Here *Cocconympha iphioides* appeared in numbers, a fair proportion of both sexes being fresh. We found the larger proportions of the specimens in the drier part of the marsh, and especially in a small grassy patch close to the stream. They fly on the level of the tops of the reeds, and one has to follow up each insect as soon as spotted, no easy task, with one's feet sinking into the bog at each step; but about midday they become lazy and lie slightly on their sides ovipositing, in which condition they are very easy to pick up. I noticed, as at La Granja, an occasional *Epinephile tithonus* flying with them, and a “blue” or two from the higher slopes.

The dark green of the heather forms an admirable background for the azure sheen of crowds of *Plebeius argus* var. *casaius*, both sexes in very good order, and many with very red spots round the bases of the wings; they are rather larger than the Pajares specimens. Of other insects there were only *Pontia daphilice* (mostly over), *Colias edusa*,

Melanargia lachesis, and a single *Lampides boeticus*. Up to now no sign of *Coenonympha dorus* var. *mathevi*.

August 2nd.—On the hills among the heather we at last found *C. dorus* var. *mathevi*, but very scarce; the total number taken by the three of us, after much tramping up and down to get them to rise, was 18 specimens, of which only the ♀s were fresh; one ♀ was taken in the afternoon, resting on heather, among a crowd of *Plebeius argus*; but all the other specimens had settled out of sight, and when disturbed flew a short distance and then settled again. *P. argus* was everywhere, flitting among the bushy heather all the morning, and resting in the afternoon about six inches down the stems. Although many settle on one plant, very rarely is there more than one on a stem, and they appear to arrange themselves so as to simulate a cluster of flowers.

Besides these few species, there seemed to be nothing at all, and if one may confess it, we found the Montañas de Leon somewhat monotonous, with their eternal repetition of gently-rounded heather-clad summits, in whatever direction one tramped.

After some poring over the wonderful geological maps (the only ones procurable and not in the least to be relied upon), we fixed on Ponferrada as a new centre from which we could, by means of a tent brought with us from England, explore both the Cantabrians to the north, and El Teleno in the Montañas de Leon to the south. It also, so far as could be ascertained from the map, promised a different rock to the carboniferous, which had not, so far, brought us much luck.

At Ponferrada we found the only fonda quite comfortable, although of course the cooking is Spanish; the extensive view from the balconies over the city and the campo towards El Teleno is, to my mind, quite unique, and the collecting is in every way more interesting than at Brañuelas. In May and early June I should say it would be an ideal spot for a stay, and it would be interesting to know what species are to be found there at that time. In August we found most of the flowers dried up, and the hills looking quite bare. Crossing the Roman bridge, and getting up into the hills on the 4th, we worked up a dry torrent bed, shaded by chestnut trees. There were *Epinephile ida* (♂s all *passés*) flying with *Aricia melon* (*astrarcho*); rather large *Rumiccia phlaeas* ab. *nigromaculata* were settling on a large-flowered lavender, together with a few *Polyommatus icarus*; *Epinephile jurtina* with many var. *hispulla* and *E. lycan* were in crowds under the chestnut trees, resting in very much the same way as Satyrids do; *E. jurtina* var. *hispulla* was also in numbers on the dry sandy torrent bed evidently enjoying the heat. Among other captures were two *Papilio podalirius* var. *feisthamelii*, one freshly emerged *Satyrus statilius*, a single *S. aleyone*, *Melitaea phoebe*, and one very worn *M. didyma* with a few *Pontia daplidice*, *Pyrameis cardui* and *Colias edusa*.

While working in this secluded valley, so far away from home, it suddenly struck us for the first time that perhaps the war might seriously affect the chances of our return; on further consideration, it seemed possible that it was our duty to return at once, although the French lines were all closed for mobilisation and the frontier impossible to pass. We therefore wired to Madrid for instructions, and having done all that was possible, made the most of our time, and next day lunched in the same valley, where, however, we found nothing fresh,

except a single specimen of *Papilio machaon*. A wire had meanwhile arrived, advising us to take an American boat from Vigo or from Coruña, and another informed Mr. Muschamp that the Swiss frontier was closed except to reservists. The next few days were passed in much uncertainty as to what might be the right thing to do; from the replies it was plain that no help could be expected from the consuls; we decided to remain where we were, and trust to the French frontier being re-opened and the train service to Paris re-established after the completion of mobilisation. All hope of penetrating the mountains with the idea of camping there now had to be abandoned, so we made the best of the grand sunny days still left to us, by working in the immediate neighbourhood of Ponferrada.

Our favourite collecting grounds were the rocky banks of the Rio Sil, above the town—a delightful spot, where in the hot sun, we took a few *Lampides boeticus*, several pairs of *Pararge aegeria* gambolling under the chestnut trees, and a couple of prettily-marked *P. maera*: *C. edusa* and *P. daphnice* were everywhere, and *S. statilius* was just emerging. Here it was our wont to take under the trees, a light repast of eggs, trout, green figs and wine, and some of us slept away the afternoons in the shade of the chestnut-trees, lulled by the gentle flow of the limpid river, the singing of many birds of species unknown to us, and the gentle breezes which tempered the heat of the fierce Spanish sun, while the energetic minority scoured the slopes in the hopes of finding new species.

While rambling one afternoon among the ruins of an exceedingly fine old castle of the Knights Templars, which dominates a bend of the river, to our delight we came upon several *P. podalirius* var. *feisthamelii* circling round the highest tower, and ever and anon alighting on the ragwort with which the enclosure was covered. Being without nets, we could not resist the temptation to follow them up, and had very little difficulty in taking them from the flowers with our fingers, setting them free again for the mere pleasure of watching them fly.

The heat continued, culminating on August 11th in a grand thunderstorm. The 12th was a hot but very pleasant day, and we worked the hills through which the river cuts its way, finding much the same insects as before, *S. statilius* increasing in numbers. Mr. Muschamp took the first *S. jidia*, just emerged. *S. statilius* appeared to be everywhere; they settle most frequently on a species of holly-thistle, where the ♀ probably oviposits. They have a habit, when disturbed, of flying a short distance, but are easy to capture if stalked; they like to rest on stones, with wings tilted sideways. Each day we took a few *P. podalirius* var. *feisthamelii*, Mr. Muschamp picking up one very yellow specimen. *P. machaon* were also captured, together with a pair of *Melitaea didyma*, in cop. A fresh brood of *P. cardui* were now emerging, while *C. edusa* seemed to be continuously brooded; *E. ida* were still coming out, as were some *Pyrameis atalanta* from Pajares pupæ. During this heat wave we found the river most attractive, the water being quite warm. Here, lying on the sun-baked rocks, and glad of the slightest breezes wafted over the water, we envied the trout darting to and fro or hiding under the rock ledges, and watched the clouds of dragonflies, the deep blue males glittering with purple iridescence as their wings caught the sunlight, flirting and mating with their greenish-yellow partners.

On the 13th we tried new ground towards the *campo*, but turned off to the left just over the bridge and followed the stream downwards; we found no butterflies here, and were presently barred by precipitous rocks, up which we scrambled and reached some rough hills above, overlooking the railway from Astorga. Here we saw many *S. statilius* and a couple of *S. julia*, but found them very wild owing to a strong wind which was blowing.

The next day was devoted to some *garbanzos* fields near the Roman bridge, where *L. boeticus* was plentiful but in varying condition, flying with a second brood of *P. daplidice*, an occasional *P. podalirius* or *P. machaon*, and a single specimen of *Colias edusa* var. *helice*. *L. boeticus* flew low among the chick-peas, the pods and leaves of which were as dry and brittle as can only be possible in a country so parched up as Spain is in August. About one-third of our captures were worth retaining, which may be partly explained by the quantity of *garbanzos* débris netted with them. It says much for the courtesy and long-suffering of the peasants who passed on mule-back, that they did nothing more than shout at us.

On our last day in Ponferrada Mr. Muschamp took a very worn *Dryas pandora* near the Rio Sil; this is an interesting record from the locality.

The French mobilisation being now completed, the Government arranged to run one train a day to Paris, commencing on the 19th; we therefore got on as far as Burgos, so as to be within easy reach of the frontier. Having wired to the French Consul at San Sebastian for instructions, we took our nets, and following the Paseo to the Cartuja de Miraflores, on a bare hill in high wind took *S. statilius* and *C. pamphilus* ab. *pallida*, the latter of which was the same form as we had taken at La Granja in 1912; one ♀ *P. coridon* ab. *obsoleta* was also netted here. No answer having come from San Sebastian, we worked the same ground again next day; the air being close and the sky overcast, we observed *S. statilius* to be as tricky as *D. pandora* had been at La Granja on a similar day. In addition to the insects noted, there were *Hipparchia briseis*, *C. edusa*, *C. hyale*, *P. daplidice*, *E. tithonus*, *Melanargia lachesis*, *E. jurtina*, and a tribe of very small *E. lycan*, with one ♀ and four ♂ *coridon* var. *aragonensis*.

Here collecting ended, as we left Burgos next morning at 3 a.m., and spent the day in San Sebastian, fulfilling the requirements of the French consul with regard to passports and photographs. Leaving in the evening for Hendaye, we found ourselves the only passengers in the train as it crossed the frontier, and we were privileged to have the attention of the military and customs officers centred upon us. They were, however, very friendly, frankly admired the insects, and passed all our luggage, camera included. Of the journey home through poor unfortunate France, and the contrast between her and the happy, peaceful Spain we had left behind us, of the kindness shown us everywhere, (and especially at Paris by some English gentlemen who had only just succeeded in escaping from Germany, and were returning home, ruined by the outbreak of war), I cannot write here. For the first time, we regretted maligning on previous trips the dear old English Channel; the crossing had always been a *bête-noire*, but we now knew La Manche to be the only bar to a similar invasion to that which was taking place so near Paris.

A Note on the *Chrysophanidi*, and *Polyommatus amandus*.

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

In the March number of the *Ent. Record* there were some notes on the *Chrysophanida* by Miss Fison, in which the fact that she had not observed the species of this tribe in abundance during the last two seasons' collecting was attributed to the weather and made the basis of certain arguments.

The majority of the *Chrysophanida* are somewhat localised in their habitats, and three or four visits on separate days to such localities cannot give one anything like a sufficiently accurate amount of information, as to their abundance or otherwise, for such arguments.

I collected during the seasons 1913 and 1914 in the Rhone valley and neighbouring country, over much of the ground referred to by Miss Fison, and my experience has been very different. Without claiming to have given any particular attention to the species in question, I should say they were quite as well represented as usual, and judging from the series taken, and those taken by friends, both *C. hippothoe* and *L. alciphron* var. *gordius* were unusually abundant. *H. vigeanae* is of course seldom abundant in the lower valleys of Switzerland, and *L. dorilis* is always erratic in its appearance, but of it I have seen a dozen or more specimens in a single morning at a less well known spot near Vernayaz. *C. hippothoe* in one or two localities was very plentiful, and *L. alciphron* var. *gordius* also. Miss Fison notes that she never found this species "really plentiful" at Vernayaz, but, on June 30th last, when I had the pleasure of taking Col. Manders to Vernayaz, the sight of the day was without doubt the dozens of specimens of this species resting on and flying round the privet bushes. We were both much interested, and I certainly had never seen it in such numbers before.

All collectors know how easy it is to overlook a species, if not singled out for special attention. A marked instance of this was shown in another note of Miss Fison's. She writes (*Ent. Rec.*, vol. xxvii., p. 16)—"Charpigny is quite ideal for *orion*, and it might get there from Branson as easily as *amandus* from Vernayaz." *P. amandus* is quite common in the marshes at the north end of the Rock of Charpigny. One can only suppose that Miss Fison overlooked this fine "blue" both seasons, as she did the *Chrysophanida*, and on taking a specimen of it at Charpigny concluded it came from Vernayaz. While mentioning *P. amandus* it may be interesting to add that it occurs over a great tract of ground on the S. side of the Rhone from Aigle down to the level of Roche, and on towards Vouvry.

I merely publish these notes as it seems a pity to try and found theories on such subjects, with so very incomplete and fragmentary an amount of data to build upon.

Egyptian Butterflies.

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

I have little indeed to add to Colonel N. Manders' most interesting account of his experiences while collecting in Lower Egypt. I had scarcely any time to collect between November 10th, 1914, when I

arrived in Egypt from Turkey, and March 23rd, when I left for Athens. In January and February *Anthocharis belemia* was noted in fair numbers, and I took an example of *Raywardia telicannus* in late January in a garden in Cairo. I have not generally taken this species in winter in Egypt. Despite heavier rain than usual the desert was most unproductive. I took four *Pontia glauconome* in December and January near Heluan. On March 14th I paid a visit to Heliopolis for *Hesperia ecanida* (*amenophis*, Rev.). Result, one ♀ *Hesperia* taken by my companion, and a larva, apparently of this species, taken among spun-up leaves on the lower stalks of *Convolvulus lanatus*.

On March 17th I went to the Mokattams to look for this "skipper" and saw, but after a hard chase failed to catch, a ♂ *Catopsilia florella*. On the 18th Dr. A. Andrés, of Heliopolis, took a ♂ of this species in Wadi Hof. This is the first recent record of *C. florella* in Lower Egypt, I believe. To the meagre list of Egyptian butterflies I must add *Anthocharis charltonia*, of which Dr. Andrés took a good ♂ late in February, 1908, at Kingi Maryut, a station in the Maryut steppe.

The butterflies observed or taken by me in Egypt this winter were:—*Chapra mathias* (just emerged, Cairo, March 21st, 1915), *Hesperia ecanida*, *Virachola liria* (larvæ), *Lampides boeticus*, *Raywardia telicannus*, *Zizera karsandra* (*lysimon* of earlier collectors, but identified by the genitalia as the sp. or var. *karsandra*), *Tarucus theophrastus*, *Pieris rapæ*, *Pontia glauconome*, *Anthocharis belemia*, *Coïtis elusa*, *Catopsilia florella*, *Danaïd chrysipus*, *Pyrameis atalanta* and *P. cardui*—a total of fifteen species.

The Colonel Mander's remarks concerning *P. lowei*, is not the large intensely coloured Egyptian ♂ form var. *gigas*? It seems to me identical with my Lebanon specimens, which are certainly *gigas*. The blue ♀ has been recently described by Dr. Andrés. As regards *Virachola liria*, I have obtained the larvæ in spring and early summer, before the pomegranate season, from the pods of "fitneb"—*Acacia farnesiana*; the larva has also, so I learn, been taken from dates. If climatic conditions prove suitable there is really no reason why this insect should not eventually make its way into South Asia Minor, Crete, Cyprus, and the Peloponnese. I have taken it near Beirut, and am inclined to think it a recent immigrant there.

An early visit to Ranmore Common, Surrey.

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

May 9th was a lovely, warm and sunny morning after several fine days, and being at liberty I thought that a trip to an old collecting ground of mine would be a pleasure. A glance into the small garden at the back of the house gave a glimpse of *Ulastrina argiolus* flying across, and on the railway bank beyond *Pieris rapæ* was also among the early risers.

Burford Bridge station was reached somewhat past ten o'clock. Strange to say not a single "white" had been seen on the banks of the railway during the journey down. The dandelion had now replaced the earlier Composite, the Coltsfoot, and other spring flowers were beginning to show strongly. I noticed that one of the row of big poplars near the station had no foliage, and showed clearly masses of

the mistletoe which all of the trees here have borne for so many years past.

Soon after leaving the station the roadside hedge, where ivy and holly mingle, was dotted here and there with the males of *C. argiolus*, either flitting or settling. Strangely there were no females, nor did I see any on my return in the late afternoon, although some of the males were worn.

Continuing along the road, after securing some half a dozen of the "blues," the ruins of the old pilgrims' church was passed, near which, years ago, quite by chance, I picked two or three Roman snails, *Helix pomatia*, for a friend, and met with one having its whorl left-handed. Along the roadside grows plenty of the delicate celandine, *Chelidonium majus*, on which one can usually find a species of the beautiful dusty-wing Rhyncophorid *Aleyrodes*. It was close here, too, that several times an adder has been met with curled up basking in the sun. Past a wood and deserted chalk pit, where later on plenty of Geometers may be met with, the road runs between open fields, usually under cultivation, and produces as a rule at this time of the year *Euchloë cardamines* and *Gonepteryx rhamni*. However, on this occasion only the latter turned up, and evidently the former was not yet generally out, as none of the orange-coloured eggs were to be found on the *Sisymbrium officinalis*, which grows so abundantly along the hedgerows.

On reaching Bagden Farm the road was left and the unfrequented footpath leading through the fields and woods to Ranmore was taken. Under the adjacent elms there was plenty of the flower-spikes of the toothwort, *Lathraea squamaria*. This spot is hallowed ground to the lover of nature, for here more than three hundred years ago our illustrious countryman, John Ray, found and recorded the occurrence of this uncommon saprophyte on the roots of the elm. The path leads into a short valley, partly ploughed up and partly covered by rough growth and a few birch, privet, hawthorn, rose, etc., bushes. This is a capital hunting ground both for insects and flowers, but to-day of the former only. *Vanessa io* in some number were met with. If a search had been made on the tree-trunks of the adjacent woods no doubt the beautiful green *Tortrix literana* would have turned up, and later on *Hamearis lucina*, *Stauropus fagi*, *Brenthis euphrosyne*, etc. Instead of continuing up the valley, which leads to the well-known post-office tea-house, a return was made to the path beneath the big tree at the right hand side, where grows abundance of the large tutsan, *Hypericum androsaemum*.

A long walk through the beautiful woods on the northern slope of the common brought me to a lonely house known as Tanners Hatch on the path leading from Bookham past Polesden Lacy, eastern side. Here among low herbage was a large and thickly clustered patch of the lady's-smock *Cardamine pratense*, on one flower of which hung a *G. rhamni*. About this spot in years past I have taken *Pararge aegeria*, but apparently this beautiful species has strangely gone from this as well as from many other of its near-London habitats during the last twenty years. The woods were seemingly very bare of Lepidoptera, for no signs were seen on the fair number of trunks examined, and nothing was stirred from the undergrowth or rubbish. Later on plenty of *Drepana unguicula* may be beaten from the overhanging beeches which grow so luxuriantly on this slope.

At last the top of the common was reached, towards the western end, where the woods were more open, with a growth of holly bushes, hawthorn and scattered oaks, and here too were *C. argyolus* males quite common, with *G. rhamni* interspersed. This was the old spot for *Tricopteryx* (*Lobophora*) *viridata*, but I have heard of no records of the species having been taken here of late years. Passing through the gate at the western end of the common a sharp turn to the left was made along an old bridle-path through the beautiful woods on the level to the very crest of the hill which dominates the wooded hollow in the Downs known as Pickett's Hole. In this neighbourhood at the right time abundance of *Hamearis lucina*, early and late races of *Anthrocera filipendulæ*, a race of *A. trifolii*, plenty of *Agriades coridon*, etc., occur. Here too in past years I have taken *Melanargia galathea* and *Pararge ægeria*. Now all to be seen were *Gonepteryx rhamni* of both sexes with one or two examples of *Euchloë cardamines* ♂ and a solitary *Pieris napi* ♂. The woods were filled at this date with bluebells, and having hitherto rarely visited Ranmore Common without meeting white aberrations of this beautiful flower of spring, I pushed into the undergrowth and almost immediately found several spikes of pure white. A halt for an al fresco lunch was made on the top of this coign of vantage, where there is an extensive view of the beautiful Holmesdale valley stretching from Reigate on the east, with the sand ridge of Reigate Park on the south of it, as far as Guildford on the west. The village of Betchworth and the town of Dorking, where the river Mole and the Horsham and Portsmouth line pass through the chalk of the North Downs, with Leith Hill, the highest point of Surrey, to the south, while the pretty village of Abinger is directly below. The continuation of the high sandy ridge from Leith Hill, covered by pines, lies right away towards Guildford on the West, with a glimpse of the isolated sandy mount of St. Martha's Hill in the middle of the valley, in view at the same time is the winding track of the S.E. Railway, which traverses the whole length from Guildford to Red Hill, and affords numerous means of ready access to the prolific collecting districts on both sides.

The area of Ranmore Common is so well besprinkled with notice boards that one would suggest that the preparation, etc., of them, must form a considerable industry in the neighbourhood. The fact is that there are many public paths and several "private roads" (which often means public path) as well as private tracks. These boards are so ambiguously placed that it is quite impossible to tell which path is forbidden, the only indication one can get is that at least one of the tracks is public, which of course to the average entomologist is more than sufficient. A ramble through the western portion of these woods on the crest, the spot for the *Tephrosia* species and *Boarmia abietaria*, produced nothing but *E. cardamines*, *P. napi* and *G. rhamni*. A path leading on to the open common again was taken with the intention of ascertaining how the "land thieves" were progressing with an old lane I have watched for many years as becoming more and more overgrown. As expected I found that the neglect and overgrowth of years has now been successful. There is a fence across the entrance, the first portion of the road cleared of undergrowth, and dug up, showing a plentiful crop of the flints that formed the road and young firtrees thickly planted. Twenty years ago this was an open track

beginning to be overgrown. Further along another path was taken to the southern slope which was traversed to and fro for some distance on the outskirts of the fringe of wood-land, but only the same species were met with. Here are to be found plenty of cowslips and bluebells, interspersed with the early purple orchid, and large quantities of the local plant, *Helleborus niger*, now showing its green flowers in abundance.

At last a turn homewards was made with a visit to the post-office for refreshment, the only spot for miles round where anything of the kind can be obtained. As a matter of fact not even water can be got at the cottages scattered around. It is said that prompt eviction would follow those who would do aught to refresh the wanderer in these beautiful spots. Having made arrangements with the post mistress for a subsequent visit, the north-eastern somewhat barren extension of the ridge of the common was traversed, and a path taken down through the woods, where *Dryas paphia* has been freely taken, and where now *Celastrina argiolus* was flying vying in colour with the superabundance of bluebell which for some years has been so prominent just here. Further on the spot where *C. argiolus* was taken earlier in the day was reached, and one or two more picked specimens taken, all males, just before reaching the station.

Nomenclature.

KIRBY, WILLIAM. "Monographia Apum Angliæ," vol. I., pp. 98-9, Ipswich, 1802. [*Dedication dated "Barham, May 1st, 1802."*]

"TERMINUM EXPLICATIO."

(p. 98).

"III. ABDOMEN."

"Pars corporis postica *tergum ventremque* complectens. Organa hujus mobilia sunt feminis *aculeus*, et *penis* maribus.

1. *Tergum*. Abdominis dorsum s. pars supina, *segmenta dorsalia*, *petiolum*, *basin*, et *anum* includens.

a. *Segmenta dorsalia*. Tergi sectiones transversæ, ventralium segmentorum latera obvolventes, spiraculis pertusæ.

α. *Spiracula*. Pori laterales, in singulo abdominis segmento dorsali utrinque solitarii, per quos respirat animal [Tab. 13, fig. 35, 36. a].

b. *Petiolus*. Pedicellus metathoraci basin abdominis subnectens."

(p. 99).

"c. *Basis*. Pars antica abdominis ex quâ oritur petiolus.

d. *Anus*. Abdominis apex genitalia exerens, *imbriam*, *aculeum*, et *penem* complectens.

a. *Imbria*. Pilorum cilia densa anum vestiens, *Melittarum* familiæ ultimæ propria [Tab. 4. **, c. fig. 1, α].

β. *Aculeus*. Instrumentum ovipositionis, et in quibusdam bellorum gladius timendus, *calceas* et *vaginam* includens [Tab. 13, figs. 27, 28].

a. *Valve*. Laminae duæ coriacea, quibus vagina retracta utrinque obtegitur [Tab. 13, figs. 27, bb., 28, aa].

b. *Vagina*. Theca cornea *spicula* jaculans [Tab. 13, fig. 29].

γ. *Spicula*. Aculei ipsissimi, intra vaginam retractiles, bini, fili,

formes, tenuissimi, apud apicem hinc retrorsum serrulati-
retinaculo instructi [Tab. 13, fig. 28, *bb*, fig. 30].

† *Retinaculum*. Squamula cornea, mobilis, quâ retinetur spiculum
ne justo longiùs jaculetur [Tab. 13, fig. 30, *a*].

γ. *Penis*. Genitale maris *forcipem* et *phallum* complectens.

a. Forcipes. Unci duo vel plures interdum internè ramosi, quibus
mas corripit et comprimit anum femine [Tab. 13, fig. 33, *aa*].

b. Phallus. Organum masculinum [Tab. 13, fig. 33, *b*].

2. *Venter*. Prona pars abdominis *segmenta ventralia* includens.

a. Segmenta ventralia. Ventris sectiones transversæ."

Bibliography of books and articles in which the Genitalia of the the Lepidoptera are considered and discussed, or used as the basis of the subject matter.

Compiled by HY. J. TURNER, F.E.S.

1736. REAUMUR, DE.—De l'accouplement des différentes espèces de
papillons. *Mém. serr. Hist. Ins.*, vol. ii., mcm. 2.,
pp. 57-120., pls. 1-5. Paris.
1738. SWAMMERDAMM, JAN.—Bybel der Natuure. Vol. ii., pp. 598-9.,
plt. xxxvi., fig. 2. Leyden.
1802. KIRBY, WILLIAM.—Terminum explicatio. *Monographia Apum
Anglicæ*. Vol. i., pp. 98-9. *Ent. Rec.*, xxvii., 132.
Ipswich.]
1809. ROLANDO, L.—Observations anatomiques sur la structure du
Sp. nerii et autres insectes. (*Mém. Acad. Turin*, vol. 16,
pp. 39-60, plt. 2. Turin.
- 1815 & 1817. GAEDE, HEINRICH MORITZ.—Beiträge zur Anatomie der
Insekten. 2 plates. Luttich.
1815. HEROLD, MAURITZ.—Entwickelungsgeschichte der Schmet-
terlinge anatomische und physiologische bearbeitet.
Cassel and Marburg.
1818. SUCKOW, F. W. L.—Anatomische physiologische Untersuch-
ungen der Insekten u. Krustenthier. pls. Heidelberg.
1820. HEGETSCHWEILER, JOHANN JACOB, (Rifferschweil).—Dissertatio
inauguralis zootomica de Insectorum genitalibus. Turin.
1821. HERRICH-SCHAEFFER, G. A. W.—De generatione insectorum
partibusque et inservientibus. Dissert. inaug. Ratisbonæ.
Ratisbon.
1826. KIRBY AND SPENCE.—Introduction to Entomology. Vol. iv.,
and Appendix, pp. 561-7. De Genitalibus et Generatione
Insectorum. plt. 22. London.
1832. BURMEISTER, H. C. C.—Handbuch der Entomologie. Vol. i.,
p. 232. (Translation by Shuckhard, Manual of Entomology, p. 216. Eng. Ed. 1836). Berlin. (London).
1837. RAMBUR, M. P.—Faune Entomologique de l'Andalousie.
Hesperides. Vol. ii., plt. 8. Catalogue ditto, pp. 60-93.
(1858). Paris.
1840. DE HAAN, WILHELM.—Bijdragen tot de Kennis de Papilionidea.
(*Voch. nat. Gesch. ned.*, 9 pls. Leyden.
1844. BASSI, DR. C. A.—Studi sulle funzioni degli organi genitali
degli Insetti da lui osservati più specialmente nella *Bomb.
mori*. (*Att. del. 5 Rinn. Sc. It., Lucca*, pp. 39-94).
Lucca.

1848. SIEBOLD AND STANNIUS.—Lehrbuch der vergleichenden Anatomie der wirbellosen Thiere. *Anat. Invert.*, p. 462 (Amer. Ed.).
Berlin.
1853. LACAZE-DUTHIERS, H.—Recherches sur l'armure génitale femelle des insectes. (*Ann. Soc. Nat.*, 3me Sér., vol. xix., pp. 203-237, pl. 4).
Paris.
1857. LEDERER, JULIUS.—Die Noctuiden Europas. p. 27., pl. 4.
Wien.
1859. HOFMANN, O.—Über die Naturgeschichte der Psychiden. *Berl. Ent. Zeit.*, pp. 1-53, 2 pls.
Berlin.
1870. SCUDDER AND BURGESS.—On Asymmetry in the Appendages of Hexapod Insects especially as illustrated in the lepidopterous genus *Nisoniades*. *Proc. Bost. Soc. Nat. Hist.*, vol. xii., pp. 282-306.
Boston.
1872. MCLACHLAN, R.—On the Sexual Apparatus of the male *Acentropus*. *Trans. Ent. Soc. Lond.*, pp. 157-162. London.
1872. HOFMANN, DR. OTTMAR.—Investigations on *Sciaphila wahlbomi-ana* and the allied species. *Stett. Ent. Zeit.*, vol. xxxiii., pp. 433-446. [Trans. *Ent. Ann.*, 1873, pp. 50-69.]
Stettin. [London.]
1876. WHITE, F. BUCHANAN.—On the Male Genital Armature in the European Rhopalocera. *Trans. Linn. Soc.*, Ser. 2, vol. i., pp. 357-369, pls. 55-57.
London.
1877. GRABER, V.—Die Insekten. *Naturkräfte Series*, xxii., p. 151.
Vienna.
1878. WHITE, F. BUCH.—Observations sur l'armure génitale de plusieurs espèces françaises de *Zygaenidae*. *Ann. Soc. Ent. Fr.*, (5), vol. viii., pp. 467-76, pls. xi.-xii.
Paris.
1881. GOSSE, P. H.—The Prehensores of male butterflies of the Genera *Ornithoptera* and *Papilio*. *Proc. Royal Soc.*, vol. xxxiii., pp. 23-27, pls.
London.
1882. GOSSE, P. H.—On the Claspig Organs ancillary to Generation in certain groups of the Lepidoptera. *Trans. Linn. Soc.*, 2nd ser., Zool., vol. ii., pp. 255-345, pls. 26-33. London.
1885. CHOLODKOVSKY, N.—Über den Geschlechts-apparat von *Nematois metallicus*. *Zeit. wiss. Zool.*, Bnd. 42. Leipzig.
1886. CHOLODKOVSKY, PROF. N.—Der männliche Geschlechtsapparat der Lepidopteren, 130 pp., 5 pls.
St. Petersburg.
1887. SMITH, PROF. J. B.—*Callimorpha*. *Proc. U.S. Nat. Mus.*, p. 338, etc.
Washington.
1887. WALSINGHAM, THE RIGHT HON. LORD.—A Revision of the genera *Acrolopus*, Poey, and *Anaphora*, Clem. *Trans. Ent. Soc. Lond.*, pp. 137-173, pls. vii. viii.
London.
1888. WALSINGHAM, THE RIGHT HON. LORD [and JOHN H. DURRANT].—*Aroturra*, gen. nov. *Insect Life*, vol. i., pp. 116-117, fig. 22.
Washington.
1888. STANDFUSS, DR. MAX.—Alte und neue Agrotiden der europäischen Fauna. *Iris*, vol. i., pp. 211-219., pl. x., xi. Dresden.
1888. HOFFMANN, O.—Beiträge zur Kenntniss der Butaliden. *Stett. Ent. Zeit.*, vol. xlix., pp. 335-247, pl. i.
Stettin.
- 1889 etc. SMITH, J. B.—Contributions towards a Monograph of the N. American Noctuidae. *Proc. U.S. Nat. Mus.*, vols. 12, 13, 15, 21; *Bull. U.S. Nat. Mus.*, 38. Washington.

1889. PIERCE, F. N.—The Determination of Species of Lepidoptera by Examination of the Anal Appendages. *Young Nat.*, vol. x., pp. 51-56. Hartlepool.
1889. SCUDDER, SAMUEL HUBBARD.—The Butterflies of the Eastern United States and Canada. Vol. iii., pls. 33-37. Cambridge, U.S.A.
1889. SMITH, J. B.—Contributions towards a Monograph of the *Noctuidae* of temperate N. America. *Proc. Am. Ent. Soc.*, vol. xvi., pp. 321-350, pl. viii. Washington.
- 1889-1901. GODMAN & SALVIN.—*Papilionidae and Hesperidae*. *Biol. Cent. Am.*, vol. ii., pp. 113-637., vol. iv., pls. 65-106. London.
1890. SMITH, J. B.—Contributions towards a Monograph of the *Noctuidae* of temperate N. America. *Bull. U.S. Nat. Mus.*, pp. 1-232., pl. i-v. Washington.
1890. JACKSON, W. H.—Studies on the Morphology of the Lepidoptera. Pt. i. *Trans. Linn. Soc., Zool.*, Ser. 2, vol. v., pl. 4. London.
1890. WALSINGHAM, THE RIGHT HON. LORD [and JOHN H. DURRANT].—*Coptotriche*, gen. nov. *Insect Life*, vol. ii., pp. 322-3, fig. 64 a-c. Washington.
1891. WALSINGHAM, THE RIGHT HON. LORD [and JOHN H. DURRANT].—*Anaphorinae*. *Proc. Zool. Soc. Lond.*, pp. 511-516, pl. 41, figs. 10-15. London.
1891. BAKER, G. T. (BETHUNE).—Notes on the Genitalia of a gynandromorphous *Eronia hippia*. *Trans. Ent. Soc. Lond.*, pp. 1-6. London.
1891. WHITE, F. BUCHANAN.—Structure of the Terminal Abdominal Segments in the males of the Genus *Eupithecia*. *Ent.*, vol. xxiv., p. 129, pls. i. and ii. London.
1891. PIERCE, F. N.—The Genital Armature of the Genus, *Miana*. *Brit. Nat.*, vol. i., pp. 70-75, 2 figs. Hartlepool.
1891. SMITH, J. B.—Contribution towards a Monograph of the *Noctuidae* of temperate N. America. *Proc. U.S. Nat. Mus.*, pp. 197-276, pls. viii.-xi.; pp. 397-406, 1 fig.; pp. 407-448, Pls. xxxvi.-xxxvii. Washington.
1891. TETENS, HERMAN.—Resultate der anatomischen Untersuchung eines lateralen Zwitters von *Smerinthus populi*. *Ber. Ent. Zeit.*, vol. xxxvi., pp. 457-466, pl. xiii., 2 text figs. Berlin.
1891. WOOD, J. H.—On Oviposition and the Ovipositor, in certain Lepidoptera. *E.M.M.*, vol. xxvii., pp. 175-185, 212-215, 253-258, figs. 1-12. London.
1891. SMITH, J. B.—Contributions towards a Monograph of the *Noctuidae* of N. America. *Ent. Am.*, vol. v., pp. 175-180. Washington.
1892. WOOD, J. H.—Our Rush-feeding *Coleophorae*. *E.M.M.*, vol. xxviii., pp. 117-122, 169-176, pl. iv., pp. 282-283, 3 text figs. London.
1892. ESCHERLICH, K.—Biolog. Bedeutung der Genitalanlage der Insekten. *Verh. k.k. zool.-bot. Gesell.*, p. 225. Wien.
1892. BETHUNE-BAKER, GEO. T.—Notes on *Lycæna* (recte *Thecla*) *rhymnus*, *tengstroemi*, and *pretiosa*. *Trans. Ent. Soc. Lond.*, pp. 27-31, pl. 2. London.

1892. PIERCE, F. N.—*Coremia ferrugata* and *C. unidentaria*. *Ent Record*, vol. iii., p. 177, text figs. London.
1892. BETHUNE-BAKER, GEO. T.—A Revision of the *Amblypodia*-Group of Butterflies of the Family *Lycaenidae*. *Trans. Zool. Soc. Lond.*, vol. xvii., pt. 1, pp. 1-153, pls. 4-5. London.
1893. ELWES AND EDWARDS.—A Revision of the genus *Ypthima* with special reference to the characters afforded by the male genitalia. *Trans. Ent. Soc. Lond.*, pp. 1-54, pls. 1-3. London.
1894. PROUT, L. B. [& F. N. PIERCE].—*Coremia ferrugaria*, Haw., and *C. unidentaria*, Haw. *Trans. City of Lond. Ent. Soc.*, vol. iv., pp. 20-35, 2 figs. (and *Ent. Rev.*, vol. v., p. 111, etc.). London.
1894. PEYTOUREAU, S. A.—Remarques sur l'organisation et l'anatomie comparée des derniers segments du corps des Lépidoptères, Coléoptères et Hemiptères. *Rev. biol. Nord. France*. Vol. vii., pp. 29-131. Lille.
Recherches sur l'anatomie et le développement de l'armure génitale femelle des Insectes Lépidoptères. *Comp. rend. Ac. Sci.*, vol. cxviii., p. 358, etc. ditto, mâle. p. 542, etc. Paris.
1894. HOFMANN, O.—Genitalanhänge bei verschiedenen Coleophoren. *Ver. Ges. deut. Naturf.* Vol. lxxv. (2), p. 140. Leipzig.
1895. PEYTOUREAU, S. A.—Contributions à l'étude de la morphologie de l'armure génitale des Insectes. (248 pp., 22 pls., 43 figs. in text.) Bordeaux.
1895. JORDAN, KARL.—The Variation of the Genital Armature of certain Papilios. *Nor. Zool.*, vol. iii., pp. 458-525, pls. xvi-xix. Tring.
1895. SMITH, J. B.—Contributions towards a Monograph of the *Noctuidae* of temperate N. America. *Bull. U.S. Nat. Mus.*, pp. 1-126, pls i.-xiv. Washington.
1895. HOFFMANN, O.—Die deutschen Pterophorinen, systematisch und biologisch bearbeitet. *Ber. des naturwiss. Ver. Regensburg.*, Heft V., pp. 200-207. Regensburg.
1896. VERNON, E.—La borsa copulatrice nei Lepidotteri. *Att. e Mem. Accad. Sc. Lett. ed Arti.*, vol. xii., pp. 369-72., 4 pls. Padua.
1896. ROTHSCHILD AND JORDAN.—Notes on Heterocera. *Nor. Zool.*, vol. iii., pp. 185-209, plt. iv. Tring.
1896. CALBERLA, H.—Über *Erebia glacialis*, Esp., insbesondere var. *alecto*, Hb. and *melas*, Hbst. *Iris*, vol. ix., pp. 377-393, plt. viii. Dresden.
1896. VERNON AND BISSON.—Die postembryonale Entwicklung der Ausführungsgänge und der Nebendrüsen beim männlichen Geschlechtsapparat von *Bombyx mori*. *Zeit. f. wiss. Zool.*, vol. lxi., p. 318, pls. xii., xiii. Leipzig.
1897. WALSHINGHAM, THE RIGHT HON. LORD [and J. H. DURRANT].—*Anaphorinae*. *Proc. Zoo. Soc. Lond.*, pp. 169-175. London.
1897. SCHULTZ, OSCAR.—Über den innren Bau gynandromorpher

- Macrolepidopteren. *Illus. Woch. f. Ent.*, vol. ii., pp. 199-202, figs. 1-3. Neudamm.
1897. DYER, HARRISON, G.—*Callimorpha* again. *Can. Ent.*, Vol. xxix., pp. 97-100, pl. 4. Ontario.
1897. ELWES AND EDWARDS.—A Revision of the Oriental *Hesperiidae*. *Trans. Zool. Soc.*, vol. xiv., pp. 101-324, pls. xxii-xxvii. London.
1898. ROTHSCHILD AND JORDAN.—A Monograph of *Charaxes* and the allied Prionopterous Genera. *Nov. Zool.*, vol. v., pp. 545-605, pl. xiv. A. Tring.
- (To be concluded.)

CURRENT NOTES AND SHORT NOTICES.

Messrs. P. J. Parrott and B. B. Fulton have issued a pamphlet from the New York Agricultural Experimental Station, entitled "Tree Crickets injurious to Orchard and Garden Fruits." They deal mainly with the three more or less abundant species in the State of New York, *Oecanthus niveus*, *Oe. angustipennis*, and *Oe. nigricornis*. The general characters of these and allied species are given for identification purposes, the distribution so far as is known, and also their economic importance, from their predatory habits in attacking other forms of insect life, and from their injurious work upon various cultivated crops. An account is given of the life stages of tree-crickets, and a section is devoted to "Natural Enemies," of which the most common and most efficient are the egg parasites, eight species of Hymenoptera. The rest of the bulletin is taken up with the detailed observation and experiment with the three species referred to and the means of control recommended. The chief damage arises apparently from the establishment of a bark disease in the oviposition punctures, which causes the bark of the older trees to become scarred and roughened, or kills the bark on the younger wood. This disease is a micro-fungus, *Leptosphaeria coniothyrium*, of which spores are probably deposited, (1) as a result of wounds produced by the gnawing of the bark by the female as the initial step in the act of oviposition; (2) by means of the ovipositor, the adhesive substance discharged at the time of oviposition serving to collect and hold such spores as may be left in and around the holes during the drilling process; (3) by the remarkable habit of the insect, which employs its own excreta to close the openings in the bark after the deposition of the egg. The chief remedial measures, upon which stress is laid by the authors, are first and most important, clean culture, and if necessary arsenical spraying. Incidentally information is given as to mating habits, musical structures and song of adults, and feeding habits. There are ten plates and a number of text figures in illustration.

The following are interesting and useful articles in the February magazines. The *Ent. Mo. Mag.* contains (1) a most important contribution by Dr. Chapman, describing larvæ and larval habits of *Ereces argiades*, with five plates, one of which is coloured. (2) Mr. D. Sharp continues his "Studies in *Helophorinae*" in an account of the aedæagus in that group of Coleoptera. (3) Mr. J. R. le B. Tomlin continues his account of the Coleoptera obtained in Herefordshire. (4) Mr. Sieh gives "Notes on the British species of *Ochsenheimeria* described by

Haworth. (5) Mr. H. Champion concludes an article on the life-history of the Snake-fly, *Raphidia*. The *Entomologist* contains (1) Description of a new flea, *Stephanocircus pectinipes* from Victoria, with a plate of details, by the Hon. N. C. Rothschild. (2) An account of the Butterflies of the Bucks Chilterns, by Mr. H. Rowland-Brown. (3) A continuation of the consideration of the Hybrids of *Oporabia* species, with a plate of the genital armatures, by Mr. J. W. H. Harrison.

In the *Canadian Entomologist* for March is an article, "The Symmetry of Insects," by H. B. Weiss. The statement is made that, "All insects are bilaterally symmetrical, or, in other words, the two lateral halves of an insect are alike, and symmetry can be defined as a pleasing equality of parts. Bilateral symmetry is sometimes known as horizontal dual symmetry, inasmuch as bilaterally symmetrical objects are usually oriented from a middle point or portion and exploited by equal movements of the eyes to the right and to the left, which is the natural method. As a result the aesthetic value of dual symmetry is greater in the horizontal than in the vertical."

In the same number is a very important article from an economic point of view, "Notes on the Pupation of the House-fly (*Musca domestica*) and its mode of overwintering," by Prof. C. Gordon Hewitt. The writer points out four methods of the latter habit in northern latitudes, (1) Dormant in cool and suitable shelter; (2) Periodical activity under periodical stimulus of temperature, etc.; (3) Permanently active in warmed buildings, factories, restaurants, etc.; (4) In the immature stages. His remarks on the pupation habits are equally useful to those engaged in sanitation work.

The monthly article in the *Canadian Entomologist* for March on Popular and Economic Entomology deals with the "Importance of Observations on apparently unimportant insects," the author supporting his assertion by numerous instances of detailed work in life-histories which, made years ago, have only recently become of first importance.

In the *Scottish Naturalist* for March is a record of the occurrence of the Coleopteron, *Cryphalus abietis*, in Aberdeenshire, a very destructive insect in many pine forests. Scotland has hitherto been immune from attacks of this destructive pest, the only previous record being one by our colleague Prof. Hudson Beare.

The *Ent. Mo. Mag.* for March contains a supplement of 64 pages and eight plates, comprising a "Synopsis of the British Siphonaptera," by the Hon. N. C. Rothschild. In all 45 species are included. In the same number the following two species of Coleoptera are recorded as new to Britain. 1. *Euthia formicetorum*, taken by Mr. Bedwell in decaying wood in the New Forest, recorded on the continent as occurring with the ant, *Formica rufa*. 2. *Bruchus pusillus* var. *seminarius*, taken in a greenhouse from a bag of French beans (seeds) from Essex. It is a species well known in the southern countries of Europe.

The *Naturalist* for March contains a full account of Yorkshire Entomology in 1914, from reports sent in by the various members of the Entomological Section of the Union. Light and sugar were both very unproductive, and imagines generally were scarce. "Melanism has not been a pronounced feature of the year. Dry seasons seem to arrest the progress of this phenomenon."

The *Annual Report of the United States National Museum*, for the year ending June, 1914, has been received. It says that, "The deposits

of insects by the Bureau of Entomology were exceptionally extensive and notable. The largest and most important was a collection made by the force of the Bureau engaged in the investigation of southern field crops, and came chiefly from Texas. This is probably the best state collection ever brought together." Other noteworthy accessions are from the Bahama Islands and Florida, New Mexico, Arizona, California and Alaska, and numerous gifts from individuals of specimens from faunas outside the United States area. No less than a hundred separate publications, from the department of insects alone, have been issued during the year, many of them containing plates and diagrams; twenty-eight of these contributions deal with the Lepidoptera.

In the *Entomologist* for April, T. V. Theobald announces a lime-tree aphid, *Pachypappa reaumuri*, as new to Britain. This is of especial interest both from its rarity and from the fact that the great French observer, Reaumur, described and figured the leaf monstrosity caused by it in Vol. II. of his famous *Mémoires pour servir à l'Histoire des Insectes* in 1737.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 3rd, 1915.—ELECTION OF FELLOW.—Prof. Wm. Blaxland, M.A., D.Sc., University of Otago, Dunedin, New Zealand. BRENTHIS PALES AND VAR. ARSILACHE FROM NORWAY.—Mr. P. A. Buxton exhibited a short series of *B. pales* and *B. arsilache* from Lesjevaerk and Surendal, Central Norway, the former having been taken at an altitude of 3,000 to 4,000 feet, the latter from 1,000 to 3,000 feet. SICILIAN SPECIES OF EUCHLOË.—Mr. J. Platt Barrett exhibited a series of *E. damone* from Mt. Etna, and commented on their lack of variation. Also a series of *E. cardamines* var. *turritis*, remarking on their small size. GYNANDROMORPHOUS LEPIDOPTERA.—Dr. Cockayne exhibited:—(1) Gynandromorphous *Agriades coridon*, from Royston, August, 1914. The specimen was predominantly female, var. *semisyngnapha*. (2) Gynandromorphous hybrid *harrisoni* (*Ithysia zonaria* ♂ × *Lycia hirtaria* ♀), bred in April, 1912, by Mr. Worsley-Wood. NOTEWORTHY BRITISH RHOPALOCERA.—Comm. Walker, on behalf of Mr. Adams, exhibited:—(a) A magnificent series of varieties of *Polygonia e-album*, including several strongly suffused examples, from the Forest of Dean. (b) Two specimens of *Araschnia levana*, gen. aest. *prorsa*, from the same locality, taken in 1914. (c) A gynandromorphous *Urbicola comma*, right side ♀, left side ♂, from Box Hill. (d) A very fine melanic aberration of *Dryas paphia* ♀, from South Wales. DIPTERA FROM THE FALKLAND ISLANDS.—Mr. F. W. Edwards exhibited two species of apterous Diptera, one belonging to the *Borboridæ*, the other to the *Ephydridæ*, both collected in the Falkland Islands by Dr. Malcolm Cameron, Fleet Surgeon of H.M.S. *Cornwall*, on December 7th, the day before the naval battle. Both appeared to be new to science. A HYBERNATING PUPA OF PYRAMEIS ATALANTA.—Mr. L. W. Newman exhibited a living pupa of *P. atalanta*, and read notes on the copulation of *Pyrameis atalanta* in October, and the hibernating of the species in the pupal stage. A LARGE FAMILY OF ACRAEA ENCEDON, L., BRED AT DURBAN

FROM A KNOWN FEMALE PARENT.—Prof. Poulton exhibited a portion of this family sent to him by Mr. E. E. Platt, who had conducted the experiment. THE GREGARIOUS HABIT DURING HIBERNATION OF *MUSCA CORVINA*, F.—Prof. Poulton described the hibernation of vast numbers of *M. corvina* in the cistern-loft of St. Helens Cottage, St. Helens, Isle of Wight. A paper was read as a basis for a discussion on mimicry:—"The Mimetic Theory—"A Crucial Test," by Colonel N. Manders, F.Z.S., F.E.S. A most important reply was made by Mr. C. F. M. Swynnerton, which he has embodied in the following paper:—"A Brief Preliminary Statement of a few of the Results of Five Years' Special Testing of the Theories of Mimicry," by C. F. M. Swynnerton, F.E.S., C.M.B.O.U. Several Fellows took part in the discussion.

March 17th, 1915.—A SIKKIM ASILID WITH A LARGE *DELIAS* AS PREY.—Prof. Poulton exhibited a female *Promachus* sp., captured with its prey, a male *Delias descumbesi*, Boisd., at Takdah (5,000 feet), Sikkim. A NOTE ON THE AFRICAN HESPERID BUTTERFLY *PLOETZIA CERYMICA*, HEW.—Prof. Poulton exhibited the specimen referred to in the following note written December 26th, 1914, by Dr. G. D. H. Carpenter, from Kakindu. "I send you a skipper of much interest. It came to light one night [December 23rd] about 9 p.m., and behaved much like a moth; the large white patch on the antenna was *extremely* conspicuous and really *glistered* in the light almost as if it were phosphorescent." Prof. Poulton said that the species was usually diurnal. SCARCE VARIETIES OF *ZONOSOMA PENDULARIA*.—Comm. J. J. Walker exhibited, on behalf of Mr. F. C. Woodforde, bred specimens of *Zonosoma pendularia*, L., var. *subroseata*, Woodforde, and var. *subochreatea*, Woodforde, with the type form of the species for comparison. ORGANS IN ANTS' ANTENNÆ.—Mr. W. C. Crawley exhibited drawings in various species of ants, of two kinds of organs in the funiculi of antennæ. They are often, if not always, in the living insects filled with air, and may possibly be connected with the sense of hearing. He also exhibited drawings of genital armatures of various ♂ ants. TERATOLOGICAL SPECIMENS OF COLEOPTERA.—Mr. H. Willoughby Ellis exhibited a male specimen of *Carabus nemoralis*, Mull., taken at Braemar, May 7th, 1912; the right posterior leg is little more than half the size of the left one; the tarsus has the 4th joint truncate at the base, making it much shorter, and soldered to the 5th joint, which is rather broadened. He also exhibited a specimen of the dark variety of *Campylus linearis*, L., taken at Knowle, Warwickshire, in June, 1899. It is of the usual size and, with the exception of the thoracic foveæ being more exaggerated and the right intermediate tarsus being very remarkable, is normal in all respects. Mr. Champion exhibited, on behalf of Mr. W. West of Greenwich, specimens of *Bruchus chinensis*, L. (*pectinicornis*, L.), found in lentils in a London warehouse, also a male found at large at Dartford. NUPTIAL FLIGHT OF BUTTERFLIES.—Dr. F. A. Dixey made a communication on this subject. In his experience the ♂ supported the ♀ in the Pierines.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

February 25th.—LANTERN EXHIBITIONS.—A special exhibition of lantern slides by Messrs. W. West (Ashted), A. E. Tonge, E. J.

Bunnett, C. W. Colthrop, and by Mr. Colthrop on behalf of the members of the Nature Photographic Society, including Messrs. Bedford, Salmon, Sanders, Main, Hocking, Tonge, Irving and Stanley Cook. BRED C. GALLI.—MR. NEWMAN, a long series of *Celerio gallii* bred from N. Cornwall ova. SICILIAN E. DAMONE.—MR. J. PLATT BARRETT, a series of *Euchloë damone* from Sicily, and remarked on the small amount of variation in the species. ABERRATIONS OF *A. CAJA*.—MR. F. W. FROHAWK, a series of yellow forms of *Arctia caja* from the Scilly Isles, where it was met with in some numbers.

March 11th.—EPHYRA PENDULARIA AB. SUBROSEATA BRED FROM SURREY.—MR. BOWMAN exhibited a bred series of *Ephyra pendularia*, including a considerable percentage of ab. *subroseata*. They were a second generation from larvae beaten in Surrey. THE HUGE NOCTUID THYSANIA AGRIPPINA.—MR. GIBBS, a specimen of the huge Noctuid *Thysania agrippina* from Costa Rica, where it sits on tree trunks as does an *Eupithecia*. A GYNANDROMORPHOUS HYBRID.—MR. WICHER, a remarkable gynandromorphous hybrid *Smerinthus ocellatus* ♂ × *populi* ♀ in which the left side was ♂ and the right side ♀. A RARE BOOK.—MR. HY. J. TURNER, a copy of an uncommon work, *Illustrations of British Mycology*, by Mrs. Hussey, 1846, with 92 coloured plates, which he had recently bought cheap, as it was about to be torn up by the bookseller to dispose of the plates at a few pence each as "pretty pictures." MICROSCOPICAL EXHIBITS.—THE rest of the evening was devoted to exhibitions under microscopes. Mr. Adkin, the structure of the cocoon of *Dicranura rinula* and antennal structure in Lepidoptera. Mr. Edwards, a species of *Nycteribia*, the parasite of the Fishing-bat. Mr. West (Ashtead), androconia of *Pieris brassicae*, a *Coccus* found on bananas, and *Hypolexylo coccineum*, a micro-fungus on wood. Mr. Coxhead, a number of mites infesting a brazil-nut. Mr. Ashdown, minute species of Coleoptera and Hemiptera. Mr. Bunnett, larva of a Thrips which had been attacked by a micro-fungus. Dr. Chapman, skins of the first and last stages of *Ereves argyades*, with figures and illustrative notes on the same.

March 25th.—SPECIAL EXHIBITION OF *A. HYPERANTUS*.—THE evening was specially devoted to an exhibition and discussion of *Aphantopus hyperantus*, contributed to by Messrs. Frohawk, R. Adkin, Bright, B. Adkin, Edwards, Dennis, Turner, Curwen, Ashdown, Gibbs, and Leeds. Ab. *arete*, ab. *vidua*, ab. *ocellatus*, ab. *lancoolata*, ab. *minor*, var. *bieti*, ab. *caera*, ab. *obsoleta*, with numerous other forms were shown. ABERRATIONS OF BRITISH LEPIDOPTERA.—MR. BRIGHT showed a fine *Argynnis aglaia* with numerous coalesced blotches of black, a *Polyommatus icarus* with extremely light ground on the underside, and a ♂ *Agriades coridon* of the form *sauris* in which red scaling was developed adjoining the eyespots of the hindwings upperside.

LONDON NATURAL HISTORY SOCIETY.—January 5th, 1915.—NEW MEMBERS.—MR. T. H. ARCHER, of 52, Elsenham Street, Southfields, and Mr. A. E. HODGE, of Southfields, were elected members of the Society. SCOTCH DIANTHOECIA NANA EXHIBITED.—MR. C. H. WILLIAMS, a long series of *Dianthoecia nana* (*conspersa*) from the Shetland Isles and

a few specimens from Croydon. ANNUAL ADDRESS.—Mr. L. B. Prout, the retiring President, read his presidential address.

January 19th, 1915.—NEW MEMBERS.—The Rev. C. E. Raven, of Cambridge, was elected a member of the Society. EXHIBIT OF EUPITHECIÆ.—Mr. L. B. Prout, two drawers containing a series of nearly all the British species of *Eupithecia*, including very variable *E. subfulvata* and its Scottish forms *cognata*, etc.; *E. pygmaea* captured flying in the afternoon at Doncaster; melanic forms of *E. castigata*, *E. albipunctata*, *E. vulgata*, etc. Mr. H. W. Wood, *E. castigata* and its melanic form ab. *obscurissima*, Prout; *E. innotata*, showing 1st and 2nd brood usual forms, and some without the usual markings, also of both broods, from Durham, and ab. *farinata* from Middlesborough; also larvæ of *Pieris brassicæ* taken in a garden at Southfields on January 17th, several degrees of frost being registered that morning. M. TILIÆ.—Mr. Bernard Cooper, a varied series of *Mimas tiliæ* bred from a Lyndhurst ♀ taken June, 1913.

February 2nd, 1915.—THE ANNUAL EXHIBITION.—Dr. Cockayne, an extreme specimen of *Rumicia phlaeas* ab. *eleus* from Berkhamstead, 1911, (a very hot season); a specimen of *Agriades coridon* ab. *semi-syngrapha*, Tutt, from Royston, showing additional blue scales on inner margin of left forewing (a gynandromorph). Also a photograph of the specimen, in which the gynandromorphic characters were clearly shown. Mr. C. P. Pickett, long series of *Agriades coridon* from Royston, the result of 4 years collecting, including males and females with underside markings obsolete; ab. *inaequalis*, Tutt, and certain gynandromorphic females with one side smaller than the other, the small side having scattered blue scales; a specimen in which the male element was on the larger side; and a female unequal on the two sides, the lunules larger and brighter on the right side, which was also of the ab. *parisiensis* form beneath. Mr. H. B. Williams, *Mimas tiliæ* and some of its commoner aberrations including ab. *centripuncta*, Clark; and a long series of *Amorpha populi* including two gynandromorphs bred from one brood in 1914; also a drawer of underside forms of *Polyommatus icarus* including ab. *obsoleta*, Clark, ab. *antico-striata*, Tutt, and others. Mr. H. W. Wood, *Larentia flaricinctata*, type from Rannoch, and a remarkable, light, local race from Ireland; three yellow abs. of *Brephos parthenias* from Surrey; *Nonagria neurica* and its ab. *fusca* and ab. *rufescens* from East Sussex; *Acidalia immorata* bred as a 3rd brood from Lewes, October, 1913; *Ptychopoda (Sterrha) contiguaria*, and a melanic form, and a drawer of *Mellinia ocellaris* and all its known British varietal forms including ab. *lineago*, Gn., and *intermedia*, also the allied species *fulvago*, L., and *gilvago*, Esp., and *gilvago* ab. *suffusa*: also drawings by Mr. Bachlade of the differentiated parts of the genitalia (penis with cornuti) of the allied species *ocellaris*, *gilvago*, and *fulvago*. Mr. J. Riches, a series of *Abraxas grossulariata* bred from wild North London larvæ from 1905 to 1913, including abs. *nigrosarsata* and *deleta (lacticolor)*, and one approaching *varleyata*: also on behalf of Mr. Dewey, of Eastbourne, three *Arctia caxa* with yellowish-orange hindwings, and two *Arctia villiva* with confluent markings, all bred in 1914, and nine *Brenthis euphrosyne* with confluent markings taken in

Abbots Wood in 1913 and 1914. Mr. G. T. Porritt, *Abraeus grossulariata* ab. *nigrocostata* (a magnificent form), and five extreme ab. *nigrosparvata* bred from wild Huddersfield larvæ in 1914; also an extraordinary small second brood specimen, bred from a wild larva. Mr. L. W. Newman, series of *Callimorpha dominula* and its ab. *rossica* from Kent, of *Strymon pruni* bred 1914 from Hunts, and of *Pieris napi* from Ireland, including strongly-marked and yellow females (second brood). Mr. A. W. Mera, series of *Coenonympha tiphon* and *C. pamphilus*, the latter including a female with a patch of upper-side coloration, containing an eyespot, on the underside of the left hindwing, also the British Acidaliids, including melanic forms of *A. idalia cambricata* and *A. incanaria*. Mr. R. S. Benton, a specimen o. *Crymodes exulis* ab. *assimilis* taken at sugar at Braemar. Mr. W. E. King, a long and varied series of *Hibernia defoliaria* from Epping Forest, including a fine melanic ♂. Mr. V. E. Shaw, a series of *Clastrina argiolus*, bred 1914 from Sandown (Isle of Wight) larvæ, a long series of *Eupithemia extensaria* bred May, 1914, from Norfolk larvæ and specimens of *Salcobia semirubella*, and its ab. *sanguinella* from Dover, 1914. Mr. H. T. Payne, two drawers of Leucaniids including *Nonagria cannae*, *N. arundinis* and ab. *fraterna*, *N. sparganii*, *Tapinostola bondii*, *Leucania vitellina* and *L. brevilinea*. Mr. A. W. Buckstone, a specimen of *Brenthis selenus* with black markings obsolescent, from Guildford, *Bithys quercus* ab. *bellus* from Oxshott, a specimen of *Euchelia jacobaeae* with hindwings smoky black and transparent, from Oxshott, a fine obsolescent underside of *Polyommatus icarus* from Sevenoaks, and several smoky females of *Bupalus piniaria* bred from Oxshott.

February 16th, 1915.—EXHIBITS.—Mr. W. E. King, a series of undersides of *Aphantopus hyperantus*, including one ab. *lanccolata* and several ab. *caeca*. Mr. J. Simes, some Spanish butterflies, including *Thais rumina*, *Euchloe euphenoides*, *Zeryx eupheme* var. *meridionalis*, *Charaxes jasius*, *Dryas pandora*, *Melanargia syllius*, *M. ines* and *M. lachesis*, *Agriades thersites*, *Nomiades cyllarus*, *Polyommatus hylas* var. *hispanica*, and var. *lycidas*. Mr. A. Willsden, *Dasygampa rubiginosa* from Bournemouth, Hereford, and Torquay, the Bournemouth specimens being lighter than the Hereford ones, and the Torquay more reddish, also a fine variety from Torquay. PAPER.—Mr. J. Simes, read a paper entitled "A month amongst Spanish Butterflies."

THE LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

January 18th, 1915.—PAPER.—Mr. Wm. Mansbridge read a paper entitled "Silverdale as a Collecting-ground." Having given a brief survey of the Geology and Flora of the district, the author enumerated a large number of local species of Lepidoptera, generally rare in the North of England, but which had been recorded from this favoured area. Many of these, however, had not been recorded for a couple of decades or longer, and members were urged to endeavour to confirm, such as *Agriades coridon*, *Livialis betulac*, *Pararge aegeria*, *Aphantopus hyperantus*, *Cupido minimus*, *Hesperia malvae*, *Stilbia anomala*, *Leptomeris* (*Acidalia*) *marginipunctata*, *Amoebis olivata*, and *Perizoma taeniata*: all of which had been recorded some thirty years ago. He also referred to the two field meetings which had been held at Silverdale; gatherings that had been greatly enjoyed by all who had attended. The author

mentioned having taken a fine specimen of *Coccyx cosmophorana* on May 30th, 1914, in the Gatebarrow wood, also *Adela jibulella* and *Eupithecia distinctaria (constrictata)*. EASTHAM LEPIDOPTERA.—Mr. A. W. Hughes exhibited Lepidoptera from Eastham as follows:—*Hybernia defoliaria*, *H. aurantiaria*, and a very long series of *Cheimatobia brumata*, the latter showing great variation from very pale to very dark brown, almost chocolate coloured forms, the last were scarce, forming only three per cent. of the number captured. *H. aurantiaria* had not been recorded previously for the locality. THE GENUS CNEPHASIA (SCIAPHILA).—Mr. F. N. Pierce showed his extensive series of the genus *Cnephasia (Sciaphila)*, containing all the British species except *wahlboniana* and *abrasana*. With regard to these he stated that it was considered very doubtful whether they had any right to be included in the British fauna or even to be ranked as good species at all. The variation was remarkable in that almost every species showed both melanism and albinism and it is only by a microscopical examination of the genitalia, which can easily be done without damaging the specimen, that the moth can be identified, especially when it approaches the extreme variation.

February 15th.—POCKET-BOX EXHIBITION.—The evening was devoted to a pocket-box exhibition of Natural History objects. Mr. F. N. Pierce contributed a selection of "Insect Habitations," which included portable cases characteristic of the *Psychidae*, *Coleophoridae*, and the *Trichoptera*; he also showed the cases of the *Coleophoridae* under the microscope, and called attention to the character of the silk of which some of them were composed. Mr. R. Wilding exhibited a number of Tortrices collected in the neighbourhood of West Derby, including series of the following:—*Diptypteryx holmiana*, *Catoptria cana*, *Orthotaenia striana*, and many of the common hedge-side species. Dr. Cotton, a box of *Triphaena fimbria* and *Carsia paludata* from near St. Helens. Mr. W. Mansbridge brought a specimen of the fungus *Polyporus betulinus*, which, when dried and cut into strips, he used for mounting micro-lepidoptera; also a series of *Adkinia (Mimaesioptilus) bipunctidactyla*, cinnamon-coloured form, from the Crosby sandhills, and a short series of a melanochroic variation of *Elloppia prosapiaria* bred from a Delamere female; he stated that, although not usually so dark as the present series, the species is considerably darker in Delamere Forest than in the South of England.

March 15th.—ELECTION.—Dr. A. Randell Jackson, M.D., M.Sc., Westcote, Hoole Road, Chester, was elected a member of the Society. PAPER.—Mr. Leonard West, M.I.M.E., read a paper entitled "A Short Account of some Neuroptera." The paper was fully illustrated by lantern slides of the principal species of the various families; these were treated in a way specially designed to enlist the interest of the young entomologist. The metamorphoses and general economy of the Stoneflies, May-flies, and Caddis-flies being ably described by the author. At the close of the paper Mr. West also shewed a number of beautiful slides of river scenery as examples of the breeding places of the insects and as showing the loveliness of the natural surroundings the student would become familiar with in pursuit of these comparatively little known creatures.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8d.; 2 in., 10d.; 2½ in., 1/-; 3½ in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eye, for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidæ*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic)
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
Pajares, <i>P. P. Muschamp, F.E.S.</i>	121
In the Cantabrians, 1914, <i>Rosa E. Page, B.A.</i>	123
A Note on the <i>Chrysophanidi</i> and <i>Polyommatus amandus</i> , <i>B. C. S. Warren, F.E.S.</i>	128
Egyptian Butterflies, <i>P. P. Graves, F.E.S.</i>	128
An early visit to Rammore Common, Surrey, <i>H. J. Turner, F.E.S.</i>	129
Nomenclature [Kirby, William. <i>Monographia Apum Angliæ</i>]	132
Bibliography of books and articles in which the Genitalia of the Lepidoptera are considered and discussed, <i>H. J. Turner, F.E.S.</i>	133
CURRENT NOTES	137
SOCIETIES:—The Entomological Society; The South London Entomological Society; The London Natural History Society; The Lancashire and Cheshire Entomological Society	139

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Dr. Cockayne, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, G. T. Bethune-Baker, H. E. Page, A. J. Fison, J. A. Simes, C. P. Pickett, Dr. Barr, A. Tetley, Parkinson Curtis, H. B. Williams, H. L. Earl, A. Sich, P. A. Buxton, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The Entomologist, vols. 20-30, 1887-1897 (11 years) £3 10s. 0d.
 " " vols. 39-46, 1906-1913 (7 years)
 Entomologist's Record, &c., vols. 1-25. Price, £5 0s. 0d.
 Practical Hints for the Field Lepidopterist, Tutt, 2 vols. 7s. 6d.
 Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
 British Moths. Tutt, 2s. Moths of Brit. Isles (South), Vol. 2. 5s.
 British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
 Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
 Lepidopterist's Calender, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the Widow of the late J. ALDERSON. Apply :—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TATCHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
 :: IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

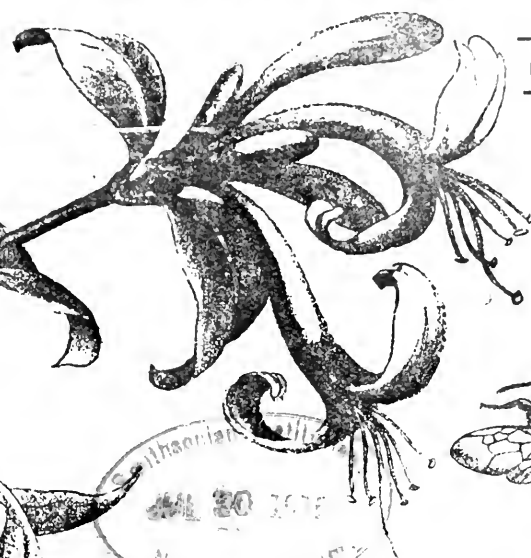
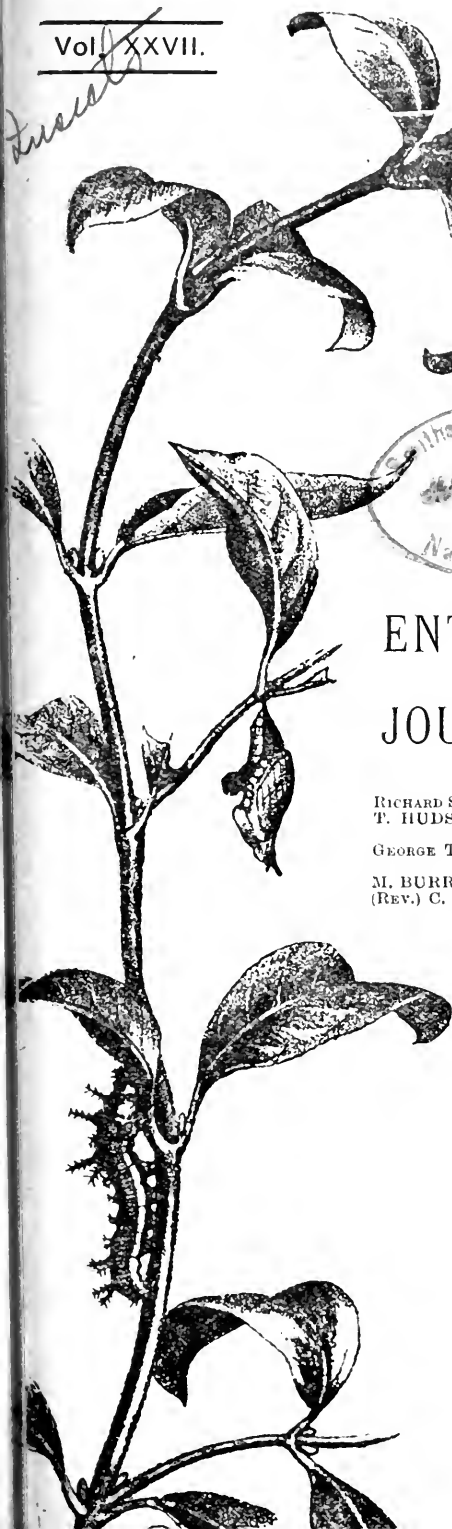
Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers] Cabinets in good condition. Full particulars on
 application.

The next Part will be issued on September 15th.

Vol. XXVII.

Nos. 7 & 8.



THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S. | T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARE, | JAS. E. COLLIN, F.E.S.
B.SC., F.E.S., F.R.S.E. | H. ST. J. K. DONISTHORPE,
GEORGE T. BETHUNE-BAKER, | F.Z.S., F.E.S.
F.Z.S., F.L.S., F.E.S. | ALFRED SICH, F.E.S.
M. BURR, D.SC., F.Z.S., F.L.S., F.E.S. | J. R. LE B. TOMLIN, M.A., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S. | GEORGE WHEELER, M.A., F.E.S.

and
HENRY J. TURNER, F.E.S.,

Editorial Secretary.

JULY-AUGUST 15th, 1915.

Price ONE SHILLING & SIXPENCE (NET).
(WITH SIX PLATES.)

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,
"BERTHOSE," GELLATIA ROAD, NEW CROSS, S.E.

LONDON:
ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:
G. REIMER, BREITENBURGER STRASSE 17

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

THE TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera.—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.*, "Varieties and aberrations of Noctuæ from Doncaster."—*H. H. Corbett, M.R.C.S.*, "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.*, "*Eudryas stæ-johannis*."—*A. Radcliffe Grote, M.A.*, "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.*, "Larvæ."—*Rev. G. M. A. Hewitt, M.A.*, "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.*, "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.*, "Pupæ hunting in October."—*J. W. Tutt, F.E.S.*, "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Riding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.*, "The Lepidoptera of Swansea."—*Major R. B. Robertson*, "*Caradrina ambigua* in the Isle of Wight."—*A. J. Hodges*, "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.*, "*Orrhodia erythrocephala* ab. *glabra* from Devonshire and comparison with *O. vacciniæ*."—*Dr. W. S. Riding, F.E.S.*, "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.*, "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Mazr, F.E.S.*, "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.*, "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.*, "Coleoptera at Ipswich."—*Claude Morley, F.E.S.*, "Notes on *Bombus visurgis*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.*, "The Lepidoptera of Grésy-sur-Aix."—*J. W. Tutt, F.E.S.*, "*Apatura iris*."—*Rev. G. M. A. Hewitt*, "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.*, "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.*, "The Genus *Smerinthus*."—*A. Bacot*, "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.*, "Wing structure."—*J. Alston Moffatt*, "On the development of sex in social insects."—*J. W. Tutt, F.E.S.*, "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.*, "Habits and variation of *Lithosia litarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.*, "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.*, "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.*, "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.*, "The Macro-Lepidoptera of Keswick."—*H. A. Beadle*, "Varieties of *Argynnis selenæ* (with plate).—*S. G. C. Russell, F.E.S.*, "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.*, "*Zygæna minos* and its varieties."—*J. W. Tutt, F.E.S.*, "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.*, Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7/6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is

H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

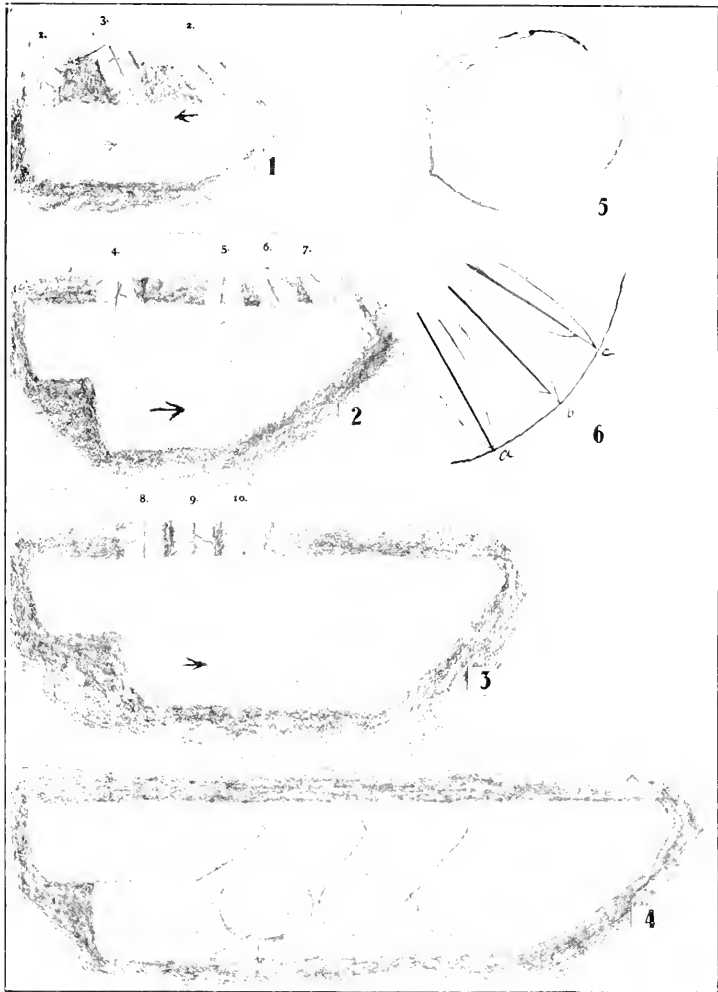
By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

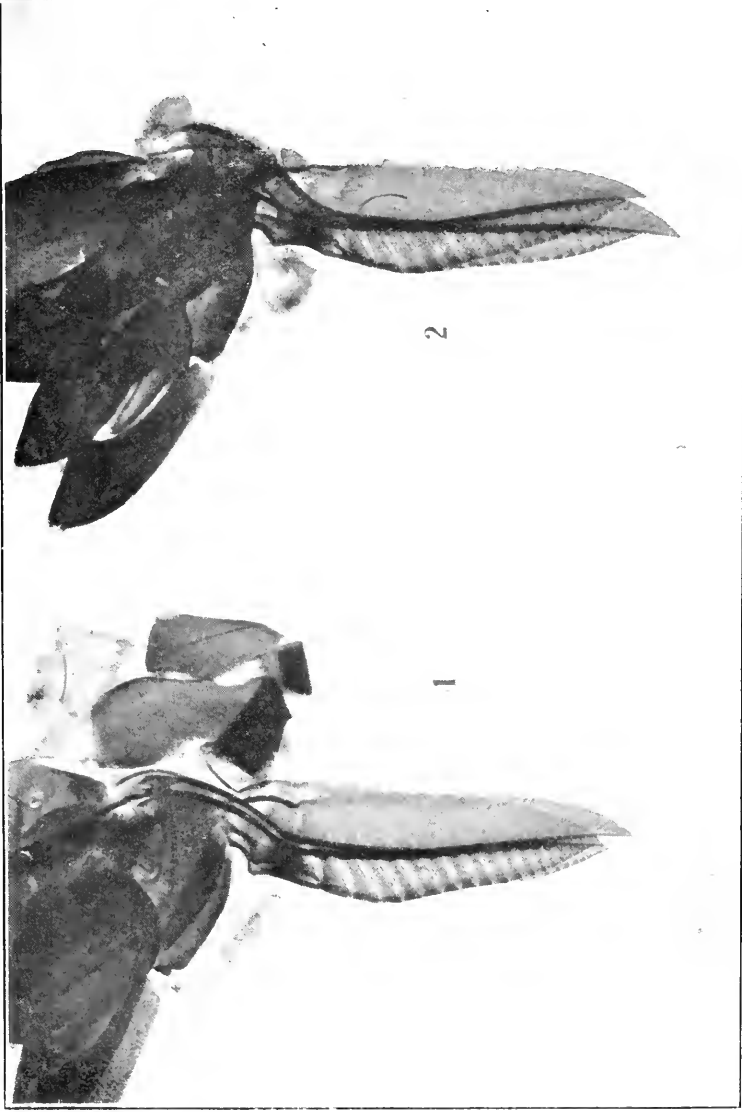
CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.



Del. T. A. Chapman.

DIAGRAMS TO ILLUSTRATE THE CUTTING OF THE POCKET BY *PHYMATOCERA* ABOUT 10.

The Entomologist's Record, 1915.



THE TERFIRA OF *PHYMATOCERA ATERRIMA* ♀ 20.

The Entomologist's Record, 1915.

Photo. J. E. Touge.

The Egg-laying of *Phymatocera aterrima*, Klug. (With two plates.)

By T. A. CHAPMAN, M.D.

Mr. L. E. Adams, having discovered in his garden a colony of *Phymatocera aterrima*, Klug., afforded me the opportunity of observing its process of ovipositing. This is the species that Mr. Morice observed, and gave so interesting an account of in his Presidential address to the Entomological Society in January, 1912. As such records are not numerous, it is not undesirable that further observations should be reported in confirmation and extension of those already made. It seems also expedient to compare the operation of egg-laying as carried out by *Phymatocera* with the procedure of *Trichiosoma*, which I observed two years ago (*Trans. Ent. Soc.*, 1914, p. 173).

Without regarding it as necessary to adopt strict priority in the naming of anatomical structures and various parts of insects, it is well to do so as far as possible.

Mr. Morice has been kind enough to give me the result of his enquiries as to the names of the several structures used by sawflies in oviposition given by the earliest authorities. Linnæus recognising, that these parts are, as has since been shown, homologous throughout the Hymenoptera, called the piercing organ, as a whole, *aculeus*.

Latreille apparently restricted *aculeus* to the ovipositor of the *Aculeata*, giving the name *terebra* to that of sawflies (and others).

Recognising that *terebra* is in one sense a partial synonym of *aculeus*, we may accept it for the ovipositor of sawflies, since though we might call it an *aculeus*, we could not very well call it a sting. The *terebra* consists of two plates, each of two parts, which in the vernacular are now known as "saws" and "supports." The Latin names for these as given by Kirby (1802?) are, for the supports, *ragina*, for the saws, *spicula*, and for the saw-sheath into which the *terebra* retires when at rest, the *rastræ*. Mr. Morice discards *scalpellum* as synonymous with *aculeus* (and *terebra*).

Phymatocera lays in stems of *Conrallaria* which are still growing and succulent, just as *Trichiosoma* lays in the young growing leaves of *Salix*. It resembles it in another peculiarity, viz., that its operations are carried out by separating the cuticle from the underlying tissues, and not by digging into the latter. The same process is followed by other species whose eggs I have examined after they were laid, though without having seen the actual laying. For example this was the case with a fly, which, if I remember rightly, Mr. Morice told me was *Emphytus grossulariæ*, of which, some years ago, I bred continuously several generations, on violet. The larva was black with white dots, quite unlike that described as that of *E. grossulariæ* in Cameron's *Phytophagous Hymenoptera*. This insect is of course unrelated to *Nematus ribesii*, the gooseberry pest. The eggs are laid singly in the upper surface of leaves of dog-violet, and grow somewhat after they are laid.

A peculiarity in the laying of *Phymatocera* depends on the circumstance that the growing stems of *Conrallaria*, in which the eggs are laid, are small, 2mm., 2.5mm. to 3mm. in diameter, larger (and older) stems are not, so far as my few observations go, affected by the insect, the largest I have seen was under 4mm. in diameter. The cutting is done transversely to the stem, and so, to accommodate itself

JULY-AUGUST, 1915.

JUL 30 1915

to the surface of so small a stem, the terebra of the insect has to be bent into a corresponding curvature. The cuticle, beneath which it works, seems to be strong enough easily to hold the saws to this curve. Until one sees that there is and necessarily must be this curvature, there is nothing in the actual working of the saws to suggest that it is so, and certainly it causes no impediment to their operation. One observes nothing to suggest, as something actually seen, this curving of the terebra whilst it is at work, but as it is for its whole length equally visible through the very transparent cuticle, it is obvious that it follows the curve of the surface between the cuticle and the underlying tissue.

(See pl. V., fig. 5, diagram of transverse section of stem of *Convolvularia*, with the incision of *Phymatocera*, through an egg, showing how the incision curves round the stem, the thinness of the raised cuticle, and the position of the egg, not quite at the bottom of the incision.)

The attachments of the bases of the saws and supports to the abdomen are much more visible than in *Trichiosoma*, and so the movement of the saws may be gathered almost as well by watching the movements of the parts at the extremity of the abdomen.

The posterior margins of the supports for a portion of their basal halves are soldered together, unlike the saws, each of which can move independently of the other, of course only through a small distance.

The fly begins her operations by penetrating the cuticle and advancing the terebra beneath it for half its length (pl. v., fig. 1, ₁), then it cuts in the direction in which the saws face, till it arrives at the position Fig. 1, ₂. It then carries the terebra back towards position ₁, with the apex all the time within the slit, as indicated in fig. 1, ₃, until it reaches the place shown in fig. 2, ₄, some way short of position ₁. It then descends to the depth of position ₁. It now again cuts, may we say, downwards as suiting the diagrams, and also as being away from the body of the insect, for the same distance as in the first incision (fig. 1) that is, about half the length of the terebra, to the actual position shown in fig. 2, ₄. It then cuts very similarly to the previous cut (fig. 1), passing through the positions shown in fig. 2, _{5, 6, 7}. The terebra then returns from position 2, ₇, to position 2, ₄, passing along with only the tip within the incision, as shown in fig. 1, ₃. It now descends into position fig. 3, ₈, which is practically identical with position 2, ₄. The first egg is now laid, in the position shown in fig. 4. The terebra is now withdrawn but not so far as fig. 1, ₃, but only as far as fig. 3, ₉, is then carried across the top of the egg and descends into position 3, ₁₀, which is identical with the position 2, ₅, but is really, the same position as regards the second egg, as fig. 2, ₄ was with regard to the first; the space for the second egg is cut as indicated in fig. 3, precisely as that for the first was done, as shown in fig. 2. Again, the terebra is brought back, in the way shown in fig. 1, ₃, and the second egg is laid, and so on.

The laying of the egg is very like that noted in *Trichiosoma*, after a short rest some heavy movements occur at the base of the terebra and at the extremity of the abdomen, and almost immediately the egg appears. It has much the effect of a conjuring trick.

At the margin of the saws at their lower cutting half, opposite the arrows as shown in fig. 3, ₈, the edge of the egg appears and gradually passes forward till it reaches the position shown in fig. 4. It seems to

come entirely from the narrow piece of terebra opposite to it, which is much too small to hold it. Some trace of its movements may be seen at the base of the terebra, but the egg certainly passes down the terebra to the place where it appears, as a very much narrowed and therefore lengthened body, so that no trace of its passage in the terebra, beyond the heaving movements of the parts, is visible; so that when it does appear, gradually protruding from the cutting margin of the terebra, it appears to come from nowhere or to be suddenly materialised from nothing.

All this agrees with Mr. Morice's observations except as to two items. One is that I never saw the fly withdraw the terebra from the incision during the whole time she was occupied with it, but always carried it back from finishing the portion being cut to the egg-laying position with the tip within the incision, except on one occasion, when I happened to shake the stem so as to cause the terebra to leave the slit. It was with a little delay and some awkwardness that the fly managed to re-introduce it properly. In discussing this point with Mr. Morice he assures me that in all his observations the terebra was removed and re-inserted as he describes.

Mr. Morice describes the terebra when first introduced as being worked straight in to its full depth at the position it will occupy when the first egg is laid, that is to the position shown in fig. 2₁.

There are two difficulties in the way of supposing that this occurs. The first is that all the incisions with eggs of *Phymatocera* I have seen show a step at the beginning of the slit, as shown diagrammatically in figs. 2, 3, and 4. The other difficulty is that the terebra seems to have no cutting power except in its distal half, by which it can cut all the sections shown in my diagrams, but could not cut the portions shown in figs. 1 and 2 at one operation, as it would have to do if it made the complete penetration at first, nor does it seem probable it would make this deep incision once only during the long process of laying a series of eggs.

The eggs when laid do not reach quite the bottom of the pocket, but rest a little way above it, as shown in diagrams 4 and 5.

It is also the case that at the line of incision the flap of cuticle does not quite return to its original place, but leaves a slight gap, as indicated in diagram 5. This seems a necessary result of the space taken up by the egg, but may also be due, to some slight extent, to contraction from desiccation.

To return to the actual process of cutting, we may take diagram 2, in which the part above the dotted line is already cut, but the part below has to be cut, the terebra taking up the several positions 4, 5, 6, and 7 in doing so.

Two photographs of the terebra are shown in Plate IV. In my hands, the two plates of the terebra never remain, when mounted, in their natural positions, one accurately applied to the other, so that there would, in such photographs as those shown, seem to be only one plate, apart from any differences in the advancement of the saw.

In my preparations (and photographs) the two plates are always more or less dislocated; this is not true to nature, but demonstrates that there are two plates. A photograph of the terebra undislocated might suggest that there was only one plate.

In the photographs the supports are to the left, and are not very

much dislocated in fig. 1, except quite at their tips, much more so in fig. 2.

In fig. 1, one plate has the saw and support in the position of rest, that is, their tips coincide; the other plate has the saw somewhat advanced. In fig. 2 both saws are advanced, but unequally. In the movements of cutting, the saws are advanced rather more than the most forward in fig. 2.

The actual cutting movements differ, not essentially, but in detail, very much from those of *Trichiosoma*. The actual cutting edge is the margin of the "saws," chiefly towards their tips, and hardly, if at all, in their basal halves. But in *Trichiosoma* the ends of the saws curl round the ends of the guides and the cutting is done to a great extent by this curled round tip. In *Phymatocera* the saws remain all the time quite straight, but in the sawing movements extend some way beyond the ends of the supports when advanced, being brought back to be level with them when retracted. The two saws seem to be thus thrust forward and retracted together, with, however, a differential to and fro movement of the one on the other. This differential movement of the saws on each other is of much less amplitude than their conjoined movement on the supports.

In making the pocket, say as in diagram 2, the terebra moves directly forward as a whole in cutting the deeper portion between 4 and 5. In doing this 36 to and fro movements of the saws on the supports were counted. From 5 to 6 the base of the terebra, *i.e.*, the extremity of the insect's body, moves little, and the terebra sweeps round to position 6, making in doing so some 50 to and fro movements of the saws; in still sweeping round in much the same way to position 7 the basal portion of the terebra gradually emerges from the pocket, and after some 50 more strokes, this portion of the cutting is finished and the terebra returns to the egg-laying position.

During the last portion of the cutting, a curious detail, illustrating the scissors-like process by which the two saws between them do the cutting is easily seen. It may be most easily made intelligible by aid of the very diagrammatic fig. 6, since, simple and obvious as it is when seen, it is not easy to describe.

The line *abc* is that to which cutting is done, and as the terebra sweeps forward, the body of the insect being the centre, the end of the supports follows the dotted line (unfortunately omitted in Plate, it should pass through the ends of the supports as *ag*, *b*, *c* does through the ends of the saws), but the saws, continuing their thrusting and to and fro movements, gradually extend further and further beyond the supports as at *b* and *c*, then by a movement of the insect the supports slide down and resume at *c* the same relation to the saws that they had at *a*.

In the straighter portions of the cutting the relative movements are the same, but the supports remain at some distance from the lower margin of the pocket.

What most interests me in these observations is their bearing on the question as to how the cutting is really done by the terebra, is it sawing, or cutting, or splitting, or by a wedge? They left on my mind no doubt that the cutting is done not as by a knife or a wedge, but by a scissors action, much as horse-clippers act. A number of projecting edges on one saw continually pass too and fro across similar edges of

the other, and at each such passage the action is that of a pair of scissors. In *Phymatocera*, the saws as they cut in this way remain quite straight, but as they cut they gradually extend beyond the supports so far as they can, and are then withdrawn, to repeat the process one step forward, or what comes to the same thing, the supports are advanced to where the saws have reached so that they can again advance.

EXPLANATION OF PLATES.

PLATE IV.

Two photographs of the Terebra of *Phymatocera aterrima* $\times 20$. In both the two plates of the terebra are dislocated in mounting so as not to be exactly over each other, as they are in nature. The saws happen to be in relation to the supports in different degrees of advancement, positions they pass through when in action.

PLATE V.

Diagrams to illustrate the cutting of the pocket by *Phymatocera*. These are sufficiently referred to in the text; it is only necessary here to emphasise that they are diagrams and not drawings, and though fairly to scale, are not to be taken as accurate in this respect. They are about ten times natural size.

 A Day in the ———.

By LIEUT.-COL. N. MANDERS, R.A.M.C., F.E.S.

[NOTE.—Owing to the strict censorship of our correspondence I am unable to state the exact position from which I write, but I daresay entomologists can make a fair guess from what I have written.]

The following, except for a few verbal alterations, is taken verbatim from my notebook dated May 3rd. I may first, however, give a general idea of what the surrounding country is like. To those who know the Riviera, and more particularly Hyères and the hills at the back of it, I need only say a description of that locality would fulfil all needful conditions except that of course there are no houses and practically no cultivation. The hills are exceedingly steep, with deep precipitous ravines covered with dwarf holly, Mediterranean heath, myrtle and rhododendrons. The pretty pink and white cistus covers the hillsides everywhere, the broom is just coming into flower; the one small open field, the only flat piece of land about, and now converted into a cemetery, is carpeted with a beautiful pink convolvulus, which no doubt in after years will cover the graves of our comrades. The view from my dug-out is very similar to that looking south from any place on that favoured coast. Beautiful summer weather prevails, with cold nights, and were it not for the perpetual cannonade and musketry one could thoroughly enjoy a ramble over the hills—a joy at present entirely denied us. But I am wandering from what I set out to do, and which runs as follows:—“I am writing this at 9.15 a.m. at the bottom of a steep wooded valley sheltered behind a bank covered with heath and holly, alongside me on a stretcher is a desperately wounded man, and close around are the bodies of an officer, four men and a mule lying in and beside a muddy stream, which is the only path. All were killed by snipers two days ago, but it has been too dangerous and times have been too strenuous to remove and bury them. The gully here leading up to the firing line beggars description. It is full of old meat and biscuit tins, boxes and broken rifles, kit of all sorts, many dead mules and not a few dead men. Testaments and bibles are

also among the débris. The butterflies flit about undisturbed by the turmoil, and among this squalor and filth, with a constant stream of wounded on stretchers, donkeys' and men's backs, with mud above the ankles, the painted ladies and green hairstreaks flutter about quite unconcerned. Shells and bullets pass over in a continuous stream, and with the echo from the hills make a perpetual din. And yet from a copse close by, possibly concealing a sniper, wonder of wonders, there is a nightingale in full song! oblivions of the making of history, and only impressing upon a casual listener that after all it is love that rules the world."

Notes on the Micro-lepidoptera of South-West London.

By ALFRED SICH, F.E.S.

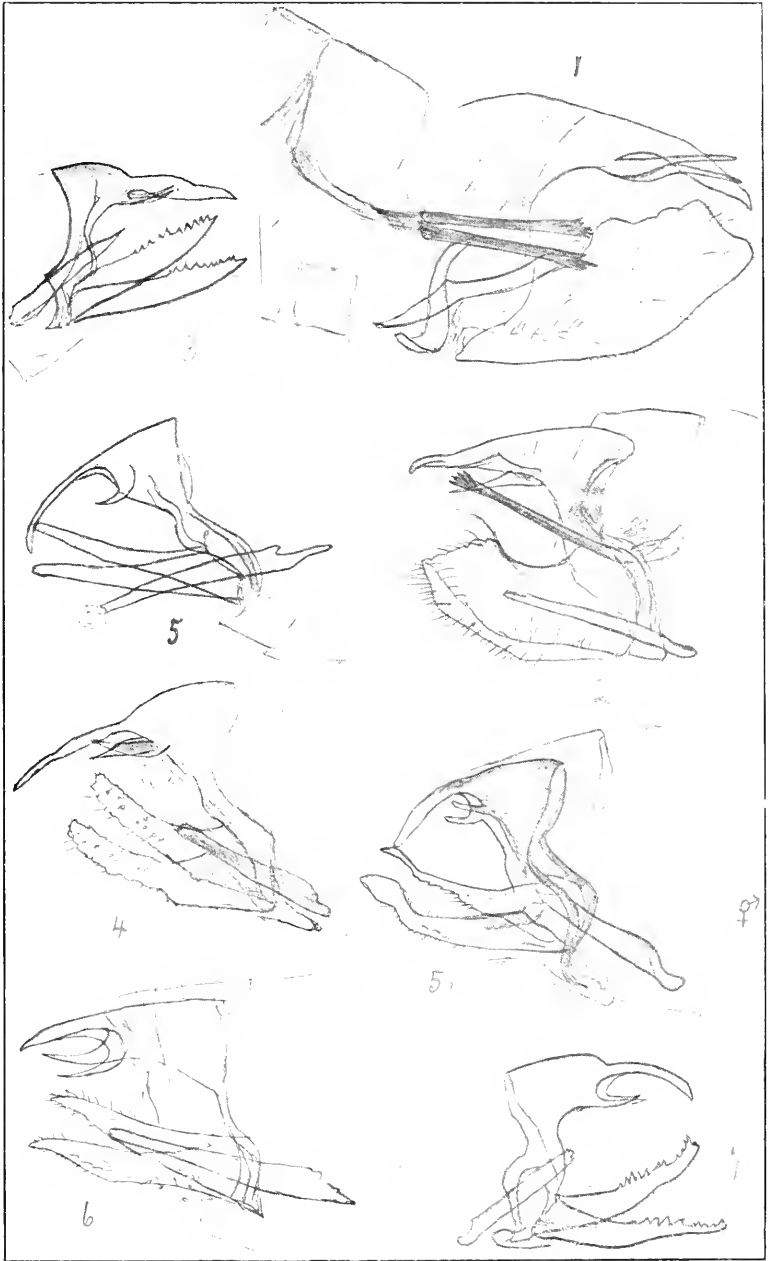
It is difficult to find a suitable title to this paper, but the above has been chosen because most of the localities to be mentioned are situated on the south-west side of London. The lanes and open spaces here included have formed the chief hunting-grounds in which, for many years past, I have endeavoured to become acquainted with those most fascinating and somewhat cryptic beings, known as the Micro-lepidoptera.

The district covered by these observations is so well known, and so much has been written concerning it, that it seems quite unnecessary to preface these notes with any general remarks on its physical, geological or even botanical peculiarities. The area in question is that situated in the Thames valley between Charing Cross and Kingston-on-Thames. It all lies within the ten-mile radius from Charing Cross. The land north of the Thames belongs to the county of Middlesex, and that south of the river to Surrey. The whole district lies at a low level and there is nowhere any chalk or limestone exposed on its surface, so that the plants and the numerous attendant Lepidoptera, which specially inhabit calcareous districts, are naturally absent. Unfortunately, too, the woods have nearly all disappeared.

The following are the localities which will be cited: Coombe Wood, the only real wood in the district, still retained its sylvan features in 1909, and no doubt many species of Lepidoptera still occur there. When in the heart of it, it is difficult to realise that the centre of the great city is not ten miles distant. It is unfortunately not available as a hunting-ground.

Richmond Park with its ponds, oaks, thorns, birches and fine stretches of turf, in which many wild flowers lie hidden, affords a home to numerous species, and would doubtless contain more but for the want of undergrowth.

Sheen Common is better favoured with bushes, such as bramble and gorse, but there is no broom. It contains some wild apple trees, and in one damp spot *Drosera* grew a year or two ago and may be there still. Palewell, though very limited in extent, was perhaps, till 1913, the most primitive and undisturbed of the unenclosed spaces. Barnes Common, Putney Heath and Wimbledon Common, Ham Common and Kew are all well known. The chief attraction of the first mentioned is afforded by the presence of broom and *Rosa spinosissima*. All these localities are in Surrey. On the Middlesex side of the river we have Chiswick, Brentford, Ealing, and Greenford. The hunting-grounds in the first three of these parishes are now confined



Del. P. A. H. Muschamp.
 EPINEPHELE (1) JURTINA, (2) NURAG, (3) IDA, (4) PASIPHAË, (5) (5a) LYCAON, (6) NARICA,
 (7) TITHONUS.
The Entomologist's Record, 1915.

to the lanes and hedgerows, and Ealing Common has been improved far beyond the needs of the entomologist. Greenford has still some pretensions to rural conditions but it is a duller and less inviting district than the higher lands on the other side of the river and therefore has had less attention paid to it. The old-time famous Hammer-smith Marshes were obliterated by houses and railways many years ago. Owing to the great extension of buildings in these suburban districts, the hunting-ground has greatly decreased in area during late years, and the increased traffic, especially due to motor cars, has rendered many of the lanes so dusty in summer that they cease to be fit habitations for the Lepidoptera. Under these circumstances any great increase in the number of species recorded for this district appears improbable, and it seems, therefore, now opportune to publish the names of those species which do or did recently occur in any of the localities mentioned. The names used are those of Standinger and Rebel's Catalogue of 1901, except where special mention is made to the contrary. A date following the name of a locality denotes the last year in which the species was observed in that locality. (For further particulars of this district see *Transactions of the City of London Entomological and Nat. Hist. Soc.*, for the year 1906, p. 37 *et seq.*)

Simarthis fabriciana.—Chiswick, abundant. It may safely be said to occur in all the localities, but being such a common insect it has been neglected.

Glyphipteryx fuscoviridella.—Chiswick, Barnes, Kew, Richmond 1915, and Wimbledon. This species may be seen on the wing at any time during the day and especially in the late afternoon. It haunts open spaces and meadows where its food plant, *Luzula campestris*, grows. The meadow in Chiswick where the moth was very abundant and the larva was first discovered has been converted into a lawn, and though the field rush still exists in the turf the moth is no longer seen. The larva may be found in April in the stem of the rush below the surface of the ground. (*Ent. Record*, vol. xii., 1900, p. 192.)

G. thrasonella.—Richmond, 1907. var. *cladiella*, Richmond. The type and the variety occur together. This species varies considerably in the intensity of the pale costal markings, in size and colour of the apical spot and dorsal patch, and in the presence or absence of the metallic spots. Some specimens are almost unicolorous. The moth flies in the sunshine and in the late afternoon in damp places about *Juncus*. Generally there are several together. I have seen them ovipositing in the heads of *Juncus*, but the larva I had all left the rush-heads on hatching. Possibly they feed in the lower parts of the stems.

G. equitella.—Chiswick, 1915. This seems to be a fairly constant species but it varies in the presence or absence of pale marks between the white lines on the costa. It delights to fly in the sunshine over the yellow flowers of the stone-crop. It sometimes comes down from its home on the wall tops into the gardens below. The egg is laid on the leaf of *Sedum acre*, and the larva feeds in the interior of the leaves. It is difficult to find, as the pale and shrunken leaves betray its presence. In captivity the larva quits the foodplant to spin its cocoon. This species probably occurs in some of the other localities of the district, but from the nature of its habitat it is not easily noticed. (*Ent. Record*, vol. xii, 1900, p. 298.)

(To be continued.)

The Ci-devant Genus *Epinephele*. (With one plate.)

By P. A. H. MUSCHAMP, F.E.S.

At Ponferrada last midsummer Mr. and Mrs. Page and myself took a large number of *E. ida* and *E. tithonus* flying together on the banks of the Sil (north-west Spain). One or two ♂s that I netted were so far from the typical form as to render it difficult to determine to which species they belonged. To settle the question I made mounts of the genitalia of the doubtful specimens, together with a number of indisputable *E. ida* and *E. tithonus*. The butterflies in question were not hybrids, but simply aberrant *E. tithonus*. There could be no doubt about this, for though these two butterflies seem from their wing coloration and pattern to be very close to one another, their respective genitalia do not belong to insects of the same genus. Wishing to compare them with their congeners, I at once made a few mounts of each of the European *Epinephele* and came to the conclusion that several distinct genera are grouped together under the name of *Epinephele*.

In his able review of the genus *Erebia*, Dr. Chapman tells us that from the standpoint of *Erebia* and its neighbouring genera—of which *Epinephele* is one—the sickle or uncus is so constant in form that one might say it presents generic characters, while those of the clasps are specific. In working through several genera, I have only found confirmation of Dr. Chapman's conclusion. Now, when I apply this rule to *Epinephele* and find that the uncus is far from being constant, I am bound to believe that this genus is really composed of several groups, so distant from one another that it would be well to break it up into several distinct genera.

Epinephele presents the strongest imaginable contrast to its near neighbour *Coenonympha*. The former seem to have been lumped together for no very good reason, the latter might all be considered as varietal forms of one or two species (see *Mitteilungen der Entomologia*, Zürich, Heft I.).

I am not yet prepared to say exactly where in the Satyrid family the different groups of this most heterogeneous genus fit in, they are all fairly closely connected with *Satyrus*, but are all, I believe, as distinctly separated from this genus as they are from one another. Unfortunately I only possess very few of the Palearctic, South American and Indian species, and must therefore confine my notes to the European species and their connection *inter se*. I should be deeply grateful to any collector who may happen to have poor specimens from any habitat outside Europe if he would allow me to examine the same, and thus enable me to learn something about the non-European *Epinephele*.

There are only seven species of European *Epinephele*, they are *jurtina*, *nurag*, *lycaon*, *nariva*, *tithonus*, *ida*, and *pasiphaë*. Of these the ovum, larva and pupa of *nariva* are, I believe, unknown; those of *jurtina*, *lycaon*, *tithonus*, *ida* and *pasiphaë* do not resemble one another any more than they resemble the *Satyrus* ova, larvæ and pupæ. There is nothing generically distinct in their antennæ, palpi or veins. It looks really very much as if they were lumped together because they are somewhat similar in colouring, especially in the ♀s. This is evidently a very convenient but perhaps not altogether satisfactory system of grouping. I see, however, that the latest authority on *Epinephele*, Dr. A. Seitz, does not seem quite comfortable about them:

he says:—"The Palearctic forms of this genus, about 70 of which have received names, belong to about 25 species, whose relationship to one another is *not yet well known in every instance*. They are closely related to *Satyrus*. The antennæ are delicate, gradually incrassate, and without distinct club. The palpi are strongly bristly and project a head's length. Eyes naked. Body weak in comparison with the width of the wings, the abdomen of the ♀s not nearly so stout as, for instance, in *Erebia*, *Oeneis*, etc. Forewing very broad, with the costal margin strongly convex, the subcostal very strongly, and the median a little less inflated at the base; the submedian, though a little incrassate at the base, is not inflated. The anal angle of the hindwings often very strongly produced, the external margin being excised above the angle." He then goes on to tell us that they are medium sized to rather small dark brown and russet-yellow butterflies, which have as a rule only one ocellus on the upperside, etc.; falling back on the worn out colour system of classification. Now all this is very well in its way, but might have been written about other genera than that of *Epinephele*: for example, about *Aphantopus*, *Coenonympha* or even *Satyrus*, if we leave out the colour clause. By the way, it would be well to know the dimensions of a *medium sized* butterfly, especially as in German and French one word includes butterflies and moths.

Epinephele's sister genera, *Erebia*, *Oeneis*, *Coenonympha*, etc., have had their social position put to the test, verified or corrected from the standpoint of the genitalia. It is fully time for *Epinephele* to be examined by the Censor. No admittance to Hübner's genus should be allowed to butterflies whose passports do not show their Epinephelian origin.

Let us first examine the *jurtina-hispulla-nurag* group. These butterflies have extremely characteristic genitalia. The uncus is mandibulate and very bold; it broadens out at about half-way between the part to which the lateral processes or brachia are attached, then tapers off like the beak of a bird of prey. The harpes are very broad and heavy, covered with rather fine bristles. It is very irregularly shaped for a Satyrid, being made up of concave and convex hills and valleys that in a drawing make it appear far less constant than it really is; even when the genitalia are allowed to float without any pressure in Canada balsam no accurate drawing can be made with the camera lucida. Most interesting are the long wands of chitinous matter, something between hairs and scales, having their points of insertion at the flattened exterior angle of the eighth sternite. These wands, each formed of a bundle of rods, seem to me to have the same function as the peniculus of certain Noctuids, *i.e.*, they act as brushes for the ædæagus. I do not think they can be styled tactile, for the microscope has revealed to me nothing near their extremities that resembles a nerve. They may evidently be extended by a backward movement of the segment to which they are attached, or, more correctly speaking, when the butterfly contracts or extends the last segment, the relative position of the wands is necessarily changed. Their normal position in an unprepared abdomen is the position they take in my drawing of *E. nurag*. I do not think that Dr. Reverdin's conjecture (vol. xxvii., p. 98, *Ent. Rev.*) can be the correct solution to the problem. I have listened very attentively to *E. jurtina* ♂s when courting and have caught no crackling sound such as Dr. Longstaff heard made by

Ageronia, or such a sound as we can hear everywhere where *Endrosa* fly. Now, at about the same time that Dr. Reverdin first noticed the Godman-and-Salvin organ in *Ageronia*, I remarked it in *Peridromia*, and we exchanged correspondence on the subject. I had only four different *Peridromia* species to examine, and, in all four, Dr. Reverdin's organ was much in evidence. Now Dr. Longstaff notes that *Ageronia* only emits the crackling sound when on the wing. This is just what one remarks in *Endrosa*; I have often noticed that *Endrosa aurita* ♂ makes its presence known by a loud tic-tic repeated about 70 times in a minute. This crackling noise is so loud that I have heard it when the moth was fully six yards away from me, possibly farther. I have on the microscope before me the big drum or sounding board of *E. aurita*, a chitinous plate connected with the thorax and the root of the femur of the moth's hind leg. I have also before me a similar part of the thorax of *Ageronia arethusa*, and of *Peridromia amphinome* and of *P. arinome*. These three butterflies have no such inflated plates as that which *Endrosa* possesses, but they are provided with hard chitinous plates which should be certainly capable of producing a crackling sound. Now if this sound were produced by my friend Dr. Reverdin's organ, it would obviously be more natural that the butterfly should produce it when settled, for then the extension and retraction of the last segment would be most facile. We are told that the sound is never produced during flight. The conclusion is obvious, the crackling sound produced by *Ageronia* = the ticking sound produced by *Endrosa*. Either many ages must have elapsed before the *Ageronia-Peridromia* or the *jurtina-nurag* organs could have reached their actual degree of development, or they were rapidly produced at an epoch when the hairs and scales had not yet taken a specialized form, and I think generic value may safely be accorded them. I am inclined to believe that *Peridromia* and *Ageronia* should be considered as one and the same genus. My mounts of *P. amphinome* might easily be confused with Dr. Reverdin's mounts of *A. februa* as published in No. 5 of the present volume. I esteem then that *jurtina*, *hispulla* and *nurag* might very well be placed in a genus of their own on the sole evidence of this peculiar and interesting auxiliary genital organ, but when we further take into consideration the Papilio-shaped valva, no doubt can subsist as to the generic separation of these butterflies from all other so-called *Epinephele*. I have made some twenty mounts each of *jurtina* and of *hispulla*, and am inclined to believe that the valve is not exactly the same in the southern var. as in the species; the valve of *hispulla* is blunter and more squared off in almost every case. As for *nurag*, of which, for want of material, I have only made two mounts, it has a still squarer and stouter valve than *hispulla*. I should deduce that it is a specialized island form of the southern var.

The second group consists of *ida* and *pasiphaë*, very distinct from one another in both valva and uncus, still near enough to justify the supposition of a not too distant common origin; the uncus, narrowing at the point of insertion of the brachia, then broadening, then strangled again and finally tapering off slowly, is very similar to that of *jurtina*. The valvæ, however, are of an absolutely different class. Those of *ida* resemble the blade of a clasp knife, or rather, thanks to the regular row of teeth, a broad-bladed saw in a clasp knife. I have before me 30 mounts of *ida*, they are absolutely constant in form.

The uncus of *pasiphaë* is similar to that of *ida*, but more finely drawn out; the valvæ are of a rough and rather irregular form, jagged on the lower side, and without the sawlike teeth on the upper edge; there is also a prominent shoulder. I have only five mounts of this species, four from Marseilles and one from N.W. Spain. Judging from such a very small number, the form of valvæ and uncus is constant. There is no peniculus.

The third group consists of *lycaon* and *narica*. The uncus, a prolongation of the tegumen, the dorsal outline of which is an unbroken curve, separates these two species from all other European ci-devant *Epinephèle*. The uncus, indeed, looks as though it were of a piece with the tegumen, and not a process of the same. The lateral processes, that I call the brachia, are stont and immovable, springing from rather low down, and broadly separated from the dorsal process, thus resembling the brachia of many of the *Erebina*, e.g., *epiphron*, *nerine*, *ceto*, *edda*, *pronoë*, *scipio*.

The uncus of *lycaon* is extremely long and fine, it curves right down over the valvæ. This in connection with much shorter brachia gives it a different aspect from the uncus of *narica*. The valvæ of *narica* are rather broader at the base than those of *lycaon*, instead of gradually tapering off from base to toe, there is a kind of heel and a rapid tapering off upwards.

In considering the connection between one species and another, I have not allowed myself to take the wing of the butterfly into consideration, but now that this part of the work is finished, it is with pleasure that I remark that the close relationship between *lycaon* and *narica* is entirely supported by the similarity of wing structure. The lengthening of the lateral and shortening of the dorsal process of the uncus in *narica*—or *vice versa* in *lycaon*—seems to be an application of Geoffroy's law of compensation which accounts for a fowl with a large tuft of feathers on the head having a diminished comb, or the possession of a large beard being accompanied by diminished wattles. Lengthen the beak and shorten the brachia of *narica*'s uncus and we have the uncus of *lycaon*. The difference between the two is rather apparent than real.

Together with the genitalia of *lycaon* I give a figure of those of the gynandromorphous *lycaon*, about which a note was published in the *Ent. Record*, vol. xxvi., pp. 252, 253. It will be observed that the uncus is foreshortened and lumpy, the valvæ asymmetrical and misformed. For an account of the ovaries and other organs, see above note.

The genitalia of *lycaon* are constant in form. I have too few *narica* to allow me to come to any conclusion on this point.

In the fourth group there is only one European representative, *tithonus*. The dorsal and lateral process is jointed on to the tegumen, there being a strong depression at the point of insertion. The valvæ has a cruel jaw-like appearance; several rather small teeth at the extremity, followed by a row of strong sharp teeth, often set in pairs. I have about 40 mounts from Switzerland, France and Spain, and find the uncus absolutely constant in all; the position and number of teeth

of valvæ vary, but not more than is usual in sister genera, such as *Erebia*.

I do not think it necessary to say anything further to prove that *Epinephele* is composed of several distinct genera, the subjoined figures are in themselves such a sledge-hammer argument that none other can be requisite.

So far as I can learn Hübner created the genus *Epinephele* for *jurtina*=*janira*, thus separating this genus from *Cocconympha*, *Pararge*, *Satyrus*, etc., to all of which he had previously given the collective name of *Oreades* with *Oreas proserpina*=*Satyrus circe* as representative. Still earlier Hubner refers to all the Satyrids by that much abused name *Papilio*.

[In 1816 Hübner published at Augsburg his "Verzeichniss bekannter Schmettlinge." *Epinephele* is the 6th Coitus of the 4th Familia (*Nubilæ*) of the 9th Stirps (*Oreades* = *Satyri*, Fabr.) of the first Phalanx (p. 59). Both Familia and Coitus are, naturally enough, purely colour arrangements. The first mentioned *Epinephele* is *janira*, no. 565, and this is followed by *eudora*, Esp. (= *lycaon*, Rott.), and by *synclimene* (*climene*, Esp.). We turn to the 5th Coitus, the *Pyroniæ*, and we find the three butterflies that have been since placed with *janira*, viz., *tithonus*, *ida*, and *narica*. We have thus a name provided for the *tithonus* group, *Pyronia tithonus*. *Pasiphæ*, Hübner calls it *pasyphe* (p. 60), has its place in the next Familia—the *Marmortæ*—and belongs to the third Coitus, the *Tisiphonæ*: now, as *tisiphone* (our *glacialis* var. *pluto*) has its uncontested place among the *Erebiæ*, we may safely utilize the name *Tisiphone* for the *pasiphæ* group. I don't think I am wrong in assuming that no author has till now separated *lycaon* from *janira*, so there is nothing for it but to find it a new name: I should propose then, the new generic name *Hyponephele*.—P.A.H.M.]

Notes on the Swiss Rhopalocera. VI.

By the late A. J. FISON.

(Communicated by Miss L. M. FISON.)

Extracts from his letters to, and kindly lent by, the Rev. G. Wheeler.
1905.

1. *Lowcia* (*Chrysophanus*) *amphidamas*, Esp., etc.

"Bex, June 9th, 1905.

"On Monday I found a good many *Polyommatus amanda* flying near Sion, but *Melitæa aurelia* was old. Yesterday I found the place for *Lowcia* (*Chrysophanus*) *amphidamas* at the end of the Tinière Road, but there was no sun, and I only took one—a ♀. To-day W. of the St. Triphon rock I got one *Polyommatus amanda*. It was very fresh."

2. *Limnitis populi*, L., and *Lowcia* (*Chrysophanus*) *amphidamas*, Esp., etc.

"Biel, June 19th, 1905.

"Am just back from Yvonand. First I tried a valley between hills and valleys S.W. of the station, 1½ miles off—but only found *Brenthis ino*, and *Melitæa dictynna*. Returning I steered for a part—say one mile S. of the station, where in the centre of the line of

wooded hills, a wall can be seen holding up a broad road (otherwise invisible) which zigzags through the forest. It was then 12.15 p.m. and passing the next corner above the wall I soon saw a *Limenitis populi* on the moist road, and got it. Three minutes later I saw, but missed, another. Though I stayed one hour there, no more were seen, probably because the sun went in somewhat. That part of the forest was of beech, ash, aspen, oak, poplar, fir, nut, cherry, etc. The specimen I took was very fresh. Saturday I went to the Tram gorge below Orange, and I took seven *Lowia (Chrysophanus) amphidamas* when the sun got up about 10 a.m. By 11 a.m. it began to rain. I saw no bilberries about there in the cow-pastures, so fancy it would not do for *Colias palaeno*. The *amphidamas* were like those from Caux."

3. *Limenitis populi*, L., etc.

"Yverdon, June 23rd, 1905.

"You will like to hear how I got five *Limenitis populi* to-day at Yvonand, seeing only seven or eight. Getting only one at my old place (the branch of the road going up S.W.) I went down to the junction and up the branch going S.E. There were larger forests, but I only got one until about 1 p.m. Returning from the top to a curved part, say 200 yards above the junction, I suddenly at one place saw a succession of three ♀s within five minutes, and got two. Waiting a little, the very fine one I missed again tried to come up the road, but turned too soon. Some ten minutes later I caught a ♀, and directly after missed a fifth; it was then 2 p.m. Two of my ♀s have bad chips, but all seem quite fresh. It is curious to see so many ♀s, and to see them two and three together, and in the same spot.

I saw a *Limenitis camilla* just above the shallow S. curve in the road."

4. *Apaturidi* and *Nordmannia acacia*, Fabr.

"Yverdon, June 29th, 1905.

"Am just back from Eclépens, where *Apatura iris* is fully out. I had 1½ hours in the wood and got four (of 3 vars.), but missed more. Before this, when on the green lane under the hill, and W. of station (150 yds.) I got eight. *Nordmannia (Thecla) acaciae* was on elder flowers. Could see no *Lycæna arca*. There were many *Nordmannia ilicis* and the "White Admirals" in the wood were a nuisance. Have arranged for attractive mess on bare path of wood opposite the station. I went no further."

5. *Apaturidi*.

"Yverdon, July 1st, 1905.

"My total catch to-day was 35. Of these eight were abs., three being yellow (ab. *clytie*) and five black. One *clytie* and two or three of the blacks are especially fine. One black has scarcely a trace of white on upperside. Of the whole most are *Apatura iris*. Only four or five are damaged. Before to-day I had caught seven at Eclépens. Of these one was ab. *clytie* and one a black. Thus out of 42 almost one in four is an aberration."

6. *Apaturidi*: *Polygonia e-album*, L.: *Satyrus circe*, Fab.

"Yverdon, July 3rd, 1905.

"My catch to-day was 35 again, several near Inn, where I got

two *Apatura ilia* ab. *clytie*, before filling my water-bottles at the fountain. Of the whole I seem to have five ab. *clytie* and seven blacks. One of these last is ab. *clytie* or *Apatura ilia*. One or two blacks are *very fine*, with scarce a speck of white, whilst one has the forewings black and the hindwings much as usual. I think though my best catch of all will be a lovely little ab. of the "Comma." It has a few large dark spots on upperside. It is small but shaped like a usual *Polygonia c-album*. As the sun went in I went to look for *Nordmannia (Thecla) acacia*, and found them very lively, taking eight in about fifteen minutes. I took also there the first *Satyrus circe* I have caught for some sixteen years.

P.S.—Two of the ab. *clytie* are large and handsome. *Apatura ilia* was more common to-day than *Apatura iris*."

7. *Apaturidi*.

"Aigle, July 11th, 1905.

"Having now ended my catch of *Apaturids*, I think you will like to hear the total is 156. This includes 22 *Apatura clytie* (you see I count *clytie* now as a type) and 18 blacks (with three or four intermediates). There is also a ♀ amongst them. One day I went for an hour into a forest one mile S.S.W. of Chavornay, and although the sun went in at times I took eight easily, including two *Apatura clytie*. I had not time in the ten days (June 29th—July 8th) to visit any wood at or towards Yvonand. On the 8th at Eclépens the sun was out all the time and I took 42, but only two of these in the clearing, which was practically deserted, as was the pit. On your high road* there were lots. I got eight *clytie* but only two black abs. Most were still in *very good condition*."

8. BUTTERFLIES AT BINN.

"Hotel Ofenhorn, Binn, July 21st, 1905.

"The season has been so backward here that when I went up a little height on Saturday I found no *Erebia* at all above the valley. A few *Colias palaeno* were flying, and lots of *Melitaea merope*, *Melitaea parthenie* var. *varia*, *Polyommatus eros*, and *Laticarina orbitulus*. Yesterday near the Albrun Pass was better, and I found some *Erebia mnestra* with their dark bordered upperwings nearly as narrow as those of *Erebia christi*, but not so regular or clearly cut. I got about ten *Melitaea cythia* in one spot (several rather black); one *facciniina* (*Polyommatus optilete*; two *Erebia gorge*; and the first *Erebia euryale* and *Parnassius delius*. On the white Dolomite rocks vegetation was too little advanced for "Erebias" to be out. I have not seen *Erebia cassiope*, *Erebia pharte*, *Erebia alecto* var. *glacialis*. Two days ago I got two *Aricia (Polyommatus) donzelii*. . . . This does not look like the place for *Brenthis thore*, *Erebia criphyle*, or *Brenthis pales* var. *arsilache*."

9. BINN.

"Hotel Ofenhorn, Binn, August 9th, 1905.

"Have got little lately until to-day on W. side of the Stockhorn (just above Binn). I got a nice lot (say twelve) ♀ *Colias palaeno*—most white, but three were pale yellow, two of them very fresh. Amongst the ♀s is one with patches or bars of greenish colour on the

* i.e., Between Oulens and Bavois.—[G.W.]

black of forewing upperside. *Parnassius delius* is very rare. Dark ♀ *Brenthis pales* are not uncommon. *Aricia (Polymmatius) douzelii* abounds on road up E. valley, and *Polymmatius eros* is still fresh there. A fortnight ago I got a dozen very dark *Melitaea merope*, and ought to have secured more, as they were in crowds. *Melitaea phoebe* has been very common."

10. MISCELLANEOUS.

"Aigle, September 12th, 1905.

"Came here from Binn a fortnight ago. Have now placed in my drawers practically all I have taken this season—and there is perhaps not so much to show for it as sometimes. At Binn I found innumerable ♀ *Colias palaeno* of different shades (white and yellow), although many were faded. *Brenthis pales* ab. *napaea* also was excessively common on the same Alp (Stockhorn), but in the clearings. Lately I have been four times to Martigny between September 5th and 11th, and twice beyond La Tour de la Bâtiâz. Have got three or four *Melitaea deione*, var. *berisalensis*. A ♂ and ♀ I took yesterday were nearly fresh, and so were the *Pieris daphidice* I found in about equal numbers, indeed they were perhaps better. It is interesting to know how late var. *berisalensis* can be had, a fact many may be glad to know, if it is as most years. At Branson Bridge we also got three or four *Erebes argiades*, var. *corctas*, a few nicely fresh. I got one fine large *Cupido sebrus* there. I had a long hunt for *Lampides (Lycaena) boeticus* around the *Colutea* corner, but saw nothing. The *Colutea arborescens* bushes are in a bad way—only one had six or seven pods on it. Twice I looked above the vines by the road beyond La Bâtiâz for *Satyrus briseis*, but could not find it. A collector took many *Parnassius delius* by Lac Lioson, sixteen *Apatura iris* on the Sépey road and some *Limenitis populi*."

11. *Lampides boeticus*, L., etc.

"Aigle, September 19th, 1905.

"Yesterday I was at Charpigny . . . and got four "Pea-pod argus" (*Lampides boeticus*), rather old of course, but two I kept are not too bad. I caught three—two high on an ash. I also took two dark yellow *Papilio machaon*."

12. *Dryas pandora*, Schiff.

"Charpigny, September 23rd, 1905.

"Have just taken a very good *Dryas pandora* here. A slight chip in one wing, but that is very little, and it is nicely fresh too. It was on clover flowers. An old ♀ *Dryas paphia* turned up too, which I took. The *pandora* was between the Chalet and Les Saves."

13. *Anthocharis simplonia*, Fr.

"Clarens, December 11th, 1905.

"If I can go to Charpigny for the two 'mountain *Simplonias*' from Binn, would you mind taking them for comparison? A Swiss collector says positively 'they are the Swiss form of *Anthocharis helva*.' I should like the question thrashed out."

* Of course they are nothing of the sort. The early stages of *A. simplonia* seem really nearer to *Pontia daphidice* than to *A. crameri (helva auctorum)*.—G.W.

1906.

1. BRANSON AND LES FOLLATERRES.

"May 5th, 1906.

"On the 4th I went to Branson and Les Follaterres for flowers. Although fine, there were scarcely any butterflies at Branson. I got one *Scolitantides orion*, one *Cupido sebrus*, and one *Polyommatus (Nomiades) semiargus*, but saw no *Everes argiades* var. *coretas*—indeed, vegetation there still seemed too backward for them. On the cool side of Les Follaterres corner I saw and caught an *Erebia* which was, as I expected, a bad *Erebia erias*."

2. *Loweia (Chrysophanus) amphidamas*, Esp., *Everes argiades*, Pallas, var. *coretas*, Ochs., etc.

"Bex, June 16th, 1906.

"Tuesday or Wednesday I hope to go to Yverdon for two weeks at least. Would it still be too early for *Limnitis populi* at Bramois or Yvonand, seeing this season is late? My more important captures have been—on the 6th: two *Everes argiades* var. *coretas* by the canal, 150 yards before the Branson Rhone Bridge from Martigny (a new place, I think); on the 7th: seventeen *Loweia (Chrysophanus) amphidamas* at Villars-sur-Ollon, but the majority in a place quite new to me. A day at En Saumont Marsh I found too early for *Lycæna arcas*, and I saw no *amphidamas* around Bains d'Alliaz. The day, however, was unfavourable. On the 14th I took six *Polyommatus amanda* below St. Triphon Quarries, in the marsh, and on my bit of land there; and yesterday five more, walking from St. Triphon to Aigle Rhone Bridge by the canal (most were about half-way there). I could see no *Cocomypha tiphon* near the Rhone Bridge, but the sun was in then. Three of my *amanda* are ♀ s."

3. *Lycæna iolas*, Ochs., etc.

"Yverdon, June 22nd, 1906.

"I do not think there can be many *Limnitis populi* about here. To-day was perfect, and at Yvonand I only saw four, and caught three. Yesterday I saw two and got one—a very fine ab. *tremulae*. All seem fresh (♀ s). I must tell you about my catch of eight *Lycæna iolas* at Sierre on the 19th. Passing the church and going under the railway I took the steep path to the left by the shooting tower or house. About 100 or 150 yards further I saw several *Lycæna iolas* down on the right and crossing the road, and a few steps further found *Colutea arborescens* on the left, and *iolas* flying freely. I never saw so many together before, and two or three times could strike at two ♂ s at once. I got two ♀ s, and then two ♂ s, the latter alive in boxes. Wishing to get more of the crowds about, I went back to the chemist to buy boxes, and on my return, confident of a good haul, not a fly was to be seen. The place was as deserted as other parts to which I soon went off. It is true I got one ♀ later, by the near arm of the lake, and saw a second *iolas*, but not another till I returned about 2.15 p.m. to the first spot. I then got two more ♂ s alive and a ♀. I concluded that when I caught the first two ♀ s the attraction for the ♂ s had gone, and had not another ♀ turned up about 2.15 p.m. I might have taken no more. I turned

out four ♀s and two ♂s at Charpigny that evening. I will write you when *Apatura iris* appears. I got a *Satyrus circe* at Eclépens, but it was lame in one wing. The roads here, too, are far too dry to attract *Limnitis populi*. I should think the collector who got six must have done so after the last wet."

4. *Limnitis populi*, L., ab. *tremulae*, Esp., etc.

"Yverdon, June 25th, 1906.

"Have got my third ab. *tremulae* to-day, and that a ♀ with three red-brown bands over its big body. Ten yards from it I got a fine *Limnitis populi* ♀, but saw no more at all. The three ♂s I have seem to me tending towards ab. *tremulae* a little. May this be more common this year! 'White Admirals' were rather abundant in the Bavois Wood, but no *Apatura iris*."

5. *Brenthis thore*, Hb., etc.

"Aigle, July 14th, 1906.

"*Brenthis thore* is taken at Faido on the cooler south or west side of the river, in the small forest glades or openings. Crossing the bridge, one goes up south above the first pastures for twelve to fifteen minutes at least. The best place was a larger clearing above and on the forest road. The clearing had a little "source" at the lower entrance to it, and at a second higher entrance is a half-hidden old limekiln hole, as I take it. I got two or three *Brenthis thore* also higher up, where a horizontal path goes along to the grass land. In most clearings I found none, but took one in the wood a good deal higher. None were seen in the woods north of the bridge, but they might still be there in cool but perhaps not too damp places. The *Parnassius apollo* I got up a gully on a common-like bit south-east of the village. Also below Lavorgo station where the old, disused road crosses the first bridge below it. The old road was excellent, especially near the big cascade. Beyond too, the half or three-quarter-mile-long path to the next rail-station was good, but hard to get along on account of brambles. I got 22 *Apatura* abs. at B¹, four or five with only forewings black. Nine were *Apatura ilia* ab. *elytic*."

1907.

1. *Limnitis populi*, L., ab. *tremulae*, Esp., etc.

"Bex, June 20th, 1907.

"To-day I took at Charpigny, in one stroke of the net, two fine *Limnitis populi* ab. *tremulae*. They were fresh, but a little chipped. Another was on the same fir trees (north of La Tête) from which the two came down, but would not be tempted to the ground even by some bait. On Monday at Villars (about 1 p.m.) I took five fresh *Loucia* (*Chrysophanus*) *amphidromus*. Have done little else lately, as am kept at Charpigny by the disease amongst our fir trees, which will, I fear, cause the destruction of all of them."

* "Mr. Fison's attempt to introduce *iolus* to Charpigny has, so far as I know, been quite unsuccessful."—L.M.F.

† No doubt Bavois.—L.M.F.

2. ECLÉPENS.

“Yverdon, July 9th, 1907.

“I saw no *Apatura iris* or *Limenitis populi* at Eclépens to-day, and shall not return for them until next week. I got the four usual Theclas, and over the tunnel, I believe, two *Lycaena euphemus* (a queer place for them), and four of the pearly *Parnassius apollo* someone spoke about last year. Their spots and colours are really very fine.”

3. NOTES ON THE SEASON 1907.

“Clarens, December 4th, 1907.

“As to butterflies, there is really very little to write about this year. I never had so bad a season, and fear that its effects will not be quickly remedied. This, however, will be quite interesting to note in 1908. For instance, *Ercbia aethiops*, generally so common at Charpigny in autumn, was scarcely there at all, and there were not many *Epinephile tithonus*. Except a few fairly dark ‘Swallow-tails,’ I found nothing to catch. I told you, I think, of the *Limenitis populi* caught there on June 20th and 24th. It is grievous to say all that line of firs on which they used to sit are now down, and quite half the firs in my wood are gone too—cut down on account of the Bostrych.* By a new order we have to burn the bark of all such trees as well as their branches.

“I have been making out a detailed list of the Apaturids, with the number of their dark aberrations, which I took at Eclépens in the last three years. I quite thought there was an interesting point about it, in the decrease of dark abs., culminating in *none* this season. However, in counting the eight transitional abs. taken in 1906, as I am doing, in the total of fifteen, there is not much in it; although it is curious that I should not certainly have seen one dark ab. this year, for although I netted only 28 in all quite 70 must have been observed. *Var. clytie* was not rare, although I only took one. The proportion of *Apatura iris* to *Apatura ilia* I have rather to guess at, and of their abs. too. Also, I have a third ab. of *clytie*, which is not given below in the following list:—

1905. Six days at Eclépens and Chavornay (one hour on July 7th, getting eight), June 29th-July 8th.

<i>Iris.</i>	ab.	<i>ilia.</i>	ab.	<i>clytie.</i>	ab.	Types.	abs.	<i>circe.</i>	<i>populi.</i>
65	10	51	8	21	1 or 2.	156	19	1	1

1906. Six days at Eclépens. June 3rd-July 10th.

42	8	38	6	9	1	103	15	8	7
----	---	----	---	---	---	-----	----	---	---

1907. Three days at Eclépens. July 9th-12th.

4	9	1	14
---	---	---	----

Upper and lower roads. From Yverdon to Yvonand, two days. July 10th-13th.

12	2	14
----	---	----

16	11	1	28
----	----	---	----

You see I count *clytie* as a type. I only caught one ♀ Apaturid—*Apatura ilia*. It is only fair to say the five days on which I caught these Apaturids this year were *very* cool, with north wind, although

* Disease amongst firs, caused by a parasite underneath the bark.—L.M.F.

sunny. One day on the lower Yvonand road I saw a good number of *Apatura iris* all along, but the strong breeze from the lake must always interfere with what might be a most excellent place, and good probably also for *Limnitis populi*. I feel rather inclined, if possible, to go again next year to Yverdon, to see if the dark abs. are again as numerous as in 1905. I should like, too, to try the wood south of Chavornay (one hour off) again, where I did so well in an hour in 1905, and to visit a wood I see four or five miles south of Yverdon.

At Finhaut in August I got very little. The only good high place was the large valley beyond and below the Col de la Gueuroz. The Barbarine Club Hut is in it. From its size and isolated position it might be a first-rate place, but I was there too late, and the *Parnassius delius*, *Breuthis pales*, and forms of *Erebia* I saw were all old."

The Upper Engadine in 1914.

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

Year by year, as my wife and I have passed the great fortress of Belfort and seen the early sun shining peacefully over the prosperous towns, Altkirch and Mulhausen, on our way to the Swiss mountains, have we thought of the terrible scenes enacted and the devastation achieved in the war of 1870. Little did we think as we again saw these fertile fields in the early morning of July 25th, 1914, that almost ere another week had passed, the scenes would be re-enacted with even greater "frightfulness" than before.

Our usual way is to go direct to Paris, get a substantial evening meal, and do the somewhat tedious crossing of France in the night, reaching Bâle in time for an early breakfast, and thence have the choice of trains to our destination. This year we were bound for the Engadine, and after a good breakfast on Bâle platform entrained for Chur, where we had our midday meal and a walk in the town while waiting for the afternoon train to St. Moritz. The weather was delightful, and what could be finer than the grand and wild scenery of the Albula as the train wound its way through the mountains, sometimes at giddy heights above huge ravines, sometimes in spiral tunnels, sometimes in open valleys, always with change of scene, until finally, after passing through the long tunnel under the Gnimms to Bevers, we saw the delightful Engadine valley, and leaving Samaden and Celerina behind at last came to the Innfall ravine, and reached St. Moritz station about 6 p.m., quite ready, after a wash and change, for a hearty meal.

The next morning, July 26th, the sun shone gloriously, and I was out before 7 o'clock. My way was along the upper Campfer road, towards that village, to the slopes of the Savretta, which I found so prolific in insect life in July, 1907. The air was very cool, and everything was soaked with moisture from the rain which had fallen in the night. Turning to the right by the St. Moritz cemetery, I was astonished to see a huge hotel standing right on top of one of the choicest parts of the ground I had previously known.

Passing some little way beyond this hotel on the lower path I had one of the greatest pleasures of an entomologist abroad, that of seeing the insects creep up from the herbage as the rays of the sun, rising over the mountains, gradually reach them. Not in ones or twos do

they come up, but in countless numbers, and their movements and orientation, or whatever one calls it, seem to indicate that they too have "joy in life." The species, so far as noted, were *Argynnis aglaia*, *A. niobe*, *Colias phicomone*, the mountain form var. *aegeidion* of *Plebeius argyrognomon*, *Coenonympha satyrion* with its ab. *unicolor*, *Agriades thetis*, *Erebia melampus*, *Anthrocera jilipendulae*, *A. purpuralis* (*pilosellae*), the Noctuids *Agrotis ocellina* and *Noctua festiva* (?), both on flower heads, the Geometers *Urogene lutearia* and *Acidalia flariolaria* in abundance, *Xanthorhoë sociata*, a plume not yet identified, numerous Tortrices and Tinea, including the common and widely spread *Aphelia argentana*, as well as many species of Coleoptera and representatives of other insect orders.

After breakfast the road taken, past the house formerly the alpine residence of Prince Henry of Prussia, led up to the gorge which forms the entrance to the wild and secluded Suvretta Thal. This road is usually a most prolific spot for butterflies before the hay is cut. Just now the cutting had scarcely commenced, and the alpine pasture flowers were at their best. With the brilliant sunshine and clear atmosphere the views of the surrounding peaks, mountains, lakes and valleys were enthusiastically admired by several English visitors who were new to the district and had come out with us for the morning. On the right one could see the peaks of Piz Julier and Piz Albana, towering close above and separating the commencement of the Suvretta Thal from the Julier Pass leading to Tiefenkastral on the Albula, below lay the Upper Engadine valley with its chain of glittering lakes, Silvaplana, Campfer, and St. Moritz, and its lovely pine woods backed by the snow covered Piz Magna, Piz Corvatsch (with its pure white glacier), and Piz Surlej, beyond the village of St. Moritz on the left, looking over the fir covered hills which separates the Upper and Lower Engadine, and which is probably the terminal moraine formed by the great glacier that ages ago filled the valley, can be seen the beginning of the Valley of Pontresina, made by the waters of the Filsbach from the Bernina Pass, with its north-east mountain boundary topped by the snow-covered Piz Albris, Piz Languard, and Piz Muraigl, on the slopes of which lies the home of the much desired *Erebia flarofasciata*.

Returning to the lesser, if not to us the less, attractive features of the walk, one could but notice the bunches of butterflies drinking the moisture on the roadway. As we passed they flew up in small clouds each few yards. *Agriades coridon*, *Polyommatus icarus*, *Plebeius argyrognomon*, *Polyommatus eros*, and *Erebia tyndarus*, formed the bulk of the drinkers, with a few *Agriades thetis* and *Polyommatus semiargus*. All the species seen in the early morning were again noted, most of them either flying across the roadway or settling on the flowers fringing it. The Noctuids mentioned above were on the head of *Centaurea* and thistles, and with them were the mountain form of *Adscita geryon* var. *chrysocephala*. *Argynnis pales* occurred, mostly quite typical, but one was taken in which the black spots were fairly conspicuous on the underside of the forewings, var. *arisilache* in tendency. An ab. *punctata* of *Agriades thetis*, an *Erebia melampus* with dots in the dull orange blotches on all the wings very minute as well as reduced in number, plenty of *Coenonympha satyrion*, both ♂s and ♀s, etc., were obtained.

The afternoon turned somewhat cloudy, with rain in the near distance, and a quiet walk was taken with our friends through St.

Moritz Bad and around the St. Moritz lake to the Meieri for a cup of coffee, of which, having once tasted, the temptation is too strong not to endeavour to make one's rambles terminate again and again at the far-famed "Gasthaus." Just at one point in the walk we saw a rainbow in the spray above the Innfall at the exit of the stream from the lake. I might say that the views during the earlier part of our visit were much enhanced by the late disappearance and frequent renewal of the snow on the mountain tops. For a week after we arrived the snow did not recede from the slopes of the Muotta Muraigl above the pine trees. The ground sacred to *E. flavofasciata* was so covered by snow that a projected visit was put off and unfortunately indefinitely so, for war broke out and all means of conveyance were stopped, small money was quite unobtainable, and when a chance of paying a visit did eventually occur it was much too late for the species to be found.

The early morning of July 27th was very misty and the sunlight was very bright at intervals, but we had determined to go to the Morteratsch Glacier and walk along the western mountain slope towards the Boval hut. I had arranged to walk from St. Moritz through Pontresina and Mrs. Turner was to come on by train and meet me at Morteratsch station later in the morning. The night had been wet and then frosty, so that the air was delightfully cold as I started to renew my memories of some seven years before, when I had taken the same road. Many were the changes I saw, all no doubt induced by the railway, which did not exist on my previous visit. My way led through the village, by the station, to the Innfall and St. Moritzer See, around which the ground was still white, as the sun's rays had not come over the tops to the eastward. The reflection of the snow-capped mountains in the perfectly clear and still waters of the See was at its best. Later in the day, when agitated by the movements of boats or the changing winds, this is to a great extent spoiled. The Meierei, where one always wanders towards late afternoon for a delightful cup of coffee, seemed unchanged, and early as it was the women were washing as usual at the running stream. Further on was reached Statzer See, a small shallow lake among the pines, now with an ugly restaurant for afternoon tea spoiling its loneliness. The path then led into the pine forest fringing the base of the Piz Rosatsch, still dripping with moisture too much to stir its foliage or undergrowth, but as was always my experience in the some dozen times I passed that way during my stay, the insects resting on the trunks, etc., were very sensitive to every neighbouring movement and flew off in considerable numbers. Species of *Scoparia*, *Gnophos* and "Carpets" seemed to be the more prevalent. As the path through the woods to Pontresina would be more or less shaded at this early hour, and was also damp, I took that leading across the rail and Bernina-bach to the lower end of the village, expecting to meet with a few insects on the low meadows covered with scattered glacier blocks, but in this I was disappointed, as not a wing was seen in spite of the now brilliant sunshine. Passing rapidly through the mile-long village, stopping a moment to admire the glorious view up the Rosegg Thal with its lovely white glacier at its head, I took the path to the right across the meadows and bach towards the Sansouci Restaurant, now relieved of its loneliness by the near approach of the Bernina Railway and a station. After passing a little way along the path I wandered to the edge of the trees and along

the railway banks, where it was more open and sunny, and collected for the remaining four miles to the Morteratsch station. Butterflies were here fairly abundant. *Brenthis pales* perhaps predominated, the males were quite normal as to colour and size, while the females were of the var. *isis* form, the upperside dusted with blackish and the yellow of the underside predominating over the red. Some females were of the ab. *napaea* with upperside shot with purple, but still not of the extreme form of this ab. There was also a tendency to develop spotting on the underside of the forewings in some of the females, a sort of intermediate step to var. *arsilache* where this spotting is strongly emphasised. One female was a very pale washed-out tint, although in good condition. One example of *Brenthis euphrosyne* was taken, and this at over 6,000 feet. It was large in size and quite fresh. There were plenty of *Erebia tyndarus* and *C. melampus* was in some number. The former were the typical twin-eye-spot upperside forewing, but the undersides of the hindwings were of a dark inconspicuous gray, devoid of character, the latter with a tendency to the diminution of the reddish patches and black spots; in one brought home there are only two reddish patches on the hindwings, and these without black dots. *Coenonympha satyrion* was very common and generally typical on the underside. All the specimens taken had no apical eye-spot on the underside of the forewings. The males were of the *unicolor* form. *Coenonympha iphis* was much worn and only a few were noted. A beautiful *Pontia callidice* was taken, nearly to the Morteratsch station. There were plenty of *Plebeius argyrognomon* of the large alpine form *aegidion* in quite good condition. *Albulina pheretes* was, as usual, in marshy spots and as usually my luck not in good condition. A Hesperiid was common, which so far as I can see was only *Hesperia alveus*. A specimen of *Larentia caesiata* was of large size and with very clearly emphasised transverse markings. A few plumes were met with but none were taken. Of Anthrocerids only one or two *Anthrocerus purpuralis (pilosellae)* were seen. The little yellow Geometer *Acidalia flariolaria* was also very abundant here, as was the Tortricid *Aphelia argentana*. The flowers noted were *Pyrola rotundifolia*, locally common under shade, and plenty of *Pinguicula vulgaris*, the fly-eating butterwort, on the wet marshy banks.

At last the station was reached, and the weather changed. The sun gradually disappeared, and collecting was over for the day. My wife met me, and we wended our way towards the glacier, and then up the steep zigzag to the level path skirting the western side. From the Chunetta one has a fine view of the glacier, its terminus, and its whole surface for miles. At one's feet are the smooth rock surfaces made by the glacier when it extended further down than now; on the centre of the glacier lies an unusually wide moraine, and along each side one can plainly see the huge lateral moraines. The path, some five miles, to the Boval hut goes sometimes on the mountain slope, sometimes on the moraine, sometimes over snow even at this time of the year. As we went it got colder, and finally, when we reached the rough steps for the final climb, it began to snow. This made us, after a rest and refreshment, forego our intention to reach the hut, and we turned back. There was an almost complete absence of insect life, but the patches of colour from the flowers were very pleasing. In many places the rhododendrons were not yet over, and on the moraine

were many flourishing plants of the beautiful *Linaria alpina*. Near the hut a plume was seen, but the spot was too dangerous to plunge, and it escaped. This was practically the only Lepidopteron seen on the path. The only quadruped seen was a mule, which passed us on the giddy steps near the hut. We ought to have had a glimpse of the chamois from here had the day been fine and bright. All around the Bernina group of the Alps the country is treated as a government preserve for this now vanishing denizen of Switzerland. The return journey was a cold one, and the coffee obtainable at the station was most acceptable and refreshing.

July 28th was chosen for a long expected visit to the Bernina Pass and Alp Grum. The rail mounts rapidly in zigzags from the Morteratsch station crossing the beautiful Bernina Falls with grand views of the huge glacier with its unusually wide central moraine, and quickly gets above the tree line. The first stopping-place is at the Bernina Haus, which is at the entrance of the narrow and wild Heuthal or Val del Fain, famed as one of the finest localities for alpine flowers, and known to entomologists for the extremely dark race of *Brenthis pales* which is said to be taken in some numbers about the falls and marshy spots at the far end some six miles distant. The road from the Morteratsch to the Bernina Haus passes through an area of sparsely timbered ground which is a capital collecting place for entomologists and amid the grandest views of snow, glaciers, and mountain peaks. Some miles further on the chain of small lakes is reached and the watershed, a narrow barrier between the "black" and "white" lakes, Lago Nero and Lago Bianco, is passed. The water from the former goes into the Inn and on to the Danube, that from the latter lake flows to the Adda, Lake Como and the Adriatic. By the Lago Bianco the road and rail diverge to unite at Poschiavo more than 4,000 feet below, the former taking the valley north-east of Piz Campassio where easier gradients are available, while the latter takes the much steeper Alp Grum, obtaining its gradients by many tunnels. As Alp Grum is our destination we pass the fine Cambrena glacier and descend the gradients, soon coming into view of the Piz Palù glacier, the curious high-perched hut on Sassal Massone and the view station of Alp Grum, which dominates the tremendous deeps of the Poschiavo valley down almost to Tirano in Italian Switzerland, with a grand circle of snow-capped mountains as a background. The air is cold, the sun elusive, but for half-an-hour after leaving the station we enjoy the warmest spot of the day, and the sun allows us to take a nice series of *Heodes hippothoe*, including a few females which are flying along the path between the only cultivated and cultivatable spots at that height. Of course they are of the *corymbia* form, but the discoidal is present in all the males, though small. The females are all ab. *nigra*, in which the upperside is without a touch of orange. Keeping fairly close to the return path (no road is possible here), towards the Bernina Hospice, *Colias palaeno* is met with, and several *Pontia callidice*, which latter the steepness of the slopes and the swiftness of the insects allow to escape, except a ragged male. *Cononympha satyrium* and *C. iphis* are both in numbers, but the latter too worn to trouble about. The steep climb having been negotiated a rest for refreshment is called. Below us we note that some workmen are quarrying. Suddenly we hear shrill whistles and at least a hundred

men rush for shelter. A terrific explosion takes place, huge rents are made in the mountain side near the path we were about to take, and great masses of rock roll down, while the echo and re-echo from side to side is grand. We hurry on out of range and come to slopes and hollows which should prove prolific spots for the collector if only the sun could be propitiated. As it was we found *Erebia gorge* var. *triopes* commonly (only one specimen of the type was noted), *Colias palaeno* several, *Coenonympha satyrium* in numbers, a few *Anthrocerus exulans* of a robust well-scaled race, one *Brenthis pales* only, and that a cripple, red predominating on the underside of the hindwings, some *Erebia tyndarus* and *E. goante*, two or three "skippers," which might have been prizes unfortunately missed, one female *Vacciniina optilete*, the only "blue" seen, a fine form in which there was considerable blue scaling on the upperside with pale bluish clouded blotches on the outer margins gradually disappearing in the general ground colour, and several nests of the larvæ of *Eriogaster arbusculæ*, which some authors take to be the alpine race of our *E. lanestris* of the lowlands, were among the things noted or taken. The flowers both here and on the more rocky places were very interesting. We were not too late at this elevation to meet with both primulas and gentians, and even a Christmas rose greeted us at one spot. The *Pinguicula* and *Soldanella* were also seen, the former in abundance. Diverging from the paths, and wishing to see the far-famed Bernina Hospice, we crossed the bare wind-swept Alp, capturing a few *Erebia lappona*, which were stirred up as we went along. Afterwards we went over the top of the pass (7,600 feet) as far as the road galleries on the eastern side, where there are numerous avalanches in winter and spring. Even now there was thick ice under these shelters, so cold had the season been. From this "coign of vantage" there is a most extensive view of the road as it circles in and out on the gradients for miles adown the valley, and no doubt traverses much ground that is entomologically good. Only one insect could I find here, and that a micro, on the moss just outside the galleries. One could only anathematise the weather and return from this grand locality with the few samples it was possible to take, and the wish to revisit with "better luck next time."

(To be continued.)

Notes on Collecting in 1914.

By W. RAIT-SMITH, F.E.S.

On previous occasions I have described my notes as collecting in the Abertillery district of Monmouthshire, but as this has been objected to on admittedly reasonable grounds I will change the title of my notes, and more especially as I have done comparatively little collecting locally this season.

The early months of the year in Abertillery produced nothing beyond the common spring insects in fair numbers. *Anisopteryx aescularia*, once very abundant here, still remains unaccountably scarce. A few *Brephos parthenias* were noticed flying round the birches on sunny days towards the end of March. *Chimabache jagella* in both light and dark forms, with ♂s largely predominating, were very common on tree trunks during April, together with a few *Tephrosia biundularia*, of

which species I took a very nicely marked example at rest on a larch trunk on the 24th. I have previously recorded *allopherys rubi* as swarming in a small valley near Abertillery in April, 1912. They were not so abundant in 1913, but occurred in even greater numbers this year. Amongst others I took a very perfect example, having the underside of the wings of a deep bronze colour in place of the usual bright green. Examples with bleached patches on one or more wings were not uncommon. The Pierids were about in fair numbers, *Pieris napi* as usual by far the most common of the three species. *Coenonympha pamphilus* was common enough, in company with odd examples of *Ranicia phlaeas* and *Polyommatus icarus*.

I spent several days in May collecting in the neighbourhood of Port-llan-fraith, principally after *Hemaris tityus* (*bombyliiformis*), of which species I took an odd example in 1907. I was fortunate enough to find this interesting insect fairly common in one marshy field at Port-llan-fraith on the 17th, eight or nine examples were seen and five were taken as they fed at bugle and other low growing flowers. The easiest way to take this species is to place one's net flat on top of them, it is quite useless striking sideways. This moth does not appear to be on the wing for any length of time. I visited this locality again a week later, but not a single specimen was to be seen, but that may have been on account of the weather, which was dull and cold, as *tityus* will only fly high in bright sunshine. *Melitaea aurinia*, which used to occur in this field in abundance, has now almost entirely disappeared, a dozen examples were seen in 1913 and only one this year. I cannot account for the disappearance of this butterfly, as the ground is untouched from year to year, and as far as I know the locality is quite unknown to any other collector. In a small wood adjoining this field I took a fine series of *Tephrosia punctularia* at rest on birch and alder trunks, together with several nice forms of *Hydriomena impluviata* and *Lampropteryx suffimata*. Beating bushes and rough herbage gave several *Lomaspilis marginata* of varied forms, *Euchocca obliverata*, *Coremia designata* and *C. ferrugata*, *Cabera pusaria*, and other common Geometers. One or two *Ornicoles hecadactyla* were beaten out of honey-suckle. A few *Brethia euprosyne* were noticed on the 17th and 24th, but they were too worn to be worth taking. The males of *Saturnia paronia* and *Macrothylacia rubi* were fairly common in large open spaces, the former at the beginning and the latter at the end of the month. *Colastrina argiolus* has been more plentiful here this year than usual, several were taken flying round the hollies on the 17th, one or two were fairly fresh but the others were decidedly *passé*. This is not a common species here as a rule. A few *Nadana glauca* and *Pharetra* (*Acrionicta*) *menyanthidis* were found at rest on stone walls during the first fortnight in May. *Pharetra* (*Acrionicta*) *rumicis* was not uncommonly at rest on tree trunks and walls; a nice var. *salicis* was taken on May 24th.

On May 31st I went down to Bickley, Kent, for a few days. Collecting at Bickley is almost entirely confined to searching the fences and going round the lamps at night. Searching the fences was rather productive. *Hepialus lupulinus* was very abundant, a beautifully marked example having the ground colour silvery white was taken on June 1st. *Eupithecia vulgata* was another very common species, dozens were seen in the course of a week. Amongst other species

taken or noticed on the fences were *Xanthorhoe fluctuata* (common), *Spilosoma menthastris* and *S. lubricipeda*, *Xanthorhoe montanata* (common), a *Coremia quadrifasciaria* on a fence near Chislehurst Common, *Tephrosia punctularia*, *Camptogramma bilineata* (common), *Xanthorhoe sociata*, *Gonodontis bidentata*, *Uadena dentina*, one very dark suffused example was taken on June 7th; *Apamea basilinea*, *Acidalia virgularia* and *Coremia ferrugata*, as well as several Tortrices and other small fry, including three fresh *Oecophora olivella* taken on a decayed oak post on June 6th. In a lane near Bickley the brilliant *Harpella geoffrella* was flying over the rank herbage in the ditches in dozens, active when the sun shone, but very lethargic and easily boxed if the weather was at all dull. This lane also produced a few *Adela fibulella*. Butterflies were rather scarce. I only noticed the following:—*Pieris brassicae*, *P. rapae* and *P. napi*, *Euchloe cardamines*, *Rumiccia phlaeas*, *Polyommatus icarus*, *Celastrina argiolus* and *Coenonympha pamphilus*.

On June 4th I went down to one of my favourite collecting grounds, the Warren at Folkestone, chiefly for the first brood of *Agriades thetis* (*adonis*). The weather was brilliant until Folkestone was reached, when unfortunately the climatic conditions changed; the sky was very heavy and overcast by the time I arrived on the Warren. This was very disappointing, so there was nothing for it but to beat and search grass stems and bushes. A few *A. thetis* (*adonis*) were taken at rest on grass stems, and I was very fortunate to include amongst them a perfect *ab. ceronus*. *Polyommatus icarus* was common enough. Beating rough herbage only produced a few common insects, such as *Ematurga atomaria*, *Coremia ferrugata*, *Camptogramma bilineata*, and *Xanthorhoe montanata*, etc., in spite of much hard work.

On my return to Abertillery, further visits were paid to Port-lanfraith, on June 14th and 21st. Insects of a common order were abundant, especially *Breuthis selene*, which swarmed here. The most interesting insect taken was an *Acronieta leporina* var. *bradyporina*, which was found at rest on a birch trunk. This is the first example of this species I have seen here. A few *Conchylis smeathmanniana* and other Tortrices were beaten out of rushes, and one or two beautiful *Mesoleuca albicillata* were found at rest on rocks.

"Dusking" at Abertillery during June was very productive as far common Noctuae and Geometridae were concerned, but nothing of any great interest was noted; the best thing was a fine *Theretra* (*Chacrocampa*) *porcellus*, only the second noticed in this district, which was netted on the 29th as it fed at the flowers of ragged-robin. Several *Scoparia cembrae*, an insect I have not previously taken here, were netted at dusk as they flew over nettles and other rough herbage. A very perfect melanic *Boarmia gemmaria* came to the light in my dining-room on the 17th; this usually common species is quite scarce here. The Plusias were scarce this year; a few *Plusia pulchra*, *P. festucae*, and *P. gamma* were netted at dusk. *P. festucae*, usually the most abundant species, was particularly scarce, not more than two or three were seen altogether, whilst *P. chrysitis* was not noticed at all. *Hepialus humuli* is usually very common where it occurs, but I have never seen it in such numbers as this season. There were scores on the wing at once in every field. "Sugaring" during June produced insects in fair numbers, but of a common order, especially *Miana*

fasciuncula and *M. strigilis*, and a few nice *Leucania comma* and *L. litharygia*. I find the latter insect comes more freely to sugared thistle heads than anything else.

On June 27th I paid a flying visit to Weston-super-Mare, in the hopes of taking *Asthenes blomeri*. This pretty little Geometer was not uncommon in the Kewstoke woods, but is not easily taken. They rest rather high up on tree trunks, principally wych-elm and ash, and are very skittish, taking flight before one can reach them. By dint of hard work I managed to get twenty good examples. *Abraxas sylvata* swarmed everywhere, especially amongst ivy. Several *Iodis lactearia*, *Hemithysa strigata*, *Acidalia aversata*, *Semiothisa liturata*, and *Zanclophora grisealis* were beaten out of rough herbage. Butterflies were rather scarce, the most common species was *Pararge aegeria*, which at this date was decidedly *passé*.

Owing to pressure of business I was unable to do much collecting during July. I do not find anything of particular interest in my notes of the little I was able to do. On the 11th my wife and I had an enjoyable day in the Forest of Dean. We had visions of taking our latest addition to the British list, *viz.*, *Araschnia levana*, a single example of which was taken near the Forest of Dean last year. We failed to find any trace of that butterfly, although several have been taken at Symonds Yat and other points of the Forest this season. We were too early in any case. I believe this is a very local species even on the Continent. Butterflies, and especially *Argynnis adippe*, were abundant. Several scores of *A. adippe* could have been taken had we wanted them. *Dryas paphia* was common, and three *Argynnis aglaia* were netted as they flew along a railway bank. The three Pierids, *Aphantopus hyperantus* and *Adopaea clara* (*thanmas*) were common, and I was interested to find several *Melanargia galatca* on the railway banks. I have always associated this local species more or less with the sea coast. I was pleased to take a few *Anthrocerus* (*Zygocera*) *loniceræ*, as they lazily flew from flower to flower, as I have not hitherto seen this burnet on the wing. A few "plumes" were beaten out of rough herbage, and a large but very worn ♀ *Boarmia roboraria* was found at rest on a pine trunk. *Olecia atra* was common, but worn. Geometers, on the whole, were scarce. Although insects have been more abundant this year than usual I notice it has only been amongst the commonest species, at least so far as this district is concerned.

On August 1st I took my annual holiday, going with my wife and family to Lymington, Hampshire. This place was chosen as I thought it would be a convenient centre both for the Isle of Wight and the New Forest. I am very sorry now we did not stick to our original intention of staying at Brockenhurst, as we did last year. On August 2nd Germany declared war on Russia, and after that everything was chaos as far as railway travelling was concerned. Our proposed trips to the Isle of Wight were stopped altogether, and getting about anywhere was difficult. There was nothing for it but to make the best of things and to collect when and where we could.

Lymington itself appeared to be a poor locality for Lepidoptera; butterflies were scarce in numbers and species, a few "whites," *Polyommatus icarus*, *Celastrina argiolus*, the commonest of the "blues," *Rumiccia* (*Chrysophanus*) *phlæas*, *Coenonympha pamphilus*, *Epinephole tithonus* and *Pararge megera* were noticed. Moths were fairly common

round the electric lamps at night. Among others we took the following at light, *Porthesia similis*, *Hydraecia nictitans* (common), *Acidalia bisetata*, *Crocallis elinguaris*, *Pionea forficulis* (common), *Eupithecia oblongata*, *E. assimolata* and *E. vulgata*, *Bryophila perla* (abundant), *Apamea secalis* (common), *Cidaria truncata*, *Miana bicoloria*, *Thamnonoma cantaria*, *Boarmia gemmaria*, *Lithosia lurideola*, *Triphaena ianthina*, *Homoosoma nebulosa*, and a few Tortrices. A fine *Mormo maura* was taken at rest under a window-sill.

Several visits were paid to Stubby and other parts of the New Forest. I was anxious to get *Ruralis (Zephyrus) betulae*, but failed to find this species, although a considerable amount of time was devoted to the search. Only one *Bithys quercus* was seen, flying high up round an oak.

Butterflies were fairly plentiful in the forest; by far the commonest species at this date was *Pararge aegeria*, in beautifully fresh condition, one or two worn *Argynnis adippe* were noticed, *Argynnis paphia* was common but very worn, a fair ab. *valezina* was taken at Stubby on the 7th. The second brood *Pieris brassicae* was abundant, and towards the middle of the month *Gonepteryx rhamni* put in an appearance in large numbers, one or two examples were taken with numerous spots and blotches of rust colour distributed over the wings, and another example had the costal margin of the forewings heavily marked with rust colour. Over twenty of these butterflies were counted in a small space of about 30 square yards at the same time. *Celastrina argiolus* was common wherever there was holly. I do not remember ever seeing this blue so abundant as it has been this year. At Brockenhurst Heath *Satyrus semele* was swarming, and in fine fresh condition. *Pararge megera* was not uncommon, and *Coenonympha pamphilus* as usual swarmed everywhere. *Polyommatus icarus* was fairly common, and a single ♀ *Plebeius argus (aegon)* in very fresh condition was taken on Rhinfield Heath. *Vanessa io* and *Aglais urticae* were common. *Pyrameis atalanta* was rather scarce. *Eugonia polychlora* was not seen, although a sharp look out was kept for this butterfly. A few very dilapidated *Limnitis sybilla* were fluttering feebly along the glades. We did not see *Apatura iris*, but we heard that one or two had been taken. I was told by other collectors we met that *iris* has been very scarce in the Forest this year.

We took a lot of sugaring mixture down with us but were unable to use it, consequently the only moths we could obtain were by beating and searching. These included, amongst others, *Mesoleuca albicollata*, *Euchotricha flammealis* (common), *Ortholitha limitata*, *Pyrausta purpuralis* and *P. sanguinalis*, *Acidalia aversata* and *A. bisetata*, a fine fresh *Cleora jubata* taken at rest on a large whitethorn trunk, *Crocallis elinguaris*, *Eupithecia vulgata* and *E. nanata*, a fine melanic *Boarmia abietaria*, beaten out of a fir tree, and a good many Tortrices and *Scoparia* and *Eudoria*.

I was anxious to get a good series of *Adopaea acteon*, so several visits were paid to Swanage. I had heard that at one or two places near Swanage this species swarmed, the exact localities were kept more or less secret. By devoting several hours to close searching, and walking several miles over rough ground, I was at last rewarded by finding one spot where this local skipper occurred in hundreds. In a very short time I got as many as I wanted. *Acteon* simply swarmed

here. I had as many as six in my net at a time. In spite of its quick flight this insect is easily taken. It is exceedingly local but very abundant where it occurs. I found a second locality a few days later where it was almost equally abundant. At the beginning of August *acteon* was in fine fresh condition; it very soon gets worn, and really good cabinet specimens require to be taken within a day or so of emergence. The "blues" were common in certain spots, *P. icarus* being by far the most abundant. A curious ab. of this species was taken on the 13th; the spots were normal on the left wings, but were altogether missing on the upperside of the right wings, on the underside the spots were quite normal in the left wing, but were streaked to a marked degree on the right wings, and especially so in the forewing. The specimen was a ♀ in fair condition. *Plebeius argus* was fairly common. A good many *Agriades coridon* were netted in the hopes of ab. *forleri*, but without success, although a few minor varieties were taken. A single ♂ *Agriades thetis (adonis)* was netted on the 13th, the only example noticed, and one or two very worn *Cupido minima* were seen on the 14th. Other butterflies noticed at Swanage were *Pararge megera*, *Epinephle tithonus*, *Melanargia galatea*, *Satyrus semele* (common), *Vanessa io*, *Aglais urticae*, *Pyrameis cardui* and *P. atalanta*, *Coenonympha pamphilus* and *Rumicia phlaeas*. Amongst the moths *Gnophos obscurata* fairly commonly on bare chalky patches, a few *Aspilates gilvaria* were beaten out of rough herbage, *Pyrausta purpuralis* was very common, with other small fry, amongst the short herbage on top of the cliffs.

We returned back to Abertillery on August 15th, bringing home about 600 insects, which kept me busy setting for a week or two. Since August I have been unable to do any collecting. Throughout September *Eudoria (Scoparia) angustea* occurred at light in extraordinary numbers, hundreds could have been taken had one wanted them. This local *Eudoria (Scoparia)* is common enough here as a rule, but I have never before seen it in such profusion. Taken on the whole, this has been a fairly good year in the Abertillery district. I have taken one or two species which rarely occur here, and have been able to add two new and interesting species to our local list, *vi.*, *Acrineta leporina* and *Scoparia cembrae*.

A month amongst Spanish Butterflies.

By JAMES A. SIMES, F.E.S.

The account published by Mr. W. G. Sheldon, F.E.S., of an expedition undertaken by himself and Mr. A. H. Jones, F.E.S., in May and June, 1913, to the Albarracin Sierras (*Entom.*, vol. xlv., p. 283, and vol. xlvi.), revived a desire which I had long felt to visit Spain armed with a butterfly net. As circumstances did not seem to interpose any obstacle to the realisation of this desire during the season of 1914, plans for an expedition speedily began to assume a definite shape; and finding that Messrs. T. F. P. Hoar, F.E.S., and A. C. Smith, F.E.S., were bent on a similar undertaking, I concluded arrangements with them for a joint campaign. Various itineraries were discussed, including some which would have left little of the Iberian peninsula unexplored: but we eventually abandoned such ambitious projects as outside the realm of practical politics, and came

to the conclusion that, for a first trip, we could not do better than follow in the footsteps of Messrs. Sheldon and Jones.

We left England on May 20th, and travelled direct to Barcelona. We broke the journey here for a few hours to make an expedition to Tibidabo. It was a glorious day, and notwithstanding that our quarry was not over-plentiful, the memory of the hours spent on that lovely hillside will not soon fade. The first hour revealed nothing more exciting than an odd *Pararge megæra* or two, a very worn *Coenonympha pamphilus*, a few hibernated *Pyrameis cardui*, and a number of *Plusia gamma*; but soon afterwards we had a vision of a fine *Iphiclidés podalirius*, shortly followed by an unmistakable *Papilio machaon*. Matters improved when we got out on to the open hillside amongst the scrub. Here we found that darkest of "burnets" *Anthrocera larandulæ* in some numbers, a few *Melanargia syllins*, mostly worn, numbers of *Celastrina argiolus*, and, to our delight, *Melitæa aurinia* var. *iberica*. Of the latter, both sexes were in evidence in first-rate condition. By dint of steady work each of us managed to pick up a short series of excellent specimens. An odd specimen or two of *Glaucopsyche (Nomia) cyllarus* and *Epincphela pasiphæe* completed our bag. So we descended to the valley, rolled our nets, and took our places on the top of the electric car which was to take us back to Barcelona. Hardly had we taken our seats when a big dark butterfly floated lazily over our heads, so low that had any one of us had a net handy the insect must have been captured. As it was the butterfly pursued its leisurely way unmolested. It was *Charaxes jasius*!

On the following morning we left for the south. We broke the journey for a few hours at Valencia—which does not strike one as being of much interest as an entomological centre—then proceeded to Teruel, where we stayed the night at the station restaurant and on the morrow embarked in the crazy mule-diligence for Albarracin, where, after many adventures, we arrived in the afternoon. We had arranged for quarters at the Hospederia Narro, where our predecessors had stayed; and we can only say that, after the dark hints we had heard in London about life in small country hotels in Spain, we were agreeably surprised at the cleanliness and comfort which we found at Señor Narro's house.

Mr. Sheldon's account of the Albarracin district is so complete and admirable that no remarks on the subject from me are called for. His notes, coupled with some additional hints and directions which were kindly supplied to us by him and his companion, Mr. Jones, were of the utmost use to us in our wanderings, and the success we met with we owe in large measure to the help ungrudgingly given us by those two gentlemen. Our hunting was done for the most part over the ground mapped out by them, our principal locality being the sainfoin fields some two or three kilometres below Albarracin and the gorges on the left bank of the Guadalaviar. The sainfoin fields were not, however, so productive at the time of our visit as they were in the previous year; but this was probably due to the fact that we were a fortnight later and the flowers were long past their best. They were most attractive on our first morning and steadily declined in their yield as the days went by. The weather, too, was distinctly less favourable to us. There were few days when there was unbroken sunshine; and on most mornings we set out under a cloudy sky, wondering if the

weather was going to clear sufficiently for insects to fly. Friend Hoar usually sallied forth wearing a warm British overcoat, albeit he carried—somewhat pessimistically—a butterfly net ready for action. I append a few notes on the individual species met with in the hope that, taken in conjunction with those published by Mr. Sheldon, they may be of assistance to future visitors.

Iphiclides podalirius. A few only. First seen on May 29th.

Papilio machaon. Very scarce. Not more than six examples seen.

Thais rumina. Practically over. One or two passable examples on May 30th. The larvæ were very numerous on the *Aristolochia* and on the stones in the vicinity. They seem fond of resting on these stones, often at a considerable distance from the plant, when not actually feeding, and I have no doubt that they usually pupate on them. Probably the stones are more comfortable than the plant because they retain the heat better.

Aporia crataegi. Fine large examples. Not common. First seen on May 30th.

Pieris brassicæ and *P. rapæ*. Abundant.

P. napi was not met with.

Pontia daplidice var. *raphani* (gen. aest.) Abundant from May 26th.

Anthocharis belia. A few in cornfields. Very worn.

Euchloë cardamines. Generally common from May 28th.

E. euphenoides. First seen on May 31st and afterwards generally abundant. The females generally have much less orange than those which I took in the Estórel some years ago. I took one male, flying strongly, which had the left hindwing of a very small size, being scarcely larger than that of *C. pamphilus*. The malformation is the more noticeable as the insect is larger than the average.

Zegris eupheme var. *meridionalis*. We were almost too late for this species and only managed to obtain about three or four each, and these were the worse for wear. Only one female was secured and this was unfortunately killed before its captor realised its sex. It is very strong on the wing and difficult to catch.

Leptosia sinapis. A few at La Losilla from June 4th onwards.

Colias hyale. Uncommon and worn.

C. edusa. Common. Fine fresh examples from May 28th onwards. *Ab. pallida* was more frequent than I have found it elsewhere.

Gionepteryx (Rhodocera) rhamnii and *G. (R.) cleopatra*. Hibernated examples only. They are very fond of a shrub which has scented blossoms resembling those of *Jasminum nudiflorum*.

Klugia (Thecla) spini. One worn example on June 10th.

Callophrys rubi. Very worn. Both upper and undersides were too rubbed to permit of any opinion as to the form to which they should be ascribed.

Loecia (Chrysopaenus) alciphron var. *gordius*. One female in a meadow by the river about three miles above Albarracin on June 8th.

Rumicia (C.) phlaeas. Uncommon and typical.

Lampides boeticus. Getting over at the time of our arrival, the few good examples taken being met with in sainfoin fields.

Scolitantides orion. Not common. First seen May 27th. They were mostly of the *nigra* form. One was taken at La Losilla.

S. baton var. *panoptes*. Practically over. Only worn examples were seen.

Plebeius sephyrus var. *hesperica*. First met with on May 30th, when five males and one female were taken on the ground indicated by Mr. Sheldon. After this it was met with regularly in this locality, though not in any great numbers on any one day. In addition to the plateau near the road, where Mr. Sheldon discovered it, we found it more than a mile up the gorge, and on June 8th I was very pleased to come across five examples by the roadside about $3\frac{1}{2}$ miles above Albarracin. I could not discover the foodplant in the latter locality, but no doubt it is there. Like the var. *lycidas*, it seems to emerge over a long period, and we found perfectly fresh examples right up to the middle of June, when we left.

Aricia medou (*astrarche*). Uncommon. First seen May 30th. All examples of the *calida* form.

Polyommatus icarus. Scarce and worn.

Agriades thersites. Numerous in the sainfoin fields, but not met with elsewhere. It was well out at the time of our arrival. In one of my males the spotting on the undersides is almost obsolete. All the females met with were of the ab. *azagra*, Sheldon, form.

Polyommatus escheri. From June 9th onwards. Males only were seen, and these are all typical. Not common.

Agriades thetis (*bellargus*). Common from May 30th. A fine large race.

Polyommatus hylas var. *nirescens*. First seen on May 30th, when one male and one female were taken. It was never abundant during our stay, my maximum take being three in one morning. It was mostly met with in the neighbourhood of Santa Croche, but we found it to be widely spread.

Celastrina argiolus. A few only in the vicinity of the town. From May 26th.

Cupido sebrus. A fine large form, abundant from May 28th. Fond of drinking on the wet mud at the side of the river on hot days. Rests in large numbers on shrubs in dried up watercourses, especially on *Artemisia fruticosa*.

Polyommatus semiargus. Very rare. Only two males seen.

Glaucopsyche (*Nomiades*) *cyllarus*. Fairly frequent, and of fine size. Continued fresh throughout our stay. First seen on May 27th.

Eugonia polychloros. Larvæ in great abundance on elms by the roadside above the town.

Aglais urticæ. A few larvæ were found which produced the form referred to and named by Mr. Sheldon (var. *teruelensis*). The imago was first seen on May 29th, when two fresh examples were taken.

Pyramis cardui. Abundant, but mostly worn.

P. atalanta. A few only, worn.

Melitæa desfontainii. Abundant in the gorge below Santa Croche. First taken on May 30th. The males frequent the hot gorges, but the females do not often visit these, preferring the open hillsides.

M. phœbe var. *occitanica*. A few from May 28th onwards. The examples taken were not of a very extreme *occitanica* type.

M. deione. Common on May 30th and for about ten days afterwards, when it completely disappeared.

Issoria lathonia. Very common.

Argynnis aglaja. Not properly out at the time of our departure. Two examples only taken.

A. niobe var. *eris*. One only.

Dryas pandora. First seen on June 8th. A fine large form.

Melanargia lachesis. This species was not out at the time of our visit. I did not take it at all. I saw it in numbers on the railway banks about twenty miles north of Barcelona, when homeward bound in the express for Port Bon.

M. ines. First seen on June 8th. We took very few owing to unfavourable weather.

Erebia erias. One example at La Losilla on June 12th.

Pararge macra var. *adrasta*. Not uncommon, but usually worn.

P. megacra. Frequent.

Epinephle pasiphæe. Common from May 29th onwards.

Coenonympha dorus. Two males on June 9th.

C. iphioides. First appeared on June 12th when we took three examples. Unfavourable weather prevented additions to the series.

C. pamphilus. Not common and very worn.

Erynnis (Carcharodus) alceae. Not uncommon; about half-a-dozen were taken.

E. (C.) althæe. Two examples on June 8th.

E. (C.) taratoræ. Frequent near Santa Croche.

Powellia sao. Not very common.

Hesperia carthami. Very numerous, especially near Santa Croche from May 31st onwards.

Of the other black and white *Hesperiidae* I cannot speak with any degree of certainty, as my specimens have not been subjected to the only reliable test of identity.

Nisoniades tages. A few of the *cervantes* form from May 26th onwards.

Adopaea flava. Not common from May 31st onwards.

Amongst the *Heterocera* the only species not met with by Mr. Sheldon, which we came across, were *Saturnia pyri*, *Dicranura cinula*, and *Trochilium apiforme*. The latter was discovered on the poplar trunks on two or three occasions about 9 a.m. It had evidently just emerged.

The very few *Geometridae* taken have been handed over to Mr. Prout for identification.

In a district new to all of us there were of course numerous natural objects of interest other than entomological ones. It was a treat to see for the first time a pair of vultures poised high over the sierras, and on another occasion to catch a glimpse of a pair of eagles—I believe, Bonelli's. Raptores of smaller species were fairly numerous, but I fear I am not ornithologist enough to hazard a guess at their identity. My notes record numbers of the little owl—a species which was generally observed on the top of a telegraph pole, from which it flew off as one approached, to take up a similar position on the next. Of the small perching birds no one could fail to remark the numbers of nightingales, which sang incessantly day and night in the bushes along the course of the Guadalaviar, and the great abundance and variability of the wheatear. One example of the latter species had all the grey parts replaced by a yellow-brown tint.

On one occasion as we rounded a bend in the road near Santa Croche a fellow passenger in the diligence excitedly exclaimed "Lobo! Lobo!" and looking in the direction indicated I was just in time to

catch sight of swishing bushes and some gray-brown fur as some animal dived into a cavern in the cliff face. It may have been a wolf, as the man said, but I could not swear to it.

Of snakes, I am thankful to say, I saw none. The only reptilian met with which interested me was the fine big green lizard (*Lacerta viridis*), which we came across everywhere.

Trout are common in the river, but they are mostly small, and a small crayfish is also abundant. When alarmed, the latter darts rapidly backwards, and is lost to sight in the cloud of mud disturbed by its motion.

Mr. Sheldon has described some of the most interesting plants of the neighbourhood, one of which is certainly the glorious blue *Linum* which is to be met with everywhere on the limestone rocks. The Savin Tree, which is frequent on the same formation, interested me very much. The adult tree strongly suggests a cypress, and it is only when ones comes across a sapling that the characteristic juniper foliage is noticed. A magnificent wild rose with huge, rich yellow blossoms was discovered in one locality near the town. The big asphodels were very common on the hillside, but I do not think they are of the same species as that which I find so abundant in Southern Italy. The root of the latter is a huge bulb like an onion, whereas the Albarracin asphodel has a root consisting of a mass of tubers something like that of our garden plant *Incarrillea delavayi*. Oleanders do not occur so high up in the sierra as Albarracin; but we saw masses of them in full bloom in dry river-beds between Valencia and Barcelona.

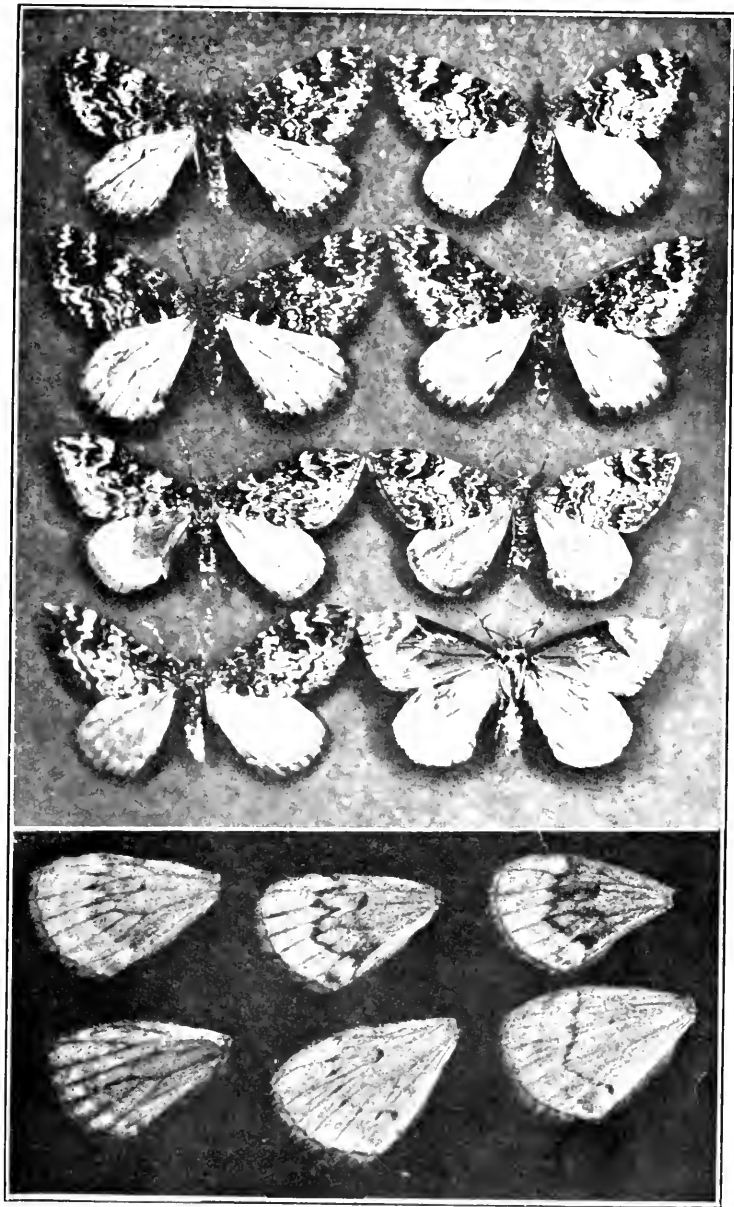
It only remains for me to place on record our indebtedness to Señor Don Mariano Rabinad, the Secretary to the Ayuntamiento of Albarracin, to whose kindness much of the success of our expedition was due. It was a matter of great regret to us that during the greater part of our stay Señor Rabinad was obliged, by official duties, to remain at Madrid.

Dysstroma concinnata, Steph. (*With three plates.*)

By E. A. COCKAYNE, M.A., M.D., F.E.S.

In a paper read before the City of London Entomological Society, Mr. Prout gave his reasons for believing *Dysstroma concinnata* to be a species distinct from *D. truncata* and *D. citrata* (*immanata*). These were based on the external appearances and genitalia of the imago, and on differences in habits, time of appearance and distribution. All these species inhabit the Island of Arran, a fact which proves that these differences are not dependent on local climate or isolation. I will summarise the points which Mr. Prout brings out so clearly.

Dysstroma truncata on Arran is double-brooded, appearing in May and June and again in August and September; *D. concinnata* is single-brooded, appearing in July or August or even occasionally at the end of June; *D. truncata* inhabits the low ground, and the larva is a general feeder; *D. concinnata* is confined to the high ground and the larva feeds on heather, *Calluna vulgaris*. It must be admitted that larvae of both the other species are sometimes seen feeding on heather, but in my experience they prefer other plants, even on the open moors. *D. citrata* passes the winter as an egg, *D. truncata* as a larva; the hibernating stage of *D. concinnata* is unknown. *D. concinnata* rests on



9
12

10
13

Post. F. A. Cook, ems.
11
14

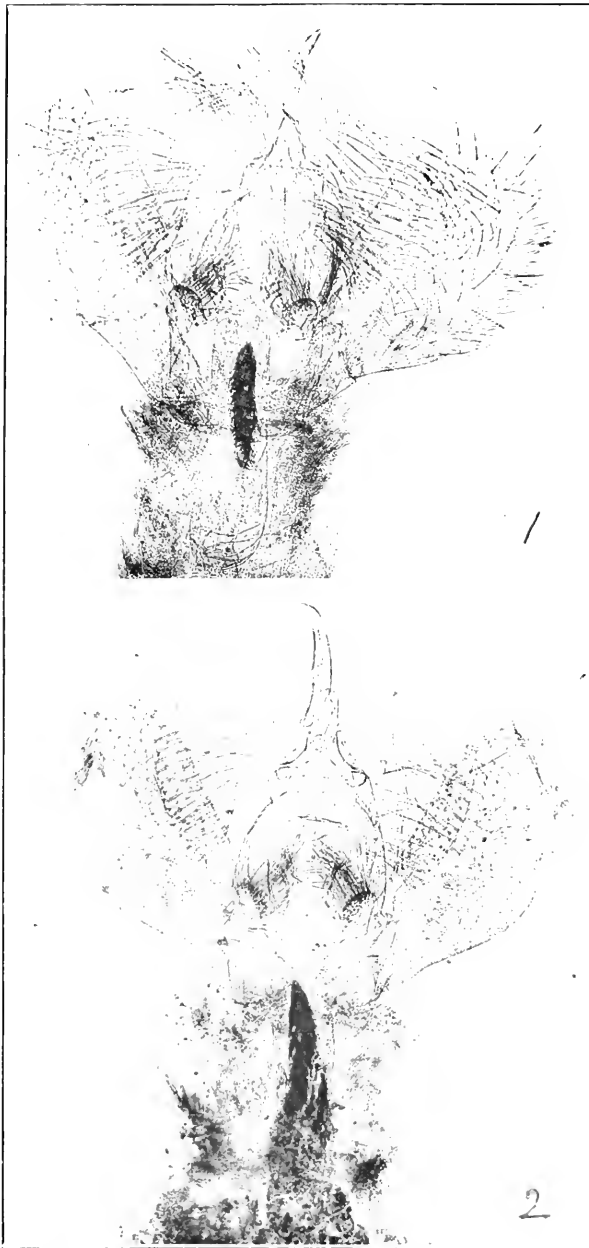


Photo. E. A. Corkayne.

MALE GENITALIA OF: 1, *DYSSSTROMA CONCINNATA*; 2, *D. TRUNCATA*.
The Entomologist's Record, 1915.



Photo, E. A. Cockburn.

MALE GENITALIA OF: 3, *DYSSEROMA CIFERATA*.



granite boulders, *D. truncata* and *D. citrata* prefer the branches and trunks of trees.

Concinnata is very variable in colouring, but has a different facies from either *truncata* or *citrata*, a difference better brought out by long series than by isolated specimens.

It agrees with *truncata* in shape. The wings lack the narrowness and slight hardness of surface seen in *citrata*.

The shape of the outermost line of the broad central band is a fairly reliable feature when large numbers are examined, and in this too it agrees with *truncata* rather than with *citrata*. In the latter this tends to make a smooth sweep from the costa to a projection outwards, which is usually double-toothed and sometimes deeply indented.

Truncata and *concinuata* generally show one or even two sharp projections near the costa, and the large elongation outwards shows three teeth, which are often ill-defined.

The dappled appearance of the central area and the well-marked pale submarginal spots on the hindwings are usually considered the most characteristic features of *concinuata*. In a considerable number of individuals which I have examined they were always present. Both features are often found in Shetland *citrata* (var. *pythonissata*, Millière), the pale submarginal row of spots in the hindwings are sometimes well developed in *truncata*, and exceptionally the central area in this species may be as dappled as that of *concinuata*. The central area in some specimens of *concinuata* is greatly suffused with black or chesnut scales, but there is never the uniformity of colouring which is the rule in similarly coloured *truncata*.

The line on the underside of the hindwing is shaped like that of *truncata*, with a deep indentation between veins 5 and 6, but the line is very thick. In *truncata* this line is usually quite thin, especially in the lighter Scottish forms, and in the darker ones there is a general suffusion of the whole wing with dark scales, which makes it even less conspicuous. In the plate the indentation in *truncata* is not sufficiently clear.

Thickening of the line is rarely met with in *truncata*, but is constant in *concinuata*, and the thick indented line appears to me the single character which is most reliable in differentiating it from its allies.

In the most melanic *concinuata* there is no general darkening of the underside of the hindwing, though there may be a good deal of black scaling in the basal area.

The shape of the line in *citrata* is usually quite distinct, being sharply angled, and without the indentation. The difference is well shown in the plate. (Plt. vii.)

The central spot in *concinuata* is, on the average, larger than in the other species, and the wing surface is more glistening.

In such protean species where variation runs on such closely parallel lines, too much reliance must not be placed on a single point; all must be considered to arrive at a correct determination.

I have failed to find any constant structural characters in antennæ or elsewhere except in the genitalia, by which I can separate one species from the others.

In outline, markings and colouring, the Arran species comes nearer to *truncata* than to *citrata*.

With regard to the male genitalia, Mr. Prout published a note in this paper stating on the authority of Mr. Pierce that in *concinmata* the spines on the ædeagus are intermediate between those of the allied species and nearer to those of *citrata*. In spite of this it appears to me that in the general appearance and in individual details alike *truncata* and *concinmata* are extremely close, whilst *citrata* is somewhat removed from either.

In the case of the ædeagus the total width and length is the same in *truncata* and *concinmata*; in *citrata* it is much longer and about double the width. The area covered by spines is also the same in length and width in these two species, but much broader and longer in *citrata*. In fact, so great is this difference that mounted specimens of the genitalia of this species can be recognised readily with the *naked eye* from those of either of the other two.

The individual spines vary considerably in length and breadth in all three species, and those of *truncata* cannot be distinguished from those of *concinmata*, but those of *citrata* are much longer and broader (about two-thirds larger). The total number is about the same in all. The valvæ in all three species differ a little. They are of equal length in *truncata* and *concinmata*, and obviously shorter in *citrata*. They widen out more abruptly in *concinmata* and reach a greater maximum width than in *truncata*. Thus the total area of the valva is greatest in *concinmata* and least in *citrata*. The valva of *citrata* has a straighter inner edge and the smooth area covered by long straight hairs (costa of Pierce) is longer than in the other two. In *concinmata* the costa is broader than in *truncata*, and the hairs on the anellus seem to be a little coarser.

The total length of the tegumen is equal in *truncata* and *concinmata*, shorter in *citrata*, it is also narrower throughout in the last-named. The uncus also is shorter and narrower in *citrata*, and is different in shape. It tapers much less gradually and the extreme tip is shorter and narrower than in either *concinmata* or *truncata*, which in this respect resemble one another closely.

The females of all three have a rather elaborate genital apparatus, but, as in the case with the male armature, the resemblance is closest between *truncata* and *concinmata*.

The signum is scobinate in all three species, but in these two species the scobinations become smaller towards the middle, leaving a smooth central area. In *citrata* Pierce says the whole is scobinate; there is, however, a very narrow, smooth strip down the centre.

In all three species there is a thickening of the chitin at the neck of the bursa, and on the inner aspect their spines are placed at regular intervals. In *citrata* these are few, and they only occupy a part of the ventral side of the neck. At a rough glance the neck appears to be spineless.

In the other two species they extend almost all the way round, but the band covered with spines in *concinmata* is nearly double the width of that in *truncata*.

Thus in every point of external appearance and in the details of internal structure *concinmata* is seen to approach more closely to *truncata* than to *citrata*.

The geographical distribution of *concinmata* is a most interesting one. It is quite common in the island of Arran and has been recorded

from the mainland, but these records are old and have never been confirmed. A *Dysstroma* which I took on July 5th at Tongue in Sutherland was shown at the City of London Entomological Society and doubtfully assigned to this species. It is, however, *truncata*. Placed with a long series of true *concinata* it has a slightly different general appearance and diverges in details, such as the narrowness of the line on the underside of the hindwing (see Plt. vii., fig. 7).

The genitalia are those of *truncata*. The Hebridean specimens, too, are said to be *truncata*, so that Arran is the only certain Scottish locality and until recently was the only known British locality. But at the pocket-box exhibition of the South London Natural History Society last year Captain Gwatkin-Williams, R.N., showed some Irish Lepidoptera, amongst which were two *Dysstromas* taken by him on July 14th, 1912. I suggested at the time that these were *concinata* and he most kindly lent them to me for further examination. Both are females. Except that they are slightly brighter in colour than the average Arran specimens and have a faint yellowish tinge on the underside they agree with them in all respects. The thick black line on the underside of the hindwings is especially well-marked. They were taken at dusk up on a bare heather-clad hill-side in Achil Island off Co. Mayo on the west coast of Ireland, a locality in many ways resembling the Arran one.

Captain Gwatkin-Williams unfortunately did not realise the interest of the capture until it was too late to pursue his investigations further. But we shall probably find the species elsewhere on the hills of this little known coast.

Outside these two restricted localities in Great Britain the species has not been met with.

I cannot help thinking, however, that if entomologists who visit Norway will look in suitable localities they will find it.

Nearly all our insects with a similar distribution have a Scandinavian origin.

STEPHENS, J. F. ... *Illus. Brit. Ent., Haust.*, 1831, vol. iii., p. 229.

PROFT, L. B. ... *Ent. Rec.*, 1908, vol. xx., p. 143.

„ ... *Trans. City of Lond. Ent. and Nat. Hist. Soc.*,
1908, vol. xviii., p. 52.

EXPLANATION OF PLATES.

PLATE VII.

- Figs. 1 & 2. *Dysstroma concinnata* from Achil Island
 „ 3 & 4. „ „ from Arran Island.
 (Fig. 3 unusually pale).
 „ 5 & 6. *D. citrata (immanata)* var. *pythonissata* from Shetlands.
 „ 7. *D. truncata* from Tongue.
 „ 8. *D. citrata* var. *pythonissata* (underside).
 „ 9, 10 & 11. Underside hindwings of *D. concinnata*, pale, average and
 melanic, respectively.
 „ 12. Upperside hindwing of *D. concinnata*.
 „ 13. Underside hindwing of *D. truncata* (Rannoch).
 „ 14. „ „ „ *D. citrata* (Aberdeenshire).

PLATE VIII.

Male Genitalia of *D. concinnata* and *D. truncata*.

PLATE IX.

Male Genitalia of *D. citrata (immanata)*.

N.B.—The Aedeagus is somewhat bent in *D. citrata*, and all are taken with equal magnification.

SCIENTIFIC NOTES AND OBSERVATIONS.

EARLIEST STAGES OF *COLEOPHORA JUNCICOLELLA*, STT.—The ovum is a low cone with several ribs, very similar to the ovum of *C. laricella*. It is laid on the lower surface of a leaf of *Calluna vulgaris*, almost at the base and half-way between the mid-rib and the margin, so that it is partly hidden by the leaf growing immediately below on the same stem. The larva on hatching passes through the base of the egg-shell into the leaf, which it mines. It then probably changes its skin. Whether this is so or not, it enters a second leaf without forming a case. As far as I was able to ascertain it forms its first case by cutting off a portion from a third leaf. The first case is formed of the upper three-quarters of a leaf which the larva has previously mined, and is of a pale fawn colour. I have always considered *C. laricella* and this species as closely allied, but there is one great difference in the larva, the former possesses four pairs of abdominal prolegs, while *C. juncicolella* only has three pairs.—ALFRED SICH.

NOTES ON COLLECTING, Etc.

COLLECTING RECORDS.—[I think the following two lists of captures should be put on record, more for the sake of the localities, than for any rarity in the insects themselves. Mr. Meyrick and Mr. Durrant have been good enough to identify some Microlepidoptera. These species I have marked with an asterisk (*).—P.A.B.]

I. MICROLEPIDOPTERA OF NORWAY.—In the *Ent. Record*, xxvi., p. 152 (1914) my brother and I published an account of two Norwegian localities. I am now in a position to give a list of the Microlepidoptera which we took there. As the larger paper shows, we were at Lesje July 25th-30th, and in the Sura valley August 1st-26th, 1913, and again at Lesje August 29th.

Pyrausta pupuralis (forewing band divided), Lesje; *Herbula cespitalis*, Sura; *Fredericina calodactyla* (*zetterstedtii*), and *Alkinia bipunctidactyla*, both the above were in worn condition early in August on the Sura; *Crambus culmellus*, *C. pratellus* both abundant on Sura and at Lesje; *C. margaritellus*, Sura; *Peronca schalleriana*, Sura, common; *P. aspersana*, Sura; *Teras contaminana*, Sura; *Sericoris lacunana*, Sura; **Argyroploce bipunctana*, Lesje; *Microdia schulziana*, Lesje, 3,500 ft.: **Euchromia arbutella*, Lesje, in bad condition; *Girapholitha ramella*, type with white ground, Sura; **G. naevana* var. *geminana*, Sura; *G. penkleriana*, common, Lesje and Sura; **Phlocdes crenana*, Sura; *Hypermercia cruciana*, Lesje and Sura, a very dark red fuscous form; *Paedisca solandriana*, not at all abundant, Sura; **Eucosma biscutana*, August 29th, Lesje, common (the species is like a very unicolorous variety of *E. similana*); *Pamplusia mercuriana*, Sura, 3,000 feet, mid-August common; *Catoptria hypericana*, Sura; *Aphelia ossana*, Sura and Lesje, common; **Swammerdamia conspersella*, Lesje; **Depressaria budiella*, Sura; **D. pulcherrimella*, Sura; **D. (Pinaris) applana*, Sura; **D. (P.) hepaticella*, Sura; **Golechia proximella*, bred from birch (*Betula*), spring of 1914; *Argyresthia brockella*, Sura; *A. retinella*, Sura; *Gracilaria elongella*, Sura; **Coleophora laricella*, Sura; **Simacthis (Allononyma) diana*, Sura.

II. FAUNA OF CALDEY ISLAND, PEMBROKESHIRE.—Before the commencement of the war some Cambridge entomologists proposed

to investigate the island of Caldey. I visited it from July 21th to 28th, 1914, and collected rather widely, hoping that my collections might supplement those of others at other seasons. There is now no hope of the investigation being completed and I am publishing this list because Caldey is an interesting locality and seldom visited. Its interest is this, that it is separated from the mainland of Wales by a couple of miles of tide-swept sea, yet it contains many forms of wingless Arthropoda, for instance *Platyarthus*, and *Campodea* and *Lithobius*, all of which are not only wingless but subterranean. The geologists must decide whether Caldey Isle has been lately connected to the mainland. If it has not, then we must suppose that it has been colonized through the medium of that ancient bone of contention—the floating log. It is clear enough that we must know much more before we can decide for or against these accidents; personally I incline to favour the log.

The isle is less than two miles long, and large parts of it are covered by gorse, bracken and heath vegetation. The cliffs, which are 300 feet high in places, are covered with thrift and many other maritime plants. The isle is inhabited and owned by a Benedictine Brotherhood, who would always be willing to further faunistic researches, and in whose Guest House I was most comfortably entertained.

LEPIDOPTERA: *Pieris brassicae*, *P. rapae*, *P. napi*, *Aglais urticae*, one *Pararge aegeria*, *Aphantopus hyperantus*, *Epinephala jurtina* (janira), *Polyommatus icarus*, *Eumecia phlaeas*, *Sphinx ligustri* (bred from larva by Brother Gilbert), *Anthrocera pilipendulae*, generally distributed and not rare even at this early date. I took a ♂ with a "Triungulin" larva on its head, and another bearing pollinia which I fancy were those of *Orchis pyramidalis*.

Aegeria muscaeformis (*philanthiformis*) (not uncommon on the thrift on the cliffs); *Hippocrita jacobaeae*: *Spilosoma menthastris*: *Hepialus humuli* (abundant); *H. lupulinus* and *Dicranura rinuli*: *Notodonta siccae* (larva of both these on poplar in the guest-house garden); *Xylophasia monoglypha*: *Mamestra brassicae*; *Miana fasciuncula* (on flower heads of *Heracleum*): *Agrotis exclamationis*: *Noctua plecta*: *Hadena oleracea*: *H. dentina*: *Cucullia umbratica*: *Chariclea umbra*: *Phlogophora reticulosa*: *Boarmia repandata*: *Lozogramma petriaria*: *Eupithecia pumilata*: *Xanthorhoe (Melanippe) fluctuata*: *Campogramma bilineata*: *Scoparia dubitalis* (*pyralis*): *S. atomalis*: *Endotricha flammealis*: *Enchyppara urticata*: *Scopula prunalis*: *Ebulca sambucalis*: *Stenia punctalis*: *Hydrocampa nymphaeata*: *Crambus hortuellus*: *C. pratellus*: *C. percellus* and var. *warringtonellus*: *Homocossoma sinuella*: *H. niubella*: *Phycis ornatella*: *Galleria mellonella*: *Peronea aspersana*: *Sericoris lacunana*: *S. urticana*: *Granolitha nigromaculana*: *Euranthis angustana*: *Ephippiphora trigeminana*: *Dichrorampha petiverella*: *Catoptria cana*: *Xanthostelia hamana*: *Chrosis albella* (*tessarana*): *Plutella cruceferarum* (the imagines frequented plants of *Reseda* after dusk, rather than the various Cruciferous plants): *Depressaria costosa*: *Bryotropha terrella*: *Glecechia marmorata* (beaten from *Psamma*): *Oecophora pseudospirella*: *Endrosis fenestrella*: *Tinea misella*: *Glyphipteryx uscheriella*: *Argyresthia nitidella*: *Coleophora fascudinella*: *Elachista cygnipennella* and *Simacthis fabriciana* (*orgacanthella*).

COLEOPTERA : Determined by Mr. Hugh Scott. *Brosicus cephalotes*, *Pterostichus madidus*, *Harpalus ruficornis*, *Melolontha vulgaris*, *Ocyppus olens*, *Laeon murinus*, *Lagria hirta*, and *Otiorynchus sulcatus*.

ORTHOPTERA : *Stauderella bicolor*.

DIPTERA : *Leptogaster cylindrica*, common.

ANTS AND MYRMECOPHILES : Determined by Mr. Donisthorpe. *Cyphodirus* (*Beckia*) *albinus*, in ants' nests; *Lasius niger* and *L. flavus* mixed, under a stone; a nest of *L. niger* with the Isopod *Platyarthrus hoffmannseggii* and the Acarid *Antennophorus foreli*. A nest of *L. flavus* with winged ♀ and *Antennophorus pubescens*.

HYMENOPTERA (other than Ants) : Determined by Dr. R. C. L. Perkins. *Prosopis hyalina*: *Colletes fodiens*; *Andrena grynana*; *Bombus terrestris*; *B. lucorum*; *B. derhamellus*; *B. agrorum*, and *Odynerus callosus*.

APTERA. I. THYSANURA. *Campodea* (sp.?) and a Machiliid of an undescribed species (*vide* G. H. Carpenter).

II. COLLEMBOLA: *Sminthurus viridis* (determined by Professor G. H. Carpenter).

CRUSTACEA : Determined by Mr. R. Gurney.

I. CLADOCERA: *Alona rectangularis*, *Ceriodaphnia quadrangula*, and *Chydorus sphaericus*.

II. COPEPODA: *Cyclops strenuus* and *C. serrulatus*.—P. A. BUXTON (F.E.S.), Fairhill, Tonbridge, Kent.

CURRENT NOTES AND SHORT NOTICES.

The April number of the *Canadian Entomologist* contains several interesting and generally useful articles. R. C. Treherne contributes notes on the history of the arrival and spread of various insect pests in agriculture in the British Columbia area. *Pieris rapae* was first seen in 1898 and '9, and in 1902 it had crossed to Vancouver Island. Two dreaded pests are being closely watched in their progress north in the States, *viz.*, the "Colorado Beetle," *Leptinotarsa decemlineata* and the San José Scale, which latter has already once been observed in Canada. The apple moth *Carpocapsa* (*Cydia*) *pomonella* has already appeared in isolated places. And since 1893 the Woolly Aphis *Eriosoma lanigera* has become a more dreaded pest each year. Further it has been observed that with the breaking up of the land and the cutting down of the forests many insects transfer their attentions to agricultural crops and fruit trees, and often thrive amazingly. Annette F. Braun gives the life-histories, with many references, of a number of North American Tineina hitherto unknown. John H. Lovell gives an account of numerous instances of spiders of the family *Thomisidae* capturing other insects, and figures a *Papilio asterias* captured by *Misumenia ratia* and a dragon-fly *Celithemis vponina* taken by the same species of spider. The victims are usually captured as they sit on the dense flower-heads on which the spiders lurk, protected as a rule by their wonderful resemblance to their surroundings when there. Three specimens of the European Praying Mantis (*Mantis religiosa*) have been recorded from Canada during the past two years, all taken in Ontario.

In the Civil List Pensions published on March 30th of the present year we read, "Mr. Robert Henry Rippon, in consideration of his con-

tributions to natural history, and of his inadequate means of support, £100." Mr. Rippon is the author of *Icones Ornithopterorum*, a monograph of the Papilionine Tribe *Troides* of Hübner, or *Ornithoptera* of Boisduval, with 104 coloured plates and many figs., 2 vols., folio, 1898-1906. He has also been responsible for the *Troides*-section of Wyttsmann *Genera Insectorum*, 1902.

We regret to announce that two members of the South London Entomological Society have fallen in action in France. Lieut. W. W. Penn-Gaskell, of the Queen's London Regiment, who was killed on May 25th, and W. D. H. Gotch.

In the May number of the *Ent. Mo. Mag.* Mr. F. W. Edwards announces several species of Diptera new to Britain, and describes one as new to science. *Trichonta flavicauda*, from Nethy Bridge, taken by D. Sharp in 1908; *T. subfusca*, from Elgin, taken by T. Jenkinson; *T. vernalis*, taken by A. Piffard, in Herts; *Rhymosia tarnanii*, from Cambridge, F. Jenkinson; *Erechia ligulata*, from Lelant, Cornwall and the New Forest, taken by Col. Yerbury and F. C. Adams; *E. membranacea*, from Crowborough, taken by F. Jenkinson; *Mycetophila bialorussica*, from Elgin, taken by F. Jenkinson; and *Culex hortensis*, from Elgin, taken by F. Jenkinson, are all new to Britain. While *Platosciara pernitida* is described as new to science, from specimens bred from rotten wood at Stanmore Common, in 1914, by K. G. Blair.

Mr. A. Bacot, who has been making investigations on the carrying of disease in Sierra Leone during the past year, is shortly to return to this country.

The Syllabus of the London Natural History Society has come to hand, and the larger proportion of its arrangements for the coming session deal with Entomology, as did those of its predecessor the City of London Society.

Mr. R. S. Bagnall, F.L.S., F.E.S., our colleague, is largely responsible for a new venture called the *Vasculum*, an illustrated quarterly dealing primarily with the Natural History of Northumberland and Durham. The general editor is the Rev. J. E. Hull, of Ninebanks, Northumberland, and in addition are the names of Messrs. G. Bolam, of Alston, Cumberland, and J. W. H. Harrison, of Middlesborough. The last named will no doubt be responsible for the Lepidoptera section, for which he is eminently qualified. Mr. G. Bolam will deal with Onithological records, etc., while Mr. Bagnall will see that the sections devoted to Coleoptera and what are known as "other orders" are adequately dealt with. In the current number a considerable mass of records of all kinds have been collected in the various articles and sections. There are several original articles, and some pages are devoted to educative notes for young naturalists. A new species of Neuroptera is described by Mr. Bagnall from species taken at Newcastle-on-Tyne, in July, 1914. He names it as *Conwentzia cryptoneuris*, and states that it is near *C. pinctivola* of Enderlein. May the *Vasculum* flourish and win its way as the *Yorkshire Naturalist* has done before it.

We regret to see the announcement of the death of a well-known illustrator of more or less popular natural history books, Mr. Thomas Carreras. Many of his drawings and photographs are to be found in *Marvels of the Universe* and *Insect Life*, and he had collaborated with Mr. Edward Step, F.L.S., in many of his undertakings. Quite

recently Mr. Carreras had finished all the outline drawings for Mr. Donisthorpe's forthcoming monograph on British Ants.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 7th, 1915.—VOTE OF SYMPATHY.—At the unanimous request of the Council, the Chairman proposed that a letter should be written to the President on behalf of the Society, offering condolences on the sudden death of his father, the late Lord Rothschild; the resolution was unanimously passed, the whole meeting rising in their places.—ELECTION.—Mr. William Carr, B.Sc., Station Road, Bentham, Lancaster, and Dr. A. Eland Shaw, Samarai, British New Guinea, were elected. ALGERIAN RHOPALOCERA.—The Rev. G. Wheeler exhibited a box of Algerian butterflies, of species treated of by Mons. Ch. Oberthür in the recently published fascicule x. of his *Lépidoptérologie Comparée*: many of the species were exhibited for the first time in England. NEW GOLIATH BEETLE.—Mr. O. E. Janson exhibited a new species of *Coelorrhina* (family *Cetoniidae*) in which the cephalic male armature usual in this genus was entirely absent, and to which he had given the name *mutica*. VARIETY OF PALOMENA PRASINA.—Mr. H. Willoughby Ellis exhibited a British variety of the Pentatomid bug *Palomena prasina*, L., differing from the type in its larger size and dark olive colour. Taken on ivy at Torquay, May 25th, 1907. NORTH AMERICAN PAPILIOS.—Mr. E. B. Ashby exhibited the following species:—*P. turnis*, *P. rutulus*, *P. eurymedon*, *P. troilus*, *P. asterias*, *P. brevicauda*, etc. GENITAL ARMATURE OF THE MALE ANT.—Mr. H. St. J. Donisthorpe showed a chart of the names applied to the genital armature of male ants, and read notes. GENITAL ARMATURE OF ACULEATE HYMENOPTERA.—The Rev. F. D. Morice exhibited a series of Lantern-slides to show the structure of the ♂ genital armature and the ventral segments adjoining it in various groups of Aculeate Hymenoptera. PAPER.—The following paper was read:—"Hymenopterous Parasites bred from the Pupæ of *Chortophila brassicae*, Bouché, and *Acidia heraclei*, L.," by J. T. Wadsworth, Research Assistant, Dept. of Entomology, University of Manchester; communicated by Dr. A. D. Imms, D.Sc., B.A., F.L.S., F.E.S.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

April 8th.—DIMORPHIC SPECIES OF LEPIDOPTERA.—Mr. Edwards, the seasonally dimorphic forms of *Papilio ajax* from North America. Mr. Schmassmann, specimens of *Papilio homerus* from Jamaica with a ♀ having ♂ coloration, and a series of the rare Pierid *Hebomoia roepstorffii* of various forms from the Andamans. PAPER.—Dr. Dixey, F.R.S., read a paper on "Seasonal Dimorphism," and gave many lantern and other illustrations of his remarks.

April 22nd.—NEW MEMBER.—Mr. T. B. Foster, of Addiscombe, was elected a member. EXHIBITION.—The evening was devoted to an Exhibition of Orders other than Lepidoptera. SOCIETY'S COLLECTIONS.—The Hon. Curator, Mr. West, exhibited eight drawers of the Society's reference collections which had recently been re-arranged, and included the drawer containing the Diptera given by Mr. H. W.

Andrews. RARE BRITISH COLEOPTERA.—Mr. West also exhibited four drawers of his own collection of Coleoptera, including British examples of *Calosoma sycophanta*, *Carabus auratus*, a series of *Micraspis 16-punctata*, *Pyttiscus circumcinctus* ♀ s, with smooth ♂-like elytra, and a series of forms of *Notiophilus 4-punctatus*. EXOTIC COLEOPTERA.—Mr. Stanley Edwards, large and attractive species of exotic Coleoptera. ABERRANT FORMS OF *P. auricularia*.—Mr. Ashdown, a series of aberrations of the earwig *Forficula auricularia*, mostly with aberrant size and form of forceps. SOUTH AMERICAN AND TRINIDAD INSECTS.—Mr. W. J. Kaye, numerous large and conspicuous insects obtained by him in South America and Trinidad: Coleoptera, Phasmids, a Mygale, *Cordiceps*, &c. PINE APHIDS.—Mr. B. Adkin, Examples of *Chermes pini*, the pine aphid, on Scots pine. A PORTUGUESE NEUROPTERON.—Mr. Main, an example of the Neuropteran, *Nemoptera coa*, brought from Cintra by Mr. Bowman, and living larvæ of the firefly *Luciola italica*, from ova obtained by Mr. Blair and himself. WASPS NESTS IN TOBACCO.—Mr. R. Adkin, the nests of wasps found rolled up in bales of tobacco from the Levant. SICILIAN INSECTS.—Mr. Platt Barrett, various conspicuous insects from Sicily and South Africa; Mantids, ant-lion, locusts, etc. A number of non-entomological exhibits were also shown.

May 13th.—ABERRATIONS OF BRITISH LEPIDOPTERA.—Mr. Leeds exhibited aberrations of *Polyommatus icarus* including ab. *obsoleta*, an asymmetrical specimen near *obsoleta*, a chocolate banded underside, and a ♀ streaked with blue; of *Agriades thetis* including a ♀ without orange in margin and bluish clouded, ♂ s with aberrant eye-spots below, etc.; of *A. coridon* including dark suffused underside, slaty suffused below, ♀ s with khaki streaks above, and ab. *semisygrapha*; of *Coenonympha pamphilus* including dark suffused below, and an underside with additional spotting; of *Pararge aegeria*, the British form *egerides* and Cornish forms much like the S. European form *aegeria*; of *Pieris brassicae* a ♀ with a pale blue tinge throughout. HYBRID B. HIRTARIA × N. LAPPONARIA.—Mr. Adkin, a short series of the hybrid *Biston hirtaria* ♂ × *Nyssia lapponaria* ♀, and gave notes on the mixture of the two specific series of characteristics. AN AFRICAN SPECIMEN OF *M. atropos*.—Mr. Moore, *Manduca atropos* from S. Africa. SWISS LYCAENIDS.—Mr. Curwen, long series of *Polyommatus eros* and *Latiolina orbitulus* from Saas Graud and the Grisons respectively. LARVAE OF *O. atrata* AND *N. fluctuata* AB. NEAPOLISATA.—Mr. B. S. Williams, larvæ of *Olezia atrata* on *Cytisus* and a very varied series of *Xanthorhoe fluctuata* with ab. *neapolisata* from Finchley. ARGENTINE INSECTS.—Mr. Cowham, cases of the large Psychid, *Oeketicus plutensis*, examples of the Neotropical *Colias*, *C. lesbia*, a large and conspicuously marked "skipper" *Oenides phoenicola* and an Aretiid, *Ecpanthera indecisa*. THE VARIATION SHOWN IN SICILIAN BUTTERFLIES.—Mr. Barrett, a large number of Lepidoptera mainly from Sicily, and read notes on the variation, they included *Thais polyxena*, *Pontia daplidice*, *Anthocharis belia*, *Euchloë cardamines*, with their racial, seasonal and aberrational forms. A NEW ANT.—Mr. Dennis, photographs of the ant *Formica pratensis*, a species closely allied to *F. rufa*. AN ABERRATION OF *T. gothica*.—Mr. Stallman, a *Taeniocampa gothica* ♀ with right hindwing reproducing

the markings of the forewing on the upperside, from Holmwood. LOCH LOMOND LEPIDOPTERA.—Mr. B. Adkin, Lepidoptera from Loch Lomond, dark suffused *Brenthis selene* and *Diacrisia sannio*, a white suffused underside of *Coenonympha pamphilus*, etc. PAPER.—Mr. A. Sich read a paper, "Notes on *Tortrix viridana*," on which a short discussion took place.

May 27th.—MICRO-LEPIDOPTERA.—Mr. Sich exhibited ova of *Tortrix viridana* laid in pairs on the bark of oak, and cases of a *Solenobia*, presumably *S. lichenella* from Barnes. S. AFRICAN LEPIDOPTERA.—Mr. Moore, Lepidoptera from near Johannesburg, Transvaal, including *Hypolimnas misippus*, *Precis sesamus*, *Colias electra* and var. *aurivillius* (comparable to *C. edusa* and var. *helice* of Europe), *Papilio demodocus*, *Pyrameis cardui* (the small Ethiopian race), *Hippotion celerio*, and *Basilothia media*, a small green Sphingid. LARVÆ OF X. SCOLOPACINA AND T. POLYCOMMATA.—Mr. B. S. Williams, larvæ of *Xylophasia scolopacina* from Finchley, and a series of *Tricopteryx (Lobophora) polycommata* from Yeovil. ABERRATIONS OF P. HUNTERA AND B. QUERCUS.—Mr. Laeblan Gibb, on behalf of Mr. H. M. Simms, a fine suffused aberration of *Pyrameis huntera* from near Montreal, an ab. *bellus* of *Bithys quercus* from near Barmouth, and an aberration of *Pharetra (Aronicta) menyanthidis* in which the orbicular stigmata were absent, from near Sheffield. A SPANISH COLEOPTERON.—Mr. Priske, an example of the Tenebrionid Coleopteron *Morica planata* from Gibraltar. PAPER.—Mr. Bunnett read a short paper, "The Maple Aphid," illustrated with drawings and lantern-slides.

June 10th.—BRED P. ESCHERI.—Dr. Chapman exhibited a living specimen of *Polyommatus escheri* bred from ova from Gavarnie, Pyrenees. It was of the form *roudoui*. A RARE BOOK.—Mr. Hy. J. Turner, the whole of the coloured plates of the first ten volumes of Herbst's *Natursystem*, 1783-1804, which he had bought for a few shillings from a street barrow. ABERRATIONS OF LEPIDOPTERA, AND THE "BUZZING" OF H. PRASINANA.—Mr. B. S. Williams, aberrations of *Selenia bilunaria (illunaria)*, a very strongly marked ♀ and a smoky ♂; larvæ of *Anticlea badiata* and aberrations of *Agrotis nigricans*, a red-brown form from Wicken and a black form from St. Anne's. He also reported that he had heard *Hylophila prasinana* make a distinct, peculiar buzzing noise when in flight at night, as it came to his lantern light. PHOTOGRAPHS.—Mr. Dennis, photographs with the stereoscope of *Hispida atra* and *Formica pratensis*, with sprays of laburnum and spiræa. BRED STRYMON PRUNI.—Mr. J. P. Barrett, a living specimen of *Strymon pruni* which had emerged on June 10th. It was considered an early date. BUCKS LEPIDOPTERA.—Mr. Dunster, a series of *Brenthis euphrosyne* taken in Bucks in May. MYGALE AVICULARE.—Mr. BUNNETT, examples of *Mygale aviculare* with photos of the same. NOTES ON R. BETULÆ AND P. TRIFOLII.—Mr. B. Adkin, series of local forms and aberrations of *Ruralis betulae* and *Pachygastris trifolii* and read notes on the exhibit. Of the former species he showed a unique aberration with an orange border to all the wings and much suffusion.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stiek, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with euphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8d.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic)
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
The Egg-laying of <i>Phymatocera aterrима</i> , Klug, <i>T. A. Chapman, M.D.</i> (two plates)	145
A Day in the —, <i>Lieut.-Col. N. Manders, R.A.M.C., F.E.S.</i>	149
Notes on the Micro-lepidoptera of South-West London, <i>Alfred Sich, F.E.S.</i> ..	150
The Ci-devant Genus <i>Epinephele</i> , <i>P. A. H. Muschamp, F.E.S.</i> (one plate) ..	152
Notes on the Swiss Rhopalocera, vi., the late <i>A. J. Fison</i>	156
The Upper Engadine in 1914, <i>Hy. J. Turner, F.E.S.</i>	163
Notes on Collecting in 1914, <i>W. Rait-Smith, F.E.S.</i>	168
A month among Spanish Butterflies, <i>James A. Simes, F.E.S.</i>	173
<i>Dysstroma concinnata</i> , Steph., <i>E. A. Cockayne, M.A., M.D., F.E.S.</i> (three plates)	178
SCIENTIFIC NOTES.—Earliest Stages of <i>Coleophora juncicolella</i> , Stt., <i>A. Sich, F.E.S.</i>	182
NOTES ON COLLECTING.—Collecting Records, I.—Norway, II.—Caldey Island, <i>P. A. Burton, F.E.S.</i>	182
CURRENT NOTES	184
SOCIETIES.—The Entomological Society of London; The South London Entomological Society	186

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, H. E. Page, A. J. Fison, C. P. Pickett, Dr. Burr, A. Tetley, Parkinson Curtis, H. B. Williams, H. L. Earl, A. Sich, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The *Entomologist*, vols. 20-30, 1887-1897 (11 years) £3 10s. 0d.
 " " vols. 39-46, 1906-1913 (7 years) }
Entomologist's Record, &c., vols. 1-23 & 25. Price, £4 15s. 0d.
Practical Hints for the Field Lepidopterist, Tutt, 2 vols. 7s. 6d.
Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
British Moths, Tutt, 2s. *Moths of Brit. Isles (South)*, Vol. 2. 5s.
British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
Lepidopterist's Calendar, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the WIDOW of the late J. ALDERSON. Apply:—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TACHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

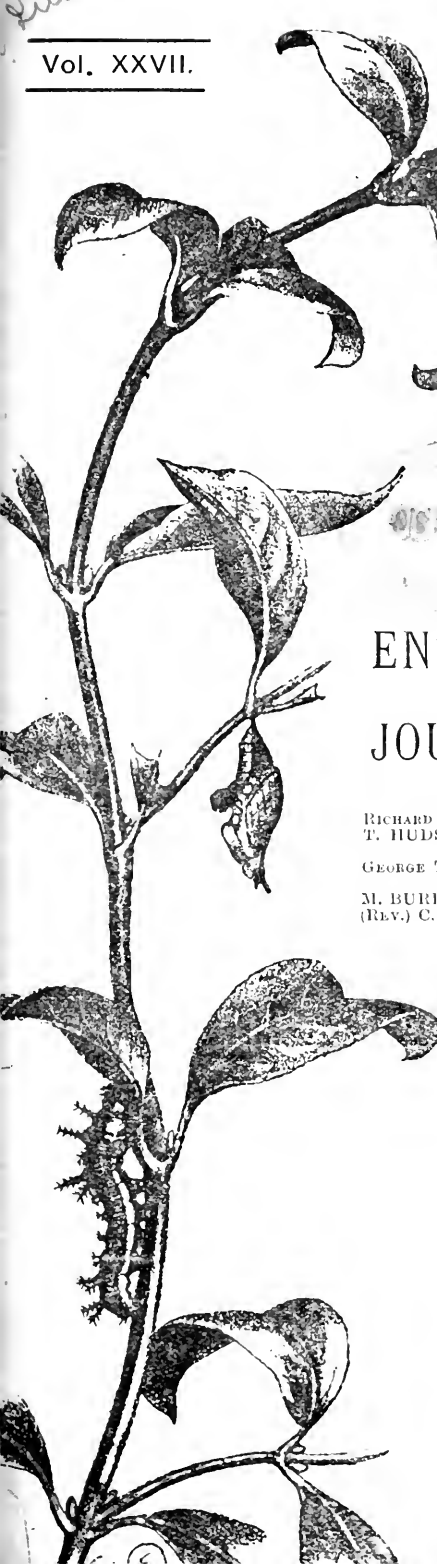
23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
 : : IMAGINES, LIFE-HISTORIES, AND APPARATUS. : :

237c

Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.



THE
ENTOMOLOGIST'S RECORD
 AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARE, B.Sc., F.E.S., F.R.S.E.	JAS. E. COLLIN, F.E.S.
GEORGE T. BETHUNE-BAKER, F.Z.S., F.L.S., F.E.S.	H. ST. J. K. DONISTHORPE, F.Z.S., F.E.S.
M. BURR, D.Sc., F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	J. R. le B. TOMLIN, M.A., F.E.S.
	GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

SEPTEMBER 15th, 1915.

Price SIXPENCE (NET).

Subscription for Complete Volume, post free
(including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,
"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.

LONDON:
ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:
R. FRIEDLÄNDER & SOHN,

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera."—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.*, "Varieties and aberrations of Noctue of Doncaster."—*H. H. Corbett, M.R.C.S.*, "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.*, "*Endryas stæ-johannis*."—*A. Radcliffe Grote, M.A.*, "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.*, "Larvæ."—*Rev. G. M. A. Hewitt, M.A.*, "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.*, "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.*, "Pupa hunting in October."—*J. W. Tutt, F.E.S.*, "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Riding, M.D.*, *R. Freer, M.B.*, *J. W. Tutt, F.E.S.*, *Rev. C. R. N. Burrows, J. Anderson, Jun.*, "The Lepidoptera of Swansea."—*Major R. B. Robertson.*, "*Caradrina ambigua* in the Isle of Wight."—*A. J. Hodges.*, "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.*, "*Orrhodia erythrocephala ab. glabra* from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Riding, F.E.S.*, "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.*, "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella*" (with plate).—*W. P. Blackburne Maze, F.E.S.*, "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S.*, *L. B. Prout, F.E.S.*, "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.*, "Coleoptera at Ipswich."—*Claude Morley, F.E.S.*, "Notes on *Bombus visurgæ*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.*, "The Lepidoptera of Grévy-sur-Aix."—*J. W. Tutt, F.E.S.*, "*Apatura iris*."—*Rev. G. M. A. Hewitt*, "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.*, "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.*, "The Genus *Smerinthus*."—*A. Baco.*, "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.*, "Wing structure."—*J. Aiston Moffatt.*, "On the development of sex in social insects."—*J. W. Tutt, F.E.S.*, "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.*, "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.*, "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.*, "A hunt for *Neuroterus aprillinus*."—*T. A. Chapman, M.D., F.E.S.*, "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.*, "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.*, "Varieties of *Argynnis selene*" (with plate).—*S. G. C. Russell, F.E.S.*, "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.*, "*Zygæna minos* and its varieties."—*J. W. Tutt, F.E.S.*, "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.*, Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7 6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
 TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Puente de los Fierros.

By P. A. H. MUSCHAMP, F.E.S.

Between my few lines about the fauna of Pajares and Mrs. Page's delightful article on the Cantabrians (pp. 121 to 129) there is a hiatus, a small elephant whose weight the lady author deemed meet to be neglected—Puente de los Fierros by name—of which I think some mention should be made, were it but to record the finding of *Leosopis roboris*. We rode down (I on a blind mare) from Pajares to los Fierros to discover a possible lodging for Mrs. Page. The pigsties, charming though they were, were wanting in many little vanities considered indispensable by the fair sex, *e.g.*, there happened to be no mirror, and then too, those unshutable doors and ventilated walls through which rats, mice, pigs and other small deer did freely circulate! At Fierros we found really excellent accommodation at the Station Hotel. The food was good and almost European—only we had to wait for our meals till the train came in; if we were starving and begged very humbly we were sometimes allowed to start on the soup, but had to let possible travellers catch us up ere the second course was placed before us. Fierros is charmingly situated from an artist's or an entomologist's point of view; we were, however, too late in the season to do very much there, and though we followed the road down northward for thirteen miles we found nothing to encourage us to continue in that direction.

On July 27th I saw a strange butterfly flying over brambles at the foot of a huge boulder, and I netted a torn and ragged "blue" which was all unknown to me. Overjoyed, I brought my catch to Mr. Page, and asked him if this could be *L. roboris*; my joy was indeed great when I was answered in the negative. Later on in the morning Mrs. Page and I perceived a second of these strangers flying about on the rocks by the roadside; a little scramble and a butterfly in pretty fair condition was bottled. Two days later I took a third, and was quite convinced that I had found a new "blue"! All three were "hens"; dark brown butterflies with violet rays at the base of wings, the underside a yellow dusted brown with a broadish bright yellow marginal border and blue arrowheads. Alas! here at home my *picture-books* promptly showed me that I had but netted three *L. roboris*. Still, I am sincerely grateful to those three ladies, for they taught me to feel the delight of the discoverer of new worlds. Finally, it is well worth noting that *L. roboris* is to be taken at Fierros. These three were last survivors, evidently, and it is very probable that a few weeks earlier we might have taken a goodly series. I do not remember seeing anything resembling *Fraxinus excelsior* in the neighbourhood, the nearest plant to the ash was the privet; these three ♀s, however, haunted a heavy bramble that was common all over the country.

A pretty butterfly, of which I took but one specimen on the heather slopes here, was *Melitaea phoebe* ab. *melanina*. The "blues" taken, in a meadow by the stream, just a little down the north road, were *Ereres argiades*, *Celastrina argiolus*, *Aricia melon* var. *calida*, *Polyommatus icarus*, a single large *Glaucopsyche melanops*, *Lampides boeticus*, *Lacosopis roboris*, some fine aberrations of *Polyommatus escherti*, *Agriades thetis* (*bellargus*) ab. *puncta*, *A. coridon* var. *albicans*, *Lycaena arion*, and

SEPTEMBER 15TH, 1915.

Rumicia (Chrysophanus) phlaeas, with var. *miegii* of *Heodes virgaureae*. It was in this meadow that we spent most of our time. Through it runs the little torrent which we had followed right up to its source above Pajares; on the north side are steep slopes through which tunnels its way the line down to the coast; the passing trains come gasping out of the hole in the hill, gather in as much sunlight and pure air as they can as they pass above our meadow, and then plunge like frightened blind-worms into a second gaping hole; they disturb the absolute calm of the spot for a moment, but leave behind them an impression of sadness and thankfulness, thankfulness for the peaceful calm, of which we are now a part, sadness to think that we too soon must plunge into the hillside depths and roll down, slowly but all too fast, to a world of toil and moil. The small skipper *Thymelicus acteon* was common enough here, and indeed all along the roadside, in the ditch. Here, too, as at Pajares, I took a single *Pyrgus proto*. *Epinephele jurtina (janira)* var. *hispulla* was abundant in the meadows on the side of the stream. At a corner of the road we disturbed each time we passed a number of *Callimorpha quadripunctaria*, the same form that we find here in Switzerland or in England, but so bright and fresh that I could not resist papering a dozen or so. A longish series of *Plusia gutta* might have been made with a little patience, but it was too annoying to plunge after a *gutta* and net a *gamma* twenty times in the hour. In the same meadow I took three *Argynnis adippe* ab. *cleodora*, and expect I might have taken plenty more. Among the moths were *Dianthoecia carpophaga* var. *capsophila**, *Cilix glaucata*, *Endrosis fenestrella*, and *Codona (Ephyra) orbicularia*, and *C. linearia*.

Collecting Lepidoptera in England, Spring, 1915.

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

One great effect that the war will naturally have upon many of us, who have in recent years collected so much abroad, will be to compel us—*nolens volens*—to throw ourselves again into the study of the Entomology of our native country, with the result that we shall probably not only have replenished our cabinets with fresh specimens, but we shall have more carefully studied and differentiated the spring and summer broods of our British butterflies. If this idea has been generally carried out, the year 1915 can be said to have been well spent from an entomological point of view.

It was with this purpose in view, that after a little sport with the males of *Celastrina argiolus* in my own garden at Hounslow in April and early May, I started, on May 22nd, for a nine days' hunt after English spring butterflies in a part of western Surrey remote from trains, holiday-makers and camps, however right and proper all those things are at this time. Almost immediately after my arrival the sun went in and I was prevented from catching more than single specimens of *Celastrina argiolus*, *Hesperia malvae* and an "emerald" moth. However, I saw one *Leptosia sinapis* on the wing.

Next morning, according to the manner of entomologists on the first day of a holiday, I was up betimes, had an early breakfast and started

* There is practically no difference in the genitalia of these two forms. See *Gen. Brit. Noct.*, F. N. Pierce, p. 63, pl. xxii.—H.J.T.

on the two miles' walk to the collecting ground. The day was perfect and the country beautiful with the freshness of its spring verdure. The first brood of *L. sinapis* was well out but only a few were taken as English representatives of a species which is so common abroad. *Euchloe cardamines*, both males and females, were fresh and abundant. The spring brood of *Pieris brassicae* was quite fresh as was that of *P. napi*. The males of *Breuthis euphrosyne* were decidedly going over while the females were generally speaking in good condition. *C. argiolus*, both males and females, were well out, and *Callophrys rubi* was in very fresh condition and fairly abundant. The pretty diurnal geometer moth, *Eulype (Melanippe) hastata*, was flying singly in the sunshine and required more catching than one would imagine at first sight. *H. malvae* and *Nisoniades tages* were both fresh and abundant. *Rumiccia phlaeas* was noticed singly and quite freshly emerged as also was *Cocconyxympha pamphilus*. It was too early apparently for *Hammaris lucina*, but I saw one or two hibernated *Vanessa io*. Amongst the bracken and bluebells of the woods *Gonepteryx rhamni* was flying freely, and occasionally singularly well preserved specimens could be selected from these hibernated butterflies.

The following day more females of *Breuthis euphrosyne* were obtained and the first "einnabar" moth, *Hippocrita jacobaeae* was met with. *E. hastata* was again met with and also a few *L. sinapis* were seen.

May 25th was a delightfully fine day throughout. Both *Breuthis selene* and *H. lucina* turned up for the first time this year quite fresh and in excellent condition: apparently these species were now only just commencing to emerge.

The following day I entrained for the North Downs area near Gomshall station. On the way up from Abinger Hammer *C. rubi* and *C. argiolus* were noticed both to be in poor condition, while on the grassy slopes of the Downs *Polyommatus icarus* was quite fully out in multitudes and in splendid condition. The object of my visit was to get the spring brood of *Agriales thetis (bellaryns)*, but unfortunately it was apparently too early, for I only succeeded in getting one quite freshly emerged male out of the two seen in a tramp of some miles along the face of the Downs towards the Rammore Common ground.

On returning to my former haunts on May 27th the weather was again perfect, and *Pararge megera* first put in an appearance. The males of *B. euphrosyne* were now well over, while both sexes of *E. cardamines* were common and in good condition.

The morning of May 28th broke very cold and it was quite impossible to do any collecting until after the sun came out, about 2 o'clock in the afternoon, when more *B. euphrosyne* and *B. selene* were selected.

On May 29th I found that *H. lucina* was becoming much more into evidence, although rather local in its habitats, as is its characteristic in this country. Rain came on and I spent much time in sheltering and in searching for larvæ.

The sun, on May 30th, was unfortunately frequently overcast and spoilt what should have been a successful day, from what I saw of the ground I was working. *H. lucina* was now quite abundant, and I took some fine larvæ of *Cosmotriche potatoaria* which have all since

produced imagines. Some females of *Diaphora mendica* were taken, and several batches of larvæ have been obtained from their ova.

The following day, the last of my holidays among the spring butterflies of 1915, produced a specimen of *Angiades sylvanus*, an indication that summer was now upon us. The only spring brood which I failed to see at all was that of *Pararge aegeria* var. *egeoides* for which I was probably too late, as it certainly occurs in the district.

"A Poser," Stainton.

(*Agrotis lunigera* versus *Agrotis trux*.)

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

A casual perusal of the pages of magazines devoted to our favourite study, which were issued in the prolific mid-Victorian period, often proves of great interest and amusement, and may even start one on a task, which has to the present time been strangely ignored or overlooked.

The *Entomologist's Weekly Intelligencer*, vol. vi., issued on April 2nd, 1859, contains the above title to its opening page, and the article begins, "Is *Agrotis lunigera* a northern variety of *Agrotis trux*?" The remainder of the article gives no opinion, nor any facts bearing on one side or the other, but simply urges collectors to place the two "side by side in the same cabinet."

At once it was suggested to my mind, "Where do we stand now?" The *Entomologist Synonymic List*, interleaved with its many MS. alterations, additions, etc., was consulted. There I found *Agrotis lunigera*, St., without a synonym. Meyrick gave no reference to *trux* and Barrett says, *Lep. Brit. Isles*, vol. iii., p. 318, "An opinion has been hazarded that it (*lunigera*) is merely a local form of *A. trux*, a species common in mountain districts of France, Italy, and Spain; but upon what ground such a suggestion has been made, it is difficult to judge." Tutt, *Brit. Noct.*, vol. ii., p. 16, does not discuss the question but quotes the suggestion of Guenée, *Noctuelles*, vol. i. (v.), p. 280, that it may be recognised at some future time as a northern form of *A. trux*. In South's *Moths of the Brit. Isles*, 1st ser., p. 205, is found the definite statement, "Although its (*lunigera*'s) position in classification is that of a local form of *A. trux*, Hübn., this moth may here retain the name that was given to it by Stephens in 1829." The italics are ours. The author evidently has not a sufficiently strong opinion of the validity of the "is" to make the necessary nomenclatorial change which that statement must entail if it be based on actual fact.

Hampson, in his comprehensive work issued by the Trustees of the British Museum, *Cat. Lep. Phalaenae in Brit. Mus.*, vol. iv., p. 245, totally ignores the question, lumps all the suggested identities together as simply synonyms of *trux*, viz., *lenticulosa*, *terranea*, *lunigera*, *olivina*, and *amasina*, giving no indication as to whether they are known as racial or aberrational in significance. He then sums all the ill-achieved results of previous authors' work in one description of *trux*, and adds—

ab. *olivina*. Forewing with slight greenish or violaceous tinge.

ab. *terranea*. Fore-wing ochreous or pale rufous.

ab. *amasina*. Fore-wing fuscous grey, darker in ♀ with median shade blackish.

ab. *lunigera*. Fore-wing with dark brown in ♂, fuscous in ♀; the claviform filled in black, the orbicular white defined by black. These are easily recognised as a mutation of Staudinger's Catalogue. So much for British custom and opinion at the present time.

What do the continental authorities say in this matter? In Staudinger's *Catalog*, ed. iii., p. 151 (1901), is found the following:—

1401. *TRUX*, Hb. 723-5; H.G. 770; Fr. B. 62; Tr. V., 2, 22; B. Ic. 79-5; H.S. 525 ab.; Gn. I., 279; Calb. *Iris*, I., 229, t. 12, f. 10; *terraea*, Fr. 34, 1; *lenticulosa*, Dup., VI., 72, 5, 6.

(a) ab. (et var. ?) *olivina*, Stgr.; *trux*, H.G., 768-769; B. Ic. 79, 46, b; *trux* var. *A.*, Gn. I., 279; (al. ant. viridescenti vel violaceo-griseis).

(b) ab. (et var. ?), *terraea*, Fr., 34, 1; *trux*, var. *C.* Gn. I., 279 (al. ant. testaceis vel griseo-rufescentibus).

(c) var. *amasina*, Stgr. (al. ant. sordide griseis, in ♀ obscurioribus, linea transversa vel fascia media (umbra) nigricante).

(d) var. (et ab.) *lunigera*, Steph., Ill. p. 113, t. 20, f. 2; Gn. I., 280; Tutt, *Brit. Noct.*, II., p. 14; Barr, *Brit. Lep.*, III., t. 128, f. 1 (al. ant. macula sagitt. distincte nigra).

Not much real evidence here. Stephens was the original describer of *lunigera* as a species. Both Tutt and Barrett dismiss the question with merely quoting the guarded opinion of Guenée. Staudinger himself evidently does not enter into the question but simply takes the unfounded suggestion as a fact and catalogues accordingly.

A perusal of Seitz, *Macro. Lep. of World*, Palearctic Fauna, vol. iii., p. 30, pl. 6, with 7 figs. of *trux* and its supposed forms, shows an equally blind acceptance of this hitherto unbased opinion.

In my own collection I have a series of 16 beautiful, picked examples of *lunigera* (eight ♂s and eight ♀s) from some 400 taken in the Isle of Wight, by Mr. A. Hodges, the first proprietor of the *Ent. Record*. They are absolutely distinctive in tone from any other British Agrotid, and their markings, although variable in emphasis, are always quite definite in position and general contour. There is a peculiarly soft silkiness of texture, which is possessed by no other Agrotid which I know, and the specimens were captured and not bred.

The following is a sketch of the history of *trux* as a species and a comparison of the figures and remarks given in various authors from the time of its first appearance in Hübner's great work.

In 1826, Hübner, *Samm. eur. Schm., Noctuae*, pl. 155, figs. 723 ♂, 724 ♀, 725 underside, gave three figures of a Noctuid which he named *trux*. There is no reference to it in his meagre letterpress. There is nothing in these three figures to compare with our *lunigera* in shape, colour or markings. The male, fig. 723, has a pale yellow basal patch on the inner margin of the forewing of considerable size, and the outline of the wing is different from that of *lunigera*. Inside the fringes of the hindwings there is a sharp black line interrupted sharply by the veins of the wing into straight short dashes, and the outer margins of all the wings are in no respect comparable with those of *lunigera*. The female, fig. 724, has a submarginal transverse line, which stands out as a clear feature never apparent in any ♀ *lunigera* and the outer margin of the forewing is much more convex, with the

result that the apex is less sharply angled. There is no trace of an oblong deep black blotch below the orbicular stigma which is always so distinctive a character of *lunigera*, even in the darkest males. The colour of the female, fig. 724, is somewhat that of *Noctua oleracea*, a tone I have never seen even suggested by any specimen of *lunigera*, however aberrant. As a general remark on the figures I would say that they are poor in execution, probably owing to the painter's failing powers, as he died the following year.

Duponchel, in the year 1826 (?), in *Hist. Nat. des Lep.*, vol. vi., p. 18, pl. 72, figs. 5 and 6, ♂ and ♀, describes and figures a Noctuid as *lenticulosa*, which on the continent is generally taken as a form of the *Agrotis trux* of Hübner. If one compares the figures, this assumption is pure rubbish, and Duponchel's figure cannot in any respect be confused with either *lunigera* or *trux* of Hübner. There is not a character in either fore- or hindwings which is comparable. Duponchel, however, in his text, says that some entomologists take it for the insect named by Ochsenheimer as *infecta*, but as M. Godart had already finished the plates on which it was figured and named, he would not adopt the prior name. He further says that it should be placed near *saucia* and *corticea*, a remark which, coupled with the figure, suggests an absolutely distinct species from either *trux*, Hüb., or *lunigera*, Stph.

[I have since, at the kind suggestion of Mr. J. H. Durrant, referred to the volumes* containing the original figures executed by M. Dumeril, etc., for the plates of this work, and must acknowledge that the strictures written above do not hold good for these. The execution in the whole of the original figures is excellent, even beyond Hübner, and will bear minute examination. The artist employed to execute the published plates must have been badly colour-blind. It is grievous to compare these caricatures with the delightful original paintings.]

In 1829 Stephens, in his *Illus.*, vol. ii., p. 113, describes, and on plate 20, fig. 3, figures a species which he names *Agrotis lunigera*, a name which we still continue to use in this country, applying it to a very beautiful Agrotid which may or may not be the species intended by Stephens. He had only seen three specimens, which all came from near Cork.

His description is as follows:—

“*Alis anticis fuscis, flavescente variegatis, strigis duabus geminatis nigricantibus, stigmâ anticâ internè flavescente; posticis luteo-albis.*”

He continues:—

“Head deep fuscous; thorax the same, varied with yellowish, with a large spot of the latter colour on each side at the base of the wing; anterior wings rich fuscous, varied with yellowish, with an angulated black streak at the base, united to an abbreviated pale striga; behind this, at a distance from the anterior stigma, is a transverse yellowish-waved stigma, bordered on each side with dusky, and very much angulated towards the inner margin; a similar striga arises from the costa, opposite to the posterior stigma, and, bending outwards, turns rather suddenly towards the inner edge, the space between the arch and the stigma being yellowish, or dull ochraceous brown; near the

* In the Walsingham Library at the British Museum (Nat. Hist.).

hinder margin is a pale waved streak, and the margin itself is spotted with black, with a pale griseous line at the base of the cilia; the anterior stigma is dusky towards the costa, and bright flavescent towards the inner margin of the wing, forming a lunule of the latter colour; the posterior stigma is margined anteriorly with black and flavescent, and posteriorly with black; the body is pale fuscous, and the posterior wings of a creamy white, with the nervures rather dusky."

Stephens' figure, by C. M. Curtis, fig. 3 (not 2, see corrigenda), plt. 20, is very stiff, and extraordinarily asymmetrical in markings on the forewings and in the venation of the hindwings, nor does it at all agree with the description, pp. 113-114. There is nothing "yellowish," nor "flavescent," nor "ochraceous brown," nor "bright flavescent" on the forewings, nor are the hindwings "creamy white." The figure is suffused over a considerable area with greenish-grey, and much of the remainder is suffused with reddish-brown (not ochraceous), while the hindwings are coloured variously evidently to portray a pearly appearance. With difficulty one can trace, or partially trace, some of the markings mentioned in the description, but the two sides are absolutely at variance, even when the characters are present, as with the stigmata.

Equally is the description of Stephens at variance with the insect we now call *lunigera*. Perhaps the most prominent specific characters in the markings of our *lunigera* are the soft silky-grey colour-texture of the forewings, the always present staring light-coloured orbicular stigma, and the ever present jet black claviform stigma beneath the orbicular. These characters are neither mentioned in the description nor included in the figure, but they are described in terms which are absolutely at variance with those conspicuous points of *lunigera* as we know it. Exception must be taken also to the shape of the wings. In the figure the apex is much too sharp, the outer margin is an impossible one, and in the hindwings the margin gives quite the opposite impression to that our *lunigera* gives. In this the darkened vein-colour extends into the cilia, and the marginal somewhat dark line appears thicker or wider between the veins at the base of the cilia, and gives a curious scalloped appearance, exactly the reverse of what is drawn in the figure. This is only seen in the males, as the dark shading of the hindwings in the female gradually intensifies towards the hind margin, and obscures the emphasis of the marginal line at the base of the cilia. There is one character of our *lunigera* which is shewn in the markings of the figure, and that is the more or less conspicuous, extremely bent, double transverse line on the basal half of the wing inside the stigmatic area. This is given in the figure on one side, but shown as a narrow deep black band of nearly uniform width. In the insect the two lines are always separate, and the space between is variable in width. The lines on the other half of the figure are not at all comparable with those referred to above.

In 1829 Freyer in his *Beiträge zur Geschichte europäischer Schmetterlinge*, vol. ii., p. 44, and plt. 62 (2 figs.), gives an account as far as is known of the *Agrotis trux*, Hübn., and gives two figures which are very different from Hübner's figs, 723, 724, in both shape and colour. The hindwings are pure white in Freyer's figures, the bodies are slender for Agrotids as a rule, the general figure is that of an insect

much more slender than the *trux* as figured by Hübner. One figure has short square wings and the apices of the forewings in both figures are much too sharp, and in one figure the anal angle is also much too sharply angled for the *trux* of Hübner. Placed side by side these two sets of figures differ absolutely in colour and markings, the latter being in different positions, of different size and different in shape. These remarks also apply equally when the comparison is made with the insect we now know as *lunigera*. In his letterpress Freyer says that his *trux* is near Hübner's *segetum*.

After the death of Hübner, Geyer continued the issue of plates *Sammlung, eur. Schm.*, and about the year 1833 issued plate 163 on which the figures 768, 769, 770 were labelled as *Agrotis trux*. No one would take these figures as representing any form of *lunigera*. The shape of the wings in the figures are not so divergent from *lunigera* as in the other figures we have examined. Fig. 769 is of an almost uniform green tint with prominent darker markings along the submarginal area of the hind margin of the forewings, and with a similarly coloured mark on the costa near the apex, together with a row of a few black dots inside the hind margin. There is a fairly emphasised discoidal mark or remnant of the reniform stigma, and a few dark costal marks, the rest of the wing area is unmistakably green or olive green. Fig. 768 shows a double row of dots in the area before the fringe of the hind margin of the forewings. The general coloration is of a bright brown, the reniform stigma is large and blackish-brown in colour. Both these figures are said to be ♂ insects. Fig. 770 is said to be ♀, but has markings so varied and ground-colour so light as almost to preclude the suggestion that it is either *trux* or *lunigera*, even if the markings were comparable. All the Noctuid markings, stigmata, blotches, submarginal lines, sub-basal lines, costal streaks, dots, etc., do not agree in size, shape, position and colour, with those of *lunigera*, nor do they agree with those of Hübner's *trux*, as previously figured. The hindwings of all the figures are dirty white, to shades of brown in both sexes, darker in the female. As before stated, *lunigera* is of a soft silky grey colour, and there is no element of green or olive perceptible or suggestible in any example I have seen; the hindwings of the males are not dirty white, but pure white.

In the same year Freyer, in his *Neue Beiträge*, vol. ii., pl. 34, p. 63, figures and describes a Noctuid, which he names *terranea*, and which subsequent authors have put down as a form of *trux*. As regards colour, he says it is comparable to *Taeniocampa stabilis*, and in size and shape to *segetum* and *exclamationis*. To us the colour of the figure is more like that of *Noctua oleracea*, with a very strongly marked submarginal whitish transverse line, and clear white-margined stigmata. In no way is it comparable to Hübner's figures, nor to Freyer's own figures in his *Beiträge* of 1829.

About the same time Boisduval, in his *Icones*, gave three figures of *Agrotis trux*, on Plate 79. Fig. 4 is named *trux*, and figs. 5 and 6 are termed varieties. In fig. 4 the orbicular is fairly conspicuous, as a dark spot and the reniform is also shown, but the claviform is non-existent. The general colour is dark grey, with a transverse brown shade midway between the two expressed stigmata; the fringe of the outer margin is also of the same brown tinge. The hindwings are

pure white, shaded slightly to the outer margin. There is no lighter area at the base of the forewing's inner margin as in some of the figures I have seen and quoted. Fig. 6 is a very similar figure as regards the ground colour, but the claviform is expressed and conspicuously dark, while the orbicular has to be looked closely for. There is no transverse band of brown tint, but the outer marginal fringes are brown or dull orange, perhaps. The hindwings are much darker marginally than in fig. 4. Fig. 5 is a brown form, the basal half being much darker, as is also a narrow irregular area inside the fringe. The fringe itself conforms to the lighter ground colour. The claviform is entirely absent, the orbicular represented by a dot, and the reniform is expressed fairly well. The hindwings are as in fig. 6. No varietal names are attached. None of these figures are at all comparable to our *lunigera*.

In 1835 Treitschke, in vol. 10, pt. 2, p. 22 of his *Schm. Eur.*, states that he has numerous examples of a species which suggests Hubner's figures of *trux*, although there is much divergence. He hazards the remark that Hubner's figure is that of a variety and not typical, and that his specimens seem to fall to this species rather than to any other. Otherwise the resemblance is greatest to *Agrotis cursoria* and in size between that species and *A. exclamatoris*. From these remarks it might seem that the author had specimens of *lunigera* before him, but his subsequent description speaks of red-brown and yellowish-brown markings, which colours are never present in any form of *lunigera*.

Herrich-Schaeffer in his vol. ii., p. 351, of *Sys. Bearb. Schm. Eur.*, refers to the extreme variability of *Agrotis trux* and notes the "bright green" example figured by Geyer (769), and a "very red" one (18) figured by himself. His description commences: "Colore valde variabilis, griseo-ochracea, fusco-grisea, subferruginea, viridi-mixta, signaturis aut bene expressis aut obsoletissimis." This is expressively full and yet delightfully vague. His further description of the markings would suit many an *Agrotid*, but not any particular species, certainly not the *lunigera* of Britain. In the synonymic catalogue at the end of the volume he lists *lunigera* as quite unknown to himself.

In Herrich-Schaeffer's copy of Guenée's *Noctuelites, Species Général*, which I possess and which has many MS. notes, he makes no additional remarks on any of the forms Guenée includes.

Guenée's work, *Noctuelites*, vol. i., dated 1852, gives as *Agrotis trux* type, the grey individuals strongly powdered with ferruginous-brown, and refers to Godart's figure of *lenticulosa* which he says is very inexact in illustration. (It is probable, from his remarks, that he had not seen the original paintings of Dumeril.) There is a sub-variety almost entirely covered with black striae, obliterating all the designs, which, he says, corresponds to the black variety of *A. segetum*.

Guenée next refers to the greyish and greenish examples, but little powdered, with scarcely any markings or stigmata, as var. A, instancing Hübner's figs. 768, 769. Next he refers to the individuals of a brick-red ground-colour with almost all the markings obliterated, as var. B, referring to Boisduval's fig. 5 in his *Icones*. The *terranea*, Frey., is not considered by him as a distinct race, and he would also include here the *ferrida* of Hübner, fig. 711, but has not seen it in nature, yet is confident that it cannot be put with *A. segetum*.

He next gives an account of what he says is the *lunigera* of

Stephens. He describes it as of a clear testaceous grey, much powdered, and suffused in parts with brown chocolate, with markings as in *trur*, but more obscure, the two median spots well developed and strongly margined with black, the orbicular round and clear, the reniform large and entirely filled up, except at one point inside, the claviform short and black. The lower wings white, somewhat yellowish, suffused with clear grey with nervures of the same colour. That this is not a description of the *lunigera* in our cabinets to-day will be evident to anyone. Whether Guenée had an insect before him at the time he made his description is not apparent. He says it partakes of the appearance of *exclamationis* and *segetum*, a remark that he may have copied from Freyer (see above), although it had quite a different appearance from *trur*, to which it is closely related. He also says that he would not say that it might not in time be recognised as a boreal form of *trur*. A specimen which Guenée had sent him for identification from Scotland, which he calls var. A. of *lunigera*, he describes as of a clear grey ground colour, almost so uniform that it renders the markings very distinct and quite clearly emphasised, and at first glance resembles *exclamationis*, but belongs to *lunigera*. From these remarks I would suggest that he had at last an example of the insect we now know as *lunigera* before him, an insect without a trace of red, brick-red, ferruginous, testaceous, green, chocolate, or yellow, etc., in its coloration.

In 1856 Stainton, in his *Manual*, vol. i., p. 221 and 224, particularly mentions the "conspicuously pale orbicular stigma," but says, "F.w. grey shaded with reddish-brown," "the ren. st. . . . filled up with red-brown."

In his *Catalogue*, ed. i., 1861, and ed. ii., 1871, Staudinger simply gives the trend of continental opinion, in the first edition *trur* and *lunigera* as two separate species, in the second *lunigera* as probably a Darwinian form of *trur*.

Newman, in 1872 in his *Ill. N. H. Brit. Moths*, p. 325, gives a short, very good, description and accurate colour discrimination of the present day *lunigera*, but his figures are too obscure to be recognisable (1st edition).

In 1884 (1888), in the first volume of *Iris*, p. 229 Calberla gives an account of various insects taken in the Roman Campagna and among them a Noctuid which nearly resembles *segetum* and which he supposes resembles the *lenticulosa* of Duponchel, and therefore must be a form of *trur*. He gives a figure (sic) of it on pl. xiii. which might represent a Noctuid and might, not. As to markings, it is marked all over with obscurities!

Tutt, in his *British Noctuae* in 1892, vol. ii., p. 15, give an excellent description of British *lunigera* (l. of Wight), having examined a very large number, many hundreds of examples, which I saw at the time. He says that "reddish forms are excessively rare," and he only knows of "two thus tinged."

In 1894 Hoffmann in *Gross Schm. Europas*, pl. 35, figs. 15, *a, b*, gives very good figures of the two sexes of British *lunigera*, and in figs. 14 *a* and 14 *b* figures the two sexes of *trur*. There seems no specific comparison between these two, the texture in the reproduction even absolutely prevents this suggestion. In the text p. 83 he treats the two as separate species.

In 1901, as seen above, Staudinger in his *Catalogue*, ed. iii., includes *lunigera* as a local race of *trux*.

Barrett's description, *Lep. Brit. Isles*, vol. iii., pp. 313-4, is an excellent one of British *lunigera*, both as regards colour and wing markings, and there is no suggestion of the red or chocolate or flavescent brown of the continental descriptions of *trux*.

(To be concluded.)

Notes from the Trenches.

By K. G. BLAIR, F.E.S.

Life in the trenches just now is not of the most exciting nature, in fact it is rather the other way, a monotonous recurrence of dull uninteresting duties, chiefly doing sentry, varied by a few fatigues, eating and sleeping, and killing time, so that one is ready to make the most of any little item of interest that turns up. The interchange of courtesies between the opposing lines is by day almost confined to the passage of a few shells and bombs, with a little spasmodic rifle fire. By night the latter becomes much more lively, indulged in for the most part by the Germans, who have an unpleasant little habit of raking the top of our parapets with machine guns on the chance of catching any sentry venturesome enough to poke his head up; but as this is practically all chance firing and not aimed at definite objects, the net result is almost negligible. By night the sentry usually has one hour on duty, one hour sitting beside his successor, then, with luck, one or two hours sleep, but if there be any trench repairing to be done he may have to forego some of his sleep for this purpose; by day just now, 4 a.m. to 8 p.m., he gets two hours on duty and four or more off, according to the number working the traverse. Cooking occupies a good deal of one's off time, as all water has to be boiled before it is safe to drink it. It may be taken from the pump of some ruined farm near the lines, often approachable only by night, or more often it is from some shell hole. Yesterday I nearly got a fine female of *Dytiscus marginalis* in my canteen for tea. A thing of that size one can, of course, avoid, but smaller fry one pays no heed to, just boils it up with the tea and swallows the lot.

The entomologist has ample leisure for noting features of interest around him, and some few species of insects there are which force themselves upon the attention of even the most unentomological of "Tommies." Probably most men if asked what point about the insects of France struck them most, would refer to the extreme abundance of lice. At first one is inclined to regard the insect with loathing, and to have the epithet "lousy" applied to one would be an insult meriting instant chastisement, but as usual familiarity breeds contempt, and one even comes to regard them as one of the minor perhaps, but none the less unavoidable, horrors of war. They may be to some extent kept down by the free use of various insecticides and frequent change of underclothing, but it seems impossible to avoid picking up a new invasion both in the trenches and in billets.

They occur in two distinct forms known generally as "white ones" and "black ones," or "Scots Greys" and "Black Watches," and the popular belief is that the white ones are so to speak, our own domestic

stock, while the black ones are exotics imported from our Indian comrades.

As my battalion forms a part of one of the Indian Divisions and we are continually using billets last occupied by some of our dusky friends, and as moreover the latter, when searching their persons and clothing for the "wee beasties," do not kill them by squeezing them between the thumbnails in our accepted fashion, but merely throw them down in the straw, there would seem to be some foundation for the belief, but it appears to be another of those pretty little theories quite unsupported by facts. The black ones, so far as my observations go, are the males and the white the females, the latter sex predominating.

In our western theatre of war they do not seem to play any part in the spread of disease, but where typhus is prevalent its transference has been traced, at any rate in part, to lice. The infection is transmitted not directly by the bite, but indirectly by the expressed contents of the alimentary canal coming in contact with an abraded skin surface; hence the importance of refraining from scratching the body when the irritation from the bites is experienced.

Flies of many species also contribute a considerable menace to the health of the troops. They are certainly much too numerous for comfort, particularly swarming around any carrion or refuse left exposed, but they may be combatted by proper attention to sanitation and by keeping all food carefully covered up. Nevertheless it is undoubtedly to the general inoculation against typhoid undergone by the troops, that the almost complete immunity from the ravages of this disease is to be attributed. In spite of a certain amount of hostility to the practice among the troops, a more ample justification of compulsory inoculation could scarcely be demanded.

Apart from those insects of economic importance to the health and well-being of the troops, there is a good deal of collecting to be done in odd moments, even in the trenches themselves. Many minute species of beetles are to be found crawling over the sandbags, the most noteworthy perhaps being *Anthriscus* sp.?, which occurs in hundreds, and numerous small *Staphylinidae*: the little earwig, *Forficula lesnei* (?), is also fairly common.

The facilities for actual collecting are not very great, and for lack of accommodation the larger specimens have to be noted only. Of the butterflies *Pararge megera* is probably the commonest species, and a single specimen of *Colias hyale* is the most out of the ordinary that I have seen. The country hereabouts does not seem to offer very great possibilities, though if one could linger in likely spots instead of merely picking up what chance throws in one's way during halts, it would be interesting to compare the fauna of this London clay area with the fauna of a similar area in Middlesex or Sussex.

**A note on *Scolitantides orion*, *Parnassius apollo*, *Lycæna euphemus*,
L. arcas, *Polyommatus amandus*, and *Cœnonympha tiphon*.
Their gradual spread in the Rhone Valley.***

By LILIAN M. FISON.

On page 16 of this volume I stated that I had discovered *Scolitantides orion* at Charpigny on June 2nd, 1914. I also found *Parnassius apollo*

* I am indebted to the Rev. G. Wheeler, and to Mr. R. Temperley, for much of the information recorded below.—L.M.F.

there on June 10th, 1914. The presence of these species interested me as I was not certain whether they had been taken in this locality before. I thought it possible that my late uncle, Mr. A. J. Fison, had introduced them by bringing larvæ to Charpigny with their foodplants, *Sedum telephium* and *Sedum album*, perhaps from the Southern Alps. However, Mr. Wheeler says (*in litt.*): "I am not aware that your uncle deliberately brought *S. orion* larvæ to Charpigny, but he may very possibly have brought ova in plants of *Sedum*, either from Branson or, more probably, from south of the Alps . . . still I had long entomological conversations with him the year before he died, and he did not mention it.

"On the other hand, *P. amandus* has become common in the Charpigny marshes, and *L. euphemus* and *L. arcas* near the Rhone at Aigle, neither species having been found there at all, till some eight or ten years back. One may say this with certainty, since they were all localities that your uncle had hunted regularly for many years. Charpigny is quite ideal for *S. orion*, and it might get there from Branson, quite as easily as *P. amandus* from Vernayaz."

(I should add that I took *P. amandus* in the Charpigny marshes in June, 1914. It occurred, too, singly at Charpigny, on the road leading to the stables, and between St. Triphon Station and Charpigny.)

Mr. Reginald Temperley, in a later letter, writes: "The *P. apollo* and *S. orion* found at Charpigny . . . were intentionally introduced by your late uncle. The caterpillars were supplied by someone whose name I have forgotten. . . ."

"As to *P. amandus*, *L. euphemus*, and *L. arcas* having put in an appearance in the localities you mention within the last ten years, this is a matter of opinion only, with nothing to support it apparently, beyond the fact that your late uncle had never found them there. I believe that Mr. Fison's not having reported any of these three species was because he had not looked well enough at the right time. Neither had he ever found *C. tiphon*, observed for the first time in 1905 by myself, and reported to him, and which species swarms in the valley on the skating-ground and upwards for quite one mile, and probably in places all the way to St. Triphon quarries, as I took a few there last June. . . ."

"Mr. Wheeler's views may be correct about *P. amandus* getting from Vernayaz. From whence comes *C. tiphon*?—Loèche?—and there is also *L. arcas* and *L. euphemus* to account for. *Arcas* occurs on the hills behind Clarens. Personally, I am of opinion that all these four species have been there for quite a long time. I could mention another fly that the late Mr. Fison had not seen in these parts which exists there."

Finally, Mr. Wheeler writes: "With regard to *P. amandus*, I can state quite definitely that it is *not* a matter of unsupported opinion. It occurs on ground that both your uncle and I, together and apart, had regularly hunted for many years. The first year it was found there very few specimens were seen; the next year they were still in small numbers, but much less scarce, and from that time onwards they have been quite common. A single female having been let out, or blown, or flown there would be sufficient to account for its appearance in so suitable a place. As far as it is ever possible to be absolutely certain of any negative fact, I do not think that the previous absence

of *P. amandus* can admit of a shadow of doubt. With regard also to *Lycaena ephemus* and *L. arcas*, Favre and Wulschlegel, in their *Macrolépidoptères du Valais*, omit all mention of their occurrence, either in that canton or in the neighbouring parts of Vaud, though this district was well within the range of Wulschlegel's hunting-grounds, and was well-known to Chanoine Favre also. To go further back still, none of these three species were known from this locality to the indefatigable Mr. Tasker of Villeneuve, nor is there any previous record of them among the almost innumerable articles which have appeared in the different magazines on the butterflies of the Rhone Valley. *C. tiphon* is certainly spreading—I found it last year in the St. Triphon marshes where I have never seen it before, though my experience of that locality began in 1897 or 1898. I was aware that it occurred in that end of the Rhone Valley, as I took one specimen somewhere in the Bouveret direction the first year I was in Switzerland, but never found another, though I frequently searched all round those parts. With regard to *P. apollo*, it has occurred at Charpigny ever since I have known the place, which was before I knew your uncle, but always singly, so that caterpillars introduced there by him would be likely to establish themselves without difficulty."

Lepidopterology.*

It would be possible to say a great deal about these volumes that has already been said about their predecessors, especially in regard to the work of M. Culot. The plates, lithographed and drawn by him, appear to be as near perfection as one can expect to meet with, though M. Oberthür regards the figures of *Egeriidae* already executed for the eleventh fascicule to be really beyond anything M. Culot has so far produced.

This leads one to think over M. Oberthür's preface, which is placed where prefaces ought to be, namely, at the end of Part 1, since prefaces like this one usually consist of something the author wishes to say to his readers, not before the work is begun, but after it is finished. It is dated March, 1915, and relates how, in the previous May (1914), the date "September, 1914" was printed on page 5 of the Title. The text was finished in June, 1914, and was printed to p. 192. M. Culot had dealt with the *Ihopalocera* and *Sesiidae* of Barbary, and had received various *Arctiidae* and others with which to continue the plates. M. Oberthür then relates how he was at Gavarnie with various members of his family, and was joined there by his grandson, Henri, and Mr. Powell, who had been making an entomological exploration of other portions of the Pyrenees, not forgetting some mountaineering as not foreign to the supposed main object. M. Oberthür's love of the mountains, of such a calm and peaceful centre as Gavarnie, finds expression in his enthusiastic pictures of the glorious weather, the abundant insects, the captures at the electric lights in the evenings, his pleasure in seeing his old friends MM. P. Rondou and Henri Posset, the latter of whom he had known for 45 years. All this is pleasing and delightful, but, alas, there came suddenly, the sad and

* Études de Lépidoptérologie Comparée. Par Charles Oberthür. Fasc. X., Partie 1, Texte, pp. 459. Partie 2, Planches, 177.

depressing change, which we have all suffered from in some degree. On July 25th, the Colonel of the 144th Infantry Regiment,* who had been making excursions and ascents with M. Henri Oberthür, had started for an ascent of Mount Perdu, and guides were hurried after him as a despatch recalled him urgently to his regiment at Bordeaux. This was disquieting, and on the 28th M. Oberthür thought it wise to make for home. Arriving there on the 31st (by automobile) there seemed still a chance for peace.

There follows a short resumé of the facts of the events up to the war. He adds that it is not his business to become, in an Entomological work, the historian of the most bloody and terrible war there has ever been. Yet one remembers at a quite recent meeting of an Entomological Society, a most interesting and vivid letter from the front was read, bearing on the experiences and exertions of members of the Society, and unfortunately on the loss of some of them, but no one seemed to regard the time spent in listening to the letter as otherwise than properly and appropriately employed. M. Oberthür's three sons and a grandson are engaged actively in the war. His grandson, aged 18, has voluntarily joined the 102nd regiment of the Infantry.

Referring to the brutality of the Germans, he adds:—

“In such unhappy times, when all families are constantly receiving the saddest news—telling of the death, glorious, no doubt, but so grievous, of some relative or friend, whom we held amongst our dearest and most loved—one feels that all scientific labour becomes impossible, and that the publication of any work begun in more propitious circumstances must be postponed *sine die*.

“Hence the date, ‘September, 1914,’ printed in May, 1914, has since elapsed. Yet the volume X. was nearly finished.

“I decide, therefore to publish the volume, so far as it goes, that is, up to the point it has reached. I realise that it will require a supplement, yet I felt I ought to so determine before successive mobilisations had left our printing works without the skilled personnel indispensable to the production of my book. How many of our fellow workers, since the first days of August, have left our house to bravely take their place in the arms where they had in their youth received military training. . . . Meantime, oppressed by anxiety for home and country, suffering acutely the pain which so many deaths have caused us, in our own town and in the Breton country, aged by cares more than by years, I fear that the present entomological work, with the portion relating to the *Aegeriidae*, in sight of completion, is the last which I shall be able henceforward to produce.

I had wished, whilst I still had the strength, to complete the *Faune des Lépidoptères de l'Algérie*. It was a purpose that was dear to me; the war which civilised nations find themselves compelled to maintain, for more than seven months, against the savages, is the reason why the dream will probably not become the reality.”

Thus abbreviated and (badly) translated, one loses almost all the apt and vivid expression, the poetic instinct and the deep feeling that the whole preface breathes; but even so it tells us something of the attitude of our leading Lepidopterist, who, whilst he still can do so

* M. Oberthür adds in a note that Col. Gauthier commanding the 144th Regiment, was killed gloriously, at the outbreak of the war.

much, finds his opportunity snatched away. One may, however, reasonably hope that after a time M. Oberthür will be able to continue to gratify us with the results we still hope for of his prolonged and ripe labours.

The text deals with the butterflies of Algeria, and one can hardly open the book anywhere without finding something of greater or less interest. Perhaps the outstanding feature is the wealth of observations of H. Powell on the habits and early stages of so many species. No less than 237 of the 860 pp. are claimed by the genus *Satyrus*, much of it dealing with Powell's observations of eggs, larvæ, habits, etc. 56 pp. contain a paper by M. Fd. le Cerf on the morphological characters of the Algerian *Satyri* with many text figures of antennæ, palpi, details of proboscis, scales and scaling, legs and genital armature, male and female.

Of our British butterflies, there is a full discussion of the forms of *Aricia medon* (*L. agestis*); *Agriades thetis* (*bellaryus*), also receives some attention as to sundry varieties. Of *Colias hyale* and *C. croceus* (*edusa*), synonymy is discussed. Mr. Powell reports that *C. edusa* lays upon many and varied *Leguminosae*, and cites lucern and other non-British plants.

Amongst the *Satyri*, there is a most interesting excursus on Linné and the name *semele*.

The portraits of Entomologists include French, Italian, Russian, Swiss, American, and English Lepidopterists.

The photographs (by Powell) of localities for various butterflies are often good pictures apart from any special interest, such as pls. 2, 14, 46, but are always good photographs and show well the nature of the country.

The seventy-six photographs, of eggs, larvæ, &c., present some excellent representations of eggs, in which the difficulty of getting so large objects altogether in focus is overcome by presenting two or more of each egg at different horizons, and in most instances with much success, as for instance in plt. 56, eggs of *Epinephele eudora-mauritanica*, × 25, *Syrichthus onopordi*, photos. 64 d, 64 c, *Syrichthus numida*, 64 f, *S. proto*, 64 j, and 64 k, etc.

When we come to the plates by M. Culot, we find illustrated chiefly those Algerian species and forms that have not been illustrated in previous portions of the "Études," just in fact as we find in the text. Four forms of *machaon* are figured, three of var. *feisthameli*. Five figures of *Thais rumina* show curious aberrations of the denticulation of the hindwings. *Aporia crataegi*, *Anthocharis jaltoui*, *A. charltonia*, *A. belia* (*eupheuo*), and *Calicharis nonna* occupy three plates, and admirably illustrate both the species and M. Culot's art. Forms of *Melitaea didyma* and *M. deione* take the next plate. Four plates of *Satyrus priouri*, *S. ellena*, *S. semele*, and *S. ulvæi* follow. *Melanargia ines*, *Epinephele* and *Coenonymphe*, *Lycaena iolas*, *Glaucopsyche cyllarus* and *Celastrina argiolus* occupy two plates. Plate 289 shows *Scolitantides* (*L.*) *abencerragus* = *baton*, *S. allardi* and *S. martini*, but especially a series of *S. (L.) fatma*, which Mr. Powell not only met with in quantity, though previously barely known, but of which also he very successfully followed out the life-history as described in the text and illustrated in the plates of photographs, and of his excellent drawings (plate 301). The foodplant (*Salvia argentea*) is very unusual for a *Lycaena*. *A. (L.)*

agestis=*medon* is very fully shown, and also various species of *Thestor* and *Cigaritis*. Several Argynnids, some skippers, and a remarkable aberration of *Satyrus idia* complete the imagines, with the exception of three plates of *Celerio euphorbiæ-mauretanicæ* and some exotic Papilios.

The fourteen plates of Powell's drawings of larvæ, pupæ, &c., show skippers, geometers, *Earias*, *Somabrachys*, *Noctua*, *Lasiocampa*, *Leuonia*, *Zygæna*, &c., those illustrating *S. fatma* already alluded to, and the greater part of four rather full plates of Satyrids seem of especial interest.—T.A.C.

A remarkable Marriage-flight of Ants and some Theories.

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

On August 8th last there took place at Weybridge, Walton-on-Thames, Hersham, and probably all over the county, the largest marriage-flight of ants of the genus *Lasius* (or *Douisthorpea*) that I have ever witnessed. At Walton it began at about 3.30 p.m., and probably in some districts was continued during the following day, as on the 9th I found hundreds of *L. niger* winged ♀ ♀ on Westminster Bridge. The three species concerned were *L. niger*, *L. flavus*, and *L. umbratus*, the first two predominating (there was also a flight of *Myrmica scabrinodis*, but we are not directly concerned with this). The ♀ ♀, both winged and dealated, covered every road and path for miles around, and on a piece of waste ground about 50 yards square there were four to six ants on every square foot.

In the case of *Lasius niger* and *Lasius flavus* the usual procedure was, after the ♂ ♂ and ♀ ♀ had joined on the ground, for the ♀ ♀ to fly up carrying the ♂ ♂ and circle round for a few minutes. Then coming to the ground, where the ♂ ♂ released the ♀ ♀ and flew right away, the latter removed their wings, using the legs to push them forward, until they dropped off. The *L. niger* ♀ ♀ on rising into the air make a deep buzz not unlike that of a wasp. The dealated ♀ ♀ always avoided each other, and many sought out holes in the ground, where they disappeared, their presence being betrayed the next day by little craters of sand. Wherever there was a nest of *Lasius niger* the ♂ ♂ came out in swarms, capturing and killing the dealated ♀ ♀ of all three species, principally *Lasius flavus* and *L. niger*, the latter presumably both strangers and friends (as I have shown experimentally). The stronger and more active *umbratus* ♀ ♀ more often ran the gauntlet in safety, and it is to the behaviour of these latter, whose parasitic habits on *niger* are well known, that I wish to draw attention.

In recording the observations and experiments (1895-1912) which established the habits of *Lasius umbratus* ♀ ♀, I repeatedly noted that the newly dealated ♀ ♀ are frequently found carrying dead *Lasius niger* ♂ ♂, and when one is confined with a live ♂ she generally kills and devours it, but is friendly to any others that are subsequently introduced. Now out of several hundred *umbratus* ♀ ♀ observed on August 8th, at least 50% carried a dead *niger* ♂ (one carried a ♂). On many occasions I watched ♀ ♀ capture and kill their ♂ ♂. That the dead ♂ was of importance to the ♀ is clear from the fact that when harried, and even when picked up with forceps, the ♀ still held

her prey. When confined in a box the ♀ invariably devoured the ♂, leaving nothing but the head, legs, and part of the thorax.

Seeing this phenomenon on such a large scale strengthened my theory that it is an important factor towards the successful adoption of the ♀ by a *niger* colony. The devouring of the ♂ would serve two purposes; first, it would enable the ♀ to exist during her search for a suitable colony, since she has not the supply of fat which enables the self-founders to exist for months without food from external sources; and secondly it would cause the ♀ to lose the *umbratus* odour and acquire that of *niger*, and thus favour her chance of acceptance by a colony of the latter. Or, looked at from another point of view, the act might set in motion a process transforming the ♀ from her present condition of antagonism towards all strange ants, into one of friendliness for, and attraction towards, *L. niger*.

Though repeated experiments have shown that it is only queenless or small colonies that normally accept a parasitic queen, I found a marked difference in the behaviour of a powerful colony (queen and several thousand ♂♂) of *L. niger* towards *L. umbratus* ♀♀ that had devoured *niger* ♂♂, and those that had not. In the latter case the ♀♀ were killed at once, but the former were approached in a very different manner, and were not attacked until some time had elapsed and they had penetrated into the centre of the nest. Every one of fourteen small queenless colonies of *niger* accepted *umbratus* ♀♀ readily, three of them taking two each, and another three. In all but one of these latter four cases the ♀♀ fought, only one surviving in each; and numerous ♀♀ put in pairs and threes always fought, the strongest killing the others by cutting them in two at the pedicel by sawing movements of the mandibles, as before described.

It is very probable that the bodies of these parasitic ♀♀ are attractive to the ants, as appears to be the case with *Anergates*, which also sometimes captures and holds, but does not kill, a host ♂ after impregnation; at any rate, they have an attraction for the myrmecophilous beetle *Claviger testaceus* not possessed by *L. niger* or *L. flavus*. In two nests of *L. flavus* containing two *Claviger* and one queen, and fourteen *Claviger* and five queens respectively, and in one of *niger* with one queen and one *Claviger*, the beetles were never observed to cling to the bodies of the queens, whereas in two colonies of *Lasius niger* with a *L. umbratus* queen and two *Claviger* in each, the beetles were almost invariably clinging to the gasters of the queens, and often appeared to lick the surface of the body.

Marriage-flights of *Donisthorpea* species on August 8th, etc.

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

When recording a marriage flight of *Donisthorpea* (= *Lasius*) *nigra* which took place at Folkestone on August 9th, 1911, I mentioned that marriage flights also took place at Margate and Seaview, Isle of Wight, on the same afternoon, and I stated:—"It is evident that the ants are affected by some atmospheric influence, and it would be interesting to find out over how large an area they are affected at the same time."—*Ent. Rec.*, 24, 6-7 (1912).

The marriage flights on August 8th this year help to answer this question. In the newspapers vast numbers of winged ants are men-

tioned as having been observed at Cardiff on that date, and I have been informed of flights of *Donisthorpea* species which occurred on that day at Penge, Forest Hill, Streatham, Wallington, Woking, Beckenham, East Farleigh, Brockley, St. Helens, Isle of Wight, and Lynton in Devonshire. My son also informs me that he saw numbers of winged ants at Abbeville in France about that date.

In my garden at Putney *Donisthorpea nigra* and *D. flava* were swarming from about 4.30 onwards, and they occurred all over Fulham, Putney, and Barnes. Later in the evening I captured two dealated *D. umbrata* ♀♀ near the entrances to nests of *D. nigra* in a road close by. I enclosed them in a box, when the one female killed the other by cutting off its head.

I should be glad if any of our readers will record marriage-flights from localities and counties not mentioned in the above two notes.

In connection with the colony-founding of species of this genus I may mention that a large number of small *umbrata* ♂♂ have at last been brought up (this year) in my captive colony of *D. aliena* obtained at Weybridge on July 10th, 1912, which accepted a *D. umbrata* ♀ on July 27th, 1913.

My *Donisthorpea fuliginosa* ♀ died on August 29th last; she had been accepted into a colony of *D. mixto-umbrata* (strengthened with ♂♂ of *D. umbrata*) on August 11th, 1912. All the ♂♂ in this colony had gradually died off, so on August 27th I went to Woking and obtained a large number of fresh *D. umbrata* ♂♂. The *D. fuliginosa* ♀ was accepted by the new ♂♂, she was very weak and died, as before stated, on the 29th, though not from injuries.

[Morice and Durrant have shown that *Lasius*, Fabricius, sinks as a homonym of the earlier *Lasius*, Jurine, a genus of bees. A new name being necessary for § *Lasius*, F., they proposed that of *Donisthorpea*, adopting *nigra* as the type [*Trans. Ent. Soc. Lond.*, 1914, 421-123 (1915)].—H.J.T.]

NOTES ON COLLECTING, Etc.

PHRYXUS LIVORNICA IN BRITAIN.—Apparently this species is quite established in its western habitat. For some years past now it has been regularly obtained and by no means as odd specimens. Many of the specimens captured are in excellent condition and evidently have emerged in this country.—H.J.T.

CELASTRINA ARGOLUS IN LONDON.—This species appears to be getting more abundant in the London suburbs year by year. Reports are continually being made of its occurrence in fresh spots as well as notes on its reappearance where it has previously been seen. On July 26th, while walking up Holborn somewhat after mid-day, I saw a male of *C. argolus* threading its way among the traffic. Of course this was a second brood specimen. In the same week specimens were frequently seen flying across my own garden at New Cross.—H.J.T.

RESTING POSITION OF EUPITHECIA OBLONGATA (CENTAUREATA).—Recently my son found on the stem of a twig of a nut-bush in the garden, about the calibre of a thin pencil, a pair of *E. oblongata* in cop. He was attracted by the appearance of a white "bird's dirt" enfolding the stem. The wings were stretched out in the usual "png" attitude along the stem so that the two insects were "looking each other in the face"

round the stem, and with faces so close that the costæ of the two pairs of forewings were overlapping.—H.J.T. [I have since seen a single specimen of the same species sitting on a grass stem with wings stretched along the stem and body transverse to it, on the bare down at Royston, Herts.—H.J.T.]

FEEDING OF *CUCULLIA VERBASCI*.—As there were several plants of *Verbascum thapsus* in the garden, and one of my visits to the chalk hills was on so cold a day that I did not even unfurl my net, I amused myself by selecting a number of larvæ of *Cucullia verbasci* which this year were extremely abundant. They were put into a conservatory and fed in the sun. So ravenous did they become under the stimulus of the heat that one could clearly hear the noise of their jaws even at some yards distant from the cage.—H.J.T.

COLIAS EDUSA IN 1915.—Friends in the Portsmouth area report *Colias edusa* has appeared in some number during the past few weeks.—C. W. SPERRING, Charlton. August 30th, 1915.

I took *Colias edusa* at Dorking on August 28th.—A. E. TONGE, Reigate.

SCIENTIFIC NOTES AND OBSERVATIONS.

THE PINE PROCESSIONARY CATERPILLAR.—Monsieur Étienne Rabaud has a short paper in the *Annales of the Entomological Society of France*, for 1915, p. 165, on certain points in the behaviour of the larvæ of the Pine Processionary, *Thaumtopoea pityocampa*, Schiff. (Read February 24th, 1915.)

He appears to establish that temperature is a very important element in determining many of their habits. His observations appear to have been completed at Amélie-les-Bains, etc.; though he does not say so, one supposes they were all made in the South of France. He refers to the observations made by Reaumur, Fabre, and Perris. He cites from them and from his own observations that a temperature of 26° Fabr. kills larvæ outside the nest, of 20° kills those inside the nest near its surface, and at about 10° Fabr. nearly all perish.

He finds that the nests are placed on the southern side of the trees and that the larvæ, in feeding, when there is a choice, attack the branches on the southern side. Further, they eat first the terminal needles, but though he speculates on the matter, says nothing definitive in explanation of this choice.

One may, however, reasonably suppose that the well-being of the larvæ is favoured by getting their food as near the nest as possible. By eating first the terminal needles, they clear downwards, and the result must be that when a larva on leading the way out to feed, finds the lower portion of a branch or twig cleared, he goes no further that way, recognizing that all beyond has been eaten, incidentally saving an unnecessary journey. If, however, the lower needles were often eaten first, it might happen that the further ones would escape altogether, with the result that branches further from the nest would have to be visited, whilst these more accessible leaves still existed unused. This would be the result if basal or terminal leaves were attacked first indiscriminately. Had the instinct been to eat the basal ones first, it must have arisen from some advantage derivable from such an instinct, but it is not easy to see what that could be, and in fact, if such advantage does exist, it has not been definite enough to produce an effect

against the weight in favour of the actual habits of eating the ends first.

The excursions from the nest for feeding are made at night, but when the nights are cold, say 23° to 41° Fahr., the larvæ do not come out, but starvation, if the cold nights continue, has its effect, and the larvæ will then come out and feed in daylight, if it be a little cloudy.

M. Perris' observation referred to seems to show that starvation, when it results from the vast numbers of the larvæ having cleared away all the needles of the trees occupied, compels the larva to adventure long journeys, in which a frosty night often catches them to their extinction.

When after feeding they return to the nest, they do so with great certainty. M. Rabaud leaves the question of how they do so uncertain, he recounts certain observations that demonstrate that they return easily when there is no silken way for them to follow, so that this usually accepted explanation fails.

He ends the paper with some remarks on the processionary instinct. He says the origin of the instinct is certainly obscure, and even seems to involve a decided danger, he says other social caterpillars disperse over the food plant and return without any processionary procedure, and that individual larvæ of *T. pityocampa* find the way home quite easily.

He appears to study the point entirely with reference to the feeding larva, and therein misses what seems to be the real advantage secured by the processionary instinct.

This instinct entirely governs the larva at one very important point in its life, that is when it finally leaves the nest and goes to find a place for pupation. It is then that they may be found in procession, by day as well as by night, and when larvæ from two different nests readily combine in the same procession.

That the larvæ should keep together in considerable numbers is of the greatest importance, because they enter together some cavity under rubbish, or even underground, and spin their cocoons together in a close mass.

It is, no doubt, for this event that natural selection has brought the habit to the perfection we observe. The possession of the same instinct in the earlier feeding stage is probably due to the tendency of any such habit or instinct, or for that matter colour or plumage, to appear earlier in the ontogeny than the point at which it developed, a result only restrained, if at these earlier stages it is disadvantageous. In the case of the processionary caterpillar there is nothing to prove that the instinct to follow a leader is injurious to the feeding larva, and it is probably even useful, generally, to a larva, who realises, may we say, knows (though the knowing is not exactly of the human, conscious, type of knowing), that a certain region of the tree is stripped of foliage and leads his fellows to new pastures.

It will of course be evident that a larva, unaware of these circumstances, might happen to lead and might lead wrong, as there is no selection of a leader, but only that all follow the one that happens to go first.

But, specially also, there are comparatively rare, but not perhaps infrequent, occasions when a tree is completely denuded, from being small or from having many nests, and it becomes imperative for the

larvæ to leave it and find another. In order to build a nest there they must all be together, and for the whole brood to fail to find a fresh tree would not be more disastrous than for all to find trees, but only two or three larvæ to each new tree, quite unable therefore to spin a new nest. The habit of pupating gregariously, at a distance, often very great, from where they fed is, then, why the processional habit developed. It is a *sine qua non*, without which they would inevitably scatter helplessly. As explaining the processional procedure we accept the gregarious pupation as a fundamental fact, equally important in this regard, whatever may be its cause or object. That there is such a cause or object there can be no doubt, and one can speculate what it may be. Various habits and structures of pupæ, almost always refer to protection from enemies, and this gregarious habit probably has that object. If so, our enquiry is narrowed to the question, How?

They are certainly protected by the circumstance that the irritating hairs which make the processional larvæ so dreaded are loosely worked into the outer layer of the cocoon, they retain all their irritating properties but are so easily disturbed and float about, that to handle the cocoons is a more unpleasant experience than to deal with the larvæ.

The massing of the cocoons makes it certain that any marauder will suffer, possibly before he has done any mischief, but unquestionably before he has injured more than a pupa or two, and the rest will escape, nor will a second attack by the same or another enemy be likely to do any further mischief. A solitary cocoon, on the other hand, might easily have the stinging hairs rubbed off, or not recognised as injurious till the pupa had been fatally injured.

Something of this sort will probably explain why the massing of the pupæ has been selected by natural selection to be the correct procedure.—T. A. CHAPMAN (M.D.), Betula, Reigate. August 9th, 1915.

AGRIADES CORDON, PODA (ROYSTON FORM).—It may be of interest to record that I received eggs of this form from Mr. Newman last autumn, and though, from inattention and other faults, I only reared sixteen specimens, they present results that possibly bear on this curious form of *A. coridon*. The two outstanding peculiarities of the Royston form appear to be the excess of females, and more extraordinary the frequency of andromorphous specimens amongst these females, for details of which we are indebted to Dr. Cockayne.

The sixteen specimens I reared were one male and fifteen females, a remarkable preponderance of the latter, greater than any I have had to explain in any other species by any hypothesis of a greater mortality of males in earlier stages. Though these females present several nice forms, I do not detect in any of them any andromorphous tendency.—ID. August, 1915.

CELASTRINA ARGIOLUS IN AMERICA.—In the *Ent. News* for July is the following elucidation of the multiplicity of names which have been ranged around the form of *Celastrina argiolus* in America, by Prof. H. Skinner. He agrees with the view that *pseudargiolus* of the American continent is only a western form of the *argiolus* of the European continent, since the genitalic work of Mr. R. C. Williams confirms it. The list is as follows:—

ARGIOLUS, Linn.

var. PSEUDARGIOLUS, Bdl. Lec. (1833).

neglecta, Edw. (1862).

- var. *LUCIA*, Kirby (1837).
violacea, Edw. (1866).
intermedia, Streek. (1878).
marginata, Edw. (1883).
cinerea, Edw. (1883).
fumida, Scud. (1889).
pseudora, Scud. (1889).
argentata, Fletch. (1903).
quesnellii, Cockle. (1910).
var. *XIG*, Streek. (1878).
nigra, Edw. (1884).
var. *ECHO*, Edw. (1864). Pacific Coast.
arizonensis, Edw. (1884).
var. *XIGRESCENS*, Fletch. (1903). Pacific Coast, from wintering
chrysalids.
var. *GOZORA*, Boisd. (1870). S. of the U.S.A.

The writer says that each of these names represent slight differences, but adds, "I see no advantage in retaining so many names for slight differences, as they are often very confusing and often take many hours of patient study to find out what they mean."—H.J.T.

CURRENT NOTES AND SHORT NOTICES.

Russian entomologists are suffering from a shortage of pins. The Caucasus Museum, however, is better off in this respect, since the Director, Colonel Kaznakov, on arriving in Lyoff, secured the entire stock in the town, several thousands, and sent them to Tiflis.—M.B.

There are some valuable collections in Lyoff, which were in danger of being ruined by the severe winter frosts owing to shortage of fuel. The sympathy and influence of Colonel Kaznakov secured a supply of fuel, and the museum was saved.—M.B.

The authorities at the South Kensington Natural History (British) Museum are much in want of a quantity of specimens of the two species *Triphaena pronuba* and *Tortrix viridana*. The condition of the specimens does not matter as to bodies, head, etc., so long as the hind-wings (yellow) of the former and the forewings (green) of the latter are intact. The specimens should be sent or given to Mr. J. H. Durrant, British Museum (Natural History), South Kensington.

Dr. Cockayne has gone abroad on Admiralty business and will probably be away for the next few months.

Some time ago we called attention to a very important exhibit at the British Museum (Natural History) dealing with the Army Biscuit Enquiry which Mr. J. H. Durrant, F.E.S., and Lieut.-Col. W. W. O. Beveridge, D.S.O., R.A.M.C., had been undertaking. We understand that the practical use which has been made of the facts elicited, and the results obtained in this enquiry, has proved of such enormous value to the government authorities that by request the materials of the former demonstration are being re-exhibited in the hall of the museum with additional items. It is significant to read the new announcement in comparison with the former one. The first, 1913, said:—"It is hoped that the researches now being carried out jointly by the War Office and the British Museum (Natural History) may ensure the pro-

tection of Army Biscuit from the possibility of such attacks by insects in the future." The second, 1915, says:—"The researches which have been carried out jointly by the War Office and the British Museum (Natural History) have ensured the protection of Army Biscuit from the possibility of such attacks by insects in the future." The italics are ours. Nothing succeeds like success.

On July 10th the Entomological Club held one of its successful meetings at the "Hand and Spear," Weybridge, under the presidency of Mr. G. T. Porritt, F.L.S., F.E.S., of Huddersfield. Four of the eight members of the club were present—Mr. G. T. Porritt (chair), R. Adkin, H. Donisthorpe, and A. Sich. The guests were Messrs. J. Platt Barrett, G. C. Champion, R. W. Lloyd, W. J. Lucas, B. H. Smith, Hy. J. Turner, and H. Worsley-Wood. After an early supper an adjournment was made to the lawn of the hotel, where a very pleasant evening was spent.

It is many years since we have inspected the one-time famous Doubleday Collections of insects which were deposited in the Bethnal Green Branch of the South Kensington Museum by his executors. These collections consist of 106 drawers of British Lepidoptera arranged in the exact order in which they were left by him at his death, and 31 double drawers of Extra-British European Lepidoptera, also arranged as regards species as left by him, but in genera according to the then Staudinger's List. The collections still appear in very good condition and the circumstances under which they are consultable are quite adequate. The attendance book shows that the series are continually being consulted, a fact which we are sure would be most gratifying to the famous lepidopterist could he know. The catalogues dealing practically with every specimen are most useful for reference. One can definitely state which drawer one wants and have it brought without delay by the courteous attendant. This is as it should be.

[Since writing the above we were astonished to hear that the collections have been suddenly transferred to the British Museum, South Kensington. It is really too bad that so useful a local collection should be engulfed and lost in the immense mass of material in the central museum.]

There are 30 beautiful specimens of the British Large Copper (*Chrysophanus dispar*) in the Doubleday collection, three of them being the types of ab. *cunwiger*, Tutt, ♀s. The total *dispar* in the museum is now made up as follows:—

British Museum (Brit. Colln.)	= 26
British Museum (Gen. Colln.)	= 18 and 1 Brit. <i>rutilans</i> .
Walsingham Collection (1+2)	= 6
Banks Collection	= 13
Doubleday Collection	= 30
Buckler Collection	= 2 (poor)
—	
Total	= 95 + 1 <i>rutilans</i> .

The sixtieth Annual Exhibition of the Royal Photographic Society of Great Britain is now being held at the Gallery of British Artists, Suffolk Street, Haymarket. Mr. Hugh Main, B.Sc., F.E.S., carries off one of the medals for a set of eleven photographs of the "Metamorphosis of the Dor Beetle, *Geotrupes stercorarius*." In addition he

exhibits sets of photographs of the life histories of *Hibernia leucophaearia*, *Dytiscus marginalis*, *Cassida equestris*, *Timarcha tenebricosa*, *Lampyrus noctiluca*, *Pterostichus madidus*, *Eryx ater*, *Aromia moschata*, *Megachile centuncularis*, *Vespa germanica*, *Pimpla instigator*, *Chrysopa flava*, and *Larion puella*, all of which deserve notice. Mr. C. W. Colthrup has a small exhibit of his favourite study of the resting attitudes of moths. Mr. A. W. Dennis also has a set of photographs of the Wood ant, *Formica rufa*. Mr. Hamm, of Oxford, has several autochrome slides of the resting attitudes of butterflies. There are many other sections of the exhibition well deserving of mention, which we ask our readers to see for themselves. The rooms will remain open until October 2nd.

In the *Ent. Record*, vol. xii., p. 5-6 (1900), Dr. Burr gave an interesting account, with portrait, of the great Orthopterist Dr. Brunner von Wattenwyl. We have just heard of the news of his death, which took place at Vienna on August 24th, 1914. He was born in 1823, and was a member of one of the oldest Swiss families.

The Entomological Society of France at its bi-monthly meetings announces news from members who are with the army. From the *Bulletin* of the April-May meetings we see that Dr. M. Bedel has been mentioned in despatches, M. Balestre is now convalescent, after being severely wounded at Saint Mihiel, MM. Georges de Bary and Xavier Roques have died of their wounds, M. Albert Lacrocq, wounded at Eparges, has recovered, M. Gaston Roché has been killed, and M. R. Decary, seriously wounded at the Marne, is now convalescent.

In the April numbers of the *Bulletin de la Société Entomologique de la France*, M. Chrétien has a series of very interesting notes on *Callophrys rubi*, *Heodes virgaureae*, *Loxcia alciphron* var. *gordius*, *Plebeius argyrognomon*, *Laticorina orbitulus*, *Polyommatus eros*, *P. escheri*, and *Cupido sebrus*: the Abbé J. de Joannis discourses on the Law of Priority; and there are several systematic articles with illustrations on new and little known Coleoptera.

In the *Ent. Mo. Mag.* for June Mr. E. Ernest Green describes two Coccids as new to science. *Pseudococcus sphagni* was discovered by Mr. Donisthorpe in a nest of *Formica picea* in Matley Bog, New Forest, amongst *sphagnum*, and *P. gahani* was found on *Ribes sanguinea* in London. In the same number Mr. R. S. Bagnall further describes a Neuropteran new to Britain, *Conwentzia cryptoneuris*, which he announced in the new periodical, the *Vasculum*, a short time ago.

In the *Canadian Entomologist* for June, the monthly article on Popular and Economic Entomology deals in a most interesting and living way with "Some Manitoban Water-Beetles." There are also descriptions of several new genera and species of Tineina from the neighbourhood of Cincinnati.

In the *Naturalist* for June is found a long Report of the Cumberland Nature Reserve, the Entomology of which is described by an old correspondent of ours, Mr. F. H. Day. He lists 15 species of Butterflies, 122 species of Moths, and 257 species of Beetles. The area now preserved is Kingmoor Common, which was formerly a locality much frequented by collectors.

The first part of the *Transactions of the Entomological Society of London* for 1915 was issued in June. It contains twenty plates, four of which are coloured, with 176 and xlvi. pages. Dr. Dixey con-

tributes a paper on "New Species and Subspecies of *Pierinae*" in the Hope Collection, Oxford. G. C. Champion, "Revision of the Mexican and Central American *Telephorinae* with descriptions of new Species." J. J. Joicey and W. F. H. Rosenberg, "Descriptions of New Species of the Pierine genera *Catantactis* and *Daptoneura*." Dr. H. Eltringham, "Further Observations on the Structure of the Scent Organs in certain male Danaine Butterflies." The *Proceedings* are even more interesting and important than usual. They contain (1) a valuable paper, "The Mimetic Theory—A Crucial Test," by Colonel N. Manders, F.Z.S., F.E.S. (who we are grieved to say has just been killed in the Dardanelles), and a very weighty reply by Mr. C. F. M. Swynnerton, "A brief Preliminary statement of a few of the Results of five years' Special Testing of the Theories of Mimicry," with the discussion which ensued; (2) "Life History of *Agrotis lucerna*," by Mr. Lupton; (3) "The African *Megaponeva foetens* and its raids upon Termites," by Prof. Poulton, based upon letters received from his various correspondents in Africa; (4) "Butterflies from Biak, the largest of the Schouten Islands north of New Guinea," by Messrs. Joicey and Talbot; (5) "*Brenthis pales* and *B. arsilache* from Norway," by Mr. P. A. Buxton and others; (6) "A hibernating Pupa of *Pyramis atalanta*," by Mr. L. W. Newman; (7) "The Gregarious Habit during Hibernation of *Musca corrina*," by Prof. Poulton; (8) "Records of the Nuptial Flight of Butterflies (British)," by Dr. F. A. Dixey; and many other smaller items concerning exhibits, and communications to the Society.

The *Annual Report of the Entomological Society of Ontario* for 1914 contains, among other interesting items, (1) Photographs of the Rev. C. J. S. Bethune, one of the great pioneers of Entomological Work in the Colony, of Dr. Williams Saunders "one of the first to realize the practical significance of entomological work," of Henri Fabre the author of "Souvenirs Entomologiques," and of Hy. H. Lyman the great helper in all natural history work in the colony who was lost in the wreck of the "Empress of Ireland"; (2) An account from various sources and with several illustrations of the great 1914 outbreak of the "army worm" *Cryphus (Heliophila) (Leucania) unipuncta* and its devastations in pastures and fields of cereals throughout the country; (3) An interesting summary of the Life and Work of the great French observer, Henri Fabre; (4) An article on "Mountains and Hills" by that ardent lover of nature, the Rev. Dr. Fyles; and (5) the various reports of the sectional societies, economic work, and Canadian records, complete a useful volume of 152 pages and many illustrations.

The June quarterly part of the *Journal of Entomology and Zoology* (Pomona, California, U.S.A.) is mainly filled with articles on Entomology. Perhaps one by Edna Mosher is the most important, an investigation into the "Homology of the Mouth Parts of the Pre-*imago* in the Lepidoptera."

REVIEWS AND NOTICES OF BOOKS.

THE PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—1914.—With 10 plates and 1 map. Published at the Society's Rooms, Hibernia Chambers, London Bridge. Price 4s.—Although the matter for this admirable annual always must be

completed by the last week in January it seems rarely that the volume appears before the middle of May. An earlier issue would be much more encouraging to the authors of papers who may wait many months for their publication. The annual issues of this progressive society for the past thirty-five years lies before us, and we can truly say that it is a lasting record of progress in the carrying out of the object of the Society, *viz.*, "The diffusion of Biological Science by means of Papers and discussions and the Formation of Typical Collections." It is a society without vicissitudes: any changes which have come about have always been changes of advance. No less than seven of the present members were members in 1880 and of these three are still almost invariably present. More than fifty have been on the roll for a quarter of a century at least.

The volume consists of three sections. The first contains all the official information, Council's Report, Balance Sheet, etc. The second part consists of the papers read during the year, concluding with the annual address. The third section contains full accounts of the proceedings at each of the twenty-three meetings with numerous short notes contributed by different members, and the reports of the field-meetings.

Probably the most valuable paper, one of more than local interest, is that on "The Genus *Melitaea*," by the Rev. Geo. Wheeler, M.A., F.E.S., in which the groups of species, and the racial and local forms from the whole of the Palearctic and Nearctic Regions are dealt with largely from a philogenetic point of view. Mr. Colthrup gives his interesting experiences in "Photographing Birds on a South Coast Beach." Mr. R. Adkin gives a summary of all that is known of the occurrence of "*Colias edusa* in Britain," dealing with the species from a historical point of view, and passing on to a consideration of its migratory habits, illustrating his remarks with a map of Europe on which suggested lines of migration are marked. Mr. K. G. Blair, B.Sc., contributes a paper on "Luminous Insects," summarising the main facts known of this subject in the various groups, and giving an account of his own experiences in North America among the "flashing" or "lightning-bugs." Dr. E. J. Salisbury, D.Sc., gives a summary of the main facts of his lecture on "The Sea Shore and its Plant Life." Mr. W. J. Lucas gives a further instalment of his contributions towards a knowledge of "other Orders" in "British Long-horned Grasshoppers," illustrating his account with three plates containing figures of all the species dealt with in the paper. Mr. R. Adkin contributes a further paper, "Some Lepidopterous Pupal Habitations and some reminiscences," a most interesting summary of the varied directions of larval labour, and illustrated by four plates of figures of the structures and one plate of microscopical details.

Not less interesting are the detailed accounts of the meetings. Among the more useful notes contributed we may mention. (1) Mr. A. E. Gibbs on the American species of the genera *Melitaea* and *Phyciodes*. (2) Dr. Chapman's record with two plates of the abundance of mistletoe on Scots pine in the Dauphiny Alps. (3) Mr. Step's notes on the *Aleurodes*. (4) Mr. Turner's summary of the variation shown in the races of *Erebia pronoe*. (5) Notes by various members on the Mite, *Tetranychus lintearius*. (6) Mr. A. E. Gibbs, an account of the variation in several species of *Parussius* in the Palearctic

fauna. (7) The contributed notes and discussion on the genus *Anthrocera* by various members, which take up some twenty pages of the letterpress, and form a most useful and important summary. (8) Mr. A. E. Gibbs, "The giant sawfly and its parasite."

Only four Field Meetings were held during the year, *viz.*, at Ranmore Common, Beaconsfield, Ascot, and Byfleet, reports of which with records of captures, notes, etc., are included. There is also a Report of the Delegates to the South-Eastern Union of Scientific Societies, giving an interesting account of the doings at the very successful Bournemouth meeting.

The volume is extremely well got up and quite worthy of the Society. Possibly one could find small points to improve in future, if one felt in carping mood, but it is not worth while to be-little what is generally so excellent.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

June 24th.—NEW MEMBER.—Mr. Fagg, of Lewisham, was elected a member. ABERRATIONS OF EUROPEAN BUTTERFLIES.—Mr. Edwards, for Mr. Dawson, exhibited several remarkable aberrations of European butterflies, including *Polyommatus icarus* with elongated marginal markings on underside; *Melitaea dictynna* with underside forewing all markings blurred and hindwings markings extensively radiated, the upperside almost wholly black suffused; a melanic *Brenthis pales*; a xanthic form of *Epinephle jurtina*; *Polyommatus hylas*, with very pale marginal area on underside; and *Melitaea didyma* with radiated undersides. He also showed nests of the humble-bee, *Bombus lapidarius* with imagines, from Worcestershire. COLEOPTERA FROM THE NEW FOREST.—Mr. West (Greenwich), the principal species of Coleoptera taken by him in late May and early June in the New Forest including *Leptura scutellata*, *Mesosa nubila*, *Clytus arictis*, *Grammoptera præusta*, *Elater sanguinolentus*, *E. miniatus*, *Agrylus viridis*, *Colydium elongatum*, *Aphodius niger*, etc. EXHIBITION AND DISCUSSION OF *L. QUERCUS*.—Messrs. B. Adkin, R. Adkin, Hy. J. Turner, A. E. Gibbs, and Cowham, series and specimens of *Lasiocampa quercus*, and Mr. B. Adkin subsequently read a paper on the species. Mr. Gibbs, a male with complete female coloration. Mr. Cowham, a female from Epsom which was two years in pupa and had emerged in May. It was of the var. *callunae*. Another example had the discoidal on the left forewing duplicated.

July 8th.—The President, in the chair. Mr. G. B. Pearson, Russell Sq., W., was elected a member. There was a special exhibition of *Malacosoma neustria*, *M. castrensis* and *Cosmotriche potatoaria*, by Messrs. B. Adkin, R. Adkin, S. Edwards, A. E. Gibbs, Leeds, Sperring and Brooks, which included series of numerous local races, and many aberrations. Mr. B. Adkin then read a series of notes on the variation attainable in the three species. Mr. B. S. Williams exhibited a bred series of *Bupalus piniaria* from Leith Hill. Mr. West (Ashtead), examples of *Triaena psi* and *T. tridens* and asked if members could point out definite markings whereby the imagines could be correctly distinguished.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Singaring Tin, with brush, 1/6, 2/-. Singaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8s.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic)
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

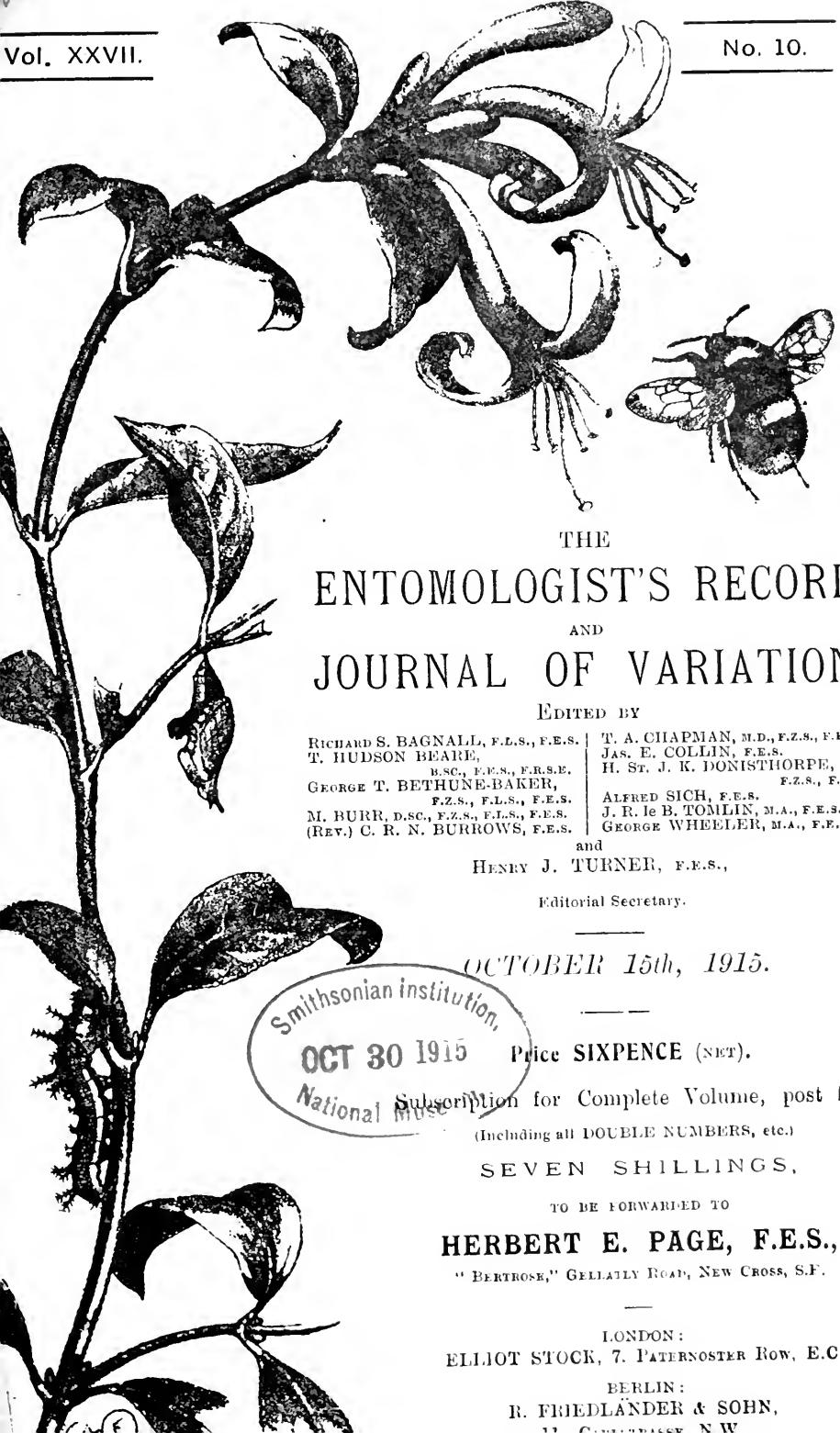
SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvae and Pupae in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvae, Pupae, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.



THE
ENTOMOLOGIST'S RECORD
 AND
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
 T. HUDSON BEARE,
 B.SC., F.E.S., F.R.S.E.
 GEORGE T. BETHUNE-BAKER,
 F.Z.S., F.L.S., F.E.S.
 M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.
 (REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
 JAS. E. COLLIN, F.E.S.
 H. ST. J. K. DONISTHORPE,
 F.Z.S., F.E.S.
 ALFRED SICH, F.E.S.
 J. R. le B. TOMLIN, M.A., F.E.S.
 GEORGE WHEELER, M.A., F.E.S.

and
HENRY J. TURNER, F.E.S.,

Editorial Secretary.

OCTOBER 15th, 1915.



Price SIXPENCE (NET).

Subscription for Complete Volume, post free
(Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS,

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

"BERTROSE," GELLATLY ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,

11, CARLSTRASSE, N.W.

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera.—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.*, "Varieties and aberrations of Noctuæ from Doncaster."—*H. H. Corbett, M.R.C.S.*, "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.*, "*Andryas stæ-johannis*."—*A. Radcliffe Grote, M.A.*, "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.*, "Larvæ."—*Rev. G. M. A. Hewitt, M.A.*, "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.*, "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.*, "Pupa hunting in October."—*J. W. Tutt, F.E.S.*, "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Riding, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.*, "The Lepidoptera of Swansea."—*Major K. B. Robertson.*, "Caradrina ambigua in the Isle of Wight."—*A. J. Hodges.*, "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.*, "Orrhodia erythrocephala ab. glabra from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Riding, F.E.S.*, "Notes on Caradrina ambigua and *C. superstes*."—*J. W. Tutt, F.E.S.*, "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Maze, F.E.S.*, "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.*, "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.*, "Coleoptera at Ipswich."—*Claude Morley, F.E.S.*, "Notes on *Bombus visurgis*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.*, "The Lepidoptera of Grésy-sur-Aix."—*J. W. Tutt, F.E.S.*, "*Apatura iris*."—*Rev. G. M. A. Hewitt*, "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.*, "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.*, "The Genus *Smerinthus*."—*A. Bacot.*, "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.*, "Wing structure."—*J. Alston Moffatt.*, "On the development of sex in social insects."—*J. W. Tutt, F.E.S.*, "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.*, "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.*, "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.*, "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.*, "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.*, "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.*, "Varieties of *Argymis selene*" (with plate).—*S. G. C. Russell, F.E.S.*, "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.*, "*Zygiena minus* and its varieties."—*J. W. Tutt, F.E.S.*, "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.*, Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7 6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets
 etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

**PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
 TABLETS TO PIN IN THE CABINET.**

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

A Butterfly Holiday in Great Britain.

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

It is possible that some sense of shame ought to accompany the admission of a "butterfly holiday" this year, but the combination of about half the work of a Central London Parish with the Secretaryship of the Entomological Society (to say nothing of other occupations), does render a holiday, even in war time, a somewhat pressing necessity, and finding it of course impossible to spend that holiday abroad, I made up my mind to utilize it entomologically by seeking some of those forms which are peculiar to our island, in particular the Cornish *Lycaena arion*, *Plebeius argus (aegon)* var. *massegi*, and the Durham and Scotch forms of *Aricia melon*. I hoped also to obtain the typical *P. argus (aegon)* and the var. *cretacea*, so as to have the opportunity of comparing these three forms in a fairly long series, and in addition I had some expectation of acquiring British forms of *Coenonympha tiphon* and *Erebia epiphron*. I had not, however, with one exception, a day without rain, and the one exception only gave the variation of a fog so thick that for most of the day it was impossible to see across the road; whilst only once did I have as much as two hours of consecutive sunshine, and, though there was a little on nearly half the days, it was generally confined to gleams of a few minutes' duration.

Leaving London at 1 o'clock on Monday, July 5th, I reached Bude soon after 7.30 in the evening, and here through a mistake of the porter's I was carried off seven miles in the wrong direction, and landed at a farm in Morwenstow. This was rather unfortunate, as the farm for which I was bound was some two miles from another in which Mr. A. H. Jones and Mr. Earl were staying, and I knew they were leaving on Wednesday morning, and further, there was a little sunshine on Tuesday morning which we had to waste in our thirteen miles' drive. An attempt to visit my friends on Tuesday evening was cut short by torrents of rain, and I was left to my own devices to find a ground for *arion*. Wednesday and Thursday were, with a short interval on the latter day, hopeless for hunting, but I searched about for likely spots. It was some time before I found any thyme at all, and when at last I did so, there was no sign of the necessary ant-hills, and I took nothing but *Melanargia galatea*, *Aphantopus hyperantus*, a fine dark form of *Epinephele jurtina*, and a single specimen of *Hipparchia semele*. On Friday morning a very welcome addition was made in the form of a single fresh specimen of the second brood of *Leptosia sinapis*, my first experience of this species in England. As the afternoon showed a promise of more sunshine, I started at about 1.30 p.m. for the farm in which my friends had been staying, and where I knew they had met with some success. Within a quarter of an hour of starting, however, I found myself in a steep field full of ant hills all covered with thyme, so felt that if *arion* was to be got anywhere in the neighbourhood I should hardly find a more likely spot. In a few minutes I discovered that it was by far the commonest thing in the field, though getting over, and I had to let out at least as many as I kept. I succeeded, however, in the hour or so that the sunshine (somewhat intermittently) lasted, in acquiring a short series of a dozen specimens, mostly in fair, and one

OCTOBER 15TH, 1915.

or two in excellent condition. A few *Polygonmatius icarus*, not in good condition, and a single *Coenonympha pamphilus* complete the Cornish bag, since *Pieris rapae* and *P. napi* were too worn to be worth taking.

On Saturday the 10th we left for Lyndhurst where we arrived in the late afternoon, our quarters at the "Crown" affording a grateful contrast to the roughness and rats of our late abode. A tramp through an open bit of the Forest on the following afternoon showed that, despite total absence of sun, it was possible to kick up a few fresh specimens of typical *P. argus* (*aegon*), and a sufficient number were obtained on the following day, which was hot, though there was but little sun till the late afternoon. Butterflies were however very scarce, with the exception of *E. jurtivo*. A very few *Dryas paphia* (no var. *calesina*) and still fewer *Argynnis adippe* put in an appearance, *Limnitis sibylla* was also very little in evidence, and such as were to be seen flew high until between 4 and 5.30 p.m., when the sun was several times out for as much as ten minutes at a time, when they came down as usual and sat on the moist wood-roads in some numbers, but were difficult to see and not in first-class condition when taken.

As I had to be in London for the Tuesday and Wednesday nights we returned home the following day, and on the Wednesday I made an expedition to Cuxton in search of *P. argus* (*aegon*) var. *cretacea*, but alas! the sun went in just after I arrived at the station and the rest of the day was given up to cold wind and occasional rain, and I returned home without a single specimen of any sort.

On Thursday, July 15th, we started for Witherslack about 1 o'clock, arriving at Grange-over-Sands in the early evening, and finding a very comfortable "taxi" at the station which quickly took us to the "Derby Arms," where we remained very comfortably for the next eight days. Our hostess was most kind and attentive, and during part of the time we had the further advantage of the company of Messrs. Mansbridge, Johnson and Crabtree, to all of whom this locality is so well-known, and by whom, especially Mr. Johnson who stayed longer than the others, I was introduced to the special haunts of various species, whether flying at the time or not. But the weather! Rain and wind were the order of the day, with scarcely ever a gleam of sun; still, I managed by hours of tramping the mosses to obtain a fine series of *P. argus* (*aegon*) var. *masseyi*, not however more than I could easily have got in an hour of hot sunshine. They were however well worth the trouble and exertion and nothing to compare with them is to be found out of England, or in England except in the northern "mosses." The ♀s are all much suffused with blue, the hindwings often to the border, and the amount of orange on the upperside varies as much as in other forms of the species; the dark part of the wings is nearly always black, not brown, as in *Agriaides thetis* ab. *urania*. I was fortunate enough also to obtain three aberrations among the ♂s; one with leaden-coloured hindwings on the upperside, very fresh and perfect, one with some coalescent spots on the underside hindwings (ab. *costa-juncta*), and one with most of the spots of the underside hindwings elongated, this specimen however having unfortunately lost a piece out of one of the hindwings. The ♂s are not at all violet-blue on the upperside, but rather of the blue of *Glaucopsyche cyllarus*, with a very narrow black

border and a series of black spots at the edge of the hindwings: when quite fresh they are nearly white on the underside, like the second-brood in Central Italy, and approaching the var. *hypochlona* of the Pyrenees, except in size. I was too late for *C. tiphon*, and the only good specimen I took was a ♀, though I found a few passable examples of both sexes. There was never a day when it was possible to go to Ambleside, and in any case I was too late for *E. epiphron*. I took both the Argynnids, but they were really over and not worth keeping, as was also the case with the 1st brood of *P. icarus* and mostly with *A. medon*, which is single brooded here. I was also between the broods of *C. pamphilus*, of which I only saw one ♀. *E. jurtina* was common and fine, with very pronounced yellow bands on the underside, sometimes even in the ♂s. *H. semele* was flying but did not seem common. Indeed, except in the "moss" in which *P. argus (aegon)* occurred, one might walk for hours without seeing a butterfly, and the only moths that were common were *Ematurga atomaria* and a pale *Crambus (perlus)*, I think). An occasional *Agriades sylvarum* was to be seen, and *Pieris napi* was fairly common, large, and well-marked. *Bupalus piniaria* was pretty frequent among the pines, which also produced a few *Sciothisa litura*: on one of the the mosses there were also a few *Selidosema cricataria (plumaria)* of both sexes. But even in such weather as we experienced Witherslack was a delightful place, and I sincerely hope to visit it again. The journey across to the Durham Coast, though only about 80 miles, took 8½ hours, of which 4½ were spent in waiting at stations, and necessitated 5 changes. We put up at the "Blackball Rocks" Hotel, which has the advantage of being within ten minutes of some of the best ground for the various forms of *A. medon* for which this coast is remarkable, and is in fact the only place in which it is at all possible to stay. I had been kindly furnished by Mr. J. H. Harrison with a plan of the coast, pointing out all the available denes and telling me which forms I might hope to find in each. Here again the weather was very bad, some days being hopeless from morning till night, but I was fortunate enough to get some very nice forms, almost all in the dene nearest to the hotel, some ten minutes' walk to the north of it. I made two expeditions to the three northernmost denes (about three miles off), of which Mr. Harrison spoke very highly, but on each occasion only saw one worn specimen in the second dene, and none at all in either of the others. These denes, at this time of year at any rate, contain four species of butterflies only:—*P. icarus*, *A. medon*, *C. pamphilus*, and *E. jurtina*, except for a very occasional *Aglais urticae*. *P. icarus* is really magnificent both in size and colour, the ♂s reminding one, on the upperside, of the specimens from Central Italy, but the ♀s are all considerably suffused with blue, which I have never seen in Central Italian specimens. Stephens' definition of *medon* var. *salmaris* is most unfortunate, as the white discoidal on the forewings is certainly commoner in the ♂ (ab. *similis*) than in the ♀. Many of the specimens of this species here are simply small *A. medon*, with a slight tendency towards obsolescence of the spots on the underside hindwing. White scales around a black discoidal (so frequently, and quite erroneously, referred to as var. *salmaris*, the original description of which absolutely excludes such specimens) did not very frequently appear, though it occurred in both sexes, but I obtained three magnificent examples of ab. *retae*.

one being of the extreme form in which the central row of spots is entirely wanting on the fore- as well as the hindwings, and also several well-marked examples of ab. *semi-redrae*: I also took a lovely little example of ab. *inclara* in which both fore and hindwings are of the form *costa-juncta*. I took two good specimens, ♂ and ♀, of *Adscita geryon* on the 26th, but saw no more. Deneholm and Castle Eden Dene are entirely in possession of the military, and quite inaccessible; moreover, just now the inhabitants of Blackhall Colliery Village—at any rate the boys—are spy-mad, and my sister-in-law, Miss Swaine (well-known to many entomologists), being taken by them for a German spy, was, during my absence at the far denes, stoned for nearly half a mile along the beach with missiles as large as one's fist; fortunately, however, their aim was as bad as their manners, and she escaped unhit. We remained a week at Blackhall, and on Friday, July 30th, left for Kinghorn on the coast of Fife. This is also in the hands of the military, and admission to the shore, on the way to which is the best place for *A. medon* var. *artaxerxes*, is only to be gained by a pass, which I was unable to secure till 8 p.m. on Saturday, which was very unfortunate, as the only sunny hour was latish on Saturday afternoon. It was not till my last day there, the following Wednesday, that I had a chance of trying again; on that day I took five—all I saw—but they were rather past their prime. This was remarkable, as the Fife coast is generally about a fortnight later than the Durham localities. Mr. Harrison, who kindly furnished me with plans of the Kinghorn localities also, warned me that I should be late at Durham, but just right at Kinghorn, whereas almost all the Durham specimens were absolutely fresh, while all I saw at Kinghorn were the worse for wear. At Kinghorn I also took a few *Humicia phlaeas*, and one or two other common species, but the great catch of this locality consists of the magnificent race of *Pieris napi*, which was very common even on bad days and mostly very fresh. These are rather large and very heavily marked, having streaks of black from the spots of the forewings to the outer margin, like *P. manni* var. *rossii*, the ♀s with heavy grey suffusion, especially at the base and along the inner margin of the forewings, yet not resembling var. *bryoniae*, since the ground colour is not yellow and the hindwings are without suffusion, which is also very slight along the nervures of the forewings when present at all.

I returned home on August 6th and have since taken two day excursions. On August 11th, I managed to put in three hours at Royston. Here two points struck me; the vastly greater proportion of ♂s of *Agriades coridon* than I have ever seen there before, amounting in some spots to half the specimens, and the number of ♀s which had little or no blue on them: ab. *semisyngropha* was there, and of course intermediates, but the proportion of the latter was much less than usual. Mr. G. L. Keynes, and I think Dr. J. N. Keynes also, have expressed an opinion that these blue forms are commoner among the later emergences. Judging from the condition of the ♂s, I should say the species had only recently appeared; it would be interesting to know whether anyone collecting there towards the end of the month had found the blue forms commoner. My other expedition was on August 13th when I went by train to Horsley and walked over the downs to Gomshall. The second brood of *Celastrina argiolus* was common in the wood towards the top of the downs, *P. icarus* was well

out, the ♀s varying from quite brown to quite blue, *A. coridon* was abundant, but the second brood of *A. medon* was only just beginning to emerge, and there was no sign as yet of *A. thutis*. *G. rhamni*, *H. senecle* and *P. phlaeas* were present but not in numbers, and *C. pamphilus* was common. The second brood of *A. thutis* is only following the example of the first this year, as is natural, in the lateness of its appearance as I saw not a single specimen of it when I was in the same locality towards the middle of June, and I have heard of similar experiences this year on the part of other collectors.

The Type of *Camponotus (Myrmoturba) maculatus*, F.

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

Dr. F. Santschi having asked me to examine and redescribe the insect named by Fabricius—*Formica maculata*—I have now done so. The ant in question is in the Banks' Collection at the British Museum (Natural History); it is labelled "Africa," and judging from what is known of the localities whence the specimens in the Banks' collection came, it probably came from Sierra Leone, or near by on the West Coast.

DESCRIPTION.

♂ Head above and below, mandibles, and scapes of antennae black; *funiculi testaceous* (unfortunately both tips of the antennae are missing). Thorax yellow beneath; pronotum, mesonotum, scutellum, and epinotum anteriorly, blackish-brown. Legs yellow. *tibia and tarsi blackish brown*. Scale yellow; gaster with first three segments with broad triangular blackish patches in centre of dorsum, with narrow yellow patches on each side; extreme apical edges of segments yellow.

The puncturation of the head and body is very fine and close, that of the gaster being rather finer. Towards the base and on the declivity of the epinotum the puncturation runs transversely in a circular manner. (The specimen is somewhat dirty, and dull with age, which makes it difficult to describe the puncturation very accurately.)

Head broader posteriorly, without any outstanding hairs beneath: clypeus a little longer than broad, strongly carinate in centre, with bluntly pointed side flaps, and a row of nine bristles on anterior border; mandibles with seven teeth on terminal border the apical one being long; frontal carinae with distinct raised ridges, gradually divergent, then rounded and convergent; frontal furrow distinct; cheeks without outstanding hairs.

Thorax: pronotum with long yellow outstanding hairs; scutellum distinct, nearly twice as broad as long; epinotum narrow, without outstanding hairs, declivity not steep. Posterior tibiae on apical half of posterior ventral surface (inner border of underside) furnished with a row of five or six short bristles (one anterior leg and the two intermediate legs are missing).

Scale narrowest at apex, not as high as epinotum, furnished with four outstanding hairs; gaster with rows of strong yellow outstanding hairs on apex and base of segments. Long. about 12mm.

Original description of *Formica maculata*, Fabricius [*Spec. Ins.*, 1, 491 (1781)]:—

"*F. nigra*, thorace postice femoribusque ferrugineis, abdomine pallido maculato.

Habitat in Africa æquinoctiali. *Mus. Dom. Banks.*

Media. Caput magnum, atrum maxillis breuibus, multidentatis. Antennae apice piceae. Thorax compressus, antice niger, postice ferrugineus. Abdomen ovatum, pilosum, nigrum lateribus pallido maculatis. Pedes nigri femoribus ferrugineis."

Fabricius was evidently in error when he wrote "antennae apice piceae," and really meant the scapes.

The form of *maculatus* with yellow tibiae from Egypt was considered until recently to be the type, but as we now see this is not the case, and, as Santschi has pointed out to me, this form (*i.e.*, the one with yellow tibiae) will have to be renamed.

The *maculatus* group (sub-genus *Myrmoturba*, Forel) is a very large one, and ranges over the greater part of the world. Specimens recently given to me by Beck, which he captured in Madagascar, have been named by Forel—*Camponotus (Myrmoturba) maculatus*, sub-sp. *radamae* var. *becki*, and others given to me by Williams, which he took at Guadeloupe, Forel has named *Camponotus (Myrmoturba) maculatus*, sub.-sp. *conspicuus* var. *williamsi*.

The Upper Engadine in 1914.

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

(Continued from page 168.)

The early morning of July 29th had a doubtful look, and having had two strenuous days, we decided to remain in the near neighbourhood of St. Moritz and enjoy some of the many lovely walks in the pine woods, picking up whatever insects we might incidentally come across. The forests of the district are chiefly of larch and the more local stone-pine, *Pinus cembrae*. The cones of the latter furnish the now well-known "pine-kernels," which have a pleasant flavour, and have gained some medicinal reputation. In many parts of the Alps of Europe the line of tree limit is but little above 6,000ft., but here it extends to over 7,000ft.

On the south-west side of the village of St. Moritz the steep-wooded slopes are known as the Alpina, Upper and Lower, and are threaded by numerous paths giving access to various admirable spots for insect colonies, while at the top, the tree limit, is a small undulating area of heather-clad ground (a somewhat rare occurrence in the Alps), where many species of butterflies and moths are always obtainable. This area was our morning ramble. It was dull weather, with intermittent sun, and decidedly cool. In fact, one wants to be ready for any variation of weather and temperature in the Engadine. The natives say that they have "nine months winter and three months cold," a terse way of expressing a desire which may not be above possible realisation. Probably no part of the neighbourhood is more varied in its flora than these slopes. Possibly the most attractive flower to meet was the Martagon Lily. There is a considerable quantity of Fennel scattered over the slopes, and *Papilio machaon* was looked for, but not met with in any stage. That it occurs here, I know, as in 1907 I met with it in some numbers. The beautiful *Parnassius apollo* butterfly was also very abundant on these slopes in

that year, but on this occasion only one was seen. Wherever there were overhanging banks, plenty of Gnophids could be disturbed, they were also abundant on the scattered boulders and exposed cliff surfaces. In a shaded watercourse hidden by the large leaves of the Coltsfoot (*Tussilago farfara*) was a colony of *Aciptilia gonodactyla*. A few *Heodes hippothoe* occurred of a smaller race than those met with on the previous day at Alp Grum, and with no trace of discoidal spots in the males. *Erebia euryale*, so extremely abundant on the same date in 1907, was seen to-day for the first time, one specimen only. In fact, during the whole of my stay I rarely saw more than one in places where I had been able to sweep up at least a dozen at once on the previous visit. *Plebeius argyrognomon* here was a small race, and on this date mainly females, some of which had only a trace of the orange markings on the hind-margin of the upperside of the hindwings. A few *Colias phicomone* were about, but worn. *Xanthorhoë montanata*, a remnant of earlier date, could be disturbed. *Scoparia sudetica* and *Cnephasia osseana* (*pratana*) were kicked up from the undergrowth. *Brenthis pales* was always in evidence, as it was during my whole stay, and in every place visited, of course, in much variety as to the underside of hindwings. The beautiful little deep yellow Geometer *Acidalia farvolaria* was everywhere. *Albulina pheretes*, the deep velvety blue Lycaenid, was worn, and *Polygonmatius icarus* was noted sparingly, the females being scarce. The walk back to the hotel was by a steep, and now unfrequented, path where the rock-rose (*Helianthemum vulgare*) was in profusion showing its delicate yellow flowers, with the Tormentil rivalling it in places. Still, this abundance did not remove the general impression already gained that at the time the dominant flowers both in number and species were Leguminous.

The afternoon seemed to intensify in dullness, and at times became showery, so that the collecting resolved itself into searching flower heads, disturbing herbage and pine foliage, and examining tree-trunks. The last, a very unproductive task, as nowhere have I found things so wary. Before reaching even net-length distance from the trees the settlers invariably scattered in all directions. The upper Campfer road was taken, past the beautiful figure, "The Apotheosis of the Snow," a monument erected to the memory of the artist Segantini, many of whose works are to be seen in the curious circular, tower-like museum on the opposite side of the road. This time, upon reaching the cemetery, the path to the left of the road was followed, through the thickly-wooded crest of the old moraine, which here crosses the valley, past the now deserted Villa Story to the lower Maloya road near the village of Campfer. In a boggy portion to the left of this path is a very good spot for collecting, and around here one again meets with heather. In the bog itself a large mass of conspicuously white rock has been unearthed, of quite different character to any rock I have met with elsewhere. Other smaller portions lie around. They have evidently attracted some attention, as they have been trenched around, but I have been unable to trace any particulars as to their origin and purport. The seed spikes of an *Orehis*, *Orehis maculata* (?), were in abundance hereabouts.

Upon reaching the road which leads back to St. Moritz Bad a few spots of rain fell and close attention was paid to the roadside flower-heads, which here were tenanted by large numbers of insects resting

or preparing to take shelter. This was particularly the case with the sheep's bit Scabious (*Jasione montana*) every head of which had hanging to its underside one or more Lycænids. *Polyommatus icarus*, *Aricia medon* var. *alpina*, the hindwings either without or almost without orange lunules, *Plebeius argyrognomon*, etc., were particularly noticeable. Hesperids of the *Hesperia alrens* group were quite inconspicuous on the brown and darkening heads of the common Yarrow (*Achillea millefolium*) and apparently well protected. Plenty of *Anthrocera nilipendulæ* were clustered on heads of Knapweed, etc., and among them a few of the high mountain form of *Adscita geryon*, with an odd example of *Anthrocera purpuralis*. From one head was taken a very fine underside aberration of *Agriaides coridon*, a male, in which there is no trace of any spots on the disc of all the wings, there being a diminished series of submarginal dark blotches on the forewings and very obsolescent submarginal markings on the hindwings, the place of the submarginal deficiencies being largely covered by almost white scaling; the discoidal spot in the forewings was well marked, that of the hindwings was a conspicuous white blotch; the white wedge mark of the hindwings was also quite conspicuous. This is the form called ab. *corydonis* by Bergstrasser and figured on Plate II., *British Lepidoptera*, vol. xi. (*Brit. Butt.*, vol. iv.), J. W. Tutt, and referred to and described, *loc. cit.* p. 35. It differs in the forewing markings being somewhat less emphasised than in the figures. Mixed with the "blues" were several very small specimens of *Erebia melampus*, no larger than the *E. satyrion* ab. *unicolor* among which they were sitting, an example of *Aricia eumedon*, a number of *Agrotis ocellina*, and several *Botys aerealis*. On the tree trunks at the back of the road-slopes were plenty of the wary *Entephria flavicinctata* and an odd specimen of *Gnophos glaucinaria*. A tap on the branches of the pines showed where the Satyrid was roosting, while the grass stems produced *Crambus furcatellus*, and one or two "plumes." I find that I have a specimen of *Acidalia umbelaria* taken in this spot. What perhaps was the most striking incident of the afternoon's walk, when the shower began in earnest, was the assemblage of great numbers of *Cleocybe lutearia* on the conspicuously coloured, large heads of the Mountain Bistort (*Polygonum viviparum*) which grew abundantly in a pasture, as it usually does in alpine pasture, by the road-side. Thousands of this brilliant yellow geometer could easily have been taken.

On July 30th some friends were intending to go over the ridge of mountains facing St. Moritz, by the Fuorcla Surlej, 9,055 ft., pass down into the Rosegg Valley and thence to Pontresina. As the Haanen See, a spot we much wished to visit, was on their way up we decided to accompany them thus far. The morning was again doubtful with intermittent sun, which allowed only fair collecting as it became colder with more wind. There are several ways of getting up to the See, about 7,070 ft., which is just at the tree-limit. The path chosen was that at the back of the Protestant Church in St. Moritz Bad, which leads by gentle ascents in the woods to the Johannisberg, and thence on the left by steep zigzags to the lake and its restaurant.

The Haanen See is a very small affair, situated curiously on a projecting portion of the mountain with steep declivities on three sides. Here I expected to get *arsilache*, but found the immediate neighbourhood of the lake very barren. *Brenthis pales* was in very small

numbers and quite typical, and with one or two dragonflies were the only Insecta around the lake. There were several nests of the social larvæ of *Eriogaster arbuscularæ* stretched on the surface of which were the inhabitants, all of them on the slightest provocation, even a shadow, jerking their heads and thoracic segments to and fro very rapidly. Presumably these movements were for protection against possible attack by ichneumons, but I should infer that it was not always very efficacious, for some larvæ that I took to rear all produced Dipterous parasites. Around this lake were a few shrubs of *Arctostaphylos uva-ursi* with the last of the flowers still remaining, and subsequently I took several specimens of the dusky little Geometer whose larvæ are attached to this plant only in the highest Alps and in Norway and Lapland, *Pygmaena fusca*. They were all males and from ignorance I omitted to search for the curious short-winged, long-bodied females. This species is closely allied to the genus *Psodos*.

A move was made across the low rocky ridge to a piece of boggy ground on the southern slope of the spur and here *Colias palacio* was careering wildly up and down. One male and a white form of the female were captured with some difficulty. *Plebeius argyrognomon* and *Coenonympha satyrium* were both observed. Several *Botys alpinalis*, one *Pyranta rhododendralis*, and a specimen of *Melitaea aurinia* var. *merope* occurred, the last somewhat larger than usual in this form. Several species of the beautiful blue Gentians were still in flower here, including the large *Gentiana acaulis*: and a large flowered species of pansy, which I have not identified, was observed.

A short rest for refreshment gave one a chance to enjoy the glorious view from this coign of vantage, quite 1,100 ft. above the valley below, and just an opposite view to that described from the Suvretta path on the other side of the valley. On the right the Alps on the western side of the Lower Engadine stretching away to the Austrian frontier, nearer the peaks Piz Ot and Piz Nair, in front the wild and lonely Suvretta Thal, Piz Albana, and behind it Piz Julier with its snowy crests, then to the left the cross valley leading to the Julier Pass, and then the Alps leading on to the Maloya Pass with the Italian frontier mountains beyond. The lakes of the long valley of the Upper Engadine are seen from here to much better advantage than from the other side, St. Moritz, Campfer, Silvaplana, and Sils make links in a chain of delightful blue, spotted here and there with reflections of the white clouds above and of the dark green foliage of the pines around. The road to the Maloya Pass can be distinguished for miles as it winds its way, alongside the lakes for the most part, diverging at one place only to cross between Silser See and Silvaplanner See to Sils Maria at the entrance of the famous Fex-thal.

Before returning, a small colony of the delicate Lycaenid, *Laticlona orbitulus*, was discovered and a short series was taken, including an aberrant female in which there were two rows of submarginal blotches on the forewings. These blotches appear as if they were suppressed spots of a different texture scaling to the rest of the general ground colour, and somewhat lighter when seen at some angles. Some of the specimens were already getting worn, while others were quite fresh. On the way down *Erichia tyndarus* was the only insect met with and that one got by disturbing it from its roosting places in the pine trees. The undersides were mostly dusky, only one had a uniformly light

surface beneath, and one example taken had only a single spot in the apex of the forewing. I took several specimens of an *Erebia* which at the time I did not identify. They are small and about the size of *E. melampus*, one appears to be a small form of *manto* from what remnants of markings there are and from the general shape of the wings, comparable to the form obtainable near Guarda, Lower Engadine, the others appear to be forms of *E. epiphron* var. *nelampus* with an approach to the *obsoleta* form of Tutt.

The absence of sun now became complete and one felt quite chilly when not moving. An abundance of *Aglais urticae* larvæ were seen on the edge of the marshy ground near the lake, in number quite too numerous for the available quantity of nettles. It is remarkable how often in the Alps one meets with the larvæ of the "tortoisehell" in similar difficulties as to its food. At the moment one recalls to mind a huge colony of the larvæ near the foot of the path familiar to all climbers of Mt. Blanc from Chamonix, where it was utterly impossible for all but the most ravenous few to attain the pupal stage, and another going up towards the little Ghedina lakes above Cortina in the Austrian Tyrol, where the larvæ were dying in numbers with only an odd chrysalis or two on objects around the devastated nettle-bed.

(To be continued.)

Bibliography of books and articles in which the Genitalia of the Lepidoptera are considered and discussed, or used as the basis of the subject matter.

Compiled by H. J. TURNER, F.E.S.

(Continued from page 137.)

1898. CHAPMAN, DR. T. A.—A note on the action of the Clasps in *Erebia*. *Ent. Rec.*, vol. x., p. 307. London.
1898. OUDEMANS, J. H.—Over de reductie, welke de vrouwelijke geslachtsorganen der Lepidoptera ondergaan. *Tid. Ned. Dier. Ver.*, vol. xx., p. lxxix., pl. 5. Leyden.
1898. HOFMANN, DR. O.—Die Orneodiden (Alucitiden) des paläarktischen Gebietes. *Iris*, vol. xi., pp. 329-359., pl. 5. Dresden.
1898. SCHULTZ, OSKAR.—Über den anatomischen Befund des Geschlechtsapparates zweier gynandromorpher Lepidopteren (*Smerinthus populi* und *Vanessa antiopa*). *Ber. Ent. Zeit.*, vol. xliii., pp. 409-414. Berlin.
1898. PACKARD, DR. A. S.—A Text-book of Entomology. (The Organ of Reproduction), pp. 485-513, figs. 458-481. New York.
1898. WALSLINGHAM, THE RIGHT HON. LORD [AND JOHN H. DURRANT].—*Lozopera francillonana*, F., compared with its allies. *Ent. Mo. Mag.*, vol. xxxiv. (ix), pp. 70-76, pl. ii. London.
1898. BACOT, A. [and F. N. PIERCE].—Notes on a Hybrid *Smerinthus populi-ocellatus*. *Ent. Rec.*, vol. x., pp. 188-190, pl. iii. London.
1898. CHAPMAN, DR. T. A.—A review of the genus *Erebia*, based on an Examination of the Male Appendages. *Trans. Ent. Soc. Lond.*, pp. 209-240, pls. v.-xvi. London.

1899. STICHEL, H.—Kritische Bemerkungen über die Artberechtigung der Schmett. *Catonephele* und *Nessaca*. *Berl. Ent. Zeit.*, pp. 1-48, 5 figs., pl. i. Berlin.
1899. TUTT, J. W. [BATESON, PROF. W.]—British Lepidoptera. Anthrocerid species. Vol. i., pp. 420-422. London.
1900. WOOD, DR. J. H.—On the Larva, Habits, and Structure of *Lithocolletis concommitella*, Bks., and its nearest Allies. *Ent. Mo. Mag.*, vol. xxxvi. (xi.), Male Genital Appendages, pp. 70-75, 9 figs. London.
1900. BASTELBERGER, DR.—Über Genitalanhänge der Männchen uns. europ. *Zonosoma*-Formen. *Iris.*, vol. xiii., pp. 73-94, pls. 2, 3. Dresden.
1900. KLINKHARDT, VICTOR.—Beiträge zur Morphologie und Morphogenie des Männlichen Genitalapparates der Rhopaloceren. 32 pp., 2 pls. Leipzig.
1900. SCHRÖDER, DR. CHR.—Die Untersuchung der männlichen Genitalanhänge als Kriterium für die Artberechtigung im Genus *Eupithecia*. *All. Zeit. Ent.*, Vol. v., pp. 305-307, 1 text fig. Neudamm.
1900. CHOLODKOVSKY, PROF. N.—Über den Geschlechtsapparat von *Parnassius mnemosyne*. *All. Zeit. Ent.*, vol. v., pp. 70-72, 1 fig. Neudamm.
1900. PETERSEN, DR. WILH.—Beiträge zur Morphologie de Lepidopteren. *Mém. de l'Acad. St. Petersburg*, vol. ix., 144 pp., 4 pls. St. Petersburg.
1900. TUTT, J. W.—The connection between Primary and Secondary Sexual Characters in Lepidoptera. *Ent. Record*, vol. xii., pp. 199-202. London.
1900. STITZ, H.—Der Genitalapparat der Mikrolepidopteren. Der männliche Genital apparat. *Zool. Jahrb.*, Vol. xiv., pp. 135-176, pls. 7-11. Jena.
1901. DYAR, HARRISON G.—Notes on the genitalia of *Halisidota harrisii*. *Can. Ent.*, vol. xxxiii., p. 30, 2 figs. Ontario.
1901. SMITH, J. B.—Contributions towards a Monograph of the North American *Noctuidae*: *Nyctina*. *Trans. Am. Ent. Soc.*, vol. xxvii., 46 pp., 5 pls. Philadelphia.
1901. PETERSEN, DR. WILH.—Zur Morphogenese der doppelten Bursa copulatrix bei Schmetterlingen. *All. Zeit. Ent.*, vol. 6, pp. 323-325, 4 figs. Neudamm.
1901. POLJANEC, LEOPOLD.—Zur Morphologie der äusseren Geschlechtsorgane bei den männlichen Lepidopteren. *Arch. zool. Inst. Wien.*, vol. xiii., pp. 155-196, 3 pls., 5 figs. Vienna.
1901. STITZ, H.—Der Genitalapparat der Microlepidopteren. II. Der weibliche Genitalapparat. *Zool. Jahrb.*, vol. xv., pp. 385-434, pls. xx.-xxiv. Jena.
1902. CHAPMAN, DR. T. A.—On Asymmetry in the Males of Hemiarme and other Sphinges. *Trans. Ent. Soc. Lond.*, pp. 679-692, pls. xxiv.-xxv. London.
1902. TUTT, J. W. [PIERCE, F. N.]—British Lepidoptera, vol. iii., *Amorphinae*, p. 390. London.
1902. STICHEL, H.—Kritische Bemerkungen über die Artberechtigung der Schmetterlinge. Die Gattung *Discophora*. *Iris*, vol. xv., pp. 50-95, pls. i. and ii., and 2 figs. Dresden.

1902. SCHRÖDER, DR. CHR.—Die Untersuchung der männlichen Genitalhänge als Kriterium für die Artberechtigung im Genus *Eupithecia*, Curt. *All. Zeit. Ent.*, vol. vii., pp. 526-529, figs. 1-9. Neudamm.
1902. GRUNBERG, K.—Untersuchungen über die Keim- und Nährzellen in den Hoden und Ovarien der Lepidopteren. *Zool. Anzeiger*, vol. xxvi., pp. 131-142, 4 figs. Leipzig.
1902. [HENDEL, FRIED.—Wird die Art durch die Form der sekundären Genitalorgane abgestempelt? *Wien. Ent. Zeit.*, vol. xxi., pp. 83, etc., 5 pls. Vienna.]
1902. SMITH, J. B.—Contributions towards a Monograph of the Lepidopterous Family *Noctuidae* of British North America. A Revision of the genus *Leucania*, etc. *Proc. U. S. Nat. Mus.*, Vol. xxv., pp. 159-200, pls. 5-6. Washington.
1903. PIERCE, F. N.—Specific differences in *Lithosiidae*, as determined by Structure of Genitalia. *Ent.*, vol. xxxvi., pp. 81-86, pl. 1. London.
1903. STITZ, H.—Zum Genitalapparat der Lepidopteren. *Zool. Anzeiger*, vol. 27, pp. 135-137. Leipzig.
1903. PETERSEN, WILH.—Entstehung der Arten durch physiologische Isolierung. *Biol. Centrbl.*, vol. 23, pp. 468-477. Leipzig.
1903. SMITH, J. B.—A Revision of the Boreal-American species of *Nonagria*, Ochs. *Proc. Ent. Soc., Wash.*, vol. v, pp. 311-321, pl. v. Washington.
1903. SMITH, J. B.—New Noctuids for 1903, etc. No. 2. *Jr. New York Ent. Soc.*, vol. xi., pp. 1-23, pl. 1. New York.
1903. SMITH, J. B.—New Noctuids for 1903, etc. No. 3. *Can. Ent.*, vol. xxxv., pp. 127-138, pl. 4. Ontario.
1903. SMITH, J. B.—New Noctuids for 1903, etc. No. 4. *Trans. Am. Ent. Soc.*, vol. xxix., pp. 191-224, pl. iii. Philadelphia.
1903. ZANDER, E.—Beiträge zur Morphologie der männlichen Geschlechtsanhänge der Lepidopteren. *Zeit. wiss. Zool.*, vol. lxxiv, pp. 557-615, pl. xxix. Leipzig.
1903. ROTHSCHILD AND JORDAN.—*Revision of the Sphingidae* (Introduction), vol. i., pp. lxxvii.-lxxxvii., 1 fig., pls. xv.-lix. London.
1904. PETERSEN, WILH.—Über indifferente Charaktere als Artmerkmale. *Biol. Cent.*, vol. xxiv, pp. 423-473. London.
1904. ZANDER, E.—Zum Genitalapparat der Lepidopteren. *Zool. Anz.*, vol. xxviii., pp. 182-186. Leipzig.
1904. VERNON, ENRICO.—Di segni esterni atti a rivelare nel *Bombyx mori* il sesso della larva. *Annuario. Stat. bac.*, vol. xxxii., pp. 125-130. Padua.
1904. GRINNELL, FORDYCE.—A New *Thanaos* from Southern California. *Ent. News.*, vol. xv., pp. 114-115, 3 figs. Philadelphia.
1904. GRUNBERG, K.—Untersuchungen über die Keim- und Nährzellen in den Hoden und Ovarien der Lepidopteren. *Zeit. f. wiss. Zool.*, vol. 74, pp. 327-395, 3 pls. Leipzig.
1904. PETERSEN, WILH.—Die Morphologie der Generationsorgane der Schmetterlinge und ihre Bedeutung für die Artbildung. *Mém. Acad. St. Peters.*, vol. xvi., ser. 7, 84 pp., 64 figs. St. Petersburg.

1905. PETERSEN, WILH.—Über die Bedeutung der Generationsorgane für die Entstehung der Arten. *Com. Rend. 6th Cong. int. Zool.*, pp. 213-224. Berne.
1905. PETERSEN, WILH.—Zur Frage der Geschlechtswitterung bei Raupen. *Ent. Zeit.* (Guben), vol. xix., pp. 20, 22-23. Guben.
1905. JORDAN, K.—Note on a peculiar secondary sexual character found among *Giemotridæ* at the sensory organ situated at the base of the abdomen. *Nor. Zool.*, vol. xiii., pp. 506-508. Tring.
1905. PETERSEN, WILH.—Ueber beginnende Art-Divergenz. *Arch. f. Nass. und Gesells.-Biol.*, vol. ii., pp. 641-662. Berlin.
(To be concluded.)

NEUROPTERA.

Pterodela livida, Enderlein, a Psocid new to the British Fauna.
(figs. 1-5).

By RICHARD S. BAGNALL, F.L.S., F.E.S.

Whilst I cannot pretend to have made a study of the *Psocidæ* I have taken sufficient interest in the group to tempt me to gather together a certain amount of literature on the European species.

One day in July I had the opportunity of spending a couple of hours in Whittle Dene, near Ovingham-on-Tyne, accompanied by Prof. Hudson Beare. Our visit was planned in the hopes of securing imagines of an unknown thrips, of which I had discovered the very distinctive larvæ upon hazel a couple of months previously. There was no sign of this thrips, however, either larval or imaginal, though the readily recognised red and white banded larvæ of *Haplothrips obscuripennis*, Bagnall, turned up, being previously known from the Oxford district, where it is not really uncommon, and widely distributed.

I bottled an interesting Hemipteron and several Psocids, especially minute forms, including a light yellow *Pterodela*, which I thought might be referable to *Pterodela livida*. The specimen was luckily a ♂, and examination in a rough glycerine mount proved at once that it was undoubtedly referable to that species, described by Dr. Günther Enderlein from Göhren, in Rügen Island, Prussia.

PTERODELA LIVIDA, Enderlein.

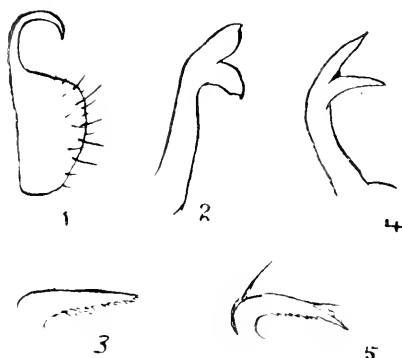
Zool. Jahrb., xviii. Abth. f. Syst., 1903, p. 374, pl. 3, 4, 6 and 9.

This species, together with *P. quercus*, Kolbe, differs from the well-known *P. pedicularia*, L., of which specimens are running about on the curtain and window-sill as I write, by the type of gonapophysis in the ♂, the latter having this organ roundly curved in the form of a crook, and simple at apex instead of bifurcate as in the former.

P. livida is a shade smaller (length of forewing 1.5mm.-1.6mm.) than *P. pedicularia*, and distinctly smaller than *P. quercus*, and differs from both in its light yellow coloration; the wings are hyaline with light yellow veins, and from *P. quercus*, apart from size, colour and general appearance, *P. livida* is at once separable by the form of the

gonapophyses and valva, as will be seen from the accompanying rough figures.

Habitat. NORTHUMBERLAND, Ovingham, 1 ♂ from oak, July, 1915.



- | | |
|--|-------------------------------------|
| 1. <i>P. pedicularia</i> ♂ Gonapophysis. | 3. <i>P. quercus</i> ♂ Valva. |
| 2. <i>P. quercus</i> ♂ " | 4. <i>P. livida</i> ♂ Gonapophysis. |
| | 5. <i>P. livida</i> ♂ Valva. |

× 160 (rough sketches after Enderlein.)

SCIENTIFIC NOTES AND OBSERVATIONS.

THE PINE PROCESSIONARY CATERPILLAR.—Dr. Chapman's theory as to the reason why the larvæ of this species spin their cocoons in a bunch seems plausible enough, but why should the larvæ of *Aphomia sociella* and of the *Hyponomeuta* group adopt a similar plan, although not protected by urticating hairs? The *Aphomia* is parasitic on bees and wasps, but sometimes at least wanders from the nest when ready to pupate, and the cocoons are clustered; see *Ent. Mo. Mag.*, March, 1895, and August, 1896, for two detailed accounts of this species; also *Ent. Rec.*, February, 1896, and October, 1896, for additional notes on the clustering habit. *Hyponomeuta*, on the other hand, is not parasitic, and the larvæ spin their cocoons in company in their nest. Is it possible that the clustering habit deters mice in the former case and birds in the latter from attacking the cocoons? or at least serves a useful purpose in making the foe too disgusted at the trouble of getting at the outer pupæ to persevere until it reached the inner ones? If so the inner and more numerous pupæ would always be preserved at the expense of the few outer ones which were devoured. It is noteworthy in this connection that the cocoons of *Aphomia* are stated to be exceedingly tough, and that the larvæ appear to possess a rudimentary processionary habit in spinning together *away from the nest in which they fed*.—C. NICHOLSON, Hale End, Chingford.

NOTES ON COLLECTING, Etc.

NOTES FROM S. ESSEX.—Although my collecting during the past few years has practically ceased, I cannot of course pass over Lepidoptera which force themselves upon my notice. This noon I found a quite fresh male specimen of *Eugonia autumnaria* at rest low down on

a gate-post. It is in perfect condition and appears not to have flown. This is the second specimen which I have taken in my garden. The other was a female which flew to my large acetylene lamp, on August 22nd, 1911. Three times this year I have seen *Pyrameis cardui*. Two specimens, much wasted, in the early summer, and the third a few weeks since, in fresh condition. A lovely female *Calamia lutesa* flew in to light in my study two nights ago.—C. R. N. BURROWS, Mucking Vicarage. September 16th, 1915.

COLIAS EDUSA AT CHICHESTER.—This butterfly has occurred here very sparingly this season. Three were seen on August 17th, and one of them (a male) was captured on that date in a clover field at Halmaker, by my friend Mr. Humphry. *Pyrameis cardui* was flying at the same time, and in September.—JOSEPH ANDERSON, Chichester. September 20th, 1915.

EASTBOURNE IN MID-SEPTEMBER.—During the meeting of the Entomological Club, on September 18th, a ramble under the cliffs and over the top of Beachy Head afforded those on collecting bent the opportunity of picking up a few odds and ends. *Polyommatus icarus*, *Agriades thetis* and *A. coridon* were in some numbers flying in the sun, and on the undercliff were noted as early going to rest wherever the sun was too low to keep them lively by its rays. *Plusia gamma*, *Aspilates ochrearia* (*citraria*) and *Nomophila noctuella* (*hybridalis*) were continually being stirred up from the herbage. Of course *Pieris rapae* was about the gardens. The only *Crambus* noted was *C. geniculens*. Belated *Epanephile jurtina* were in some numbers, while several species of ant were indulging in their marriage flights, wherever there were stretches of undercliff, which had been sheltered from the wind for most of the afternoon. Frass on the footpaths of the roads in the neighbourhood of Meads betrayed the presence of the larvæ of *Pygaera bucephala*, and *Celastrina argiolus* was flitting around the ivy in suitable spots, while *Orygia antiqua* could be noticed darting hither and thither in the roadways. It was reported that *Colias edusa* had been seen on the front during the morning, while Mr. Adkin exhibited the capture of the day, a living specimen of *Polygonia c-album*, which had been taken in the garden shortly previous to the meeting.—H. J. T.

NOTES ON LEPIDOPTERA IN NORTH WALES.—At Barmouth in Merioneth, in September, the reigning butterfly was *Pieris brassicae*, we saw it flying along the sea coast, on the hills above the town and also half-way up Cader Idris. *P. napi* was once seen, and once or twice we thought we saw *P. rapae* but *P. brassicae* was everywhere. *Vanessa io*, *Pyrameis atalanta* and *Aglais urticae* were common especially where there was a clump of *Eupatorium cannabinum* by the way-side. *Pararge megera* accompanied us along the lanes, sunning itself on the rocks or hedge banks. Here and there *Rumiccia phlacas* and *Polyommatus icarus* appeared as bright spots in the herbage. At Dovey Junction we saw a belated ♀ *Dryas paphia* on September 9th. On the stone walls we saw several beautiful specimens of *Polia chi*, they were all of the whitish form. Larvæ of the following species were also observed: *Phaetra* (*Acrionicta*) *rumicis*, *Spilosoma menthastris*, *S. lubripeda*, and *Phalera bucephala*.

On September 3rd, by the waterfall at Tyn-y-Groes, I found three mines of *Nepticula septembrella* on *Hypericum pulchrum*. In these small leaves the larva at first makes a slender gallery and afterwards

consumes the whole of the parenchyma. When the mine is completed the leaf assumes the shape of a small bladder, and in this the larvæ pupates without leaving the mine. One mine of *Lithocolletis alniella* was found on alder and the imago appeared a few days later. At Barmouth the mines of *L. coryli* and *L. nicellii* were found on hazel and those of *Nepticula plagiocolla* on sloe and *M. trimaculella* on poplar also occurred. An *Elachista* of the *obscurella* group was taken on the summit of Cader Idris (2929 feet) on September 7th and an imago of *Cerostoma xylostella* was noted some height above Arthog. Perhaps the most interesting species observed was *Nepticula tiliaræ*, two mines of which were found in the leaves of a lime tree overhanging the stream in the Torrent Walk at Dolgelly, on September 11th. When tenanted the mines are inconspicuous. Quite by chance the first was noticed and the leaf obtained. The next morning when examining the mine a second mine was discovered in the same leaf. The mine is much contorted at first but becomes bolder towards its termination. In the Fairy Glen near Bettws-y-Coed (Carnarvonshire) several old mines of this species were seen on a lime similarly situated to that in the torrent walk but higher above the stream. It would seem therefore that this species prefers a shady situation near water.—A. SICH, Corney House, Chiswick, W. *September 25th, 1915.*

SCYMNUS ARCUATUS.—From July 17th to September 5th I have taken over a hundred specimens of *Scymnus arcuatus*, including five larvæ and five pupæ on old ivy at Stoner Park, Henley-on-Thames. They feed on the larvæ of an *Aleurodes*. The male is easily distinguished by its white head.—(REV.) J. F. PERRY.

[One specimen of this interesting beetle was taken by Wollaston on August 10th, 1872 at Shenton Hall in Leicestershire, by sweeping old ivy. As he had previously taken it in abundance in Madeira, unfortunately some doubt was expressed about his capture. I have been to Shenton Hall (some time ago), and through the kindness of Lord Camoys and the Rev. J. F. Perry I have been able to take a series of *Scymnus arcuatus* at Stoner Park, and the old ivy is growing under similar conditions in both localities.—HORACE DONISTHORPE.

CURRENT NOTES AND SHORT NOTICES.

The volume, *British Ants, Their Life-History, and their Classification*, by our colleague Mr. H. Donisthorpe, was published last week.

On Saturday, September 10th, a meeting of the Entomological Club took place at Hodeslea, the residence of the late Prof. Huxley, with Mr. R. Adkin as host. There were present Mr. Adkin, in the chair, Messrs. Donisthorpe and G. T. Porritt, members, Mr. A. H. Jones, honorary member, R. South, hon. secretary, and Messrs. E. J. Bedford, W. L. Distant, A. E. Gibbs, E. P. Sharp, A. E. Tonge, and Hy. J. Turner. After lunch a long walk was taken over the downs of Beachy Head, where some of the guests made numerous captures. Tea was partaken of at the top of the downs, and a return to the house made in time for a meeting and discussion in the study where Huxley worked during the latter part of his life, and where his bookshelves still remain. Supper was served at seven o'clock, and after a day of delightful weather the meeting dispersed in time to give the guests from a distance a late return home.

During the summer months there has been a most interesting exhibition at the Zoological Society's Gardens, Regents Park, in connection with the campaign against the House-fly. The pamphlet published on the subject, entitled *The House-fly Campaign*, is by Prof. H. Maxwell Lefroy, M.A., and deals with the life-history of *Musca domestica* (the common house-fly) as well as other allied species, flies as carriers of disease, with notes on specific diseases, methods of destruction applied to hospitals, barracks, houses, etc., concluding with a list of reference books on the subject. The exhibition was particularly strong on the practical side; traps of all kinds, ingenious devices for attacking the pests in their various stages, various methods of protecting foodstuffs, etc., should have afforded enquirers much suggestive and useful information. In this connection we might refer our readers to the horribly realistic exhibit in the Hall of the Natural History Museum, South Kensington. At one end of the case a plate of ham set for a meal with a glass of milk beside it, at the other end a filthy midden heap with clustered flies and maggots. Other flies are passing between the two while some are sipping the milk and tasting the ham, plate, etc. The Museum pamphlet, *The House-fly as a Danger to Health*, by E. E. Austen, tells us that, "Since this fly (*Musca domestica*) is incapable of biting, its action as a disease-carrier is contaminative The germs of disease are carried on the exterior of its legs, wings, head or body, or, as is more usually the case, in the insects crop or intestine, and may subsequently be deposited on food or other substance," and goes on to urge every possible precaution against contamination.

In the *Ent. Mo. Mag.* for August, Mr. D. Sharp describes a new species of Coleoptera, *Helophorus championi*, which he has recently separated from its close ally, *H. strigifrons*, in the collection of Mr. G. C. Champion. The species was taken at Guildford and elsewhere, but is very rare.

The son of our colleague, Mr. H. Donisthorpe, is now convalescent and will probably return shortly to his duties in France.

Colonel Kaznakov, the Russian entomologist, whom I reported as severely wounded some time ago, had recovered before the summer. He convalesced at Geok-Tapa, and had returned to his military duties some time before I arrived there in July.—M. B.

In the *Scottish Naturalist* for August is a short but interesting account of a combined excursion to the Outer Hebrides, in 1914, by a party of zoologists to investigate the entomological fauna. The following extract concerning *Nyssia zomaria* may be interesting. "The larvæ were present in myriads on the sandhills near Barvas. They were often blown into hollows in such numbers as to hide the ground. They were in various stages of growth. The vegetation in these places was extremely mixed, and included conspicuously *Petasites*, wild carrot, and a species of rue. It is impossible to state what plants were especially attacked."

More or less recently we have received from the Smithsonian Institute, Washington, the following separata from the *Proceedings of the United States National Museum*. "On a Collection of Javanese Crane-flies (*Tipulidae*, Diptera) in the U.S. Nat. Museum," with nine plates of figures of details; "New Genera and Species of Gall-midges," with numerous figures of details; "Flies of the Genus *Agromyza*,

related to *Agromyza rivens*," with a plate of details; "The Dipterous Genus *Symphoromyia* in North America," with figures; "A Revision of the N. American Ichneumon-flies of the Sub family *Opiinae*," with plates; "Notes on some Sawfly Larvæ belonging to the genus *Dimorphopteryx*;" "The North American Bees of the Genus *Andrena*," by H. L. Viereck and T. D. A. Cockerell, the latter of whom has become a great authority on Hymenoptera since we knew him years ago in the South London Society; "Notes on the Life-history and Ecology of the Dragonflies (*Odonata*) of Washington and Oregon," with more than 200 figures; "Notes on Neotropical Dragonflies, or *Odonata*," with seven plates. "Lepidoptera of the Yale-Dominican Expedition of 1913;" and descriptions of many new species of Lepidoptera, Odonata, Orthoptera, Hymenoptera (Aculeata, Parasitica and Tenthredinoidea) and Diptera.

The *Transactions of the Cardiff Naturalists' Society* for 1914, recently to hand, contains a further long instalment of the excellent account of the "Coleoptera of Glamorgan," by our colleague Mr. J. R. le B. Tomlin. It will be found that the locality records, brought quite up to date, and the biological notes are extremely useful, while the historical references are interesting to those even who only take passing notice of the smaller inhabitants of their homeland area. Mr. Hallett gives a series of entomological notes for the year, mainly comprised of additions to the county records in the Hymenoptera Aculeata. From the bird notes by E. Cambridge Phillips, we take the following extract:—"We have had this year (1914) a visitation of countless caterpillars of the White Butterfly, which have devastated all our green stuff, brussels sprouts, broccoli, etc., to an extent that must be seen to be believed, in many gardens not a vestige of green can be seen on the grim skeletons of the stalks. Various remedies were tried, amongst others lime, and also weak carbolic acid and water, but all to no purpose. Poultry would not touch them, and the only aid was rendered by the following kinds of Tits, *vis.*, the Great Tit, Blue Tit, and Marsh Tit, which came in numbers to eat them. I daresay other Tits came, but these were the only ones I saw."

We regret to hear that the youngest son of Mr. C. G. Champion, our honorary Librarian at the Entomological Society of London, has been wounded at the front. A later report says that his injury is not serious, and that he is progressing very favourably.

The second part of the *Transactions of the Entomological Society of London* was issued early in August, and contains the following contributions:—(1) "New Butterflies and a Moth from Biak," by J. J. Joicey, F.L.S., and A. Noakes, F.E.S., with eight coloured plates. Biak is an island off the north coast of New Guinea, which although visited by W. Doherty in 1892, was not again explored until 1914, when the Messrs. Pratt spent more than two months there. (2) "Notes on the Larva and Pupa of *Caligo memnon*," by Dr. Davis of Belize, British Honduras, with a plate of figures. (3) The Descriptions of a large number of new species of South American Micro-Lepidoptera, seventy-two of them being created from the examination of either one or two examples only, by E. Meyrick, F.Z.S., F.E.S. (4) A series of excellent biological notes made by Prof. Poulton's correspondents in various parts of Central Africa.

The *South-Eastern Naturalist* has just been issued, and in its account of the Congress of the South-Eastern Union of Scientific Societies quite belies the somewhat pessimistic views we expressed as to the probable success of a meeting at Brighton in a year of war. The volume contains no entomological matter and very little which can be said to justify its title of "Naturalist," yet the matter is most interesting both locally and generally, and does great credit to the Hon. Secretary of the Union, Dr. William Martin, to whose efforts, so ably seconded by the Hon. Assist. Secretary, H. Norman Gray, the success of the Congress is due. The Presidential Address and papers read occupy nearly a hundred pages, and the reports of the various sections, proceedings of the Congress, and general information, take more than another hundred. There are seven plates.

The *Transactions of the London Natural History Society* for 1914 has just been issued. It consists of some 86 pages, some of which contain advertisements, and one plate. Much on the same lines, it is a continuation of the record which was formerly issued by the late City of London Entomological and Natural History Society. It contains an itinerary of the exhibits at the meetings; the Presidential Address by Mr. L. B. Prout, in which he deals lightly with many entomological questions of the year as well as the general progress of our study; some very valuable and practical "Notes on Breeding and Collecting the Sesia" = *Legeeriidae*, by Mr. L. W. Newman; an extremely scientific summary of what is known of "Gynandromorphism," by the present President, Dr. E. A. Cockayne, together with articles on Ornithology and Archaeology. One would like to have had Dr. Cockayne's article completed by a full bibliography and possibly by a plate or two. Mr. Mera, who was in the chair of the old City of London Society for some years, has contributed a series of interesting personal reminiscences of the parent society. We are glad to see from this record that entomology has not been swamped, as we feared it might be, as a result of the amalgamation.

The *Entomological News* for July contains three plates. The first illustrates an article on "Recent Work on *Catocalæ*" from Missouri. The second gives detailed figures for the "Studies on Costa Rica *Homata*: the Waterfall Dwellers; the Transformation. External Features and attached Diatoms of *Thaumatonera* Larvæ"; and the third illustrates some dozen "New Species of Lepidoptera-heterocera." described by F. Hainbach of Philadelphia, mostly Pyrales. W. Wild describes and figures a new species of *Colophora*, *C. albiantennella*, the larvæ of which were found feeding on dogwood at Buffalo.

In the *Ent. Mo. Mag.* for July Mr. D. Sharp describes a new *Homata*, *H. exillima* belonging to the sub-genus *Meotica*. It has been taken in sphagnum in the New Forest by several collectors. Mr. Jas. Edwards describes several new species of *Homoptera* from Britain:—*Megophthalmus scabripennis* from Colesbourne and numerous other places; *Idioceras albicans* ab. *fusco-coeruleus* on white poplar at Norwich; *Deltocephalus thenii*, common on Norfolk coast marshes at Wells and Weybourne; *Limotettix saturata*, in a marsh at Horetton, Norfolk, Leith Hill and Gomshall; *Zygina mali*, on apple trees at Colesbourne; and *Psylla subcorymbosa*, common on any coniferous tree between October and April. Mr. A. E. J. Carter adds three species to the

List of British Diptera: *Trichopticus mutatus*, taken by the Rev. Jas. Waterston near Peebles; *Lasiops eriophthalma*, taken in Perthshire on a stone wall; and *Eccoptomera pallescens* from Midlothian.

The *Irish Naturalist* for July contains an annotated "List of the Ichneumonidae from the North of Ireland," by the Rev. W. F. Johnson with the aid of Mr. Claude Morley.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 5th, 1915.—LIVING PUPÆ OF PYRAMEIS ATALANTA.—Following on his exhibit and notes of March 3rd last, Mr. Newinan again exhibited these pupæ, and said he thought he might now fairly claim to have proved that this species can pass the winter in England in this condition. THE AMATHUSID GENUS HYADES, BOISD.—Mr. Talbot exhibited specimens of the genera *Hyades* and *Taenaris*, and read notes. NEW LEPIDOPTERA FROM THE ARFAK MOUNTAINS, DUTCH NEW GUINEA.—Mr. Talbot also exhibited on behalf of Mr. J. J. Joicey some new Lepidoptera from the Arfak Mountains, Dutch New Guinea, including a local race of *Ornithoptera paradisea*, Stgr. THE ITALIAN MODE OF EXCLUSION OF THE HOUSE-FLY.—The Rev. F. D. Morice drew attention to a paper in the *Trans. Ent. Soc.*, vol. i (1836), by W. Spence on this subject. FURTHER NOTES ON THE HABITS OF THE AFRICAN ANT, MEGAPONERA FOETENS, F.—Prof. Poulton read a further account sent to him March 27th, 1915, by Mr. C. O. Farquharson. INTERESTING BUTTERFLIES FROM THE EAST COAST OF MADAGASCAR.—Prof. Poulton exhibited specimens from a collection kindly sent to the Hope Department by Archdeacon G. K. Kestell-Cornish, from Ambinanindrano, Mahanoro (about 400 ft.). A UGANDA BUG DEVOURING A LYCENID BUTTERFLY.—Prof. Poulton exhibited a pair of *Monomyia grandicollis*, Germ. (Cryptocerata), captured *in cop.* on a bird-dropping on wet sand, Nsadi I., W. of Kome I., N.W. Victoria Nyanza, March 30th, 1914, by Dr. G. D. H. Carpenter. One of the two bugs was devouring a male *Lycaenesthes larydas*, Cr., also exhibited to the meeting. OBSERVATIONS ON BUTTERFLIES AND THE ATTACKS MADE ON THEM BY BIRDS, ABOUT 30 MILES W. OF THE VICTORIA NYANZA AND ABOUT 1° S. LAT.—Prof. Poulton read a letter on this subject from Dr. G. D. H. Carpenter. PAPERS.—The following papers were read:—"New Lepidoptera from New Guinea," by J. J. Joicey, F.L.S., F.E.S., A. Noakes, F.E.S., and G. Talbot, F.E.S. "Descriptions of South American Micro-Lepidoptera," by E. Meyrick, B.A., F.R.S., F.E.S. "Life-History of *Caligo memnon*," by F. L. Davis, M.D., F.E.S. "Some Palaearctic Species of *Cordulegaster*," by Kenneth J. Morton, F.E.S. "Experiments on some Carnivorous Insects," by C. F. M. Swynnerton, F.E.S.

June 2nd, 1915.—ELECTION.—Dr. A. B. Northcote, Blenheim House, Monkgate, York, was elected a Fellow of the Society. LARVÆ OF AGRIADES ESCHERI.—Dr. Chapman exhibited some full-fed larvæ of *Agriades escheri* bred from the egg. VARIATION IN ORNITHOPTERA ALEXANDRAE.—Mr. O. E. Janson exhibited specimens of *Ornithoptera alexandrae* selected from a series to show the extreme variations in the wing-markings; also a female example of *Morphotenaris keuricki*: all from New Guinea. METHOD OF BREEDING PSOCIDÆ, ETC.—Mr. C. B.

Williams exhibited a method of breeding *Psocidae* and other small insects which feed on fungi, etc. BEE AND PLANT FERTILISATION.—The Rev. F. D. Morice exhibited a ♀ of the solitary bee *Audreua labialis* taken near Woking on May 19th, 1915, having attached to the disc of its clypeus a vegetable substance apparently a pollinium of some orchid. NOTEWORTHY ANTS.—Mr. Donisthorpe exhibited specimens of *Anochetus cameroni*, Forel, a new species taken by Dr. Cameron at San Roque, December 1914, and *Cremastogaster inflata*, F. Smith, taken by Mr. Bryant at Sarawak, December 1913. The latter species has the thorax distended, which acts as a reservoir for honey, in the same way as the distended gasters of the true "Honey Ants." FURTHER OBSERVATIONS ON AFRICAN INSECTS BY DR. G. D. H. CARPENTER.—Prof. Poulton said that he had received another consignment of insects and further letters from Dr. Carpenter, who had added further information to the notes read to the Society on May 5th last. A FAMILY OF ACRAEA JONSTONI.—Dr. Eltringham exhibited a family of five examples of *Acraea johnstoni*, Godm., bred by the Rev. K. St. A. Rogers at Sagalla, B.E.A., together with the female parent. The latter and four of the offspring were of the form *confusa*, Rogenh. LIVING ELATER SANGUINOLENTUS.—Comm. Walker exhibited living specimens of *E. sanguinolentus*, beaten from *Pinus sylvestris* at Brockenhurst on the morning of the meeting. PAPER.—The following paper was read:—"What the larva of *Lycaena arion* does during its last instar," by T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

REVIEWS AND NOTICES OF BOOKS.

BRITISH ANTS. THEIR LIFE HISTORY AND CLASSIFICATION.—By H. St. J. K. Donisthorpe, F.Z.S., &c.—Wm. Brendon and Sons, Ltd., Plymouth. Published by subscription.

Four things, said the ancient Semitic sage, are little upon the Earth, yet are exceeding wise; and the first of these are the Ants, "a people not strong, yet who prepare their meat in the summer." And from the far-off days when those words were written, up to the present time, the social Hymenoptera, more especially the *Formicidae*, have excited the admiration and stimulated the curiosity of mankind, because they, more than any other creatures, have displayed the working of instincts, which have seemed comparable with the intelligence of Man himself. And so it has come to pass, that although other orders of the Insecta appeal perhaps more in variety of form and beauty of coloration to the student of Nature, yet none have secured the interest of the Biologist to the same extent, or in the same manner, as the Hymenoptera; and it is for this reason that we welcome the appearance of the first book in the English language, devoted, with any approach to scientific accuracy, entirely to our British Ants.

The entomological public need no introduction to the author of the volume before us—least of all the readers of *The Entomologist's Record*. Mr. Donisthorpe has long been known by his writings, published here and elsewhere, as our chief British authority on the *Formicidae*: and by his careful and patient study, extending now over many years, of various species of ants kept in captivity, to be singularly well fitted to interpret their activities to that increasing number of the public, for whom such things have an interest.

Mr. Donisthorpe's treatment of his subject is particularly exhaustive and the book is, in each of its parts, furnished either with woodcuts or reproduced photographs, which completely illustrate the subject of the text.

The first portion is devoted to an explanation of the anatomy of the group, both external and internal. The second treats of the economic and physiological ant characteristics, including a specially interesting description of the curious polymorphism which obtains within the species, and which must of course be studied with reference to the singular arrangement implicit in the socialism of the Hymenoptera, and in them alone among the Arthropoda, whereby the function of the female has been so divided that it becomes finally expressed in two forms, morphologically as well as functionally distinct, with the result that each species appears to exist in three sexes, or at least separate forms. The third part of the book tells of all that is known of the Psychology, or as some Biologists might prefer to express it, the Physiology, of Ants.

Notes on collecting, and the treatment of Ants kept in captivity for observation follow, and the remainder of the volume is devoted to separate descriptions of every species of Ant which inhabits our Islands.

These descriptions, prefaced of course by appropriate dichotomic tables, which should enable the most inexperienced student to name his captures without difficulty, are exhaustively complete; they are accompanied, wherever possible, by the original description of the species, quoted *literatim*, and by lists of all allusions to it in Entomological literature. Particulars of the distribution of the species in this country follow, with the observers name given for each record. Every description is illustrated by photographic reproductions from specimens in the author's collection, of male, female, and worker, and to say that these photographs are by A. W. Dennis is to guarantee their excellence. More fascinating perhaps to the general reader, will be the descriptions of the life-histories and activities of these several species, the curious coadaptations and relativities which exist between species and species, how they act as guests, on differing terms, to so many other totally unrelated species of the Arthropoda, or fight pitched battles among themselves.

Particularly, will the interest of the reader, who perhaps may care nothing about the discrimination of species, be excited, by such a story as that describing the slave raids of *Formica sanguinea* (p. 284 *et seq.*); how this ant goes forth by companies to capture and remove to its own nest, there to be retained as slaves, the pupæ of another species of ant, *Formica fusca*, or reading (p. 248) that the workers of *Formica rufa* continue to toil without cessation from sunrise to an hour after sunset, all through a summer's day—be reminded of that familiar invitation to the "slacker" of all times to "consider her ways and be wise."

But taking this book as a whole, it seems possible that the chapter headed "Psychology," as it will attract the deepest interest by others than professed entomologists, may also invite their only criticism. The subject is, in fact, how far the activities of the *Formicidae* (as of course other Hymenoptera) are induced by factors comparable with human intelligence. Mr. Donisthorpe does not commit himself to

any decided views on this question, but from the opinions cited and the instances adduced, it might possibly be felt that the interpretation of these activities is perhaps too much in terms of human consciousness. The fact that man possesses five separate avenues whereby the external world may excite such appropriate nervous action as can be transmuted by the brain into distinct consciousness, does not in any way preclude the assumption, that the Insecta, which are doubtless the last evolutionary phase of the Arthropoda, may possess quite other, or more numerous methods, by which external influences, necessarily unknown to our experience, may stimulate their nervous system. Thus Henri Bergson, the philosopher who has supplied the modern world with a new conception of Life, as is well known, considers Instinct and Intelligence to be quite distinct vital phenomena, and not that the former is merely an incomplete or undeveloped form of the latter. As he says:—"These creatures (Hymenoptera) represent the culminating point of a progressive evolution of instinct. Their marvellous actions can only be explained by supposing that instinct is a quite different and, in a certain manner, opposite mode of mental activity to that by which we apprehend reality." But it is obvious that anything like an adequate consideration of such a subject as this is quite out of place in a brief review of a book on ants, and we only allude to it to show into what wide fields of speculation, and even philosophy, a single chapter in this most excellent work might lead us. As a whole the work brings our knowledge of the British Ants up to a point which leaves nothing to be added, and we can only wish for it that publicity which Mr. Donisthorpe's treatment of his subject deserves.

OBITUARY.

Colonel Neville Manders, D.D.M.S., F.Z.S., F.E.S.

It is with no conventional expression of regret that we record the death of Colonel Neville Manders, who, as we shortly announced in our last issue, was killed in the Dardanelles in August. He was well known to entomologists who attend the meetings of the Entomological Society of London, and his genial manner and attractive personality must make his death to many others, as it is to the writer of this notice, the loss of a real friend.

He was both by birth and education a Marlburian, having been born at Marlborough in 1859, the youngest son of Major T. Manders, and educated at the College. He joined the Army Medical Service in 1884, and saw active service in Egypt the following year, and again in Burmah two years later. He was afterwards stationed in the Shan States, at Rawal Pindi, at Colombo, and in the Mauritius, as well as holding appointments at home, at Aldershot and at the Curragh Camp in Ireland amongst other places, and had also made holiday excursions in such widely different localities as Switzerland and Java, and was finally appointed, at the end of 1913, to the Deputy-Directorship of the Medical Service in Egypt, a position which he held till the beginning of the present year, when he was appointed to the Headquarters Staff of the Australian and New Zealand forces, with whom he proceeded to the Dardanelles.

His interest in Entomology began in early boyhood, and only

ended with his life. A proof of the former statement may be found in the August number of the *Entomologist*, in a note in which his entomological reminiscences date back to his tenth year, whilst a proof of the latter is to be found in our own July-August issue (p. 149) in a note actually written from the trenches where he was so soon to meet his death. He joined the Entomological Society of London so far back as 1887, and in 1890 we find in their Transactions a paper from his pen on the Butterflies of the Shan States, which contains also most valuable notes on the country and climate. Four other papers of his are published in the Transactions, one on certain breeding experiments in Ceylon, another on the Butterflies of the Mauritius, and two on subjects connected with Mimicry, in which he always showed, as the readers of this magazine are well aware, a special interest. He was often regarded, quite mistakenly, as an opponent of the theory; in reality he was a careful student, unwilling to assent definitely to any theory without sufficient proof—a thoroughly sound (indeed, the only thoroughly sound) and scientific position; he was however driven into an attitude towards the question, described by the present writer in this magazine as one of “armed neutrality,” by the efforts made by some of the supporters of the theory to make it account for many things which could much more readily be accounted for in other ways—indeed, it seems to be the peculiarity of most specialists to imagine that their favourite theory accounts for *everything*. Many of his notes and short articles in this magazine are connected with this subject. He first wrote for us in 1904, and since then it is rarely indeed that his name did not figure in the “list of the contributors,” and all that he said was worth saying. As a controversialist he was an ideal opponent, for he always kept his temper; and this was no doubt partly because he had no axe of his own to grind, his aim was to get at the truth, not to support a theory. His last paper on the subject of Mimicry was published in August last in the Proceedings of the Entomological Society, and valuable as it was, it called forth the yet more valuable reply of Mr. Swynnerton, who produced the very proofs for which Colonel Manders had always been asking.

Colonel Manders leaves a widow and daughter, to whom we offer our deepest and most respectful sympathy.—G.W.

Nomenclature.

[Addendum to “KIRBY, WILLIAM. Monographia Apum Angliæ.”
Page 132.]

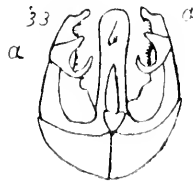


Fig. 33. a. Forceps. b. Phallus.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8c.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic)
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
A Butterfly Holiday in Great Britain, <i>G. Wheeler, M.A., F.Z.S., F.E.S.</i>	217
The Type of <i>Camponotus (Myrmoturba) maculatus</i> , <i>F., H. Donisthorpe, F.Z.S., F.E.S.</i>	221
The Upper Engadine in 1914 (continued), <i>Hy. J. Turner, F.E.S.</i>	222
Bibliography of book and articles in which the Genitalia of the Lepidoptera are considered, etc., <i>Hy. J. Turner, F.E.S.</i>	226
NEUROPTERA:— <i>Pterodela livida</i> , Enderlein, a Psocid new to the British Islands, <i>Richard S. Bagnall, F.L.S., F.E.S.</i>	229
SCIENTIFIC NOTES AND OBSERVATIONS:—The Pine Processionary Caterpillar, <i>C. Nicholson</i>	230
NOTES ON COLLECTING:—Notes from S. Essex, <i>Rev. C. R. N. Burrows</i> ; <i>Colias edusa</i> at Chichester, <i>Joseph Anderson</i> ; Eastbourne in Mid-September, <i>H.J.T.</i> ; Notes on Lepidoptera on N. Wales, <i>A. Sich, F.E.S.</i> ; <i>Scymnus arcuatus</i> , <i>Rev. J. F. Perry</i>	230
CURRENT NOTES AND SHORT NOTICES	232
SOCIETIES:—The Entomological Society of London	236
REVIEWS:—British Ants	237
OBITUARY:—Colonel Neville Manders, <i>G.W.</i>	239
ADDENDUM:—Nomenclature	240

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, H. E. Page, A. J. Fison, C. P. Pickett, Dr. Burr, A. Tetley, Parkinson Curtis, H. B. Williams, H. L. Earl, A. Sich, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The Entomologist*, vols. 20-30, 1887-1897 (11 years) } £3 10s. 0d.
 " " " vols. 39-46, 1906-1913 (7 years) }
Entomologist's Record, &c., vols. 1-23 & 25. Price, £4 15s. 0d.
Practical Hints for the Field Lepidopterist, Tutt, 3 vols. as one. 10s. 6d.
Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
British Moths. Tutt, 2s. *Moths of Brit. Isles (South)*, Vol. 2. 5s.
British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
Lepidopterist's Calendar, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the WIDOW of the late J. ALDERSON. Apply:—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

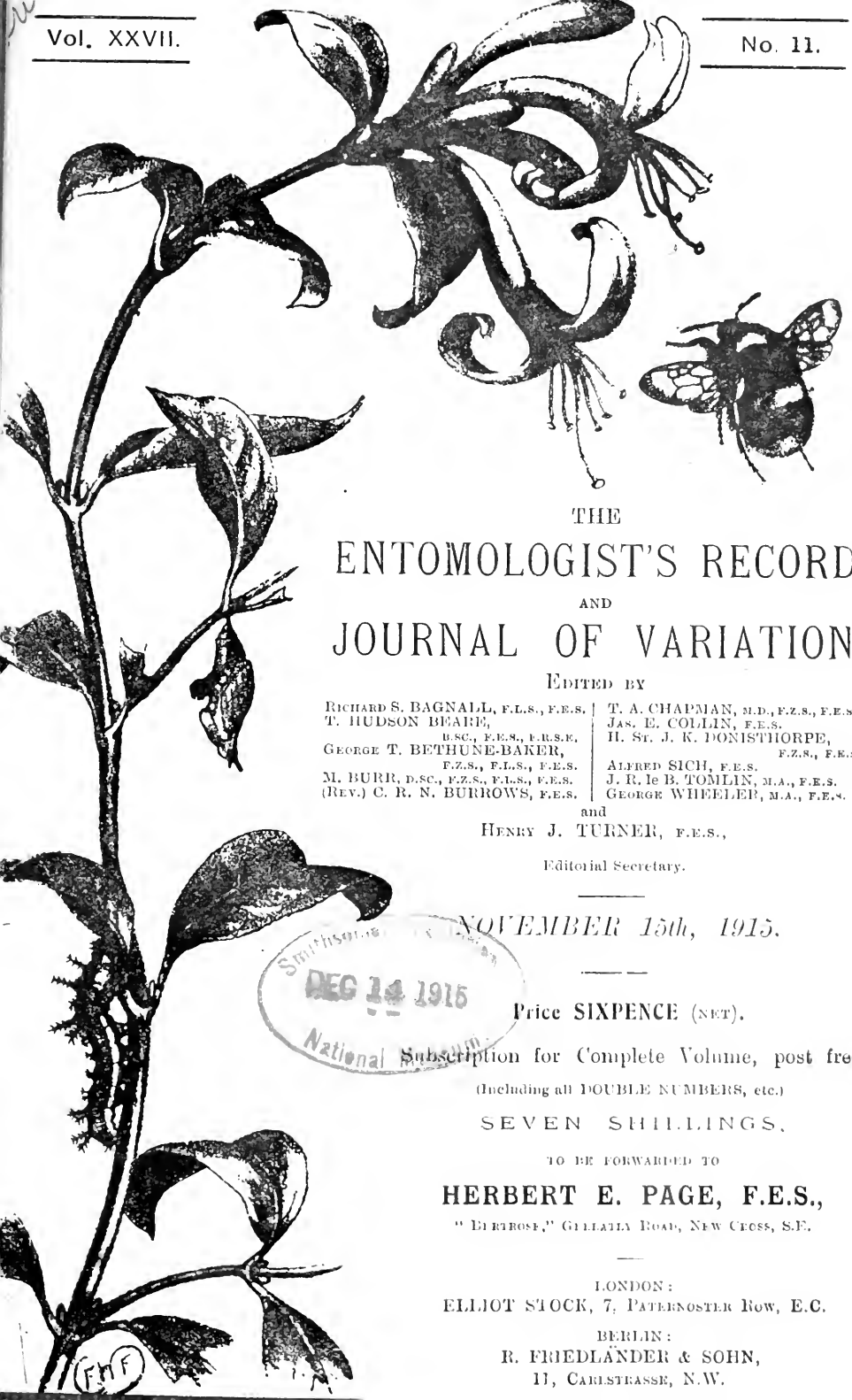
LEONARD TATCHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
 : IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.



THE
 ENTOMOLOGIST'S RECORD
 AND
 JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.	T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
T. HUDSON BEARD,	JAS. E. COLLIN, F.E.S.
B.SC., F.E.S., F.R.S.E.	H. ST. J. K. DONISTHORPE,
GEORGE T. BETHUNE-BAKER,	F.Z.S., F.E.S.
F.Z.S., F.L.S., F.E.S.	ALFRED SICH, F.E.S.
M. BURR, D.SC., F.Z.S., F.L.S., F.E.S.	J. R. LE B. TOMLIN, M.A., F.E.S.
(REV.) C. R. N. BURROWS, F.E.S.	GEORGE WHEELER, M.A., F.E.S.

and

HENRY J. TURNER, F.E.S.,

Editorial Secretary.

NOVEMBER 15th, 1915.

Price SIXPENCE (NET).

Subscription for Complete Volume, post free
 (Including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO

HERBERT E. PAGE, F.E.S.,

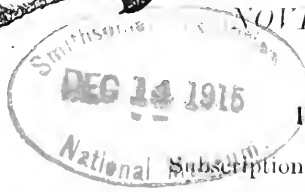
"BERTHOFF," GILLGATE ROAD, NEW CROSS, S.E.

LONDON:

ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:

R. FRIEDLÄNDER & SOHN,
 11, CARLSTRASSE, N.W.



(EMF)

Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

THE TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera.—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.*, "Varieties and aberrations of Noctue from Doncaster."—*H. H. Corbett, M.R.C.S.*, "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.*, "*Eudryas ste-johannis*."—*A. Radcliffe Grote, M.A.*, "Parthenogenesis or Agamogenesis."—*J. W. Tutt, F.E.S.*, "Larvæ."—*Rev. G. M. A. Hewitt, M.A.*, "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.*, "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.*, "Pupa hunting in October."—*J. W. Tutt, F.E.S.*, "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Ridling, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Burrows, J. Anderson, Jun.*, "The Lepidoptera of Swansea."—*Major R. B. Robertson.*, "*Caradrina ambigua* in the Isle of Wight."—*A. J. Hodges.*, "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.*, "*Orrhodia erythrocephala* ab. *glabra* from Devonshire and comparison with *O. vacemii*."—*Dr. W. S. Ridling, F.E.S.*, "Notes on *Caradrina ambigua* and *C. superstes*."—*J. W. Tutt, F.E.S.*, "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Maze, F.E.S.*, "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.*, "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.*, "Coleoptera at Ipswich."—*Claude Morley, F.E.S.*, "Notes on *Bombus visurgie*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.*, "The Lepidoptera of Grèsy-sur-Aix."—*J. W. Tutt, F.E.S.*, "*Apatura iris*."—*Rev. G. M. A. Hewitt.*, "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.*, "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.*, "The Genus *Smerinthus*."—*A. Bacot.*, "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.*, "Wing structure."—*J. Alton Moffatt.*, "On the development of sex in social insects."—*J. W. Tutt, F.E.S.*, "The British representatives of the Genus *Caradrina*."—*L. B. Prout, F.E.S.*, "Habits and variation of *Lithosia lutarella* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.*, "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fenn, F.E.S.*, "A hunt for *Neuroterus aprilius*."—*T. A. Chapman, M.D., F.E.S.*, "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.*, "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.*, "Varieties of *Argynnis selene* (with plate).—*S. G. C. Russell, F.E.S.*, "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.*, "*Zygæna minos* and its varieties."—*J. W. Tutt, F.E.S.*, "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.*, Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 7.6 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SEARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE
 TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

A brief review of the British Coniopterygidae (Neuroptera), with tables of the European Genera and Species. (*Figs. 1-12.*)

By RICHARD S. BAGNALL, F.L.S., F.E.S.

When the late Mr. Lachlan published his *Monograph of the British Neuroptera-Planipennia* (Trans. Ent. Soc., 1868, pp. 145-224, pl. viii.-xi.) he remarked, "These insects are as yet ill-understood, and I regret that the subject can receive no elucidation from me."

He diagnosed the three species, as follows:—

Coniopteryx psociformis, Curtis. "Antennæ with about forty joints, much longer than the body. Wings very unequal, the posterior pair being very small. Expanse of wings $3\frac{3}{4}$ - $4\frac{1}{2}$ lines."

Coniopteryx tinciformis, Curtis. "Antennæ about the length of the body, with about twenty-five joints. Wings sub-equal, slightly smoky-gray. Abdomen rather short, ochreous. Expanse of wings, $2\frac{1}{2}$ - $2\frac{3}{4}$ lines."

Coniopteryx aleurodiformis, Stephens. "Antennæ with more than thirty joints, longer than the body. Wings sub-equal, broad, the neuration tolerably distinct. Abdomen thin. Expanse of wings, $3\frac{1}{2}$ - $3\frac{3}{4}$ lines."

These descriptions—brief as they are—admirably fit the three species we have known as British for so long, and, until this year, no addition has been made to the list. Abroad, however, O. M. Reuter, Loew, Klapalek, Wallengren and Enderlein, had made new discoveries, and in 1906 the last-named author, Dr. Günther Enderlein, published a monograph of the world's species, with tables and figures (*Monographie der Coniopterygiden* in "Zool. Jahrb.," xxiii., Abt. f. Syst., pp. 173-242, pls. 4-9). Herein he describes ten European species, any one of which might possibly occur in the British Isles. A few of these are separated on what some might regard as slight characteristics so far as neuration is concerned—vide *Coniopteryx tinciformis* and *C. pygmaeus*—but an examination of the ♂ genitalia more than strongly confirms specific rank.

In June of this year I described *Conwentzia cryptoneuris*, found on sallow in the North of England (*Ent. Mo. Mag.* and *The Vasculum*), and two months later Mr. J. W. H. Harrison brought forward the larch species, *C. pineticola*, Enderlein, from North Yorkshire and South Durham as British (*The Vasculum*). The former may prove to be a form of *pineticola*, and it is desirable that the genitalia of both *C. cryptoneuris* and also *C. pineticola* var. *tetensi* be examined before finally settling their respective status.

The interest that these discoveries aroused caused me to suggest to Professor Poulton that the species in the Daleian collection should be examined, and thanks to his kindness I have had the opportunity of doing this so far as their dried condition would permit.

Of the bulk of the material in this collection falling into the genus *Coniopteryx*, s.s., and standing under the names *C. aleurodiformis*, Steph. (error in identification), *C. hyalinus*, *C. parvulus*, Vill. (= *C. tinciformis*), and *C. obscurus*, I have been unable to make any satisfactory report—though the study of an abundance of fresh material might lead to interesting results.

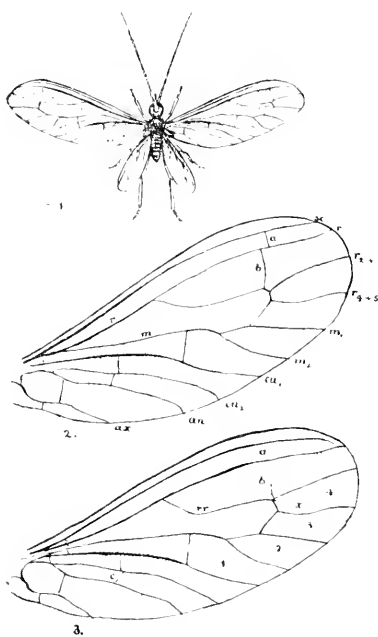
Coniopteryx tinciformis, *C. pygmaeus*, *Semidalis aleurodiformis*, S.
NOVEMBER 15TH, 1915.

curtisiana, and *Conwentzia psociformis* are all represented in this collection, and *C. pygmaeus* and *S. curtisiana* are now brought forward as British for the first time.

I have said sufficient to show that this is a little group that might well repay the serious study of British entomologists, and, as a guide and help to any who may turn their energies in this direction, I have added tables of the European genera and species—to some extent modifications of Enderlein's tables—and rough sketches—also largely drawn from Enderlein's monograph.

I may add that the names *hyalinus* and *obscurus*, quoted from the Dale collection, appear to be label or MS. names.

Block of figures 1-3 has been kindly loaned by the Editors of *The Vasculum*.



Figs. 1-3. 1. *Conwentzia psociformis*, After Curtis.
 2. *C. pineticola*, forewing.
 3. *C. cryptoneuris*, forewing.
an. Analis; *ax.* Axillaris; 1, 2, 3, Cells with light patches in *C. cryptoneuris*.

Family—CONIOPTERYGIDÆ.

Enderlein divides the family into two well-marked sub-families on the strength of differences in the wing neuration as well as strong morphological features.

External lobe of maxilla 1-jointed; abdomen without ventral "sacs."... .. CONIOPTERYGINÆ.

External lobe of maxilla 3-jointed; 5-6 pairs of small ventral "saes," on abdominal segments
 1-6 ALEUROPTERYGINÆ.

Sub-family—CONIOPTERYGINÆ.

Tribe—CONWENTZIINI, Enderlein.

Easily recognised by the very small hindwings with strongly reduced venation (fig. 1). Contains only the one genus.

CONWENTZIA, Enderlein.

1. Colour lighter, antennæ 38-43 jointed; nervules of forewing between sub-costa and radius and radius and radial-ramus apart, the latter striking the upper arm (r_{2+3}) of fork ... *C. psociformis*, Curtis.

Colour darker, antennæ 28-34 jointed ... 2.

2. Nervules above-named touching, running in one line and striking at the fork-point or the upper arm just above it (fig. 2). Light or semitransparent, elongated patches in distal cells marked 1, 2 and 3 (fig. 3). Found on sawfly. *C. cryptoneuris*, Bagnall.
3. Nervules apart, the latter striking the stem of the fork (fig. 2). Forewings apparently without transparent patches in the distal cells. Found on larch. *C. pineticola*, Enderlein.

Tribe—CONIOPTERYGINI, Enderlein.

Hindwings normal.

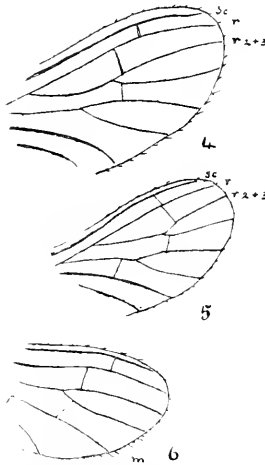
TABLE OF GENERA.

1. Media in hindwing forked (figs. 7-8)... .. 2
 Media in hindwing not forked, simple (fig. 6).
 CONIOPTERYX, s.s.
2. Nervule connecting the fore-cubitus (cu_1) and the media (m) in fore- and hindwings striking the latter on the lower arm (m_2) of fork (figs. 7 and 8) SEMIDALIS, Enderlein.
3. Above-named nervule in both wings striking the media on the stem of fork below the fork-point (fig. 9). Species dark PARASEMIDALIS, Enderlein.

Genus—CONIOPTERYX, Curtis.

1. Size smaller (scarcely more than 5mm. across the wing), antennæ shorter and less than one-half the length of forewing, stouter; nervules between the sub-costa and radius and radius and radial-ramus touching or almost touching in both fore- and hindwings (fig. 5); marginal setæ of wings more minute and sparse *C. pygmaeus*, Enderlein.
2. Size larger (6mm. to 7.0mm. across wings); antennæ longer and more slender, 25 to 26 (rarely more) jointed. Above-named nervules well

apart in both fore- and hindwings (figs. 4 and 6), and setæ on margins, especially the hind margin, less sparse (fig. 6) *C. tineiformis*, Curtis.



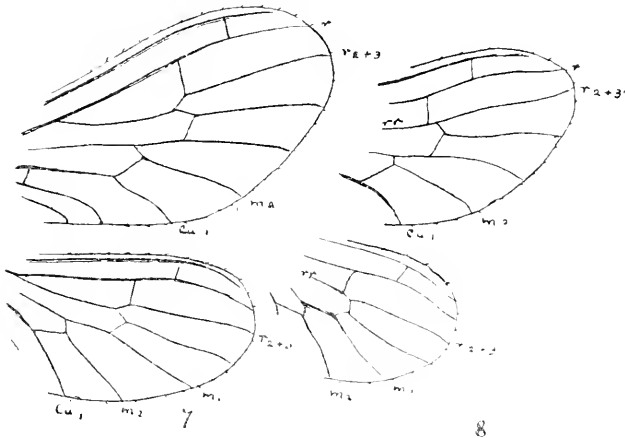
Figs. 4-6. 4. *Coniopteryx tineiformis*, end of forewing.

5. *Coniopteryx pygmaeus*, " " "

6. *Coniopteryx tineiformis*, " " "

sc. Sub-costa; r. Radius; r_{2+3} . Upper arm of fork of radial-ramus; m, media—simple in the hindwing in this genus.

Genus—SEMDALIS, Enderlein.



Figs. 7, 8. Fore- and hindwings of

7. *Semidalis aleurodiformis*.

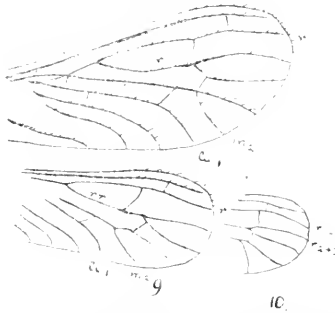
8. *Semidalis curtisiana*.

rr. Radial-ramus, stem; m_1 and m_2 . Upper and lower arms of media which is forked in the hindwing in this genus; cu_1 . Upper arm of cubitus.

1. Nervule connecting radius and radial-ramus in both fore- and hindwings striking the latter in upper arm of fork (r_{2+3} , fig. 7) ... *S. aleurodiformis*, Steph.
2. Above-named nervule in both fore- and hindwings striking the stem of fork below the fork-point (rr fig. 8) *S. curtisiana*, Enderlein.

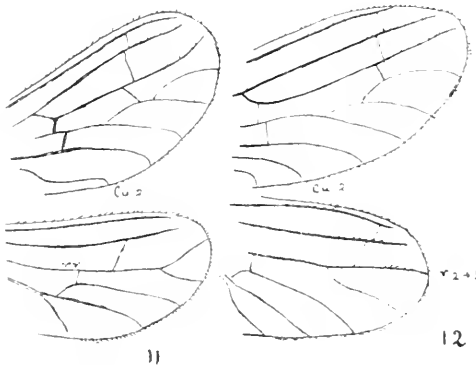
GENUS—PARASEMIDALIS, Enderlein.

The following species are known on the Continent, but have not been discovered in the British Isles.



Figs. 9, 10. 9. Fore- and hindwings of *Parasemidalis annae*.
10. End of hindwing of *P. fuscipennis*.

1. Nervule connecting the radius and radial-ramus in both fore- and hindwings striking latter on the stem below the fork-point (rr , fig. 9).... *P. annae*, Enderlein.
2. Above-named nervule in the hindwing striking the radial-ramus on the upper arm of the fork (r_{2+3} , fig. 10) *P. fuscipennis*, Reuter.



Figs. 11, 12. Fore- and hindwings of
11. *Aleuropteryx loewi*.
12. *Helicoconis lutea*.
 cu_2 . Lower arm of cubitus.

Sub-family—ALEUROPTERYGINÆ.

Two European species are known, namely, *Helicoconis lutea*, Wall., and *Aleuropteryx loewi*, Klap., but neither have yet occurred in the British Isles.

1. Lower arm of cubitus (cu_2) in forewing normal (fig. 12); nervule connecting radius and radial-ramus in hindwing striking the latter on the upper arm of the fork (r_{2+3} , fig. 12)
HELIKOCONIS, Enderlein.
2. Lower arm of cubitus (cu_2) in forewing strongly bent towards end (fig. 11); nervule connecting radius and radial-ramus in hindwing striking the stem (r) of the latter well below the fork-point (fig. 11)
ALEUROPTERYX, Löw.

NOTES ON BRITISH SPECIES.

1. *Conwentzia psociformis*, Curtis.

1834, *Brit. Ent.*, pl. 528: 1836, Steph., *Ill.*, x., 117.

Common throughout the summer (McLachlan).

Evidently widely distributed. The following are some recent northern records:—Quite common in the Cleveland district (Yorks.), especially on holly (J. W. H. Harrison); Gibside, Co. Durham, and Ovingham-on-Tyne, Northumberland (R.S.B.). Twenty-four examples are in the Daleian collection.

2. *Conwentzia pineticola*, Enderlein.

1905, *Ber. Westpr. bot.-zool. Ver.*, pp. 26-27, figs. 10 and 11.

Mr. Harrison brings this interesting insect forward in *The Vasculum*, i., p. 56, 1915; recording it as very common and widely distributed in the Cleveland area (Yorks.) on larch, and also records a pair from county Durham. The insect is very variable, and it is possible that the following, found on willow, may prove to be a form of it, though it differs in many points from Enderlein's description. The light patches in the distal cells of forewing may have been overlooked in *pineticola*—they are not present in examples of *pineticola* I have examined, but I have noticed variation in this direction in *C. psociformis*.

3. *Conwentzia cryptoneuris*, Bagnall.

1915, *Ent. Mo. Mag.*, li., 192-3, June, and *The Vasculum*, i., pp. 22-24, figs. 1-3, June.

Northumberland, Newcastle-upon-Tyne. Three examples found on willow, July, 1914. See above remarks.

4. *Coniopteryx pygmaeus*, Enderlein.

1906, *Zool. Jahrb.*, xxiii., Abt. f. Syst., p. 201, figs. 6, 36, 55, 58, and 61.

This species will probably be found in British collections mixed with *tinctorum*. When fresh examples can be examined strong differences will be found in the form of the last abdominal segment, and in the structure of the genitalia in the ♂.

There is at least one example of this species (labelled *Coniopteryx hyalinus*, Steph.) in the Daleian collection.

5. *Coniopteryx tineiformis*, Curtis.

1834, *Brit. Ent.*, pl. 528; 1836, Steph., *Ill.*, x., 116.

Not uncommon in summer, especially in fir trees (McLachlan).

Probably a widely distributed insect. Quite common on oak and sawin in the Cleveland district (J. W. H. Harrison); on oak, Gibside, county Durham (R.S.B.).

A large number of the examples in the Daleian collection fall into *Coniopteryx*, spp., but I am not able to deal with the bulk of them.

6. *Semidalis aleurodiformis*, Steph.

1836, Steph., *Ill.*, x., 116.

Probably equally common with the last (*C. tineiformis*), but I cannot say that I have personally noticed it (McLachlan).

Apparently rare. The following are recent northern records:—Cleveland district, Yorkshire, one example from honeysuckle (J. W. H. Harrison); Felton, Northumberland, one from oak, 1915. (R.S.B.)

The only two examples in the Daleian collection that I can identify as this species with any degree of certainty are labelled (and have been wrongly identified as) *C. parvulus*, Vill., = *tineiformis*. Other examples standing under that name are true *Coniopteryx*, spp.

7. *Semidalis curtisiana*, Enderlein.

1906, *Zool. Jahrb.*, xxiii., Abt. f. Syst., p. 212, figs. 13, 62.

Recognised chiefly by the position of cross-veins (nervules) in both fore- and hindwings, and the relative lengths of the joints of the hind tarsus.

There are two undoubted examples in the Daleian collection labelled “*Coniopteryx aleurodiformis*, Steph.,” 124 67 and 125 67.

“A POSER,” STAINTON.

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

(Continued from page 199).

I have now made an examination of the series of *trux-lunigera* in the British Museum. There is first a set of the *lunigera*, British, from the Leech collection. They are all of the well-known form only varying within the usual limits, orbicular and claviform staring in both males and females, reniform well marked, the usual soft grey surface in the males and the delicate surface of the darker females, hindwings strongly pearly in the males, etc. Next follows a series of thirty-six specimen of what is called *trux*. It is a series made up from various sources and is presumably a very good exponent of what many well-known authorities and collectors have recognised as *trux* within the last fifty years. There are six from the Zeller collection, six from the Frey collection, and fourteen from the Leech collection including two of Staudinger's and one of Gerbard's.

The first impression, which becomes still more dominant on closer examination, is that the series called *trux* is a very distinct species from the *lunigera* of Britain. It is a bigger, bolder species and practically every character contrasts strongly with the delicate general

characters of *lunigera*. No one could have any hesitation in separating the two if a mixed assortment were put before them.

The following notes are made on the individual specimens :—

1 & 2. Are labelled ab. *olivina*. They are from the Leech coll. locality France. Both have the claviform well marked and deep black, but in olive tone are not comparable with the figures in the two copies of Hübner's *Samm. eur. Schm.*, with which I compared them. Possibly Hübner's figures may have faded but this would be very unlikely.

3. Is labelled ab. *terranea*, locality France, from the Leech collection. I can see no difference between this specimen and many others in the series.

4. Leech collection, from France.

5. Zeller collection, no locality.

6, 7, 8. Leech collection, from Central France.

9. Zeller collection, no locality.

10, 11. German in origin.

12, 13, 14. Leech collection, locality France. One specimen has the claviform, well developed deep black, another has a part of the orbicular strongly white, the rest of the stigmata are inconspicuously traceable.

15. Zeller collection, no locality.

16. Labelled Europe. These two are possibly not *true* at all, but a distinct species, from their size, shape, markings, etc.

17. Leech collection, from Staudinger collection.

18, 19. Frey and Zeller collection respectively, no localities.

20. Leech collection, no locality.

21, 23. Frey collection, no locality.

22. Not labelled.

24. Zeller collection, no locality.

25. Leech collection, from Gerhard collection, no locality.

26, 27, 30. Frey collection, no locality.

28, 29. From Switzerland, "Wallis," *i.e.*, Valais.

31. Leech collection, from Staudinger, locality Switzerland.

32. Zeller collection, no locality.

33, 34. From the island of Capri, Italy.

35, 36. From Teneriffe, one specimen has the strongly emphasised claviform.

It may be assumed that probably the Frey specimens are Swiss in origin and that Zeller's are German.

As a whole the 36 specimens are very uniform in size, except the two noted above, numbers 15 and 16, which are much smaller, have differently shaped wings and do not conform in marking and tone with the rest of the series. There is no single insect which one would pick out from these 36 specimens and place, even with the slightest doubt, among a series of British *lunigera*.

Taking the characters of the markings in detail, it is noted that—

(1) The stigmata are generally indefinitely developed in all the specimens. Rarely is there one of the three stigmata conspicuous, and not in a single specimen do we find all three developed as is invariably the case with *lunigera*. In many cases the reniform is quite obsolescent and even untraceable.

Only six specimens have the claviform well developed and in these the rest of the characters are in no way comparable with those of

lunigera. Only two examples have the orbicular staring, but in these it is miss-hapen, the upper part being clouded over and indistinct in outline.

(2) Not a single specimen has a tone in any way approaching that of *lunigera*, so much so that anyone familiar with either species and unfamiliar with the other, when meeting with it for the first time would never confuse the two. One or two specimens are somewhat lighter at the base on the inner margin.

(?) A considerable proportion have a ruddy or ferruginous tinge which is never seen in the large number of *lunigera* which I have examined. Those that are grey are of an ochre colour rather than a soft grey as in *lunigera*.

(4) In shape of wing all but two are uniformly bold, much larger than *lunigera* both in length and width, the costa and inner margin are not so nearly parallel, there is difference in the apex of the wing.

(5) The specimens of French origin are noticeable as having the hindwings more pearly in appearance than have the rest.

As suggested above, one would say that in the Museum series of *true* there are at least two species mixed, and it may be that most of the French examples will also be separated as distinct.

I failed to find any *lunigera* in the *Agrotidae* taken from Stephens' collection, but there is a very fine, long series in the Banks' collection, all of which have the salient characters of the species.

In the Bethnal Green Branch of the South Kensington Museum are deposited the collections of Henry Doubleday.* These consist of extensive series of our British Lepidoptera and more or less short series of the Macro-lepidoptera of the continent of Europe. In the former is a long series of British *lunigera* in very good condition and quite in accord with every other series I have seen, not one specimen of aberrance outside the usual narrow limit of the species, in marking or in size. In the continental series are the following three sets:—

1. Five specimens under *true*, with no localities, nor any sign of origin. They are large and bold insects.

(1) A ♂, with no dark suffusion inside hind margin of hindwing.

(2) A ♂, in which the reniform is much obscured in shape by an extensive and irregular clouding all around it, and having the hindwing with clouded suffusion in the submarginal area, but not emphasised quite so much as in the case of the ♀s.

(3) A ♂, the nearest approach to *lunigera*, in emphasis of the three stigmata, that I have met with. However, the delicacy of surface found in *lunigera* is quite wanting in this specimen, and above all, the suffusion in the hindwing, leaves a considerable, quite light area inside the hind-margin, which is suggested in no specimen of either *true* or *lunigera* that I have examined. The size and shape, as well as the collective impression suggested by the markings, preclude one from confusing the specimen with *lunigera*. If not an aberrant form of *true* it may possibly be distinct.

(4) A ♀, with a suspicion of olive in its tint, possibly faded; it has the reniform fairly obvious, rest of marking almost obsolete.

(5) A ♀, with the markings all suppressed, the uniform grey being hard and ochrous.

* Since writing this, these collections have been removed to S. Kensington.

The dark suffusion in the marginal area of the females is but a little more intense than in the two males which have a similarly placed darkening. This set agrees on the whole with the British Museum series of *trux*.

2. This set consists of two specimens from South France, labelled as var. *terranca*. One of them in texture and colour suggests that of a somewhat faded *Noctua olivacea*; it has a smoother surface than the other. These examples are smaller than average *trux*, still they are larger than British *lunigera*, to which they have not the slightest resemblance.

3. This is a set of three insects from the South of France labelled *lunigera*. It is significant that Doubleday did not place this set next to the series of *trux* but in quite a different group of the Agrotids. ["The species stand in the order in which Doubleday left them."—See OFFICIAL CATALOGUE.] He evidently did not consider the two species comparable.

These three insects certainly resemble *lunigera* in character of marking and even approach that species in colour and texture, but are larger and much more robust, and without the delicate surface so strong a character in the latter. All three are females but not so dark as the average females of British *lunigera*. The stigmata of the first and third are well developed and emphasised; in the second specimen the stigmata are scarcely developed and it is so aberrant that one feels inclined to say that the specimen is hardly co-specific with the other two. The third specimen is quite one-third as large again as average *lunigera*. If these are continental representatives of our species *lunigera*, they belong to a very remarkable geographical race. They are certainly separable from *trux* to which they have little or no resemblance.

Thus our investigation of what has been done in the past fifty-six years with the "Poser" which Stainton put out in 1859, shows that his suggestion of placing *trux* and *lunigera* "side by side" in the same cabinet has been faithfully carried out. (See the British Museum series which has recently been re-arranged with this suggestion incorporated). But yet we have not reached the consideration of the inference one should draw from Stainton's suggestion, *viz.*, to satisfactorily settle the question as to the specific distinction of *trux* and *lunigera*. Thus far have we progressed in more than fifty-six years.

From the above facts and observations there are very few entomologists but will be perfectly satisfied to consider British *Agrotis lunigera* as a good species, and as quite distinct from the continental species known as *Agrotis trux*. There is, however, one other line of investigation which has not been used, and that is the comparison of the genitalia of the two species. The genitalia of *A. lunigera* have been figured and shortly described by Pierce, but I do not know if those of *A. trux* have been done. Later on, no doubt, when we can get specimens of the latter species from the continent, the comparisons can be made, and this final test applied to confirm the decision, which is so strongly foreshadowed in this article.

In the Caucasus again.

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

[cf. *Ent. Rec.*, xxiv., p. 297; xxv., pp. 12 and 37 (1912 and 1913).]

The fortune of war, in the literal sense, transplanted me unexpectedly to the Caucasus, in June, 1915. As this was the last thing in the world that I had been expecting, my net, bottles, and apparatus were all left at home. But fortunately good Russian friends came to the rescue, and partly in the rooms of the Russian Entomological Society in Petrograd, and partly in the Caucasus Museum at Tiflis, some entomological plant was forthcoming, and so a good opportunity was not wasted.

It was in the evening of June 12th that we arrived at the *stantsia* Kazbek, where we stayed three days to rest. The weather had been threatening, but the dawn broke fine and clear, so I took advantage of the occasion to borrow an old rifle and to enlist the services of a native sportsman, and set out to try to stalk a *tur*, or Caucasian wild goat; there are four species of *Capra* peculiar to the Caucasus, without counting the ibex, which occurs in Karabagh, and Gmelin's sheep, which is found in the southern mountains. While scanning the rocks with a telescope to pick out the resting animals on the crags and peaks, I found time to turn over a few stones for earwigs. There were a few fragments of males of *Anechura bipunctata*, Fabr., but no living ones; probable few survive the winter, and none the spring; females were by no means rare, living in little trenches dug in the moist soil under fairly heavy stones, where the ground was neither too dry nor too wet; each of the females was attending a fairly numerous family of about a dozen well-grown progeny, I should say in the second instar; they were very nimble, and it was impossible to count them accurately. There were not many beetles, a few small Carabids and some dung-beetles being all I came across. As to Orthoptera, I only observed a very young larva of *Leptophyes*, at an altitude of about 6,000 feet. Of butterflies I saw but few; some well worn *Pyrameis cardui* up to an altitude of about 7,000 feet, and a few freshly emerged *Aglais urticae*, one or two *Pieris rapae*, a single *Euchloe cardaminis*, and a large and small fritillary complete the list of Lepidoptera that I noticed on that sunny day in June, the whole of which, from dawn to dark, I spent on that fragrant carpet of alpine plants on the slopes and jagged crags of Nakhorete. As to the *tur*, it is enough to say that a sweeter and more tender *shshlyk* it has never been my good fortune to eat.

After two wet days at Kazbek, we motored to Tiflis: that wonderful drive over the Georgian Road is still more glorious in spring than in autumn; quantities of snow made the air keen and crisp, while the June sun prevented chill, even in a motor on the crest of the pass at the Krestovaya Gora, over 7000 feet. A minute's stop at Gudaur failed to show the same colony of *Forficula auricularia* that I had seen there in August three years ago, and a fragment of a corpse of *A. bipunctata* alone rewarded my labours in turning over dozens of stones. Before the end of July, it fell to my lot to do the drive three times; there was little collecting to do, but I was able to note forty species of birds, although the seat of a motor is by no means an ideal observation post.

When at Dushet, I carelessly turned over a brick lying by the

roadside, and to my delight found a fine macrolabious male of *Forficula tomis*, Kol. It was the first time that I had seen this fine Russian earwig alive; it was on July 11th, and on the 24th and exactly a week later on my way back, I took the female under the same brick.

In Tiflis, a week's steady rain and mundane occupations rendered collecting impossible; the only entomological occupations were long conversations with Philip Adamovich Zaitseff, Evgeny Georgevich König, and Boris Petrovich Uvaroff.

Nor was I any luckier in the interesting old town of Kutais, the capital of Imeretia, reputed to have been the home of Aëtes and Medea. Two separate visits to the hilly region of Guria, the interesting district behind the Black Sea Coast from Batum to Poti were also disappointing from an entomological point of view; although I spent a number of days in the hills and forests, sometimes camping out, either by sheer ill-luck, or because it was too early in the season, or because the weather was not generally favourable, I observed little and took less. Guria is a hilly country of strongly folded Oligocene and Miocene shales and sandstones, with basaltic and trachytic intrusions. The climate is moist and warm; the vine and maize flourish, and tea is cultivated by a few enterprising landowners; the hills are covered with a tangled jungle of creepers and rhododendrons. I saw very few butterflies; *Gonepteryx rhamni*, *Pararge megera*, *Pyrænis atalanta* were fairly common. In Orthoptera, I found *Nemobius heydeni*, Fisch., *Gryllus burdigalensis*, Latr., *Tettix bipunctatus*, L., and *Stauropoderus bicolor*, Charp., were pretty common everywhere. Sweeping casually at Sankhto I was lucky enough to pick up a fine macrolabious male of *Forficula kaznakovi*, Sem.; which species I had hitherto only known from descriptions; it is closely related to the Balkan *F. actolica*, replacing it on the eastern shores of the Black Sea. In the thickets on the Pliocene conglomerates and Maikopian sandstones and shales of Ompareti, near the station of Supsa, I found an immature *Olythoscelis*, *Leptophyes laticauda*, Friv., and a brilliant green *Podisma*; most unfortunately I did not come across a male, and so dare not name it with certainty; probably it is *P. königi*, described by me from Bakuriani. The most interesting botanical observation was the remarkably luscious flavour of a berry, resembling a mulberry, but far superior, that wastes its fragrance on the thicket air, being apparently most underservedly neglected by the natives.

At the *stantsia* of Meria near Notanebi, while waiting by the roadside for a horse, I took with my fingers a pair of *Parapleurus alliaceus*, Germ., which, I believe, has not hitherto been recorded from the Caucasus.

On July 7th I arrived at the scorching swampy station of Evlakh, at 4 a.m., and was promptly attacked savagely by dense columns of mosquitos, which plastered my hands as fast as I swept them off. Malaria is the scourge of these marshy plains; the natives build high towers in their gardens to escape from the pest, and there sleep at an altitude above their range of flight. It was a glorious drive over the steppe in the cool morning air, with the snow-clad crest of Daghestan in the distance. At six the "phaeton" reached Geok-Tapa, where there was waiting a warm and cheery welcome from Alexander Borisovich Shelkovnikov.

I was allowed a week's holiday in this entomologist's paradise; my

fellow-guests were my old friend V. Bianki the ornithologist, with his three sons, so that all nature came in for a share of observation and discussion. My previous visit had been in September, and it was particularly interesting to note the difference in the fauna in the early part of July (7th-16th). In the garden there were scarcely any signs of *Thisioectrus dorsatus*, F. de W., and *Euprepocnemis plorans*, Charp., which are so prominent in the autumn; in their place there were numbers of *Olythoscelis indistincta*, Bol. This fine species was first described by Bolivar from Asia Minor, and then recorded by me, on specimens taken by König, from Mts-khet and Tiflis. Since then Uyaroff has recorded it from numerous localities in the Caucasus. In July it was very numerous in the gardens and park at Geok Tapa; I was particularly struck one day, when after a tropical rain all the morning, the sun came out at mid-day; on a shrub in the garden I saw no less than four specimens sitting boldly on the leaves, basking in the sun, trusting to their agility to escape from any dangers. As a rule it is a timid creature, lurking among the thorny stems of the dense shrubs; its habits are much the same as those of our common English species, *O. griseoptera*, but it is a great deal larger, and its leaps carry it much further; I noticed the same habit of chirping in a particularly lively manner before an evening shower. Compared with its Balkan and Mediterranean congeners, it is a size larger and more powerful than *O. littoralis*, about as strong and big as *O. chabrieri*, but less so than *O. transylvaticus* and *O. dalmaticus*.

The other common Locustid in the garden was a *Poecilimon* which I dare not venture to identify until this very difficult genus has been once more monographed and revised. It crawls sluggishly over the shrubs and thistles, and is easy to pick up with the fingers; it seems quite defenceless, and its green protective colouring only advertises it when it is foolish enough to sit on a big blue thistle, where I have often seen a dozen or more incautiously exposing themselves, no doubt fondly imagining that they were assimilated to their environment; even on green leaves, they are perfectly easy to see. It is a pity that these delicate and interesting creatures are so difficult to preserve with any degree of satisfaction.

Of my old acquaintances, *Labia minor*, L., and *P. auricularia*, L., were common, the former flying to light in the evenings, often in numbers. *Platyceles grisea*, Fabr., *Pl. assimilis*, Fieb., *Pl. rittata*, Charp., *Paratettix meridionalis*, Ramb., *Tettix bipunctatus*, Latr., L., *Stanoederus bicolor*, Charp., *S. cognatus*, Fieb., *Decticus albifrons*, Fabr., *Nemobius saussurii*, Burr., were all common and adult. Nymphs of *Pyrgomorpha brachyptera*, Bol., began to appear; *Oedipoda salina* and *O. caeruleus*, L., *Sphingonotus caeruleus*, L., *Aerotyglus insubricus*, Scop., *Oedaleus nigrofasciatus*, De Geer, and its slender eastern relative, *O. mlakosievici*, Bol., *Sphingonotus azureus*, Ramb., all reached maturity during the last week of my visit. Of Mantids, only nymphs of *Mantis religiosa*, L., and *Sphodromantis biculata*, Burm., were about, but on the steppe I found *Bolivaria brachyptera*, Pall., fully grown.

The desert had outwardly the same appearance in July as in September: the sparse vegetation was already burnt up, though *Prosopis stephaniana* was not yet ripe. But the Orthopteran fauna was quite different. I found no traces of *Stanoederus simplex*, Eversm.,

and merely a few larvæ of *Pyrgomorpha brachyptera*, Bol., which are so characteristic of the steppe in autumn. The ubiquitous *Caloptenus italicus*, L., only became obvious at the end of the week. No signs of *Thisioicetrus adpersus*, Redt., but *Stauronotus maroccanus*, Thunb., and *St. anatolicus*, Kr., were already evident. But the most striking difference was the abundance of *Imethis bilobus*, Stål., and *Oedipoda schochii*, Sauss.; of these two ponderous fellows, the former I had not seen alive, and always regarded as a rarity; now it was common on the desert, and in spite of his clumsy build, the male is fairly active, and takes short flights; its smoky wings do not make it very obvious on the wing. *O. schochii* is a typical desert species; I only found three specimens in September, but in July there were plenty of it, though only on the desert. An interesting addition to the local list was *Celes variabilis*: the crimson-winged form was tolerably common on the steppe; the males were all deep black, and conspicuous: at first, indeed, I took them for *Psophus stridulus*. A single female *Arcyptera truchmana*, F. de W., was an addition to the local list. An interesting capture was *Dericorys gibbosus*, F. de W., of which I took three or four specimens in different parts of the desert. This species has sea-green and smoky wings, quite different from the pink wings of its near relative *D. roseipennis*; the former is fairly active and took long flights; but the latter I never saw on the wing, and was, in fact, struck by its sluggish habits, though the difference of season may account for this discrepancy; the former I only took in July, the latter only in September; *D. gibbosus* flew freely about the steppe; *D. roseipennis* sat sluggishly chewing the juicy stems of *Salsola*: when disturbed, it did not fly, but fell to the ground, and pretended to be dead. Other common objects of the desert were *Palpares libelluloides*, which often flapped across; once or twice I noticed what I took to be a big Dipteron hovering over a plant, like a *Bombylius*: I took one out of curiosity, and found it was a hyaline-winged *Ascalaphus*, with dilated abdomen and apical tufts; my specimen, which incidentally gave me quite a severe bite on the finger, was handed over to my host, who provided it with a comfortable home.

But the most numerous, prominent, insistent, and self-advertising inhabitant of the steppe is the Cicada; on the desert a fairly big brown species occurred in swarms in July; in September I saw none; it filled the air with its stridulation; they are versatile musicians, with a considerable range of note; they strike up on one note, and then tune up, before settling down to their regular buzz; often enough I mistook them for Orthoptera for a moment, as frequently they stridulate like a big Locustid. They sit on the sprigs of *Artemisia maritima* and keep up a vigorous chorus. I afterwards noticed in the train along the shores of the Caspian, on the baking plains between Baku and Derbend, that the noise of these creatures penetrates through the rumbling of the train, and is quite audible inside the carriage where passengers are sitting talking. Often a Cicada, in flying from one sprig to another, would get his wings entangled in the grass and fall to the ground; there he would lie for nearly a minute, using terrible language, which at once attracted attention to his plight, when he could be easily caught; if allowed to recover himself he would fly off with a contented hum.

There are several problems of identity which remain to be cleared

up in connection with this desert fauna; in *Stauronotus* there is a muddle; apparently we have a choice of about half a dozen species, *St. maroccanus*, Thunb., *St. brevicollis*, Eversm., *St. kraussi*, Adel., *St. anatolicus*, Kr., and *St. albicornis*, Kr.; which is which is hard to say. I appealed to Boris Petrovich Uvaroff for his opinion; his reply is encouraging, "I see no possibility of determining species of this genus until it has been thoroughly revised. I am already collecting material for this, and shall look to you to help me in the matter." If he clears up this muddle, and the worse one of *Pocilimon*, he will do valuable work.

In the green herbage in the irrigated district, *Locusta viridissima*, L., is abundant, but I did not find *L. caudata* on the plains. But one interesting creature occurs in the high herbage and stridulates by day, with a voice not at all unlike that of *L. viridissima*. I took four or five males, but unfortunately no females. I regarded it at first as a new species of *Locusta*, a kind of reduced *L. cantans*, and it was only a month later that I noticed that it is a Decticid. I sent one to B. P. Uvaroff, who made the same obvious mistake at first glance, taking it to be an altogether remarkable new species of *Locusta*. It is, however, a Decticid in spite of its outward appearance. It will be described in due course, and will very probably require a new genus.

Just below the homestead there is a wild field where the buffaloes graze and wallow in the muddy pools; it is a thorns paradise; Nature's own "barbed-wire entanglements" occur in the form of dense and impenetrable thickets of *Paliurus australis*, *Rhamnus pallasii*, *Granata punicum*, various milder forms of *Rubus*, and, worst of all, *Eleagnus angustifolia*, with long thorns like crucible steel. There, in the afternoon before my departure, I heard an unfamiliar buzz, unlike that of *Decticus*, and distinct from that of *Locusta*, yet evidently that of a powerful Locustid. Instead of a prolonged chirp on one note, it is a double note, *i.e.*, an introductory "chip," followed at once by a longer buzz-zz-zz-zz-zz. The musician was very timid, and it required the utmost patience to stalk him down. At last I saw one, and could scarcely believe my eyes; either they or my ears were deceiving me; surely this was *Locusta viridissima*. In this case my eyes were deceiving me; I noticed slight differences in habits which are significant; this creature was sitting head upwards, and after a moment's silence, broke out again into song, buzz-zz-zz-zz-zz, but *Locusta* prefers to sit head downwards. Slowly and cautiously I raised my net and struck. The insect disappeared, while I was held a helpless prisoner. *Rhamnus pallasii* held my arms; *Granata punicum* held my hat; *Eleagnus angustifolia* had seized my net; and *Paliurus australis* was gripping my legs. It took me a long time to release myself, and I then set to work and devoted three consecutive hours to catching a specimen of this puzzling creature; patience was rewarded and I took one male; luck brought me across the path of a female who had lost both her hind legs; I took advantage of her helplessness and committed the atrocity of throwing her at once into the fumes of poison gas. It required quite a close inspection to see that these specimens were not *Locusta*: the pronotum is more compressed, with better marked edges; the elytra are narrower, and the stridulating portion a little different, and the veins better marked; the ovipositor of the female has a characteristic downwards bend; and then under the first tarsal seg-

ment of the posterior legs I saw the free lobes; it was a Dectid, an all-green Dectid. A careful examination among my takings showed a second pair, already in my possession, noted of course as *Locusta*. As a matter of fact they are referable to the interesting genus *Gampsocleis*. It is a remarkable thing that hitherto I had known of no single all-green Dectid, and yet here at Geok Tapa in one week I had taken two, both new to science. In the Zoological Museum at Petrograd, I afterwards found Adelung's type of *Gampsocleis ussuriensis*, which is a third all-green Dectid, indeed, the first one described, I know of no others. My species is remarkably close to *G. ussuriensis*, from the valley of the lower R. Ussur, near Vladivostok, a long cry from Geok Tapa. Yet the difference seems quite slight; the new species differs in the absence of two dark markings on the frons, in the black-ringed antennæ, well-marked edges of the pronotum, which is decidedly compressed, and in the strongly pubescent anal segment of the male, with median incisions, and in the armature of the posterior femora, which have only five or six black spinules on the under surface and on the inner margin only. The female has the subgenital plate obtusangular with broad obtusangular lobes, and in the middle of the disc a raised obtusangular lobe, soldered to the disc. I should add another difference between the habits of this species and those of *L. viridissima*: *Gampsocleis*, sp. n., stridulates in the latter part of the afternoon, and ceases at sundown, just when the evening chorus of *Locusta* begins with gradually increasing intensity.

In the same field there are several species of *Platypleis* of the *P. grisea* group, e.g., *P. grisea*, L., *P. assimilis*, Fabr., and a third species which I have not yet identified; an addition to the local list was *Platypterna tibialis*, F. de W., of which I took a single male by chance sweeping that same afternoon.

Aerida turrita was just maturing when I left, and *Epacromia thalassina*, Rossi, had begun to be a nuisance; I always felt obliged to catch a lot to see if there were not some *E. tergestina* among them, especially on the salt marshes. (*Edipoda caeruleus*, L., and the beautiful *C. salina*, Pall. (= *gratiosa*, Serv.), and *Acrotylus patruelis*, Sturm., were just beginning to appear in numbers. The burning sun brought all those forms on very early; we are accustomed in our latitudes to look upon Dectids as a late maturing group, and in England *O. griseo-aptera* stridulates away merrily late into October, but seldom appears adult before the late middle of August; yet at Geok Tapa, *O. indistincta* was in full maturity in the second week of July, and I did not see an immature specimen. The other local Dectids, e.g., the four species of *Platypleis* and *Decticus albifrons* were also fully mature; in the first few days there I found one or two nymphs of the *Platypleis*, and saw a *Decticus* emerging from a nymphal skin; yet on July 23rd, at Mtskhet, at the junction of the Aragva and Kura, eighteen versts above Tiflis, I found *Paradrymadusa sordida*, Herm., only in the nymph stage. Perhaps the junction of the two valleys at this point, with two rapid streams, keeps the air cool, for Mtskhet is a favourite summer resort for the residents of Tiflis, although the difference in altitude is trifling.

Gryllotalpa gryllotalpa, rather smaller than our West European specimens, is common in the garden at Geok Tapa, and sometimes flies to light; *Tridactylus variegatus*, Latr., was just appearing on the

muddy banks of the river. *Gryllodes lateralis*, Fieb., I did not find this time, but *Gryllus burdigalensis* and *G.* sp. ?, were common in the garden, with *Nemobius saussurei*, Barr, flying to light in considerable numbers.

Alexander Borisovich has an arc lamp on his balcony, with a sheet fastened to the wall, and stretched across to a table, and here on a still dark evening, collecting is done en masse; a dozen cyanide bottles are rapidly filled; in a few minutes the sagging part of the tablecloth is a crawling mass of *Corixa*, which is periodically emptied and cleared up, and they are thrown away by the quart. Hawk moths come dashing around; the commonest in July and September is *Theretra alecto*, *Hyles euphorbiae* and *Smerinthus ocellatus* are fairly common. Crowds of water beetles arrive, with ant-lions, *Epacromia thalassina*, the cricket mentioned above, *Gryllotalpa*, *Ceanothus pellucens*, Scop., and *O. turanicus*, Uvaroff; earwigs come too, *Labia minor* and *Labiduca riparia* are the commonest, but great rarities occasionally turn up, e.g., *Porticula pomerantzeri*, Sem., of which the male is still unknown; four or five females have been thus taken in as many years, and also a still undescribed species. The substantial number of *Ulychota* which I took were reserved for Oshanin, but I brought back a few Coleoptera. A. P. Semenoff-Tian-Shansky has named a few for me; there are *Egosoma scabricorne*, a fine Cerambycid, *Hydrophilus profanifugus*, Sem., or also *H. flavipes*, Scop., *Arrhaphypterus shelkornikori*, Reitter, the interesting Buprestid, *Labodella dilaticollis*, Sem., and the eastern Longicorn, *Apatophyes caspica*, Sem., all taken at light. In the garden *Cicindela sublaevis* swarmed on the footpaths.

The creatures which obtruded themselves most upon one's notice were the irrepressible Cicadas. The big brown one which makes the desert noisy when no other creature can bear the heat has already been mentioned. In the garden there is a smaller brown species, equally insistent, and a small green one, probably *Rustorelia burriana*, Horvath. Dr. Horvath erected this genus and described the species on a single stray specimen picked up by me in September, 1912; in July it swarms in the garden and park. Dr. Horvath wished to pay a delicate compliment to the Georgians in naming this elegant species after their poet, Rustaveli; it is a pity that this is not quite appropriate, as Geok Tapa is far out of the Georgian region of the Caucasus; it is a pure Tartar district.

July 19th found me for a couple of days at Kislovodsk, after a very hot but interesting journey of thirty odd hours from Baku, where I had been baked for two days without being able to do any collecting, past Derbend, with its fine old wall and Persian fortress. As the train approaches the junction of Mineralnya Vody, we were afforded a magnificent view of the snowy jagged range of the main Caucasus, standing out in relief in the clear morning air, with half a dozen peaks higher than Mt. Blanc, and, towering head and shoulders above his neighbours, the massive twin-headed peak of Elbruz himself, rearing up almost to 19,000 feet, in solitary majesty; the cloudless sky showed up the characteristic gentle concavity of the flanks as seen in profile.

Kislovodsk is the chief of a group of fashionable watering places; its neighbours are Piatigorsk, with its memories of Lermontoff, and Essentuki, whose bottled waters are familiar to all travellers in Russia. Kislovodsk itself is a very pleasant spa, with good music, theatres, and

restaurants; in the morning crowds of health seekers stroll about the park, sucking the chalybeate water through bent glass tubes. The hills around reach no great altitude, but are very picturesque and command a fine panorama, although Elbruz is usually only visible in the early morning. On the grassy slopes of these hills I found *Forficula auricularia* abundant under stones; *Stauroderus apricarius*, L., is the common grasshopper, but larvæ were still numerous on July 20th; its habits recall those of *Omocestus viridulus*, L., while its voice resembles that of *St. bicolor*. A grey *Platypleis* was not yet mature, and a young *Olynthoscelis* occurred sporadically. The thistle beds and clumps of shrubs sheltered *Locusta caudata*, Charp. I was interested to note that his stridulation is much deeper than that of *L. viridissima*, and the song less sustained.

On the top of the plateau I found a *Decticus verrucivorus*, L., just emerging from the nymphal skin; the only stridulations audible here recalled that of *Ephippigera*, with a similar peculiar timbre; I traced it down to a glaucous blue Phaneropterid, probably *Isophya ampli-pennis*, that sat and buzzed on the low herbage; he sits and chirps boldly on the bluish leaves, his long hind legs stretched out conspicuously. The chirp of *Gryllus campestris* resounded in the lower ground, and I took a single *Gryllus burdigalensis*.

In butterflies I noticed *Papilio machaon*, *Epinephele jurtina* (*janira*) and *Colias hyale*. I should add that my identification of Lepidoptera is amateurish in the extreme, and very untrustworthy, being only a reminiscence of boyhood days.

My collecting was now done; it had been snatched at intervals in a busy time; I had still to return to Tiflis, Kutais and Guria, over the Georgian road, and back again, but had no more opportunity of collecting. Retracing the ground gave opportunities of confirming many interesting ornithological, philological, ethnological and geological observations, but that is another story.

Descriptions of a Pterergate and two Gynandromorphs of *Myrmica scabrinodis*, Nyl., with a list of all the known cases of the latter.

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

On July 30th last, when hunting for colonies of *Myrmica scabrinodis*, at Weybridge (to be used for the experiments being carried on in connection with *Lycæna arion*), I was fortunate enough to discover the above mentioned forms. In one colony, the nest of which was situated partly in the ground and partly under the bark of a fir stump, I found the pterergate. It struck me as being curious as soon as I saw it, and on bottling it I at once perceived what it was.

DESCRIPTION.

Head, shape of ♀, blackish.

Thorax pale yellow with some black marks as follows:—Pronotum slightly blackish; mesonotum with two round deep black spots; scutellum present, small but distinct, blackish.

Two small forewings are present, which possess traces of veins at the base only, the one on the right measures 2mm. in length, that on the left .7mm. only.

The hindwings are represented by two very small projecting tubercles, which are longer than broad, and are composed of the substance of wings, not being chitinous. Legs pale yellow.

Epinotum pale yellow, spines long and straight; gaster brownish-yellow. Long 5.2mm.

The colony contained two queens, some males and brood. No further pterergates were produced, and only males hatched from the sex pupæ present.

As far as I am aware this is only the second pterergate which has been taken in Britain. The other, which was taken by Keys, near Plymouth, is described in my book (*British Ants*, p. 131).

The colony which contained the two gynandromorphs was nesting in the ground, a small hole in the turf forming the entrance. It contained one queen, some normal males, sex pupæ, and small larvæ. This colony has been kept under observation ever since it was dug up all the pupæ hatched and produced only normal males. The two gynandromorphs were noticed at once and bottled in the field.

DESCRIPTIONS.

No. 1. Mixed Gynandromorph.

Head ♀ shape; clypeus anteriorly, mandibles, antennæ, cheeks, right temple, a thin streak on left temple, frontal carinae, and a patch on left side of front red, rest of head blackish. Left eye a little larger than right eye; ocelli a little larger and more prominent than in a normal ♀; antennæ 12-jointed, with 3-jointed clubs, but with shorter and stouter scapes than in normal ♀, left scape more the shape of ♂, and without the tooth at the bend, right scape with tooth.

Thorax: pronotum red with dark patches anteriorly, in centre, and on left side posteriorly; mesonotum with distinct Mayrian furrows, the right side and the space between the furrows black, the left side red, and the right parapsis red. The space between the Mayrian furrows is channelled in centre, which is not the case in either normal ♂ or ♀, the rest being slightly striate; scutellum and praescutellum black on right side; metanotum black. *Epinotum* ♀, but black at base and between the spines, right spine shorter than left; petiole small, deformed, black at base and left corner, fixed to right half of post-petiole; post-petiole larger on left side with a dark longitudinal mark in centre, right side blackish at base; gaster more ♀ shape and bristles, dirty blackish-yellow with ill-defined darker patches and round yellow spots, with five visible segments and ordinary ♂ genitalia.

Wings intermediate between ♂ and ♀. Legs intermediate between ♂ and ♀, partly black, partly yellow. Long. 5.7mm.

No. 2. Mixed Gynandromorph.

Head shape of ♀; right mandible at base, clypeus in centre and on left, frontal area, front, temples, and occiput, with the exception of certain round spots, black, rest of head yellow. Antennæ ♀, 12-jointed, with 3-jointed clubs, but right scape more shape of ♂, and black above.

Thorax: pronotum yellow with two black patches posteriorly; mesonotum with part of Mayrian furrow present on right side, and a black patch, the shape of the space between the Mayrian furrows if both were present, in centre; a broad black patch occurs on the right parapsidal furrow and a narrow one on the left; scutellum black with the exception of a red patch on right anterior portion. *Epinotum* black, with the exception of the outer portion of the left spine, a thin streak on right spine and the right half of the space between the spines, which are yellow. The right spine is longer than the left. Petiole black with the exception of a yellow circular patch on left anterior corner and another on right posterior corner; post-petiole, left half yellow, right half black. Wings intermediate between ♂ and ♀. Legs intermediate, partly black, partly yellow.

Gaster blackish, with indistinct yellow patches, with four visible segments above, and ♂ genitalia considerably exerted at apex. Long. 6.3mm. (including ♂ genitalia 6.8mm.).

In 1903, Wheeler [*Bull. Amer. Mus. N.H.*, 19, 653-683 (1903)] described and recorded all the known cases of gynandromorphic ants. These are:—

1. *Formica sanguinea*, Latr. (Tischbein, 1851).

2. *Tetramorium simillimum*, Smith (Roger, 1859).
3. *Tetramorium simillimum*, Smith (Meinert, 1860).
4. *Myrmica lobicornis*, Nyl. (Meinert, 1860).
5. *Myrmica ruginodis*, Nyl. (Forel, 1874).
6. *Formica exsecta*, Nyl. (Forel, 1874).
7. *Formica rufibarbis*, F. (Forel, 1874).
8. *Formica truncicola*, Nyl. (Forel, 1874).
9. *Polyergus rufescens*, Latr. (Forel, 1874).
10. *Polyergus rufescens*, Latr. (Forel, 1874).
- *11. *Myrmica laevinodis*, Nyl. (F. Smith, 1874).
12. *Leptothorax tuberculatus*, F. (Adlerz, 1886).
13. *Myrmica scabrinodis*, Nyl. (Wasmann, 1890).
14. *Myrmica scabrinodis*, Nyl. (Wasmann, 1890).
- *15. *Stenamma westwoodi*, West. (Perkins, 1891).
16. *Ateca instabilis*, F. Smith (Forel, 1892).
17. *Camponotus ligniperdus*, Ltr. (Klapálek, 1896).
18. *Formica microgyna*, Wheeler (Wheeler, 1903).
19. *Polyergus rufescens*, Ltr., sub sp. *lucidus*, Mayr (Wheeler 1903).
20. *Stenamma (Aphaenogaster) fulvum*, Roger, sub sp. *aquia*, Buckley, var. *piccum*, Emery (Wheeler, 1903).
21. *Stenamma (Aphaenogaster) fulvum*, Roger, sub sp. *aquia*, Buckley, var. *piccum* (Wheeler, 1903).
22. *Leptothorax obturator*, Wheeler (Wheeler, 1903).
23. *Epipheidole inquilina*, Wheeler (Wheeler, 1903).

In 1914, Wheeler [(Amer. Nat., 48, 49-56 (1914))] enumerated and described the gynandromorphous ants described during the decade 1903-1913, viz. :—

24. *Cardiocondyla batesi*, For., var. *nigra*, For. (Santschi, 1903).
25. *Anergates atratulus*, Schenck (Adlerz, 1908).
26. *Anergates atratulus*, Schenck (Adlerz, 1908).
27. *Formica sanguinea*, Ltr. (Donisthorpe, 1909).
28. *Formica sanguinea*, Ltr. (Donisthorpe, 1909).
29. *Solenopsis fugax*, Ltr. (Santschi, 1910).
- *30. *Myrmica scabrinodis*, Nyl. (Donisthorpe, 1913).

In 1914 [*Ent. Rec.*, 26, 136 (1914)] I described another gynandromorph :—

31. *Monomorium florivola*, Jerd. (Donisthorpe, 1914).
- And in my book [*British Ants*, 323 (1915)] yet another.

- *32. *Formica rufibarbis*, F. (Donisthorpe, 1915).

The two specimens described in the above note bring the total up to 34 :—

- *33. *Myrmica scabrinodis*, Nyl. (Donisthorpe, 1915).
- *34. *Myrmica scabrinodis*, Nyl. (Donisthorpe, 1915).

Those specimens marked with an asterisk are British. Of the 34 above recorded cases, the writer has described seven and eight are British.

NOTES ON COLLECTING, Etc.

AGRIUS CONVULVULI AT CHICHESTER.—A few *Agrilus (Sphinx) convulvuli* have been noticed here during September and early in October. Some of the insects were of remarkably small size and of worn appearance.—JOSEPH ANDERSON, Chichester.

CURRENT NOTES AND SHORT NOTICES.

Our colleague, Dr. Burr, has been appointed Assistant Military Landing Officer, with Captain's rank, "somewhere in the East." He sailed last week to take up his new duties.

In the *Gazette* of October 2nd appears the appointment of Mr. Cyril Herbert Page, N.D.A., N.D.D.—son of our colleague Mr. H. E. Page, F.E.S., and Mrs. R. Page, B.A.—as Second-Lieutenant in the Royal Garrison Artillery, 1st Hants Heavy Battery.

The South London Entomological Society holds its Annual Exhibition on November 25th at 7.30.

In the April number of the *Entomological News*, which was considerably delayed in transit to us, we note a useful article on the Mounting of Insects, by H. B. Weiss. The apparatus consists of a vertically supported pin bearing a small cube of cork. Through this cork runs a horizontal support having, at its distal end, a prong which is thrust into the ventral surface of the thorax. The opposite end of this horizontal support, after it leaves the cork, is bent to form a little crank, by means of which the specimen can be readily turned, exposing all parts of its surface for inspection. In addition this support prevents the abdomen from drooping in the process of drying." The advantages of this method are claimed to be:—The specimen is rotatable about a longitudinal axis, the dorsal surface is preserved intact, there is an unobstructed view of the specimen, the insect can be raised and lowered, a number of specimens can be mounted on a single pin for storage or carriage, bodies are less likely to become detached, pairs can be mounted tandem on one main support, no extra label pins are needed, the vertical pin can carry a label which will *not* be obscured by the insect, there is a saving of time in moving specimens, and the inventor claims that it requires no additional time to set insects in this way, and that the method is readily adaptable for all sizes and classes of insects.

Some months ago we referred to a pamphlet issued by the New York Agricultural Experimental Station on "Tree Crickets injurious to Orchard and Garden Fruits," by Messrs. P. J. Parrott and B. B. Fulton. The latter author has continued his subject by a succeeding work, "The Tree Crickets of New York; Life History and Bionomics." In this he deals in considerable detail with seven species of the genus *Eucanthus* and one species of the genus *Neorabica*. "The interest in these insects centers chiefly about their remarkable reproductive structures and instincts and their peculiar oviposition habits. The song of the male, which serves to attract the female, is produced by a minute rasp on the underside of the forewing, which is scraped by a structure on the inner edge of the opposite wing. In producing the sound the wings are raised at right angles to the body and vibrated rapidly. When the wings are so raised, there is exposed on the metanotum a glandular hollow, the secretion of which is very attractive to the female. The latter climbs over the abdomen and feeds on the gland. The male takes advantage of the position and inserts the barbed capillary tube of a spermatophore into the genital opening of the female, and the sperms pass into the seminal receptacle. The spermatophore is formed in a peculiar pouch at the tip of the abdomen, by the hardening of a viscous liquid about a mass of sperms." There are a considerable number of illustrations and six plates, four of which are in colour.

We have been assured that the Doubleday Collection of British Lepidoptera will not be absorbed into the general collection at South Kensington, but will be kept intact and separate.

The Thirteenth Annual Report of the Photographic Survey and Record of Surrey is to hand. The work is carried on by means of six sections, *i.e.*, Architecture, Art and Literature, Antiquities and Anthropology, Geology, Natural History, and Topography. Among the 310 prints which have been added to the collection during the past year there are none dealing with Entomology. Possibly some of our readers have negatives of subjects native to the county, and we are sure prints from these would be most serviceable; while their presence in the collection would help to keep our specialised work before the public. The Collection is housed in the Public Reference Library, Town Hall, Katherine Street, Croydon. It is stored in specially designed drawers, and is open for consultation by any member of the general public from 10 a.m. to 9 p.m. every weekday. Mr. E. A. Martin, F.G.S., 285, Holmsdale Road, South Norwood, whom some of us know for his enthusiastic work on behalf of the South-Eastern Union of Scientific Societies, is the Hon. Secretary of the Natural History Section.

In the *Entomologist* for September Mr. H. Rowland-Brown contributed "Some Remarks on *Thecla aesculi*, Hb., chiefly in the South of France," in which he contends that the two forms *ilicis* and *aesculi* are specifically distinct, as asserted by most of the older authors of note. To this are added the notes of Dr. Chapman on his examination of the genitalia of the two forms, which go to show that they are very closely related, but that the more minute details arrange themselves into two definite series, and may be interpreted as indicating two separate species. There are two plates of details.

In the same number Mr. G. T. Lile announces a genus and species of *Braconidae* as new to Britain. Mr. D. Sharp discovered the beetle *Hypophloeus linearis* in the burrows of *Tomicus bidens* in fallen branches of *Pinus sylvestris*. From the branches he bred the Braconid *Coenopachys hartigii*.

In the same number Mr. A. A. Girault announces two species of Chalcidoid Hymenoptera as new to Britain and to science, *viz.*, *Cocophagnus britannicus* and *Apterotrix longiclara*, both received from Manchester. They were reared from the Homopteron *Lepidosaphes ulmi*. At the same time a new form of the Hymenopteron *Aphidencyrtes aspidiotei* was reared, which is introduced as var. *britannicus*.

Our colleague, Mr. R. S. Bagnall writes an appeal in the September number of the *Ent. Mo. Mag.*, for material from all parts of the British Isles, to aid him in his study of the British *Comptelidae* (Thysanura). His address is Penshaw Lodge, Penshaw, Co. Durham.

In the *Ent. News* for October are two articles discussing the statements made concerning *Lycaena piasus* and *L. rhaea* in the article, "Notes on the Synonymy of Boisduval's N. American species of *Lycaenidae*," by Dr. McDunnough, *Ent. Record*, vol. xxvi., page 201 (1914). The first by J. R. Haskin, of Los Angeles, does not agree with Dr. McDunnough's conclusions, while the second by Prof. H. Skinner says that the weight of evidence supports them.

We have seen the announcement of the decease of Dr. Wm. Saunders, who was the co-founder of the *Canadian Entomologist*, with the Rev. C. J. S. Bethune and for many years one of its editors.

He was a Devonshire lad and born in 1835. After five-and-twenty years of successful business life as a wholesale and retail druggist in London, Ontario, on his retirement he became Director of the Experimental Farms of the Dominion. He was one of a small band of earnest workers in entomology, whose efforts, persistently pursued, at length obtained the recognition of the Government. In 1862 Dr. Saunders took part in the founding of the Entomological Society of Ontario, and in 1906 was elected President of the Royal Society of Canada. He was taken ill in 1911 while on a visit to Europe, his first real holiday, and never entirely recovered.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

July 22nd.—PARASITES IN OVA.—Mr. Newman exhibited living examples of a Braconid (?) which had just emerged from a batch of ova of *Macrothylacia rubi* found at Rutham in the autumn of 1914. LOCAL VARIATION IN *L. ORBITULUS* AND *A. ESCHERI*. ICHNEUMON IN APHIDS.—Dr. Chapman, specimens of *Latiiorina pyrenaica*, the first that had been bred, from the Pyrenees, and *L. orbitulus* var. *oberthürri* from the same area, but found also in Switzerland. He also showed specimens of the Ichneumon, *Aphidius ervi* bred from the Aphis of *Ononis arvensis*. ABERRATIONS OF ♀ *P. ICARUS*. SYNTOMIS PHEGEA BRED.—Mr. B. H. Curwen, some first brood females of *Polyommatus icarus* from Rammore Common, all much suffused with blue, and several underside aberration *melanotora (arcuata)*. He also showed a series of *Syntomis phegea* interbred for the past four years. DRAWINGS OF LARVÆ OF *T. PSI* AND *T. TRIDENS*.—Mr. Sich, coloured drawings of the larvæ of the British species of *Acroneicta* and pointed out the differences between the larvæ of *Triæna psi* and *T. tridens*. VARIATION IN BRITISH *A. IRIS*.—Mr. B. Adkin, long series of *Apatura iris* from many British localities and showed that the species was much more variable than it was usually considered to be. A considerable discussion took place on the occurrence and disappearance of the species in its near London localities. EPHESTIA KÜLSIELLA IN RICE.—Mr. R. Adkin, living larvæ, pupæ, and imagines of *Ephestia külsiella* in rice flour. REMARKS ON THE SEASON.—Several members gave experiences of the present season, making remarks on *Agriades thetis*, *Polyommatus icarus* (abs. of ♀s), *Celastrina argiolus*, *Pyrameis cardui*, *P. atalanta*, *Lithosia complanula* and *Euchloe cardamines*.

August 12th.—ZEW ZEALAND LEPIDOPTERA.—Mr. H. Smith exhibited a number of Lepidoptera from New Zealand, including Chrysophanids, Lycænids, and species of the giant Hepialids. CONFLUENT *A. TRIFOLII*.—Mr. B. S. Williams, *Anthrocera trifolii* var. *palustris* with confluent forms from Somerset, and an aberration of *Nanthorrhoe sociata* in which the usual dark band on the disc of the left forewing was reduced to a blotch on the inner margin. OVA OF *C. PERLA*.—Mr. West (Ashtead), the ova of *Chrysopa perla*, laid solitary on a long stalk. *B. PALES* VAR. AND *P. PLANTAGINIS* VARS.—Mr. Hy. J. Turner, examples of an excessively local form of *Brenthis pales* var. *arsilache* taken by him on one side of one small lake at St. Moritz, Engadine, and a series of *Parasemia plantaginis* varying from the normal yellow and black males to the form with a much extended white ground on the one hand, and on the other hand to the form with a much extended

black area. REPORT.—Mr. Edwards read his report, as delegate, to the Congress of the S.E. Union of Scientific Societies at Brighton.

O B I T U A R Y .

Henri Jules Fabre, Hon. F.E.S.

At the great age of 92 we have to record the death of M. Jules Henri Fabre, the Reaumur of the nineteenth century. For the past 30 years he had lived and made his wonderful observations at the little village of Sérignan, in Provence. Like the mass of the French peasants, he naturally possessed that patience and perseverance which were so much called upon in the long sustained series of minute observations carried on for so many years.

The series of *Souvenirs Entomologiques*, in ten volumes, published from 1879 to 1907, form a great monument to his keenness of observation and his extraordinary perseverance.

"No investigator of natural phenomena has ever played so lonely a hand as Fabre did. He was almost entirely unindebted to the naturalists who had gone before him, partly because he had very little opportunity of becoming acquainted with their work, partly because he was little disposed to do so." "He thought that science was unscientific and laughable when it dealt with his entomology." These words tersely express his aspect of mind.

He must have seen how much he was handicapped in his own studies by want of early opportunities and encouragement, for we find him giving gratuitous lessons in nature-study in the town of Avignon, where for 20 years he held a small professorship in the University. Strange to say this action of his, added to his extremely retiring nature and failure to take part in the ordinary social life of the town, whereby he could advertise his ability, usually an inseparable item in the "getting on" successfully, brought to a climax the persecution of years and he was dismissed. He says himself, "La haute société, je l'évite autant que possible, j'aime mieux la compagnie de moi-même. Aussi n'ai-je vu personne et ne me suis pas rendu à l'appel du principal pour faire la tournée officielle."

Although Darwin was a personal friend, Fabre held the doctrine of evolution in contempt, and his ignorance of most of the theories of the day and of the great mass of observations made by previous nature-workers, often led him to make elaborate experiments to obtain facts, which others had obtained in a much simpler and more expeditious way, and to come to absurd deductions from the limited facts upon which they were based.

It was not until late in his life that Fabre's work won for him any public recognition. In 1894 he was made honorary member of the Entomological Society of France; of that of London in 1904. He was made a Chevalier of the Legion of Honour some years previous, but it was only in 1912, when rumours of extreme poverty were uttered, that a government pension was bestowed on him.

Not all Fabre's writings have been translated into English. We have "Insect Life," translated by the author of "Mademosella Mori;" "The Life and Love of the Insect," translated by Alexander Teixeira de Mattos, who has also just completed another translation entitled "Bramble-bees and others," and Bernard Miall has translated "Social Life in the Insect World."—H.J.T.

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self-acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, lin., 6d.; 1½ in., 8d.; 2 in., 10d.; 2½ in., 1/-; 3½ in., 1/4; 4 in., 1/6; 5 in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked back, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennæ 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass-top and Glass-bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Scalpels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidae*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic)
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to—

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larvæ and Pupæ in captivity, cleaning insects for grease, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larvæ, Pupæ, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.

CONTENTS.

	PAGE.
A brief review of the British Coniopterygidæ (Neuroptera), <i>R. S. Bagnall, F.L.S., F.E.S.</i>	241
A "Poser," Stainton, <i>Hy. J. Turner, F.E.S.</i>	247
In the Caucasus again, <i>Malcolm Burr, D.Sc., F.E.S.</i>	251.
Description of a Pterergate and two Gynandromorphs of <i>Myrmica scabrinodis</i> , <i>F., H. Donisthorpe, F.Z.S., F.E.S.</i>	258
NOTES ON COLLECTING:—A. convolvuli at Chichester, <i>J. Anderson</i>	260
CURRENT NOTES AND SHORT NOTICES	261
SOCIETIES:—The South London Entomological & N. H. Society	263
OBITUARY:—Henri Jules Fabre, <i>H.J.T.</i>	264

Communications have been received or have been promised from Dr. Chapman, Dr. Verity, Rev. G. Wheeler, Messrs. R. S. Bagnall, Hy. J. Turner, C. W. Colthrup, H. E. Page, A. J. Fison, C. P. Pickett, A. Tetley, Parkinson Curtis, H. B. Williams, W. G. Sheldon, P. P. Graves, F. E. Lowe, P. A. Muschamp, G. T. Bethune-Baker, H. L. Earl, A. Sich, etc., with Reports of Societies and Reviews.

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

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

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

FOR SALE.

BOOKS : : ENTOMOLOGICAL.

- The Entomologist, vols. 20-30, 1887-1897 (11 years) } £3 10s. 0d.
 " " " vols. 39-46, 1906-1913 (7 years) }
 Entomologist's Record, &c., vols. 1-23 & 25. Price, £4 15s. 0d.
 Practical Hints for the Field Lepidopterist, Tutt, 3 vols. as one. 10s. 6d.
 Stainton's Manual of Butterflies and Moths, vol. 1. 2s. 6d.
 British Moths. Tutt, 2s. Moths of Brit. Isles (South), Vol. 2. 5s.
 British Lepidoptera, Tutt, vols. 1-5. The 5 vols. for £3 0s. 0d.
 Natural History of the Brit. Butterflies and Moths, Ed. Newman, 2 vols. 17s. 6d.
 Lepidopterist's Calender, Jos. Merrin. 4s. Out of print.

To be sold for the benefit of the WIDOW of the late J. ALDERSON. — Apply:—

Mr. F. S. THOMAS, 23, Park Villas, Cheam, Surrey.

LEONARD TATCHELL & Co., Breeders and Collectors of
 British Butterflies and Moths,

23, The Arcade, BOURNEMOUTH,

OFFER THEIR NEW LISTS OF LIVING LARVÆ & PUPÆ,
 : IMAGINES, LIFE-HISTORIES, AND APPARATUS. ::

Many good Vars., and Melanic Forms.

10, 12, 15, 20 and 40 Drawers Cabinets in good condition. Full particulars on application.



THE
 ENTOMOLOGIST'S RECORD
 AND
 JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.
 T. HUDSON BEARE,
 B.S.C., F.E.S., F.R.S.E.
 GEORGE T. BETHUNE-BAKER,
 F.Z.S., F.L.S., F.E.S.
 M. BURR, D.S.C., F.Z.S., F.L.S., F.E.S.
 (REV.) C. R. N. BURROWS, F.E.S.

T. A. CHAPMAN, M.D., F.Z.S., F.E.S.
 JAS. E. COLLIN, F.E.S.
 H. ST. J. K. DONISTHORPE,
 F.Z.S., F.E.S.
 ALFRED SICH, F.E.S.
 J. R. LE B. TOMLIN, M.A., F.E.S.
 GEORGE WHEELER, M.A., F.F.S.

and
 HENRY J. TURNER, F.E.S.,

Editorial Secretary.

DECEMBER 15th, 1915.

Price ONE SHILLING (NET).
 (WITH INDEX.)

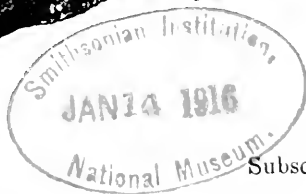
Subscription for Complete Volume, post free
 (including all DOUBLE NUMBERS, etc.)

SEVEN SHILLINGS.

TO BE FORWARDED TO
HERBERT E. PAGE, F.E.S.,
 "BERTHOSE," GILLIATLY ROAD, NEW CROSS, S.E.

LONDON:
 ELLIOT STOCK, 7, PATERNOSTER ROW, E.C.

BERLIN:
 R. FRIEDLÄNDER & SOHN,
 11, GARTENSTRASSE, N.W.



Entomologist's Record & Journal of Variation

(Practical Hints, Field Work, etc. useful for every year's collecting).

VOL. VI.

The TITLES of some of the articles are as follows:—Notes on Butterfly Pupæ, with some remarks on the Phylogenesis of the Rhopalocera.—*Dr. T. A. Chapman, F.E.S.*, "Phytophagic Species."—*Prof. A. Radcliffe Grote, M.A.* "Varieties and aberrations of Noctue from Doncaster."—*H. H. Corbett, M.R.C.S.* "The frenulum of the British species of *Smerinthus*."—*G. C. Griffiths, F.Z.S., F.E.S.* "Eudryas ste-johannis."—*A. Radcliffe Grote, M.A.* "Parthenogenesis or Aganogenesis."—*J. W. Tutt, F.E.S.* "Larvæ."—*Rev. G. M. A. Hewitt, M.A.* "Retrospect of a Lepidopterist for 1894."—*J. W. Tutt, F.E.S.* "Generic Names in the Noctuidæ."—*Prof. A. R. Grote, M.A.* "Pupa hunting in October."—*J. W. Tutt, F.E.S.* "Polygamy and Polyandry in Moths." "The nature of certain insect colours."—*W. S. Ridings, M.D., R. Freer, M.B., J. W. Tutt, F.E.S., Rev. C. R. N. Barrows, J. Anderson, Jun.* "The Lepidoptera of Swansea."—*Major R. B. Robertson.* "Caradrina ambigua in the Isle of Wight."—*A. J. Hodges.* "The insects of Bourg St. Maurice."—*J. W. Tutt, F.E.S.* "Orrhodia erythrocephala ab. glabra from Devonshire and comparison with *O. vaccinii*."—*Dr. W. S. Ridings, F.E.S.* "Notes on Caradrina ambigua and *C. superstes*."—*J. W. Tutt, F.E.S.* "Entomology and Entomologists, being the Annual Address to the City of London Entom. Society." Notes on *Aphomia sociella* (with plate).—*W. P. Blackburne Murr, F.E.S.* "Apterous females and Winter Emergence."—*E. F. Studd, M.A., B.C.L., F.E.S., L. B. Prout, F.E.S.* "Collecting Noctuidæ by Lake Erie."—*A. Radcliffe Grote, M.A.* "Coleoptera at Ipswich."—*Claude Morley, F.E.S.* "Notes on *Bombus visurige*." "Synonymic Notes on *Acidalia humilata* and *A. dilutaria*."—*L. B. Prout, F.E.S.* "The Lepidoptera of Grèssy-sur-Aix."—*J. W. Tutt, F.E.S.* "Apatura iris."—*Rev. G. M. A. Hewitt* "Scheme of Classification of the Rhopalocera founded on the structure of the Pupæ."—*T. A. Chapman, M.D., F.E.S.* "Glimpses of American Entomology."—*J. W. Tutt, F.E.S.* "The Genus *Smerinthus*."—*A. Bacot.* "Variation considered biologically: Some notes suggested by the Romanes Lecture of 1894."—*J. W. Tutt, F.E.S.* "Wing structure."—*J. Aston Moffatt.* "On the development of sex in social insects."—*J. W. Tutt, F.E.S.* "The British representatives of the Genus Caradrina."—*L. B. Prout, F.E.S.* "Habits and variation of *Lithosia liturata* and its variety *pygmaeola*."—*J. W. Tutt, F.E.S.* "On the gradual disappearance of Lepidoptera from South-Eastern London and its neighbourhood."—*C. Fynn, F.E.S.* "A hunt for *Neuroterus aprillinus*."—*T. A. Chapman, M.D., F.E.S.* "On the development of pigment in *Nemeobius lucina*."—*F. J. Buckell, M.B.* "The Macro-Lepidoptera of Keswick."—*H. A. Beadle.* "Varieties of *Argynnis selene* (with plate).—*S. G. C. Russell, F.E.S.* "Hadenoid genera with hairy eyes."—*Prof. A. R. Grote, M.A.* "Zygæna minos and its varieties."—*J. W. Tutt, F.E.S.* "Notes on the pupæ of *Castnia* and *Anthocharis*."—*T. A. Chapman, M.D., F.E.S.* Besides these articles, a large number of short notes are contained in every number under the following titles: "Scientific Notes and Observations," "Variation," "Notes on Larvæ and Life-histories," "Notes on Collecting," "Current Notes." The reports of Societies are very carefully edited, and only scientific paragraphs published. The "Practical Hints" and "Field work" for each month are quite unique.

The entomologist who will read carefully through the back numbers of *The Entomologist's Record* will find himself better equipped for the further study of his subject than by any other means.

Price 76 per volume, of Mr. H. E. Page, "Bertrose," Gellatly Road, New Cross, S.E.

OVA, LARVÆ, AND PUPÆ.

The Largest Breeder of Lepidoptera in the British Isles is
H. W. HEAD, Entomologist,
BURNISTON, Nr. SCARBOROUGH.

Full List of Ova, Larvæ, and Pupæ, also Lepidoptera, Apparatus, Cabinets etc., sent on application.

Many Rare British Species and Good Varieties for Sale.

Lantern Slides in Natural Colours.

LEPIDOPTERA & LARVÆ A SPECIALITY.

Photographed from life and true to Nature in every detail.

SLIDES OF BIRDS, WILD FLOWERS, &c.,

By same Colour Process.

LANTERN SLIDES MADE TO ORDER FROM ANY SPECIMEN OR COLOURED DRAWING.

PHOTOS IN COLOUR OF LARVÆ, LIFE SIZE, ON IVORINE TABLETS TO PIN IN THE CABINET.

For List apply to—

CHARLES D. HEAD, Cherrymount, Donnycarney, DUBLIN.

Myrmica schencki, Emery, an ant new to Britain.

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

Myrmica schencki, Em.¹

Myrmica rubra subsp. *scabrinodis* var. *schencki*, Emery, Zool. Jahrb. Syst., 8, 315 (1895)¹. *Myrmica scabrinodis schencki*, Emery, Deutsch. Ent. Zeitschr. 1908, 178². *Myrmica rubra* subsp. *scabrinodis* var. *schencki*, Wheeler, Ants 566 (1910)³. *Myrmica schencki*, Bondroit, Ann. Soc. Ent. Belg. 55, 11 (1911)⁴; 56, 351 (1912)⁵. *Myrmica scabrinodis* subsp. *schencki*, Karawajew, Rev. Russe Ent. 12 583 (1912)⁶. *Myrmica scabrinodis* race *schencki*, Forel, Mitt. Schweiz Ent. Gesell. 12, 29 (1915)⁷.

♂ Lighter or darker brownish-red, head and gaster darker: mandibles, antennae and legs lighter. The colour is lighter and more uniform over the whole body, than in *lobicornis*.

Head: frontal area longitudinally striate, not shining; temples more regularly striate than in *lobicornis*; antennae with scape sharply bent at the base, and furnished above with a strong transverse ridge, which however is both broader and longer than that of *lobicornis*, the scape itself also being longer; club of antennae three-jointed. Thorax more regularly striate; epinotal spines long and straight, longer than in *lobicornis*, with the space between smooth and shining. Petiole and post-petiole not so strongly rugose as in *lobicornis*, the former seen in profile does not form such a strong or abrupt angle, and the latter seen from above is rounder. Long. 4.5mm.-5mm. (4mm.-5mm. teste, Emery).

♀ Head and gaster blackish-brown, scutum of mesonotum with a black patch anteriorly and two others, one on each side, posteriorly, prae-scutellum, post-scutellum, and metanotum black; mandibles, antennae, rest of body and legs reddish yellow. The whole colouring is lighter than in *lobicornis*.

Other characters as in ♀. Wings with pterostigma and veins pale brown, not as yellow as in *lobicornis*. Long. 6mm.

Described from a number of ♂♂ and three ♀♀ from Glamorgan. These ♂♂ agree closely with specimens I possess from Switzerland and Belgium. I have not seen a British ♂, but in some Swiss specimens in my collection the scape of the antennae is abruptly bent at the base, as in *lobicornis*, but a slight, but distinct, ridge occurs above at the bend, which is not the case in *lobicornis*.

Original description of *Myrmica schencki*, Emery [*Zool. Jahrb. Syst.*, 8, 315 (1895)]:—

“Diese Form wurde bis jetzt mit *M. lobicornis* Nyl. verwechselt und vermengt. —Der ♂ is von derselben durch längere Dornen des Metanotums verschieden. Der 1. Knoten des Stielchens ist auch oben meist weniger winklig, oder sogar etwas depress und abgerundet. Die Farbe der amerikanischen Exemplare ist meistens ziemlich dunkel, schmutzig braun-roth, Kopf und Hinterleib schwärzlich. —Was aber diese Form von *lobicornis* besonders unterscheiden lässt, sind die Fühler des ♂. Der Schaft ist dick und kurz, kürzer als bei *subuleti* und selten länger als $\frac{1}{2}$ der Geißel, bei den meisten, europäischen Exemplaren etwas kürzer, nahe der Basis stumpf geknickt.”

Habitat.

According to Emery *Myrmica schencki* occurs in Central Europe in flat and hilly country, extending eastwards to China and Manchuria². It has also been recorded from the Northern States of America³, Belgium⁴, Russia⁶, Switzerland⁷, and occurs in Wales.

British distribution as at present known:—Glamorgan: Sully (*Hallett*). A colony of this ant was discovered by Mr. H. M. Hallett, at Sully, in Glamorgan, on May 30th, 1915. He, however, took it to be *lobicornis*, and knowing I had plenty of the latter from various parts, he unfortunately did not send me specimens at once, when I might have got it into my book. On July 25th he visited the colony again and captured several winged females, but no males were present.

DECEMBER 15TH, 1915.

On October 25th he wrote to me to say he was sending "♂♂ and ♀♀ of the *Myrmica lobicornis*, taken at Sully," and he mentioned that ". . . . the transverse ridge on the antennæ of the ant looks unusually developed." On examining them I at once recognised that they were *Myrmica schencki*, Emery, a form not known to have occurred in Britain before.

Hallett tells me the nest was situated in a bank of stiff marly soil, the entrance being a small round hole, much as is made by the smaller bees (*Halictus*, etc.).

As to whether *schencki* should be regarded as a good species, subspecies, or variety, is really not of much value, as in any case it is a quite distinct form, and all the individuals in the colony are alike.

Emery² now considers it to be a subspecies of *scabrinodis*, and Forel⁷ is of the same opinion, though he prefers his old name "race" to "subspecies." Forel on the other hand considers *lobicornis* to be a good species, but Emery also treats this as a subspecies of *scabrinodis*. In 1910 Wheeler³ calls *scabrinodis* a subspecies of *M. rubra*, L., and *schencki* a var. of *scabrinodis*: but in 1911 he writes [*Journ. New York Ent. Soc.*, 19, 163 (1911)]:—" *Myrmica rubra* or some one of the closely allied species (*scabrinodis*, *lerinodis*, *rugulosa*, etc.) which were formerly regarded as mere subspecies."

I prefer to follow this later view. Mr. Hallett is to be congratulated on discovering this interesting ant in Britain.

Notes on the Swiss Rhopalocera. VII.

By the late A. J. FISON.

(Communicated by Miss L. M. FISON.)

Extracts from his letters to, and kindly lent by, the Rev. G. Wheeler.

1. MISCELLANEOUS. 1908.

Grand Hotel des Bains, Bex, May 21st, 1908.

"At Charpigny this year there seem to be more dark *Papilio machaon* than usual and from the light colour of the anal spot I think all must be ab. *burdigalensis*, Trimoulet. I also took a *Papilio podalirius* with an extra line. Both types are very common at Charpigny this year The cold, and quite three weeks late, spring has been making up for lost time the last fortnight. I never saw things advance so rapidly. A collector has taken twelve or more *Eucres coretas* and *Scolitantides orion* at Branson, and up to date too."

[Dark *P. machaon* were quite moderately common at Charpigny in 1913-14.—L.M.F.]

2. THE SEASON 1908-9.

Bex, May 25th, 1909.

"Last season was not a very good one In June I went for a fortnight to Champéry. At Bonaveau there were some interesting *Erebia oeme* with very small spots, or almost none; but my best catch was *Parnassius delius*, close above Champéry village, where the stream divides. A series of about twelve or fourteen taken in some forty minutes, contained finer marked females and more variation than one usually gets in these parts. On July 2nd I was at Eclépens, on my way to Yverdon, and left on the 8th. I only saw one black

aberration of *Apatura iris* or *A. ilia*, but var. *elytie* was common. Apaturids were not very abundant, and had been out a few days before I arrived. I took 12 *Apatura iris*, 22 *A. ilia* and 8 var. *elytie*. *Satyrus circe* and *Limenitis populi* were very scarce, and *Strymon pruni* invisible. I got, however, a very fine *Araschnia levana* var. *prorsa* a mile north of Yverdon, by the lake side. On that road, too, were a good number of the three Apaturids, but I saw no dark aberrations on the Yvonand road. *Melanargia galathea*, with yellow ground colour, was frequent. My next five weeks at Gsteig under the Sanetsch Pass did not produce much. However, one day, on the top of the Col de Pillon, I got the darkest aberration of *Argynnis aglaia* that I ever saw. The upper wings were $4/5$ black with fulvous spots near outer edge, more clearly marked on upper wing. The fore- and hindwing bases contained most of the fulvous colour, which spreads especially towards their lower edges. Indeed the lower part of the upper wing had a fulvous line nearly to lower edge. The underside of the forewing was about three-quarters black, containing two fulvous spots. The outer edge fulvous with two black unpupilled spots or eyes in it. Hindwing with very little black except three or four black spots forming two lines at right angles, angle just outside white centre, which lies just inside apex of the angle. Inside this angle were six fulvous or silver spots ringed with black. Each one corresponded with its fellow on the same side. *Parnassius delius* I did not see until August 3rd. In 1907 I saw lots of *Colias palaeno* on certain pastures, but at the same date and later I only saw one last season. This last year, as in 1908, I again found many dark aberrations of *Papilio machaon* at Charpigny. On June 9th, 1908, I got a lovely *Strymon pruni* there. Last summer, from the end of July to the end of August, I was at Finhaut. There the Col de la Gueulaz, Emosson and Emaney valleys give very good hunting ground, but not so good as the Champéry district. This curious season, 1909, flowers are few, irregular and small, but I cannot say much yet as to butterflies. On Friday a friend and I got a fair number of "swallow-tails" and a female *Cupido sebrus*. *Glaucopsyche cyllarus* seemed over, and we found no *Anthocharis simplonia* near the Gryonne."

"I found several *Erebia oeme* in another part of the same district, on the lower slopes of the Petite Dent de Valerettes, below Vërossaz, at about 2700 feet under the Dent du Midi, June 12th, 1914. Several continued flying when the sun went in. These specimens, too, seemed to have smaller spots than some from various localities in my late uncle's collection.—L.M.F.]

3. *Polyommatus amandus*, Schmid., etc.

Clarens, January 19th, 1910.

"From April 29th to May 5th, 1909, I got in and above the Avençon valley, two or three miles, several *Hesperia malvae* ab. *taras*. On June 15th *Polyommatus amandus* was flying on the marsh west of the St. Triphon rock more abundantly than I ever saw it elsewhere. My attempt to introduce *Lycæna iolas* at Charpigny is likely to fail, as the *Colutea arborescens* bushes do not grow or flower well. I may try this year to turn out there some female *Parnassius apollo*. This summer one or two "blues" were taken at Martigny in which there were male markings one side and female the other."

4. MISCELLANEOUS. 1911.

Charpigny, July 3rd, 1911.

"Looking at my *Brenthis selene* to-day, I see if you cannot get any at the Meienthal, you might perchance get almost the identical forms in the Murgthal, September 3rd, 1904. The only difference I can see (I have only one from the Murgthal) is that the Wassen flies are a shade lighter in general colour underside. Also in the underside hindwing the black centre of the largest red spot in the band next body, is rather more obscured with yellow dust. There is some of this dust on the Meienthal flies on the same spot, but much less on specimens from other parts . . . I got three *Apatura iris* at Charpigny. There are some every day on the trees north and east of La Tête. A friend got *Lycaena arcaea* and six or seven fine *Coenonymppha tiphon* on the Aigle skating ground."

[The form of *Brenthis selene* referred to has purple suffusion comparable to *Brenthis pales* ab. *napaea*.—G.W.]

Certain Egyptian Urbicolids.

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

During the last two months I have had some opportunity on odd afternoons, when military work has not been too pressing, of paying some attention to the habits of certain Urbicolids of Egypt. These are *Chapra mathias*, *Baoris zelleri*, *Geigenes nostradamus* and *Hesperia evanida* (*amenophis*, Rev.).

1. *Chapra mathias*.—At the date of writing, October 25th, *Chapra mathias* is practically over. It was pretty frequent in August, September and the early part of the present month, always in or near cultivated ground. I took a specimen in the third week in March this year and am of opinion that there are two or three broods of this fine "skipper," if indeed it is not continuously brooded during the hot season.

C. mathias is a stronger and faster flier than any of its relatives in this country. When startled it disappears like a flash, and though approachable when feeding on any attractive blossom, or late in the afternoon when it rests with closed wings on clods of earth, stones and sometimes on the branches of shrubs, it is not an insect one can afford to miss. In the heat of the day it sometimes develops the habit of flying up and down at top speed, usually in front of, and along, a wall facing the sun, or up and down a path or the side of a road.

I have not yet been able to note any amatory displays on the part of this insect, save the chasing at top speed of a ♀ by a ♂. I have seen one ♀ oviposit on what appeared to me to be a rice-plant. The egg was laid with remarkable speed and absence of preliminary explorations at the junction of a blade and the stem proper of the rice-grass.

2. *Baoris zelleri* was out in September at Meadi, a suburb of Cairo, on the Helouan Railway. There it occurred—alas, usually in bad order—in gardens and in shady places such as hedges, under trees, etc. I have a strong impression that *B. zelleri*, in its typical form at any rate, requires some shade and moisture. I have never yet taken it in open ground in Egypt, and my only Syrian *zelleri* was netted in the hottest and moistest part of the Dog River Valley, near Beirut. In

speed of flight *B. zelleri* is little inferior—over short distances—to *C. mathias*. It is as shy, if not shyer, pugnacious, attacking its own or other species which throng it on a coveted flower, and always seems to rest towards evening on plants or bushes. It is distinctly “earlier to bed” than *C. mathias*, much earlier than *G. nostradamus*, and though conspicuous when settled, from its golden powdered underside under the vertical rays of the sun, is decidedly less visible toward evening against a green or greenish-yellow background of leafage.

In the collection of Egyptian Lepidoptera at the Ministry of Agriculture, Cairo, is a handsome *Baoris*, somewhat damaged, from Amrieh or Amriya, in the Maryut Steppe. It looks like an all-black *B. zelleri*. Can this be a form of *Baoris* (*Parnara*) *borbonica* var. *holli*, Obth., which, according to Dr. Reverdin, is decidedly close to *B. zelleri* in the conformation of the ♂ genitalia. I have not seen typical *B. (Parnara) borbonica* figured, and my recollection of M. Oberthur's figure (by M. Culot) of var. *holli* is a trifle vague. Perhaps this Amrieh insect is a local steppe race of the typical *B. zelleri*, which has lost the yellow markings of the upperside. *B. zelleri*, I may add, was over by the end of September this year.

3. *Gegenes nostradamus*.—This species is still abundant as it has been since the end of August. It is common all about Cairo, also near Marg, and on the desert edge between Kassassin and Tel el Kebir, though I have not yet taken it deep in the desert.

So far, though on the look out for *G. lefeberii*, I have not certainly taken it in Egypt. I have had my doubts about certain specimens, but none that I have taken here seemed so black or so square winged as *lefeberii* as I know it from Beirut. However, Dr. Reverdin must have the last word as regards my Egyptian *Gegenes*.

In this connection I should like to note that—

- (1) Fresh ♂ *G. nostradamus* sometimes show very faint traces of (a) three apico-costal spots, (b) of the two or more submarginal pale spots on the upperside of the anteriors.
- (2) The upperside light markings on the anteriors of the fresh ♀ *G. nostradamus* are yellowish-cream and often yellow. They seem to wear quickly to yellowish-white, and finally to white.
- (3) The upperside of ♀ *G. nostradamus* is always brown with a yellowish mixture, in my experience. The tone differs considerably, but seems never to approach the depth of blackish-brown so noticeable in *G. lefeberii*.

G. nostradamus is not easily caught when flying wildly around in the sun, but given an attractive blossom, e.g., Tamarisk flower, on October 23rd, at Kassassin, nothing can be more easily captured. It frequented these Tamarisk flowers with *Chilades trochilus*, a few *Zizera karsandra* and *Virachola livia* ♀s, and could almost be taken with the hands.

I made the following notes of the behaviour of a ♂ and ♀ *G. nostradamus* at Kassassin.

- (a) ♂ alights on a flower spike and runs up it towards ♀ already perched thereon. Then stops and proceeds to move his wings, opening them about two-thirds of their full expanse, and at times seemingly depressing and further expanding the posterior wings.
- (b) ♀ flies about three yards and settles on a plant, ♂ follows suit and repeats the previous performance.

- (c) ♀ returns to Tamarisk. ♂ follows and again repeats previous movements, this time apparently raising and lowering his body from the flower spike by movements of the legs.
- (d) ♀ after several minutes begins to respond to ♂'s demonstrations by partly opening and quivering her wings. ♂ walks up to ♀ and turns round several times. ♀ finally flies off rapidly with ♂ in pursuit.

4. *Hesperia evanida*.—I took one ♂ and two ♀s of this interesting species in the desert, near Kassassin, on October 23rd, an interesting record, proving that this species is at least double-brooded.

Convolvulus lanatus was common where it occurred. I have nothing to add to Colonel Mander's account—would that he had been spared to give us more of his observations—of this "skipper," except that the butterfly, when settled on the desert sand or stones, is extremely hard to see, the white and olive underside closely resembling a variegated quartz or limestone pebble.

Some Lepidoptera of Guernsey, 1915.

By the Rev. F. E. LOWE, M.A., F.E.S.

For the first time for twenty years or more the writer was in Guernsey during the whole summer. I hoped by renewing my acquaintance with what were once familiar hunting grounds, to renew some of the pleasure with which I exploited these places in days gone by. There was also reason to suppose that possibly there were not a few species of lepidoptera in the Island which had not yet been recorded. Though we had a splendid summer, and insects were very abundant, there was little in the way of discoveries to reward diligent work. I have reason to fear, on the other hand, that the number of species has declined, and that the enormous extension of greenhouses and the frequent destruction of trees to accommodate them with sufficient sun, and the cutting up of many pastures for bulb-growing, have considerably reduced the numbers of our butterflies and moths. In two important respects, it must be admitted, my investigations were seriously handicapped, I could neither "sugar" nor use the attraction of light. Owing to the war, military authority prescribed the use of light under severe limitations—which were especially stringent by the coast. Thus my enjoyable stay of five weeks at the extreme south end of the Island, at the Pleinmont Hotel, from June 22nd to the end of July, was robbed of more than half its entomological possibilities, and there was added practically nothing to our list of the local fauna. In a few instances, where only a single specimen of a species had been recorded, and on what seemed sometimes doubtful authority, I was able to give fresh testimony to its occurrence. The season opened late—due perhaps to drought. An entry in my diary on June 21st reads: "first rain for a month." So if "*a drip in June, sets all things in tune,*" any little discordant note may be accounted for by this month's shortcomings.

My first important country walk was on April 19th, to the cliffs, beyond Petit Bôt. *Pararge aegeria* ab. *intermedia* was to the fore. Larvæ of *Dasychira fascelina*, noted very small; also a few of the "oak-eggar," *Lasiocampa quercus*. On May 11th the first brood of *Rumiccia* (*Chrysophanus*) *phlaeas* was out with *Pararge megera*. Larvæ of *Melitæa*

cinxia were wandering, having left their winter quarters. On this day I was surprised by being compelled to yield my quarry to an unexpectedly agile entomologist. I had missed, with a rather careless stroke of the net, a geometer—probably *Xanthorhoë fluctuata*—it flew a couple of yards, and I made for it in earnest, but before I could reach it a swallow dived between us, missed the moth, doubled back and caught it, all within two feet of my pursuing net.

May 27th. *Melitaea cinxia* was still in the larval stage, and the first brood of *Polyommatus icarus* on the wing. *P. megera* was very numerous. [Here I may note a capture which really took place May 18th, 1914, but which I have not before recorded, of a very beautifully fresh female *P. megera* ab. *medio-lugens*. This probably is very rare, as it is not "stocked" by the chief continental dealers. It is a very striking aberration, in which the whole of the space between the two transverse lines of the forewings is filled with deepest brown, almost black, forming a strong band, the wing-rays thickened considerably with the same colour, and the whole of the basal area to the centre of the hindwings, much suffused. Seitz says that this form is reported to almost replace the type on some parts of the Upper Rhine. I much doubt the truth of this report, because the dealers do not offer it for sale.]

June 21st. I took *Arctia villica*, *Nemoria viridata*, and *Perizoma flavofasciata* (*decolorata*) fairly common, and *Epinephele jurtina* abundant.

June 22nd. *Satyrus* (*Hipparchia*) *semele* began to be common, as also *Anthroca* (*Zygæna*) *trifolii*, both of which increased in numbers to an enormous extent during the next ten days. *Adscita* (*Procris*) *statives* was also widely distributed and numerous, and *M. cinxia* became common. I got one nice aberration. I was certainly not expecting *Epinephele tithonus* on June 23rd, but males were out in some numbers—surely a very early date. The females did not appear until the 29th.

On June 25th *Xanthorhoë galiata* first showed up. Larvæ and pupæ of the *Dianthoeciae* were scarce, on and under plants of *Silene maritima*. *D. capsicola* and *D. capsophila* are generally not hard to get, *D. conspersa* more rarely. I worked very hard for *Dianthoecia luteago* var. *lowei*—pupæ. I only got three in all. These emerged successfully June 26th, 27th, and 29th. The last has none of the orange tone of *lowei*, but seems to be a veritable var. *barretti*—which form I should say is not very near the French *argillacea* from Digne.

June 30th. Some larvæ of *M. cinxia* were still feeding, consequently a few fresh imagines were to be taken up to almost the end of July. Under broom, and heather growing like mats on rocks, larvæ of *Selidosema ericetaria* and *Lithosia caniola* were to be found, the latter commonly. I bred a few of each. Another interesting insect to breed again was *Dasychira fascelina*. I took twenty larvæ and got from these seventeen imagines. The first, a male, emerged July 15th, the last on the 30th. These dates agree with my old experience of this species in Guernsey. I notice that Newman and Leeds give May and June as the time of flight. It is never so here. This year I took a freshly emerged female on August 16th, the first I have ever taken in the imago stage, but as I have seldom been in Guernsey in July or early August, there is nothing extraordinary in this. Our *D. fascelina* is the slaty-grey form. While larva hunting it was a disappointment not to

find a single *Pachygastris (Lasiocampa) trifolii*. For many years I have not seen a larva of this species—in the “eighties” I used to find it abundant. I fear it has become almost or quite extinct with us. Two *Miltochrista (Callegenia) miniata* were beaten out of hedges at La Grande Mare. This pretty thing is of rare occurrence. I also obtained a series of *Coremia unidentaria*, important, as up to the present its only Guernsey representation has been an odd specimen which came to light some years ago in my study. At the same time and place *Cabera exanthemaria* was common among shallows, another insect which had hitherto been on our list, also only not on my authority but based on testimony now a quarter of a century old.

Here I may be permitted to notice other captures which have a local interest apart from their true value. *Craniophora (Acronieta) ligustri*, which has only been taken once before. On August 20th *Scotosia dubitata* obligingly flew into the house and was caught. The late Mr. Luff says in his catalogue of our “macros”: “have seen two specimens.” Whether he means he had seen two which he was not able to box, or whether, as is I think more likely, some one showed them to him, and he doubted their *local origin*, must remain uncertain. It was pleasant to have a nearly full grown larva of *Eumorpha (Chœrocampa) elpenor* brought to me for identification, as this, too, has not been noted before in any stage of its transformation. It was taken crawling on the ground in the well known “Caledonian Nursery.” *Noctua subsequa* is also an addition to our recorded fauna. This with *Hypnometia plumbellus* I think completes the list of new captures.

Another insect which seems to be losing ground is the recently introduced *Tortrix pronubana*. I have only seen one for certain this autumn. *Gnophos obscurata*, a scarce insect here, provided me with four rather worn examples from the Gouffre on August 23rd. I have never taken it, or the larva, except in this particular neighbourhood. *Eubolia peribolata*, one of our specialities, was not abundant, nor widely spread. *Callimorpha quadripunctaria (hera)* was certainly below the average in numbers, and gave me no var. *flarescens*. *Agrius convolvuli* afforded a pardonable thrill of pride, not unminged with fear, to three or four people who brought me specimens, but we suffered from no invasion in force from this annual visitor.

On my return home I was able to do a little “sugaring” during August and September in the seclusion of my own garden in town. In some years I have taken good things, such as *Leucania vitellina*, *L. albipuncta*, *Agrotis lunigera* and *Leucania putrescens*. Not so this year. With the exception of *Noctua subsequa* and *Catocala nupta*, a rarity with us, all the moths were without interest. The number and variety of *Noctua pronuba* was astonishing, among them I picked out two or three good ab. *innuba*. There was a sprinkling of *Noctua rubi*, *N. umbrosa*, a few *Agrotis saucia* and *A. suffusa*, and *A. puta* second brood, with the usual crowd of *Polia flavicincta*, middle and end of September. The “old ladies” drank heavily for some five weeks. *Caradrina quadripunctata* and *C. ambigua* are always common. While on the subject of the *Caradrinae*, it is curious to note the rarity of other species of this genus. I took one *C. taraxaci*, July 18th, at flowers of ragwort. Only the second known to have occurred here. Mr. Luff and myself are credited with one, each, of *C. morphœus*. As yet there is no record of *C. alsines*. Of six fine pupæ of *Gortyna ochracea* got from thistle stems

three only emerged. A fine female *Heliophobus hispidus* was bred on September 23rd, from a larva taken at Pleinmont.

I would conclude these very unsystematic notes with a few general observations about certain butterflies.

Gonepteryx rhamni.—Saw one male August 13th, and a female on 23rd. This is a very scarce insect here, and I suspect an immigrant.

Vanessa io.—I saw one on August 14th. This, too, is a species that I can hardly think is always with us. For years together it is not seen, and when seen, only one or two in a season. I do not think I could have taken, had I wished it, ten specimens in the 35 years I have lived here.

P. atalanta.—Has been very abundant.

Pyrameis cardui.—Promised well in the spring—hibernated specimens were common. The autumn emergence seems to have been small.

Polyommatus icarus.—The females of the second brood were remarkably fine—*blue* forms—of hundreds that I saw on one day feasting on wild thyme, August 26th, I only observed one female of the *brown* form.

Pieris brassicae.—Strange to say my best catch this season was a female with a widened black border of forewings with extended dashes to the two black spots on the disk—these are also united by a black suffusion. The whole of the base and the costa are also exceptionally dashed with black. It comes very near var. *wollastoni*, as depicted by Seitz, from Madeira, the additional markings make it a very handsome insect.

Colias edusa.—One only have I seen, and it was gone before I could identify the sex.

Aricia medon.—As usual was very scarce.

Plebeius aegon (argus).—Though it does occur I did not meet with it.

Callophrys rubi.—Our only "Hairstreak" was not abundant.

Of "Skippers," strange to say, we have none.

Melitaea cinxia.—I am very glad to be able to report that this species shows no signs of diminution in numbers, rather, I think, it was more abundant than in many recent years. It was late. I was not on the cliffs in time to chronicle its first appearance, which is generally the last week of May, but it was at its height nearly three weeks later than usual, *viz.*, about June 30th.

Hipparchia semele.—Was excessively common—it is generally of small size in Guernsey, and this year was no exception.

Epinephela jurtina.—The abundance of this species was perhaps the most remarkable. A patch of ragwort some twelve feet across, one morning, I found alive with butterflies. They were literally in hundreds. I examined them carefully for aberrations, and all were *jurtina* with the exception of a single male *E. tithonus*.

CORRECTION.—The persistence of error, in spite of persistence of editorial struggle, is well exemplified in line 4 of page 241 where "Mr. Lachlan" should of course be "Mr. McLachlan."—H.J.T.

Bibliography of books and articles in which the Genitalia of the Lepidoptera are considered and discussed, or used as the basis of the subject matter.

Compiled by Hx. J. TURNER, F.E.S.

(Continued from page 229.)

1905. CHAPMAN, DR. T. A.—On *Erebia palarica*, n.sp., and *E. stygus*.
Trans. Ent. Soc. Lond., pp. 9-34, pl. vi. London.
1905. BETHUNE-BAKER, G. T.—“A Monograph of the genus *Ogyris*.”
Trans. Ent. Soc. Lond., pp. 269-292, pl. xv. London.
1905. ZANDER, E.—Der männl. Genitalapparat d. Butaliden. *Zeit. wiss. Zool.*, vol. lxxix., pp. 308-340. Leipzig.
1905. PETERSEN, WILH.—Über beginnende Art-Divergenz (*Hadena adusta*). *Arch. Rassen.*, vol. ii., pp. 641-662, figs.
1905. JORDAN, KARL.—Der Gegensatz zwischen geographischer und nichtgeographischer Variation. *Zeit. wiss. Zool.*, vol. lxxxiii., pp. 151-210. Leipzig.
1905. MARSHALL, H.—The reproductive organs of the female *maia* moth. *Hemilenca maia*. *Trans. Wis. Ac. Sc.*, vol. xv., pp. 1-14. 2 pls. Madison.
1906. MEIXNER, A.—Der männliche und weibliche Genitalapparat der *Chloroclystis rectangulata*. *Zt. u. Insek.*, vol. ii., pp. 337-344, 376-381. Husum.
1906. PETERSEN, WILH.—Zur Anatomie einiger centralasiatischer Schmetterlinge. *Hor. Soc. Ent. Ross.*, vol. xxxvii., pp. 347-351, pl. St. Petersburg.
1906. WENKE, KARL.—Anatomie eines *Argynnis paphia* Zwitters, nebst vergleichend-anatomischen Betrachtungen über den Hermaphroditismus bei Lepidopteren. *Zeit. wis. Zool.*, vol. lxxxiv., pp. 95-138, 2 pls. Leipzig.
1906. TUTT, J. W. [CHAPMAN, DR. T. A.]—British Lepidoptera, vol. ix., *Celastrina argiolus*, p. 389, pl. xxviii. London.
1906. PIERCE, F. N.—Notes on hybrid *Notodonta ziczac-dromedarius*. *Ent.*, vol. xxxix., pp. 122-124, 1 fig. London.
1906. MEIXNER, ADOLF.—Der männliche und weibliche Genitalapparat der *Chloroclystis rectangulata*. *Zeit. wiss. Insek.*, vol. ii. (xi.), pp. 337-344, 376-381, figs. 1-8. Neudamm.
1906. SCHWANGART, DR. F.—Review. *Zeit. wiss. Insek.*, vol. ii. (xi.), pp. 178-180. Husum.
1906. ROTHSCHILD AND JORDAN.—A Revision of the American Papilios. *Nor. Zool.*, vol. xiii., pp. 411-746, 6 pls. Tring.
1906. REBEL, DR. H.—*Olethreutes valesiana* and *O. turfosana*. *Iris.*, vol. xix., pp. 232-234, figs. 1-4. Dresden.
1906. TUTT, J. W. [CHAPMAN, DR. T. A.]—British Lepidoptera, vol. v., *Alucitides*, p. 270, pl. i.; p. 317, pls. ii., iii.; p. 457, pl. iv. London.
1906. CHAPMAN, DR. T. A.—Differentiation of *Triaena tridens* and *T. psi* in the imaginal stage. *Trans. City of Lond. Ent. Soc.*, vol. xvi., pp. 34-37, pls. 1-2. London.
1907. PETERSEN, WILH.—Die Artberechtigung von *Miana latrunculae*. *Rev. russ. ent.*, vol. vii., pp. 206-210. St. Petersburg.

1907. CHAPMAN, DR. T. A.—Entomology in N.W. Spain. *Trans. Ent. Soc. Lond.*, pp. 152-159, pls. vi. vii. London.
1907. PETERSEN, WILH.—Über Spermatophoren bei Lepidopteren. *Hor. Soc. Ent. Ross.*, vol. xxxviii., pp. cxlix-cliii., 2 figs. St. Petersburg.
1907. PETERSEN, WILH.—Über Speimatophoren bei Schmetterlinge. *Zeit. wiss. Zoo.*, vol. 88, 117-130, plt. 1, 2 figs. Leipsic.
1907. MEIXNER, A.—Der männliche Genital apparat von *Hebelia plumella*. *Ent. Jahrb.*, pp. 125-128, figs. 1-3. Leipzig.
1907. SCHIMA, DR.—Männlichen Genital-apparates bei *Pieris rapae* und var. *manni-rossi*. *Verhand. k.-k. zool.-bot. Gesell.*, vol. lvii., pp. (92-3), 2 figs. Vienna.
1907. FRUHSTORFER, H.—Monographische Revision der Pieridengattung *Hebomoia*. *Iris*, vol. xx., pp. 89-109, plt. 6. Dresden.
1908. DAMPF, A.—Ueber den Genital-apparat von *Rhopobota nacrana*, Hb. *Iris*, vol. xxi., pp. 304-329, pls. 5-6. Dresden.
1908. TSHETVERIKOV, S. S.—Noch einmal über *Dendrolimus pini*, *D. segregatus*, and *D. sibiricus*. *Rev. Russ. d'Ent.*, vol. viii., pp. 1-7. St. Petersburg.
1908. CHAPMAN, DR. T. A.—*Erebia lefebrei* and *Lycaena pyrenaica*. *Trans. Ent. Soc. Lond.*, pp. 307-316, pls. viii.-xiii. London.
1908. REBEL, PROF. H.—*Ereves (Lycaena) argiades* and *E. coretas*. *Verh. k.-k. zool.-bot. Gesell.*, pp. (32)-(34), figs. 1-2. Vienna.
1908. CHAPMAN, DR. T. A.—Sur deux Phalènes des Pyrénées. *Ann. Soc. Ent. Fr.*, vol. lxxvii., pp. 496-500, pls. 10-13. Paris.
1908. CHAPMAN, DR. T. A.—On *Stenoptilia grandis*, n.sp. *Trans. Ent. Soc. Lond.*, pp. 317-320, pls. xiv.-xvii. London.
1908. CHAPMAN, DR. T. A.—Are *Ereves argiades* and *E. coretas* distinct species? *Trans. Ent. Soc. Lond.*, pp. 371-374, pls. xxi.-xx. London.
1908. SMITH, J. B.—A Revision of some species of *Noctuidae* heretofore referred to the genus *Homoptera*, Bdv. *Proc. U.S. Nat. Mus.*, vol. xxxv., pp. 209-275, pls. xxxi.-xxxvi. Washington.
1908. DAMPF, DR. A.—Zur Frage der Artberechtigung von *Satyrus hermione*, L. und *S. alycone*, S.V. *Ent. Zeit.*, vol. xvii., pp. 128-9, fig. 8. Stuttgart.
1908. CHAPMAN, DR. T. A.—Notes from the Pyrenees: *Marasmarcha tuttodactyla*. *Ent. Rec.*, vol. xx., pp. 50-53, pls. vi.-viii. *Cleogene peletieraria*. *loc. cit.*, pp. 151-159, pls. xvi.-xvii. London.
1908. ROEPKE, WALTER.—Ergebnisse anatomischer Untersuchungen an Standfußschen Lepidopterenbastarden. *Smerinthus hybr. hybridus* und *hyb. operosa*. *Jen. Zeit. Natur.*, vol. xlv., pp. 1-122, 3 pls. Jena.
1908. FRUHSTORFER, H.—Neues über die Copulationsorgane der Satyriden. *Ent. Zeit.*, vol. xvii., pp. 121-123, 129. Stuttgart.

1908. JOHN, OSCAR.—Beitrage zur Kenntniss der Gattung *Plusia*.
Rev. russ. ent., vol. viii., pp. 74-86, pp. 215-227.
St. Petersburg.
1909. FRUHSTORFER, H.—Neues Über das Jullienische Organ. *Ent. Zeit.*, vol. xxii., pp. 74-75, pp. 190-191.
Stuttgart.
1909. TUTT, J. W. [CHAPMAN, DR. T. A.]—British Lepidoptera, vol. x. (iii.). *Ruralides*, pp. 42-43, pl. ii.; p. 50, pl. iii.; pp. 155-157, pls. xx.-xxiii., and l.
London.
1909. CHAPMAN, DR. T. A.—A Review of the species of the lepidopterous genus *Lycaenopsis*. *Proc. Zool. Soc. Lond.*, pp. 419-476.
London.
1909. BANKS, EUSTACE R. [and F. N. PIERCE].—*Evetria pinicolana*, Dbl., specifically distinct from *E. buoliana*, Schiff. *Ent. Rec.*, vol. xxi., pp. 3-4, pl. i.
London.
1909. SOUTH, RICHARD [and F. N. PIERCE].—*Luperina queucci*, Dbl., and var. *bacteri*, Stb. *Ent.*, vol. xlii., pp. 289-292, pl. vii.
London.
1909. PETERSEN, W. M.—Zusatz Kenntniss der Gattung *Eupithecia*. *Iris*, vol. xxii., pp. 203-314, pls. a-c.
Dresden.
1909. JULLIEN, JOHN.—Un problème résolu: *Satyrus hermione*, *syriaca*, *alcyone*. *Bull. Soc. Lep. Gen.*, vol. i., p. 361.
Geneva.
1909. PIERCE, F. N.—Genitalia of the British Noctuidae, 100 pp., 32 pls.
Liverpool.
1909. TUTT, J. W.—Genitalia of the British Noctuidae (Review). *Ent. Record*, vol. xxi., p. 88-93, pl. vi.
London.
1909. REVERDIN, PROF. J.—*Pieris rapae*, L., and *P. mauni*, Mayer. *Ent. Rec.*, vol. xxi., pp. 149-150, pl. xiii.
London.
1909. DAMPF, DR. A.—Ueber *Agrotis tecta*. Hb., und var. et ab. *cinerea*, Stgr. *Berl. Ent. Zeit.*, vol. liv., pp. 128-134, 6 figs.
Berlin.
1909. ROEPKE, WALT.—Ergebnisse anatomischer Untersuchungen an Standfuss' schen Lepidopteren-bastarden. I. Folge: *Smerinthus* *hyb. hybridus* und *hyb. operosa*. *Jena Zeit. Natur.*, vol. xlv., pp. 1-122, pls. 1-3, figs. 1-53.
Jena.
1909. PETERSEN, DR. WILH.—Ein Beitrag zur Kenntniss der Gattung *Eupithecia*, Curt. *Iris*, vol. xxii., pp. 203-314, pls. a-c, figs. 1-28.
Berlin.
1909. MEISENHEIMER, JOHANNES.—Experimentelle Studien zur Soma- und Geschlechts-Differenzierung. Erster Beitrag: Ueber den Zusammenhang primärer und sekundärer Geschlechtsmerkmale bei den Schmetterlingen und den übrigen Gliederteiren, pp. vii. and 149, 2 pls.
Jena.
1909. MEISENHEIMER, JOHANNES.—Ueber die Beziehungen zwischen primären und sekundären Geschlechtsmerkmalen bei den Schmetterlingen. *Nat. Woch-schr.*, vol. 24, pp. 545-553.
Jena.
1909. KUSNEZOV, N. J.—On the probable viviparity in some Danaid, i.e., Pierid butterflies (Russ). *Hor. Soc. ent. ross.*, vol. 39, pp. 634-648, etc., pl. xxvi.
St. Petersburg.
1909. KUSNEZOV, N. J.—A new species of *Hipparchia* (*Satyrus*) from the Crimea. *Ann. mus. zool.*, vol. 14, pp. 140-144, pls. ii. and iii.
St. Petersburg.
1910. REVERDIN, DR. J. L.—Note sur l'armure génitale mâle de

- quelques Hespéries paléarctiques. *Bull. Soc. lép. Gen.*, vol. ii., pp. 1-16, pls. iv.-vi. Geneva.
1910. BETHUNE-BAKER, G. T.—Revision of the African species of the *Lycaenesthes* group of the *Lycaenidae*. *Trans. Ent. Soc. Lond.*, pp. 1-84, fig. 1, plt. i.-xiii. London.
1910. CHAPMAN, DR. T. A.—On *Zizeeria*, Chap. (*Zizera*, Moore), a group of Lycaenid Butterflies. *Trans. Ent. Soc. Lond.*, pp. 479-496, pls. lv.-lx. London.
1910. REBEL, DR. H.—*Melitaea deione* var. *rosinae* eine neue Tagfalterform aus Portugal. *Anz. k.k. Nat.-hist. Hofmus.*, pp. 375-378, plt. xi. Wien.
1910. FRUHSTORFER, H.—Zwei neue *Taenaris*-formen am Deutsch-Neu-Guinea. *Iris*, vol. xxiv., pp. 52-4, plt. 2. Berlin.
1910. SMITH, J. B.—Notes on certain *Taeniocampa* species. *Can. Ent.*, vol. xlii., pp. 317-323, plt. 8. Ontario.
1910. SMITH, J. B.—Notes on *Mamestra trifolii* and its Allies. *Ent. News*, vol. xxi., pp. 357-362, plt. xi. Philadelphia.
1910. FLETCHER, T. BAINBRIGGE.—On the genus *Deuterochops*. *Trans. Ent. Soc. Lond.*, pp. 107-141, pls. xlv., xlv. London.
1910. GROSEBECK, J. A.—Studies of the North American Geometrid Moths of the genus *Pero*. *Proc. U.S. Nat. Mus.*, vol. xxxviii., pp. 359-377, pls. 13-16. Washington.
1910. CHAPMAN, DR. T. A.—On the generic characters of the ancillary appendages of the Plebeiid section of the Lycaenids. *Ent. Rec.*, vol. xxii., pp. 101-103, plt. v. London.
1910. CHAPMAN, DR. T. A.—Exhibit of Malformation of the male appendages of *Acrionicta tridens*. *Proc. Ent. Soc. Lond.*, p. lxi., plt. A and text fig. London.
1910. FRUHSTORFER, H.—Neues über die Genitalsorgane der Rhopaloceren. *Ent. Zeit.*, vol. 24, pp. 150-151, 154-155. Stuttgart.
1910. JULLIEN, J.—*Enterpia loudeti*, Bdv. *Bull. Soc. lép. Gen.*, vol. ii., pp. 22-29, plt. vii.
1910. POSPELOV, V. P.—“Bau der Genitalorgane in verschiedenen Lebensphasen der Lepidopteren.” (Russ.) *Zap. Obsc. jest.*, vol. 21, pp. 163-410, pls. iii.-ix. Kiev.
1910. CHAPMAN, DR. T. A.—On *Callophrys aris*, Chpm. *Trans. Ent. Soc. Lond.*, pp. 85-106, Plts. xiv.-xliii. London.
1910. LACREUZE, C.—Observations sur les Hespérides de la Suisse. *Bull. Soc. lép. Gen.*, vol. ii., pp. 30-44, pl. 3. Geneva.
1910. PIERCE, F. N.—Value of Genitalia. *Ent.*, vol. xliii., p. 304.
1910. CHAPMAN, DR. T. A.—On the Conjugation of *Peridea trepida*. *Ent. Rec.*, Vol. xxii., pp. 53-4, plt. iii. [and REV. C. R. N. BURROWS, *loc. cit.*, p. 90]. London.
1910. BANKES, EUSTACE R. [and DR. T. A. CHAPMAN].—*Monopis weaverella*, Scott (*semispilotella*, Strand.), specifically distinct from *M. rusticella*. *Ent. Mo. Mag.*, vol. xlv. (xxi.), pp. 221-228, plt. v. London.
1910. DAMPF, DR. A.—Untersuchung der Generationsorgane einiger *Melitaea*-Arten. *Iris*, vol. xxiii., pp. 138-146, figs. 1-12. (Dresden.) Berlin.
1911. VERNON, ENRICO.—Über die Vernonsche Zelle der Autoren in den Hodenfächern der Lepidopteren. [Prioritätsfrage.] *Zool. Anz.*, vol. 38, pp. 81-84. Leipzig.

1911. REVERDIN, DR. J. L.—*Hesperia malvae*, L., et *Hesperia fritillum*, Ramb. *Soc. Ent.*, vol. xxvi., pp. 17-18, figs. 1-2.
Zurich.
1911. REVERDIN, DR. J. L.—*Hesperia malvae*, L., *H. fritillum*, Rbr., and *H. melotis*, Dup. *Bull. Soc. lép. Gen.*, vol. ii., pp. 61-77, pls. 11-14.
Geneva.
1911. TURNER, HY. J. [and DR. T. A. CHAPMAN].—*Luperina (Apamea) guenei*, Dbld., as a species, and as a British species. *Ent. Rec.*, vol. xxiii., pp. 201-203, pls. vii.-ix. London.
1911. McDUNNOUGH, DR. J.—On the Nomenclature of the Male Genitalia in Lepidoptera. *Can. Ent.*, vol. xliii., p. 181-189, figs. 8-10. London, Ontario.
1911. CHAPMAN, DR. T. A.—The Scaphium of Gosse. *Ent. Rec.*, vols. xxiii., p. 285-288, pls. x.-xi. London.
1911. CHAPMAN, DR. T. A.—On the British (and a few Continental) species of *Scoparia*, Hw. *Trans. Ent. Soc. Lond.*, pp. 501-516, pls. xxxv.-xliv. London.
1911. BURROWS, REV. C. R. N.—On the *nictitans* group of the genus *Hydroecia*, Gn. *Trans. Ent. Soc. Lond.*, pp. 738-748, pls. li.-lviii. London.
1911. STICHEL, H.—The family *Riocolinidae (Erycinidae)*. *Genera Insectorum*, pp. 1-452, pls. 1-23. Berlin.
1911. HORNIZAKI, FRHR. C.—Die systematische und morphologische Stellung der bukowiner Formen von *Melitaea athalia*, Rott., und *M. aurelia*, Nick. *Zeit. wiss. Insek.*, vol. vii. (xvi.), pp. 213-218, 261-267, figs. 1-20. Neudamm.
1911. FRUHSTORFER, H.—Neue Hesperiden des Indo-Malayischen Faunen. *Notocrypta. Iris*, vol. xxv., pp. 20-27, pl. 1. (Dresden.) Berlin.
- 1911-12.—VERSON, ENRICO.—Sulla penetrazione di trachee entro ai follicoli testicolari dei Lepidotteri. *Venez. Att. Ist. Ven.*, vol. lxxi., pp. 261-263.
1911. ELTRINGHAM, HARRY.—On the forms and geographical distribution of *Acraea lycoa* and *A. johustoni*. *Trans. Ent. Soc. Lond.*, pp. 1-15, pls. i.-ii. London.

NOTES ON COLLECTING, Etc.

MR. MUSCHAMP'S SPANISH CAPTURES.—MORE INFORMATION DESIRABLE.—I am quite sure that numerous readers of this magazine have been surprised at some very interesting and remarkable records of captures made by Mr. P. H. Muschamp, in Spain, last year. These records seem all the more remarkable by Mr. Muschamp's making them without further comment than that he had taken certain species, or forms of species. Actually they may greatly revise our knowledge of one species of butterfly and a local form of each of two others. It is of course desirable that these records should be as ample as possible, and I venture to suggest that it would be most interesting if Mr. Muschamp could see his way to let the readers of the *Ent. Record* have a short article on his captures of the following species:—

1. On page 123 of this magazine Mr. Muschamp records that at Pajares, in the north-west of Spain, he took "a few *Tarucus theophrastus* flying with *Polyommatus boeticus* over a mixed barley and pea-field."

T. theophrastus is a well known and widely distributed species in North Africa, but the few undoubted specimens that have been taken in the extreme south and south-east of Spain led one to suppose, previous to the present record, that the species was probably migratory and doubtfully native. Staudinger's Catalogue, the 1902 edition, gives Spain south, as a locality, without details. Undoubtedly the best authority on this species in Spain is Carl Ribbe's *Lepidopteren Fauna von Andalusien*, 1909-12, an exceedingly careful treatise on its subject, and which deals with the distribution in Spain of all species occurring in Andalusia. Ribbe says of this species, "at Algeciras I obtained two worn specimens on the seashore at the commencement of April, 1905, as I was going towards the landing stage of the Gibraltar steamer; Staudinger gives Hispania, and Korb writes me that he has taken *T. theophrastus* in Murcia in April, on a thornbush." The latter record evidently refers to a single specimen, and we are thus reduced to the small number of three examples, about which there should not be much doubt; but it is to be noted that Ribbe says his specimens were *worn*, and I am not by any means certain that it is possible to distinguish in all cases *worn* examples of this species from the vastly more abundant (in Spain) *T. telicannus*. The latter species is of course widely distributed in Spain. Mr. Jones and I found it commonly in May, 1913, at Albarracin, and it is interesting to note that Dr. Chapman mentions in *Transactions Ent. Soc. London*, 1907, p. 161, that he found "*Lycaena telicannus* abundant in all stages except the pupa" in north-west Spain.

2. On page 190 Mr. Muschamp says, "In the same meadow I took three *Argynnis adippe* var. *cleodora*, and expect I might have taken plenty more." This was at Puente de los Fierros. So far as I am aware these are the first recorded var. *cleodora* from Spain or Portugal. There is of course a form of *adippe* which is widely distributed in Spain without silver on the underside, and which is thus a parallel form to var. *cleodora*. This form has, however, not the ochreous ground colour underside of the central European var. *cleodora*, but it is simply an unsilvered form of the typical Spanish *A. adippe* var. *chlorodippe*, and it has, like this, the underside of all the wings green in ground colour. This is the ab. *cleodippe* of Stgr., and it occurs freely with var. *chlorodippe* in certain localities in Spain. Dr. Chapman says, *Transactions Ent. Soc. London*, 1907, p. 161, he found in N.W. Spain "*A. adippe* rather *chlorodippe* than type form, but not so marked as in Central Spain," whilst I have one example of ab. *cleodippe*, taken at La Granja in 1905, which has less green on the underside than usual, but it is not var. *cleodora* by any means.

3. On page 189 Mr. Muschamp records from Puente de los Fierros, *Agriades coridon* var. *albicans*. This form of *A. coridon* is of course abundant in many localities in Andalusia, and is especially attached to the environs of the city of Granada, but I very much doubt, in spite of Staudinger's Catalogue, which states that it is found in Arragen, if it has ever been found hitherto elsewhere. I have not much doubt but that Staudinger's authority is the *Catalogo de los lepidopteros de la Provincia de Teruel*, by Bernardo Zapater and Maxamiliano Korb, which states, "*Lycaena corydon* var. *albicans*, Albarracin, on the sunny banks, July, rare." I have seen and captured a great number of *A. coridon* at Albarracin, but there were none of them that could be called var.

albicans. Of course the common Central Spanish form var. *aragonensis*, if it has been on the wing for some time, becomes almost white, and has thus some resemblance to var. *albicans*, for a description of which one cannot do better than refer to the last volume of Tutt's *British Butterflies*, pp. 51 and 52. It would be important to know if Mr. Muschamp's specimens were *all* var. *albicans*, and if so how many there are, or if there were any var. *aragonensis* amongst them, and if so how many.

It will of course be borne in mind that both Pajares and Puente de los Fierros are in North-West Spain, where the rainfall is one of the heaviest of any district in Europe, and that the climate there is totally different from that of the sunburnt Mediterranean shores.—W. G. SHELDON. *November 5th, 1915.*

ANACAMPSIS CORONILLELLA IN KENT.—On the occasion of the Field Meeting of the South London Entomological and Natural History Society, at Otford, Kent, on June 19th, 1915, I took a specimen of *Anacamopsis coronillella* by sweeping. This rare Gelechiid has hitherto only been taken at Mickleham, in Surrey, as far as the British Isles are concerned. Mr. J. H. Durrant kindly confirmed my identification of the specimen. It would appear certain that the larva feeds on some other foodplant besides *Coronilla*, as the field where this moth was taken was not in the neighbourhood of any cottage garden where *Coronilla* might have been growing.—ALFRED SICH, Corney House, Chiswick.

WHERE DOES *C. BOREATA* HIDE DURING THE DAYTIME?—Can any of our readers familiar with this insect throw light on this question? A friend of mine asked if I could send him a series of this species. I answered I should only be too pleased, but that a light would not be allowed on the ground, so that it would scarcely be possible to get them until after the war. To this he said, "Why go at night? Why not box them sitting about in the afternoon?" I confessed my ignorance as to this habit as, although I had seen hundreds of *C. boreata* at night, I had never noticed them in daylight. However, I was game to try. Accordingly Mr. Turner and I reached the ground about three o'clock on November 6th, and diligently searched and beat the birches, gorse, etc. Our search produced nothing; the contents of our umbrellas leaves only; Mr. Turner's remark was, "We are too early." I dissented, but agreed to go a fortnight later. On reaching home I consulted my note book and found as under:—

"1875, November 27th, common; 1885, November 27th, very common but worn; 1886, November 20th, common, condition fine, November 27th, still common, condition good; 1887, November 12th-26th, common; 1888, October 27th; November 17th, very common; 1889, November 2nd, November 16th, common; 1891, November 14th, in fair numbers; 1892, November 12th, common; 1893, October 23rd, November 11th, common; 1895, November 16th, common; 1896, November 21st, in fair numbers; 1905, November 18th, plentiful."

We tried again on the afternoon of November 20th, and our total bag for two hours' work was two ♀s. This was conclusive proof that the species was out, although not a single ♂ did we see. As the trees and gorse were beaten and searched systematically they could not have been there. Search among the heather and gorse stems on bended knees revealed nothing. At least, where was *defoliaria*, that also occurs plentifully in the locality? We returned to the station con-

siderably chastened as to our prowess on the field, but thirsting for more knowledge. H. E. PAGE. *November, 1915.*

CURRENT NOTES AND SHORT NOTICES.

In the September number of the *Ent. Mo. Mag.*, Mr. Edwards announces a Dipteron, new to science and to Britain, under the name *Plastosciara keilini*, bred from larvae found at Barton Mills, Cambs., in rotten wood, in large numbers.

Our colleague, Professor Hudson Beare, F.R.S.E., F.E.S., has, we understand, diverted all his energies into the making of munitions.

Our colleague, Captain Burr, M.A., D.Sc., has a paper in the October issue of the *Jour. of the Royal Micro. Soc.*, "On the Male Genital Armature of the Dermaptera," Pt. I., with five plates and three text figures. In this first part the Protodermaptera (except *Psalidae*) are dealt with in much detail. Two previous authors have written on this subject, H. W. Verhoeff, "Ueber Dermapteren, I. Aufsatz. Versuch eines neuen, natuerlichen Systems auf vergleichend-morphologischer Grundlage und ueber den Microthorax der Insekten," in *Zool. Anzeig.* (1902), and Dr. F. Zacher, "Studien ueber das System der Protodermapteren," *Zool. Jahrb.* (1911). The former paper, although of considerable merit, was not fully appreciated by students on account of "the entire absence of figures, the employment of a number of new characters under new and unfamiliar names, which are nowhere explained, the author's ignorance of the literature of the subject, and the rather obscure language which he employed." "Zacher's work has a double virtue; it not only has its own inherent goodness, *i.e.*, the actual original observation, but it has a key to Verhoeff rendering his crabbed words intelligible." The present contribution is really a review and supplement to Zacher's pioneer papers, based upon an immense amount of material more than was then available, and very considerably modifies Zacher's results, in many parts based on only meagre material. The matter here published was really intended to form part of an introduction to Dr. Burr's projected Monograph of the Dermaptera of the world, which he now has to indefinitely postpone owing to the war. The more primitive earwigs, the Protodermaptera, are here dealt with, omitting the more difficult and large family, the *Psalidae*, which will be considered in a second part. Part III. will deal with the higher earwigs, the Endermaptera. The Family, Sub-family and Generic characteristics are all set out in tabulated form, and the species are also dealt with in the same way. There is no doubt that this paper is the most important on this subject up to the present time, based as it is, by a master of the subject, on such abundance of material.

In the October number of the *Ent. Mo. Mag.*, Mr. Norman H. Joy describes a new species of Coleopteron, *Mecitica criliformis*, which he has separated from *M. crilis*. It is probably generally distributed: specimens have come from Lundy Is., Berkshire, Norfolk, etc. Mr. E. A. Butler at the same time describes a Capsid Homopteron new to the British list, *Brachyarthrum limitatum*, hitherto recorded only from Scandinavia, Finland and Bohemia. It was found in Epping Forest in some numbers on aspen.

The third number of the quarterly *Jour. of Ent. and Zool.*, from

Pomona, California, contains the following articles:—"The Biology of the N. American Crane Flies," by C. P. Alexander; "Some inhabitants of the Round Gall of the Goldenrod," by Chi Ping; "*Aphidae* of California, IX," by E. B. Essig; all of which are well illustrated, as is usual in this publication.

In the *Entomologist* for October, Mr. G. Meade-Waldo figures and shortly diagnoses a new aberration of *Euxoa* (*Agrotis*) *corticea*, in which the claviform and orbicular stigmata are almost obsolete. He names it ab. *obsoleta*.

In the same number Mr. Cecil Floersheim commences some further "Notes on the Papilionids," in continuation of those which he at various times handed to the late Mr. Tutt for inclusion in his works on British Butterflies.

Further Notes on *Strymon* (*Thecla*) *aesculi* are contributed to the *Ent.* for October, by Messrs. G. T. Bethune-Baker and H. Rowland-Brown.

The following is the list of Officers and Council who are nominated for the South London Entomological Society during the ensuing year. *President*, Hy. J. Turner, F.E.S. *Vice-presidents*, A. E. Gibbs, F.L.S., F.Z.S., F.E.S., and R. Adkin, F.E.S. *Treasurer*, T. W. Hall, F.E.S. *Librarian*, A. W. Dodds. *Curator*, W. West (Greenwich). *Editor of Proceedings*, Hy. J. Turner, F.E.S. *Hon. Secretary*, Stanley Edwards, F.L.S., F.Z.S., F.E.S. *Council*, S. R. Ashby, F.E.S., B. S. Curwen, F. W. Frohawk, F.E.S., M.B.O.U., W. J. Kaye, F.E.S., D. R. Morford, W. G. Sheldon, F.E.S., T. H. Stallman, A. E. Tonge, F.E.S., and C. B. Williams, B.A., F.E.S.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.

October 6th, 1915.—The Honble. N. Charles Rothschild, M.A., F.Z.S., President, in the Chair.—ELECTION OF FELLOWS.—Messrs. Arthur Gibson, Entomological Branch, Dept. of Agriculture, Ottawa, Canada, and Harold Beck Williams, 82, Filey Avenue, Stoke Newington, N., were elected Fellows of the Society. LIVING LARVÆ OF LYCÆNA ARION.—Capt. Purefoy exhibited young larvæ of *Lycæna arion*, with an accompanying ant. DRAWINGS OF LYCÆNID LARVÆ.—Dr. Chapman exhibited drawings of various Lycænid larvæ with the epidiascope. DUTCH CHRYSOPHANUS DISPAR.—The Hon. N. C. Rothschild exhibited four specimens of *Chrysophanus dispar*, taken this year in Holland, apparently identical with the extinct British race. A CURIOUS CASE OF SYNGRYPTIC RESEMBLANCE.—Dr. Chapman exhibited a specimen of a Dipteron, a species of *Nemotelus* (Fam. *Stratiomyidae*), which was quite common where the cases of *Luffia ferchaultella* occurred, the cases of *Luffia* being imitated by a spider (*Cyclosa conica*). This Dipteron at rest also closely imitated the *Luffia* cases. A NEW ABERRATION OF EUXOA CORTICEA.—Mr. G. Meade-Waldo exhibited a new aberration of *E. corticea*, Hb., taken in his light-trap at Hever, Kent, in July; the specimen, known as ab. *obsoleta*, showing only the faintest trace of the orbicular and reniform stigmata. PROPORTIONS IN MONGREL FAMILIES.—Mr. L. W. Newman exhibited a very long and varied series of *Aplecta nebulosa* and its varieties ab. *robsoni* and ab. *thompsoni* and intermediate

forms, bred from a male and female both of the *robsoni* form, the percentages being: *robsoni* (including intermediates) 50%, typical specimens 26%, *thompsoni* 24%. Also a series of *Boarmia repandata* var. *conversaria*, from a pairing obtained between a typical light Huuts ♀ crossed with a *conversaria* ♂, every specimen being var. *conversaria* and every one a ♀. A NEW COCCID.—Mr. E. E. Green exhibited specimens and drawings of a new British Coccid, discovered at Camberley upon grasses in uncultivated meadows, referable to Signoret's genus *Fairmairia* (now known as *Parafairmairia*). REMARKABLE HYMENOPTERA.—The Rev. F. D. Morice exhibited:—(1) Gynandromorphous *Hylacus (Prosopis) brevicornis*. (2) *Haliectus larvigatus* ♂. In this specimen there were only two cubital cells in each upper wing, as in *Dufourea*, *Haliectoides*, etc. (3) A larva (in spirit) and numerous imagines—all ♀s—of the Sawfly *Pteronus (Lophyrus) sertifer* (= "*Tenthredo pectinatarufa*" of Retzius) with cocoons from which they emerged. FURTHER OBSERVATIONS FROM DR. G. D. H. CARPENTER.—Prof. Poulton said that, since the June meeting of the Society, he had received several interesting letters and boxes of specimens from Dr. Carpenter, and read and exhibited some of them. LIVING MYRMECINA GRAMINICOLA.—Mr. Donisthorpe exhibited a colony of *Myrmecina graminicola*, Latr., which he had kept in captivity for over five years, his object in showing this colony being to call attention to the number of winged females which had been reared in the nest this summer. The following papers were read:—"Observations completing an outline of the Life History of *Lycaena arion*," by T. A. Chapman, M.D., F.Z.S., F.E.S. "Further observations on the last stage of the larva of *Lycaena arion*," by F. W. Frohawk, M.B.O.U., F.E.S. "A contribution to the Life History of *Agriades escheri*, Hb.," by T. A. Chapman, M.D., F.Z.S., F.E.S. "On the early stages of *Latiiorina (Lycaena) pyrenaica*, Boisd.," by the same. "Notes on the early stages of *Scolitantides orion*, Pall.," by the same. "New Lepidoptera from the Schouten Islands," by J. J. Joicey, F.L.S., F.Z.S., F.E.S., and G. Talbot, F.E.S. "Some new *Parnassii*," by A. Avinoff, F.E.S. "A new Micropterygid from Australia," by A. Jefferis Turner, M.D., F.E.S. "Record of some new species of the genus *Teracolus* occurring in the northern territories of the Gold Coast, W. Africa," by G. C. Dudgeon, F.E.S. "*Glossina morsitans*, Westw., some notes on the parasitisation of its pupæ," by Hereward C. Dollman, F.E.S.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

August 26th.—TWO SPECIES OF PHYLLOTOMA.—Mr. Main exhibited leaves of the sycamore in which were the larvæ of the sawfly *Phyllotoma aceris*, and leaves of alder in which another species of *Phyllotoma* fed in a somewhat similar manner. S. AMERICAN SEXUALLY DIMORPHIC BUTTERFLIES.—Mr. Edwards, butterflies from S. America of the genera *Cybdelis*, *Cyclogramma*, *Catonephile* and *Myscelia*, showing marked sexual dimorphism. A HYBRID AGRIADES.—Mr. Newman, a "blue" captured in Kent in July, which he considered a hybrid between *Agriades coridon* and *A. thetis*, from its colour and markings. CHRYSOPA OVA.—Mr. Bunnett, ova of the lace wing *Chrysopa flava*, each laid on a stalk which were assembled in bunches. ITALIAN LEPIDOPTERA.—Mr. C. B. Williams, a box of Lepidoptera he had met with in the

Italian Val Formazza, from Domodossola leading up to the Tosa Falls. ABERRATIONS OF COCCINELLA.—Mr. Ashdown, two aberrations of *Coccinella bipunctata*, in which the spots were enlarged and united in a very unusual manner. A RARE COLEOPTERON.—Mr. West (Greenwich), a rare Coleopteron, *Scymnus arcuatus*, presented to the Society's collections by the Rev. J. F. Perry. MELANIC BOARMIA GEMMARIA.—Mr. Sperring, extremely dark examples of *Boarmia gemmaria* (*rhomboidaria*) bred from ova, the female parent from Darenth. CONFLUENT *A. FILIPENDULÆ*.—Mr. Tonge, confluent examples of *Anthroccera filipendulæ* from Reigate. A GYNANDROMORPHI (?) G. RHAMNI AND MELANIC *H. DEFOLIARIA*.—Mr. B. S. Williams, on behalf of Mr. Wanhill, a *Gonepteryx rhamni* in which male and female colour were mixed on the forewings, and several melanic specimens of *Hibernia defoliaria* from Epping Forest. MELANIC AND OTHER FORMS OF *H. DEFOLIARIA*.—Mr. Bowman, a very fine series of *H. defoliaria* from Epping Forest, including a dozen melanic examples, several light forms, strongly banded forms, mottled forms, etc. In the nine years previous to 1914 he had only met with two melanic forms in this locality.

September 9th.—LIFE-HISTORY OF *R. INQUISITOR*.—Mr. Sano exhibited living larvæ, pupæ and imagines of the Longicorn Coleopteron, *Rhagium inquisitor*. ABERRATIONS OF LYCENIDÆ.—Mr. Leeds, underside aberrations of *Agriades coridon* ab. *semisyngrapha*, blue suffused females of *Polygonatus icarus* and an ab. *syngrapha* with very dark margins to the wings. THE PYLADES GROUP OF PAPILIO.—Mr. H. Moore, imagines of the *pylades* group of *Papilio* from Africa, and read notes. A RARE SPECIES OF COLEOPTERA.—Mr. West (Greenwich), the rare Coleopteron *Athous rhombus*, taken at Swinley during the field meeting on July 3rd. ABERRATION OF *E. SUBNOTATA*.—Mr. B. S. Williams, an aberration of *Eupithecia subnotata* in which the mottled markings were absent, there being present on the submarginal area a series of quadrate light spots.

September 23rd.—An evening for the exhibition of Lantern-slides.—Mr. Rowan exhibited some beautiful slides illustrating the habits of birds. Mr. Tonge, the resting attitudes of the imagines of several Lepidoptera. Mr. Colthrup, the attitudes of living larvæ of several Lepidoptera. MENDELIAN AND OTHER RESULTS OF BREEDING.—Mr. Tonge exhibited a series of *Boarmia repandata* reared from Norfolk ova, the *repandata*-form ♂ = 1, ♀ s = 29, and *conversaria*-form ♂ = 0, ♀ s = 39. He also showed a series of *Numeria pulveraria* reared from Abbot's Wood ova, the variation was practically nil, ♂ s = 24, ♀ s = 27. ABERRATION OF *C. ELINGUARIA*.—Mr. B. S. Williams, an aberration of *Crocallys elinguaris* in which the ground colour was heavily dotted with dark brown, and the central band sharply margined white. THE CRUSTACEAN *B. DIAPHANUS*.—Mr. West (Ashted), the freshwater Crustacean, *Branchipus diaphanus*, from Claygate. *P. VILOSELLA*.—Mr. Morford, the case of the Psychid *Pachythelia vilosella* from the New Forest. ABERRATION OF *L. DEFLANA*.—Mr. Buckstone, a bred series of *Lithosia deplana* from Mickleham, one example being very smoky with rich yellow costa and fringes. ABERRATIONS OF LYCENIDS, ETC.—Mr. Leeds, many aberrations of "blues" taken this season mainly in Herts, with an *Epinphele jurtina* having extra ocelli on both upper and lower side, and an *Agriades coridon* ab. *semisyngrapha* from Kent.

THE LONDON NATURAL HISTORY SOCIETY.

March 2nd, 1915.—NEW MEMBER.—Mr. Herbert Loney, of 354, Goswell Road, E.C., was elected a member. THE SPOTTED FEVER ORGANISM.—Dr. Cockayne exhibited *Diplococcus intracellularis-meningitidis* of Weickselbaury, the organism which produces epidemic cerebro-spinal meningitis ("spotted fever"). ABERRATIONS OF THE GENUS BRENTHIS.—Mr. H. B. Williams, aberrant forms of *Brenthis euphrosyne* and *Argynnis aglaia*. Mr. A. W. Mera, two cabinet drawers of "fritillaries," including some fine dark forms of *Brenthis selene* and *Argynnis adippe*.

March 16th.—NEW MEMBERS.—Mr. W. H. A. Austen, of 102, Knightsbridge, S.W.; Prof. F. E. Hopkins, M.A., F.R.C.P., F.R.S., 71, Grange Road, Cambridge; Mr. G. T. Porritt, F.L.S., Elm Lea, Dalton, Huddersfield; and Mr. R. Worsley-Wood, M.A., Emmanuel College, Cambridge, were elected members of the Society. LEPTOCIRCUS SPECIES EXHIBITED.—Dr. Cockayne exhibited specimens of *Leptocircus curius* and *L. libelluloides*. GYNANDROMORPH H. MARGINARIA, ETC.—Mr. W. E. King, a gynandromorph of *Hybernia marginaria*, right side ♀, left ♂, and a series of ♀s, and a series of *H. leucophaearia* with ab. *marmorinaria* and ab. *merularia*, all from Chingford. ABERRATION OF A. THETIS.—Mr. C. H. Williams, a series of ♀ *Agriades thetis*, varying from brown with well developed marginal lunules to almost entirely blue. COLLECTION OF BRITISH SOCIAL WASPS.—Mr. C. Nicholson, a complete type collection of British social wasps, with examples of their nests, together with a comprehensive collection of insects of other orders, in illustration of a paper read by him on "Parasites, Paying-guests, and Mimics of Wasps."

April 20th.—Mr. A. W. Mera exhibited spring insects from Epping Forest, including dark *Phigalia pendaria*, *Apocheima hispidaria*, and *Hybernia leucophaearia* with its ab. *marmorinaria*. LARVÆ OF A. ASHWORTHII.—Mr. L. W. Newman, larvæ of *Agrotis ashworthii* from Colwyn Bay. It was pointed out by Mr. Robbins that these larvæ, which were feeding on sawlow, began their meal by eating a hole between the midrib and the edge of the leaf. HIBERNATING STAGE OF P. ATALANTA.—Mr. Newman stated that the larvæ of *Pyramis atalanta*, taken in October, had pupated in November. The pupæ had been exposed to frost and were now all alive. He suggested that this went to prove that the insect was capable of passing the winter in the pupa state, and that all early (May) specimens seen had passed the winter as pupæ.

May 18th.—DISCRIMINATION OF THE XANTHIA (SENS. LAT.) LARVÆ.—Mr. H. Worsley-Wood exhibited the larvæ of *Citria (Xanthia) fulvago* and *C. (X.) lutea*, and pointed out the obvious distinctions in them, also larvæ of these two species together with larvæ of *Chebia aurago* and *Xanthia ocellaris* in a box, all feeding on Poplar, and invited the members to divide them correctly. ABERRATION OF P. HASTIANA.—Mr. G. B. Heath, a long and very varied series of *Peronca hastiana*, bred from larvæ collected in S. Wales in an area of twenty square yards. ABERRATION OF P. NAPI. Mr. R. W. Robbins, a ♀ *Pieris napi* with the tips of the forewings exceptionally black, and the veins covered with black scales

on the outer margins of all wings. GYNANDROMORPH OF *A. POPULI*.—Dr. E. Cockayne. four gynandrous *Amorpha populi* which he had recently dissected. He remarked that the dissections seemed to illustrate a tendency for each half of the insect to produce a perfect whole. In some of the specimens certain organs showed a tendency to reduplicate, while others failed to develop altogether. Drawings of the dissected specimens were also shown. RESEMBLANCE OF PUPÆ TO SURROUNDINGS.—Mr. A. W. Mera, dimorphic pupa cases of *Papilio machaon* and *Pararge megera* to illustrate the assimilation of pupæ to the colour of their surroundings. SOME GALL INSECTS.—Mr. Burkill, a visitor, showed galls of *Rhabdophaga salicis* on *Salix repens* and of *R. rosaciella* on the same bush, from Esher, also *Dasyneura sisymbrii* on *Nasturtium amphibium* from near Bedfont. PAPER.—A paper was read by Mr. A. Sieh, F.E.S., on “A Hawthorn Hedge in Middlesex.”

June 1st.—ABERRATIONS OF IRISH *P. NAPI*.—Mr. L. W. Newman exhibited a long and varied series of *Pieris napi* from overwintering Irish pupæ. The series included a ♀ with forewings almost entirely black, and some males approaching *Pontia daplidice* in upperside coloration. Mr. A. W. Mera, dark forms of *Hybernia marginaria* from Epping Forest. SOME MORE GALL INSECTS.—Mr. H. J. Burkill, galls of *Urocystis violae* on *Viola sylvestris* from Ruislip, *Andrius ramuli* on *Quercus robur* from Esher and Oxshott, *Asphibolia radiceis* on *Q. robur* Staffordshire and Surrey, and *Eriophyes dispar* on *Populus tremula* from near Claygate. Dr. Cockayne, galls of *Eriophyes tri-radiatus* on *Salix fragilis* from Golders Green. SPRING LARVÆ.—Mr. J. Riches, a large number of different species of spring larvæ from Epping Forest.

June 15th.—NEW MEMBERS.—Mr. H. J. Burkill, of 103, Gresham House, E.C., and Mr. Vernon Stuart, of West Hill, Putney, were elected members. A SPECIAL EXHIBITION OF LARVÆ.—Mr. L. W. Newman showed larvæ of *Eutricha quercifolia*, *Pachygasteria trifolii*, *Trichiura crataegi*, *Asteroscopus nubeculosa*, *Geometra vernaria*, *Taeniocampa populeti*, *Polygoniac-album*, *Asphalia rideus*, *Endromis versicolor*, *Tephrosia crepuscularia*, *Polia chi*, *Euchloë cardamines*, *Maleydris* (*Larentia*) *multistrigaria*, *Nyssia lapponaria*, *Chesias spartiata* and *Lobophora carpinata* (*lobulata*). Mr. H. Worsley-Wood, *Agriopsis aprilina* and *Dyschorista fissipuncta* from Abbots Wood, the larvæ of both species were infested by parasitic worms, *Cleora lichenaria*, *Asphalia rideus*, *Psilura monacha*, *Taeniocampa munda*, *T. stabilis*, *Apocheima* (*Biston*) *hirtaria*, *Anathes* (*Orthosia*) *lota*, *Lygris testata*, *Poecilocampa populi*, *Eupithecia abbreviata*, and nymphs of the Homopteron *Ledra aurita* beaten from oak at Bookham the previous day. Mr. F. Mann, *Mala-cosoma neustria* and *Saturnia paeonia*. Mr. H. B. Williams, larvæ of *Spilosoma mendica*, *Aglais urticae*, *Rumicia phlaeas* and *Gonepteryx rhamni*. Mr. A. W. Mera, larvæ of *Miselia oxyacanthæ*, *Nola cucullatella* and others, and ova of *Rumia crataegata*. Mr. C. Nicholson, larvæ of *Orygia antiqua*, *Lygris testata* and *Euproctes chrysorrhoea*. Mr. L. J. Tremayne, pupa of *Epinephle jurtina* (*janira*). Mr. C. H. Williams exhibited a series of ♀s of *Polygonmatius icarus*, and a supposed *Anaitis plagiata* with the inner line entirely obsolete. Mr. H. B. Williams recorded *Brenthis euphrosyne* from Wimbledon Common, and Dr.

Cockayne *Abraxas sylvata (ulmata)*, at Abingdon on June 5th, a very early date.

September 7th.—It was announced that the President, Dr. Cockayne, had been granted a commission in the Royal Naval Volunteer Reserve, and had departed on active service. ABERRATIONS OF BRITISH LEPIDOPTERA.—Mr. B. Cooper exhibited a fine underside variety of *Plebeius aegon* and a series of *Satyrus semele*, including some very dark males from the New Forest. Mr. C. H. Williams, a long and very varied series of *Aglais urticae*. Mr. W. E. King, varieties of *Epinephle jurtina (janira)* and *Coenonympha pamphilus*. BRITISH GALLS NEW TO BRITAIN.—Mr. H. J. Burkhill, a small midge gall on *Epilobium angustifolium*, which had not been hitherto recorded in Britain.

September 21st.—NEW MEMBERS.—Mr. E. A. Aris, 9, Oak Avenue, Hornsey, N., and Mr. C. S. Bayne, 7, Trafalgar Square, Chelsea, S.W., were elected members. OCCURRENCE OF THE MITE T. LINTEARIUS.—Mr. L. B. Hall exhibited a colony of the red spinning mite *Tetranychus lintearius*, from gorse bushes on the cliffs of South Devon. BRITISH "BURNET" MOTHS.—Mr. A. W. Mera, a long and very varied series of "Burnets" with pupa cases of *Anthrocera trifolii*, *A. pilipendular*, and *A. eulans*, the last on heather. BRITISH GALLS.—Mr. H. J. Burkhill, two rare midge galls, *Perrisia salicaria* on *Lythrum salicaria*, and *Perrisia genisticola* on *Genista tinctoria*.

CONTENTS OF VOLUME XXVII.

(By J. R. LE B. TOMLIN, M.A., F.E.S.)

PAGE	PAGE
Aberrations and Varieties (see also Variation):— <i>Abraxas grossulariata</i> , 23; <i>Agriades coridon</i> , 24, 85, 141, 142, 210, 220, 224; 284; <i>A. thetis</i> , 187; <i>Agrotis nigricans</i> , 188; <i>A. corticea</i> , 282; <i>Anthocharis simplonia</i> , 27, 66, 82; <i>Anthrocera trifolii</i> , 263; <i>Araschnia levana</i> , 106, 108; <i>Arctia caja</i> , 141; <i>Argynnis aglaia</i> , 76, 141; <i>A. niobe</i> , 92; <i>A. pales</i> , 164; <i>Arctia medon</i> , 219; <i>Brenthis euphrosyne</i> , 81; <i>B. pales</i> , 166, 263; <i>B. selene</i> , 143; <i>Collophrys rubi</i> , 169; <i>Cheimatobia brumata</i> , 144; <i>Coenonympha arcania</i> , 106; <i>C. pamphilus</i> , 143; <i>C. satyrion</i> , 166; <i>Colias edusa</i> , 62; <i>C. palaeno</i> , 158, 225; <i>Callis clingularia</i> , 284; <i>Epinephle tithonus</i> , 77, 152; <i>Erebia epiphron</i> , 31; <i>E. manito</i> , 26; <i>E. melampus</i> , 164, 166; <i>E. tyndarus</i> , 166; <i>Euchelia jacobaeae</i> , 143; <i>Eupithecia subnotata</i> , 284;	<i>Glyphipteryx thrasonella</i> , 151; <i>G. equitella</i> , 151; <i>Gonepteryx rhamni</i> , 172; <i>Heodes hippothoë</i> , 167, 223; <i>Lasiocampa quercus</i> , 216; <i>Latorina orbitulus</i> , 225; <i>Limnitis populi</i> , 160; <i>Loecia dorilis</i> , 15; <i>Melanthia bicolorata</i> , 96; <i>Melitaea aurelia</i> , 104; <i>M. dictynna</i> , 216; <i>Nomiades cyllarus</i> , 27; <i>Pararge aegeria</i> , 25; <i>P. megera</i> , 25, 271; <i>Parasemia plantaginis</i> , 263; <i>Phaetra menyanthidis</i> , 188; <i>Pieris brassicae</i> , 273; <i>P. napi</i> , 38, 122, 220, 286; <i>Plebeius aegon (argus)</i> , 122, 124, 218; <i>P. argyrognomon</i> , 223; <i>P. lowei</i> , 63, 129; <i>Polyommatus icarus</i> , 51, 95, 141, 173, 187, 216, 219; <i>P. semiargus</i> , 35; <i>Psilura monacha</i> , 46; <i>Rumiccia phlaeus</i> , 70, 108; <i>Ruralis betulae</i> , 188; <i>Satyrus semele</i> , 77; <i>Taenioecampa gothica</i> , 187; <i>Tephritis flavipennis</i> , 57; <i>Vacciniina optilete</i> , 168; <i>Xanthorhoë montana</i> , 77; <i>X. sociata</i> 263

	PAGE		PAGE
Aberrations of <i>Argynnis aglaia</i> and notes from Minehead district ..	76	at Henley, 232; Species and Vars. New to Britain, 21, 138, 233, 235; Teratological Examples of ..	149
Abnormal <i>Crabro albilabris</i> , 45;		Collecting Lepidoptera in England, Spring 1915 ..	190
<i>Melitaea aurinia</i> ..	45	<i>Colymbola</i> ..	184
Abundance of <i>Amathes circellaris</i> , 75; <i>A. helvola</i> , 75; <i>A. litura</i> , 75; <i>Cleogene leucaria</i> , 224; <i>Corira</i> , 257; <i>Crambus culmellus</i> , 51; <i>C. hortuellus</i> , 50; <i>Eudoria angustea</i> , 173; <i>Glaucopsyche cyllarus</i> , 103; <i>Nyssia zonaria</i> (larvæ), 233; <i>Plutella maculipennis</i> , 68; <i>Porthesia similis</i> , 7; <i>Ptychopoda holosericata</i> , 6; <i>Pyrameis cardui</i> , 119; White Butterfly larvæ ..	234	Colour Discrimination by Bees ..	119
Addendum to Mr. Fison's Note on <i>Loewia amphidamas</i> ..	65, 104	Colours of Flowers and Butterflies	71
<i>Ageronia</i> , Unknown Organ in Anticiliary Appendages of ..	97, 153	<i>Coniopterygidae</i> , Brief Review of the British ..	241
Ants 16, 52, 72, 91, 93, 117, 120, 140, 184, 187, 205, 206, 213, 221, 231, 236, 237, 258, 265, 266.	283	Constantinople, Collecting at, in 1914 ..	35
<i>Apaturidi</i> in Switzerland ..	157, 162	Contribution to the Life-History of <i>Pyrgus proto</i> ..	102
Aphaniptera ..	138	Courtship of <i>L. dorilis</i> and <i>R. phlaeas</i> , 35; <i>G. nostradamus</i> ..	269
Aphides, New Myrmecophilous ..	52	Crackling Noise made by Lepidoptera ..	98, 153
"A Poser," Stainton ..	192, 247	Crustacea ..	184
Aptera ..	184	Cumberland Nature Reserve ..	213
Army Biscuit Enquiry ..	212	Current Notes and Short Notices 17, 43, 88, 116, 137, 184, 211, 232, 261, 281	281
Arthropoda from Algeria, Myrmecophilous ..	16	Day in the —, A ..	149
Assembling with <i>A. betularia</i> , 2; <i>O. antiqua</i> ..	2	Day-flying of <i>Cerigo matura</i> ..	7
Asymmetry 24, 85, 142, 143, 155, 175, 216	216	Dermaptera ..	281
Bees and Colour ..	119	Description of <i>Agrotis lunigera</i> , 194; <i>A. trux</i> , 193, 247; <i>Campionotus maculatus</i> , 221; <i>Coniopterygidae</i> , 241; <i>Myrmica schencki</i> , 265; New Myrmecophilous Aphides, 52; <i>Plebeius loewii</i> , 64; <i>Pyrgus proto</i> (larva) ..	103
Bibliography (Genitalia of the Lepidoptera) ..	133, 226, 274	Description of a Pterergate and two Gynandromorphs of <i>M. scabrinodis</i> , with list, etc. ..	258
<i>Braconidae</i> new to Britain ..	262	Diptera, 45, 57, 92, 138, 139, 140, 184, 185, 200, 233, 281; new to Britain, 20, 185, 235; new to Science ..	185
Breeding <i>Odontopera bidentata</i> , Notes on ..	109	Distinction between <i>Agrotis trux</i> and <i>A. lunigera</i> , 192, 247; <i>Thecla aesculi</i> and <i>T. ilicis</i> ..	262
Brief Review of the British <i>Coniopterygidae</i> , with tables, etc. ..	241	Doubleday Collection 212, 249, 262	262
British Lepidoptera (J. W. Tutt) ..	69	<i>Dysstroma concinnata</i> , Steph. ..	178
Butterflies of Lower Egypt 60, 128	128	Early Visit to Rammore Common ..	129
Butterfly Holiday in Great Britain 217	217	Easy method of Identifying Species of <i>Cnephasia</i> (= <i>Sciaphila</i>) ..	99
Buzzing of <i>Hylophila prasinana</i> ..	188	Egg-laying of <i>Phymatocera aterrima</i> ..	145
Caucasus, In the, Again ..	251	Egyptian Butterflies ..	60, 128
<i>Chrysophanidi</i> , Note on the ..	128	Entomological Club ..	212, 232
<i>Chrysophanus dispar</i> in the British Museum ..	212	Entomology in the U.S.A. ..	117
Cicada, Stridulation of the ..	254	<i>Epinephele</i> , The Ci-devant Genus 152	152
Ci-Devant Genus <i>Epinephele</i> , The 152	152	Fauna of Caldey Is. ..	182
<i>Cnephasia</i> , Easy Method of Identifying Species of the Genus 99, 144	99, 144	Feeding of <i>Cucullia verbasci</i> ..	208
<i>Coccidae</i> new to Science ..	213	Flight of Butterflies in coitu 71, 140	71, 140
Coleoptera 21, 87, 120, 184, 187, 212, 216, 237, 262, 281; <i>Cryphalus abietis</i> in Scotland, 138; Giant Glow-worm, 120; In the Trenches, 199; New Species and Vars. of, 21, 186, 233, 235; of Caldey Is., 184; of Glamorgan, 234; Records for S. Wales district, 87, 234; <i>Scymnus arcuatus</i>		Food-plant of <i>Cucullia verbasci</i> , 208; <i>Glyphipteryx equitella</i> , 151; <i>G. tuscoririadella</i> , 151; <i>G. thrausonella</i> , 151; <i>Hesperia evanida</i> , 64; <i>Nyssia zonaria</i> , 233; <i>Odontopera bidentata</i> , 110; <i>Parnassius apollo</i> , 200; <i>Plebeius loewii</i> ,	

	PAGE	PAGE
63; <i>Pontia glauconome</i> , 62; <i>Pygmaena fusca</i> , 225; <i>Pyrgus proto</i> , 102; <i>Scolitantides fatma</i> , 204; <i>S. orion</i> , 200; <i>Thaumatoptoea pityocampa</i> , 116; <i>Virachola livia</i> 64, 129		
Gall insects 286, 287		
Gelechiid, A rare, <i>A. coronillella</i> .. 280		
Genital armature, 7, 10, 31, 40, 43, 47, 56, 60, 97, 99, 132, 144, 240		
Genitalia:—Bibliography, 133, 226, 274; of <i>Dysstroma</i> , 180; <i>Epinephele</i> , 152; <i>Erebia palarica</i> , 121; the Genus <i>Cnephasia</i> .. 99, 144		
Gynandromorphous <i>Abraxas sylvata</i> , 95; <i>Agriades coridon</i> , 23, 46, 95, 139, 142, 210; <i>A. thetis</i> , 24; <i>Anthropera hippocrepididis</i> , 95; <i>Amorpha populi</i> , 95, 142, 286, ants, 259; <i>Boarmiia repandata</i> , 95; <i>Ematurga atomaria</i> , 95; <i>E. piniphela lycaon</i> , 155; <i>Euchloë cardamines</i> , 95; <i>Fidonia piniaria</i> , 95; <i>Gonepteryx rhamni</i> , 284; <i>Hemerophila abruptaria</i> , 95; hybrid <i>harrisoni</i> , 139; <i>Hybernia marginaria</i> , 285; hybrid <i>Smerinthus</i> × <i>Amorpha</i> , 141; <i>Myrmica scabrinodis</i> , 258; <i>Odontopera bidentata</i> , 112; <i>Plebeius argyrognomon</i> , 45; <i>Polyommatus icarus</i> , 24, 45, 46, 70, 95; <i>Saturnia carпинi</i> , 95; <i>Urbicola comma</i> 139		
Gynandromorphs and Sex 58		
Habitat of <i>Myrmica schencki</i> 265		
Habits of <i>Cheimatobia boreata</i> , 280; <i>Dysstroma</i> , 178; <i>Gegenes nostrodamus</i> , 269; <i>Glyptipteryx equitella</i> and <i>G. thrasonella</i> , 151; <i>Hesperia evanida</i> , 64; <i>Neorabea</i> , 261; <i>Odontopera bidentata</i> , 109; <i>Oecanthus</i> , 261; <i>Plebeius lowii</i> , 63; <i>Pyrgus proto</i> , 103; <i>Scolitantides barius</i> , 39; <i>Virachola livia</i> 63		
Hemiptera, 184, 186, 232, 236; new to Britain 43, 52, 67, 139		
Hibernation of <i>Musca corvina</i> , 140; <i>Vespa vulgaris</i> , 87, 115; <i>P. atalanta</i> 285		
Homoptera new to Britain 235		
Hybrid <i>Agriades</i> , 283; <i>Amorpha</i> and <i>Smerinthus</i> , 23, 46, 95; <i>Anthropera</i> , 22; <i>B. hirtaria</i> and <i>N. lapponaria</i> , 187; <i>Colias</i> , 71, 72; <i>Oporabia</i> 118		
Hymenoptera (see also Ants), 46, 61, 72, 87, 92, 113, 115, 119, 137, 145, 184, 213, 237, 262, 283; new to science 262		
Injurious Insects 119, 137, 138, 184, 212, 214, 233		
In the Cantabrians 124		
In the Caucasus again 251		
Isopoda, Myrmecophilous 17		
Jullien Organ in <i>Satyridae</i> 98		
Larva of <i>Anechura bipunctata</i> , 251; late spring, 286; <i>Lycænid</i> resembling flower, 93; <i>Nepticula septembrella</i> , 231; <i>N. tiliæ</i> , 232; <i>Odontopera bidentata</i> , 110; <i>Pyrgus proto</i> , 102; <i>Seymus arcuatus</i> , 232; <i>Thaumatoptoea</i> 86, 116, 208, 230		
Lepidoptera, at lighthouses, 20, 21; at the front, 200; genital armature of, 7, 10, 31, 40, 43, 47, 56, 97, 144; genus <i>Cnephasia</i> , 99, 144; genus <i>Epinephele</i> , 152; in Ireland, 20; in the Rhone Valley, 200; new species and vars. of, 95, 118, 119, 122, 213, 236; new to Britain, 95, 118, 119; noises made by, 98, 153, 188; returning to same place, 22; Swiss, 13, 25, 65, 103, 156; teratological examples, 93; unknown organ in 97		
Lepidoptera of Aix, 79; Albarracin, 174; Annot, 83; Bude, 217; Caldey Is., 183; Caucasus, 251; Costebelle, 81; Digne, 83; Durham coast, 219; Eastbourne, 231; Grange-over-Sands, 218; Highgate, 2; Lower Egypt, 69, 128; Minehead, 76; Nice, 82; North Wales, 231; Pajares, 121; Puente de los Fierros, 189; Rammore Common, 129; S. Moritz, 163, 222; Scarborough, 73; South Provence, 78; South-West London, 150; Spain, 121, 124, 143, 152, 173, 189; Upper Engadine 163, 222		
Lepidoptera round about Scarborough 73		
Lepidopterological Notes for 1914 .. 1		
Lepidopterology 202		
Lice in the Trenches 199		
Life-History of <i>Musca domestica</i> , 233; <i>Pyrgus proto</i> , 102; Tree Crickets 261		
Lower Egypt, Butterflies of .. 60, 128		
<i>Lycænidæ</i> , Resting attitude of .. 16		
<i>Lycænid</i> larva resembling flower .. 93		
Male <i>L. quercus</i> with female colouring 216		
Marriage-Flight of Ants, Remarkable 205, 206		
Marriage-Flights of <i>Donisthorpea</i> on August 8th, etc. 206, 231		
Melanie <i>Brenthis palæa</i> , 216; <i>Boarmiia abictaria</i> , 172; <i>B. gemmaria</i> , 170, 284; <i>B. repandata</i> , 70; <i>Dryas paphia</i> , 139; <i>Dysstroma concinnata</i> , 179; <i>Ellopija prosapia</i> , 114; <i>Eupithecia albipunctata</i> , 142; <i>E. castigata</i> , 142; <i>E. innotata</i> , 119; <i>E. lariciata</i> , 119; <i>E.</i>		

	PAGE		PAGE
<i>nanata</i> , 119; <i>E. vulgata</i> , 142; <i>Odontopera bidentata</i> , 111; <i>Psi- lura monacha</i> , 70; <i>Ptychophora contiguaria</i> , 142; <i>Xylophasia monoglypha</i>	75	Priority in terminology (Genitalia)	9, 11, 32, 47, 60, 145
Mendelism and results	109, 283, 284	Priority Note	60
Method of Examining Genitalia ..	99, 144	Processionary caterpillars	86, 116, 208, 230
Microlepidoptera of S.W. London, 150; Norway	182	Protective resemblance in <i>B. zelleri</i>	269
Microscopic Stage, Movable	93	Psocid new to the British Fauna	229
Month among Spanish Butterflies	173	Pterergate of <i>Myrmica seabrinodis</i>	253
Mounting of Insects	261	Publication of Papers	116, 215
Myrmecophilous <i>Acarina</i> , 184; <i>Arthropoda</i> , 16; <i>Aphides</i> , 52; <i>Isopoda</i> , 17, 184; <i>Thysanura</i> ..	17	Puente de los Fierros	189
<i>Myrmica schencki</i> , an Ant new to Britain	265	Pupal Habitations	93
Neuration in <i>Melitaea aurinia</i> , Ab- normal	45	Pupa of <i>Odontopera bidentata</i> ..	111
Neuroptera 93, 144, 185, 213, 229,	241	<i>Pyrameis cardui</i> flying by night ..	5
New Myrmecophilous Aphides, 52; Ant	265	Remarkable Marriage Flight of Ants and some Theories	205
Night-flying <i>P. cardui</i>	5	Reply to the Rev. C. R. N. Burrows	56
Nomenclature	132, 240	Resting attitude of the <i>Lygaeonidae</i> , 16; of <i>Eupithecia oblongata</i> ..	207
Nomenclature of Genital Organs, 8, 11, 31, 47, 60, 132, 133, 145; of the Genus <i>Cnephasia</i>	100	Sallowing	1, 75
Note on <i>Loewia amphidamas</i> , Ad- dendum to	65, 104	Scarcity of "Coppers"	65, 128
Note on <i>Scolitantides orion</i> , etc. ..	200	Scientific Notes and Observations 16, 67, 85, 115, 182, 208, ..	230
Note on the <i>Chrysophanidi</i> and <i>P. amandus</i>	128	Seasonal Notes	68
Note on Mr. Muschamp's Spanish captures	278	Season of 1913	65, 77
Notes from Minehead district	76	Season of 1914	1, 35, 49, 65, 68, 76, 78, 124, 163, 168, ..
Notes from the trenches	199	Season of 1914 in South Provence	78
Notes on breeding <i>O. bidentata</i> ..	109	Season of 1915	190
Notes on Collecting, etc. 16, 68, 86, 182, 207, 230, 260,	278	Second Brood of <i>Abraeus grossu- lariata</i> , 143; <i>Anthocharis bele- mia</i> , 62; <i>Aricia medon</i> , 221; <i>Clastrina argiolus</i> , 2, 220; <i>Colias edusa</i> , 126; <i>Eupithecia innotata</i> , 142; <i>Leptosia swapis</i> , 217; <i>Odontopera bidentata</i> , 113; <i>Pieris brassicae</i> , 172; <i>Polyom- matus icarus</i> , 22; <i>Pontia glau- conome</i>	62
Notes on Collecting in 1914	168	Societies' Reports:—City of Lon- don Entom. Soc., 91; Entomo- logical Congress (Third), 92; Entom. Soc. of London, 18, 44, 70, 92, 119, 139, 186, 236, 282; Lancashire and Cheshire Entom. Soc., 23, 94, 143; London Nat. Hist. Soc., 24, 69, 91, 141, 185, 285; North London Nat. Hist. Soc., 95; Royal Photographic Soc., 212; Société Entomologique de la France, 213; Société Lépi- doptérologique de Genève, 90; South-Eastern Union of Scien- tific Societies, 89, 235; South London Entom. and Nat. Hist. Soc., 18, 21, 90, 116, 120, 140, 186, 216, 261, 263, 283; York- shire Naturalists' Union	19
Notes on Swiss <i>Rhopaloeera</i> 13, 25, 65, 103, 156,	266	South Provence, The season of 1914 in	78
Notes on the Microlepidoptera of S.W. London	150	Spread of Butterflies in the Rhone Valley	200
Notes on the Taxonomic Value of the Genital Armature in Lepi- doptera	7, 10, 40, 56	Sugaring	3, 6, 75, 77, 170, 172, 272
Obituaries:—Dr. Brunner von Wattenwyl, 213; T. Carreras, 185; H. J. Fabre, 264; H. H. Lyman, 18, 96; Col. N. Man- ders, 239; Dr. W. Saunders ..	262	Sunless Seasons and Scarcity ..	66, 104
Odonata	36, 61, 126, 184, 213	Swiss <i>Apaturidi</i>	157, 162
Organ hitherto unknown in Ancil- lary Appendages of Lepidoptera,	97, 153		
Orthoptera	71, 93, 184, 187, 200, 213, 251, ..		
Ova of <i>Odontopera bidentata</i>	110		
Oviposition of <i>Phymatocera ater- rima</i> , 145; <i>C. mathias</i>	278		
Pajares	121		
Parasites attacking <i>Odontopera bidentata</i>	113		
Poser, A	192, 247		

	PAGE
Swiss Rhopalocera	13, 25, 65, 103, 156
Symmetry of Insects	.. .. 138
Syncryptic resemblance	.. .. 282
Taxonomic Value of Genital Armature	.. .. 7, 10, 40, 56
Tegumen	.. .. 9, 11, 31, 42
<i>Teracolus</i> in Egypt	.. .. 62
Teratological Examples	.. .. 93, 140
Terebra, Definition of the	.. .. 145
Terminology of the Genital Organs,	8, 11, 31, 47, 60, 132, 133, 145
The Season 1914 near Pollock-shields, etc.	.. .. 49
<i>Thysanoptera</i>	.. .. 19, 21
<i>Thysanura</i>	.. .. 17, 184
Type of <i>Camponotus maculatus</i> , The	.. .. 221
Upper Engadine in 1914	.. .. 163, 222
Valvæ	.. .. 9, 11, 32, 42
Variation in the Wing-markings of <i>Tephritis flavipennis</i> ,	57; in

	PAGE
<i>Agrotis trux</i> and <i>A. lunigera</i> ,	192, 218; <i>Apataridi</i> , 157, 162;
<i>Aphantopus hyperantus</i> ,	141;
<i>Aricia</i> , 279; <i>Argynnis adippe</i> ,	279; <i>Celastrina argiolus</i> ,
210; <i>Dysstroma</i> , 179; <i>Eupitheciae</i> ,	142; <i>Glyphipteryx thrasonella</i> ,
151; <i>Melanthia bicolorata</i> ,	96; <i>Odontopera bidentata</i> ,
112; <i>Plebeius aegon (argus)</i> ,	122, 218;
<i>P. loewii</i> ,	63; <i>Polyommatus icarus</i> ,
219; <i>A. coridon</i>	.. .. 279
Verrall Supper	.. .. 44
War Notes	17, 41, 69, 88, 92, 116, 117, 149, 185, 199, 203, 211, 213, 233, 234, 261, 281
What are the Tegumen and Valvæ in the Armature of the Lepidoptera?	.. .. 31
Wing-markings of <i>Tephritis flavipennis</i> , Variation in the	.. .. 57

REVIEWS AND NOTICES OF BOOKS, ETC.:—*Annals of the Ent. Soc. of France*, 208; *Annual Rep. of the Photographic Survey and Record of Surrey*, 262; *Annual Rep. of the U.S. Nat. Museum*, 138; *Annual Rep. of the Ent. Soc. of Ontario (1914)*, 214; *British Ants, their Life-History and their Classification*, H. Donisthorpe, 91, 232, 237; *British Lepidoptera*, vol. xi., 69; *Bulletin de la Soc. Ent. de la France*, 213; *Canadian Entomologist*, 18, 20, 118, 138, 184, 213; *Entomological News*, 92, 119, 210, 235, 261, 262; *Entomologist*, 19, 20, 21, 118, 139, 262, 282; *Entomologists' Monthly Mag.*, 19, 20, 21, 43, 67, 118, 137, 138, 185, 213, 233, 235, 262, 281; *Études de Lépidoptérologie Comparée*, C. Oberthür, 202; *Genitalia of the Geometridæ of the Brit. Isles*, F. N. Pierce, 47; *House-Fly as a Danger to Health*, E. E. Austen, 233; *House-Fly Campaign*, Prof. Lefroy, 233; *Irish Naturalist*, 20, 236; *Journal of Economic Entomology*, 117; *Journal of Entomology and Zoology*, 92, 214, 281; *Journal of the Royal Microscopical Society*, Dr. Burr, 281; *Naturalist*, 19, 138, 213; *Proceedings of the S. London Ent. and Nat. Hist. Soc.*, 214; *Proceedings of the U.S. Nat. Museum*, 233; *Scottish Naturalist*, 18, 20, 21, 118, 138, 233; *Smithsonian Institution*, 20; "Some South Indian Insects . . . from an Economic Point of View," T. B. Fletcher, 46; *South-Eastern Naturalist*, 235; *Transactions of the Cardiff Nat. Soc. (1914)*, 234; *Transactions of the City of London Ent. Soc.*, 91; *Transactions of the Ent. Soc. of London*, 43, 90, 213, 234; *Transactions of the London Nat. Hist. Soc. (1914)*, 235; *Tree-Crickets injurious to Orchard and Garden Fruits*, P. J. Parrott and B. B. Fulton, 137, 261; *Tree-Crickets of New York*, B. B. Fulton, 261; *Vasculum*, 185; *Year's Scientific Work in Yorks* 19

LOCALITIES:—Abertillery, 168, 170; Aigle, 159; Aix-en-Provence, 79; Albaracín, 174; Algeria, 16; Annot, 83; Arrochar, 49; Burnmouth, 231; Belgrade Forest, 35; Bernina Pass, 167; Betchworth, 6; Bickley, 169; Binn, 158; Blackhall, 219; Branson, 160, 266; Brancúles, 124; Brentwood, 3; Bridlington, 75; Brodieck, 51; Bude, 5, 217; Burgos, 127; Cairo, 268; Caldey Is., 182; Caucasus, 251; Caux, 101; Champéry, 26, 30, 266; Charpigny, 13, 15, 25, 30, 266; Chiswick, 68, 150; Clarens, 14; Coire, 15; Constantinople, 35; Costebelle, 81; Crookston, 19; Davos, 15; Digne, 83; Dil Iskelessi, 37; Eastbourne, 231; Elepens, 162, 267; Egypt, 60, 128, 268; El Kantara, 17; Engadine, 163, 222; Epping Forest, 285; Essex, 230; Faïdo, 104; Fierros, 189, 278; Folkestone, 1, 170; Forest of Dean, 171; Geok Tapa, 252; Glen Sluain, 51; Gourrock, 49; Grange-over-Sands, 218; Guernsey, 270; Gyok-su, 36; Hamman Meskoutine, 16; Hampstead Heath, 1; Hershams, 205; Highgate, 2; Irvine, 51; Kazbek, 251; Kinghorn, 220; Kingmoor Common, 213; Kislovodsk, 257; Kutais, 252; Lambèse, 16; La Valette, 81; London, 150, 207; Lugano, 25; Lymington, 171; Murtigny, 13, 14; Milngavie, 49; Minehead, 76; Monte Bre, 25;

New Forest, 172, 218; Nice, 82; North Downs, 191; Norway, 182; Ongar, 7; Pajares, 121, 124; Pendik, 38; Pickering, 73; Plan Cerisier, 25; Pollokshields, 49; Ponferrada, 125, 152; Pont-du-Gard, 80; Pontresina, 107, 165; Port-llan-fraith, 169; Putney, 207; Rammore Common, 129; Rhone Valley, 28, 128, 159, 200, 267; Remouilins, 80; Richmond, 68, 150; Royston, 220; St. David's, 87; St. Moritz, 163, 222; Scarborough, 73; Sertigthal, 106; Sheen, 159; Sierre, 27; Silverdale, 143; Sion, 103; Spain, 121, 124, 143, 152, 173, 189; Stampa, 108; Surrey, 190; Swanage, 172; Tibidabo, 174; Tramelan, 28; Tyn-y-groes, 231; Utznach, 15; Walton-on-Thames, 205; Weesen, 26, 29, 105, 108; Weston-super-Mare, 171; Weybridge, 205, 258; Whistlefield, 51; Wimbledon, 68; Wye, 3, 4; Yverdon 160

LIST OF CONTRIBUTORS.

	PAGE		PAGE
Allen, J. W.	87	James, R.	1
Anderson, J.	231, 260	Lowe, Rev. F. E., M.A., F.E.S. ..	270
Ashby, E.B., F.E.S.	190	Manders, Col. N. (the late), F.E.S.,	60, 149
Bagnall, R.S., F.E.S. 68, 229, 241		Metcalf, Rev. J. W., F.E.S. ..	99
Bethune-Baker, G. T., F.L.S.,		Muschamp, P. A. H., F.E.S. 121,	152, 189
F.E.S.	10, 31	Nicholson, C., F.E.S.	115, 230
Bird, J. F.	76	Page, Rosa E., B.A.	124
Blair, K. G., F.E.S.	199	Page, H. E., F.E.S.	280
Bowater, W., Lieut., R.A.M.C.T.,		Perry, Rev. J. F.	232
F.E.S.	109	Pierce, F. N., F.E.S.	7, 99
Burr, Capt. M., D.Sc., F.L.S.,		Rait-Smith, W., F.E.S.	168
F.Z.S., F.E.S. .. 89, 211, 233, 251		Reverdin, Dr. J. L.	97
Burrows, Rev. C. R. N., F.E.S.	40, 56, 230	Sheldon, W. G., F.E.S.	102, 278
Buxton, P. A., F.E.S.	16, 182	Sich, A., F.E.S. 50, 68, 150, 182,	231, 280
Chapman, T. A., M.D., F.Z.S.,		Simes, J. A., F.E.S.	173
F.E.S. .. 116, 145, 202, 208, 210		Sperring, C. W.	208
Cockayne, E. A., M.D., M.A.,		Tetley, A. S., M.A., F.E.S. ..	73
F.L.S., F.E.S.	178	Theobald, F. V., M.A., F.E.S. ..	52
Collin, J. E., F.Z.S., F.E.S. ..	57	Tonge, A. E.	208
Crawley, W. C., B.A., F.E.S. ..	205	Turner, H. J., F.E.S. 7, 46, 58,	107, 120, 129, 133, 163, 190, 192,
Dalglish, A. A., F.E.S.	49	207, 208, 210, 222, 226, 231, 247,	264, 274
Donisthorpe, H. St. J. K., F.Z.S.,		Warren, B. C. S., F.E.S.	128
F.E.S. 117, 206, 221, 232, 258, 265		Wheeler, Rev. G., M.A., F.Z.S.,	14, 25, 27, 29, 30, 60,
Earl, H. L., F.E.S.	78	F.E.S. 158, 159, 217, 239	
Fison, A. J. (the late) 13, 25, 103,		Williams, H. B.	85
156, 266			
Fison, Lilian M. 13, 25, 65, 86, 87,			
103, 156, 200, 266			
Graves, Capt. P. P., F.E.S. 35,			
128, 265			

LIST OF ILLUSTRATIONS, &c. (Notice to Binder).

	To face	PAGE
PL. I. Wing-markings of <i>Tephritis flavipennis</i>	57
PL. II. <i>Ageronia</i> spp.—An Unknown Organ	97
PL. III. Diagnostic details in the Genitalia of the Genus <i>Cnephasia</i>	99
PL. IV. The terebra of <i>Phymatocera aterrima</i>	145
PL. V. Diagrams to illustrate the cutting of the pocket by <i>Phymatocera</i>	145
PL. VI. <i>Epinephele jurtina</i> , <i>nurag</i> , <i>ida</i> , <i>pasiph-v</i> , <i>lycaon</i> , <i>narica</i> , <i>tithonus</i>	152
PL. VII. <i>Dysstroma concinnata</i> , <i>D. citrata</i> and <i>D. truncata</i>	178
PL. VIII. Male genitalia of <i>Dysstroma concinnata</i> and <i>D. truncata</i>	178
PL. IX. Male genitalia of <i>Dysstroma citrata</i>	178

TEXT FIGURES.

Page 230	Gonapophyses and Valvæ of <i>Pterodela</i> spp.
„ 240	Forceps and Phallus in Hymenoptera.
„ 242	<i>Conucentzia</i> spp.
„ 244	Neuration in <i>Coniopteryx</i> and <i>Semidalis</i> .
„ 245	Neuration in <i>Parasemidalis</i> .

WATKINS & DONCASTER,

Naturalists and Manufacturers of Entomological Apparatus and Cabinets.

Plain Ring Nets, wire or cane, including Stick, 1/3, 2/-, 2/6, 3/-. Folding Nets, 3/6, 4/-, 4/6. Umbrella Nets (self acting), 7/-. Pocket Boxes (deal), 6d., 9d., 1/-, 1/6. Zinc Collecting Boxes, 9d., 1/-, 1/6, 2/-. Nested Chip Boxes, 7d. per four dozen, 1 gross, 1/6. Entomological Pins, 1/6 per ounce. Pocket Lanterns, 2/6 to 8/-. Sugaring Tin, with brush, 1/6, 2/-. Sugaring Mixture, ready for use, 1/9 per tin. Store-Boxes, with camphor cells, 2/6, 4/-, 5/-, 6/-. Setting-Boards, flat or oval, 1in., 6d.; 1½in., 8s.; 2in., 10d.; 2½in., 1/-; 3½in., 1/4; 4in., 1/6; 5in., 1/10; Complete Set of fourteen Boards, 10/6. Setting Houses, 9/6, 11/6; corked buck, 14/-. Zinc Larva Boxes, 9d., 1/-, 1/6. Breeding Cage, 2/6, 4/-, 5/-, 7/6. Coleopterist's Collecting Bottle, with tube, 1/6, 1/8. Botanical Cases, japanned double tin, 1/6 to 4/6. Botanical Paper, 1/1, 1/4, 1/9, 2/2 per quire. Insect Glazed Cases, 2/6 to 11/-. Cement for replacing Antennae 4d. per bottle. Steel Forceps, 1/6, 2/-, 2/6 per pair. Cabinet Cork, 7 by 3½, best quality 1/6 per dozen sheets. Brass Chloroform Bottle, 2/6. Insect Lens, 1/- to 8/-. Glass top and Glass bottomed Boxes, from 1/- per dozen. Zinc Killing Box, 9d. to 1/-. Pupa Digger, in leather sheath, 1/9. Taxidermist's Companion, containing most necessary implements for skinning, 10/6. Sculptels, 1/3; Scissors, 2/- per pair; Eggdrills, 2d., 3d., 9d.; Blowpipes, 4d.; Artificial Eyes for Birds and Animals. Label-lists of British Butterflies, 2d.; ditto of Birds' Eggs, 2d., 3d., 6d.; ditto of Land and Fresh-water Shells, 2d. Useful Books on Insects, Eggs, etc.

SILVER PINS for collectors of Micro-Lepidoptera, etc., as well as minute insects of all other families.

We stock various sizes and lengths of these Silver Pins which have certain advantages over the entomological pins (whether enamelled black or silver or gilt).

For instance, insects liable to become greasy and to verdigris like *Sesiidæ*, etc., are best pinned on Silver Pins which will last much longer than ordinary pins.

We shall be pleased to send pattern cards on application.

SHOW ROOM FOR CABINETS

Of every description of INSECTS, BIRDS' EGGS, COINS, MICROSCOPICAL OBJECTS, FOSSILS &c.

Catalogue (100 pages) sent on application, post free.

LARGE STOCK OF INSECTS AND BIRDS' EGGS (British, European, and Exotic)
Birds, Mammals, etc., Preserved and Mounted by First class Workmen.

36, STRAND, LONDON, W.C., ENGLAND.

SYNOPSIS OF THE ORTHOPTERA OF WESTERN EUROPE.

By **MALCOLM BURR, D.Sc., F.Z.S., F.L.S., F.E.S., &c.**

Bound in Cloth, 160 pp., with good Index (Specific and Generic).

Price 3s. net.

A pocket handbook for the use of collectors in the field. Covers all species found west of the Carpathian Mts. Description of each species, habits, habitats and distribution.

Will be sent Post Free on receipt of Postal Order for 3s. to

A. H., 41, Wisteria Road, Lewisham, S.E.

SOMETHING NEW AND CHEAP.

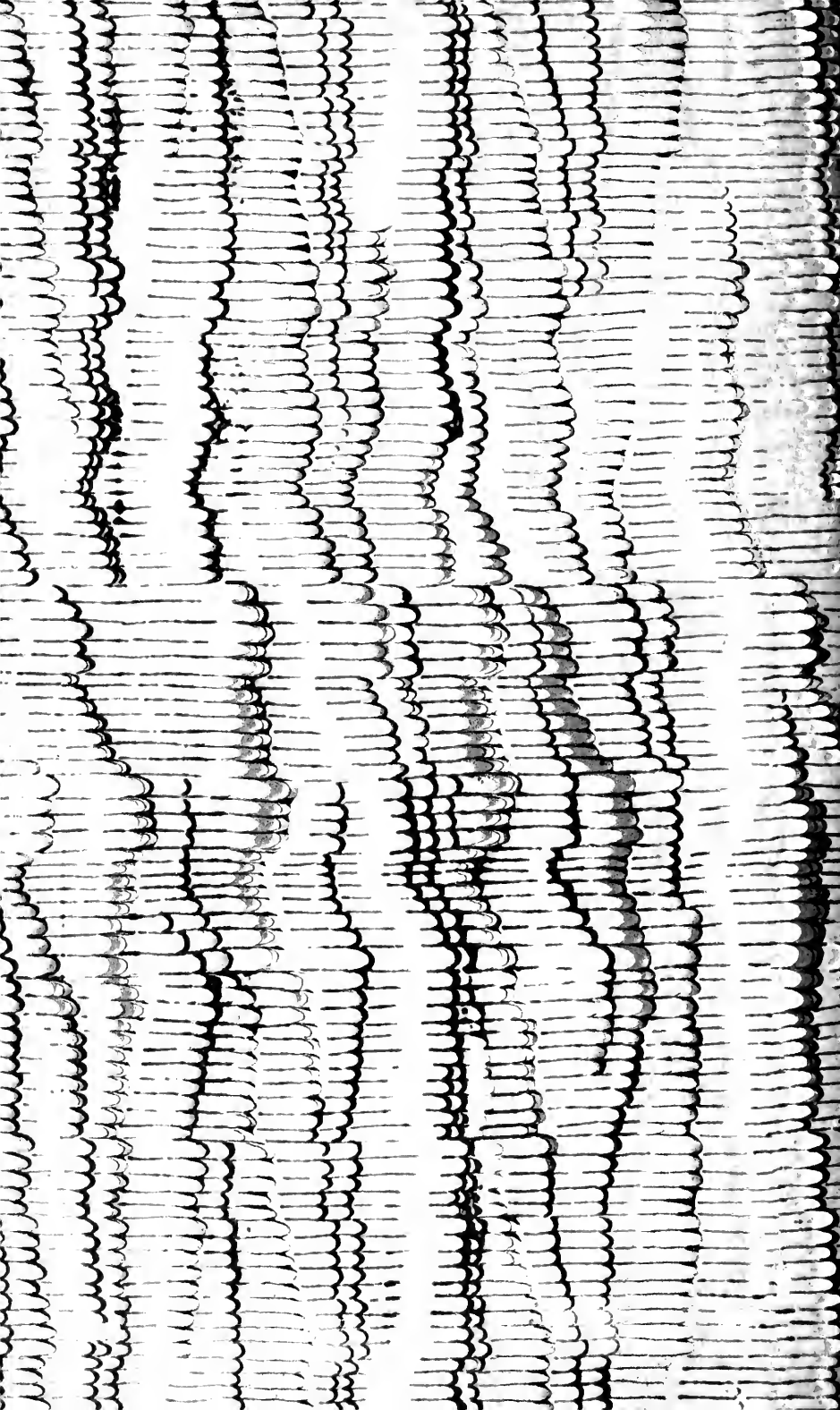
By special request of many of my clients, I have issued a small leaflet entitled, "**Valuable Hints to Collectors.**" This little work will be found most useful to the advanced collector as well as the beginner and one of the hints alone is worth more than the cost of the work. Amongst other matters it deals with treatment of Ova, Larva and Pupae in captivity, cleaning insects for green, killing and setting, and gives some very useful substitute foodplants. Price **9d.** only, post free.

Write for latest price lists of Ova, Larva, Pupae, and Set Insects, the smallest order thankfully received. Don't forget I can supply all apparatus at usual prices.

Remember my Relaxing Tins and Text-book.

L. W. NEWMAN, F.E.S., Bexley, Kent.





iation

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 3809