



Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation

15101
F

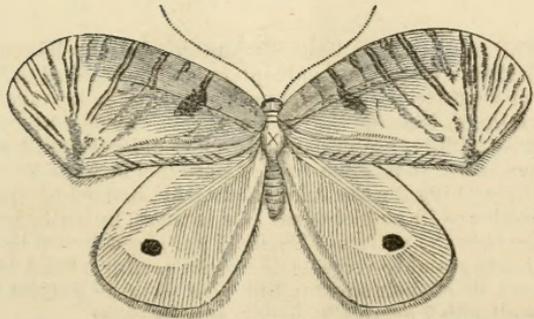
Biological
& Medical
Series

THE
ENTOMOLOGIST

CONDUCTED BY

EDWARD NEWMAN.

VOLUME VII.



PSYCHOPSIS MIMICA.

207029
13:11:26

LONDON:

SIMPKIN, MARSHALL, & CO., STATIONER'S HALL COURT.

1874.

“Observe the INSECT RACE ordained to keep
The lazy Sabbath of a half-year's sleep.
Entombed beneath the filmy web they lie,
And wait the influence of a kinder sky.
When vernal sunbeams pierce their dark retreat
The heaving tomb distends with vital heat;
The full-formed brood, impatient of their cell,
Start from their trance, and burst their silken shell;
Trembling awhile they stand, and scarcely dare
To launch at once upon the untried air.
At length assured, they catch the favouring gale,
And leave their sordid spoils and high in æther sail.”

MRS. BARBAULD.

“Even in favour of the mere butterfly-hunter—he who has no higher aim than that of collecting a picture of Lepidoptera, and is attached to insects solely by their beauty or singularity—it would not be difficult to say much. Can it be necessary to declaim on the superiority of a people, amongst whom intellectual pleasures, however trifling, are preferred to mere animal gratifications? Is it a thing to be lamented that some of the Spitalfields weavers occupy their leisure hours in searching for the Adonis butterfly, instead of spending them in playing at skittles or in an alehouse? Or is there, in truth, anything more to be wished than that the cutlers of Sheffield were accustomed thus to employ their *Saint Mondays*; and to recreate themselves, after a hard day's work, by breathing the pure air of their surrounding hills while in pursuit of this, their ‘untaxed and undisputed game’?”—KIRBY AND SPENCE.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- Adams, C. L. 207
Anderson, Joseph, jun. 22, 161, 164
- Baly, Joseph S., F.L.S. 293
Barrett, J. P. 71
Bartlett, Henry, 296
Batchelor, T. 81
Bell, Alfred 210
Bennett, A. W., M.A., B.Sc., F.L.S. 135
Bignell, G. C. 185
Birchall, E., F.L.S. 21, 121, 149, 271
Borrer, W., jun. 186
Bradbury, S. 91
Bright, A. H. 213
Brook, George 292
Brunton, T. 43
Buckton, G. B., F.R.S., F.L.S. 114, 141
- Capper, Samuel James 216
Carrington, John T. 205, 206, 228
Clifford, John R. S. 22, 129, 208, 224,
225, 226, 230
Clogg, Stephen 259
Cole, William 14
Cooke, Nicholas 178
Cooke, W. 163
Cope, W. J. 213
Corbin, G. B. 44, 45, 70, 132, 137,
167, 182, 183
Cordeaux, John 161, 203
Crewe, Rev. H. Harpur, M.A. 290, 291
- Dale, J. C., F.L.S., the late 290
Dashwood, E. S. 140
Dawson, George R. 23, 94, 169
Dearnley, F. 163
Doubleday, Henry 87, 112, 115, 260
- Edwards, W. 163
Eedle, T. 206
Egles, Rev. E. H. 91, 178
- Fitch, E. A. 24, 45, 140, 293
Fletcher, J. E. 69, 71
Forbes, W. A. 23, 112, 162, 165, 185,
231, 234
- Gardner, J. 178
Garlick, Constance 259
Gatcombe, J. 233
Goss, H. 203, 205
Gregson, C. S. 17, 68, 255
Grigg, William H. 179
Grubb, John 91
Gulliver, George 259
Gustard, H. Stafford 203
- Hamilton, A. 212
Hamilton, J. 72
Hamlin, C. 259
Harper, W. 218
Harrison, John 163
Harwood, W. H. 129, 288
Herkomer, Mrs. Hubert 73, 98, 145,
170, 193, 217, 241, 265
Hervey, Rev. A. C. 91, 259
Hillman, Thomas 290
Hodges, H. C. 233
Hodgkinson, J. B. 90, 175, 178, 205,
231
- Jennings, Rev. P. H. 229, 230,
285
- Kay, R. 291

- Leconte, John L., M.D. 277
 Lilly, J. A. 228
 Llewelyn, John T. D., F.L.S. 260
 Lockyer, Bernard 138
 Lomas, T. 164
 Lucas, T. P., M.D. 292
 Luff, W. A. 10, 42

 Macmillan, W. 140
 Maling, W. 89, 225
 Marshall, W. C. 209, 213
 Mathew, G. F., R.N., F.L.S. 62
 May, J. W. 252, 267
 McRae, W. 22
 Meek, E. G. 19, 165, 177
 Mills, Rev. John W. 174
 Moncreaff, Henry 93, 130, 132
 Mosley, S. L. 228

 Newman, Edward, F.L.S. 24, 49, 53,
 70, 88, 93, 97, 105, 119, 125, 140, 184,
 211, 212, 213, 234, 236, 242, 260, 295
 Norgate, Frank 69

 Oldfield, G. W. 139, 289
 Oldham, Charles 228

 Parry, G. 16, 289
 Paul, Arthur W. 154
 Pease, Edward R. 174
 Perkins, Anne Steele 20, 210
 Peyton, W. 82
 Phillips, F. J. 165
 Porritt, Geo. T., F.L.S. 90, 109, 110,
 175, 180
 Potts, J. 162
 Poulton, E. B. 176, 177
 Prest, Wm. 181
 Price, David M. G. 139, 182, 204, 206

 Raynor, G. H. 21, 228
 Reeks, Henry, F.L.S. 89, 110, 222,
 231
 Robinson, Henry 204
 Robinson-Douglas, W. Douglas 162,
 227
 Ruston, A. Harold, 185

 Shearwood, Geo. P. 224
 Sheldon, Wm. 178
 Sims, H. 180
 Smith, Frederick 66, 166, 257
 South, R. 174
 Standish, F. O. 20, 23, 44
 Stevens, Samuel, F.L.S. 173, 204

 Talbot, William 15
 Tawell, J. A. 139
 Thomas, W. 164
 Thompson, W. 174
 Timms, E. W. 96, 296
 Trangmar, F. 164
 Tugwell, W. H. 86, 88, 160, 205

 Walker, Rev. F. A., M.A., F.L.S. 75,
 79, 198
 Walker, Francis, the late 4, 12, 25,
 36, 46, 54, 71, 74, 75, 92, 93, 94,
 98, 99, 100, 103, 113, 126, 147,
 166, 193, 195, 196, 207, 208, 218,
 219
 Weise, Anna 1, 50
 Wellman, J. R. 43, 227
 Wigan, W. 171, 172, 205, 233
 Williams, John 21
 Wilson, Owen 13, 113, 168
 Wittich, H. 104, 181
 Wormald, P. C. 292
 Wratislaw, Rev. A. H., M.A. 175

ALPHABETICAL LIST OF SUBJECTS.

- Acanthocinus ædilis* 93, 213
Acidalia rubricata—is it a single-brooded species? 175
Acronycta Alni at Doncaster 162; in Yorkshire 163; near Doncaster *id.*; at Malvern *id.*; near Sheffield 178; in the New Forest 186; at Lyndhurst 205
 " *Leporina* 177
Agrotera nemoralis 216
Albipuncta, *Lathonia* and *Leucophæa*, in the matter of 16
Anarta Myrtilli 178
Andrena tibialis and *Stylops* 143
Andricus noduli 99
 " *quadrilineatus*, gall of, in Essex 140
Ant, hermaphrodite 115; white, bred at Kew 188
Anthrocera Lonicæræ 181
Anthocharis Cardamines, variety 70
Anticlea sinuata in Hampshire 44; near Dorking 164
Ants, foraging 56; leaf-cutting 57; making mad 58; and tiger-beetles 60; winged, swarming of a brood 83; the plague of 233
Apamea unanimitis making up in decayed willow-wood 180
Apaturis Iris in Monmouthshire 203
Aphelopus melaleucus 26
Aphides of Amurland 12; British, requested 114, 141; a note on 166
Aphides, three notes on 12; no indigenous in New Zealand 48
Aphilothrix Corticis 50
 " *Globuli*, a gall-maker new to Britain 24
 " *Radicis* 3, 45
 " *Rhizomatis* 51
 " *serotina* 170
 " *Sieboldii* 52; in England 93
Aphis-honey 13
Aphis-life in the Fall, yearly close 12
Arctia larva, aquatic 117
 " *lubricipeda*, variety 169
 " *Menthastri*, food of 230
Argynnis Adippe, variety 49
 " *Lathonia* at Broadstairs 233; near Canterbury 288
 " *Niobe* 88; in Kent 171, 172, 173, 225, 288
Asthena Blomeraria at Malvern 163
Attelabidæ 284

Bark-galls 50
Bat, parasites of 215
Bees, humble, wanted for New Zealand 47; fertilizing gentians 113; and wasps, economy 141; fertilizing flowers 184; honey 292
Beetle, timber-boring 187; epizoic 293
Belt, Thomas, F.G.S., 'The Naturalist in Nicaragua' 56
Belytidæ 30
Betularia, buff variety 164
Bethylidæ 34
Biorhiza aptera 3; on roots of *Deodars* 47
Blennocampa Cerasi 236
Blepharicidæ 104
Bluebottles on leaves 294
Boarmia larva, ichneumonideous parasite on 91
Bœus seminulum 6
Bombus Lucorum 231
Bombyx with aquatic larva 94
Botys Terrealis bred 178
Brachycentrus subnubilus bred 47; on the common comfrey 186
British Bee-keepers' Association 192
Bud-galls 145
Butterflies, migrating 60; in Newfoundland at Christmas 89; migration of 110, 161; at Dry Drayton 198, 224

Cabinets, insect, metal drawers for 213
Captures of Hymenoptera near Norwich 67; at Little Hampton *id.*; in the Island of Anglesea 68; in the

- New Forest 138; in Sutherland-shire 207; at or near Eastbourne during the latter part of July 224
- Carabus nitens* in the New Forest 44
- Cassida vittata* 118
- Catocala Fraxini* at Folkestone 228; near Canterbury 289
- Ceraphronidæ 28
- Cetonia aurata* 44
- Chauliodes chærophylellus* bred *id.*
- Chelogyne dorsalis* 27
- Chesias obliquaria* 178
- Chærocampa Nerii* near Lewes 290
- Cidaria picata* double-brooded in confinement 230; life-history *id.*
- Cirrhœdia xerampelina* near Llangollen 20
- Clostera*, hybrid specimen 47
- Cnethocampa pityocampa* said to occur in Kent 81, 82; and another, as observed at Nice 104; larvæ 181
- Coffee-borer of Natal 188
- Coleoptera, Scotch 215; Rhynchophorous, classification of 277
- Collection, Olivierian 95
- Coluocera Attæ* 115
- Congregation of *Psen* 47
- Crocallis elinguarina* 285
- Crotch, George Robert, death of 236
- Crymodes exulis* again taken 178
- Cryptocephalus bipustulatus* 112
- " supposed new 23
- Cynips argentea* 194
- " *cerricola* 73
- " *conglomerata* 266, 293
- " *conifica* 170
- " *Hartigi* 145
- " *hungarica* 217
- " *Kollari* 241
- " *Lignicola* 252, 265, 293; additional parasites 252
- " *tinctoria* 218
- " *Truncicola* 146
- Dasycampa rubiginea* at Christchurch 22
- Dasypolia Templi* 113
- Deane, Henry, death of 119
- Death-watch, supposed 140
- Deilephila Euphorbiæ* at Harwich 46
- Deiopeia pulchella* in Cornwall 188, 259; in Sussex 204; in Hampshire 259, 290; near Christchurch 259; near Hastings *id.*; at Brighton *id.*; near Lewes 290
- Dianthœcia albimaculata* bred; description of the larva 130; near Folkestone 165; and larvæ 177
- " *capsincola*, is it double-brooded? 228
- " *compta* 19
- " *conspersa* and *D. compta* 17
- Diapridæ 29
- Dicondylus pedestris* 27
- Diptera, Amurland European 103; congeries of 165
- Dipterous insect, ash-leaves affected by 215
- Dor-beetle at work 132, 182
- Dryinidæ 34
- Dryocosmus cerriphilus* 75
- Dryophanta macroptera* 98
- East Sussex, a few days in 160
- Ecitons 56
- Embolemidæ 33
- Embolemus Ruddii* 25
- Emmelesia unifasciata* 260; at Cheltenham 209
- Entomological pins 71
- Entomological Society, extracts from Proceedings 46, 94, 115, 143, 186, 214
- Epunda lutulenta* at West Wickham 43; eggs 286
- " *nigra* at Sherwood Forest 228
- Epyris niger* 28
- Erastria fuscula*, food-plant 185
- " *venustula* at Horsham, Sussex 206
- Eremobia ochroleuca* at Christchurch 22
- Eriogaster lanestris* five winters in the pupa state 91
- Eupisteria heparata*, description of the larva 175
- Eupithecia consignata* 164
- " *innotata*, note on 68; and *E. egenaria* 87, 115; food-plant 291
- " *Knautiata* 255; of Gregson = *E. minutata* of Hübner 290
- " new to Science, with notes on its life-history 255
- " *plumbeolata* 205
- " *pygmeata* 231

- Eupithecia valerianata* 231
Euryporus picipes 118
- Field Naturalists' Society 181
 Flies, two-winged, notes on the wing-bones 36, 100, 126, 147, 196, 219
 Food of *Arctia Menthastris* 230
 Food-plant of *Erastria fuscula* 185;
 new (?) for *Melitæa Artemis* 203;
 of *Orygia gonostigma* 204, 226, 227;
 of *Eupithecia innotata* 291
- Geometer larvæ eating oak-galls 165;
 correction 234
 Glow-worms, colonizing 183
 Goat-moth larva underground 125
Gordius aquaticus 212
Gortyna flavago and its house-
 holding 121; at Horsham in Octo-
 ber 139
Gryon misellus 6
- Haggerston Entomological Society
 236, 296
Halonota Grandævana at Hartlepool
 90, 178
Haltica ærata 214
Haplogastra 283
 Heloridae 33
Hepialus Velleda at Horsham, Sussex
 204
 Hive-bees, black 215
 Honey-bees 292
 Hornet, death through the sting of
 209, 231
 Hornets, do they ever build in the
 ground? 257
 Humble-bees wanted for New Zealand
 47; fertilizing gentians 113
 Hybrid specimen of *Clostera* 47
Hylurgus piniperda, testaceous speci-
 men 91
 Hymenoptera reposing 45; captures
 in 1873, 66; nest-building 70
- Insect congeries 14, 165; develop-
 ment, is heat the chief agent in?
 167; Dipterous, ash-leaves affected
 by 215
 Insects, certain, emerge from the
 pupa by hydraulic pressure 15;
 taken at Glenarm 43; oak-leaf 92;
 photographs of, taken with camera
 obscura 94; in limestone caves 95;
 organs of hearing in 113; injurious
 to wheat 115; to coffee-trees 118;
 Spitzbergen *id.*; pollen-eating 135;
 destructive to coffee plantations
 141; Netherland 149, 271; names
 of 185; peat 210
- Labeo vitripennis* 26
 Larva of *Zygæna Trifolii*, description
 90; Bombyx with aquatic 94;
Arctia, aquatic 117; goat-moth,
 underground 125; of *Dianthæcia*
albimacula, description 130; of
Eupisteria heparata, description
 175; of *Notodonta Carmelita*, de-
 scription of varieties 176; Lepi-
 dopterous, walnut eaten by 214;
 Dipterous, Turkey carpet eaten by
 215
 Larvæ, Geometer, eating oak-galls
 165, 234; required for figuring
 168; of *Dianthæcia albimacula*
 177; hairy, on the black currant
 181; rearing in earthenware pots
 208; of *Saturnia Carpini*, do they
 hibernate? 227, 289
Lathonia, *Leucophæa* and *Albipuncta*,
 in the matter of 16
 Lepidoptera, cause of shrivelling of
 wings 13; forwarded to Edward
 Newman by G. F. Mathew, Esq., R.N.
 62; controlling sex in 69; certain,
 mode of oviposition 285; contribu-
 tion to the history 291
Leucania albipuncta at Folkestone
 228
Leucophasia Sinapis ovipositing 175
Ligdia adustata, life-history 229
 Lime-galls 45
Limenitis Sibylla at Hendon 174
 Linnean Society of London, extract
 from Proceedings 141
Liparis auriflua and *L. chrysoorrhæa*
 22, 129
 Locusts devouring woollen materials
 and leather 118; a railway train
 impeded by 166
 Longicorn destructive to coffee planta-
 tions at Natal 95
Lycæna Argiolus ovipositing 292
Machærium maritimum 207, 215
Macrogaster Arundinis, description of
 the larva 21

- Macro-Lepidoptera taken in Alderney 10; additions to the list 42; of Lütbeck 154
 Mantid, a living, exhibited 188
 Megastigmus, note on 71
 Melanagria Galathea in Lincolnshire 203
 Melanippe fluctuata 286
 Melitæa Artemis 24; new (?) food-plant for 203
 Microgaster in Brazil 207
 Miselia Oxyacanthæ 287
 Moth, Yucca 214
 Moths, names of 182
 Mycetophilidæ 103
- Nematus latipes 252
 Newcastle-on-Tyne Entomological Society 72
 Night-flyer, gold-cloth 122
 Noctua glareosa at Sherwood Forest 228
 „ sobrina in Rannoch 205; correction 228
 Nola albualalis, &c., in North Kent 180
 „ centonalis at Sittingbourne 205
 Nomenclature, zoological 119
 Notodonta Carmelita (*read* N. camellina), description of varieties of the larva 176
- Oak-galls, descriptions 1, 50, 73, 98, 145, 170, 193, 217, 241; Geometer larvæ eating 165; correction 234, 265
 Oak-leaf insects 92
 Œdipoda Germanica, red and blue varieties 79
 Œnistis quadra 185
 Olivierian collection 95
 Oniscigaster Wakefieldi 117
 Ophiodes Lunariss near Brighton 164
 Orchids, pollen masses 234
 Orgyia gonostigma, food-plant 204, 226, 227
 Ornithomyia avicularia 212
 Orthoptera, musical 117
 Orthosia litura 287
 Owen, Alfred, death of 216
 Oxyura, notes on 4, 25
- Pachnobia alpina from Bræmar, &c. 46; in Rannoch 206; correction 228
- Parasite, ichneumonideous, on a Bomarmia larva 91
 Parasites 137; of a bat 215; of Cynips lignicola, additional 252
 Parasitism, Goureaux's observations on 93
 Phibalapteryx vitalbata 286
 Phigalia pilosaria 91
 Phlogophora meticulosa 287
 Phycis Davisellus 47, 112; economy 132
 Phylloxera Quercus 208
 Pieris Napi 162
 „ Rapæ, variety 140, 162
 Pins, entomological 71
 Platypylla Castoris 294
 Platypteryx Sicula near Bristol 179
 Plusia interrogationis near Driffield 23; *read* P. Pulchrina 94
 Polia flavocincta abundant at Huddersfield 292
 Pollen-eating insects 135
 Polydrusus sericeus 112
 Potato-beetle, Colorado 116
 Potato-bug, Colorado 105; artificial remedies 106, 107, 108, 109; supposed 183
 Proctotrupidæ 33
 Prosacantha varicornis 6
 Psen, congregation of 47
 Ptilophora plumigera 22
 Pupa, certain insects emerge from by hydraulic pressure 15
 Pyrarga Egeria, &c. 129, 161
- Rhinomaceridæ 284
 Rhopalocera, Continental, geographical distribution 75
 Rhynchitidæ 284, 285
 Root-galls 2
 Rose-beetle 44
 Rose-galls 94, 113
- Saturnia Carpini—is it ever double-brooded? 139, 162; do the larvæ hibernate? 227, 289
 Satyrus Semele, tenacity of life in a specimen 23
 Sawflies, life-histories 252, 267
 Scelionidæ 9
 Scotosia certata 140
 Selandria annulipes 267
 Smerinthi, hybridizing 21

- Smerinthus ocellatus* emerging in September 233
Solenobia, supposed albino 186
 South London Entomological Society 24, 48, 71, 192
 Species, British, *alias* Continental 20
Sphinx Convolvuli at Christchurch 22; at Maidenhead 218
 „ *Pinastri* at Harwich 46
 Spider, mimicry in 61.
 Spiders 59
Sterra sacra near Neath 260
Syntomis Phegea as a British insect 88

Tæniocampa opima, &c., hints on breeding 86; breeding 110
Tapinostola Bondii at Lyme Regis 205, 292
Teleas clavicornis 6
Telenomus brachialis 4
 „ *Laricis* 5
 „ *Othus id.*
 'The Naturalist in Nicaragua' 56
Thecla Pruni in Buckinghamshire 174
 „ *Quercus* with an orange spot 69
 „ *Rubi*, variety 215
 „ *W-album* on the flowers of the lime tree 174
 Thorn, bull's-horn 61
Thoron fornicatus 7
 Tiger-beetles and ants 60
Tortrix cerasana and *T. ribeana* 112
Trichiura Cratægi 228

Trigonaspis megaptera 193
Tryphæna fimbria 286

Vanessa Antiopa near Newcastle 225
 „ *Polychloros* in Northumberland 89; at Westbury-on-Trym 174
 Varieties, red and blue, of *Ædipoda Germanica* 79; of the larva of *Notodonta Carmelita*, description 176
 Variety of *Argynnis Adippe* 49; of *Anthocharis Cardamines* 70; of *Melitæa Selene*? 97; of *Pieris Rapæ* 140, 162; of *Pieris Napi* 162; buff, of *Betularia* 164; of *Aretia lubricipeda* 169; of *Thecla Rubi* 215

 Walker, Francis, death of 260
 Wasps, our common 222; and bees, economy 141
 West London Entomological Society 96, 296
 Wing-bones of the two-winged flies 36, 100, 126, 147, 196, 219
 Wings of Lepidoptera, cause of shrivelling 13

Xanthia aurago near Llangollen 20, 21
Xenomerus Ergenna 7
Xylina conformis near Neath 260

Yucca moth 214

Zeuzera Æsculi 139
 Zoological nomenclature 119
Zygæna Lonicerae, breeding 109
 „ *Trifolii*, description of the larva 90

. It is intended in future to publish the *Alphabetical Lists of Contributors and Subjects* annually, instead of biennially as heretofore.

THE ENTOMOLOGIST.

No. 125.]

JANUARY, MDCCCLXXIV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's
'Die Mitteleuropäischen Eichengallen.' By Miss ANNA
WEISE.

[Mr. Walker has most kindly consented to add, under each description, such remarks on the parasites of the gall-maker, or the inquilines of the gall, as may have come under his own notice; these will be accompanied by any observations that may tend to illustrate the subject and render it more complete, such additions being always signed with his name. I may also say that in the course of this translation it may frequently be convenient to intersperse, in the form of footnote or otherwise, certain allusions to, or illustrations of, a theory of my own, *namely*, that under no circumstances are these oak-galls new or independent parts or organs of the oak; that when we see an object, such as an oak-apple, which we have been taught to suppose a new part or organ, *additional* to the stems, leaves, buds, flowers, stipules, hairs, &c., described by botanists, we are not to conclude it is thus new or additional, but rather to regard it as a form or phase of one of these, caused by the presence or by the prior action of an insect, in some manner or by some process not yet ascertained, and concerning which it would be useless for an entomologist to speculate, seeing it is rather the province of the chemist to conduct such researches. This theory, if so it may be called (perhaps hypothesis were the better word), has not been generally accepted, but on the contrary, has been rigorously and most ably controverted by naturalists who have given great attention to the subject of oak-galls: among others, I may mention Mr. Peter Incbald, whose arguments in the 'Field' newspaper cannot fail to interest every entomologist, although they were subsequently disputed by Mr. Parfitt, of Exeter, in the same newspaper. The discussion in this instance was confined to the *pseudo-balani*, or false acorns, familiarly

known as Devonshire or woody galls of the oak; but the hypothesis comprehends all known galls. On the other hand, Mr. W. F. Bassett, of Waterbury, Connecticut, U.S., has concluded that certain American galls, the development of which he had watched from the earliest stage, "were only a modified leaf-stem and blade, and that the tuft of long woolly hairs which terminates the cell is only the enormous development of the leaf's pubescence." (See Entom. vi. 552.) The late lamented Mr. J. B. Walsh opposed this idea, and there never has been an entomologist whose opinion is entitled to greater respect. Therefore, although fully convinced of the soundness of my position, I am very desirous it should receive the most searching investigation. These additions will always be signed with my own name.—*Edward Newman.*]

I. ROOT-GALLS.

The two kinds of root-galls with which we are acquainted, being invariably covered with earth, we rarely enjoy the opportunity of examining them.—*G. L. Mayr.*

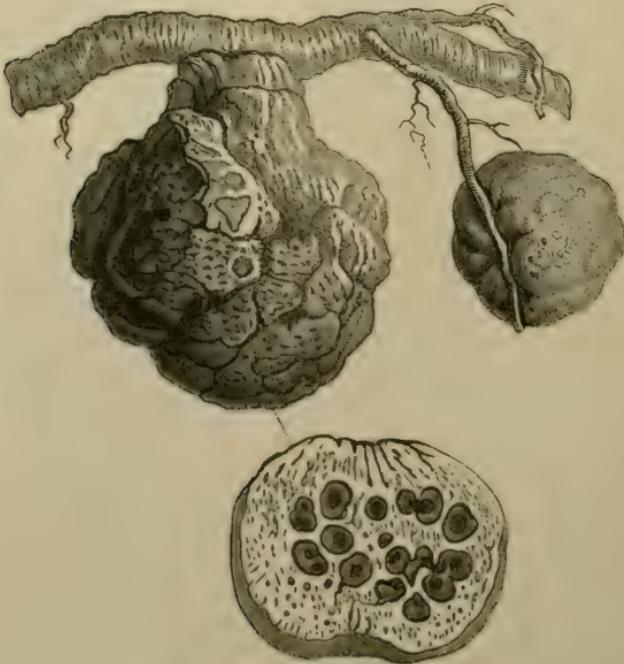


Fig. 1.—APHILOTHRIX RADICIS.

Aphilothrix Radicis.—The gall produced by this species is found on the roots of old oak-trees, near their junction with the trunk, and is generally sparingly covered with earth: in form it is almost spherical, but the surface is irregular, and not unlike that of a potato; in size the specimens differ greatly, some being as small as a walnut, while others are as large as a man's fist; externally it is very rough, and of a dark brown colour; the interior is hard and woody, and contains a considerable number of oval larva-cells. The imago appears in April.—*G. L. Mayr.*

Aphilothrix Radicis, which has not been found in England, is attended in the gall by *Synergus incrassatus*, one of the inquiline Cynipidæ, or lodgers, whose presence in the galls is not in accordance with the welfare of the first inhabitants.—*Francis Walker.*



Fig. 2.—BIORHIZA APTERA.

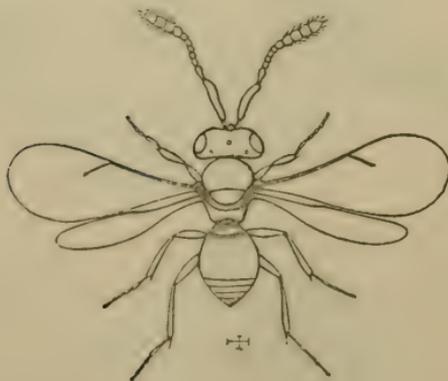
Biorhiza aptera.—This species occurs on rootlets, which vary in size from the quill of a raven to that of a goose, and seems only to be found on oak-trees that have been uprooted. It rarely occurs singly, and when this is the case it varies in size from a pea to a cherry; generally several are clustered together in one spot on the root, in which case all of them are flattened where they press

against each other (as is also the case in *Cynips Terricola*), forming altogether a brown mass, on the extreme of which the outline of each separate gall is readily to be perceived. When recent this gall is said to be succulent, but when dry its section exhibits a reddish mass of cells, divided from each other by their septa. Harting states these galls have but one cell, but on investigation I find that the smaller or pea-sized specimens possess from one to three cells, and the larger or cherry-sized galls from three to five, or in some instances as many as nine; these larger cells are oval, measuring seven millimetres in their longest, by six millimetres in their shortest, diameter, and are enclosed in a pale yellow, softish, thinly-walled capsule, which is throughout firmly united with the substance of the gall.—*G. L. Mayr.*

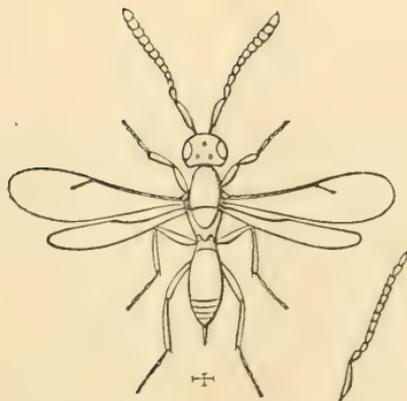
The existence of *Biorhiza aptera*, whose gall has been often found on the roots of oak-trees in the south of England, is liable to be shortened by the introduction of the germ of a new life within it, as it is not secure from *Callimome Roboris*, one of the gorgeous *Chalcidæ*, or metallic-coloured flies, of which much must be said afterwards.—*Francis Walker.*

Notes on the Oxyura.—Family 2. *Scelionidæ.*

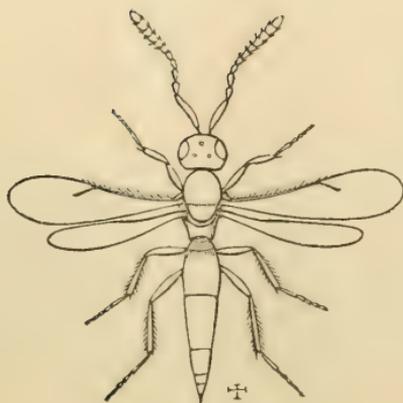
By FRANCIS WALKER, Esq.



TELENOMUS BRACHIALIS.



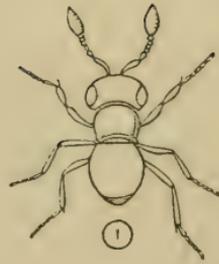
TELENOMUS LARICIS.



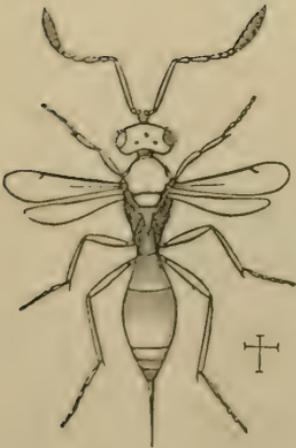
TELENOMUS OTHUS.



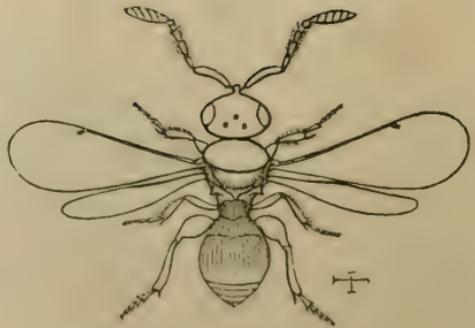
GRYON MISELLUS.



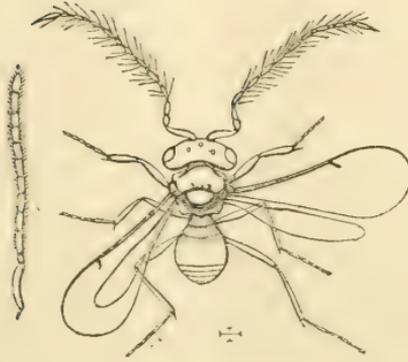
BCEUS SEMINULUM.



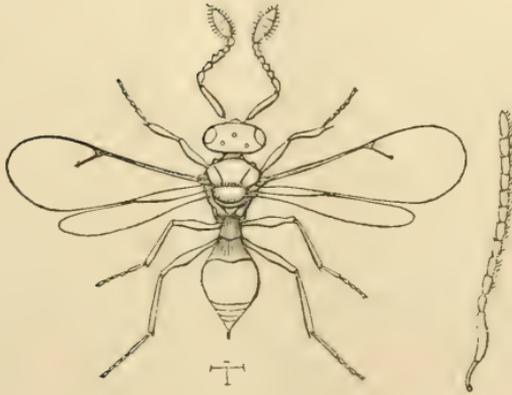
PROSACANTHA VARICORNIS.



TELEAS CLAVICORNIS.



XENOMERUS ERGENNA.



THORON FORNICATUS.

IN anticipation of preparing some notes on the distribution and characters of the generally parasitic Hymenoptera, the translation of the classification of the families, which are distinguished by their comparatively small size and simple structure, is here continued. The Ichneumonids, Braconids, Cynipids, are deferred, and a Synopsis of the European genera of Chalcids has appeared in the "Notes

on Chalcidæ." The remaining families, of which the Mymaridæ and Platygasteridæ have already been noticed, are interesting on account of their indicating various beginnings of the Hymenopterous race, and from their being individually and collectively, as it were, a life set above a life, or being part of a double existence going on in a single outer form, the increase of one being by the decrease of the other, exhibiting or suggesting the same process in continually higher degrees. The Scelionidæ are nearly allied to the Platygasteridæ, but excel them and the Mymaridæ in the development of the wings, of which the vein or bone has much resemblance to that of the Chalcidæ; they are also distinguished from the Platygasteridæ by the structure of the antennæ, and have a greater variety in size and in form. The little Telenomi are parasitic on eggs of Lepidoptera and of Hemiptera, and the more diminutive Bæus occurs on windows, where Mymaridæ may often be secured by means of a brush and a bottle. Thoron may be found on banks of ponds, and occasionally take to the water. Scelio and Sparasion are widely different from the two preceding genera. The Ceraphronidæ are also in some of their forms of very minute size; one kind may be considered as an injurious insect, being, like Asaphes and Coryna, a devourer of the beneficial Aphidii. There do not appear to be any links between them and the other families. The slow movements of the Diapridæ are very unlike the quickness in running or in jumping of the two preceding families; the males are distinguished by their elegant antennæ, and the species, like the Belytidæ, dwell chiefly in woods, where they are parasites on wood-eating or on fungus-eating Coleoptera or Diptera. Platymischus inhabits the sea-shore, where it is of frequent occurrence in the South and West of England, and is probably parasitic on some sea-weed insect. In the Belytidæ and in the Proctotrupidæ the fly begins to rise above the more rudimentary structure, which distinguishes the preceding families. A Proctotrupes has been observed to be parasitic on *Orchesia micans* and on *Lithobius*. The Heloridæ, like the Proctotrupidæ, indicate a passage to the higher tribes, but there is no occasion here to mention particulars of this transition. In the Embolemidæ there is a still nearer approach to aculeate Hymenoptera, which include part of the Bethylidæ.

SCELIONIDÆ.

- A. Club of the antennæ not jointed.
- a. Wings developed. - - - THORON.
- b. Wings none or rudimentary.
- * No scutellum. - - - - BÆUS.
- ** Scutellum developed. - - - - ACOLUS.
- B. Club of the antennæ jointed.
- a. Subcostal vein shortened, not joining the costa. - - - - BEONEURA.
- b. Subcostal vein not shortened, joining the costa.
- * Marginal branch very long, at least four or five times as long as the stigmatic branch.
- † Scutum with two sharply-defined complete furrows. Antennæ of the male long, verticillate; of the female clavate. - XENOMERUS.
- †† Scutum without such furrows. Antennæ of the male not verticillate.
- ‡ Hind tarsi thick. Middle tibiæ with feeble spines. - - - - TELEAS.
- ‡‡ Hind tarsi not thick. Middle tibiæ without spines. - - - - PROSACANTHA.
- ** Marginal branch very short, mostly shorter than the stigmatic branch.
- † First abdominal segment narrow.
- ‡ Second abdominal segment the largest. - TELENOMUS.
- †† Third abdominal segment the largest.
- § Furrows of the parapsides very distinct. Wings with no postmarginal branch. - ANTERIS.
- §§ Furrows of the parapsides not apparent. Wings with a long postmarginal branch. - BARYCONUS.
- †† First abdominal segment broad.
- ‡ Front with a sharply-defined border. - SPARASION.
- ‡‡ Front with no such border.
- § Postmarginal branch much developed, longer than the stigmatic branch.
- × Postscutellum with some spines. - - - TRIMORUS.
- ×× Postscutellum with no spine.
- Δ Antennæ filiform in the female. - - - APREGUS.
- ΔΔ Antennæ clavate in the female, filiform in the male.
- + Marginal branch punctiform. Last joint of the club of the antennæ twice as long as the preceding joint. - - - GRYON.

- +-+ Marginal branch half as long as the shaft of
 the stigmatic branch. Last joint of the
 club of the antennæ little longer than the
 preceding joint. Body short, contracted. HADRONOTUS.
 §§ Postmarginal branch wanting, or shorter than
 the stigmatic branch.
 × Postmarginal branch wholly wanting. - SCELIO.
 ×× Postmarginal branch much shorter than the
 stigmatic branch. - - - IDRIS.

SPARASION.

- A. Flagellum of the antennæ with horizontal
 hairs: - - - - frontale, Latr.
 B. Flagellum with hairs not horizontal.
 a. Head slight. Mesothorax æneous-green. - ænescens, Foerst.
 b. Head and mesothorax black. - - - lepidum, Foerst.

The genus *Trimorus* is established on *Gryon Nanna* and on *G. Phlias*; *Apegus leptocerus* is mentioned as the type of the genus *Apegus*, but no description is given. In like manner *Hadronotus laticeps* and *H. stygirus* are merely mentioned as the representatives of that genus, but are not described. A short description is given of *Scelio fulvipes*, found near Aachen; *Idris flavicornis* is cited as the only species of that genus, but is not described.

FRANCIS WALKER.

A List of Macro-Lepidoptera taken in Alderney.

By. W. A. LUFF.

THE following, with one or two exceptions, were taken from the 23rd to the 30th of June, 1873:—

Melitea Cinxia.—Rather plentiful, but only in one locality, in a valley on the west coast of the island; they had, however, been out some time, and were nearly all much worn.

Vanessa Urticæ.—Saw one specimen.

Pyrameis Atalanta.—Plenty of hibernated specimens.

P. Cardui.—One.

Pyrarga Megera.—Two specimens, one with a bipupilled eye-spot. I may here say that this variety is not at all uncommon in Guernsey and Sark.

Epinephele Janira.—Extremely abundant.

Polyommatus Phlœas.—Not uncommon.

Lycæna Icarus.—By far the most abundant species.

Colias Edusa.—One specimen, sent me in 1868 from Alderney.

Pieris Rapæ.—Very common.

P. Brassicæ.—Saw only two.

Acherontia Atropos.—I have no doubt that this insect is common, as I had a good description of the larva from one of the natives.

Sphinx Convolvuli.—Received a specimen from Alderney in 1868.

Macroglossa Stellatarum.—Two.

Euchelia Jacobæe.—Not uncommon; the food-plant, *Senecio vulgaris*, very abundant.

Chelonia caja.—Seems commoner than in Guernsey; I took four specimens.

C. villica.—One.

Arctia fuliginosa.—Not uncommon.

A. lubricipeda.—Very common.

A. Menthastris.—Took several.

Liparis auriflua.—One larva feeding on hawthorn.

Bombyx Trifolii.—Found the larvæ pretty common all around the coast, but they were most abundant close to Fort Touraille; there I took fifty specimens in about two hours: they were feeding on a coarse, wiry grass growing amongst the sand.

Rumia cratægata.—Took two or three.

Acidalia subsericeata.—Several on the west coast.

Aspilates citraria.—Not uncommon, but of no use as specimens, being too much worn.

Abraaxas grossulariata.—Pupæ abundant on gooseberry and currant bushes.

Emmelesia decolorata.—Not uncommon.

Melanippe ocellata.—One.

Campptogramma bilineata.—Extremely abundant.

Cidaria russata.—Not uncommon.

Pelurga comitata.—One fine specimen.

Xylophasia polyodon.—Several at sugar.

Mamestra Brassicæ.—Larvæ abundant.

Apamea oculea.—One.

Miana strigilis.—Two at sugar.

Agrotis Segetum.—One.

Tryphæna pronuba.—Two at light.

Dianthæcia conspersa.—Found several young *Dianthæcia* larvæ feeding in the seed-pods of ragged robin (*Lychnis Flos-Cuculi*), which I suppose were *Conspersa*, but I did not succeed in rearing them.

Phlogophora meticulosa.—One or two at sugar.

Euplexia lucipara.—Not uncommon.

Cucullia umbratica.—Several resting on stones and gate-posts.

Plusia Gamma.—Extremely abundant.

The above list shows a total absence of many of the commonest British Lepidoptera on the wing in June. The island is so exposed, and almost devoid of hedges and trees, that I was almost surprised to find so many species. The nearest point of France, Cape La Hogue, is only ten miles distant, so that rare species would be not unlikely to occur if the island was searched at all times of the year.

W. A. LUFF.

Guernsey.

Three Notes on Aphides. By FRANCIS WALKER, Esq.

1. *Aphides of Amurland*.—There are only two species of the *Aphis* tribe to record from Amurland, but they are both of interest on account of their distribution elsewhere. The first is *Lachnus Piceæ*, known as one of the most northern insects observed, and of frequent occurrence among the snows and glaciers of Switzerland: it appears occasionally and irregularly near London, but has not been often observed in England. The second is *Dryobius croaticus*, a native of Italy and of Croatia, and closely allied to *D. Roboris*, which is a native of more Northern Europe, and some may suppose that the difference between the two, and the more darkened wings of the former, is the effect of a difference of climate.

2. *Yearly Close of Aphis-life in the Fall*.—October is the egg-laying season of *Lachnus Piceæ*, and of very many other kinds of the *Aphis* tribe, and at this epoch there is a great gathering of *Aphides* to the spots which witnessed in the

spring their exclusion from the egg state. Many-coloured leaves are continually falling, or are wafted by the breeze, and are freighted with more or less limited companies of Aphides, which they convey peacefully to the earth, to mingle there with dust. Their futurity is secured in the egg, and the quiet close of their yearly life differs much from the summer period. They are not now destroyed by outward nor by inward enemies, and are free from the officious over-running of the ants, when the latter remark their growing, but transitory, abundance, and calculate on a proportionate supply of honey.

3. *Aphis-honey*.—Bees find their honey comparatively prepared for them in flowers, but the honey by the medium of Aphides has various beginnings, and analysis may show whether it has a difference in quality by the difference in its origin. It is extracted from the crevices of old oak trees, from the twigs of young oak trees, from the roots of grass, of sow-thistles and of parsneps, from the nettle and the bramble, from the ivy and the honeysuckle, from the willow and the poplar, from the bog-myrtle and the sea-aster, and its sweetness has abundance of other sources.

FRANCIS WALKER.

Entomological Notes, Captures, &c.

Cause of Shrivelling of Wings of Lepidoptera.—Will some of your correspondents assign a satisfactory reason for the shrivelling of the wings of Lepidoptera? There are doubtless several causes to which this imperfection can be traced. Amongst others is the scarcity of provisions when the larvæ are about to be full fed, which will no doubt lead to this. When the feeding-house contains many larvæ of the larger sorts it is really difficult to provide them with sufficient provender; and though you may supply them over-night with what you consider to be "a heavy feed," in the morning when you approach the breeding-cage, to your surprise, you find it contains nothing but sticks and stalks, and hungry animals. It requires an old hand to be able to cater properly for creatures with such enormous appetites, and if the quantity of food is insufficient the result will be shrivelled-winged

imagos. But this is not always the reason for this malformation. This season I had two larvæ of *Liparis dispar*, which were confined in a large, wide-mouthed glass with a muslin cover, and which were abundantly fed, their food being the large leaves of the plum, and their number so small there was no difficulty about it, and they spun up in the midst of plenty on the 21st and 24th of July. The imagos appeared on the 15th of August; both females, with shrivelled wings. Should the pupa be enclosed in a glass or box which is not sufficiently large to give the imago ample room to expand, the same shrivelling will occur; but in this case, neither a want of space nor a scarcity of food could have been the cause.—*Owen Wilson; Cwmffrwd, Carmarthen, August 16, 1873.*

Insect Congeries.—Many species of insects are known to occur occasionally in vast swarms, and our entomological periodicals contain several records of facts of this description. In the “nest-room” at the British Museum may be seen a cluster of the Dipterous fly *Atherix Ibis*, concerning which Walker’s ‘*Diptera*’ contains the following note:—“The female of this fly is gregarious, and attaches its eggs in large clusters to boughs hanging over streams, and there remains, and shortly dies. The cluster is generally pear-shaped, and sometimes contains many thousands of dead flies, and continually receives accessions by new comers settling upon it.” Similar masses have since been found of even larger size, and they are probably not uncommon. I have a vivid recollection of seeing small heaps of dead bodies of winged ants on the roof of the great tower of the Abbey Church of St. Alban’s, in September, 1870; and a like swarm gave rise to an alarm of fire at Cobourg in 1865,—noticed in the daily papers at the time: smoke was apparently seen issuing from the spire of the cathedral; a scaffolding was hastily erected, and a man sent up with buckets of water to check the impending conflagration. It was then discovered that an immense congregation of winged ants flying around the tower was the sole cause of the alarming phenomenon. Everyone recollects the service the myriads of *Syrphidæ* and *Coccinellæ* rendered to penny-a-liners in search of a subject on which to exercise their florid pens during the “silly season” a few years back; and many kinds of *Aphides* and *Thrips* are oftentimes equally anxious to achieve notoriety by the mere force of numbers.

As a contribution to this subject I beg to put on record an incident which my brother and I witnessed during an afternoon's ramble at the latter end of August last. We were "prospecting" in a favourite nook of ours in Epping Forest, near the village of Woodford, when we chanced upon an astonishing sight: a patch of fern and broom, about four yards square, was literally blackened by a swarm of a little fly, *Sepsis cynipsea*, *L.*; every frond and twig seemed alive with the myriads of insects, slowly moving about and gently fanning their beautiful, spotted, iridescent wings with a steady and simultaneous motion. Some idea of their prodigious numbers may be formed when I mention that two or three sweeps of a butterfly-net secured a mass of flies which weighed more than half a pound! We noticed that the mass exhaled a rather strong, and by no means an unpleasant, odour of "lemon-thyme." The swarm consisted of males and females; but a long examination of the spot failed to throw any light on the cause of this assembly. The larvæ, Mr. Walker informs me (I am indebted to him for the name of the insect), feed on decaying matter, but we could find no difference in this respect in the small patch of herbage covered with the insects, or the ground beneath them, compared with the surrounding open forest glade. Mr. Walker once found a large cluster on a statue in Highgate Cemetery. I shall be glad if this notice leads to the publication of similar facts, for a rational explanation of this class of phenomena, based on observation, would certainly be welcomed by all lovers of Nature.—*Wm. Cole; The Common, Stoke Newington, N.*

Certain Insects emerge from the Pupa by Hydraulic Pressure.—Being only a beginner and having seen nothing in any work I have read on the emergence of insects from the pupa, but that they "wriggle out," I was surprised and delighted when I saw the wonderful power at their command to effect their deliverance. On the 14th of July last, as I sat watching some *Bembeciformis* dry themselves after their birth on the stem of an old willow, I took in my fingers a pupa that had just come to the mouth of its tunnel, and holding it between my eye and the light, being in a gloomy part of a wood at the time, I saw that the anal segment of the case was empty, and the enclosed insect emitting several drops of fluid

till this space was full, when the case burst in the usual place, and the insect walked out; there was no wriggling or contortion during the operation. I had frequently observed this fluid in the recent cases, but had no idea of the use the insect had made of it in expelling itself from its envelope by its means. Readers acquainted with the pressure of fluids will understand the comparatively immense power an insect may have in this way. As I had several hundred pupæ of *Bembeciformis* and *Typhæ* I had frequent opportunity of observing the process, and these moths emerge at a convenient time, from eight to twelve o'clock a.m., for observation. I also remarked that when the pupæ of *Typhæ* were removed from the support of the stem of the food-plant the abdominal segments of the case were forced off, the anterior remaining on the insect, but when supported this did not happen.—*William Talbot; Tarbert, Limerick.*

In the matter of Lathonia, Leucophæa, and Albipuncta (Entom. vi. 563).—I have sent you the dates and localities of the three above-named insects, all taken within fourteen miles of Canterbury, as I see by the December number of the 'Entomologist' many specimens of the above-named insects, in fact the majority of those sold as British were nothing but continental, and the three insects named I have no hesitation in saying have their head-quarters in this locality. The first-named I took the first year I collected, which is about seventeen or eighteen years ago, when my father, brother and myself took nineteen, all of which Mr. Cooke, of New Oxford Street, had alive, as he was collecting in this locality. I did not see it again until 1868, when I took thirteen. Since then I have taken it every year, and believe I shall continue to do so. As to *Pachetra leucophæa*, the first I ever saw was taken by myself on June 13th, 1872, which was a female, and not knowing the insect I forwarded it alive to Mr. Stevens, who named it for me. I then worked hard to find more, and tried the next night, when I only found one poor specimen, which was flying at the top of the long grass. I then tried sugar, and the first time I sugared, which was a Saturday night, I took twenty-three, out of which there were only four bad specimens; the others were as good as bred. I sent an old one alive to Mr. Bond, also a second to Mr. Newman. I also took two on the 19th and one on the 21st. All the above I

took in about eight days. This year I have not taken so many: although I have worked very hard for them I have only taken twenty, and about one-half of these were bad specimens; the females are almost sure to be good. No one could be taken in with continental specimens of *P. leucophæa*, as they differ from ours as much as though they were two distinct species: our specimens are very pale, being almost white; the marks are quite white, especially along the hind margin of the wings; whereas the foreign specimens are larger and very much darker in colour, even on the under side. I will now mention *Nonagria albipuncta*, the third specimen known, which I took in a pine wood, August 12th, 1869, and sent alive to Dr. Harper, of Hyde Park; on the 16th I took one; on the 17th, one; on the 19th, three. I also sent one or two of the others off alive. In 1870 I took eleven fine specimens in our Blean, Hospital, and Pine Woods; in 1871, a collector, named Edney, and I took upwards of twenty, mostly fine; in 1872, only nine specimens; and in 1873, only five specimens between two of us. I may add that had we worked well we could have taken upwards of a hundred in 1871. In conclusion, if any private gentleman is in want of the above-named three species, I shall be but too happy to take him to my hunting-ground, where I can promise he shall take them himself.—*G. Parry; Church Street, St. Paul's, Canterbury, December 1, 1873.*

D. conspersa and *D. compta* (Entom. vi. 518, 546, 564).—In reply to Mr. Meek's singularly inaccurate and illogical paper, permit me to answer him categorically. First, then, I never asked if *D. compta* was British. I wished that some one would place so-called British (Irish?) specimens(?) in a relaxing-box, &c., and never showed him a *Dianthœcia compta*, or said I took one on the Big Hill of Howth, in Wales, or elsewhere; *he and others* called my *Penmaenbach var.* of *Conspersa*, *Compta*; *not I*; and I am quite sure no amount of placing it in a damp box will ever make it *Compta*. I think your readers perfectly understand what he pretends puzzles him, hence I need not pursue that phantom, but proceed at once to show that Mr. Warrington cannot help me much. He (Mr. Warrington) says, in reply to my question:—"I have seen the remarks about *Compta* and *Conspersa* in the 'Entomologist.' I recollect picking out *Conspersa* in

your collection as most like the one I took in Ireland, named *Compta*; but, as I said before, I do not know *Compta* so well as to distinguish the difference, so I took Mr. Meek's word for it: it was the latter end of July when I took it." But he says nothing of having seen Mr. Meek take one. How logical Mr. Meek is, when he says he spent night after night looking for *one species* and did not take *another species*, I need not comment upon, merely observing *D. Cæsia* var. *Manani* appears as a fleeting blue speck, gliding more like a *Sphinx* from flower to flower, and frequenting those *Silene* plants which grow nearest to high-water mark on the coast, whilst *D. Barrettii* appears as a spinning dark *Plusia Gamma*-like flying moth, and frequents those plants of *Silene* and honeysuckle which grow at a considerable elevation up the banks and grassy slopes. And last, I do not remember telling anybody "*Sesia Philanthiformis* was common at Howth."* I did not want that species when I was there, else I should have gone more on the southern end of Howth, amongst the almost inaccessible cliffs, not on grassy banks, where *D. Barrettii* is most abundant, and where there is only one small patch of rock which could supply the peculiarly stunted plants of sea-pink within range of the splash of the tidal spray, which this species seems to affect most. Even at Onchan, Isle of Man, Mr. Meek might have noticed that he only found the pupa of *Philanthiformis* within a zone of a few feet wide, and in June, not July, and that zone within a few feet of high-water mark; at any rate, I directed him so to search for it there. I am quite aware one person may take a species and others fail to find it, but there are species I should not expect to find under certain circumstances, for example,—Mr. Meek wrote me several letters (now before me) from the "Manx Arms," Onchan, Isle of Man, in June, 1871, asking me to come and show him how to find the larvæ of *Polia nigrocincta*, he having failed to find it in its very best time (first two weeks in June), and said he had taken a new *Bombyx*. When I got there Mr. Warrington had sold him

* [Possibly the following is the passage to which Mr. Meek referred:—"*Additions to Mr. Birchall's List of the Lepidoptera of Ireland.*—*Sesia Philanthiformis* freely on the coast of Howth, from the baths to the Round Tower in Dublin Bay, where the sea-pink (*Statice Armeria*) grows upon the rocks. June and July.—*C. S. Gregson; Stanley, Liverpool.*" '*Entomologist's Monthly Magazine*,' vol. iv. p. 70.—*Edward Newman.*]

several *Nigrocincta* larvæ at three shillings each. I met him on the rocks, and took eighteen larvæ that night, and think he took about the same number, as we worked close together. Afterwards he showed me three of his new *Bombyx* on the sets, asking me what they were. I said, "*Gluphisia crenata*, certain." Next day he observed, "Well, you see they are bred here and on the sets, but I should have liked you to have seen them alive." I remarked, "I did not doubt their being bred here; the question is, Were they fed here?" Now, as I do not know a single plant of their reputed food growing near Onchan, I think I may fairly be excused if I refuse to go searching for it there. But to return to *D. compta*. Now we know how many specimens are reported from Howth, I think I am more justified than ever in asking that the so-called (Irish) *Compta*, which have so freely been moving about amongst buying collectors of *Lepidoptera*, should be tested; but another reason is also patent. *Polia nigrocincta* is also being offered for sale, and being sold freely. Now, as Mr. Meek has had *all* the *Manx* specimens of this species which have been sold, with one or two exceptions, up to this year, so the numerous specimens being sold cannot be, and, so far as those of them which have been submitted to me for identification go, are not *Manx*, or like *Manx*, specimens: they are the common suffused German form of this species, not the variety called *Statices*, in consequence of its differing so very materially in colour and intensity of markings from any form of continental *P. nigrocincta* I have yet obtained or seen. Three *Compta* have recently been in Lancashire; but without any desire to depreciate Mr. Meek's success, I feel bound in justice to myself to show there is no truth in his statement, that I said this or did that, as I am sure that the time has quite come when people should cease reiterating that I said so and so, or did so and so, for any purpose.—*C. S. Gregson; Rose Bank, Liverpool, November 9, 1873.*

Dianthæcia Compta (Entom. vi. 563).—Where is Mr. Warrington? I shall feel greatly obliged if he will come forward and state the fact that he captured *Compta* with me at Howth. On referring to my diary I find the following notes:—June 21st, six *Barrettii*, one *Compta*; June 23rd, one *Compta*, seven *Barrettii*; June 25th, one *Compta* taken by Warrington, and thirteen *Barrettii* by myself. Although

I stayed till early in July I did not find any more *Compta* that season. I shall be very pleased to join any London gentleman entomologist next season for a trip to Howth, when no doubt we can settle the "matter of *Dianthœcia Compta*" for ever. I may add that *Compta* occurs on the cliff at the bottom of Sir Edward Burrows' grounds, and the paths are beautifully ornamented with fuchsias, sweet-williams, and nasturtiums, also huge patches of sea-pink and *Silene maritima*, collected from various parts of the coast; every particle of the latter was destroyed by a well-known entomologist about six years ago, much to Sir Edward's annoyance.—*E. G. Meek*; 56, *Brompton Road, S.W.*

British Species alias *Continental* (Entom. vi. 563).—True lovers of the collecting of British insects must hail with pleasure the remarks of our valued friend, Mr. Henry Doubleday, on the authenticity of numerous rare species passing as British, but in reality and without doubt aliens; such a mode in forming a collection of British insects is very damaging to this interesting Science. I, for one, have lost much of the interest I hitherto had, principally from this cause, that there is scarcely any depending on an insect (called rare) from whatever quarter you may receive it.—*F. O. Standish*; 1, *Glendale Villas, King's Road, Cheltenham, December 1, 1873.*

[This controversy must now cease.—*E. Newman.*]

Xanthia aurago and *Cirrhœdia xerampelina* near *Llangollen* (Entom. vi. 547, 564).—In the 'Entomologist' for December, 1873, Mr. Gregson records the capture of a specimen of *Xanthia aurago* at Llangollen, and states that he is not aware of any previous capture of that insect on this side of England or in Wales. It may, therefore, interest him to know that in the year 1865 I found a good, fresh specimen of *X. aurago*, resting, by day, on the staircase of this house, which is ten miles from Llangollen. I am unable to give the exact date, as I had not then begun to collect with any system. It was one of the first moths I ever captured, but is still in good preservation, though unfortunately set on a common pin. It was not till some years afterwards that, on obtaining your 'British Moths,' I learned the name and value of the species. I may mention that though I have never taken another *Aurago*, my

sisters and I have, at different times, found *Xanthia gilvago* and *Cirrhædia xerampelina* within the limits of our own garden.—[Miss] *Anne Steele Perkins*; *Ashgrove, Overton, Flintshire, December 2, 1873.*

Xanthia Aurago (Entom. vi. 564).—Permit me to say that I think Mr. Gregson's note scarcely adds to our knowledge of the westerly range of *Xanthia Aurago*. The insect having long ago been recorded to occur in Ireland, its capture at Llangollen is not remarkable, so far as westerly longitude is concerned.—*Edwin Birchall.*

Hybridizing Smerinthi.—This year I bred out specimens of *Smerinthus ocellatus* and *S. Populi*, which I was lucky enough to have crossed, male *Populi* with female *Ocellatus*; in about twenty-four hours after she began to deposit her batch of eggs: they were deposited in batches differing in number; they were all unattached; the number deposited was a hundred and seventy, deposited at intervals, and more so after being disturbed. The duration in the egg state was fifteen days; colour at first was bluish, then changed in a few days to a light flesh-colour; the caterpillar fed on apple-leaves. After feeding for three weeks began to wander from their food, and died with the diarrhœa. If you can throw out a few hints it may be a guide for the future, to myself as well as others, how to treat them if lucky enough to cross. Is this a common occurrence?—*John Williams*; 100, *Well Street, Hanley, Staffordshire, November 12, 1873.*

Description of the Larva of Macrogaster Arundinis.—The following notes on this larva may be useful, as being fuller than those given in your work on 'British Moths.' On May 9th, 1873, I found a single larva of this species inside the stem of a reed, at Wicken Fen. The following description was taken on May 10th:—Bulk slender in proportion to length; head flattened, about half the size of the 2nd segment, and retractile within it; form cylindrical, but tapering towards the extremity; a corneous plate, with ten black spots on the 2nd segment. The larva is covered with a number of warts, emitting some six short hairs on each segment, but more numerous on the last. Spiracles pink, and not easily perceptible. General colour a pale rose. Head dull ochreous; mouth black, with two black spots on each side. Medio-dorsal line conspicuous, being of a darker tint

than the ground colour; subdorsal line broader, interrupted, and of a brownish colour; spiracular line very indistinct. Each segment, excepting the first two, is mottled with two patches of brown, nearly coalescing. The under surface is pinkish white. Hind legs blackish pink. Claspers of a dull white colour. The larva unfortunately did not go into pupa successfully.—*G. H. Raynor; St. John's College, Cambridge, October 20, 1873.*

Liparis auriflua and *L. chrysorrhæa*.—It may be within your recollection that I raised the question, in the 'Entomologist' of June last, as to whether it was now the habit of *L. auriflua* to form a common nest in the winter season, since that has become, on the average, so much milder than formerly. I had never myself found any such winter colony, and friends of whom I enquired made the same admission; and also that in autumn, beating for larvæ, they had not found the species feeding gregariously. No reply was sent to your pages, or none that you thought desirable to publish. This month I have seen many of their winter nests, more particularly in the hedges lying towards the marshes below Gravesend, where it is, doubtless, colder in winter than in many places. I have forwarded to you a couple of these colonies for examination. Somehow, I still think it is not the normal habit of *L. auriflua* thus to congregate; but I may be wrong.—*John R. S. Clifford; 120, Windmill Street, Gravesend, October 10, 1873.*

[I think Mr. Clifford's larvæ, which are very small, will turn out to be *L. chrysorrhæa*.—*Edward Newman.*]

Ptilophora plumigera.—It is very likely that many specimens of *Notodonta plumigera* have been taken in Hampshire; but as at the time your invaluable 'History of Moths' was written, Buckinghamshire was the only recorded locality, I thought it might be worth while to mention that on the evening of November 20th I took a magnificent specimen from a street-lamp, and at the same time a male *Petasia cassinea*, also in splendid condition.—*Joseph Anderson, jun.; Alresford, Hants, November 21, 1873.*

Dasycampa rubiginea, *Eremobia ochroleuca*, and *Sphinx Convolvuli*, at Christchurch.—On the evening of the 7th of November I caught a fine specimen of *Dasycampa rubiginea* at ivy-bloom in my own garden. The Rev. A. C. Hervey

informed me that he had caught three specimens of this beautiful *Noctua* in this neighbourhood last year. I think, therefore, we may fairly claim Christchurch as one of the localities for *Rubiginea*. I wish also to mention (as I find some reference to *Eremobia ochroleuca* in the 'Entomologist' for November) that I caught several specimens of this insect on the evenings of the 14th, 18th, and 19th of August last; and in August, 1871, *one flying by day*. On the 3rd of October a boy brought me a live specimen of *Sphinx Convulvi*: being a female, and in rather a dilapidated condition, I kept it for a fortnight, in the hope of obtaining some eggs, but I am sorry to say it died without gratifying me.—*W. McRae; Christchurch School, Hants, Nov. 22, 1873.*

Plusia interrogationis near Driffield (Entom. vi. 516).—Like your correspondent, Mr. Robinson, I had the pleasure of taking a very fine specimen of *Plusia interrogationis* on the 11th July, 1873, over some honeysuckle.—*Geo. R. Dawson; Poundsworth, near Driffield, November 21, 1873.*

Supposed New Cryptocephalus.—In May, 1870, I took, flying in the bright sunshine, in the trench that surrounds the old Roman camp on the summit of St. Catherine's Hill, Winchester, a specimen of a smallish *Cryptocephalus*, perfectly black, with the exception of a small yellowish spot at the extremity of each elytron. Mr. F. Smith, of the British Museum, referred this to a variety of *C. Moræi*, from which, however, it differs by its much larger size, being nearly half as big again as that species. Mr. E. W. Janson, however, thinks that it must be *Cryptocephalus lineola*, with specimens of which it certainly agrees better than with *C. Moræi*. *Lineola* is, I believe, almost exclusively a northern species, so that its occurrence in such a southern locality as Winchester is interesting.—*W. A. Forbes.*

Singular fact: Tenacity of Life in a Specimen of Satyrus Semele.—One day, being very windy, while sojourning on the South coast during the past summer, and for want of better employment, I amused myself in netting a few *Satyrus Semele*, and in the act of getting one in my cyanide-bottle the head got cut off; as the *Semele* tried to escape I pill-boxed it, and had it therein alive for four days, occasionally letting it out, and it would fly a short distance. The head, with antennæ, blew out of my net. One would almost ask, Whereabouts was its vitality?—*F. O. Standish; 402, High Street, Cheltenham.*

Aphilothrix Globuli, Hart., a Gall-maker new to Britain.—I found a gall of this species on oak in Hockley Bull Wood, near here, on the 13th of October. This species is allied to *Aphilothrix Gemmæ*, Linn. (=Fecundatrix, Hart.), the maker of the artichoke gall of the oak.—*E. A. Fitch*; *Down Hall, Rayleigh, Essex, November 15, 1873.*

Correction of Error.—The plant, in the flower-heads of which I find galls produced by *Urophora solstitialis*, Linn., is not *Serratula tinctoria*, as I stated (*Entom. vi. 142*), but the common knapweed (*Centaurea nigra*).—*Id.*

The South London Entomological Society.—The Second Annual Exhibition of this Society took place at the "Horns" Assembly Rooms, Kennington, on Wednesday, December 10th, and was well attended, notwithstanding a thick fog which prevailed all the evening. The principal exhibitions were:—Lepidoptera, by Mr. Wellman (the President), Mr. Farn, Mr. Allin, Mr. Stevens, and Mr. Williams; Mr. Boden also exhibited some remarkable varieties; Mr. Hoey exhibited several life-histories of great interest. Coleoptera, by Mr. Champion, Mr. Marsh, Mr. Jarvis, Mr. Oldham, and Mr. Bull. Neuroptera, by Mr. M'Lachlan. Hymenoptera, by Mr. Hoey. Diptera, by Mr. Verrall. Exotic Lepidoptera, by Mr. Janson.—*Edward Newman.*

Haggerston Entomological Society.—The Sixth Annual Exhibition of this Society took place at their Rooms, 10, Brownlow Street, Dalston, on the 13th of November. Among the most interesting objects were a striking variety of *Galathea*, exhibited by Mr. Stevens; very fine varieties of *Nupta* and a black *Grossulariata*, by Mr. Eedle; and a black variety of *Paphia*, by Mr. Moore.—*Id.*

Melitæa Artemis.—A Plate, on steel, with four coloured figures of the English, Irish and Scotch forms of *Melitæa Artemis*, illustrating Mr. Birchall's paper in the December 'Entomologist's Magazine,' may be obtained on application to the Author, Kirkstall Grove, near Leeds, price one shilling, post free. Fig. 1 represents the English form of *Artemis*; fig. 2, male and female of the Irish form (*var. Hibernica*); fig. 3, the Scotch form (*var. Merope*).

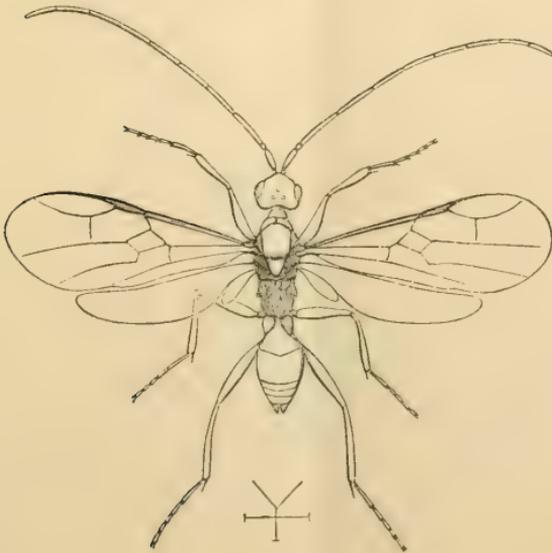
THE ENTOMOLOGIST.

No. 126.]

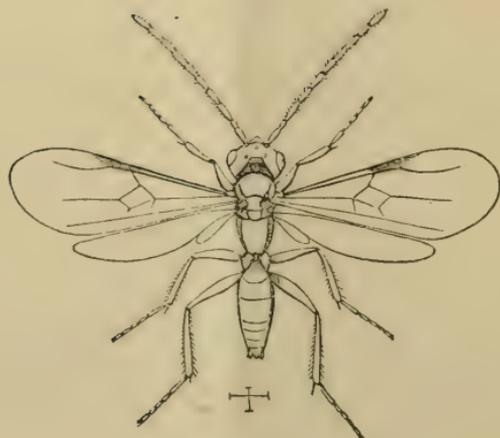
FEBRUARY, MDCCCLXXIV.

[PRICE 6d.

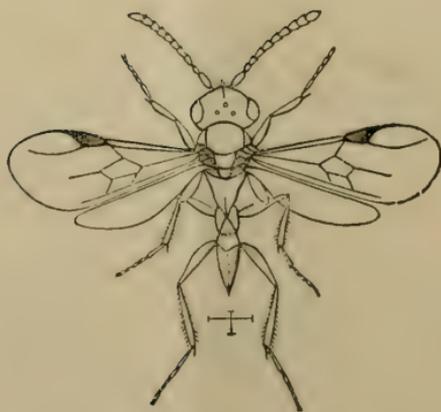
Notes on the Oxyura.—Family 3. *Ceraphronidæ*. 4. *Diapridæ*. 5. *Belytidæ*. 6. *Proctotrupidæ*. 7. *Heloridæ*. 8. *Embolemidæ*. 9. *Bethylidæ*. 10. *Dryinidæ*. By FRANCIS WALKER, Esq.



EMBOLEMUS RUDDII.



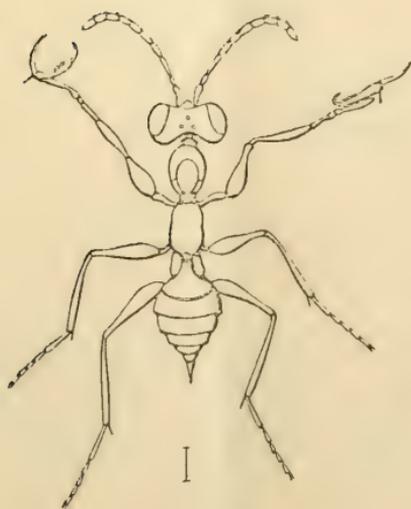
LABEO VITRIPENNIS.



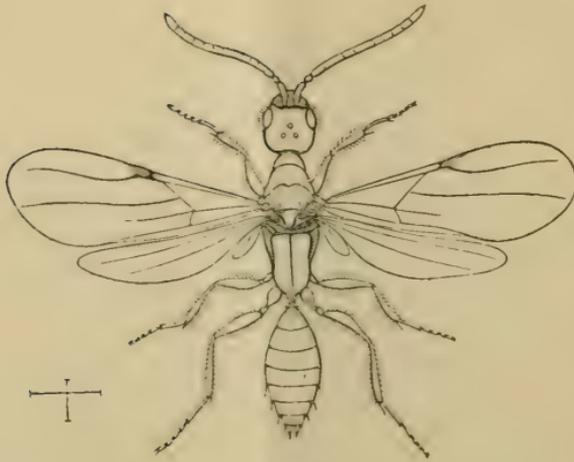
APHELOPUS MELALEUCUS.



CHELOGYNUS DORSALIS.



DICONDYLIUS PEDESTRIS.



EPIYRIS NIGER.

CERAPHRONIDÆ.

- A. No ocelli. - - - - - LAGYNODES, female.
- B. Ocelli conspicuous.
 - a. Wings without a determinate costal stigma, or merely with a linear one.
 - * Front between the base of the antenna with a spine. - - - - - LAGYNODES, male.
 - ** The same with no spine. - - - - - CERAPHRON.
 - b. Wings with a broad costal stigma.
 - * Wings hairless. - - - - - TRICHOSTERESIS.
 - ** Wings hairy.
 - † Antennæ of the male serrated. Eyes of the female bare. - - - - - LYGOCERUS.
 - ‡ Antennæ of the male filiform. Eyes of the female hairy. - - - - - MEGASPILUS.

The genus Lagynodes was previously named Microps, but Foerster does not recognize the latter name, because it had been already applied to a reptile and to a beetle. The genus Ceraphron of Jurine is not identical with that of Latreille and of Nees, but corresponds with the genus Calliceras of the latter, and the name Calliceras is set aside by Foerster on account of its resemblance to the Dipterous genus Callicera. The genus Megaspilus formerly included the

species which now represent the genera *Lygocerus* and *Trichostoresis*, and the type of the latter is *Cenaphron clandestinus*, *Nees* (= *glaber*, *Boh.*).

DIAPRIDE.

- | | | | |
|----------------|---|---------|----------------|
| A. | Wings notched at the tips. | - - - | ENTOMACIS. |
| B. | Wings not notched at the tips. | | |
| a. | First joint of the antennæ very much dilated. | | PLATYMISCHUS. |
| b. | First joint of the antennæ not very much dilated. | | |
| * | Front much elongated. First joint of the antennæ distorted in the middle. | - - | GALESUS. |
| ** | Front not much elongated. First joint of the antennæ not distorted. | | |
| † | Subcostal vein not extending to the costa. | | |
| ‡ | Subcostal vein with a stigmatic branch at the tip. | - - - - | ANEURHYNCHUS. |
| ‡‡ | Subcostal vein with no stigmatic branch at the tip. | - - - - | LABOLIPS, fem. |
| †† | Subcostal vein extending to the costa. | | |
| <i>Male.</i> | | | |
| ‡ | Antennæ 12-jointed. | - - - | CEPHALONOMIA. |
| ‡‡ | Antennæ with thirteen or fourteen joints. | | |
| § | Antennæ with thirteen joints. | | |
| × | First joint of the flagellum hardly half as long as the second. | - - - | PARAMESIUS. |
| × | First joint of the flagellum as long as the second or longer. | | |
| o | Second abdominal segment with one or more grooves at the base. | | |
| + | Wings with a costal vein. | - - - | IDIOTYPA. |
| ++ | Wings with no costal vein. | - - - | HEMILEXIS. |
| oo | Second abdominal segment with no groove at the base. | - - - | SPILOMICRUS. |
| §§ | Antennæ 14-jointed. | | |
| × | Wings with no basal vein. | - - - | DIAPRIA. |
| × | Wings with a basal vein. | | |
| o | First joint of the flagellum distinctly shorter than the second. | - - - | BASALYS. |
| oo | First joint of the flagellum not distinctly shorter than the second. | - - - | LOXOTROPA. |
| <i>Female.</i> | | | |
| ‡ | Antennæ 12-jointed. | | |
| § | Head large and flat. | - | CEPHALONOMIA. |

§§	Head not large and flat.		
×	Wings with no basal vein.		
o	Scutum with distinct furrows.	-	GLYPTONOTA.
oo	Scutum with no furrows.	-	DIAPRIA.
×	×		
o	Club of the antennæ 5-jointed. Scutum with furrows.	-	IDIOTYPA.
oo	Club of the antennæ at most 4-jointed. Scutum with no furrows.	-	LOXOTROPA.
†	Antennæ with thirteen joints.		
§	Club of the antennæ with only one joint.	-	MONELATA.
§§	Club of the antennæ with more joints.		
×	Abdomen conical, acuminate.	-	PARAMESIUS.
×	×		
o	Wings with no marginal branch.	-	HEMILEXIS.
oo	Wings with a marginal branch.	-	SPILOMICRUS.
††	Antennæ with fourteen joints.	-	POLYPEZA.

Of *Entomacis*, which he describes as closely resembling *Encoila* (= *Cothonaspis*), there are three species, which he does not name, and he is quite silent as to the species of the other new genera which he has established.

BELYTIDÆ.

Male.

A.	Eyes bare.		
a.	Scutum without furrows. Incisures of the abdomen very strongly marked.	-	ISMARUS.
b.	Scutum with furrows. Incisures of the abdomen not very deep.	-	PSILOMMA.
B.	Eyes hairy.		
a.	Postscutellum with a stout spine.	-	OXYLABIS.
b.	Postscutellum with no spine.		
*	Middle keel of the metathorax divided near the tip.	-	BELYTA.
**	Middle keel of the metathorax not divided.		
†	Radial areolet none, or open.		
‡	Stigmatic branch and postmarginal branch so much thickened that the radial areolet is hardly distinct.		
§	Basal veins obsolete.	-	SYNACRA.
§§	Basal veins distinctly emitted.	-	PANTOLYTA.
††	Radial areolet more or less distinctly formed.		
§	Fore tibiæ with a tooth or a spine.	-	ZYGOTA.

§§	Fore tibiæ with no tooth nor spine.	- -	ACLISTA.
††	Radial areolet closed.		
†	Petiole of the abdomen not or only slightly longer than the metathorax.		
§	Scape with the border at the tip produced, and in some aspects dentate.	- - -	ACROPIESTA.
§§	Scape with the border at the tip not produced.		
×	Apical ventral segment straight, grooved.	-	ANECTATA.
×	Apical ventral segment somewhat curved, not grooved.	- - -	PANTOCLIS.
††	Petiole of the abdomen much longer than, mostly twice as long as, the metathorax.		
§	Marginal branch more than twice as long as the radial areolet.	- - -	MACROHYNNIS.
§§	Marginal branch not twice as long as the radial areolet.		
×	Marginal branch as long as or hardly longer than the stigmatic branch, always much shorter than the radial areolet.	-	XENOTOMA.
×	Marginal branch much longer than the stigmatic branch, generally as long as the radial areolet.		
o	Scape as long as the first joint of the flagellum. Second abdominal segment contracted on each side.	- - - -	LEPTORHAPTUS.
oo	Scape longer than the first joint of the flagellum. Second abdominal segment not contracted.	-	CINETUS.

Female.

A.	Eyes bare.		
a.	Scutum without furrows. Incisures of the abdomen very strongly marked.	- . -	ISMARUS.
b.	Scutum with furrows. Sutures of the abdomen not deep.	- - - -	PSILOMMA.
B.	Eyes hairy.		
a.	Antennæ with more than twelve joints.		
*	Antennæ 14-jointed.		
†	No ocelli.	- - - -	ANOMMATIUM.
††	With ocelli.		
†	Radial areolet hardly distinct.	- - -	PANTOLYTA.
††	Radial areolet well defined.	- - -	ANECTATA.
**	Antennæ 15-jointed.		
†	Postscutellum with a stout spine.	- - -	OXYLABIS.
††	Postscutellum with no spine.		

‡	First joint of the flagellum almost as long as all the following joints together. - - -	DIPHORA.
‡‡	First joint of the flagellum much shorter than all the following joints together.	
§	Middle keel of the metathorax forked. - - -	BELYTA.
§§	Middle keel of the metathorax not forked.	
×	Third dorsal abdominal segment much longer than the fourth.	
o	Marginal branch as long as the radial areolet. Last joints of the flagellum more than twice as long as broad. - - -	CINETUS.
oo	Marginal branch much shorter than the radial areolet. Last joints of the flagellum not more than twice as long as broad. - - -	XENOTOMA.
×	Third dorsal abdominal segment not longer or not much longer than the fourth.	
o	Dorsum of the abdomen with eight segments.	
+	Radial areolet closed.	
×	Joints of the flagellum only slightly shortened near the tip. - - -	ZELOTYPA.
++++	Joints of the flagellum much shortened near the tip. - - -	PANTOCLIS.
++	Radial areolet open.	
++	Stigmatic branch and submarginal branch much shortened, the former emerging from a nearly right angle. - - -	ZYGOTA.
++++	Stigmatic branch and submarginal branch not unusually shortened, the former emerging from a very crooked angle. - - -	ACLISTA.
oo	Dorsum of the abdomen with less than eight segments.	
+	Dorsum of the abdomen with seven segments. -	ACROPIESTA.
++	Dorsum of the abdomen with less than seven segments.	
++	Marginal branch more than twice as long as the radial areolet; recurrent continuation of radial branch intersecting the basal vein. - - -	MACROHYNNIS.
++++	Marginal branch shorter, as long as, or a little longer than, the radial areolet; recurrent continuation of radial vein not intersecting the basal vein.	
∞	Dorsum of the abdomen with three segments; second unusually elongated, almost extending to the tip. Marginal branch distinctly shorter than the radial areolet. - - -	MIOTA.

∞∞ Dorsum of the abdomen with three, very rarely with four, segments; second not unusually elongated. Marginal branch not shorter than the radial areolet. - - - LEPTORHAPTUS.

Of Ismarus Foerster has described three species—Rugulosus, Halidayi and Neesii, the last being a synonym of Belyta unomala, Nees. Of Psilomma, Oxylabis, Synacra, Pantolyta, Zygota, Aclista, Acropiesta, Anectata, Pantocelis, Macrohynnis, Xenotoma, Leptorhaptus, Anommatium, Diphora, Zelotypha, and Miota, he mentions no types.

PROCTOTRUPIDÆ.

Foerster makes of the genus Proctotrupes two genera, Proctotrupes and Disogmus, the type of the latter being P. areolator, to which he adds three other species, as follows:—

- A. Fourth, fifth and sixth joints of the flagellum dentate.
- a. The tooth near the tip of each of these joints.
- * First joint of the flagellum distinctly longer than the second. - - - discrepator.
- ** First joint of the flagellum as long as the second. æquator.
- b. The tooth in the middle of each of these joints. - areolator.
- B. The above joints not dentate. - - - picicornis.

HELORIDÆ.

This family is limited to one genus, Helorus. Of this Foerster observes that he has one species, H. anomalipes, Panz., from the pupa of Hemerobius, and he distinguishes it from the other species, as follows:—

- A. Antennæ luteous. - - - ruficornis, Foerst.
- B. Antennæ black.
- a. Scutum quite scabrous. Legs wholly black. nigripes, Foerst.
- b. Scutum quite smooth. Tibiæ and tarsi luteous. - - - anomalipes.

EMBOLEMIDÆ.

- A. Eyes convex. Ocelli large. Basal joint of the antennæ shorter than the first joint of the flagellum. Wings complete. - EMBOLEMUS.

- B. Eyes quite flat. Ocelli very small. Basal joint of the antennæ much longer than the first joint of the flagellum. Wings rudimentary. - - - - MYRMECOMORPHA.

Myrmecomorpha corresponds with *Pedinomma*, *Foerst.*, and is an earlier name. I have found the species on which it is founded under a stone near Chepstow.

BETHYLIDÆ.

- A. Head without ocelli. - - - - SCLERODERMA.
 B. Head with ocelli.
 a. Wings without a stigma.
 * Wings with a stigmatic branch and a marginal branch. - - - - BETHYLUS.
 ** Wings with no marginal nor stigmatic branch.
 † Antennæ 13-jointed. - - - - ATELEOPTERUS.
 †† Antennæ 12-jointed. - - - - HOLOPEDIOUS.
 b. Wings with a stigma.
 * Basal vein with a diverging branch.
 † Antennæ 12-jointed. - - - - PERISEMUS.
 †† Antennæ 13-jointed. - - - - GONIOZUS.
 ** Basal vein with no branch.
 † Furrows of the parapsides distinct. Abdominal segments about equally long. - - - - EPYRIS.
 †† Furrows of the parapsides not apparent. Abdominal segments unequally long. - - - - ISOBRACHIUM.

Foerster changes *Scleroderma* to *Sclerochroa*, because the former name was previously used in Botany. *Ateleopterus* is founded on *Bethylus ateleopterus*, *Perisemus* on *B. triareolatus*, *Goniozus* on *B. clavipennis* and on *B. fuscipennis*, and *Isobrachium* on *B. dichotomus*: all these species were previously described by him, and *B. dichotomus* is a synonym of *B. fuscicornis*, *Nees* (male), and of *B. nigricornis*, *Nees* (female). The materials of this family do not agree well together; a connection may be traced between them and the *Chrysididæ*.

DRYINIDÆ.

- A. Vertex much compressed.
 a. Winged. - - - - DRYINUS.
 b. Wingless. - - - - GONATOPUS.
 B. Vertex convex, not compressed.

- a. Hind head deeply excavated. Vertex and neck separated by a sharp edge. - - - LABEO.
- b. Hind head slightly concave. Vertex and neck not parted by a sharp edge.
- * Fore tarsi of the female with long claws. Prothorax of the male distinctly visible above, not longer than the mesothorax.
- † Fourth joint of the fore tarsi of the female much longer than the third. Prothorax of the male and female as long or nearly as long as the mesothorax. - - - CHELOGYNUS.
- †† Fourth joint of the fore tarsi of the female as long as or a little longer than the third. Prothorax of the male and female much shorter than the mesothorax. - - - ANTEON.
- ** Fore tarsi of the female without long claws. Prothorax not visible above, or longer than the mesothorax.
- † Prothorax much longer than the mesothorax. Mesothorax with no trace of the furrows. Wings short, spatulate. - - - MYSTROPHORUS.
- †† Prothorax not or slightly visible above. Mesothorax wide, with distinct furrows. Wings ample. - - - APHELOPUS.

There are no illustrations here of the Ceraphronidæ, Diapridæ, Belytidæ, Proctotrupidæ, and Heloridæ; they are figured in Jurine's 'Nouvelle Méthode.' The Ceraphronidæ come next to the Scelionidæ, and, like them, are distinguished by the sculpture at the base of the abdomen, and by a simple costal vein. The Diapridæ, like the great part of the Platygasteridæ, have no wing-veins, or none beyond the base of the wing. In the Belytidæ and Proctotrupidæ there are indications of an increase of bones in the wing, and this increase is more extensive in the Heloridæ. The Dryinidæ come last, and are distinguished by their rapid movement, and by their mimicry of some of the aculeate Hymenoptera.

Additional notes on the preceding families, which conclude the series of British Oxyura, are deferred till opportunity occurs of examining in detail the genera and their respective species.

FRANCIS WALKER.

Notes on the Wing-bones of the Two-winged Flies. By
FRANCIS WALKER, Esq.

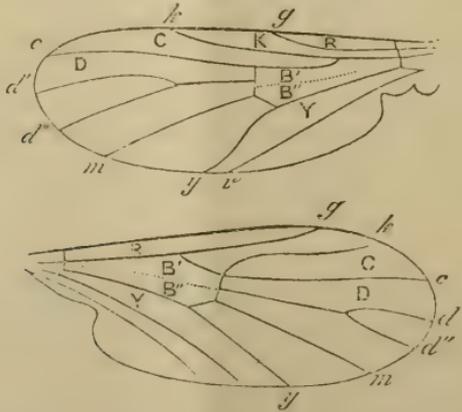
VEINS.

- g* Subcostal vein.
k Radial vein.
c Cubital vein.
c' Cubital vein, 1st branch.
c'' Cubital vein, 2nd branch.
d' Præbrachial vein, 1st branch.
d'' Præbrachial vein, 2nd branch.
m Pobrachial vein, 1st branch.
y Pobrachial vein, 2nd branch.
v Anal vein.

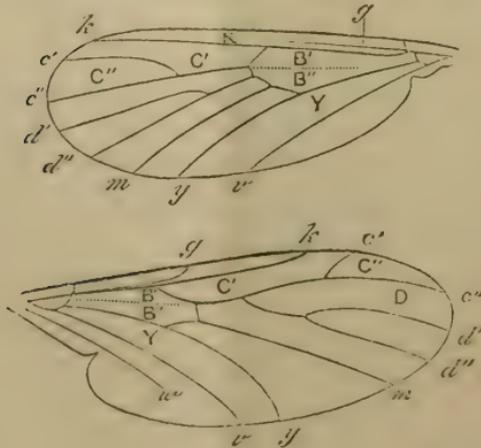
AREOLETS.

- R Subcostal areolet.
K Radial areolet.
C' Cubital areolet, 1st.
C'' Cubital areolet, 2nd.
B' Præbrachial areolet.
B'' Pobrachial areolet.
D Subapical areolet.
Y Anal areolet.

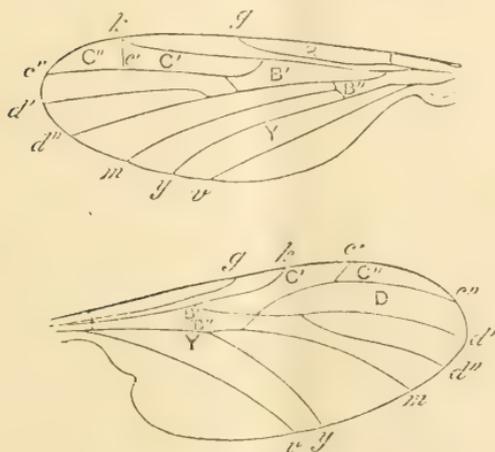
Figs. 1 & 2.—*Diadocidia ferruginosa*. *Mycetobia pallipes*.



Figs. 3 & 4.—*Ditomyia annulata*. *Platyura*.



Figs. 5 & 6.—Mycetophila. Macrocera.



The above figures, and others which will follow, are from the drawings of A. H. Haliday. The same letter refers to the same parts in all the figures.

One of the chief attractions in noticing the Diptera is the great variety of their manner of flight, and this corresponds with the difference of structure in the wings. These variations will be briefly traced in some notes, which are preceded by the following extract from the MSS. of A. H. Haliday on the same subject.

“The subcostal areolet lies between the costal vein and the first longitudinal vein, usually the mediastinal (but if this vein is effaced, then the subcostal).

“The mediastinal areolet lies next beyond this, between the mediastinal and subcostal veins; and if the mediastinal vein is wanting there is no mediastinal areolet.

“The radial areolet lies between the subcostal and radial veins; if the latter divides into two branches at the end, another radial areolet is enclosed between them; and in either case, if the radial vein is connected with the subcostal by a transverse vein, the radial areolet may be thus divided into more than one. This areolet may become entirely closed without extending to the margin, in case the radial vein rejoins the subcostal before the end, as in *Laphria*, *Volucella*, *Hirmoneura*, and *Midas*.

“The cubital areolet lies between the radial and cubital veins; if the latter is branched a second cubital areolet is enclosed between its branches, as is ordinary with many families of Diptera, *e.g.* Tabanidæ. In this case, particularly, the cubital and radial veins are not uncommonly joined by a transverse vein, forming a third cubital areolet. When this is the case the direction of the veins may be so modified as to make it doubtful whether the radial or cubital vein be the one that is branched; but analogy to allied genera will generally give a clue, even where the direction of the veins is so far changed as to give the contrary appearance, as in some of the Asilidæ. Rarely the cubital vein also returns to the subcostal, so that the cubital areolets do not extend to the margin; this is the case in *Hirmonoura* and in *Midas*.

“Before the præbrachial vein lies the præbrachial areolet, bounded in front by portions of the (subcostal) radial and cubital veins, or some of them, and at the tip by the præbrachial transverse vein. Between the præbrachial and pabrachial veins is the pabrachial areolet, usually bounded at the tip by a more or less evidently oblique or transverse vein (the pabrachial transverse vein), often in connection with a twist or branching of the longitudinal veins. Between the pabrachial and anal veins lies the anal areolet, which is open to the margin when the subanal vein runs on as a continuation of the pabrachial, as in the Tipulidæ generally, and in some other cases, but becomes closed when the subanal vein runs to join the anal; either obliquely, as in Syrphidæ, Conopidæ, Stratiomydæ, Asilidæ, and the neighbouring families in general; or transversely, as in most Muscidæ, many Empidæ, and the Dolichopidæ. These three areolets (the præbrachial, pabrachial, anal), sometimes jointly called the ternate areolets, can in most cases be determined from the manner in which the conjugate axis divides into the three veins,—præbrachial, pabrachial, and anal; and their determination is of prime importance for the determination of the others. A very characteristic areolet, also, when it is present, is the discal, which (generally speaking) lies beyond the præbrachial and pabrachial, commencing in the angle between the tips of these two.

“The veins which run to the margin of the wing from the

præbrachial, or the discal, and the pobrachial areolets, scarcely admitting of any further classification, are comprehended under the general name of externo-medial veins, and the areolets adjacent to them are called externo-medial, and discriminated when necessary by their ordinal number, commencing with that nearest the tip of the wing. This one only, on account of the characters it affords, has received a peculiar name (the subapical areolet); it lies immediately behind the cubital areolet, and is bounded behind by a vein (the first of the externo-medial veins), which is also, when it has to be noticed, called subapical vein, or subapical portion of the præbrachial vein, of which in most of these cases it appears as the continuation. This subapical vein is often (*Cyrtoneura*, *Alophora*, *Hyalomyia*, *Conops*, *Pangonia*, and many *Syrphidæ*, &c.) curved, so as to meet the cubital vein and close the subapical areolet before the margin (many *Muscidæ*, *Tachinini*, *Syrphidæ*), or it is forked, and the anterior branch runs obliquely towards or to the cubital vein, and becomes to all intents a transverse vein (the subapical transverse), closing the subapical areolet as before mentioned.

“Sometimes another of the externo-medial areolets becomes closed before the margin (as in many *Asilidæ*, *Cyrtus*, &c.), the last but one of the externo-medial veins running obliquely or transversely to meet the last of them. In *Nemestrina*, and a few allied forms, the areolets towards the posterior margin and tip of the wing become so subdivided by supernumerary veins that it is only by comparison with simpler forms that we can trace the limits of the cubital area and the two branches of the cubital vein, the externo-medial veins being too complicated for any available denominations. But here, also, the præbrachial, discal, pobrachial and anal areolets being distinct, the boundaries of the externo-medial portion of the wing are still defined. The portion of the wing which lies behind the anal vein and beyond the axillary lobe, or sinus, is divided by the subaxillary vein into two open areolets, the axillary before and the subaxillary behind that vein, or if the vein be wanting the whole space is comprised under the former of these.

“In general, it is easiest to trace out the analogy and apply the nomenclature to the *Diptera Brachycera*. Among these, having followed out the gradual simplification of the system

of veins and change in their direction, little difficulty arises from such anomalies as an additional transverse vein, such as subdivides the subapical areolet into two in *Microdon*, or the pobrachial in *Idioptera*. The *Hypocera* are hardly to be reduced with certainty to an analogous type, but the simplicity of the veining and the contrast between the strong veins which end in the fore margin, and the faint ones (*venulæ*) which run to the hind margin, allow of and recommend a different and simple nomenclature.

“The *Nemocera* have a much greater variety in the veining of the wings, and there is not a little difficulty in accommodating to them the nomenclature used for the *Brachycera*, partly from the multiplication of longitudinal veins, as in the *Psychodini*, but yet more from the extreme faintness of the veins in many, as in *Simulia*, and the ultimate disappearance of all but one or two in the *Cecidomyidæ*. Still, apart from these extreme cases, we may observe such a degree of gradual modification of the veining in most as to be able to apply an analogous nomenclature to at least some of the principal veins, and by relation to them to denominate the rest; although it may be doubted whether it is not best to employ a different and simpler numerical nomenclature when the veins become few in number, and the closed areolets nearly null or insignificant. *Rhyphus* has been taken as the type by which to assimilate the nomenclature of the *Nemocera* to the *Brachycera*, as it is scarcely possible to overlook the analogy between *Rhyphus* and the *Leptidæ* and allied families of the *Brachycera*. From *Rhyphus* the transition is not difficult to the *Tipulidæ*, and thence to the *Culicidæ*. From the latter probably the *Psychodini* on the one hand, and the *Chironomidæ* on the other, may be illustrated with sufficient probability. The transition from the *Tipulidæ* to the *Mycetophilidæ* is more abrupt; and these last, in respect to the veining of the wings, not only undergo great diversities, but present two manifest types separated by as abrupt an interval. The first of these, characterized by the more or less complete coalescence of the præbrachial and pobrachial areolets (*Bolitophila*, *Thaumalea*, *Macrocera*, *Platyura*, *Ceroplatus*, *Ditomyia*, *Asindulum*, *Diadocidia*, *Mycetobia*), still preserves most analogy to the preceding family. The second, in which these two areolets are separated by a strong præbrachial vein, but

in which the pabrachial areolet is prolonged open to the hind margin (*Sciophila*, *Tetragoneura*, *Leia*, *Gnoriste*, *Mycetophilina*, *Cordyla*): this type extends from *Sciara* to *Zygoneura* and *Lestremia*, and thence to *Campylomyza* and the *Cecidomyiæ*, in which the simplicity of the veining least of all admits or needs the application of the complicated nomenclature that may have been retained in the previous families. The *Bibionidæ*, in general, may perhaps be best illustrated by a comparison with the first type of *Mycetophilidæ* (as *Platyura*, &c.); see *Rhyphus* also; while *Scatopse* seems not remote from the second type of that family, and *Aspistes* presents a case almost as hard to the assumed type as is that of the *Diptera Hypocera*.

“The *Culicidæ* and *Psychodini* have the cubital vein simple, the radial forked. The *Tipulidæ* either have both these veins simple (*Limnobia*, *Rhipidia*, *Rhamphidia*, *Symplecta*, *Idioptera*), or the radial forked (*Dixa*),—*Trichocera*, *Anisomera*, *Limnephila*, *Tipula*, *Ctenophora*, *Pachyrina*, *Nephrotoma*, *Erioptera*, &c. In a very few cases (*Ptychoptera*, *Limnophila immaculata*, &c.) the veins divide in such a way that we must consider the radial as simple and the cubital forked. In nearly all other cases, when either of these is branched, it is the cubital, and this holds good among the other *Macrocera* (as *Mycetophilidæ* of the first section, and some *Bibionidæ*), as well as in the *Brachycera*. In *Tipula* and the allied genera—*Pachyrhina*, *Nephrotoma*, *Megistocera*, *Ctenophora*—there are five externo-medial areolets, of which two are behind the discal areolet, while in the rest,—*Limnobia*, *Limnophila*, *Erioptera*, *Trichocera*, *Ptychoptera*, &c.,—whether the externo-medial areolets be four or five, only one lies behind the discal areolet (which is sometimes wanting). Generally the anal areolet is open to the margin in the *Nemocera*, though there are a few exceptions (*Eriocera nigra*, *Macq.*, and *Limnobia Trentepohlii*, *Wied.*), and closed in the *Brachycera*, or nearly so; and in the latter families (*Muscidæ*, &c.), small and distant from the margin. In *Cylindrotoma*, *Macq. Dipt. pl. I. f. 15*, the subcostal vein seems to reunite with the radial before the end, the usual termination of the former being probably obliterated, and what is elsewhere a transverse vein connecting the subcostal and radial, here appearing as the termination of the former.

“Of the three areas into which Latreille divides the wing (exclusive of the extreme basilar area), the costal ends with the cubital vein, or its hindmost branch, if branched. The intermediate extends back from this to the anal vein, and the internal occupies the rest behind the anal vein. The first of these areas becomes very narrow in those Nemocera which lead to Cecidomyia, and recedes more and more from the tip of the wing, not the mediastinal alone, but the subcostal vein often disappearing. In other cases, and generally where the veining of the wing is most fully developed (Tabanidæ, Asilidæ), the costal area takes in the whole tip of the wing, though sometimes the intermediate area expands itself by the curvature of veins as it reaches the margin (so in Midas, &c.). The tip of the wing, therefore, may be considered as the medium point of limit at the margin between the costal and intermediate areas. When the costal vein vanishes without being continued round the posterior margin, it most commonly ends at the end of the subapical vein.”

FRANCIS WALKER.

Additions to the List of Macro-Lepidoptera inhabiting Guernsey and Sark. By W. A. LUFF.

(See Entom. vi. 375.)

THE following were, with one exception, taken during 1873.

Sesia Philanthiformis.—One specimen. Captured in Guernsey on June 8th.

Nola cristulalis.—One. June 17th, in Guernsey.

Metrocampa margaritaria.—Not uncommon in Guernsey.

Odontopera bidentata.—Mr. Tunley took one in Guernsey, May 27th.

Ennomos angularia.—Bred a specimen on August 20th.

Himera pennaria.—One. Taken at light, in Guernsey, by Dr. Wakefield.

Nemoria viridata.—Beat several out of furze-bushes on the Guernsey cliffs.

Acidalia trigeminata.—Several specimens taken in Guernsey.

Macaria notata.—One specimen. Guernsey.

Eupithecia subumbrata.—Not common in Guernsey.

E. nanata.—Several in Sark.

Anticlea rubidata.—My notice of *Berberata* (Entom. vi. 356) must apply to this species. *Berberata* occurs in Guernsey, but I have only seen one specimen.

A. badiata.—Not rare in Guernsey.

Leucania albipuncta.—I find I have included a specimen of this insect amongst my series of *Lithargyria*. It was captured in 1871, on the flowers of the ragwort, in Guernsey.

Dasyptolia Templi.—Mr. Dawson took one at rest in a conservatory, on November 20th, in Guernsey.

Axytia putris.—Common in Guernsey and Sark.

Xylophasia lithoxylea.—Common in Sark. I have taken a specimen in Guernsey.

Trigonophora empyrea.—A crippled specimen emerged in my breeding-cage on September 27th. The larva was found in Guernsey.

W. A. LUFF.

Guernsey.

Entomological Notes, Captures, &c.

List of Insects taken at Glenarm, 1873.—*Smerinthus Populi*: bred. *Bombyx Rubi*: caterpillar, common on heath, September. *Agrotis porphyrea*: common on heath, September. *Hybernia defoliaria*: 9th December, 1873, by light. *Cheimatobia brumata*: 9th December, 1873, by light. *Scotosia dubitata*: 23rd November, 1873, hibernated females. *Cidaria miata*: October, hibernated. *Sphinx Convolvuli*: I saw a specimen of the above insect at Larne, about twelve miles from here, taken in September, 1873, by a miller, off the wall of the mill; it was showed to me for the death's-head moth.—*T. Brunton; Glenarm Castle, Larne, Ireland.*

Epunda lutulenta at West Wickham.—Referring to the notice in the December number of the 'Entomologist,' wherein Mr. Forbes informs us that he took *Epunda lutulenta* in his garden in September last, will you allow me to say that in September, 1866, while sugaring in West Wickham Wood with my friend Mr. Miller, we took one specimen of this species.—*J. R. Wellman; 14, Portland Place North, Clapham Road, S.W., December 18, 1873.*

Anticlea sinuata in Hampshire.—The occurrence of a specimen of this local insect—near Winchester, I believe—is recorded in the August number of this journal (Entom. vi. 456). This specimen was taken on the 10th of July, 1873. One evening, on the 30th of the same month, I was collecting on the borders of the New Forest, taking a few of the pretty little *A. emarginata*,—which, indeed, was about the only species to be met with, for everything has been unusually scarce this season,—and I was somewhat surprised to beat out a very good specimen of *A. sinuata* from a bush of hawthorn and bramble. I believe it is the first instance of its occurrence in the neighbourhood of the New Forest; and, although I visited the locality several evenings after my capture, I did not see another specimen. The one I caught is the first I ever saw *alive*.—*G. B. Corbin.*

Chauliodus charophyllellus bred.—Towards the end of August last I gathered a few larvæ of this species from off the parsnep growing in my garden. The larva may be detected on the under side of the leaf, near the tip, by giving it a ragged appearance; it changes to pupa by making a netted web on the leaf, and the insect appears in a week or two afterwards. The larva is not much unlike that of *Xylopada Fabriciana*.—*F. O. Standish*; 402, *High Street, Cheltenham, November 30, 1873.*

Cetonia aurata, or the *Rose-beetle*.—Not being a Coleopterist I do not know whether it will interest your readers to know that, while digging round an old ash-tree for pupæ of Lepidoptera, I turned out from a decayed part of the tree about a dozen of this beetle, each in a strongly-made earth-cocoon, similar to that of *Cucullia Verbasci*, except that it was free from web. May I ask if it is usual for this pretty beetle to hibernate in this singular way?—*Id.*

[It had probably fed on the decayed wood of the ash, and had emerged from the pupa state without flying. I do not think it could be said to have hibernated.—*E. Newman.*]

Carabus nitens in the *New Forest*.—During a day's collecting of Lepidoptera in the New Forest I caught two, and saw several others, of this lovely ground-beetle. They were running about in the *sunshine* on a boggy piece of heath, and seemed to lose much of their activity if the weather became cloudy. Is such a habit common to this species? as

we generally find that its relations, *C. hortensis*, *C. violaceus*, &c., are lovers of the night rather than of sunshine, for we often meet with ground-beetles when sugaring for Lepidoptera. Not being a collector of Coleoptera, I need hardly state that I am unacquainted with the habits of the lovely creatures included in that order.—*G. B. Corbin*.

Aphilothrix Radicis.—After Mayr's translated description of the gall of this species, Mr. Walker says, "This insect has not been found in England," &c. This I think must have been an oversight, as Mr. Marshall includes it in his descriptions of British Cynipidæ (*Ent. Mo. Mag.* vol. iv. p. 7); also Mr. Müller, in his list of British gall-insects (*Ent. Ann.* 1872, p. 6); and I have myself found it at Shirley, in Surrey, and at Rayleigh, in Essex. I believe it to be generally distributed were it only looked for.—*E. A. Fitch; Down Hall, Rayleigh, Essex, January 3, 1874.*

Hymenoptera reposing.—During the summer I saw what I supposed was some species of wild bee attached to the end of a blade of grass, and as the weather was dull and the wind blowing somewhat briskly it was swayed backwards and forwards, and continually buffeted by the surrounding herbage, yet it held on firmly, without taking any apparent notice of such rough usage, until I attempted to box it, when it immediately flew away. I believe I have seen a record of a similar occurrence in some journal, but I forget where. Is such a habit of general occurrence, and what is the name of the species possessing such a peculiarity, or are there more than one? To all appearance the insect seemed asleep when I first saw it in its peculiar swinging situation, but as soon as I touched the blade of grass with my finger it flew away, although I did not disturb it half so much as the wind had previously done. I did not see the insect settle upon the grass-stem, so I cannot say whether it crawls up, or at once settles at the point, but it does seem a strange situation for an insect to be "rocked to sleep;" but why should I call it strange, when the peculiarities and economy of almost every insect are so wonderfully interesting. Possibly this habit is well known to those who have made the Hymenoptera their especial study,—if, indeed, I am right in referring the insect I saw to that order,—and who will, I hope, give us a fuller account of the insect, or insects, which choose such a position

to rest (?) in, and under what conditions it is chosen?—*G. B. Corbin.*

[This habit is very familiar to Hymenopterists; I have observed it in several species of *Nomada*, and also in *Chelostoma florissomme*. These observations have been frequently recorded, and have been styled “roosting by the mandibular process.”—*Edward Newman.*]

Lime-galls.—In the ‘Fifth Annual Report on Insects of the State of Missouri,’ by C. V. Riley, there is a figure (p. 119) of a gall that grows on the vine-leaf, and the author remarks that similar, but distinct, galls grow on the leaves of hickory and hackberry. Each of these vine-galls contains a pale orange larva, made by a *Cecidomyia*, which has not yet been described. These galls exactly resemble the excrescences which may be seen here and there on lime-leaves in England, but no insects have been found in these excrescences, except an *Acarus*, as was mentioned in a French publication, which I cited many years ago in a notice on these formations. It is uncertain whether this *Acarus*, or mite, is identical with one or other of two kinds of mites which often occur under lime-leaves,—the green *Tetranychus Tiliarium*, which I have before spoken of, and the little white *Acarus*, which transfers to itself the hollow remnants of the *Aphides*, whose contents have been already appropriated by *Aphidii*. The round red gall on the twigs of the lime is of more frequent occurrence than the lanceolate formation before mentioned, and is inhabited by the grub of *Sciara tilicola*, which leaves them and enters the earth, and there assumes the imago state.—*Francis Walker.*

Extracts from the Proceedings of the Entomological Society of London, November 17 to December 1, 1873.

Deilephila Euphorbiæ and *Sphinx Pinastri* at Harwich.—Mr. Higgins exhibited two bred specimens of *Deilephila Euphorbiæ* (one a remarkable variety), and a *Sphinx Pinastri*, taken near Harwich in June, 1872, when several specimens of the former were found in the larva state.

Pachnobia alpina from Braemar, &c.—Mr. Champion exhibited a bred specimen of *Pachnobia alpina* from Braemar; also *Harpalus quadripunctatus* from Braemar; *Anisotoma*

macropus from Claremont; *A. pallens* from Deal; *Liosomus Troglodytes* from Faversham; and *L. oblongulus* from Caterham.

Brachycentrus subnubilus Bred.—Mr. W. C. Boyd exhibited living larvæ of *Brachycentrus subnubilus*, which had been reared from the eggs. They fed upon *Confervæ*, and the cases constructed by them were clearly quadrangular (though the angles were not prominent) and very diaphanous, so that the movements of the larvæ could be discerned within.

Pempelia Davisella Bred.—Mr. Vaughan exhibited *Pempelia Davisella* reared from larvæ, feeding in a web, upon shoots of *Ulex*.

Biorhiza aptera on *Roots of Deodars*.—Mr. Müller remarked that at a meeting of the Scientific Committee of the Royal Horticultural Society, on the 12th instant, Dr. Masters had exhibited some galls found at Wimbledon on the roots of *Deodars*. That gentleman had since submitted to him further specimens of this gall, which he had found to agree, in external and internal structure, with those of *Biorhiza aptera*, *Fab.*, usually occurring on roots of oak. Mr. Müller stated that he had since bred several specimens of *Biorhiza aptera* from these *Deodar* galls, and that he believed it to be the first instance where a true *Cynips* had been known to transfer its attacks from oak to any species of Conifer.

Hybrid specimen of Clostera.—Mr. Bond exhibited a hybrid specimen between *Clostera curtula* and *C. reclusa*, partaking of the characters of both parents.

Congregation of Psen.—Mr. Jenner Weir exhibited specimens of a minute species of *Psen*, which he had observed in large numbers in June last, on a pear-leaf at Lewes. They had congregated together on the surface of the leaf like a swarm of bees, though it was not apparent what motive brought them together.

Humble-bees wanted for New Zealand.—Mr. Dunning read some portions of a letter which he had received from Mr. Nottidge, enclosing the Eighth Report of the Canterbury (New Zealand) Acclimatization Society, and stating that the red clover had been introduced into the colony, but that they had no humble-bees to fertilize the plant. Also that certain Lepidopterous insects had been accidentally imported into

the islands, and that corresponding ichneumons were wanted to keep down their numbers. He would be glad of any suggestions as to the best mode of introducing such humble-bees and ichneumons into the colony, as might be requisite. It was suggested that by procuring a sufficient number of humble-bees in a dormant condition, and keeping them in this state (by means of ice) during the voyage the result might be attained.

No indigenous Aphides in New Zealand.—Mr. M'Lachlan mentioned that he had received a letter from Capt. Hutton, from New Zealand, stating that indigenous Aphides did not, apparently, exist there, but imported species were becoming very destructive, and he asked if it would be possible to introduce Chrysoidea.—*F. G.* [*Selected by E. Newman.*]

*Proceedings of the South London Entomological Society,
January 1st and 15th, 1874.*

Mr. J. Jenner Weir exhibited two cases to illustrate "mimicry," and explained the meaning of the word in its relation to insects. The species included *Papilio Merope*, a species of Heliconian, another of *Pieris*, together with the various forms of Danaids, which they resemble (or mimic). Amongst British insects *Nemeobius Lucina* may be said to be a good representative of mimicry, as it closely resembles *Melitæa Athalia*, and is very unlike its congeners.

The President exhibited a case of bred specimens of *Cidaria russata* from various parts of Britain.

Mr. Barrow exhibited two large species of Orthoptera from the Cape of Good Hope.

Donations of the 'Entomologist' and 'Zoologist' for January, 1874, from Mr. Newman, and of a copy of 'The Origin and Metamorphoses of Insects,' from Sir John Lubbock, Bart., M.P., were announced, and votes of thanks passed to the donors.

Mr. Harris exhibited living specimens of *Isotoma trifasciata* and *Macrotoma plumbea*.

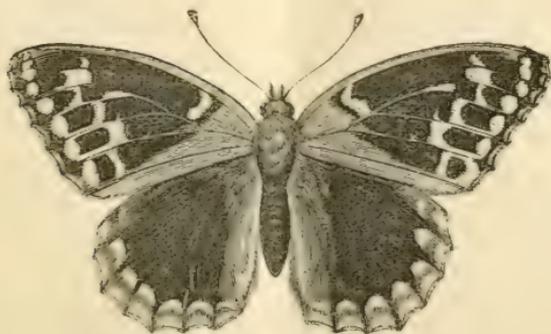
Mr. Hoey exhibited the larvæ and pupæ of *Nonagria geminipuncta*, *Leucania Phragmitidis*, *Sesia Tipuliformis*, and *Tinea tapetzella*.—*J. P. B.*

THE ENTOMOLOGIST.

No. 127.]

MARCH, MDCCCLXXIV.

[PRICE 6d.



ARGYNNIS ADIPPE (MELANIC VARIETY: UPPER AND UNDER SIDES).

Variety of Argynnis Adippe.—I am indebted to Mr. C. S. Gregson for the loan of this beautiful specimen, which he sent me purposely for figuring in the 'Entomologist.' On the upper side the costal margin itself is black, and immediately beneath this is a narrow fulvous stripe extending from the

base of the wing nearly to its apex; the distribution of fulvous and black on the remainder of the wing is clearly indicated in the figure, from which it will immediately be seen that black greatly predominates; the basal portion of the wing is iridescent fulvous, and the colour extends along the inner margin to the anal angle; on the hind wing the disk is almost entirely black, the inner margin being tinged with fulvous iridescence, and the hind margin having a double series of fulvous lunules. On the under side the central portion of the fore wing is almost entirely black; the hind wings have five silver spots about the base, but none on other parts of the wing; the median diagonal series of silver spots is entirely absent, but their position is indicated by a series of obscure markings.—*Edward Newman.*

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.' By Miss ANNA WEISE.

II. BARK-GALLS.

THE three species next to be described are generally found more or less covered with earth, moss, or dead leaves, on the lowest parts of the stem, or on shoots growing out of the ground; others only occur on that portion of last year's shoots which is above the ground: they are almost invariably in clusters, and in two instances are perceptible only from the unevenness of the bark or the incrasation of the twig.

Fig. 3.



A. CORTICIS.

Aphilothrix Corticis.—Of this rare gall I have seen only a few clustered specimens. It is of an obconical form, and swells about seven or nine millemetres above the surface of the bark of old oak-stems (probably of *Quercus sessiliflora* or *Q. pedunculata*). The aperture at the apex is from three and a half to five millemetres in diameter; more than half of the gall is sunk in the bark, which seems to form a wall round it. It is hard, of a brown colour, and somewhat cylindrical in shape, but more or less compressed: the opening is sharply defined and nearly circular; within the opening, and about a millemetre or a millemetre and a half below the summit, is a convex septum,—thin, hard, and of

a yellowish colour; in the space between them and the margin is a circle of scabrous points. In the interior is a large larva-cell, and a hole in the convex septum shows where the imago has escaped.—*G. L. Mayr.*

Aphilothrix Corticis is accompanied in the gall by *Synergus incrassatus*, which has already been mentioned as a tenant in the gall of *Aphilothrix Radicis*, and is one of the winter species, Dr. Mayr having divided the *Synergi* into winter flies and summer flies according to the time of their appearance. The following note refers to the likeness of oak-galls to organs of the oak. The differences of the parts of an organism, such as the oak, and the means which successively occasion these differences, are of much interest, as the result of one agent,—the circulation in the living form. But the differences between the kinds of oak-galls are more remarkable: they are also the products of the circulation of the oak, and therefore it would seem to be likely that they must resemble the native products of that circulation; and such in some kinds is the case. But two kinds of galls, quite different in structure, may be found in close contiguity, or almost connected, on the oak; and it remains to be ascertained whether this difference is caused by the puncture, by the egg, by the grub, or by the joint influence of these three.—*Francis Walker.*

Aphilothrix Rhizomatis.—This occurs partly under ground and partly on those shoots which are but slightly raised above the ground: a roughness or unevenness in the bark is observable, and a crack or furrow appears, in which the galls are seated in sparse clusters: the visible portion of each gall is conical or hemispherical, or sometimes nearly oval, and of an ochreous colour; at the base of the cone are striæ or furrows, similar to those on the species next to be described, but these vanish towards the summit, where no trace of such striæ is perceptible; the summit itself is rounded, and is pierced in the centre by the imago in making its escape. Each gall contains one large larva-cell, the exposed portion of which is from two to three millemetres in

Fig. 4.



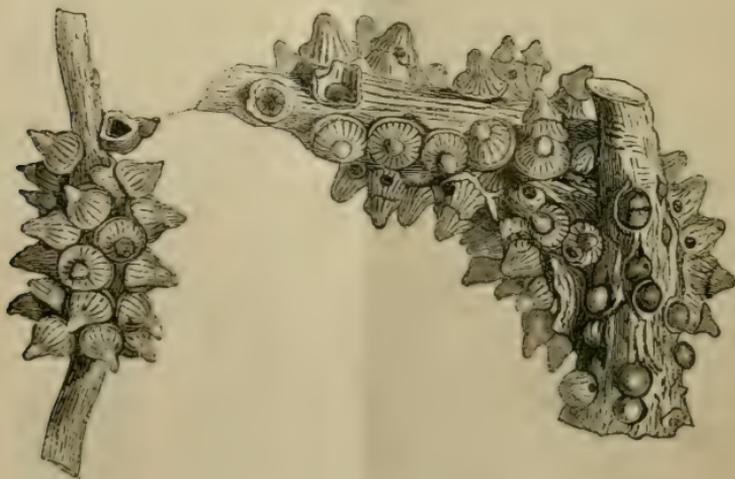
A. RHIZOMATIS.

height, and 3·5 to 5·5 millimetres in diameter at the base. Of this rare gall I have only one small branch, with a number of galls on it: it seems to be found only on *Quercus sessiliflora* or *Q. pedunculata*, as these are the only oaks growing in Nassau, the country from which my specimen was recorded.—*G. L. Mayr.*

No inquiline has been observed in this gall.—*F. Walker.*

When nothing is said of the occurrence of the gall in Britain, it is to be assumed that nothing has been recorded, but we must on no account conclude that it is absent on this ground, but that it has escaped observation. We have scarcely a dozen entomologists who collect oak-galls, and therefore many species will of necessity escape notice.—*Edward Newman.*

Fig. 5.



APHILOTHRIX SIEBOLDII.

Aphilothrix Sieboldii.—This red or reddish brown gall is found under or near the surface of the ground, on twigs that are one centimetre or one and a half centimetre in diameter. It seldom occurs alone, but numbers of them are usually found crowded together, and the twig may possibly attain a diameter of three centimetres. The gall itself is conical: it stands from five to six millimetres in height, and its

diameter at the base is about the same, but is sometimes narrower than this, and sometimes even broader; from the base to the apex it is thickly and coarsely striped or furrowed, and its surface is smooth. Single galls, or those not very crowded, are perceptible on the outside on short or uneven space of the bark, which latter, however, can only be regarded as a ring, for the base of the gall penetrates farther into the bark than the periphery, so that half of the spacious larva-cell is below the circumference of the cone. The substance of the gall is composed of two thinnish layers: the outer one, of a reddish colour, is doubtless full of sap; while the inner, which is yellowish, is hard and sharply furrowed, from the circumference of the cone to the apex, in a way that makes the furrows appear deeper at the circumference than nearer the apex; the striæ, or the outer layer, unquestionably result from its adhering so closely to the grooves and furrows of the inner layer during the slow process of drying. In old galls the outer layer is generally cracked, and we then only see the brownish yellow inner layer. In this condition the deeper furrows round the periphery of the cone appears as dots; the aperture through which the imago makes its escape is on the side, and above the periphery of the cone.

M. von Siebold has been so kind as to send me typical specimens, found at Dantzic and Friebourg on *Quercus sessiliflora*, and from these it appears that Professor Schenck considers this gall to be that of *Cynips corticalis* of Hartig. Now, as Hartig's description of *Corticalis* is such that one cannot distinguish it from *A. Sieboldii*; and, moreover, as Hartig doubtless applies the reference to "*Malpighi (op. omn. tab. 17, fig. 60*") although the figure of the gall represents that of *A. Sieboldii*, I think it very probable that *C. corticalis* and *C. Sieboldii* are synonyms of the same species, and that Hartig, when describing his *Corticalis*, had only ill-preserved specimens at his disposal. I therefore feel justified in retaining the later name, since under that name the gall is minutely described, and typical specimens have been submitted to me for examination.—*G. L. Mayr.*

Synergus incrassatus inhabits this gall.—*F. Walker.*

I think it will be impossible for an entomologist to examine attentively the beautiful figures of the bark-galls,

produced by *Aphilothrix Sieboldii*, without perceiving their very close correspondence with the small aborted acorns we find so commonly on the long peduncles of *Quercus pedunculata*. On these peduncles it is not unusual to find *one* normally developed acorn near the base, and one, two, or three aborted acorns beyond it, as though the first had appropriated the sap destined for the nutriment of the others, as well as its own. These aborted acorns are manifestly represented by the galls in question, the stigma in both instances being the only part of the acorn that protrudes beyond the cup.—*Edward Newman*.

The Synergi—or fellow-workers, or inquilines, or lodgers—have been lately mentioned in the 'Entomologist,' and a short abstract of Dr. Mayr's treatise on them may be of use to the observers of galls. He praises Hartig's work as being a good foundation for the history of oak-gall-making flies, but observes that the above author is less successful with regard to the Synergi, which failure, he says, may be owing to the great difficulty in determining the often very variable species. He adds that these difficulties can only be overcome by continual researches, and by complete and plentiful materials brought together and well arranged. He next says that he has particularly studied the lodgers for a series of years, and mentions his examination of Hartig's type specimens, and the help he has received from correspondents, and the division by Foerster of Hartig's genus *Synergus* into two genera, *Synergus* and *Sapholytus*, and notices the characters of these two genera, and also of *Ceroptre*, *Phanacis*, *Periclistus*, and *Xenophanes*. The genus *Ceroptre*, he says, is interesting on account of its biology. He has reared from *C. arator*, *Hart.*, more than six hundred females, but not one male; and of *C. Cerri*, *Mayr*, ninety-eight females, and only four males, and he supposes that only some few females are impregnated, but that the unfertilized also lay developing eggs. He then defines two kinds of parthenogenesis: the mixed parthenogenesis, of which *C. Cerri* is an example; and the Thelykotik, or simple female parthenogenesis, represented by *C. Arator*. He next returns to the difficulty of ascertaining the species of *Synergus*, owing to their great variableness, of which *S. melanopus*, that lives in many kinds of galls, is the chief example, and concludes that most

of the hitherto described species of *Synergus* have not been clearly distinguished from each other. He has many proofs that two certainly different kinds of lodgers live together in one gall; and he gives in short the result of his observations on *C. lignicola*. He isolated about four hundred galls of this species. From most of these only the *Cynips* appeared; the rest gave the following results:—sixteen galls produced only *Synergus melanopus*; two, *S. melanopus* and a *Eurytoma*; twenty-eight, only *S. Hayneanus*; five, *S. Hayneanus*, with *S. melanopus*; two, only *S. pallidipennis*; three, *S. pallicornis*; one, *S. pallicornis* and *S. melanopus*; one, *S. vulgaris*; two, the *Cynips* and *S. melanopus*; one large gall produced the *Cynips*, seven examples of *S. melanopus*, and one *Eurytoma*; four, the *Cynips* and *S. pallicornis*; and lastly, two, a *Pteromalus*. In the galls from which the *Cynips* and the *Synergus* appeared the cell of the first was quite closed and normally formed, but the cells of the lodgers were separate in the parenchyma. He mentions a gall of *C. cericola*, which afforded him in April nineteen examples of *S. thumacera*, and in May two of *S. variabilis* and three of *Eurytoma*: these all came from one hole, the passage to which was divided, and led from many chambers. It thus seems that in general the contrivances of the lodgers cause the death of the proprietor, for in sixty galls seven produced the *Cynips* and the *Synergus*; the latter only or the parasite proceeded from the rest, and the imprisonment of the *Cynips* by the *Synergus* was first observed by Spinola. Life in these kinds of galls may be divided into two parts,—the inner life and the outer life,—the first represented by the *Cynips* and its parasites, the latter by the *Synergus* and its attendants; and the multiplying of the *Cynips* is not only limited by its parasites, but by the *Synergi* in the outer life; and in case the latter are the victims of other parasites, their habitations are not the less obstacles to the emergence of the *Cynips*; and the complications of life-forms in a gall are a little epitome of biology generally, with regard to insects. Dr. Mayr observes on the strangeness of the fact, and of its being worthy of close study, that a *Synergus* lives in one kind of gall three to four months, but in another kind a year or more. The species which appear in winter are more numerous than those which appear in summer, and those which are

disclosed in both seasons use one kind of gall for the winter and another kind for the summer.—*Francis Walker.*

‘*The Naturalist in Nicaragua: a Narrative of a Residence at the Gold-mines of Chontales, in the Savannahs, and Forests; with Observations on Animals and Plants in reference to the Theory of Evolution of Living Forms.* By THOMAS BELT, F.G.S. London: John Murray, 1874. Post 8vo; 404 pp. letterpress, and 26 Illustrations on stone and wood.

[At Brighton anglers bait for mackerel with a bit of tin: it glitters in the sun, and proves far more attractive to these silly fishes than substantial, wholesome, and natural food. Mr. Belt baits for Natural-History readers with “evolution of living forms.” He evidently aims to capture a shoal of naturalists, and considers this the most “killing bait.” I think he under-rates us; I think he under-values our attainments and our intelligence: we are not, like the mackerel, to be caught by tin or tinsel; and this very announcement on the title-page had well-nigh induced me to close the book unread. Fortunately I did not, for ‘*The Naturalist in Nicaragua*’ is a capital book,—brimful of information, and worthy of attentive study by the most profound entomologist. I have no space in this journal for an extended review, but I will make some entomological extracts, which cannot fail both to instruct and delight my readers, and will recommend the book far more than anything I can write in its praise.—*Edward Newman.*]

Ecitons, or Foraging Ants.—“I saw many large armies of this, or a closely allied, species in the forest. My attention was generally first called to them by the twittering of some small birds, belonging to several different species, that follow the ants in the woods. On approaching, a dense body of the ants—three or four yards wide, and so numerous as to blacken the ground—would be seen moving rapidly in one direction, examining every cranny, and underneath every fallen leaf. On the flanks, and in advance of the main body, smaller columns would be pushed out; these smaller columns would generally first flush the cockroaches, grasshoppers, and spiders.

The pursued insects would rapidly make off, but many in their confusion and terror would bound right into the midst of the main body of ants. At first the grasshopper, when it found itself in the midst of its enemies, would give vigorous leaps, with perhaps two or three of the ants clinging to its legs; then it would stop a moment to rest, and that moment would be fatal, for the tiny foes would swarm over the prey; and after a few more ineffectual struggles it would succumb to its fate, and soon be bitten to pieces and carried off to the rear. The greatest catch of the ants was, however, when they got amongst some fallen brushwood: the cockroaches, spiders, and other insects, instead of running right away, would ascend the fallen branches and remain there, whilst the host of ants were occupying all the ground below. By and bye up would come some of the ants, following every branch, and driving before them their prey to the ends of the small twigs, when nothing remained for them but to leap, and they would alight in the very throng of their foes, with the result of being certainly caught and pulled to pieces. Many of the spiders would escape by hanging suspended by a thread of silk from the branches, safe from the foes that swarmed both above and below."—P. 18.

Leaf-cutting Ants.—"Nearly all travellers in tropical America have described the ravages of the leaf-cutting ants (*Ecodoma*): their crowded, well-worn paths through the forests; their ceaseless pertinacity in the spoliation of the trees, more particularly of introduced species, which are left bare and ragged, with the midribs and a few jagged points of the leaves only left. After travelling for some hundreds of yards, often for more than half a mile, the formicarium is reached. It consists of low, wide mounds of brown, clayey-looking earth, above and immediately around which the bushes have been killed by their buds and leaves having been persistently bitten off as they attempted to grow after their first defoliation. Under high trees in the thick forest the ants do not make their nests, because I believe the ventilation of their under-ground galleries, about which they are very particular, would be interfered with, and perhaps to avoid the drip from the trees. It is on the outskirts of the forest, or around clearings, or near wide roads that let in the sun, that these formicariums are generally found: numerous

round tunnels, varying from half an inch to seven or eight inches in diameter, lead down through the mounds of earth; and many more, from some distance around, also lead underneath them. At some of the holes on the mounds ants will be seen busily at work, bringing up little pellets of earth from below and casting them down on the ever-increasing mounds, so that its surface is nearly always fresh and new-looking. Standing near the mounds one sees from every point of the compass out-paths leading to them, all thronged with the busy workers carrying their leafy burdens. As far as the eye can distinguish their tiny forms troops upon troops of leaves are moving up towards the central point, and disappearing down the numerous tunnelled passages. The out-going, empty-handed hosts are partly concealed amongst the bulky burdens of the in-comers, and can only be distinguished by looking closely amongst them. The ceaseless, toiling hosts impress one with their power, and one asks—What forests can stand before such invaders? how is it that vegetation is not eaten off the face of the earth? Surely nowhere but in the tropics, where the recuperative powers of Nature are immense and ever-active, could such devastation be withstood.”—P. 71.

Making Ants Mad.—“Don Francisco Velasquez informed me, in 1870, that he had a powder which made the ants mad, so that they bit and destroyed each other. He gave me a little of it, and it proved to be corrosive sublimate. I made several trials of it, and found it most efficacious in turning a large column of the ants; a little of it sprinkled across one of their paths in dry weather has a most surprising effect: as soon as one of the ants touches the white powder it commences to run about wildly, and to attack any other ant it comes across. In a couple of hours round balls of the ants will be found all biting each other, and numerous individuals will be seen bitten completely in two, whilst others have lost some of their legs or antennæ. News of the commotion is carried to the formicarium, and huge fellows, measuring three-quarters of an inch in length, that only come out of the nest during a migration or an attack on the nest or one of the working columns, are seen stalking down with a determined air, as if they would soon right matters. As soon, however, as they have touched the sublimate all their stateliness leaves them: they rush about, their legs are seized hold of by some

of the smaller ants already affected by the poison, and they themselves begin to bite, and in a short time become the centre of fresh balls of rabid ants. The sublimate can only be used effectively in dry weather. At Colon I found the Americans using coal-tar, which they spread across their paths when any of them led to their gardens. I was also told that the Indians prevent them from ascending young trees by tying thick wisps of grass, with the sharp points downwards, round the stem: the ants cannot pass through the wisp, and do not find out how to surmount it, getting confused amongst the numberless blades, all leading downwards. I mention these different plans of meeting and frustrating the attacks of the ants at some length, as they are one of the greatest scourges of tropical America, and it has been too readily supposed that their attacks cannot be warded off. I myself was enabled, by using some of the means mentioned above, to cultivate successfully trees and vegetables of which the ants were extremely fond."—P. 78.

Spiders.—"Near the river were some fallen-down wooden sheds, partly overgrown with a red-flowered vine: here a large spider (*Nephila*) built strong yellow silken webs, joined one on to the other, so as to make a complete curtain of web, in which were entangled many large butterflies, generally forest species, caught when flying across the clearing. I was at first surprised to find that the kinds that frequent open places were not caught, although they abounded on low, white-flowered shrubs close to the webs; but, on getting behind them and trying to frighten them within the silken curtain, their instinct taught them to avoid it, for, although startled, they threaded their way through open spaces and between the webs with the greatest ease. It was one instance of many I have noticed of the strong instinct implanted in insects to avoid their natural enemies."—P. 108.

Spiders.—* * * * "To return to the spiders. Besides the large owner and manufacturer of each web, who was stationed near its centre, there were on the outskirts several very small ones, belonging, I think, to two different species, one of which was probably the male of a *Thomisus*, the males in this genus being much smaller than the females. I sometimes threw a fly into one of the webs: the large spider would seize it and commence sucking its blood; the small ones,

attracted by the sight of the prey, would advance cautiously from the circumference, but generally stop short about half-way up the web, evidently afraid to come within reach of the owner, thus having to content themselves with looking at the provisions, like hungry urchins nosing the windows of an eating-house. Sometimes one would advance closer, but the owner would, when it came within reach, quickly lift up one of its feet and strike at it, like a feeding-horse kicking at another that came near its provender, and the little intruder would have to retire discomfited. These little spiders probably feed on minute insects entangled in the web, too small for the consideration of the huge owner, to whom they may be of assistance in clearing the web."—P. 110.

Tiger-beetles and Ants.—"In some parts brown tiger-beetles ran or flew with great swiftness; in others, leaf-cutting ants in endless trains carried along their burdens of foliage, looking, as they marched along with the segments of leaves held up vertically, like green butterflies, or a mimic representation of a moving Birnam Wood. Sometimes the chirping of the ant-thrushes drew attention to where a great body of army-ants were foraging amongst the fallen branches, sending the spiders, cockroaches and grasshoppers fleeing for their lives, only to fall victims to the surrounding birds. On the fallen branches and logs I obtained many longicorn-beetles; the wood-cutters brought me many more; and from this valley were obtained some of the rarest and finest species in my collection. On the myrtle-like flowers of some of the shrubs large green cockchafers were to be found during the dry season, and bright green rosechafers were to be found also common. I was surprised to find on two occasions a green-and-brown bug (*Pentatoma punicea*) sucking the juices from dead specimens of this species."—P. 127.

Migrating Butterflies.—"As we rode along great numbers of a brown-tailed butterfly (*Timeles Chiron*) were flying over to the south-east: they occurred, as it were, in columns. The air would be comparatively clear of them for a few hundred yards, then we would pass through a band, perhaps fifty yards in width, where hundreds were always in sight, and all travelling one way. I took the direction several times with a pocket-compass, and it was always south-east. Amongst them were a few yellow butterflies, but these were

not so numerous as in former years. In some seasons these migratory swarms of butterflies continue passing over to the south-east for three to five weeks, and must consist of millions upon millions of individuals, comprising many different species and genera. The beautiful tailed green-and-gilded day-flying moth (*Urania Leilus*) also join in this annual movement."—P. 152.

[It is curious that Mr. Belt, who has seen this beautiful butterfly, should accept the strange hypothesis that it is a moth. It is one of the moth-butterflies, or concealers (Celantes), in which the caterpillars hide themselves in a silken follicle, or cocoon, before changing into chrysalids. All the skippers, or Hesperidæ, belong to the same natural division.—*Edward Newman*.]

The Bull's-horn Thorn.—"These thorns are hollow, and are tenanted by ants that make a small hole for their entrance and exit near one end of the thorn, and also burrow through the partition that separates the two horns, so that the one entrance serves for both. Here they rear their young; and in the wet season every one of the thorns is tenanted, and hundreds of ants are to be seen running about, especially over the young leaves. If one of these be touched, or a branch shaken, the little ants (*Pseudomyrma bicolor*, Guer.) swarm out from the hollow thorns, and attack the aggressor with jaws and sting. They sting severely, raising a little white lump that does not disappear in less than twenty-four hours."—P. 218.

Mimicry in a Spider.—"On the leaves of the bushes there were many curious species of Buprestidæ, and I struck these and other beetles off with my net as I rode along. After one such capture I observed what appeared to be one of the black stinging-ants on the net: it was a small spider that closely resembled an ant, and so perfect was the imitation that it was not until I killed it that I determined it was a spider, and that I need not be afraid of it stinging me. What added greatly to the resemblance was that, unlike other spiders, it held up its two fore legs like antennæ, and moved them about just like an ant. Other species of spiders closely resemble stinging-ants: in all of them the body is drawn out long like an ant, and in some the maxillary palpi are lengthened and thickened, so as to resemble the head of one."—P. 314.

*List of Lepidoptera forwarded to Edward Newman by
G. F. MATHEW, Esq., R.N.*

[The names of the butterflies have been most kindly supplied by Mr. Hewitson; those of the moths by Mr. Walker.—*Edward Newman.*]

No. 22. *Junonia Lavinia*. Rio de Janeiro; Callao; Peru. September, 1872; April, 1873.—Woods at Tijuca, near Rio, and also near Callao and Lima. It is frequently seen alighting in pathways or bare spots, where it rests with its wings widely expanded and pressed close to the ground. I believe I took the larvæ of this species near Lima, but they were not full grown, and all perished on board ship, as I could not procure their proper food in the immediate neighbourhood of Callao.

No. 30. *Anartia Amatheia*. Rio de Janeiro. September, 1872.—This pretty species is one of the most common butterflies near Rio, haunting marshy ground in woody places, where dozens of them may be seen flying about together. They are very fond of chasing each other, and usually fly slowly and near the ground, but when frightened they go off at a very respectable pace.

No. 31. *Eudamus Eurycles*. Rio; Callao. September, 1872; April, 1873.—A common species. It flies rapidly, after the manner of all skippers, and is found in woods and waste places, where it delights to fly among long grass and low underwood; consequently the tails soon become damaged. They are very pugnacious, chasing and fighting every other butterfly, no matter its size, that comes within their reach.

No. 58. *Agraulis Vanilla*. Rio; Callao. September, 1872; April, 1873.—I only saw half a dozen of this species in a marshy piece of ground near Rio, but at Callao it was very plentiful in grassy meadows. There appears to be no difference whatever between the specimens from each country. The one enclosed is from Rio.

No. 92. *Papilio Archemas*. Valparaiso. November, 1872.—The largest butterfly found near Valparaiso, and it is common, though local, in the valleys between the hills, and also in the flat country near Vino del Mar and El Salto. It flies fast, is difficult to catch, and is seldom perfect. I have worked out the life-history of this species. The specimen

forwarded, which is slightly crippled, was bred at sea on the 7th inst., in lat. $35^{\circ} 4' N.$, long. $161^{\circ} 1' W.$, after having been in the chrysalis state since November last.

No. 93. *Pieris Xanthodice*. Valparaiso. November, 1872.—Common. I have partially worked out the life-history of this species, and should have done so had we remained at Valparaiso a few days longer. The larvæ feed on a wild species of cress, and also in gardens on wallflower. Male and female specimens are forwarded.

No. 94. *Colias rutilans* (male). Valparaiso. November, 1872.—Damp meadows at Limache, about thirty miles inland from Valparaiso.

No. 98. *Colias rutilans* (female). Valparaiso. November, 1872.—Rather a scarce butterfly. Is it a variety or female of No. 94? It is frequently found where No. 94 is not.

No. 99. *Hesperia paniscoides*. Valparaiso. November, 1872.—Very common.

No. 100. *Hesperia fulva*. Valparaiso. November, 1872.—Very common.

No. 103. *Thecla* (new species). Valparaiso. November, 1872.—Scarce. Flies round the tops of bushes like a *Thecla*.

No. 105. *Lycæna chilensis*. Valparaiso. November, 1872.—Common. The female has an orange-coloured blotch in the centre of the fore wings.

No. 106. Same as No. 103. Valparaiso. November, 1872.—Common in dry, grassy spots.

No. 116. *Epinephele* (new species). Valparaiso. November, 1872. Abundant everywhere. Habits similar to those of *S. Tithonus*.

No. 117. *Satyryrus chilensis*. Valparaiso. November, 1872.—Common. Seldom found below an elevation of eight hundred feet. Habits of *S. Semele*.

No. 118. *Epinephele* (new species). Valparaiso. November, 1872.—Mountain gorges at a considerable elevation, flying among a stunted description of cane.

No. 123. *Satyryrus Montrolii*. Valparaiso. November, 1872.—Appeared towards the end of the month in woody mountain gorges. Rather common.

No. 124. *Hesperia fasciolata*. Valparaiso. December, 1872.—El Salto, about seven miles from Valparaiso. Not common.

No. 125. *Euptoieta Claudia*. Valparaiso. December, 1872.—Limache and El Salto. Rare. Flies rather weakly.

No. 127. *Callidryas Eubule* (male and female). Valparaiso. December, 1872.—Tolerably common, but flies fast and is difficult to catch. I have worked out the life-history of this species, and bred several fine specimens.

No. 139. *Epinephele* (new species). Valparaiso. December, 1872.—Appeared towards the end of the month, and was by no means numerous.

No. 140. *Terias Beigitta*. Valparaiso. January, 1873.—Common, but very local, and is a weak flyer.

No. 141. *Syrichthus Americanus*. Valparaiso. January, 1873.—Common, but extremely local. I have another species (but only a single example) from Valparaiso, which comes pretty near this one.

No. 169. *Deilephila Daucus*. Valparaiso. Various dates.—A maritime species, and I have worked out its life-history.

No. 171. *Ctenucha* (new species). Coquimbo. March 1873.—These singular moths were very abundant in the marshes between Coquimbo and La Serena. They fly straight and rather heavily in the bright sunshine, carrying their antennæ aloft at right angles to their bodies, which gives them a peculiar appearance. Their flight somewhat resembles that of *Anthrocera*, but they are more active. A tall, umbelliferous plant, which was in blossom and grew in patches here and there throughout the marshes, was much frequented by them, and on approaching one of these patches the moths flew off in clouds.

No. 172. New species. Arica; Peru. March, 1873.—Habits and locality, where found, similar to the above; but the insect was rare.

No. 179. New species. Arica; Payta; Peru. March, 1873.—Flies, after the fashion of a *Thecla*, round the branches of an evergreen prickly and stunted bush growing close to the beach.

No. 180. New species. Arica; Callao. March, 1873.—Very abundant, especially in some lucerne fields, where they occurred in countless thousands.

No. 182. *Hesperia fasciolata*. Arica; Callao. March, 1873.—This species also occurred in prodigious numbers, and I often had a dozen or more in my net at a time.

No. 183. *Pieris Monuste*. Callao. April, 1873.—Common. This species puzzles me, as I fancy there are two or three closely allied, but distinct.

No. 184. *Pieris Monuste*. Callao. April, 1873.—Probably the female of No. 183.

No. 185. *Anartia Jatrophæ*. Callao. April, 1873.—This pretty and delicate butterfly was common close to the town of Callao; but although I caught plenty of them very few were fit to set. I suspect they were just passing. In its habits this species reminded me of *V. Urticæ*. When disturbed it flies for a short distance, and settles on the road or a wall, and constantly expands and shuts its wings. It is a strong flyer.

No. 187. *Thecla Marsyas*. Callao. April, 1873.—This lovely species was by no means uncommon in the neighbourhoods of Callao and Lima. Its habits are those of a *Thecla*. Near Callao I obtained it flying round an evergreen shrub growing from eight to ten feet high, possessing ovate-lanceolate and slightly pubescent leaves, and bearing at the tip of each of its branches a conglomerate bunch of mauve-coloured flowers.

No. 189. New genus, new species. Valparaiso. Larvæ taken in December, 1872.—Bred on board. Have worked out the life-history of this species.

No. 193. *Hipparchia*? Valparaiso. Larvæ taken in January, 1873.—Bred on board. Took the larvæ of this species at Limache, and have worked out its history. The specimen forwarded is a small one, as some I have bred are nearly twice the size.

No. 200. *Acræa Alalia*. Callao. April, 1873.—Have worked out the life-history of this species. It is very abundant at Callao, though local.

No. 212. New species. Callao. April, 1873.—This is, I have no doubt, the male of No. 180, as they occurred together.

No. 219. *Hadena*? (new species). Honolulu. June, 1873.—This is the produce of what the Hawaiians term the "army worm," a larva which does great mischief to their pasture lands; and the specimens sent herewith were bred from larvæ taken by myself. These larvæ, which I observed in incredible numbers, and which feed perfectly exposed,

vary slightly in colour. Their general hue is deep olive velvety-green, with alternate stripes of madder-purple and pale yellow; spiracles orange; head, prolegs and claspers varying from madder-purple to sap-green. Some of the larvæ were darker, and some paler than others. They undergo pupation about an inch below the surface, where in a brittle cocoon, composed of the surrounding earth, they change to a bright reddish brown pupa. The perfect insects differ as much as the larvæ, as can be seen by the two examples now forwarded. In some places, where the larvæ had been feeding on the grassy uplands, I observed large patches, which presented a dried and burnt-up appearance, and which was caused by these "army worms" eating the grass right down to the very roots. Sometimes while walking I found it quite unpleasant, as it was impossible to avoid crushing dozens of them at every step.

No. 226. *Botys*? (new species?) Honolulu. June, 1873. —This species also occurs in immense numbers, and is said to commit almost as much damage as the "army worm." They were not confined to any particular locality, but were found everywhere, from the gardens in the town to the summits of the lofty hills behind. The larvæ are of a dirty white colour, with shining, reddish brown heads, and when touched they wriggle themselves backwards vigorously. In their habits they appeared to be semi-subterranean, as I found them feeding on the root of grasses just on the level with the surface of the ground, and they also feed, I was told, on a variety of garden and other plants. Pupæ of this species, which I obtained under stones, were enclosed in a slight silken web, and were of a pale reddish brown, and I bred several of the perfect insects.

GERVASE F. MATHEW.

H.M.S. "Repulse." At sea.

Lat. 46° 39' N. Long. 140° 18' W.

July 19, 1873.

Captures of Hymenoptera in 1873. By F. SMITH, Esq.

FOR the information of entomologists who may be interested in the study of the aculeate Hymenoptera of Great Britain, I publish a record of the capture of species made during the

past year; also the localities, and names of the captors. I may also repeat that which I stated a few years ago, and which has been fully corroborated by Mr. John B. Bridgman, of Norwich, that the neighbourhood of that city is one of the richest localities for Hymenoptera in Great Britain, particularly Mousehold Heath, where the gentleman named has captured the species of which a list is appended. This, it should be observed, was the first season of his collecting the order.

*Captures on Mousehold Heath, near Norwich.**—*Hedychrum lucidum** (July), *Tiphia femorata** (August), *Pompilus fuscus* (April), *Ammophila sabulosa* (April), *A. viatica* (April), *A. lutaria** (April), *Gorytes mystaceus* (June), *Crabro cribrarius* (June), *C. patellatus* (June), *Oxybelus mucronatus,** *O. uniglumis*, *Diodontus minutus*, *D. luperus*, *Passalæcus insignis*, *P. cornigera*, *Cemonus unicolor*, *C. lethifer*, *Cerceris labiata,** *C. ornata*, *Colletes succincta*, *C. Daviesana*, *Prosopis signata*, *P. hyalinata*, *Sphæcodes gibbus*, *S. rufescens*, *S. ephippia*, *Halictus rubicundus*, *H. leucozonius*, *H. cylindricus*, *H. albipes*, *H. Tumulorum*, *H. minutissimus*, *Andrena cingulata*, *A. thoracica,** *A. vitrea,*** *A. albicans*, *A. helvola*, *A. varians*, *A. atriceps*, *A. nigroænea*, *A. Trimmerana*, *A. bimaculata,*** *A. nigriceps,** *A. angustior*, *A. tridentata,** *A. minutula*, *A. Afzeliella*, *A. convexiuscula*, *A. xanthura*, *Cilissa hæmorrhoidalis,** *Panurgus Banksianus*, *Nomada ruficornis*, *N. furva*, *N. lineola*, *N. Solidaginis*, *N. alternata*, *N. succincta*, *Epeolus variegatus*, *Cœlioxys simplex*, *Melecta armata*, *Osmia ænea*, *Megachile centuncularis*, *M. maritima,** *Anthidium manicatum*, *Anthophora retusa*, *A. Acervorum*, *Bombus Muscorum*, *B. Derhamellus*, *B. Pratorum*, *B. Lucorum*, *B. terrestris*, *B. lapidarius*, *B. Latreillellus*, *B. subterraneus*, *Apathus rupestris*, *A. vestalis*, *A. campestris*, *A. Barbutellus*.

Another excellent locality is Little Hampton, in Sussex. I have frequently recorded the capture of rarities at this locality, and I now give a list of species, taken in August last by Mr. Edward Saunders.

Captures at Little Hampton.—*Myrmosa melanocephala*, *Pompilus exaltatus*, *P. agilis*, *P. pectinipes*, *P. plumbeus,** *Tachytes pompiliformis*, *Astata stigma,*** *Ammophila viatica*, *Cerceris arenaria*, *Mimesa bicolor*, *Pemphredon lugubris*,

* Local species marked with a *; rare species, **.

Crabro leucostoma, *Stigmus pendulus*,* *Oxybelus uniglumis*, *Crabro brevis*, *Nysson dimidiatus*,* *Chrysis ignita*, *Hedychrum ardens*, *Prosopis hyalinatus*, *P. annularis*, *Colletes fodiens*, *C. Daviesana*, *Halictus prasinus*, *H. albipes*, *H. cylindricus*, *H. Tumulorum*, *H. longulus*, *H. minutissimus*, *H. rubicundus*, *H. leucozonius*, *H. villosulus*, *H. morio*, *H. minutus*, *Andrena labialis*, *A. Coitana*, *A. nana*, *A. fulvicrus*, *Megachile argentata*,* *M. centuncularis*, *Nomada flavoguttata*, *Cilissa leporina*.*

Captures in the Island of Anglesea.—The following list of species of aculeate Hymenoptera will prove to possess some degree of interest, from the fact of its being probably the first of such as inhabit the island of Anglesea. It is certainly a very incomplete record of the Hymenopterous Fauna of the island. During the month of August last I was resident at Garth (Bangor), North Wales, but had few opportunities of collecting, as, with the exception of about four days, rain fell heavily during portions of all the rest. All the species enumerated were captured along the road-side, between Garth Ferry and Beaumaris:—*Formica rufa*, *F. fusca*, *F. flava*, *Myrmica ruginodis*, *M. scabrinodis*, *Pompilus gibbus*, *Ammophila sabulosa*, *Crabro dimidiata*, *Mimesa bicolor*, *Harpactus tumidus*, *Mellinus sabulosus*, *Vespa germanica*, *V. rufa*, *Prosopis hyalinatus*, *Sphécodes ephippia*, *Halictus minutus*, *H. morio*, *H. rubicundus*, *Andrena Gwynana*, *Apathus rupestris*, *A. campestris*, *Bombus Muscorum*, *B. senilis*, *B. Pratorum*, *B. Lucorum*, *B. terrestris*, *B. Hortorum*, *B. lapidarius*:

FREDERICK SMITH.

British Museum.

Entomological Notes, Captures, &c.

Note on Eupithecia innotaria.—This distinct species, formerly in our list, has been ignored as British by recent writers, but is, nevertheless, a species well known to me, occurring at Wallasey in the larva state on mugwort, in September, along with the larva of *E. succenturiata*, and being occasionally taken around the sand-hills in June: this is, in my opinion, the *Eupithecia egenaria* of Mr. Doubleday's Catalogue; it is a variable species, like *E. expallidata* in form, but, unlike that species, it also varies in markings,

varying from a long, narrow-winged insect, like *Fraxinata* of Crewe, to the broader form of *Egenaria*, and varying much in the intensity of its markings from a plain dull dim colour, to a light ashy gray, with well-developed markings. My remembrance of the fine, unique specimen of *Egenaria*, when in Mr. Buxton's collection, was not vivid enough to warrant me in saying his insect was a large *Innotaria*, but I often said I thought it was so; but on seeing his specimen again about two years ago, and comparing *Cheshire Innotaria* with it, all doubt in my mind vanished. I possess German *Innotaria*, which in no way differ from English specimens in my collection, either in colour, size, or markings; that is, they, the German specimens, differ in size, colour, and markings, as do our own.—*C. S. Gregson; Rose Bank, Fletcher Grove, Edge Lane, Liverpool, January 1, 1874.*

Controlling Sex in Lepidoptera.—As bearing somewhat on the subject of "controlling sex by supply of food" in insects, it may be worth while to give the following:—During last summer I had a few larvæ of *Exapate congelatella* feeding on privet: as I was greatly occupied with other things they were neglected; the supply of food was very irregularly given, and short in quantity, yet the moths produced from them consisted of four males, full sized, and eleven females, some of these latter being much below the average of the species in size.—*J. E. Fletcher; Pitmaston Road, Worcester, February 2, 1874.*

Thecla Quercus with an Orange Spot.—Last autumn I took, with other specimens of purple hairstreaks, one female, which differs from all the rest, in having a wedge-shaped orange spot above the centre of each upper wing (on the upper side of the wings); the small end of the orange wedge is directed towards the tip of the wing, and the large end towards the base of the wing. Is this an unusual variety? It can hardly be a distinct species. I also took, by beating some oaks, two larvæ of *S. Fagi*, and from birch two larvæ which were more like *D. pudibunda* than any other species that I am acquainted with, but they were of a grayish brown colour (instead of a pale greenish yellow), with black incisions, and golden brown tufts on 5th to 8th segments, and a purple tuft on 12th segment. Is this a variety of *D. pudibunda*?—*Frank Norgate; Sparham, Norwich, December 29, 1873.*

[Mr. Doubleday, to whom I have shown the note, considers

the presence of the orange spot accidental. He does not mention ever having seen such a variety. It may be observed that the late Mr. J. F. Stephens transposed the sexes of this butterfly, describing male for female, and *vice versá*. The variety of *Pudibunda* is not very uncommon; such specimens are generally late ones.—*Edward Newman.*]

Variety of Anthocharis Cardamines.—I am indebted to Mr. C. S. Gregson for the loan of this very abnormal specimen. Hemigynous specimens of this pretty species are uncommon, but the sexes are usually separated at a mesial line passing longitudinally down the body. This specimen is much more remarkable: on the upper side the left fore wing is entirely male, the right fore wing entirely female; the hind wings are normal in colour. On the under side the left fore wing is male, a pure white stripe occupying nearly the whole of the costal margin, and a second white stripe passing nearly through the middle of the wing, but being interrupted by the central black spot; the right fore wing is entirely female; the hind wings are normal in markings. The peculiarity to which I particularly wish to invite attention, is that either wing should be male on one side and female on the other. The difficulty of representing the colour induced me to abandon my intention of giving a figure.—*Edward Newman.*

Nest-building Hymenoptera.—Last season, when on an entomological ramble in the New Forest, I found a wasp's-nest suspended from the branch of a beech shrub, about eighteen inches from the ground. It was of a globular form, nearly as large as a man's head, and of a grayish hue in colour. A closer inspection convinced me that the inmates of this "nest" had no notion of my taking away their home, much as I wished to possess it. This took place in July, so I determined to leave it till the end of the summer; but a subsequent visit revealed the fact of its having been torn to pieces by some creature,—possibly a honey buzzard, as I saw one of those noble birds not far from the spot where I first found the "nest." A few days ago I was in the meadows, and in the grass I saw what I at first supposed was a mouse's nest: I took it in my hand, and at the same time I fancied I heard a buzzing inside the ball-like structure. Having pulled it to pieces, a humble bee of a yellowish colour made its escape, and in the centre of the nest—which was chiefly

composed of the cottony flowers of the "spear"—was a single cup-shaped waxen cell, nearly half an inch in diameter. The humble bee, after making its escape from the soft mass of material I held in my hand, circled round my head a few times in the air, and then went directly to the spot in the grass where I had taken the "nest" from, at the same time buzzing loudly, and being apparently in great agitation as it settled, and ran about amongst the blades of grass. Having no net with me I could not capture it. I have before seen similar occurrences to both I have here briefly described, so that the facts are as "old as the hills;" but may I ask what is the name of the respective builders, and did the humble bee construct the nest itself?—*G. B. Corbin.*

[The larger nest, the wasp's, was probably that of *Vespa britannica*; the smaller one, a bee's, that of *Bombus Sylvorum*.—*Edward Newman.*]

Note on Megastigmus.—As I believe I have lately made two mistakes in stating that *Megastigmus giganteus* occurs in England, I wish to take the first opportunity of rectifying them. The first error is in the name, *M. giganteus*, *Kollar*: it appears to be a synonym of *Cleptes stigma*, *Fabr.* (*Ichneumon stigma*, *Fabr.*, olim.). The second error is in the supposition that this species is a parasite of *Cynips Kollari*: it is a parasite of *C. argentea*, and differs slightly, though probably specifically, from the *Megastigmus* of *C. Caput-Medusæ*, and still more from that of *C. Kollari*. This last *Megastigmus* has followed its prey into England, and there are some other undetermined British species of the green-back group of *Megastigmus*.—*Francis Walker.*

Entomological Pins.—I should be obliged to any readers of the 'Entomologist' who would kindly inform me where I can obtain pins measuring two-thirds of an inch in length, and of the stoutness of No. 10. I have met with several pins of the size, but have failed to find out whence they were obtained.—*J. E. Fletcher; Pitmaston Road, Worcester.*

*Proceedings of the South London Entomological Society,
January 29th and February 11th, 1874.*

Donations announced.

Sir John Lubbock's work on the 'Collembola and Thysanura;' from the author.

Kirby and Spence's 'Introduction to Entomology;' Mr. Newman.

Exhibitions.

By the President, specimens of the rare *Eupithecia Irriguata* and *Consignata*.

Mr. C. G. Barrett, some striking varieties of *Russata* and *Immanata*.

Mr. O. E. Janson, a specimen of *Agestrata orichalcea*, from Borneo, with *eight* legs; also five examples of the "learned beetle" *Hypothcnemus eruditus*: this species was described by Professor Westwood forty years ago, and has not been recorded since. Mr. Janson found his specimens in the cover of a book, which was produced at the meeting.

Mr. Champion, specimens of *Euryporus picipes*, *Lathrobium angustatum*, *Liosomus oblongulus*, *L. Troglodytes* from Faversham; also *Cicones variegatus* from Loughton; and *Melasis buprestoides*, *Strachia ornata* (1), *Conurus litoreus*, *Bolitobius undulata*, and other species, captured at Chatham by Mr. J. J. Walker, of Sheerness.

Mr. Bull, *Stenus major*, and *Anchomenus scitulus*, taken at Putney.

Paper read.

By Mr. Power, on the "Scales of the genus *Phyllobius*." He gave a description of the shape and sculpture of the scales when viewed under a microscope, and showed that each species could readily be distinguished by the scales highly magnified figures were exhibited.—*J. P. Barrett.*

Newcastle-on-Tyne Entomological Society.—The annual meeting was held, on February 3rd, in the museum of the Natural History Society, Mr. J. Hancock in the chair, who exhibited two cases of *Lepidoptera* in fine preservation, collected by himself in Switzerland during the summer of 1844; also some fine specimens of beetles and moths from Africa and South America. Mr. F. Raine exhibited specimens of *V. Antiopa*, taken at Durham and Helmsly in 1872; *A. melanopa* and other species, taken at Rannoch in 1873; also several fine varieties, and a quantity of preserved larvæ. W. Maling, Esq., was re-elected President.—*J. Hamilton, Secretary; 13, Union Street, Newcastle, February 13, 1874.*

THE ENTOMOLOGIST.

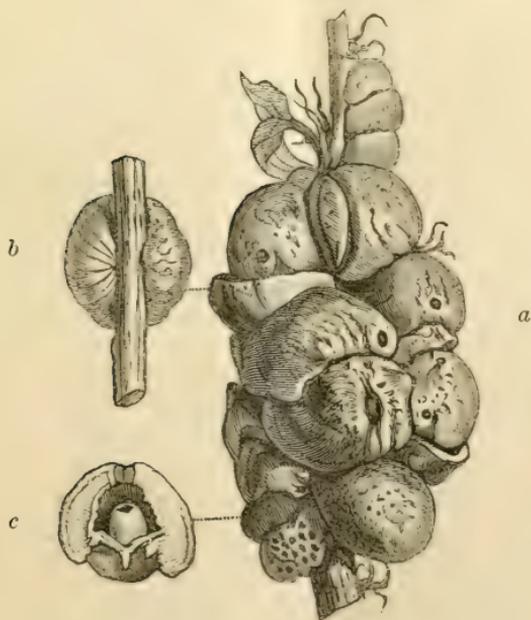
No. 128.]

APRIL, MDCCCLXXIV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER *née* WEISE.

Fig. 6.



CYNIPS CERRICOLA: *a.* CLUSTER OF GALLS. *b.* SINGLE GALL SEEN FROM BEHIND.
c. SECTION OF THE SAME.

Cynips cerricola.—Notwithstanding the dissimilarity in size and shape which is observable among specimens of this gall, and also that it is sometimes in clusters and sometimes

solitary, it may be easily distinguished by always occurring on the bark of the Turkish oak (*Quercus Cerris*) in the form of knobs, varying in size from a hempseed to a walnut. If a specimen be detached from the twig it may be plainly seen to have been growing on the woody part, seated on a very short pedicle, and to have raised up the bark in its immediate vicinity. It is found singly on the most slender young shoots, in the form of a spherical knob, or occasionally it has so enclosed the twig that its protruding sides meet exactly opposite the point of its attachment. On the larger twigs we find a great number of these galls so crowded together that each becomes flattened at the point of contact, and the mass thus formed surrounds the twig in the form of an irregular band, that sometimes extends to three centimeters in length and thickness. The longitudinal fissure in the bark, through which these galls have forced their way, may be readily perceived if one of the size of a hempseed or a pea has happened to remain undeveloped, and to grow separately on a thicker twig. The galls appear at midsummer, and are of a light green colour, and more or less clothed with a short tomentum; later in the autumn they assume a brownish yellow hue, and lose their tomentum, more especially the larger ones, whilst the immature specimens often retain it. The interior of the gall consists of a rather loose parenchyma: it is hollow in the centre, and contains a moderately large, oval, inner gall, which is seated at or near the base of the outer one; sometimes this is quite detached, at others it is loosely adherent to the substance. In the smaller specimens, which only contain parasites, this inner cell is not developed, and we frequently find, as in several other species of galls, little oval cavities, arranged in a radiating manner in the parenchyma, and these serve as homes for the parasites. This gall is not deciduous, and specimens two or three years old, and partly destroyed, may be often met with on twigs. The perfect insect emerges in December of its first year.—*G. L. Mayr.*

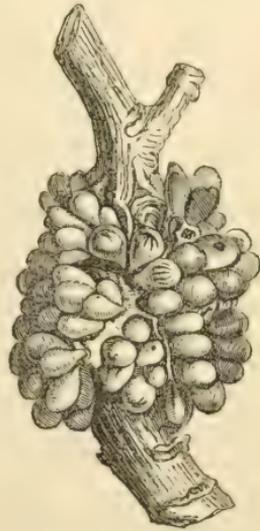
Cynips cerricola is accompanied by four inquilines, and the distinctive characters of these, and of others of their tribe, may be noticed on another occasion:—(1) *Synergus variabilis* of Mayr—it appears from March to July in the second year; (2) *Synergus thumacera* of Dalman—April, second year; (3) *Sapholytus undulatus* of Mayr—it appears in May and

June, second year; (4) *Ceroptus Cerri* of Mayr—it appears from April to June, second year.—*Francis Walker*.

Dryocosmus cerriphilus.—This rare gall is also found on the young twigs of the Turkish oak (*Quercus Cerris*). The galls are about the size of a hempseed, and are attached to one spot in the twig, quite surrounding it, and more or less densely crowded. Each gall, by means of a short pedicle, is inserted in the bark of the twig, which, in consequence, is thickened: sometimes the pedicle becomes gradually lengthened, and the gall terminates in a spherical head, thus assuming a clavate form; the interior is occupied by a rather large larva-cell. As I have never seen the gall in a recent state, but only on a two-year-old twig, in company with similar old galls on an oak that was about eighty years of age, I should recommend the reader to seek farther information from Dr. Giraud's 'Signalements, &c., Ver. zool. bot. Ges. 1859,' p. 354.—*G. L. Mayr*.

Dryocosmus cerriphilus has one inquiline, *Synergus variabilis* of Mayr; it appears from April to June of the second year.—*Francis Walker*.

Fig. 7.



DRYOCOSMUS CERRIPHILUS.

Geographical Distribution of Continental Rhopalocera.

By the Rev. F. A. WALKER, M.A., F.L.S.

In compiling the following catalogue it must be understood that I have only set down such species as fell under my own personal observation. The statistics accordingly of each locality, though greatly defective, may be relied on as far as they go.

Bellagio and its environs.—1. *Papilio Machaon*: gardens of Hotel Grande Bretagne, Villa Serbelloni, Villa Julia,

Villa Melzi, Villa Vigoni, and at Gorla. 2. *P. Podalirius*: gardens of Hotel Grande Bretagne, Villa Julia, Villa Melzi, Villa Vigoni. 3. *Pieris Brassicæ*: Villa Vigoni, &c. 4. *P. Rapæ*: Villa Vigoni, &c. 5. *P. Napi*: Villa Vigoni, &c. 6. *Leucophasia Sinapis*: at Gorla. 7. *Gonepteryx Rhamni*: Villa Julia. 8. *Colias Edusa*: gardens of Villa Serbelloni, Villa Julia, Villa Vigoni, and at Gorla. 9. *C. Hyale*: gardens of Villa Serbelloni, Villa Julia, Villa Vigoni, and at Gorla. 10. *Limenitis Camilla*: Villa Julia, on ivy blossoms. 11. *Vanessa Io*: Villa Julia. 12. *V. Antiopa*: just outside Villa Vigoni. 13. *V. Cardui*: Villa Serbelloni. 14. *V. C-Album*: lane leading to Villa Julia. 15. *Argynnis Lathonia*: Villa Serbelloni, and at Gorla. 16. *A. Paphia*: Villa Julia. 17. *Melitæa Athalia*: Villa Julia. 18. *M. Didyma*: Villa Julia. 19. *Arge Galatea*: at Gorla. 20. *Satyrus Semele*: at Gorla. 21. *S. Mæra*: at Gorla. 22. *S. Megæra*: at Gorla. 23. *S. Ægeria*: outside of Villa Melzi. 24. *Minois Phædra*: at Gorla. 25. *M. Hermione*: at Gorla. 26. *Erebia Medea?* at Gorla. 27. *Chrysophanus Phlæas*: Villa Julia. 28. *C. —*: Villa Julia. 29. *Pamphila Sao?* Gorla.

Neighbourhood of Geneva.—1. *Papilio Machaon*: fields outside Geneva. 2. *Colias Edusa*: meadows adjoining the meeting of the waters. 3. *C. Hyale*: meadows adjoining the meeting of the waters. 4. *Vanessa Atalanta*: meadows adjoining the meeting of the waters. 5. *V. C-Album*: meadows adjoining the meeting of the waters. 6. *V. Cardui*: waste ground to left of Hotel des Bergues. 7. *Argynnis Lathonia*: waste ground in the outskirts. 8. *Melitæa Athalia*: waste ground to left of Hotel des Bergues. 9. *M. Euphrosyne*: meadows adjoining meeting of waters, and waste ground to left of Hotel des Bergues. 10. *Satyrus Janira*: meadows adjoining meeting of waters.

Montreux.—1. *Papilio Machaon*: bank at landing-place. 2. *Colias Hyale*: bank at landing-place. 3. *Leucophasia Sinapis*: bank at landing-place.

Villeneuve.—*Cænomypha Arcanius*: upland meadows. 2. *Arge Galatea*: upland meadows. 3. *Limenitis Sibylla*: upland meadows.

Neighbourhood of Brussels.—1. *Papilio Machaon*: Sion Mount, Waterloo. 2. *Argynnis Lathonia*: Abbey of Villers la Ville.

Forest of Fontainbleau.—1. *Argynnis Paphia*. 2. *A. Niobe*. 3. *A. Aglaia*: extremely abundant along sunny drives. 4. *Melitæa Athalia*. 5. *Limenitis Sibylla*. 6. *Satyrus Mæra*. 7. *S. Hyperanthus*. 8. *Cænonympha Arcanius*: extremely abundant along sunny drives. 9. *Arge Galatea*. 10. *Thecla W-Album*: extremely abundant along sunny drives. 11. *Aporia Cratægi*. 12. *Pamphila Sylvanus*.

Black Forest, Baden Baden.—1. *Papilio Machaon*. 2. *Colias Edusa*. 3. *C. Hyale*. 4. *Vanessa Antiopa*. 5. *V. Prorsa* (autumn type). 6. *Argynnis Paphia*. 7. *A. Aglaia*. 8. *Melitæa Athalia*. 9. *Minois Proserpina*. 10. *Satyrus Ægeria*. 11. *S. Janira*. 12. *S. Mæra*. 13. *Polyommatus Arion*. 14. *P. Corydon*. 15. *P. Adonis*. 16. *P. Alexis*. 17. *Chrysophanus Xanthe*. 18. *Vanessa C-Album*.

Cologne.—*Colias Hyale*: abundant in meadows close to suburb of Dentz.

Tiefenhasten.—1. *Colias Edusa*. 2. *C. Hyale*. 3. *Satyrus Semele*.

Julier Pass.—1. *Colias Hyale*. 2. *Melitæa*. 3. *Erebia Pirene*.

Schyn Pass.—1. *Papilio Machaon*. 2. *Parnassius Apollo*. 3. *Satyrus Semele*. 4. *Minois Hermione*(?). 5. *Erebia Pirene*.

Pontresina.—1. *Parnassius Apollo*: Piz Languard, Bernina Pass, road to Roseg glacier, and stony slopes above Pontresina. 2. *Colias Edusa*: stony slopes above Pontresina. 3. *C. Hyale*: stony slopes above Pontresina. 4. *C. Phicome*: stony slopes above Pontresina, and Piz Languard. 5. *Pieris Callidice*(?): stony slopes above Pontresina, Piz Languard, and Bernina Pass, above Lago Rianco. 6. *Argynnis Lathonia*: Pontresina. 7. *A. Adippe*: road to Roseg glacier. 8. *A. Aglaia*: road to Roseg glacier. 9. *Melitæa Didyma*: road to Roseg glacier. 10. *M. Euphrosyne*: road to Roseg glacier. 11. *M. Dia*: Bernina Pass, and stony slopes above Pontresina. 12. *Polyommatus Corydon*: road to Roseg glacier. 13. *P. Damon*: road to Roseg glacier. 14. *Chrysophanus Virgaureæ*: stony slopes above Pontresina, and road to Roseg glacier. 15. *Cænonympha Philea*: Piz Languard, and stony slopes above Pontresina. 16. *Erebia Pirene*: road leading to Roseg glacier. 17. *E. Euryale*: road leading to Roseg glacier. 18. *E. Clio*(?): road leading

to Roseg glacier. 19. *E. Melampus*: road leading to Roseg glacier, and road leading to Morteratsch glacier.

Chamounix.—1. *Parnassius Apollo*. 2. *Aporia Cratægi*: road by Geneva to Chamounix. 3. *Cœnonympha Philea*: Col de Voza. 4. *Erebia Pirene*. 5. *E. Euryale*. 6. *E. Melampus*. 7. *E. Manto*: Col de Voza and Montauvert. 8. *E. —?* Jardin, Mer de Glace. 9. *Satyrus Mæra*: neighbourhood of Chamounix. 10. *Polyommatus Corydon*: road by Geneva to Chamounix. 11. *P. Damon*: road by Geneva to Chamounix. 12. *Chrysophanus Dorilis*: Chamounix. 13. *C. Virgaureæ*: Chamounix. 14. *C. Chryseis*: Chamounix. 15. *Thecla Betulæ*: Chamounix. 16. *Pamphila Comma*: Chamounix. 17. *Argynnis Niobe*: Chamounix.

Martigny.—1. *Papilio Machaon*: road between Martigny and Great St. Bernard. 2. *P. Podalirius*: road between Martigny and Sion, hovering over muddy puddles. 3. *Parnassius Apollo*: road between Martigny and Great St. Bernard. 4. *Colias Edusa*: road between Martigny and Great St. Bernard. 5. *C. Hyale*: road between Martigny and Great St. Bernard. 6. *Leucophasia Sinapis*: osier beds, near Martigny. 7. *Limenitis Camilla*: road between Martigny and Great St. Bernard. 8. *Minois Actæa*: road between Martigny and Great St. Bernard. 9. *M. Hermione*: cliffs near Martigny, and road between Martigny and Great St. Bernard. 10. *Erebia Euryale*: road between Martigny and Great St. Bernard. 11. *E. Pirene*: ditto. 12. *E. Stygne*: ditto. 13. *E. Goante*: ditto. 14. *E. Melampus*: ditto. 15. *E. Neleus*: ditto. 16. *E. Mnestra*: ditto. 17. *E. Clio* (?): ditto. 18. *E. Gorge* (?): ditto. 19. *Satyrus Hiera*: ditto. 20. *S. Lycaon*: ditto. 21. *S. Mæra*: ditto. 22. *S. Semele*: ditto. 23. *Polyommatus Corydon*: road between Martigny and Great St. Bernard, abundant hovering over muddy puddles. 24. *P. Damon*: road between Martigny and Great St. Bernard. 25. *Chrysophanus Virgaureæ*: road between Martigny and Great St. Bernard, frequent on wild thyme. 26. *C. Chryseis*: road between Martigny and Great St. Bernard. 27. *Erebia Manto*. 28. *Melitæa Didyma*. 29. *M. Amathusia*. 30. *M. Phœbe*. And 31. *M. —?* ditto. 32. *Vanessa C-Album*: road between Martigny and Great St. Bernard, and near railway station, Martigny. 33. *Pamphilus Comma*: road between Martigny and Great St. Bernard.

34. *Argynnis Niobe*: road between Martigny and Great St. Bernard.

Sion.—1. *Papilio Podalirius*: steep rocks by Castle of Sion. 2. *Pieris Daplidice*: steep rocks by Castle of Sion. 3. *Minois Actæa*: steep rocks by Castle of Sion.

Jersey.—1. *Pieris Daplidice*: St. Ouen's Bay. 2. *Argynnis Lathonia*: St. Ouen's Bay. 3. *Satyrus Mæra*.

Wiesbaden.—1. *Gonepteryx Rhamni*: Russian cemetery.

Venice.—1. *Colias Edusa*: Botanical Gardens. 2. *Vanessa Cardui*: Botanical Gardens.

St. Malo.—1. *Papilio Machaon*.

Lucerne.—1. *Argynnis Lathonia*. 2. *Vanessa Cardui*.

It remains for me merely to supplement the above very fragmentary data by stating that, as far as my own success in collecting is concerned, I decidedly give the preference to the Vallais over any other district. The foregoing facts stand for what they are worth. My knowledge is too imperfect, and my stay was too limited, in the localities mentioned, for me to attempt an elaborate generalization, as regards the widespread range of certain species, and the local occurrence or total absence of others.

F. A. WALKER.

Entomological Notes, Captures, &c.

Notes on the Red and Blue Varieties of Ædipoda Germanica.—So far as my very imperfect knowledge of this insect extends, its red and blue varieties are about equally common, occurring, however, by no means in the same proportion in each place, as while travelling on the Continent I have observed the red alone almost exclusively in one spot, and similarly the blue in another; while in a third locality I have noticed both forms, though not in equal plenty. But as mine are necessarily hurried notes of a passer through the different countries where I remarked the said grasshopper, as, for example, Germany, Switzerland, Italy, and Corsica, it is not at all improbable but that a longer investigation, as well as a more careful and further extended search, would succeed in discovering the red, where I only found the blue, and *vice versâ*. The fact that both varieties are undoubtedly found in one and the same place, would seem to preclude

altogether the idea which I once entertained, that their respective tints were adapted, for the purpose of self-protection and disguise, to the particular colour of the soil that they inhabited. Notwithstanding, there is no ground, I should imagine, for supposing that the discrepancy of their hues constitutes them two distinct species, inasmuch as we possess a similar instance of various colouring in the *Heliconius Doris*, of the Amazon region, where *var. A* has the stripes on the lower wings of a bright brick-red, and *var. B* of a slaty blue. I may remark that the upper wings of both varieties are of very different shades, in the case of several specimens that I observed and captured, being sometimes of a uniform dark hue, occasionally variously mottled, and others, again, indistinguishable in colour from the dust of the road on which they were settled: a familiar instance in point, I may observe, is furnished by the numerous tints of the upper wings of our own common yellow underwing (*Pronuba*). *O. Germanica* presents the same number of different tints of upper wing, as far as I am aware, in red and blue varieties alike, nor is there any mark in the said wings whereby one may determine which of the two it is, until the insect is disturbed, and flies upwards from its resting-place. However, it may be noteworthy to add, with regard to the specimens in my own collection, that a uniform dark tint is the most frequent form of the upper wing of the red variety, whereas that of the blue is more often variously mottled. I myself possess two specimens of the red variety having the upper wings mottled, but none of the blue that, in this respect, are dark. But it is very likely that a series of this same insect in another cabinet may tell a widely different tale, in reference to the above particulars. I have now only one more point to notice, namely, that in all my specimens of the red variety the black band, which borders the red in the lower wings, extends to the extreme margin of the same, whereas in the blue, without exception, beyond the same black band, there is always "a transparent piece of network." I subjoin a list of localities, where I have noticed both varieties of this insect:—Black Forest, Baden Baden, August, 1857, only blue variety. Mount Pilate, October, 1865, only red variety. Pontresina, September, 1872, only red variety. Road to Roseg Glacier, August, 1872, only red variety. Geneva, August, 1872, a few

of blue variety. Gorta (near Bellaggio), September, 1872, a few red; mostly blue. Villa Julia, Bellaggio, September, 1872, only blue variety. Julier Pass, August, 1872, red and blue varieties. Thusis, September, 1872, red and blue varieties; red if anything more abundant. Lido, Venice, October, 1872, only blue variety. Pineta, Ravenna, October, 1872, only blue variety. Bastia, October, 1872, red and blue varieties. Ajaccio, October and November, 1872, red and blue varieties; the red with only partially-developed wings, notwithstanding the lateness of the season.—[Rev.] *F. Augustus Walker, M.A.; Dry Drayton Rectory, Cambridge.*

Cnethocampa pityocampa said to occur in Kent.—You will doubtless recollect a communication I made to you some months ago respecting some strange pupæ which I found, and the fritillary butterflies which I caught. I regretted that I could not submit them to you at the time, as I had such a number of applicants, and such tempting offers, that I had exchanged them away before I saw them announced in your magazine, as I did not get the 'Entomologist' for that month until the 14th, through a blunder, which the bookseller, who supplies me with it, made: he got me the 'Entomologist's Monthly Magazine,' which, though perhaps more scientific, is not nearly so suitable as yours for a young beginner in my position. I have now found a number of some gregarious larvæ, which appear to be of the same kind as the pupæ were, as their cast skins resembled these, and they were in the same clump of trees, and in pine trees in two other spots in this neighbourhood, and I herewith send a few for your examination: some of them are much larger than these, but these are the only ones at present outside of the silk nests they spin for themselves. I shall be extremely obliged if you can inform me if they really are *B. processionea*. Last summer I found a number of strange pupæ in an old magpie's nest (Entom. vi. 487), which I showed to an acquaintance, then living at Tunbridge Wells, who had several fine cases of moths, and he told me that he thought my pupæ were *B. processionea*, and showed me a moth which he called by that name. Some time afterwards one of my pupæ emerged, and the moth was like it, but smaller and paler. On the 15th of this month, last Sunday, I found some strange gregarious larvæ, inhabiting

large silken nests, on the same pine tree as I found the pupæ, and they are just like the cast skins that were with the above pupæ; and I took some more, in a fresh spot, on the 17th: they are the most curious and eccentric creatures I ever saw. I keep them in an open box, which they do not seem inclined to leave; and whenever they move about they arrange themselves in the most perfect lines or processions, generally singly; but this morning a large number of them were moving about, four abreast, with the most perfect regularity over the pine branches I have given them to feed upon, and which they have already enveloped in a mass of very tough white silk. They are of a grayish black ground colour, with pale rings, arranged something like the rings on the larvæ of *Carpini*: these rings are clothed thinly along the sides with long white hairs, and along the back they are thickly set with tufts of short hair of a bright orange colour; the head is large, black, round, and rather oily-looking. This is the description of the largest, but they vary in appearance, as well as in size. They are most voracious eaters, and consume large quantities of pine or Scotch fir.—*T. Batchelor; Yew Tree Farm, Southborough, Kent, February 18, 1874.*

PS. *March 14.*—The places where I find these larvæ are some distance along the Penshurst Road: their head-quarters is a wood of pine trees, called Ashew Wood, on a farm in the occupation of my uncle; the firs are now being cut down, and I find these larvæ on the top and upper branches of the fallen trees.—*T. B.*

Cnethocampa pityocampa said to occur in Kent.—I shall be greatly obliged if you will tell me the name of the enclosed larva. I cannot find any description which at all accords with them in your 'British Moths.' I found them on the 4th, feeding in batches, under cover of a white web, on some fir trees, on Seal Chart, about three miles from Sevenoaks.—*W. Peyton; Seal, near Sevenoaks, Kent, March 6, 1874.*

[I have printed these letters without altering a single word, because I desire not to prejudice the case by any opinion of mine. Mr. Doubleday has kindly given me the name of the larvæ. Both instalments are of the same species: it is *Cnethocampa pityocampa*. It assumes the pupa state singly, on or just below the surface of the earth, in a cocoon resembling that of the *Cucullia*. Mr. Doubleday

adds that *C. processionea* spins up gregariously, in the web previously inhabited by the caterpillar. I think it may be interesting to add a few references to the history of *Cnethocampa pityocampa*. 1. Pliny, (C.S.) 'Historia mundi naturalis,' lib. xxxviii. c. 9. 2. Mouffet, 'Theatrum,' p. 185. 3. Amoreux (P.J.), 'Notice des Insectes de la France réputé Venimeux,' p. 158. 4. Kirby and Spence, 'Introduction to Entomology,' vol. i. p. 131: "Of this nature also is the famous *Pityocampa* of the ancients, the moth of the fir *Lasiocampa pityocampa*, the hairs of which are said to occasion a very intense degree of pain, fever, heat, itching and restlessness. It was accounted by the Romans a very deleterious poison, as is evident from the circumstance of the Cornelian law, 'de Sicariis,' being extended to persons who administer *Pityocampa*." Again, Kirby and Spence, 'I. E.' vol. ii. p. 22: "Equally amusing is the progress of another moth, the *Pityocampa*, before noticed. They march together from their common citadel, consisting of pine leaves united and interwoven with silk which they spin, in a single line, thus forming a series of living wreaths, which change their shape every moment: all move with a uniform pace, no one pressing too forward, or loitering behind; when one stops, all stop, each defiling in exact military order." And Réaumur suggests that the singular anal patch of scales, resembling those of the wings, but considerably larger, which is found in the female of *Cnethocampa pityocampa*, is destined for the purpose of covering her eggs. 5. Stephens, in his 'Illustrations of British Entomology, Haustellata,' vol. ii. p. 48, has described *Cnethocampa pityocampa* as a British insect, on the authority of a stunted specimen in the British Museum, said to have been taken in Devonshire by the late Dr. Leach. I ought to add that the account given by Mouffet in 1634, to which I have referred above, is well worth an attentive perusal, not only as a specimen of minute and accurate description, but also as showing how ably and elegantly the Latin language was employed in Natural History a century before the invention of what is called the "language of Science."—*Edward Newman.*]

Swarming of a Brood of Winged Ants.—On the afternoon of October 6th, at about 4 P.M., we were attracted to a part of the large yard surrounding our home by a multitude of

large-sized insects that filled the air, and appeared to be some unusual form of insect-life, judging of them from a distance. On closer inspection these creatures proved to be a brood of red ants (*Formica*) that had just emerged from their under-ground home, and were now for the first time using their delicate wings. The sky, at the time, was wholly overcast; the wind strong, south-east; thermometer 66° Fahr. Taking a favourable position near the mass, as they slowly crawled from the ground up the blades of grass and stems of clover and small weeds, we noticed, first, that they seemed dazed, without any method in their movements, save an ill-defined impression that they must go somewhere. Again, they were pushed forward usually by those coming on after them, which seemed to add to their confusion. As a brood or colony of insects their every movement indicated that they were wholly ill at ease. Once at the end of a blade of grass, they seemed even more puzzled as to what to do. If not followed by a fellow ant, as was usually the case, they would invariably crawl down again to the earth, and sometimes repeat this movement until a new comer followed in the ascent, when the *uncertain* individual would be forced to use his wings. This flight would be inaugurated by a very rapid buzzing of the wings, as though to dry them, or prove their owner's power over them; but which, it is difficult to say. After a short rest the violent movement of the wings would recommence, and finally losing fear, as it were, the ant would let go his hold upon the blade of grass and rise slowly upwards. It could, in fact, scarcely be called flight. The steady vibration of the wings simply bore them upwards, ten, twenty, or thirty feet, until they were caught by a breeze, or by the steadier wind that was moving at an elevation equal to the height of the surrounding pine and spruce trees. So far as we were able to discover, their wings were of the same use to them, in transporting them from their former home, that the "wings" of many seeds are,—in scattering them; both are wholly at the mercy of the winds. Mr. Bates, in describing the habits of the Saüba ants (*Ecodoma cephalotes*), says ('Naturalist on the River Amazons,' vol. i. p. 32):—"The successful *début* of the winged males and females depends likewise on the workers. It is amusing to see the activity and excitement which reign in an ant's nest when the

exodus of the winged individuals is taking place. The workers clear the roads of exit, and show the most lively interest in their departure, although it is highly improbable that any of them will return to the same colony. The swarming or exodus of the winged males and females of the Saüba ant takes place in January and February, that is, at the commencement of the rainy season. They come out in the evening in vast numbers, causing quite a commotion in the streets and lanes." We have quoted this passage from Mr. Bates' fascinating book because of the great similarity and dissimilarity in the movements of the two species at this period of their existence. Remembering, at the time, the above remarks concerning the South American species, we looked carefully for the workers, in this instance, and failed to discover above a dozen wingless ants above ground, and these were plodding about very indifferent, as it appeared to us, to the fate or welfare of their winged brothers. On digging down a few inches we could find but comparatively few individuals in the nest, and could detect no movements on their parts that referred to the exodus of winged individuals then going on. On the other hand, the time of day agrees with the remarks of Mr. Bates. When we first noticed them, about 4 P.M., they had probably just commenced their "flight." It continued until nearly 7 P.M., or a considerable time after sundown. The next morning there was not an individual, winged or wingless, to be seen above ground; the nest itself was comparatively empty; and what few occupants there were seemed to be in a semi-torpid condition. Were they simply resting after the fatigue and excitement of yesterday? It was not possible for us to calculate what proportion of these winged ants were carried by the wind too far to return to their old home; but certainly a large proportion were caught by the surrounding trees; and we found, on search, some of these crawling down the trunks of the trees with their wings in a damaged condition. How near the trees must be for them to reach their old home we should like to learn; and what tells them "which road to take?" Dr. Duncan states ("Transformations of Insects," p. 205):—"It was formerly supposed that the females which alighted at a great distance from their old nests returned again, but Huber, having great doubts upon this subject

found that some of them, after having left the males, fell on to the ground in out-of-the-way places, whence they could not possibly return to the original nest!" We unfortunately did not note the sex of those individuals that we intercepted in their return(?) trip; but we cannot help expressing our belief that, at least, in this case, there was scarcely an appreciable amount of "returning" on the part of those whose exodus we have just described, although so many were caught by the nearer trees and shrubbery. Is it probable that these insects could find their way to a small under-ground nest, where there was no "travel" in the vicinity, other than the steady departure of individuals, who, like themselves, were terribly bothered with the wings they were carrying about with them?—*C. C. Abbott; from the 'American Naturalist.'*

Hints on Breeding Tæniocampa opima, &c.—As very many have failed to breed this species from the egg, possibly a short account of the method I have found very successful may be interesting to some: from a batch of eggs, kindly sent by Mr. Owen, of Liverpool, April, 1873, about a hundred larvæ hatched on May 15th. They were placed in a three-ounce wide-mouth bottle, with sprigs of broad-leaved willow: tie over the mouth of the bottle with fine muslin, and then place it mouth downwards on a shelf; this keeps the food fresh, and allows a little air to enter. I found that a bottle loosely filled with suitable sprigs kept perfectly fresh for a week; now, as the young larvæ spin a quantity of silken galleries, in which they rest and change their skins, it is rather difficult to change their food without disturbing them, and to avoid this, having filled a second bottle of the same size and character with food, untie and remove the muslin from the neck of the first bottle, and place the two bottles neck to neck. Securing them in this position, by binding a strip of muslin two inches wide tightly round the rims of them, the larvæ can now crawl from the stale to the fresh food, without injuring or disturbing those that may be changing their skins. After two or three days remove the first bottle, and clean it out carefully, for repeating the process when required. After the second change of skin it was necessary to divide my family into two separate bottles, and work as before. After the third change, procure a large

earthen shallow pan, such as is used to stand flower-pots in, and a horticultural glass to fit on it,—*a bee glass is best*; half-fill the shallow pan with tolerably dry earth, on which to rest the glass cover, and prevent escape of larvæ. The food is plunged into wet sand contained in one of the smallest-sized flower-pots, and pressed into the mould of the pan to keep it steady, and introduce a layer of loose dry moss over the mould inside the glass: this is important, as after the fourth change the larvæ leave the food during the day, and hide under the moss. By having a duplicate small flower-pot of wet sand stuck full of fresh *mature* willow sprigs (I found young succulent twigs droop directly), removing your glass, and introducing the fresh pot of food, the change is done quickly, without irritation to the caterpillars. By following this process I succeeded in getting over ninety fine pupæ, not losing more than eight or ten from the egg. Owing possibly to my want of care in not baking the earth I had placed for their pupation, the chrysalids were attacked by a fungus, a species of *Sphæria*, which destroyed a great many before I discovered it; but, by carefully washing them under running water, I have now the satisfaction of breeding some beautiful specimens for my pains. The quantity of leaves my family ate was extraordinary; I never fed so voracious a lot before. I had to walk two miles *out* to get good food for them, making four miles each time, and had to repeat my walk ten times: they gave me altogether a forty miles journey. The introducing moss with the food-plant of *Noctuæ* larvæ I find generally very successful. I bred *Agrotis agathina* so, last August, getting a fine series. There may be no novelty in the plan of breeding sketched out, but I can say that it answers well. *Mem.*—Never place either larvæ or pupæ, when under the bee or horticultural glass, in the direct ray of the sun, as too much heat is collected. This I proved to my cost, killing one hundred or more pupæ of *Geminipuncta* by so doing.—*W. H. Tugwell*; 3, *Lewisham Road, Greenwich, S. E.*

Eupithecia innotata and *E. egenaria* (Entom. vii. 68).—Although too unwell to pay much attention to Entomology at the present time, I will pen a short reply to Mr. Gregson's note upon *Eupithecia innotata* and *E. egenaria*. I introduced *Innotata* into our lists on the authority of worn specimens

given to me by the late Mr. Paget, of Yarmouth. The late M. Becker saw these specimens the first time he paid me a visit, and said they were *Innotata*. He promised to send me German specimens, which he did soon after his return home, and they appeared to agree with those captured by Mr. Paget. Some years afterwards my friend, the Rev. H. Harpur Crewe, bred a closely-allied species from larvæ found on ash, which he named *Fraxinata*. I then thought it possible that Mr. Paget's insects were this species, but I still entertained a suspicion that M. Becker was right, and mentioned this to some of my friends, and I think to Mr. Gregson some years ago. I also said that the larvæ should be looked for on *Artemisia campestris*, which grows abundantly on the sandy heaths of Norfolk and Suffolk. I have bred *Innotata* from larvæ sent me, from Cannes, by M. Millière. If Mr. Gregson has known for years that this species is found in Norfolk, I am rather surprised that he has withheld the information so long from his friends. I am quite certain that the *Eupithecia* which Mr. Buxton sent me was not *Innotata*: it was not a "fine" specimen, one of the superior wings being considerably damaged. I looked over Herrich-Schæffer's figures of *Eupithecia*, and it appeared to me to agree better with that of *Egenaria* than any other species. I then sent it to my friend M. Guenée, who said that as far as he could judge from a single specimen it was new to him, and that he had never seen *Egenaria*. I then sent it to Herrich-Schæffer himself, and he said it was his *Egenaria*, an insect of which very little is known, as Dr. Staudinger doubtfully gives it as a variety of *Arceuthata*.—*Henry Doubleday; Epping, March 18, 1874.*

Argynnis Niobe.—Mr. Doubleday has called my attention to a statement at p. 154 of the 'Entomologist's Annual' for 1874, to the effect that as yet there is no evidence of the female of *Argynnis Niobe* occurring in this country, whereas *all* the reputed British specimens of *Niobe* are females: the sexes are very different, and do not assimilate like the sexes of *Adippe*. I believe all the reputed specimens of *Niobe* have passed through my hands, some of them while still living, and certainly they were females.—*Edward Newman.*

Syntomis Phegea as a British Insect.—The writer of an article in the 'Entomologist's Annual' for 1874, p. 155, has

erroneously assumed the Mr. J. G. Batchelor, jun., who captured *S. Phegea*, near Folkestone, in 1872, to be the same gentleman as Mr. T. Batchelor, of Yew Tree Farm, Southborough, Kent, who last year reported *A. Dia* and *B. processionea* from his locality, and the writer *implies* a doubt as to the genuineness of his statement. As I have personally known Mr. J. G. Batchelor, of Reigate, for some twenty years, I can fully vouch for the fact of *S. Phegea* being actually taken as reported below, in his own words, in answer to a letter of mine, asking details of his capture. He writes me:—"I took it (*Phegea*) on the coast, between Folkestone and Dover, on the wing, about half-past twelve o'clock, July 24, 1872, weather bright and hot; if it had not been for the yellow band on the insect, I do not suppose I should have taken any notice of it, as only butterflies and the larger moths attract any attention from me." Although this may be a unique and unlooked-for capture in England, there is not the slightest doubt as to the fact as reported.—*W. H. Tugwell; Greenwich, March 23, 1874.*

Butterflies in Newfoundland at Christmas.—Twelve months since I chronicled in the 'Field' newspaper four species of butterflies, namely, *V. Io*, *V. Polychloros*, *V. Urticæ*, and *G. Rhamni*, on wing here, on December 26th. A short time since I heard from one of the settlers at Cow Head, Newfoundland, who incidentally mentioned that "last Christmas Day (1872) a shower of white butterflies fell" there! This, therefore, is the day preceding that on which the butterflies were observed on wing in this neighbourhood. My informant unfortunately neglected to note the temperature, although I left a thermometer there expressly for that purpose. Of course the weather must have been remarkably mild. The mean temperature of that part of Newfoundland at Christmas would average about 15° above zero.—*Henry Reeks.*

Vanessa Polychloros in Northumberland.—I have the pleasure to report the occurrence of the large tortoiseshell butterfly (*Vanessa Polychloros*) in this county. A specimen was found yesterday (March 20th) by Mr. M. Henderson, of this town, on the floor of the chapel in All Saints' Cemetery, near the town. When I saw it to-day it was in a semi-dormant state, and had no doubt hybernated among the rafters in the roof of the chapel. I believe this is the only really authentic capture of this butterfly in the county of

Northumberland; and the neighbouring county of Durham can only boast of two instances in which it has been met with, namely, at Whitburn, by Mr. John Hancock, on July 23rd, 1858, and by Mr. J. Sang, at Darlington.—*W. Maling*; 22, *Jesmond Road, Newcastle-on-Tyne, March 21, 1874.*

Description of the Larva of Zygæna Trifolii.—Early in July last I received a number of cocoons and three larvæ of this species from the Rev. A. C. Hervey, of Pokesdown. The latter were of the usual Zygæna shape; when at rest about five-eighths, but when crawling nearly an inch in length. Ground colour yellowish green; the head black and shining, with a streak of gray above the mandibles. There are two longitudinal rows of black marks on the dorsal area, each segment containing four of these marks; there is another row of similar, but smaller, marks between the subdorsal and spiracular regions; and an interrupted smoky stripe along the region of the spiracles. The segmental divisions are yellow, and expand into conspicuous yellow marks along the sides, these marks being on the posterior [part] of each segment, between the two rows of black marks. The ventral surface is dingy, yellowish green, with smoky central line. Skin soft, and clothed sparingly with very short gray hairs. Moths emerged during the latter part of July.—*Geo. T. Porritt*; *Huddersfield, January 9, 1874.*

[Will Mr. Porritt kindly inform the readers of the 'Entomologist' how these larvæ may be preserved through the winter? I have often hatched the eggs of a five-spot burnet, and have watched their entrance into this world, and found they will immediately distribute themselves over the leaves of any leguminous plant provided for them; this lasts for a few days only: if you hold up the food on which they are feeding and give it a sharp tap, the infant larvæ fall about five or six inches, but always secure themselves by a thread, and thus swing suspended like a family of recently-hatched spiders. They soon regain their standing, and nibble little holes in the leaves; but I have always lost them in the winter.—*Edward Newman.*]

Halonota Grandævana at Hartlepool.—A few months ago Mr. Gardner, of Hartlepool, sent a box of Micro-Lepidoptera for my acceptance: among them was a specimen of Grandævana; it appears rather an old one, and no doubt it has been in existence before the species was

added to our list. I had placed it among my *Pœcilochroma* as a new species, until I sent it to Mr. Stainton, and he returned it as *H. Grandævana*.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston, March 7, 1874*.

Phigalia pilosaria.—One emerged on the 7th and another on the 14th inst. Mr. Newman says the larva feeds upon the oak, but what I have taken in pupæ have been dug up from under the elm, as I keep them all in separate boxes. I believe the larvæ are pinkish brown, but of that I am not quite certain at present.—*S. Bradbury*; *Uttoxeter*.

[I have received specimens of *Phigalia pilosaria* at rather unusual dates during the past winter: one in November, three in December, two in January, and several in February.—*Edward Newman*.]

Testaceous Specimen of Hylurgus piniperda.—On the 5th September, 1873, I found an entirely testaceous specimen of (apparently) *Hylurgus* or *Dendroctonus*. What species is it? We find about here a species of *Dendroctonus*, answering exactly to *Dendroctonus piniperda*. What species is it? We also find another species of the same genus (apparently), but with the elytra and part of the thorax ferruginous on the top, looking as if it had been rubbed. What species is it? The last two are common; of the first only one was found, and that by myself.—*John Grubb*; *Newtown School, Waterford, February 24, 1874*.

[The testaceous insect is probably an immature specimen of *Hylurgus piniperda*. I cannot venture to name the others.—*Edward Newman*.]

Eriogaster lanestris Five Winters in the Pupa State.—I bred out a pair of this insect on March 18th, 1874, the same having gone into pupa on July 8th, 1869, thus passing five winters in the pupa state. I have a few more pupæ, which still show no signs of coming out.—[*Rev.*] *A. C. Hervey*; *Pokesdown, Bournemouth*.

Ichneumonideous Parasite on a Boarmia Larva.—Will you kindly inform me what the enclosed is caused by? I find some of them every year on my Clematis. Last year I had a larva, which I supposed to be that of *Rhomboidaria*: it grew enormously for a time, but eventually died; and I found two of these combs protruding from the skin, as though caused by an *Ichneumon*.—[*Rev.*] *E. H. Eyles*; *Enfield*.

[The curious objects which accompanied this are the

elegant combs of a minute Ichneumon, *Microgaster alvearius*, the specific name being given in allusion to their wonderful resemblance to pieces of honeycomb: each cell contains a parasite, either in the state of larva, pupa, or imago.—*Edward Newman.*]

On Oak-leaf Insects.—The strength of the oak is proportioned to its trials or sufferings, and they are many and great, and the last, though not the least, of them in this country is the fly that deprives it of its offspring, and substitutes a changeling for a babe,—for acorns may be observed to be few or none where Devon-galls are many. One of the oak's little trials is the *Phylloxera*, of which at this season there are indications beneath one oak-leaf of the former presence of a thousand individuals, and a large Hemerobid larva, under the same leaf, accounted for their absence, and would have probably soon gleaned up the little remnant, about ten in number, that was left. In addition to the three species of insects before mentioned, a little *Callimome* at this season takes part in the economy of the spangle by committing to it an egg, and seems to be very rare as compared with the spangles; these are very variable as to their occurrence: some leaves are quite unspangled, others have only a few rosy spangles; other leaves are covered beneath with two hundred or three hundred beginning-spangles, not so large as the head of a very small pin. The full-grown spangles increase the beauty of the foliage at this time by adding to the diversity of its tints, sometimes by yellow marks; in other cases, when they are in excessive abundance, by causing the leaf to curl up and to display the under side, which is wholly rusty red by means of the spangles. The immense profusion of these is balanced by the fall of the leaf, which is previous to the swelling of the spangle and to the consequent growth of the enclosed grubs, and their increase is probably promoted by the destruction of birds and of other agents by which they are consumed. The little oak-button, formed by *Neuroterus Numismatis*, is sometimes thinly or thickly intermingled with the spangle, and sometimes has the whole of the under surface of the leaf to itself. The slug-like glutinous green grub of *Blennocampa stramineipes* is at this season stripping off by its jaws the covering of the oak-leaf with exceeding neatness, and leaving the skeleton quite transparent, with all the veins untouched.—*Francis Walker.*

Goureau's Observations on Parasitism.—A few more extracts from Goureau's observations on parasitism may be added as an indication of what is likely to be remarked in England with regard to the same insects. *Platygaster scutellaris*, *Nees* (male = muticus, *Nees* fem.), is parasitic on *Cecidomyia Tritici*; also a species of *Coleocentrus* lays its eggs outside those of the *Cecidomyia*, and its larva devours twenty larvæ of the latter. From the three Micro-Lepidoptera, *Yponomeuta Padella*, *Y. Malinella*, and *Y. Evonymella*, Goureau obtained *Pimpla scanica*, *Ichneumon brunnicornis*, *Campoplex sordidus*, *Anomalon tenuicorne*, *Mesochorus splendidulus*, *Encyrtus fuscicollis* (which comes by hundreds out of a single caterpillar or pupa), and *Eurygaster* (*Erythræus*) *pomariorum*; the grub of the latter lives in the nest, and devours successively larvæ and pupæ. He also mentions one specimen of *Eulophus Cervus*, which he does not describe.—*Francis Walker.*

Acanthocinus Ædilis.—*Acanthocinus Ædilis* is the name of the beetle sent by Mr. Sclater, of Castle Eden. I am obliged for it.—*Edward Newman.*

Aphilothrix Sieboldii in England.—I send for your acceptance a few galls, which I think you will find to be one of the species mentioned in the 'Entomologist' for March,—most likely *A. Sieboldii*. I also enclose the three imagos that I reared from them. Early in January, 1873, I found the above on the small twigs of an oak, which had been repeatedly cut down, and was growing in a hedge-bank. They were near the bank, covered with dead leaves, but not under the mould. The galls were quite new to me, and most of them were empty; but finding a few of them unbroken, I took them home, corked them up in a glass, and, I think, in May the three imagos emerged. The empty galls may have been old ones, but I at the time thought that most of the flies had escaped during the autumn of 1872. You will observe that the galls are very sparingly distributed over the branch, and not clustered. If they turn out to be one of the species of *Aphilothrix*, I will hunt them up, and perhaps I may find better specimens.—*Henry Moncreaff; High Street, Portsmouth, March 2, 1874.*

[There can be no doubt that these galls are those of *Aphilothrix Sieboldii*, and Mr. Moncreaff's communication is particularly interesting as showing, first, that the range of

this species extends to Britain, and, secondly, as positively connecting the gall with the gall-maker; probably, however, the name of *A. Corticis*, which has the claim of priority, will supersede that of *A. Sieboldii*. The species appear to be identical.—*Edward Newman.*]

Rose-galls.—I have by me an American rose-gall, of which the English rose-gall, about to be mentioned, is a little representative. The latter is inhabited by *Rhodites Rosarum* of Giraud, and, like the former, which nourishes *Rhodites bicolor* of Harris, is distinguished by its elegance, and it has generally the shape of a little spine-set ball, and its spines are red like the spines of the briar, and sometimes it has not a pea-shape, but is merely a swelling of the basal part of the spine. In this state it is with other spines, but in its round form it occurs on the surface or on the edge of a leaf, and is only indicative of the spines, which, like other spines and thorns, are said to be merely rolled-up leaves. With this gall there is another little one without spines; it is made by *Rhodites Eglanteriæ* of Hartig, and much resembles the *Rosa spinosissima* gall, in which *Rhodites spinosissimæ* of Giraud is reared; but more may be said on this matter in a future note on rose-galls.—*Francis Walker.*

Correction of an Error.—I am sorry I have to contradict my notice of the capture of *Plusia Interrogationis* (Entom. vii. 23). It proved to be *P. Pulchrina*, a species I had never seen. Mr. N. F. Dobrée, upon seeing it, instantly discovered my mistake; and I should not like knowingly to add one to the long lists of "rarities," whose history is, to say the least of it, doubtful.—*Geo. R. Dawson; Pounds-worth, Driffield, March 20, 1874.*

Extracts from the Proceedings of the Entomological Society of London, January 5 to February 3, 1874.

Photographs of Insects taken with Camera Obscura.—Mr. Mendola exhibited some photographs of minute insects taken with the camera obscura and microscope.

A Bombyx with Aquatic Larva.—Mr. M'Lachlan called attention to a paper in the last part of the 'Annales de la Société Entomologique de France,' by M. Bar and Dr. Laboulbène, on a species of a Bombycidae closely related to the tiger-moths described and figured by M. Bar as *Palustra*

Laboulbenei, and of very extraordinary habits, the larva being aquatic, living in the canals of the sugar plantations in Cayenne, and feeding upon an aquatic plant. The hairy larva had all the form usual for the group, and breathed by means of small spiracles,—a supply of air being apparently entangled in its hairs. The cocoons were joined together in little masses floating on the surface of the water.

Olivierian Collection.—Mr. M'Lachlan read a letter that he had received from M. Ernest Olivier, stating that the collection of insects formed by his grandfather had been purchased some years after his death by MM. Chevrolat and Jouselin. A great part of the collection had been suffered to fall into decay; but recently a portion, comprising the Curculionidæ, Heteromera, Lamellicornes, Sternoxi, Chrysomelidæ, Clavicornes and Hydrocantharidæ had come into his possession, and he would be happy to show them to any English entomologist who might desire to examine any of the numerous types. Unfortunately the Carabidæ and Longicornes were almost entirely lost.

Election of Officers.—The following gentlemen were elected Members of Council for 1874:—Sir Sidney Smith Saunders, Messrs. W. C. Boyd, Dunning, Grut, Meldola, Moore, M'Lachlan, F. Smith, Stainton, Stevens, Verrall, Jenner Weir, and Professor Westwood. The following officers were subsequently elected, *viz.*:—Sir Sidney Smith Saunders, President; Mr. M'Lachlan, Treasurer; Messrs. Grut and Verrall, Secretaries; and Mr. Janson, Librarian. The President then read an Address on the progress of Entomology during the past year.

Insects in Limestone Caves.—Mr. Müller exhibited the following specimens, which he had found on a recent visit to some limestone caves in the Jurassian Mountains. 1. A blind Myriapod, found on decayed trunks of trees carried into the cave by floods. 2. A minute Podura, which had, however, become quite shrivelled. 3. A species of Hæmalastor, *Koch* (a genus of Schusselzecken), mentioned by Kolenati in 'Die Parasiten d. Chiroptera' (Dresden, 1857). Mr. Müller did not observe any bats in the cave, but the insect was creeping on one of the stalactites, from which it dropped into his hand. He believed it was the first time that any blind specimens had been found in the caves of Switzerland.

Longicorn destructive to Coffee Plantations at Natal.—The Secretary read extracts from a letter from Mr. W. D.

Gooch, of Spring Vale, Natal, on the destruction of the coffee plantations there by a Longicorn beetle. He stated that they were splitting up the diseased stumps, and that only about two per cent were unaffected. The larvæ bored into the tree between the forks of the root, working into the heart and feeding on the wood, as high up as nine or twelve inches above ground. A specimen of the insect was exhibited, which proved to be *Anthores leuconotus*, *Pascoe*. In the bottle with the larvæ were also specimens of *Ceroplesia caffra*, but the former insect was stated to be the cause of the evil. They had split up some five thousand trees, which were diseased, and the only remedy which they had, as yet, tried, was to apply Stockholm tar to the roots: he would be glad to be advised as to the best mode of exterminating the insects. Mr. M'Lachlan remarked that it was very important to ascertain if the insect was really the original cause, or whether, as he believed, the trees were previously diseased. Mr. Müller was of opinion that the eggs were laid on sound trees, and he added that the maximum time for the appearance of the perfect insect was only about two weeks, and suggested hand-picking as they came out, a practice frequently adopted on the continent of Europe, with regard to *Melolontha*: it was also very desirable to avoid shooting the various species of insectivorous birds, which were frequently destroyed for the sake of their plumage.

[I entirely agree with Mr. Müller in supposing the eggs were laid on sound wood. During fifty years attention to this subject, I have never found the larvæ of Longicorn beetles in decayed wood, or those of Lamellicorn beetles in sound wood.—*Edward Newman*.]

The West London Entomological Society.—The first exhibition of the above Society took place December 2nd and 3rd, 1873. The principal rarities were a specimen of *Bolitobia fuliginaria*, taken in the Blackfriars Station of the London, Chatham and Dover Railway, exhibited by Mr. Dow; some varieties of *Cidaria suffumata*, by Mr. Seabrook; a series illustrating the life-history of *Orgyia gonostigma*, and a hermaphrodite specimen of *Anthocharis Cardamines*, by Mr. Wyatt; specimens of *Cerura bicuspis* and *Notodonta Carmelita*, from Tilgate Forest, by Mr. Cooke.—*E. W. Timmins*.

THE ENTOMOLOGIST.

No. 129.]

MAY, MDCCCLXXIV.

[PRICE 6d.



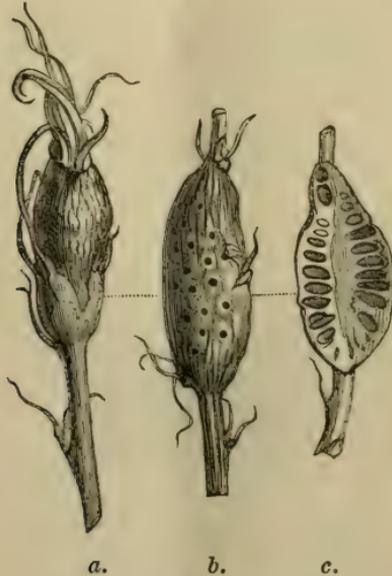
MELITÆA SELENE ? VARIETY.

Melitæa Selene ? variety.—This singular specimen, which is in the rich collection of Mr. Stevens, almost defies every attempt to fix its specific name. The colour on the upper side is fulvous, or raw-sienna brown marked with black, in the manner which the clever drawing by Mr. Willis so well indicates: the fore wings have three amorphous blotches in a longitudinal series beneath the costa and above the middle of the wing; the wing-rays are incassated by black margins, and each intervening area is divided by a short transverse bar; on the left-hand wing four of these areas have each an oblong narrow spot near the middle; the hind wings are dark, almost black, but not without paler spaces and reflections in the basal portion; each has also a submarginal series of six oblong fulvous spots. The under side can scarcely be described, the black, brown, fulvous, and silver, are so mixed up, and so entirely without distinguishing specific characters.

—*Edward Newman.*

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER née WEISE.

Fig. 8.



DRYOPHANTA MACROPTERA.

- a.* WITH THE GALL-MAKER STILL PRESENT. *b.* THE GALL AFTER THE ESCAPE OF THE GALL-MAKER. *c.* A SECTION.

Dryophanta macroptera.—On the young twigs of the Turkish oak, *Quercus Cerris*, this species produces swellings, which vary considerably in size and form; sometimes they are small and of an elongate-oval form, and, like cocoons, contain a larva, and in this case they produce merely a slight incrustation of the twig. Sometimes the cells are densely crowded, and arranged in a radiating fashion under the rind, causing a manifest thickening of the twig. The perfect insect emerges in October of the same year.—*G. L. Mayr.*

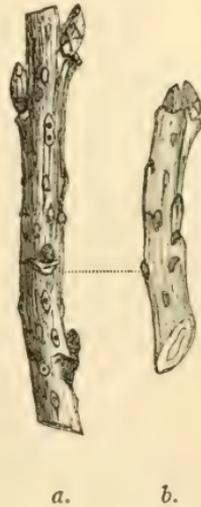
Dryophanta macroptera has four inquilines; one of them occurs also in the two preceding galls. (1) *Synergus flavipes*, *Hart.*: June; second year. (2) *S. variabilis*, *Mayr*: May to July; second year. (3) *S. rotundiventris*, *Mayr*: May; second year. (4) *Ceroptres Cerri*, *Mayr*: May; second year.—*F. Walker.*

Andricus noduli.—This little gall, like the preceding, is invisible from the exterior, being embedded in the bark of *Quercus pedunculata* and *Q. pubescens*. A small spherical or oval swelling is observable on the young shoots of the *Quercus pedunculata*, raising the bark or rind from 1·5 millimetres to 2 millimetres in diameter, and beneath this swelling is situated the gall. On *Quercus pubescens* the swelling occasioned by this gall is still less perceptible, on account of the tomentum on the surface, and sometimes it is entirely absent. It is best to look for these galls at the end of September, when the perfect insect emerges: after some have escaped, and have left little circular holes in the rind, it is easier to watch the remainder, as they usually follow in the course of a few days. The circular aperture, made by the perfect insect on its escape, is

scarcely half a millimetre in diameter. The oval gall, only 1·3 millimetre in length, is situated either between the bark and the wood, or in the wood itself, and is placed longitudinally with the twig: it is white, and closely surrounded by wood and bark; it has a thin covering, and contains one larva cell. On the twigs of *Quercus pedunculata* the externally-visible swelling subsides after the escape of the perfect insect, and becomes a blackish coloured speck, with a circular aperture in its middle. In *Quercus pubescens* you are frequently unable to detect the swelling at all, and if any unevenness has existed it remains after the perfect insect has made its escape, and the surface of the bark does not change colour. This gall is occasionally on leaf-pods and on petioles. It is probable that the gall named *C. Turionum*, with which I am unacquainted, belongs to this species.—*G. L. Mayr*.

Mayr mentions three inquiline inhabiting the galls of *Andricus noduli*: *Ceroptres arator*, *Hart.*, *Sapholytus conatus*, *Hart.*, and *Synergus apicalis*, *Hart.* The first appears in May and June of the second year; the third in May of the second year.—*Francis Walker*.

Fig. 9.



a. ANDRICUS NODULI.
b. A SECTION.

Notes on the Wing-bones of the Two-winged Flies.

By FRANCIS WALKER, Esq.

(Continued from p. 42.)

BONES.	AREOLETS.
<i>g</i> Subcostal.	R Subcostal.
<i>k</i> Radial.	K Radial.
<i>c</i> Cubital.	C' Cubital, 1st.
<i>c'</i> Cubital, 1st branch.	C'' Cubital, 2nd.
<i>c''</i> Cubital, 2nd branch.	B' Præbrachial.
<i>d'</i> Præbrachial, 1st branch.	B'' Pobrachial.
<i>d''</i> Præbrachial, 2nd branch.	D Subapical.
<i>m</i> Pobrachial, 1st branch.	Y Anal.
<i>y</i> Pobrachial, 2nd branch.	
<i>v</i> Anal.	

Fig. 7.—Sciophila.

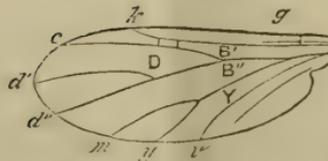
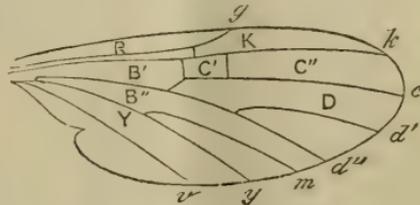


Fig. 8.—Tetraneura sylvatica.

Fig. 9.—Gnoriste.

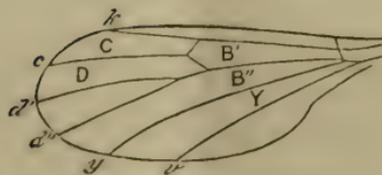
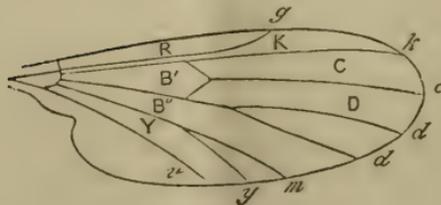


Fig. 10.—Mycetophila, sp.

Fig. 11.—Sciara.

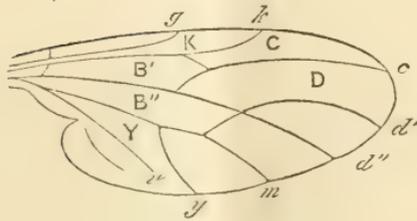
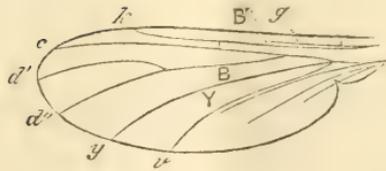


Fig. 12.—Bibio.

THE inspection of the wing of a fly is generally sufficient to ascertain the genus of the individual to which it was attached, and there is much interest in tracing the great variation of the wing-bones of Diptera, and in observing how many changes are effected by the modifications of a few parts of the structure. Strength and swiftness of flight is generally accompanied by many wing-bones, but in numerous cases the bones are many, and the flight is very feeble. In a few groups some of the bones are very slender, so as to be termed secondary. This is more conspicuous in some Hymenoptera, such as Chalcidix, when the fore wing has generally only one bone near the costa, but in the largest species one or two diffuse veins or incipient bones in the disk may be indistinctly traced. The return of mild or warm weather and the morning sun impart much vivacity to the wings by means of electric currents through the bones, and recal the Diptera from a torpid state, like as comets become developed and move more rapidly when they approach the sun.

Five of these six figures, and the preceding six in the 'Entomologist,' pp. 36, 37, represent the wing-bones of Mycetophilidæ: this family forms two divisions, Mycetophilini and Sciarini, of which the first includes seven sub-families,—Diadocidinx, Mycetobinx, Boletophilinx,

Macrocerinæ, Ceratoplatinæ, Sciophilinæ, and Mycetophilinæ. Mycetobia (sub-fam. 2) differs especially from Diadocidia (sub-fam. 1) in the much greater length of the subcostal, and in the nearer approach of the radial to the tip of the wing. Ditomyia (sub-fam. 2) differs from Mycetobia in the incomplete and very short subcostal, in the forked cubital, and in the much longer fork of the præbrachial. In Platyura (sub-fam. 5) the subcostal is complete but short, the radial is much shorter than that of the Ditomyia, and the fore fork of the cubital is very short. In Bolitophila (sub-fam. 3) the subcostal is elongated, the fore fork of the cubital is as short as that of Platyura, but joins the radial near the tip of the latter; the first pabrachial is much longer than in any of the preceding genera. In Macrocera (sub-fam. 4) the subcostal and the radial are shorter, and the very short fore fork of the cubital is beyond the tip of the radial; the curve of the cubital also distinguishes this from all the preceding genera. In Sciophila (sub-fam. 6) a greater change occurs in the structure of the bones; the cubital has two short approximate directly transverse forks, which join the radial. In Tetragoneura, belonging to the same sub-family, the structure is still more altered; the subcostal is incomplete, and very short; the radial and the cubital are gathered closer to the costa, and the two forks of the radial are shorter and more approximate than in Sciophila, and the two branches of the pabrachial are much nearer to the tip of the wing. In Gnorista and in Mycetophila (sub-fam. 7) the cubital is simple, and the arrangement is much like that of Diadocidia and of Mycetobia, excepting the peculiar curved radial of the latter. In the Mycetophila, here figured, there is no subcostal, and the præbrachial does not form two branches. In Sciara (div. Sciarini) the resemblance to Tetragoneura is apparent; the radial and the cubital are curved near the costa; the other veins are slight or secondary, and the præbrachial does not form two branches. There is a transition from Sciara to Cecidomyia when the veins are very few; but these notes are limited to the figures which they accompany. The flight of all the preceding genera is feeble, short, and flitting; that of Bibio (fam. Bibionidæ) is hovering, and of long continuance, and there is another plan in the construction of the wing-bones.

FRANCIS WALKER.

Notes on some Amurland European Diptera.

BY FRANCIS WALKER, Esq.

MYCETOPHILIDÆ.

THERE are probably many undescribed European species of this family, notwithstanding the extent of Winnertz's monograph: very few have been recorded from South Europe.

Div. 1. *Micetophilini*. Subfam. *Macrocerinæ*.

Genus *Macrocera*.—*M. vittata* occurs near Rome.

Subfam. *Ceratoplinae*.

Genus *Platyura*.—*P. nemoralis* and *P. discoloria* were observed near Rome, *P. basalis* at Florence, and there appear to be two undescribed British species, one found in North Wales, the other in the Isle of Man. The large British species, *P. vitripennis*, is not recorded by Winnertz; it mimics *P. atrata*, which belongs to another division of the genus.

Subfam. *Sciophilinae*.

Genus *Sciophila*.—Two species not recorded by Winnertz: one found in the Isle of man, the other at Florence.

Genus *Polylepta*.—One undescribed species found in North Wales.

Subfam. *Mycetophilinae*.

Genus *Sytemma*.—One new species found in North Wales.

Genus *Trichonia*.—One new species in the Scilly Isles.

Genus *Allodia*.—One new species in North Wales.

Genus *Phronia*.—One new British species, and one found in Switzerland. *S. nitidiventris* occurs in the Scilly Isles.

Genus *Evechia*.—One new species in North Wales, another found near Pisa.

Genus *Sceptonia*.—*S. nigra* inhabits Amurland.

Genus *Mycetophila*.—*M. punctata* and *M. gibba* in Amurland.

Div. 2. *Sciarinae*.

Genus *Sciara*.—*S. Thomæ* occurs near Rome and in Amurland, where there are some other species which are not sufficiently well preserved to be recorded. Two apparently

undescribed species occur in Italy; one in Switzerland; and I have found *S. alpicola* on the Col de Voga, near Chamouni.

BLEPHARICIDÆ.

I have found species of this family near Martigny, in Switzerland, and near Florence, in Italy, and remarked its peculiar characters and manner of flight, and have placed it between the Cecidomyidæ and the Bibionidæ. A. H. Haliday wrote to me about the localities in which he saw them, and about the genera and species of the family, and remarked that "the analogy in the development of the eyes (male) to a *Baetis* is very striking, and the secondary net-work of delicate veins of the wings is also remarkable. I have been able to observe its carriage when alive, and find little to justify the comparison with *Chironomus* that has been made. It seems always to alight on the under surfaces, so hanging back downwards, the wings divaricated and a little deflected from the horizontal plane, the abdomen above their level, while the head is stooped."

FRANCIS WALKER.

Entomological Notes, Captures, &c.

Cnethocampa pityocampa and another, as observed at Nice.—With reference to the captures of larvæ of *C. Pityocampa*, recorded in the 'Entomologist' for April (Entom. vii. p. 81), it may interest you to know that I made a little acquaintance with them during my stay at Nice this winter. I first observed their nests on the fir trees, about a fortnight before Christmas, 1873, and upon examining one of these webs I found some hundred or hundred and twenty larvæ, about half an inch long, very closely packed,—I suppose for warmth: when I handled them I did not feel any effects from their urticating quality, which perhaps they did not then possess; and to save myself the trouble of feeding them up, and besides having no convenience at hand for doing so, I left them on the tree where I found them, and did not again look at them until the middle of March, 1874, when I observed that they began to descend the tree by ones and twos, and toward the end of the month they commenced forming their

processions across the garden-path: unfortunately, I never counted how many there were in these processions, but I think I shall be within the mark when I say that they ranged from twenty to one hundred, all marching in admirable order. I have also seen them walking three and four abreast, but not often. I then discovered that their small hairs came off when they were handled, and occasioned me severe irritation, which in the course of a few hours became very painful, producing something like the effects of a stinging-nettle, namely, small white spots on the skin, which continued for about forty-eight hours afterwards. In addition to *C. pityocampa* I found one specimen of another larva, which also possessed this irritating power: it is about two and a half inches long, of a mahogany colour, sprinkled rather sparingly with grayish blue fine hairs all along the back; on the 3rd and 4th segments it has crests of deep blue hairs, longer than the others, extending on either side almost to the spiracles; partly on the 8th and partly on the 9th segments it has the figure of a minute butterfly of the swallow-tail type, also of grayish blue, and measuring a quarter of an inch across; it has legs on the 2nd, 3rd and 4th segments, and claspers on the 7th, 8th, 9th, 10th and last segments. After preserving this larva my wrists and round the lower part of my eyes were covered with minute blisters, which caused me great irritation; I took the precaution to wear gloves, so that my hands did not suffer.—*H. Wittich*; 6, *Lansdown Cottages, Dalston, April 20, 1874.*

The Colorado Potato Bug.—Panic is a cherished "Institution" among us dauntless Britons,—“Hearts of Oak,” as we call ourselves. This bugbear takes a variety of forms: sometimes it is a Napoleon, then a ghost, then, *presto!* it is a comet, anon an invisible fungus, *Peronospora infestans*; then a second Napoleon, then a bottle-nosed whale, then a coal famine, and now a potato bug. A few, a very few, incline to investigate: they exclaim, “We must look into this matter;” but their “lookings into” are confined to the penny-a-lining columns of the ‘Telegraph’ and ‘Times,’ and the penny-a-liners adopt a florid and fluent, but vague, style, in order to extend the panic: if they succeed in getting up a deputation to a President of the Board of Trade, or to a Chancellor of the Exchequer, so much the better; it hurts no one, and brings grist to their mill. Under great pressure,

and throughout all the correspondence about the potato bug, I have been silent; I have not cried "Wolf," simply because I do not believe the wolf is coming. The editor of the 'American Entomologist' informs us that there are "at least a dozen different species of potato bug:" these are principally of the genera *Lytta* and *Epicauta*, beetles very nearly related to the familiar blister-beetle, *Lytta vesicatoria*. The more destructive, or more noticed, are *Epicauta marginata*, *E. lineata*, *E. strigosa*, *E. murina*, and especially, *E. atrata*. The Count Dejean, with his usual fertility of name-giving, has multiplied these names, but whether he has discovered new species I will not venture to say. All these beetles, when in the perfect state, devour the potato-haulm with a rapidity and voracity that appears almost incredible, leaving the bare stalks standing up like stag's-horns. Next in importance are the various species of *Chrysomela*, or bloody-nosed beetle, and entomologists incline to place the *Chrysomela decemlineata* of Thomas Say at the head of them for mischief; the larva is even more voracious than the perfect insect: both devour the haulm, and the haulm only. The third family of potato-beetle comprises the genera *Cassida*, *Cryptocycla*, and *Chelomorpha* (tortoise beetles), the larvæ of which are beset with prickles in a very curious fashion: all these beetles are leaf-eaters, and if I may take the statement of our friends in America they are *potato*-leaf eaters. It will be hardly necessary to state that I have no practical acquaintance with any of these beetles, except as preserved in cabinets, or that I see small prospect of their crossing the Atlantic; but still when I recollect that *Pieris Rapæ* has already crossed in a contrary direction, I can by no means deny the possibility of such an event; and, therefore, I will give my English readers an opportunity of studying the remedies which our transatlantic friends think they have found most efficacious.—*Edward Newman*.

Artificial Remedies: Paris-green.—The many entomologists and agriculturists who have experimented on this insect—with various poisons and other substances, in those portions of the United States where it has been so destructive for some years past—concur in recommending the use of Paris-green diluted with flour, ashes, or air-slacked lime, as the best remedy known for destroying the insect both in its

larva and beetle state, without injuring the plant. The results of our experiments and investigations confirm this opinion, and this remedy is, no doubt, a reliable one, provided the Paris-green be of good quality. Our experience has also satisfied us that flour is a much better substance to mix the green with than either ashes or lime, as the insects eat it more readily, and, at the same time, it adheres more tenaciously to the surface of the plant, and hence is not so easily washed off by rain. We found good effects from a mixture of one part by weight of Paris-green, with ten or twelve parts of flour, dusted lightly on the vines early in the morning, when the dew is on the foliage.

“Quantities Required, and Probable Cost per Acre.—After a careful estimate, we consider that three pounds of the Paris-green, economically used, will be found sufficient for one acre of potatoes. Assuming fifty cents to be the ordinary retail price per pound of Paris-green, every application of the mixture would cost from two to three dollars per acre, exclusive of the labour. If the insect is very abundant, two or more applications may be required, as exposure to wind and rain will eventually remove the powder entirely from the leaves, rendering them liable to further attacks. Some discretion should be exercised in selecting a suitable time for using the mixture, which should not be applied during high winds, or immediately before a rain storm.

“Other Remedies Tried.—We did not content ourselves with the use of Paris-green only, but experimented with as many other substances as the limited time at our disposal would admit of; and, although we would not have the results here given to be considered as final in reference to the materials used, we trust they will be of value as indicating the most promising remedies for further trial.

“Arsenious Acid (Arsenic).—This chemical being much cheaper than Paris-green, and more uniform in its composition, we hoped it would have proved a practical and sound remedy. We tried it in the proportions of half-ounce, one ounce, and two ounces, to a pound of flour; and while we are not prepared, from the few trials we have made, to entirely disapprove of its use, the results we have obtained point to the conclusion that where it has been used in sufficiently large proportions to destroy the insect, it has caused

more or less injury to the leaves. In cases where Paris-green is not obtainable this might be used as a substitute, in the proportion of one ounce to a pound of a flour, which should always be coloured with some black powder, such as charcoal or black antimony, so as to lessen the risk of accident from its use.

“*Powdered Cobalt or Fly-poison.*—Another arsenical compound was also tested, known in commerce as powdered cobalt, or fly-poison. This was used in the same proportions as the last mentioned, and with similar results, but, owing to its higher price, we do not recommend it for general use.

“*Sulphate of Copper (Blue-stone).*—A strong solution of this salt was tried in the proportion of two ounces to one gallon of water, and showered on the vines with a watering-pot, without damage to either the insect or the plant.

“*Bichromate of Potash.*—This is a poisonous substance largely used in dyeing, and one which has attracted some attention in France of late, as a remedy for insects. We used it dissolved in water, in the proportion of two ounces to three gallons of water. This killed the insects effectually, but, at the same time, destroyed the plants. Whether, in a more diluted form, this remedy could be effectively used without injury to the foliage, we are unable at present to say, but shall experiment further with it.

“*Powdered Hellebore.*—This powerful irritant, which is so effectual as a remedy for the currant-worm, we tried without perceptible effect, both in powder and also mixed with water. Several other poisonous substances were also used with like results.

“*Carbonate of Lime.*—There are several preparations sold under this name, which we found to vary much in composition and character, and equally so in effect. We tried an article known as Dougall's, without any good result, but succeeded better with one prepared by Lynam Brothers, of Toronto,—a black powder, manufactured, we understand, from coal-tar. This destroyed a large proportion of the larvæ, but we doubt whether it would kill the perfect insect; it is, moreover, used in an undiluted form, which would render its cost greater than that of the Paris-green mixture. Some see no advantage in using it, although the fact of its being less poisonous may induce some to try it who are prejudiced against Paris-green.

Ashes and Air-slacked Lime.—This, we found, had been extensively used by many of the farmers on the frontier districts, but, as far as we could see or learn, without any perceptible results.

Suggestions.—Paris-green, which we regard as the most practical and efficient remedy for this insect-pest is, unfortunately, as found in commerce, a substance most variable in its composition. It is an arsenite of copper, and the best qualities contain about sixty per cent. of arsenic, on which its activity depends, but the inferior grades contain a much smaller percentage, and are proportionately less effective, and sometimes almost worthless for this purpose. It is highly important that the public be supplied with a good quality of this useful material, and at as low a price as possible, as an encouragement to its use; and we would strongly urge on the Department the expediency of making such arrangements with the wholesale dealers in Toronto as will enable farmers and others to obtain a reliable preparation at a stated uniform price. We would further suggest that, for convenience sake, the Paris-green be made up in packages containing one pound each, with printed directions for its use, and cautions regarding its poisonous qualities. We would also recommend the Department to strongly urge upon farmers to plant in future only such quantities of potatoes as they can well look after: one acre, carefully cultivated and watched over, will probably yield more gross results than four or five acres if neglected; indeed, wherever the beetle is numerous, negligence is sure to be repaid by the utter destruction of the crop."

Breeding Zygæna Loniceræ.—In reply to the editor's note to my paper on the larva of *Zygæna Trifolii*, in the April number of the 'Entomologist' (Entom. vii. p. 90), I have on only two occasions attempted to rear the larva of a *Zygæna* through the winter, and on both occasions the species was *Loniceræ*. No difficulty was experienced in keeping them alive. In the first brood I kept, some years ago, the larvæ were confined in an ordinary breeding-cage, and, as Mr. Newman says, ceased feeding in the autumn very early, and when very small, and attached themselves to the sides and roof of the cage, though some of them occasionally wandered about a little throughout the winter. A great difficulty

presented itself in the spring, however: though apparently quite healthy, they absolutely refused to *grow*, and this sort of thing continued until the end of the summer, and long after the imagos should have been out, the larvæ being even then little more than a quarter of an inch in length. Indeed, as it appeared evident they would hibernate a second time, I got thoroughly tired of them, and either turned them out or gave them away, I do not remember which. The other brood is from a few eggs I obtained last summer, and the larvæ thus far have acted in precisely the same manner as did the former ones: when examined yesterday many of them seemed quite healthy, but show no disposition to feed, though there has been food growing in the cage throughout the winter, and now looks beautifully fresh. The cage has been kept during the winter in a greenhouse (no artificial heat) in the garden. Larvæ of various *Acidalia* and other species, kept under precisely the same conditions, have been feeding several weeks.—*Geo. T. Porritt; Huddersfield, April 2, 1874.*

Breeding Tæniocampa opima.—I have read your correspondent Mr. W. H. Tugwell's account of the way in which he successfully reared the larvæ of *Tæniocampa opima* last year (*Entom.* vii. p. 86). I was equally successful with my brood of that species, though with a totally different kind of treatment. The previous year I had lost every caterpillar, I supposed through having kept them rather closely confined (the plan which has succeeded in Mr. Tugwell's case), so last year I kept them in a roomy cage, which was placed close to a small, constantly-open window; this kept the larvæ nearly always in a *draught*, sometimes a strong one. The brood was a large one, and fed up fast on willow, and a healthier or finer lot I think I never saw; scarcely one seemed to be lost. Has not the season something to do with it? *Opima* seems to have been much easier to rear last year than it was the previous one. Willow, too, seems decidedly the most satisfactory food.—*Id.*

Migration of Butterflies.—Mr. Belt, in his interesting work, 'The Naturalist in Nicaragua,' pp. 152—154, speaking of this curious fact, says that the butterflies (*Timetes Chiron*) were all flying in a south-easterly direction, and that the beautiful day-flying moth (*Urania Leilus*) also joins in this annual movement. Many other travellers have observed

similar migrations in South America, Ceylon, &c., but none seem to give any satisfactory explanation of why these migrations should annually take place. Mr. Belt, I think, nearly hits on the probable solution when he says: "I thought that some of the earlier flights in April might be caused by the vegetation of the Pacific side of the Continent being still parched up, whilst on the Atlantic slope the forests were green and moist; but in June* there had been abundant rains on the Pacific side, and vegetation was everywhere growing luxuriantly; neither would their direction from the north-west bring them from the Pacific, but from the interior of Honduras and Guatemala: the difficulty is that there are no return swarms." If this be correct—and I believe Mr. Darwin, Mr. Bates, Mr. Holdsworth, and a host of other eminent authorities, incline to this view—we can advance so far on the stage of enquiry as to set down for certain that the migration takes place *after* the eggs have been deposited on, or near, the food-plant, otherwise the species would become extinct in the north-west quarter, from which it started in two or three years at the most. Is anything known of the food-plant of either of the migratory species of butterflies? If so, does it occur in patches widely separated, or is it generally distributed along the whole route of migration? Cannot Mr. Bates or Mr. Holdsworth give us some information on this point? I fancy, although not observed by Mr. Belt, that there must be an autumn, as well as a spring, migration, otherwise how are the insects provided for the next spring flight, except the eggs be deposited before the insects leave the immediate neighbourhood where they were hatched? I take it, that if there is no hybernation of insects in tropical countries, there can be little necessity for this provision of Nature during an almost perpetual summer. It would certainly be helping us in the enquiry if we knew (1) whether the migratory flights consist of both sexes, and (2) whether the larvæ are found feeding in the districts vacated by the imagos? This would probably give a clue to the cause of migration: it would tend to show whether sportive or of necessity. I am no believer at present in the sportive theory;

* I am unable to see how rain in June would influence the growth of vegetation in April, especially where so much rain falls annually as in Nicaragua.—H. R.

there must I fancy be a necessity—a movement, in fact—in search of a locality where the food-plant in spring is earlier, as suggested by Mr. Belt. At any rate, with entomologists living on the spot, especially in Ceylon, we ought soon to have more reliable data on the economy of migratory butterflies.—*Henry Reeks; Manor House, Thruxton, April 9, 1874.*

Tortrix ribeana and *T. cerasana*.—"Mr. Barrett asked me whether I thought *Tortrix ribeana* and *T. cerasana* were species, or only varieties. Dr. Knaggs quotes a portion of my reply, and appears to infer that I had only once seen the two forms in copulation. I have seen them so repeatedly, and, as the larvæ are similar, I have no doubt of their being varieties of one species.—*Henry Doubleday; Epping, March 14, 1874.*" ('*Entomologist's Monthly Magazine*' for April, p. 253.)

[When, as in this instance, two shades of colour in imago are produced from similar larvæ, and the two shades habitually intercopulate, we must not suppose them species, otherwise the species of some Tortricidæ would be endless.—*Edward Newman.*]

Phycis Davisellus, Newman.—I sent a pair of this species to my kind friend Professor Zeller, who informs me that it is new to him, and he believes it is unknown on the Continent. It bears no resemblance whatever to *Albariella*, and does not belong to the same genus.—*Henry Doubleday; Epping.*

Polydrusus sericeus.—In May of last year (1873) I had the good fortune to secure, near Crabbe Wood, Winchester, a single example of the beautiful green weevil, *Polydrusus sericeus*, *Schönherr*, a species which, as I am informed by Mr. Janson, "though taken in some numbers many years ago by the late Rev. G. T. Rudd, in a wood at Kimpton, near Ringwood, Hants, has not, to my knowledge, occurred since."—*W. A. Forbes.*

Cryptocephalus bipustulatus.—With regard to *Cryptocephalus bipustulatus*, which I have noticed in the January number of the '*Entomologist*' (*Entom.* vii. p. 23) as occurring on St. Catherine's Hill, Winchester, it may be of interest to know that *C. lincola*, of which *C. bipustulatus* is regarded by some as a variety, has also occurred during the past summer in exactly the same locality, so that this, as far as it goes, seems to show that the above view is the correct one. I may

add that no heather, on which *C. bipustulatus* is taken, grows nearer than about half a mile off, and there only in a small patch on the top of another hill.—*W. A. Forbes.*

Dasypolia Templi.—I am advised to keep *Templi* larvæ out of doors in an open box planted with *Heracleum sphondylium*. Is this wise, when they are so likely to be attacked with ichneumons? Would it not be better to cover the box with tarlatan?—*Owen Wilson; Cwmffrwd, Carmarthen, April 13, 1874.*

[I would, nevertheless, recommend the larvæ being kept in the open air; the chance of the ichneumon of *Dasypolia Templi* finding the larva of that insect in a state of captivity, as it may be called, is very small.—*Edward Newman.*]

Rose-galls.—In the beginning of April the gall, mentioned in the 'Entomologist' (*Entom.* vii. p. 94), produced one female specimen of *Rhodites Rosarum* and two males of a *Callimome*.—*Francis Walker.*

Humble Bees Fertilizing Gentians.—The closed gentian (*Gentiana Andrewsii*) has flowers an inch and a quarter or more in length. These inflated, bright blue flowers of late autumn appear to be always in the bud, as they never open. The corolla is twisted up, so as to leave no opening at the top. The flowers are all nearly erect, with two stigmas considerably above the five anthers. I see but one way in which it can be fertilized, that is by insects. Several of my students, as well as myself more than two years ago, have often seen humble-bees entering these flowers. They pry into or untwist the opening with their mouth-organs and legs, and then pop into the barrel-shaped cavity, which they just fill.—'American Naturalist,' vol. viii. p. 180.

Organs of Hearing in Insects.—At the last meeting of the National Academy of Sciences, Professor A. M. Mayer exhibited experimental confirmation of the theorem of Fourier, as applied by him in his propositions relating to the nature of a simple sound, and to the analysis by the ear of a composite sound into its elementary pendulum-vibrations; and to show experiments elucidating the hypothesis of audition of Helmholtz. Placing a male mosquito under the microscope, and sounding various notes of tuning-forks in the range of a sound given by the female mosquito, the various fibres of the antennæ of the male mosquito vibrated sympathetically to

these sounds. The longest fibres vibrated sympathetically to the grave notes, and the short fibres vibrated sympathetically to the higher notes. The fact that the nocturnal insects have highly organized antennæ, while the diurnal ones have not, and also the fact that the anatomy of these parts of insects shows a highly developed nervous organization, lead to the highly probable inference that Prof. Mayer has here given facts which form the first sure basis of reasoning in reference to the nature of the auditory apparatus of insects. These experiments were also extended in a direction which added new facts to the physiology of the senses. If a sonorous impulse strike a fibre so that the direction of the impulse is in the direction of the fibre, then the fibre remains stationary. But if the direction of the sound is at right angles to the fibre, the fibre vibrates with its maximum intensity. Thus, when a sound strikes the fibrils of an insect, those on one antenna are vibrated more powerfully than the fibrils on the other, and the insect naturally turns in the direction of that antenna which is most strongly shaken. The fibrils on the other antenna are now shaken with more and more intensity, until, having turned his body so that both antennæ vibrate with equal intensity, he has placed the axis of his body in the direction of the sound. Experiments under the microscope show that the mosquito can thus detect to within five degrees the position of the sonorous centre. To render assurance doubly sure, Prof. Mayer, having found two fibrils of the antennæ of a mosquito which vibrated powerfully to two different notes, measured these fibrils very accurately under the microscope. He then constructed some fibrils out of pine wood, which, though two or three feet long and of the thickness of small picture-cord, had exactly the same proportion of length to thickness as the fibrils of the antennæ of the mosquito. He found that these slender pine rods or fibrils had to each other the same ratio of vibration as the fibrils of the mosquito.—*American Naturalist*, vol. viii. p. 236.

British Aphides requested.—For the last two years I have been engaged in describing and drawing from life all the British Aphides that have come under my notice. May I ask, through your pages, such co-operation from our entomologists as they may have it in their power to give? I shall

much appreciate help in obtaining the following Aphides; their food-plants are fairly indicated by the specific names of the insects. Winged and wingless forms can be safely transmitted by post in quills, the ends of which are simply plugged with cotton. If the quills are rolled in a green ivy or cabbage leaf the Aphides will live three or more days. Autumn specimens are particularly valuable, since at that season the males and the oviparous females often occur. *Desiderata*.—Siphonophora Artemisiæ, S. Absinthii, S. Tussilaginis (female), S. Tanaceticola, Phorodon Inulæ, Rhopalosiphum Berberidis (female), Myzus Lythri, M. Asclepiadis, M. tetra-rhoda, Aphis Nasturtii, A. Ballotæ, A. subterranea (female), A. Symphiti, A. Plantaginis, A. Capsellæ, A. Euonymi, A. Viburni, A. Craccæ, A. Serpylli, A. Euphorbiæ, A. Origani, A. Beccabungæ, A. terricola (parsnep roots), Cladobium populeus, Atheroides Serratulæ, A. Glyceriæ, Lachnus pinicola (female), L. agilis (female), L. Juniperi, L. Quercus, L. longirostris, Schizoneura lanigera (female), S. vagans (female), Pemphigus (not Bursarius), Vacuna Alni, *Passerini*, Phylloxera Quercus, Dryobius Roboris, *Koch*, Monaphis antennata, *Kalt*.—*G. B. Buckton; Weycombe, Haslemere, Surrey.*

Correction of an Error.—In my reply to Mr. Gregson's note upon Eupithecia innotata and E. egenaria, I inadvertently wrote "Norfolk" instead of Cheshire.—*Henry Doubleday; Epping, April 16, 1874.*

Extracts from the Proceedings of the Entomological Society of London, February 16 to March 16, 1874.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Insects Injurious to Wheat.—Mr. Weir exhibited a sample of wheat from Australia which was infested with the weevil, Sitophilus Oryzæ, the cargo being so much damaged that about two tons were utterly useless. The weevil was accompanied by Læmophlœus ferrugineus. He also showed specimens of Sitophilus granarius and Rhizopertha pusilla infesting wheat from Japan.

Hermaphrodite Ant and Coluocera Attæ.—Mr. F. Smith

exhibited (1) a hermaphrodite ant, *Myrmica lævinodis*, captured by Mr. J. Chappel, at Dunham Park, Cheshire: this insect combines characters of male, female, and worker. (2) Specimens of *Coluocera Attæ*, *Kraatz*, described in 'Berliner Entomologische Zeitschrift, 1858,' found by Mr. J. Traherne Moggridge, at Mentone, in the seed-magazines of *Aphænogaster (Atta) Structor*. With reference to the latter Mr. Moggridge writes as follows:—"I have lately been exploring a very large and far-spreading nest of *Atta Structor*, and I find in the abundantly-filled granaries great numbers of the small beetle which I enclose. *Platyarthrus* is also very common in the nests. I have never observed this beetle elsewhere, and I do not think it would have escaped me if it had been at all abundant in the nests of *Atta barbara*. I have opened but few nests of *A. Structor*, owing to their being usually placed either in terrace-walls or in garden-ground. I spend a great deal of my time now in digging for seeds in ants'-nests, as I want these seeds for the experiments I am making, in the hope of learning the secret method by which the ants can at will render their seeds dormant in damp soil. I am much struck by the frequent occurrence of the nests of trap-door spiders in the very soil of the ants'-nests, the spider's tubes often running quite close to, and in the midst of, the galleries of the ants. Ants certainly form a large part of the food of trap-door spiders, and this helps me to understand how it comes that the spiders can get a living without leaving their nests. The spider sits watching at the mouth of her tube, with the door raised very slightly, and then snatches in any insect that may chance to pass within reach."

Colorado Potato-Beetle.—The Secretary read some remarks taken from the 'Times' and 'Gardener's Magazine' on the rapid progress of the Colorado potato-beetle (*Doryphora decemlineata*) through the United States and Canada, and the remedy of Paris green, which was stated to have been used with success by the farmers in Canada. The fifteen-spotted ladybird was mentioned as a powerful enemy to the potato-beetle, devouring it in the larva-state. The writer in the 'Times' suggested the encouragement of small birds as the best security against the pest; but, as it had been stated that the insects when crushed produced blisters on the skin,

whenever they came in contact, and if they touched a wound caused severe inflammation and painful ulcers, Mr. Bates expressed a doubt as to whether the small birds would care to meddle with them.

[The beetles here spoken of as producing inflammation and ulcers are in all probability species of *Lytta* and *Epicauta*, and not members of the family *Chrysomelidæ*, to which *Doryphora 10-lineata* belongs.—*Edward Newman.*]

Musical Orthoptera.—Mr. M'Lachlan exhibited two male examples of an Orthopterous insect, belonging to the family *Locustidæ*, which had been placed in his hands by Mr. Daniel Hanbury, who received them some years since from his brother at Shanghai. It appeared from Mr. Hanbury's statements that these insects were sold in the streets of Shanghai, confined in little ornamental wicker-cages, and bought for the sound they produced. The species appeared to be undescribed, and to pertain to a new genus, somewhat allied to *Xiphidium*. The President remarked that in Turkey a kind of cricket was kept in a similar manner in paper cages, and fed upon lettuce-leaves.

Oniscigaster Wakefieldi.—Mr. M'Lachlan also exhibited a series of examples illustrating the natural history of *Oniscigaster Wakefieldi* from New Zealand. He had recently received from Mr. Wakefield a second series of specimens, including the male imago, female sub-imago, adult nymph, and larva. The lateral wing-like horny expansions of the terminal segments of the abdomen in the imago and sub-imago are continued in the aquatic conditions on each segment of the abdomen, and in addition there are similar formations along the back of the abdomen placed longitudinally and vertically.

Aquatic Arctia Larva.—Mr. M'Lachlan further remarked that in the Bulletin of the Proceedings of the French Entomological Society, at the Séance of the 28th January last, M. Guenée avowed himself much puzzled concerning the supposed aquatic larva producing a species of moth, described by M. Bar as *Palustra Laboulbenei*, which he considered was allied to the genus *Cnethocampa*. He thought further information very desirable, for all the characters of the insect were opposed to aquatic habits in any stage; and he suggested that the bubbles of air entangled in the hairs might be only expired air.

Spitsbergen Insects.—The Rev. A. E. Eaton exhibited a few Arctic insects which he had brought from Spitsbergen. Amongst others were a Trichopterous insect, probably *Goniotaulius arcticus*, *Boheman*, and also some Lepidoptera, *Plutella Cruciferarum*, the larva of which feeds on a species of *Draba* and a species of *Phycita*, near to *Sub-ornatella*. They were mostly collected on the higher parts of the hills, where there was a very small amount of vegetation. He also exhibited several excellent photographs, illustrative of the scenery of those desolate regions, and pointed out some depressions in the ground where patches of stunted willows grew, from which he obtained specimens of a kind of sawfly.

Cassida vittata.—Mr. Champion exhibited a specimen of *Cassida vittata*, taken by Mr. Walker near Chatham. The red colour was of peculiar brilliancy when alive, though its brightness had since somewhat faded.

Insects Injurious to the Coffee Trees.—A further communication was received from Mr. J. V. Gooch respecting the injury to the coffee trees, in Natal, from the Longicorn beetle, *Anthores leuconotus*, *Pascoe*. Mr. Gooch remarked that he was disposed to think that the plants were suffering from fungus before they were attacked by the insect, and stated that the ground into which the coffee-plants had been put contained a large number of decaying roots of the trees which formerly stood there for ages, and that when cleared for planting with coffee these roots were carelessly left in the ground, though, at the time, there was no idea in the minds of the planters as to any injury being likely to arise from them. He had drawn his son's attention to this point, and he hoped before long to obtain some information which might prove of interest to the Society, and which he would not fail to communicate to them.

New Parts of 'Transactions.'—Part V. of the 'Transactions' for 1873, concluding the volume, was on the table; and also Part I. of the 'Transactions' for 1874.

Euryporus picipes.—Mr. Champion exhibited specimens of *Euryporus picipes* taken near Chatham, by Mr. Walker.

Locusts devouring Woollen Materials and Leather.—Mr. Smith directed attention to an article in 'Household Words' of 30th December, 1855, in which a description was given of the ravages of locusts, and stating that the locusts devoured

woollen materials and leather, a fact of which he was not hitherto aware.

Zoological Nomenclature.—At the request of Dr. Sharp the Secretary read the following note:—"I find that in his Address, at the recent Anniversary Meeting of the Society, the late President noticed a pamphlet recently published on the subject of Zoological Nomenclature. In this notice the President states that Dr. Sharp proposes to have 'three names for each species.' This statement, however, not only does not represent what I propose, but is calculated to convey such a misconception about my propositions that I do not think it would be right to allow it to pass without observation from me. So far from having 'three names for each species,' it is my object to have but one name for each species. I do not consider it desirable that the classificatory name shall be used at all as a part of the name of a species. And the main object of the pamphlet, noted by the learned President, is to facilitate the complete separation of species nomenclature from classification nomenclature. Till this object be attained there can be no solution of the nomenclature question; and the only way of obtaining it is either to establish a separate mononymic system of species names, or to adopt the compromise proposed by me."

Death of Mr. Deane.—On Saturday, the 4th of April, Henry Deane, of Clapham Common, a most painstaking entomologist, but unknown as a collector of insects, died suddenly of heart disease, in his sixty-seventh year, at Dover, whence he was about to embark for the Continent. I can scarcely over-rate the ardour or thoroughness with which Mr. Deane investigated subjects of natural Science: as an instance of this I may mention that when in 1872 the question of the food of Syrphidæ was agitated, and it was discovered that these flies fed on dry pollen granules, Mr. Deane was the only naturalist in the kingdom who condescended to consider the question. He possessed one of those rarely candid minds which aims simply at the discovery and promulgation of truth, entirely careless how it may interfere with hypothesis. He saw almost at the first glance that it was simple pollen granules that distended the abdomens of these flies; and then he traced the reception of these granules into the

mouth, and their passage through the long, leathery haustellum, or promuscis, into the œsophagus and stomach, there to constitute the support of these flower-loving flies. I have before me a most interesting autobiography of this excellent naturalist and kind man, and from this I have made the following brief extract:—"I was born at Stratford, in the parish of West Ham, Essex, near London, on the 11th of August, 1807. My parents, Moses and Elizabeth Deane, being members of the Society of Friends, I was brought up in that persuasion, and continued a member thereof until my marriage in 1843. For nearly the first eleven years the only sound instruction I received was from my beloved parents. Although I was sent to what was considered a good day-school, in the immediate neighbourhood, I have a most distinct recollection of its utter inefficiency as a place for communicating even the merest rudiments of knowledge, and it was not until my father sent me to a school at Epping that I had the slightest idea of what it was to be systematically taught, and to know the value and pleasure of learning. Amongst my schoolfellows were Henry and Edward Doubleday, who have since attained a world-wide notoriety as entomologists. I was occasionally favoured with an invitation to go home with them to tea, occasions which were highly prized, as affording opportunities for seeing their collections and illustrated books of Natural History. From collecting insects, collecting plants and drying them—without regard to names, but for their intrinsic beauty—seemed naturally to follow. Thus habits of observing the beauties of creative wisdom were early fixed in my heart, and I often look back with thankfulness to that now far distant day when my friends the Doubledays sowed that seed which was to keep out many temptations to evil, and prove such a lasting source of pure enjoyment." When sixteen years of age Mr. Deane attended a series of lectures on Natural and Experimental Philosophy, at the Mathematical Society's Rooms in Crispin Street. These were so admirably delivered, and made so deep an impression on his ardent mind then thirsting for knowledge, that they constituted, as he himself tells us, a turning-point in his life; and although afterwards for many years assiduous at his business of chemist and druggist, he never lost his intense love for natural Science up to the hour of his death.—*Edward Newman.*

THE ENTOMOLOGIST.

No. 130.]

JUNE, MDCCCLXXIV.

[PRICE 6d.

Gortyna flavago and its Householding. By EDWIN
BIRCHALL, Esq.

TRULY there is nothing new under the sun. We look for knowledge, but what we mostly find is our own ignorance. Every collector is familiar with the larvæ of *Gortyna flavago*: in many parts of England it is difficult to cut open a thistle-stem in July or August without finding its traces. The moth emerges from the pupa in September, quickly deposits its eggs, and dies; and there, until lately, my knowledge ended. None of the published histories of the insect, that I have seen, carry the matter further, or state in what condition, or where, the insect exists from September to June. The egg is said to be laid on the stems of burdock, thistle, &c. ('British Moths,' *Newman*, p. 280); but as the old thistle-stem dies down in the autumn, and a new one does not appear for many months, there is an evident want of continuity in the chain of circumstances, and it is left open to conjecture whether the female moth hibernates, or if the egg is deposited in the autumn, when the larva hatches, and what becomes of it, till thistles and June come round again. I have been able this spring to fill the gap in the history of the insect; but a kind friend having given me a copy of the works of Christian Sepp, and finding that he knew all about it one hundred years ago, I prefer that he should tell the story in his own quaint way, and hope that your readers will find pleasure in perusing the account of a "Morning's Collecting in the Last Century." Unfortunately, Dutch is a language with which few Englishmen are familiar, so I venture to offer a translation. The work is entitled 'A Description of God's

Wonders in the Least-noticed Creatures; or, Netherland Insects in their Remarkable Householding, Wonderful Transformations, and other Peculiarities worth Knowing.' Described from own observations, pictured after life, done in copper, and coloured by Christian Sepp: printed at Amsterdam, 1762.

"No. 1.—*The Gold-cloth Night-flyer* (De Goudlakens nacht-vlinder).—The name of gold-cloth has been given to this beautiful insect, because it seems at first sight to have some similarity to the so-called gold-cloth hen. Possibly many collectors may not yet know this insect, at least not its derivation; I doubt not then that it will be agreeable to them for me to try to give its history as a topic of the present treatise. In the following manner I have got at the whole householding of this insect. In the latter part of June, 1760, I was busy with my son, outside the town a little, seeking insects, when he found in the stalk or stem of a burdock-bush (klisse-struick) some round holes, which we guessed were made by some insects, and that these might possibly still be hid therein: he cut the stalk off,—but how unlucky, and yet lucky, was this cut, for it went right through the body of a caterpillar! and this grieved us certainly not a little; the joy, however, over this new discovery soon caused us to forget the loss, and to strive so much harder after more of such-like 'hermits' (or shall I call them pith-eaters?); consequently we found that day other five of these caterpillars in the burr-stems: they were all well grown; we took care not to disturb them in their dwellings, and we brought them safe home; but of these five, only one of them pleased us by turning itself into a pupa and by becoming a fly. That same summer the other four died. Thus far, then, we had discovered this insect, but that year there was no chance of learning to know it from the egg, so we were forced to wait till next year.

"No. 2.—June having come round again we again got some of these caterpillars, which were not yet full grown; we did not delay to give them always fresh burr-stems, and had the pleasure of seeing enough of them changed into pupæ, and then into flies. Consequently it happened that in the month of September a male and female fly one day happened to appear at the same time, and we put them by themselves into

a box to pair, and that this happened appeared by the issue. The female laid on the 20th of the month one hundred and twenty-one little eggs; further, other thirty: they were set here and there by heaps, and fastened with a shining humour or glue, appearing in their natural size and colour like *a*, fig. 1, table iii.; to the naked eye they seemed smooth and shining, but through the microscope they looked a little rough. At the elapse of eight days they changed colour and became somewhat darker, but at the same time they became crumpled and withered, a proof that they were not wind-eggs, but fruitful: they remained thus all winter.

“No. 3.—April 18, 1762, the caterpillars came out of the eggs; the day before, the eggs were blacklead-coloured (potloot kleurig), and to the last as transparent as glass, so that I could see the grubs in them with a microscope of two lines focus: at ‘*c*’ I picture an egg of this sort thus magnified. The grubs when hatched were very nimble and cheerful, and of the size like ‘*d*.’ They stretched themselves also (ze spanden toen noch), that is, they used only twelve feet in walking, but I could see with a good magnifying-glass that they had already sixteen feet. At first sight they seemed to be of a brown colour, but when I looked at them through the microscope (with an armed-eye) they seemed yellowish with brown rings, black head, and horny shields (dierge lyke schildjes) behind the head or on the first ring. They did not eat up the empty shells of their eggs. I gave them at first burr-leaves, for there were no burr-stalks grown yet, but they let the leaves lie untouched; on the contrary, they made themselves holes in the stems of them, and thus made ready a way to the inside, where they found their food, with which also they helped themselves until we could give them stalks. But since these grubs, according to their way of living, always kept themselves hid in the aforesaid stalks, it was hard to observe how often they sloughed, and I have only been able to note with certainty that the first sloughing happened when they were eight days old. After this sloughing they walked on fourteen feet, and stretched thus still a little; but it was not long before they used sixteen feet in walking,—that is all their feet.

“No. 4.—Their food, as proved above, is the pith only of the burr-stems, and to get at it the caterpillar makes with its

mouth outside the stem a round hole, continually throwing the chewed stuff away till it gets to the pith, and like as the same goes in the middle of the stem, right up and down, so also the caterpillar must take its way along this channel, and, always going forwards, he makes thus a canal in it of the same width as his body: it does not turn itself round, but only creeps forwards, or it can move itself out afterwards, as I have figured at fig. 4. After the caterpillar, through continually eating away of the pith that continually stands before its mouth, lengthens the channel before it, it fills it behind with its filth, or excrement; and whenever it has thus eaten the stem empty up to the top, or other circumstances cause it to begin another, it leaves the former in the same way as it entered it, for it makes again another round hole, but now from the inside to the outside, and goes through the same elsewhere.

“No. 5.—The grub undergoes the above changes inside the burr-stem; but when it is about to become a pupa it does not creep into the earth like many other grubs of this kind (bende), but remains in its beloved cell: it has also the prudence to make the place where the change is to take place a little wider, or somewhat hollower, for as caterpillar they can stretch themselves out, and thus place themselves in a new channel, but that does not occur when they have become pupæ; besides, these are also somewhat thicker than the grub. Indeed, this is a wonderful idea in so small and contemptible a beast, and which it truly never found out for itself, but must draw our attention to the highest Wisdom and Might with feelings of reverence and awe. At fig. 5 I have pictured the pupa in a burr-stalk, and at fig. 6 a pupa out of the stalk in his natural form and colour: most are of this size, seldom greater, sometimes much smaller. They usually remain lying three or four months in the pupal state, and the longer they remain the darker they become. At last, when it has become quite ripe and is to come out as a fly, the wings begin to appear through the pupa-membrane one or two days before, and the rings of the pupa are visibly stretched out.

“No. 6.—The birth of the fly happens on the same wise, as I have more than once described it in the former part of this work. According to my observation the gold-cloth moths appear in the month of August, sometimes also, but seldom,

in September. At fig. 7 I picture a female at rest with outstretched antennæ, which, however, when quite at rest, they place close to their body. At fig. 8 we see a flying male. There is not a sufficient difference between their antennæ to distinguish in this case the male from the female (though this is in many sorts the best sign of sex), but the tail-end of the former runs out somewhat broader than that of the latter; the male has also a slenderer body than the female. Besides there is a remarkable difference between these moths in the liveliness of their colours, some being very strongly, others only paler, coloured; the marking of them is always the same, so that one does not observe the least trifles; they are not larger. I have chosen the largest for my drawing.

“Lastly.—I must append here a few remarks. (1) It does not follow that you can always see the holes in the burr-stalk through which the insect has entered, as the grub may have entered quite young, and consequently through an almost imperceptible hole. (2) In one stalk you sometimes find more than one grub, not side by side, but above one another. (3) For the safety of the pupæ, whenever you wish to allow them to remain in the burr-stalk till they come out winged, you must split the stalks at one end and stick a little wedge in, otherwise through the shrinking of the stalk the channel, or lane, in which the pupa lies, will be narrowed, and consequently press it to death; you may also take them out of the stalks, and put them on cotton or other soft stuff.”

EDWIN BIRCHALL.

Kirkstall Grove, May 15, 1874.

The Goat-moth Larva Underground.—The larva sent by P. E. is that of the goat-moth (*Xyleutes Cossus*); the smell has often been noticed as resembling that of a he-goat, and doubtless the name has reference to this peculiarity. This caterpillar has on several previous occasions been found in the ground, having buried itself to undergo its transformation. It is occasionally turned up by the gardener in his spring diggings, and is generally in a slight cocoon composed of earth and a small portion of silk. A life-history of the species, extending to sixteen pages, will be found at page 333 of the fourth volume of the ‘Entomologist.’—*Edward Newman.*

Notes on the Wing-bones of the Two-winged Flies.

By FRANCIS WALKER, Esq.

(Continued from p. 102.)

BONES.		v	Anal.
j	Mediastinal.	w	Subaxillary.
g	Subcostal.	AREOLETS.	
k	Radial.	R	Subcostal.
c	Cubital.	K	Radial.
c'	Cubital, 1st branch.	C'	Cubital, 1st.
c''	Cubital, 2nd branch.	C''	Cubital, 2nd.
d'	Præbrachial, 1st branch.	B'	Præbrachial.
d''	Præbrachial, 2nd branch.	B''	Pobrachial.
m	Pobrachial, 1st branch.	D	Subapical.
y	Pobrachial, 2nd branch.	Y	Anal.

Fig. 13.—Plecia.

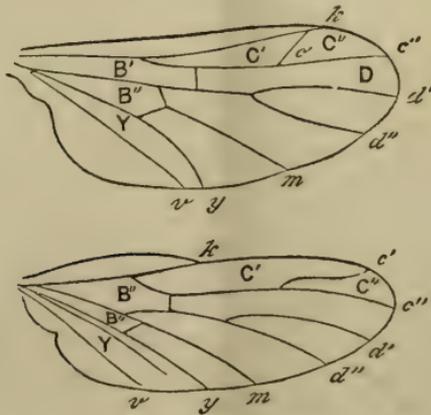


Fig. 14.—Penthetria.

Fig. 15.—Scatopse transversalis.

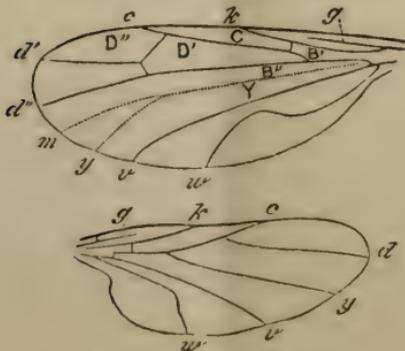


Fig. 16.—Aspistes.

Fig. 17.—Chironomus.

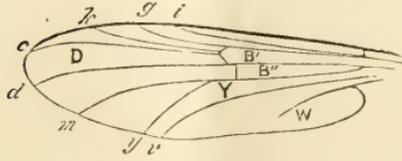
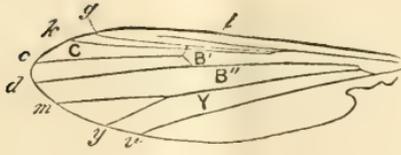


Fig. 18.—Tanypus.

Fig. 19.—Culex.

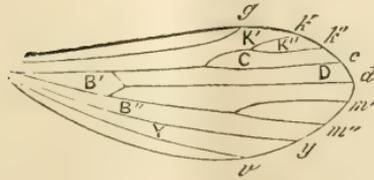
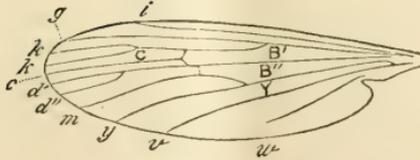


Fig. 20.—Phlebotomus.

Fig. 21.—Sycorax.

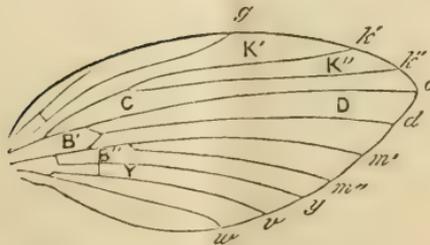
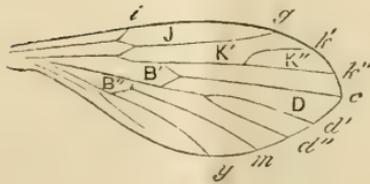


Fig. 22.—Psychoda (Pericoma).

Fig. 23.—Orphnephila.

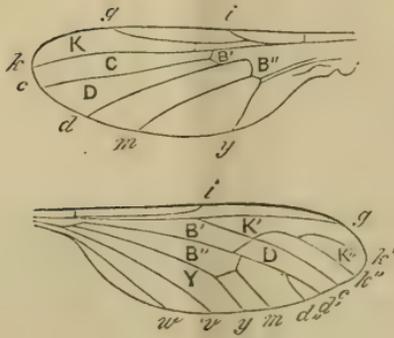


Fig. 24.—Dixa.

IN *Sciara* the nearness of the cubital bone to the costa is apparent, and there is a transition through some intermediate forms between this genus and *Cecidomyia*, where the bones mostly disappear. In *Biblio* the arrangement of the bones is quite changed, and the new pattern is continued in the two following genera, *Plecia* and *Penthetria* (figs. 13, 14), where the cubital is forked. *Penthetria* differs chiefly from *Plecia* in the shortness of the radial, and in the junction of the first branch of the cubital with the costa, and not with the radial. In *Scatopse* (fig. 15), which is the type of the second division of the *Bibionidæ*, the cubital is again near to the costa, and is joined by a transverse bone to the first branch of the præbrachial, and there is an undulating subaxillary. In *Aspistes* (fig. 16) the structure is much more simple, and A. H. Haliday remarks that its analogy to that of *Scatopse* is very doubtful. In the *Chironomidæ* (figs. 17, 18) there is another plan in the formation of the bones: neither the cubital nor the præbrachial is forked, and the anal extends to a greater distance from the base of the wing; the hovering flight and the great swarms of some kinds of this family are well known. In *Culex* (fig. 19) another change occurs: the longitudinal bones are more numerous, and the passage from it by *Phlebotomus* (= *Hæmasson*, fig. 20) to the little moth-like flies (figs. 21, 22), whose abundance and feeble flight are well known in this country. I have placed *Orphnephila* (fig. 23) with the *Chironomidæ*, and *Dixa* (fig. 24) next to the *Tipulidæ*, as the formation of the wings agrees generally with that of *Limnobia* and of the neighbouring genera.

Entomological Notes, Captures, &c.

Pyrarga Egeria, &c.—Yesterday at St. Osyth I took five specimens of *Pyrarga Egeria*. This species is quite rare in this part of the country now. It was more frequently to be met with formerly, but I have never found it common, and none of my numerous correspondents seem to obtain it in any numbers. In most of the books on butterflies it is stated to be quite a common species, and I have often wondered whether this is one of the numerous errors which one author has been in the habit of copying from another, or whether—so far as the country generally is concerned—it is an actual fact. Perhaps *Egeria* is one of the species which has become scarce of late years, for, hereabouts, it seems wholly to have disappeared from several localities where it was formerly to be met with, and in the few places where it still lingers it is so seldom to be seen that I cannot help regarding the traditions of its former abundance with some amount of scepticism. I also took *T. punctulata* yesterday; and this morning, to my surprise, found a fine pair of *N. trepida* out in one of my breeding-cages. Considering that my pupæ are kept out of doors, this seems very early. I am now breeding some lovely specimens of *N. Carmelita* and *S. certata*, and have recently bred a considerable number of *A. prodromarius*, *S. opima*, and other species. Hybernated *Polychloros* are very abundant this season, and the same may be said of other hybernating species.—*William Harwood; Colchester, April 22, 1874.*

Liparis auriflua, &c.—I wrote you (*Entom.* vii. 22) relative to nests of *L. chrysorrhæa* (or, as I then thought, *Auriflua*), enclosing a specimen. Since then Mr. Doubleday has received some from me, and he concurs in the identification, and adds, in a note to me, that he believes *Auriflua* is not social throughout the larval life, as a rule. The colonies of *Chrysorrhæa* do not, I find, breed up in the spring, but a new abode is formed of enlarged size. Apparently they separate after the last ecdysis, as might be expected. There is a great difference of size noticeable, some broods being now only half grown, or hardly that; others past the final ecdysis. A question of interest occurs to me with regard to this insect, and one you can better pronounce upon than I can venture to do. How far are the published accounts reliable, as regards the details they profess to give, of the injury done by the

brown-tail to fruit-trees in other days? My own impression has been always that these are exaggerated, both in the case of England and the Continent. Now here, at Gravesend, we are encompassed by fruit-producing districts,—at Higham, Singlewell, Southfleet, and Green Street Green, are large orchards of pear, apple, plum, and cherry. The increase of *L. chrysorrhœa*, to be injurious to these trees, would be serious. At present, I find no signs of them on fruit-trees; these nests described to you are all on three lines of hedge, running near each other, about a mile from Gravesend. The larvæ are evidently most inclined to feed on hawthorn, though some have colonized the blackthorn, and even the bramble. It would probably be an easy matter to collect and burn two hundred nests, which, at the moderate average of thirty to a nest, might represent six thousand larvæ; yet, for my own part, looking at the thing with a naturalist's eye, I should not like to suggest it, unless it really ought to be done. I can hardly see that the insect is one that calls for such interference.—*J. R. S. Clifford; 120, Windmill Street Gravesend, May 11, 1874.*

[I have often thought the accounts of the brown-tail moth, as given in that most choice of all Natural Histories, Kirby and Spence, rather surprising: "The oaks, elms, and whitethorn hedges, looked as if some burning wind had passed over them and dried up the leaves." Now I have seen something of this appearance produced on the oak by *Tortrix viridana*, and on the whitethorn hedges by *Yponomeuta padella*, but never by *Liparis chrysorrhœa*. Then again it is said, as regards leaves, these larvæ "ate only the upper surface," and "they devoured the fruit," both of which statements are contrary to the usual habits of the larvæ in question. Then it is stated that "churchwardens and overseers burnt the caterpillars by bushels." It would puzzle these gentlemen, even when assisted by the most energetic of beadies, to collect a single bushel of caterpillars. All things considered, I quite agree with Mr. Clifford that these statements may fairly be challenged.—*Edward Newman.*]

Dianthœcia albimacula Bred: *Description of the Larva.*
—I send you a short description of the larva of *Dianthœcia albimacula*, which I captured off *Silene nutans* last summer. The above plant formerly grew in abundance in this locality,

but as its habitat had been destroyed I had given up, after several years' search, all hope of again seeing it. However, accident revealed what careful search had failed to discover. In the autumn of 1872 I had rambled several miles from home, and was sitting down boiling my tea with the help of a spirit-lamp, when at my feet and around me I discovered the dried capsules of my old friend in a new locality, and many of them bore unmistakable signs of having been eaten out by some Lepidopterous larvæ. After I had enjoyed my tea I set to work pupa-digging, but without success, so was reluctantly obliged to abandon the search until last summer (1873), when I again made a pilgrimage to the locality, and then had the good fortune to find the plants in flower, and to collect from them several larvæ, some of which I knew to be the larvæ of *Dianthœcia carpophaga*; the others were unknown to me. I succeeded in rearing from them several healthy pupæ late in the year: these I have kept in a warm room, and last autumn one specimen of *D. carpophaga* emerged, and two others the beginning of April, and on the 28th of the same month a fine specimen of *D. albimacula* made its appearance. This morning I had the pleasure of seeing the second specimen drying its wings. I do not care to make the locality public until I find how its food-plant is distributed, as an eager collector might, so far as I can see at present, clear the whole of the plants in the course of one visit, and I should not like to see it served as some of my hunting-grounds have been by ruthless hands. When young the caterpillar conceals itself in the seed-capsule, and, as it grows older, at the root of the plant, crawling up after the sun has set, to feed on the unripe seeds. When full-fed it is about one inch and a quarter, long, tapering slightly towards each end. The head is smaller than the 2nd segment, pale brown in colour, with four darker lines down the face; the colour of the body is pale ochreous-yellow, inclining to brownish yellow on the anterior segments. The points of a series of dark brown triangular marks form the dorsal line, and the legs of each triangle pass diagonally through two black dots on each segment, and reach almost to the spiracular line, which is waved, and dark brown in colour. The spiracles are pink, surrounded by a black ring, and over each is a black dot; the legs, claspers, and body beneath,

are yellowish white, and in some specimens the markings are very indistinct, and only indicated by a series of cloudy spots. It feeds on *Silene nutans*, on which plant I captured the larva last summer in this district. It will eat *S. inflata* and *S. maritima*, but does not appear to like either. When full-fed it descends beneath the surface of the ground, and spins a slight cocoon of silk mingled with grains of sand, &c., and in this changes to a pale brown pupa. The imago emerges in June; but a precocious individual has just put in an appearance (April 28) in my breeding-cage, the first British bred specimen of *Dianthœcia albimacula*.—*H. Moncreaff; High Street, Portsmouth, May 6, 1874.*

Economy of Phycis Davisellus.—A description of the full-grown larva of *Phycis Davisellus* has been already published, but as its earlier state has not been noticed the following information may be acceptable. The eggs of *P. Davisellus* are laid in July and August on young shoots of *Ulex campestris*, and as soon as the larvæ emerge they spin a thick net-work of silk round the branch, and under this feed until the approach of winter, when each forms for itself a close cocoon or tunnel of silk in which to hibernate. In early spring the larvæ lengthen these cases, and extend; as they increase in size, the silken web, feeding on the young buds and blossoms beneath it. On fine days they may be seen sunning themselves on the outer part of the web, but they retreat into their tunnels on the least alarm. The little companies of larvæ are very abundant in this district in winter and spring, and as the summer advances form conspicuous objects on the furze bushes. The larvæ cannot be dislodged by beating, and it is only by pulling their nests to pieces that their presence can be detected. The imago is figured in 'Morris's British Moths' as *P. Palumbella*, and under that name I have had it in my collection for several years.—*H. Moncreaff.*

The Dor-beetle at Work.—In the afternoon of Easter Monday I was rambling over the extensive heaths in this neighbourhood seeking specimens or information; the cold winds and frequent showers put the collecting of Lepidoptera out of the question, and the numberless footprints around the bog were an intimation that a search for lapwing's eggs would not be a very successful venture. As I stood upon a

grassy plot watching at some distance the headlong, tumble-down, dashing flight of the birds in question, I was surprised at the number of dead dor-beetles lying about at my feet, scattered here and there. On closer examination each of these defunct beetles proved to be but a shell—so to speak—of its former self, the soft parts of the body having all disappeared most probably in the ants'-nest at no great distance, many members of which association formed a foraging party amongst the grass-stems, notwithstanding the inclemency of the weather. I furthermore observed that this small, sandy greensward was a regular nursery for the beetle above named, and that its soft spongy surface was tunnelled in many places, and in the choice of such a site the beetles had exercised no small amount of wisdom, for not only was the nature of the ground peculiarly adapted for their "borings," but the droppings of the rabbits, which came to feed upon the grass at night, made such a situation doubly convenient, for here was food for their future offspring close at hand, and, more than that, the pellets were ready made. Several beetles were busy collecting these pellets; one of these I watched more closely than the rest, and its mode of procedure was as follows:—the tunnel at which the creature was working was surrounded with a small, sandy mound, caused no doubt by the throwings out during the excavation; at the base of this mound several pellets of dung were lying, as the beetle did not dispose of them down the tunnel as it brought them, but collected several before they were drawn up the side of the so-called mound to be rolled into the tunnel. Whether these pellets were discovered by scent or sight I could not satisfactorily prove,—possibly by a combination of both,—but most of us are aware that the olfactory organs of these creatures are very acute. In searching for these pellets the beetle invariably went in the same direction, and on finding one it seemed to be recognized by an application of the palpi: the pellet was then seized by the two fore legs, the hooks and pointed projections—of which the use was very apparent—holding it firmly, whilst the pellet was further steadied by the head of the operator. In this position it was dragged, the beetle going backwards in exactly the same track as it had come in its search, and it was surprising to see how tenaciously it held on to its prize, for in returning it often

fell backwards over some impediment or other, but the pellet in most cases was held firmly, although sometimes the beetle and pellet went tumbling over each other. If the beetle chanced to lose its burden it seldom searched for it again, but went off on the look out for another. Having accomplished the task of pulling some three or four pellets to the base of the mound around the tunnel, the next thing was to find the tunnel itself, which seemed to perplex the poor insect very much, for with the labour of collecting these pellets it apparently had lost the knowledge of the exact position of the tunnel, but after a longer or shorter search it was sure to find the desired aperture, when, thrusting its head and thorax therein, it would remain motionless for a few seconds, as if making sure that all things were right. It then proceeded to drag the pellets, one by one, up the side of the mound, and almost invariably the beetle fell backwards into the mouth of the tunnel with its load, which, being released, rolled instantly down the oblique gallery: this having been accomplished, the beetle would return to the mouth of its subterranean nursery and remain very quiet, as if resting from the fatigue of its previous exertions, before entering upon the labour of pulling up another pellet. I thus saw the creature dispose of eight or nine of these pellets, and at last left it resting in the mouth of its retreat; but whether the work of provision had thus been completed, or but partly fulfilled, I did not learn, but I believe I saw the commencement of the work, for when I first observed the tunnel I saw that just below its surface two galleries were excavated opposite each other and in divergent directions, but one of them was very shallow,—not more than an inch and a half deep,—as I could see its end; possibly this was commenced before the larger and deeper one, but some obstacle prevented its completion, and so the second had to be bored. I inspected several other borings, but each had only a single shaft, as it were; and one thing I wish to notice, with regard to the one upon which my chief observations are founded, namely, that the beetle seemed to be actuated by a sort of blind instinct throughout its proceedings, as the first three or four pellets in the tunnel rolled into the shallow chamber, which they almost filled, and yet the beetle never took the least notice of them there, but always entered the deeper burrow for a short

distance whenever a pellet was disposed of, regardless of its destination and position, thus reminding one of the story of the owl who laid its eggs in a nest with a hole in it, each egg falling through as it was produced. Another thing that struck me was the immense amount of muscular power the beetle possessed, for it often hoisted the pellet quite off the surface of the ground over which it was pulling the treasure, especially when any more than common obstacle stood in its way.—*G. B. Corbin.*

[I wish Mr. Corbin had informed us the name of the beetle. Was it *Typhæus*, *Stercorarius*, or *Sylvaticus*? Again, I wish Mr. Corbin had given more precise information as to the cause of death: the presence of ants is not sufficient to account for the mortality. In walking over Woking Common I once took the pains to count the specimens of *Typhæus* which I found on the turf, and these were in the proportion of fifteen dead ones to one live one. Another common heath-species is often in the same disproportion. Did Mr. Corbin ascertain whether the beetles confined themselves to collecting pellets of rabbits'-dung? because this would be an interesting fact, and perhaps assist in determining the species.—*Edward Newman.*]

Pollen-eating Insects.—Entomologists who consider that a complete knowledge of insects consists in an acquaintance with their external form, doubt whether it is possible for insects, and especially for those which, like the *Diptera*, are not furnished with mandibles, to eat pollen. Indeed, I have been assured, by a well-known professor at one of our great seats of learning, that the thing is impossible, and therefore absurd. Nature, however, is of a different opinion from that of the learned professor as to its impossibility. Having satisfied myself long ago that *Diptera* are great consumers of pollen, I was pleased to find a full confirmation of the fact in the writings of the German botanist and entomologist Hermann Müller, of Lippstadt, who has paid more attention to the mode of fertilization of different kinds of flowers than any other living naturalist. In his book, 'Die Befruchtung der Blumen durch Insekten,' will be found, by anyone who can read German, a full description, accompanied by admirable drawings, of the various contrivances by which this is effected. The pollen-eating propensities of the

Diptera I have found at present almost confined to the Syrphidæ. In my own little garden, and in the gardens of the Royal Botanic Society, in the Regent's Park, I have been in the habit, during the last few summers, of capturing specimens of the two most common species, *Eristalis tenax* and *Syrphus clypeata*, eviscerating them, and examining the contents of the abdomen under the microscope, which I found to be coloured a bright orange, by the presence of enormous quantities of the peculiar spined pollen-grains characteristic of Compositæ, and evidently obtained from the various species of Aster, over which such numbers may be seen hovering. That they are not accidentally taken up, but form an actual article of food for the flies, is sufficiently proved by finding them in every stage of digestion, the fluid contents of the pollen-grains being apparently the nutritive substance, and the skins being ultimately excreted. Specimens of several species of Muscidæ, captured on the flowers of the Aster, when examined in the same manner furnished only a very few grains of pollen, apparently sucked up accidentally through the proboscis with the fluid food. During the present spring I captured, on the flowers of the sloe, *Eristalis tenax* and *Andrena fulvicrus* (male and female). The abdomen of the former was full of pollen-grains, belonging to at least three kinds of plants,—the sloe, the dandelion, and some large triangular pollen-grains, apparently those of *Fuchsia*. The tubes of the latter species contained only a very few grains, as was also the case with the honey-bee, the pollen belonging in the latter case apparently to the dandelion. I was interested at the same time in watching the constancy with which insects visit only the same species of flowers on the same visit. In the case of a bank covered with the white dead-nettle, red dead-nettle, and ground-ivy, the white dead-nettle was visited only by one species of humble-bee, *Bombus Pratorum* and *Anthophora retusa*; the ground-ivy only by the hive-bee, except on two solitary occasions by the *Anthophora*; while the red dead-nettle was entirely neglected by both, the only insect observed to visit it being a butterfly, *Vanessa Urticæ*. An examination of the pollen carried away on the thighs of the hive- and humble-bees confirmed this observation, the pollen-grains of the three species named being particularly easy to distinguish by their colour:

that of the white dead-nettle being yellow; of the red dead-nettle, red; and of the ground ivy, white. Similar observations, as to the constancy of insects in confining their visits to the same species during the same journey, have been made by that accurate observer, Mr. Traherne Moggridge, in respect of a species of fumitory in the South of France.—*Alfred W. Bennett*; 6, *Park Village East, Regent's Park.*

[At page 60 of the first volume of the 'Entomological Magazine' is a review of Professor Rennie's "Alphabet of Insects," from which it seems evident the writer did not think professors infallible. I believe the fault then, as now, is to be found in the fact that professors and teachers of all kinds trust too much to books, and too little to observation. On the other hand, I think there may be an error in relying too exclusively on observation. Book-knowledge often serves to test and to rectify observations too hastily made, and is therefore of infinite value.—*Edward Newman.*]

A Parasite.—The different species of pheasants have some most remarkable parasites infesting them, and indeed there are few, if any, members of the vast creation which are free from the attacks of parasites in some form or another. I recollect finding one of extraordinary size upon a kestrel, and I may enumerate others, as the tiny brown creatures taken from a hen harrier, or the white elongated forms of those found on a sheldrake; however, I have no wish to generalize in such a way, unless I knew what the various parasites were, but I may mention one whose occurrence interested me more than usual. In the autumn of 1873 I had a long-eared owl sent me, and whilst inspecting it I fancied I saw some insect make a hurried appearance upon the breast of the bird, and as quickly shuffle out of sight amongst the feathers. I searched most carefully, but without success, and I had caught only a glimpse of the creature, which from its movements I thought was not an Acarus, even had its size not forbidden the belief, so I determined to secure it if possible, and the following day, after another close scrutiny, I found it under one of the bird's wings. It proved to be a Dipterous fly, with body of a greenish hue, and is, I suspect, one of the *Hippobosca* genus, for in its side-long movements, its tenacious hold, and general outline, it seemed to proclaim itself a relation of the "forest-fly." I subsequently obtained two

more specimens of the same fly from a longeared owl, which I preserved for a friend, in March. I may state that the green tint of the body soon disappears when the fly is immersed in spirits of wine. I never detected it on any species of bird except the owl above named, but I am informed by a friend that a fly somewhat similar, if not identical, abounds on grouse in the Highlands.—*G. B. Corbin.*

[I do not much hesitate in expressing an opinion that this parasite was *Ornithomyia avicularia*, but I shall at all times feel greatly obliged for specimens of any of this remarkable order of insects: they are certainly allied to *Hippobosca*, but as certainly not of that genus.—*Edward Newman.*]

Captures in the New Forest during parts of April, June, July, and August, 1873.—I paid four visits to Lyndhurst last season: on the first two occasions the weather was simply villanous, more especially at Whitsuntide, when a drenching rain, combined with a rather high and not very mild wind, rendered butterfly-hunting far from profitable, and larva-hunting by no means pleasant, owing to the saturated state of the bushes and trees: in spite of very favourable weather during my other excursions I did not do as well as I had hoped to do, and can quite endorse Mr. Tugwell's remarks as to the general scarcity of insects. As will be seen, however, I did not find sugar quite so unprofitable as he appears to have done, though it was not nearly so attractive as in 1871. I am indebted to Mr. George Tate, of Pondhead, for a knowledge of the locality where all my captures by means of sugar were made, and also for a great deal of other valuable information respecting the forest. The following is a list of my best captures. *L. Sinapis* was common in May and June, but owing to bad weather at the time of my visit I only succeeded in capturing a series. *L. Sibylla*, common. *T. Rubi*, one. *L. Ægon*, very common. *N. Lucina*, four. *L. Testudo*, one, beaten out of a beech tree. *N. strigula*, one very bad specimen, at sugar. *C. miniata* and *L. mesomella*, not rare. *L. aureola*, one, bred from larva. *L. helveola*, one. *L. quadra*, larvæ not uncommon in June, imago very rare; I only know of five having been captured, two of which fell to my share. *E. cribrum*, one. *E. russula*, one. *L. monacha*, very common the only day I was able to go after it. *A. pro-*

dromaria, one larva. B. roboraria, three (one at sugar). P. cytisaria, not common. H. auroraria, one. A. immutata, not rare. C. taminata, one. M. liturata, two. T. plumaria, abundant. L. sexalata, one. M. albicillata, not uncommon. P. cassinea, larvæ rare. N. chaonia and N. dodonæa, larvæ. T. derasa and batis, common. D. Orion, one, in fine condition, July 17th: Is not this rather late? L. turca, next to M. strigilis, by far the most common insect at sugar. C. Cytherea, just coming out when I left. A. caliginosa, very common. T. fimbria, a few larvæ; I did not see the imago. T. miniosa, larvæ not rare. H. contigua, four. H. dipsacea; I was too late for this species, and only took one. E. fuscula, one. C. promissa, just coming out when I left. Besides the above I took several common species not worth mentioning.—*Bernard Lockyer; 179, Camden Road, London, April 27, 1874.*

Zeuzera Æsculi.—In the garden here, on the stem of a small Siberian crab-tree is an orifice, from which the frass of some larva is thrown continually: the tree is but about four inches in circumference, the orifice about the size of a cedar-pencil. Will you or some of your correspondents be good enough to say if the insect is likely to be *Æsculi*, and if its capture in the imago state may be expected to appear this season?—*J. A. Tawell; 30, Compton Street, Islington, April 23, 1874.*

[The larva was certainly that of *Zeuzera Æsculi*; the moth will come out in June or July.—*Edward Newman.*]

Is Saturnia Carpini ever Double-brooded?—I write to you in reference to *S. Carpini* to ask you if that species is ever double-brooded, and if so whether it is unusual. I find, on referring to Newman's 'British Moths,' it is stated that the caterpillar feeds in August and September, the moth appearing the following April. I had some moths of this species last month, from which I obtained eggs about three weeks ago, and some of which have hatched to-day. I may mention that the eggs have been in a room in which a fire has been burning.—*G. W. Oldfield; Wadham College, Oxford, May 15, 1874.*

[Will correspondents kindly give their experience in this matter?—*Edward Newman.*]

Gortyna flavago at Horsham in October.—On the 15th of

last October I took two good specimens of this insect off the gas-lamps: they were flying with *Xanthia Cerago*, &c. I see that Newman gives the month of June in his 'British Moths,' p. 280. I also took one on October 7th, 1872. Would you kindly inform me if this is of frequent occurrence, or whether the moth is double-brooded? All three seemed fresh from the chrysalis; and I have never seen a June specimen.—*D. Price; West Street, Horsham, May 7, 1874.*

[Mr. Price will find a paper on this subject at p. 121 of the present number.—*Edward Newman.*]

Scotosia Certata.—I netted a specimen of this insect here, on May 11th, when the weather was raw and cold.—*W. Macmillan; Castle Cary, Somerset, May 14, 1874.*

Variety of Pieris Rapæ.—On the 15th of March, in the present year, a good specimen of *Pieris Rapæ* was found in-doors, at Billington Rectory, East Dereham, Norfolk, at about half-past ten o'clock at night. It is one inch seven lines in the expansion of the wings; it has the markings of the ordinary *Rapæ*, but the wings on the upper side are of a dull yellowish tint, more so than I have ever seen in this species, whereas all the wings on the under side are of a yellow, very nearly as bright as that of the male *Rhamni*. Can you give me any information about this?—*E. S. Dashwood; Billington Rectory, East Dereham, Norfolk, May 2, 1874.*

[I can hardly express an opinion from this description. The under side of *Pieris Rapæ* is yellower than the upper side; but a variety of this species is occasionally found of an intensely bright yellow on the upper side. The late Mr. Curtis possessed such a specimen.—*Edward Newman.*]

Supposed Death-watch.—The beetle sent is *Dermestes murinus*. It is not known to me as the author of that ticking which is called the "death-watch." If, therefore, the statement made by "A Good Observer" can be authenticated by a real name and address, it will be interesting and acceptable. Without such authentication I cannot publish it.—*Edward Newman.*

Gall of Andricus quadrilineatus (H.) in *Essea*.—This gall was first noticed as British by Mr. Traill last year (*Ent. Mo. Mag.* x. 39), who met with it at Aberdeen. I am now finding

it commonly here on the male flowers of the oak. Its occurrence first in a northern locality, and in a southern one when looked for, must tend to show that it is widely distributed over the country, and would no doubt be found to be so, were the Cynipidæ more studied by British entomologists. Dr. Mayr's description and figures of the gall will no doubt appear in a later number of the 'Entomologist.' I hope the reproduction of the excellent figures in his work will call entomologist's attention to the study of British galls, their makers, and parasites.—*Edward A. Fitch; Down Hall, Raleigh, Essex, May 9, 1874.*

Correction of an Error.—May I ask you to state that all the Aphides marked "females" in my list of desiderata, inserted in your May number, are required to be "winged females," except *Schizoneura vagans*, unless they should be oviparous females. Your readers are doubtless aware that Aphides occur under five forms, namely, as larvæ, pupæ, winged females, winged males, and wingless oviparous females. The three first are oviparous, and have incomplete sexual characters; the two last are to be regarded as the mature individuals of the series.—*G. B. Buckton; Weycombe, Haslemere, May 5, 1874.*

Extract from the Proceedings of the Linnean Society of London, March 19, 1874.

Dr. G. J. Allman, F.R.S., in the chair.

Economy of Bees and Wasps.—Sir John Lubbock read some "Observations on Bees and Wasps." The paper commenced by pointing out, with reference to the power of communication with one another, said to be possessed by Hymenoptera, that the observations on record scarcely justify the conclusions which have been drawn from them. In support of the opinion that ants, bees, and wasps, possess a true language, it is usually stated that if one bee discovers a store of honey, the others are soon aware of the fact. This, however, does not necessarily imply the possession of any power of describing localities, or anything which could correctly be called a language. If the bees or wasps merely follow their fortunate companions, the matter is simple

enough. If, on the contrary, the others are sent, the case will be very different. To test this, Sir John kept honey in a given place for some time, in order to satisfy himself that it would not readily be found by the bees, and then brought a bee to the honey, marking it so that he could ascertain whether it brought others or sent them, the latter, of course, implying a much higher order of intelligence and power of communication. After trying the experiment several times with single bees and obtaining only negative results, Sir John Lubbock procured one of Marriott's observatory-hives, which he placed in his sitting-room. The bees had free access to the open air; but there was also a small side or postern door, which could be opened at pleasure, and which led into the room. This enabled him to feed and mark any particular bees; and he recounted a number of experiments, from which it appeared that comparatively few bees found their own way through the postern, while of those which did so the great majority flew to the window, and scarcely any found the honey for themselves. Those, on the contrary, which were taken to the honey, passed backwards and forwards between it and the hive, making, on an average, five journeys in the hour. Sir John had also in a similar manner watched a number of marked wasps, with very similar results. These, and other observations of the same tendency, appear to show that, even if bees and wasps have the power of informing one another when they discover a store of good food, at any rate they do not habitually do so; and this seemed to him a strong reason for concluding that they are not in the habit of communicating facts. When once wasps had made themselves thoroughly acquainted with their way, their movements were most regular. They spent three minutes supplying themselves with honey, and then flew straight to the nest, returning after an interval of about ten minutes, and thus making, like the bees, about five journeys an hour. During September they began in the morning at about six o'clock, and later when the mornings began to get cold, and continued to work without intermission till dusk. They made, therefore, rather more than fifty journeys in the day. Sir John had also made some experiments on the behaviour of bees introduced into strange hives, which seemed to contradict the ordinary statement that strange bees are always recognized and attacked. Another

point, as to which very different opinions have been propounded, is the use of the antennæ. Some entomologists have regarded them as olfactory organs, some as ears, the weight of authority being perhaps in favour of the latter opinion. In experimenting on his wasps and bees, Sir John, to his surprise, could obtain no evidence that they heard at all. He tried them with a shrill pipe, with a whistle, with a violin, with all the sounds of which his voice was capable, doing so, moreover, within a few inches of their head; but they continued to feed without the slightest appearance of consciousness. Lastly, he recounted some observations showing that bees have the power of distinguishing colours. The relations of insects to flowers imply that the former can distinguish colour; but there had been as yet but few direct observations on the point.

Extracts from the Proceedings of the Entomological Society of London, April 6, 1874.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Andrena tibialis and *Stylops*.—Mr. Frederick Smith communicated to the Society the fact of his having captured seven specimens of *Andrena tibialis*, on Hampstead Heath, on the previous Friday, April 3rd, two being females and five males. One of the females had the exuviae of two males of *Stylops* remaining in the abdomen, the other female had had one male of *Stylops*, and also a female which of course remained in the abdomen of the bee. Of the male *Andrenæ*, one contained two females, a second having one of the same sex remaining in its abdomen. Mr. Smith mentioned this circumstance to give collectors of Coleoptera an opportunity of capturing the rare *Stylops*; and recommended searching for *Styloped* bees between the hours of nine and twelve in the morning, as, according to his experience, the *Stylops* always emerged from the body of the bee on the day on which the latter first quitted its nest, should the day be bright and sunny; and he also mentioned the fact of his never having captured a bee which had a male *Stylops* remaining in its abdomen at a later hour of the day than

twelve o'clock. He had himself bred *Stylops* five or six times, and had never done so later than the month of April, always having captured the attacked, or infested, bees early in the day. On one occasion he bred a *Stylops* on the same day on which he had captured the infested *Andrena*, conveying the bee home, shut up in a pill-box; then, on arriving at home, he had placed the bee in the sun, enclosed in a wooden box having a glass lid; when, in the course of half an hour, the *Stylops* quitted the body of the bee. On other occasions he had kept *Stylopized* bees in pill-boxes the whole of the day of capture, but on placing them in a good-sized glass-topped box, and supplying the bee with a few fresh flowers, the *Stylops* had emerged early the following morning. The President remarked that he had once found a large number of bees in the afternoon at dusk, some of which contained male *Stylops*, but on that occasion the morning had been wet and dull, and therefore the bees had probably only just made their appearance. Some further discussion ensued, during which the President stated that during flight the males do not move the rudimentary anterior wings (or "elytra").

Insects Destructive to Coffee Plantations.—Some further remarks were communicated by Mr. Gooch, of Natal, respecting the ravages of a Longicorn beetle in the coffee plantations there, which gave rise to a discussion as to whether the larvæ of Longicorn beetles attack healthy wood or not, a remark having been made by Mr. Newman in the 'Entomologist' that, according to his experience of fifty years, he had never found the larvæ of Longicorn beetles in decayed wood, or those of Lamellicorn beetles in sound wood. Mr. M'Lachlan stated that from his own observations healthy wood was not attacked by British species of the family, though there were exceptions, such as *Saperda populnea*. Mr. Smith remarked that he once attempted to sit upon a rail, which broke under him, when it was found to be infested with *Rhagium bifasciatum*, and was completely rotten; and the President had experienced the same thing in Turkey with regard to a chair, which was destroyed by Longicorn larvæ. Mr. Janson thought that the larvæ of Longicorns do not attack wood rotten from other causes; but Mr. M'Lachlan understood Mr. Newman's observation to refer to living and healthy trees.

THE ENTOMOLOGIST.

No. 131.]

JULY, MDCCCLXXIV.

[PRICE 6d.

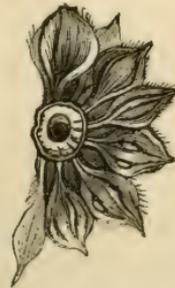
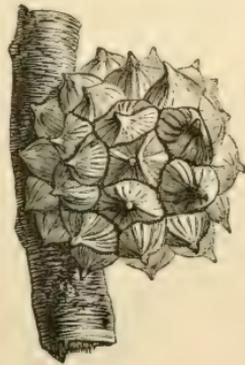
Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER née WEISE.

III. BUD-GALLS.

(On twigs that are two years old or more, or on the trunks.)

Cynips Hartigi.—This beautifully-shaped gall is developed from growing buds on the branches and stem of *Quercus sessiliflora*, chiefly on their under side: it appears as a half or three-quarter sphere of three centimetres in diameter; it is of a dark brown colour, tinged with bluish white; it has numerous short conical projections, and is firmly attached to the branch at the base by a very short foot-stalk. On detaching this gall from the twig the bud-scales are always found. A section of this gall exhibits in the centre a hard, white, spherical, inner gall, about the size of a pea, which is attached to the twig by a short foot-stalk; it always contains a single larva-cell; an exterior surface is covered with many small rugosities and shallow furrows; from each of the little excrescences issues a brown (at first green) stalk, about one millimetre in diameter, and from three to four millimetres in length; this stalk gradually thickens

Fig. 10.

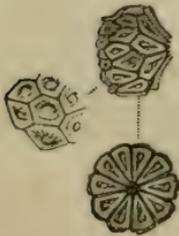


CYNIPS HARTIGI.

into a club of the same tint; in appearance it resembles a blossom-bud, and is from four to seven millemetres in diameter, with a spongy interior, the upper extremity being conical, and terminating in a point; therefore as these conical projections constitute the exterior surface of the gall, and as each club radiates, they form altogether a spherical or hemispherical gall covered with short cones. The individual clubs are so closely fastened together that it is impossible to introduce the point of a pin into the gall without damaging its structure. When in a fresh green state, as I have found it in May, it may be readily detached, but the dead gall, when found at midsummer, is so hard and brittle that in attempting to cut or detach it in dry weather the clubs are very liable to separate and come off. The gall-maker has assumed the perfect state in December, but does not emerge and use its wings until the following March.—*G. L. Mayr.*

Cynips Truncicola.—This spherical gall is found, although rarely, on the branches and twigs of *Quercus pubescens*, and is always seated on growing buds. It is about the size of a pea, or perhaps a little larger; it is of a brownish black colour, with a deeply-furrowed surface; between these clefts the inner gall is frequently visible. The fissured part, covering the inner gall like a layer of bark, is remarkable for the somewhat symmetrical form which it assumes, appearing as equilateral triangles, meeting each other at central points: on the basal half of the gall this bark-layer is cracked into triangular, square, and sometimes almost circular, divisions. The interior gall is horny and thin; it has a rough, tuberculated surface, and contains one large larva-cell. Both my description and figure are made from type specimens, which Dr. Giraud had the kindness to send me. He thinks it possible that this gall may prove a crippled form of *Cynips Hartigi*.—*G. L. Mayr.*

Fig. 11.



CYNIPS TRUNCICOLA.
Seen above and sideways,
and with some magnified
under-facets.

Notes on the Wing-bones of the Two-winged Flies.
By FRANCIS WALKER, Esq.

(Continued from p. 128.)

BONES.	AREOLETS.
<i>j</i> Mediastinal.	B Subcostal.
<i>g</i> Subcostal.	K Radial.
<i>k</i> Radial.	C' Cubital, 1st.
<i>c</i> Cubital.	C'' Cubital, 2nd.
<i>c'</i> Cubital, 1st branch.	B' Præbrachial.
<i>c''</i> Cubital, 2nd branch.	B'' Pobrachial.
<i>a'</i> Præbrachial, 1st branch.	D Subapical.
<i>d''</i> Præbrachial, 2nd branch.	Y Anal.
<i>m</i> Pobrachial, 1st branch.	V Subanal.
<i>y</i> Pobrachial, 2nd branch.	I Discal.
<i>v</i> Anal.	
<i>w</i> Subaxillary.	

Fig. 25.—Limnobia.

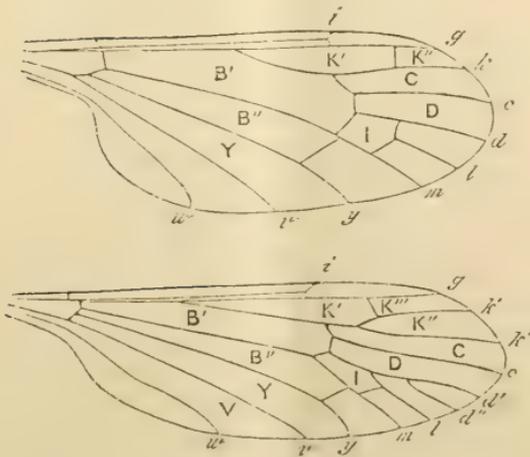


Fig. 26.—Limnophila.

Fig. 27.—Ptychoptera.

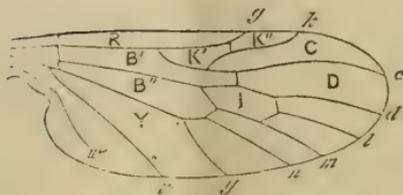
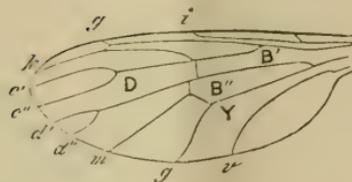


Fig. 28.—Rhyphus.

Fig. 29.—Sargus cuprarius.

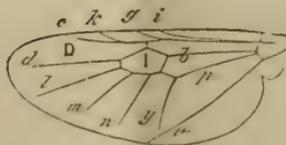
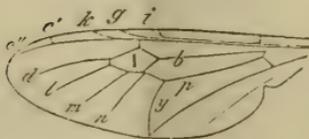


Fig. 30.—Nemotelus pantherinus.

IN *Limnobia* and in *Limnophila* (figs. 25, 26) it will be seen that the general arrangement of the wing-bones is like that of *Dixa*, and that the præbrachial is forked in *Dixa* and in *Limnophila*, and is undivided in *Limnobia*. The numerous variations of these bones in *Limnobia* are considered as sections by Meigen, and as genera by more recent authors.

In this figure of *Limnobia* there are two radial areolets, and in that of *Limnophila* there are three, owing to the radial bone being simple in the former and forked in the latter. The discal areolet is absent in some sections or genera, and also in *Ptychoptera* (fig. 27). This genus differs much from *Limnobia* and *Limnophila* in the shortness of the præbrachial and the pabrachial areolets, and the cubital bone is forked, and the radial is approximate to the costa. In *Rhyphus* (fig. 28) the radial ceases much before the tip of the wing, and the discal areolet is very large. *Sargus* and *Nemotelus* (figs. 29, 30) are distinguished by the approximation of the mediastinal, subcostal, radial, and cubital bones, and by the more or less abbreviation of the hinder bones. In 'Diptera Britannica' the second branch of the pabrachial is the subanal, and the præbrachial and pabrachial are termed the first and second externo-medial. In fig. 27 the letter *d''* corresponds to *l* in fig. 28, where there is an intermediate bone (*n*) between the forks of the subanal.

FRANCIS WALKER.

Netherland Insects. Translated from the Dutch of Christian Sepp, by EDWIN BIRCHALL, Esq.

“DER DENNE PYLSTAARTE NACHT VLINDER.”

The Fir-tree Arrow-tail Moth (*Sphinx Pinastri*).

§ I.—IT often happens that the discoverer in the arts and in the sciences, whilst he is busy in some enquiry or other, unexpectedly by that means makes a new discovery in quite a different direction, of which he had before never once thought, let alone the seeking after it. Even so has it happened to the student of insects. Frequently one seeks an already well-known insect on shrubs where it should be found, and, behold! one finds, instead of that or of the like of it, a quite other, and sometimes a much more agreeable sort: a circumstance which causes this study to become so much more enticing. This very thing happened to me with regard to the present insect. In the autumn of 1763 I was with my son outside Naarden, at the great country house of *Kraailo*; seeking the grubs of the *Anomalus*-moth (*Fidonia Piniaria*) on the pine or fir-trees: we discovered on these trees, for the first time,

the caterpillars of the fir-tree arrow-tail moth. I cannot well express with words how delighted we were, and the more so as we supposed that this insect did not dwell at all in this country, but, as we knew already, in Germany. We found a small caterpillar on a fir-leaf, and observing that it had a horn on the tail we could come to no other conclusion but that it must be the caterpillar of the fir-tree arrow-tail moth, although somewhat pale; the smallness of the caterpillar showed that it had not escaped from the egg many hours. Through this new discovery, uncommonly encouraged, we became very zealous in searching for this insect, and found several of its eggs, but these were, to our sorrow, impregnated with strange eggs, and consequently perished: another new discovery,—a very strange phenomenon,—at which we wondered not a little; for that the caterpillars should be impregnated with eggs of wasps and flies, and thus become destroyed, was a well-known fact, but that the eggs also of some flies should have to submit to this lot seemed to us paradoxical and incomprehensible. I shall, further on, speak more on this subject, but must now consider the history of this insect. After some search we found other two of these caterpillars, the one much greater than the first and probably already twice changed, the other nearly full grown. These three caterpillars having been fed carefully with the fir-leaf, and having grown large, we saw, to our great delight, that towards the end of September two of them crept into the earth and became pupæ, but the third died still young. The two pupæ remained all winter in the ground, and on the 6th July following there came out of the one a beautiful and lively moth, but the other brought forth a so-called bacon-eater (being a certain kind of wasp), with whose eggs this caterpillar had been impregnated.

§ 2.—The complete house-holding of this insect, from the very egg to the last or flying state, was now sufficiently known to us, except that we had not yet seen any undamaged eggs; but in the year 1767, on the 12th July, we found two good eggs, out of which the caterpillars came on the 21st of the same month, which we brought up until they were almost full grown, when, however, they died. But in the following year, 2nd July, a great and eminent amateur gave us a still better opportunity of observing the house-holding

of this insect, and I openly express my thanks to him on that account. This gentleman furnished me with sixty of these eggs, together with the female fly which had laid them. On the 8th July all the caterpillars appeared. Five or six days before the caterpillar comes out the egg begins to change colour only, and becomes dark brown at the place where the head of the caterpillar is, then again slowly brighter, and at last as clear as glass, so that the grub is seen in it most plainly; and I have pictured it at fig. 2, as it appears under a good magnifying-glass. Not less plainly is seen the movement of the dark spot under the head, which is the mouth of the caterpillar. The little animal is then trying to make a little hole in the top of the egg, and as soon as this is big enough for it to put its head through, the little caterpillar creeps out of it. Just after it is born it is of a yellow colour, with a dark brown head, and has a white horn bent forward on its tail, but this shortly afterwards becomes coal-black, and is split above on the point, or rather it has there two fine little points, which anyone who is sharp-sighted can see with the naked eye. This just-born fir-tree arrow-tail grub is shown at fig. 3. Most of these little caterpillars, after they are hatched, let the empty egg-shell lie, without making any further use of it; some, however, ate it up greedily; some even were not satisfied with their own egg-cover, but consumed also those of others. After consuming this breakfast the fir-tree needles are afterwards their special food, when, being still young, they feed in the manner aforesaid, like the caterpillar of the Anomalous fly (*Fidonia Piniaria*), in that they eat more at the edges of the spines, but afterwards, when they have become older and bigger, they eat them off cross-wise, beginning from above at the point and going thus down, leaving often a morsel of the spine at the foot. The growth of this caterpillar lasts above four weeks, within which time they moult four times, usually about every six or seven days: at each moult they eat up all the cast-off skins. After the first change the caterpillar appears striped with green, like fig. 4; after the second and third moults the stripes become longer and more distinct, and the little horn still remains forked at the point, as is pictured at fig. 5, magnified; but after the fourth, or last change, the rosy stripe on the back and the narrow black rings first come in sight. The little horn,

which at the birth of the caterpillar was bent forwards, and after that stood almost straight up, is now bent backwards, and is no longer forked, but ends in one sharp point. Full grown, the caterpillar appears like fig. 6. Here I must observe that all fir-tree arrow-tail caterpillars are not exactly marked like this: on some the stripes run right through to the reverse side of the body, whilst here they are shown broken up into little patches; however, besides this, there is no other difference in the markings.

§ 3.—This insect, having completed its life as caterpillar, and being now about to undergo its first transformation, or become a pupa, creeps into the ground, and there makes this change, in the same way as I have already described this operation in the description of other arrow-tails. As pupa, it appears in the shape, size and colour of fig. 7, having this remarkable peculiarity, that the sheath of the sucker of the moth, which dwells in the pupa, is somewhat separated from the body, and scarcely stuck fast to it by the thick end, there being consequently a small opening between them. This is also the case with the pupæ of the “liguster” and bindweed arrow-tail moth, but not with others. The fir-tree arrow-tail pupæ remain all winter laid in the ground, and the moths come out late in the following summer. This second change occurs also in all points like that of other moths, so I need not make any further remark about it here.

§ 4.—Our fir-tree arrow-tail moth now having left the pupal membrane, and its wings having obtained their proper stiffness, appears, when at rest, like fig. 8, that being a female, which by its thicker abdomen alone is sufficiently distinguishable from the male, this latter being seen flying at fig. 9. The antennæ differ very little in the sexes, but those of the male are a little thicker and rather more downy. With regard to the marking of this insect, it seems at first sight to be always alike, but if one looks at it a little closer one finds here and there a little difference: the ground colour, namely, is not the same exactly in all; a property, which this sort has in common with by far most other sorts.

§ 5.—With regard to our new discovery about the impregnation of eggs of some moths with foreign eggs, of which I made mention in the beginning, I have not yet found anything like it in any describer of insects; consequently this

phenomenon must be quite unknown to them, as they give a full account of the impregnation of caterpillars with foreign eggs. At a time when we knew nothing about the impregnation of insects' eggs, we found some eggs of the fir-tree arrow-tail moth, which were blackish or iron-coloured, and these first caused us to suspect that something strange must have happened to them, for we well knew that the arrow-tail eggs had not this colour, either when empty or when full: therefore we looked at them very narrowly, and, behold, we discovered in each egg an uncommonly small hole, out of which it was impossible for a caterpillar to have crept. But what then? Without doubt, nothing else but one or more of the very smallest wasps. However, this was simply a guess; but the same day we were convinced of the truth of the matter, for shortly after we found one of these eggs, out of which apparently the caterpillar had come, and which was an empty shell, as clear and white as glass, the hole or opening therein being proportionately wide to the size of the caterpillar, which had made its escape through it. This strengthened not a little our guess; but what settled the matter was this, namely, we discovered on a fir-spine seven small eggs of the moth, whose caterpillar is called the jumping-caterpillar ("spring-rups"). They are as big as the smallest pins'-heads, or so-called gnat feet: these eggs were likewise iron-coloured, and, looking very closely at them, we saw also in them a right small hole, out of which no caterpillar could have come; immediately afterwards we found a small shoal of these eggs on an oak-leaf, having the same quality; but luckily there were some of them which had not yet any hole in them. These we kept, when we got home, in a glass well pasted up at the top; and, behold, in two days the wasps actually came out of them, uncommonly small, yellow in colour, with round shining wings. The affair was settled; and the fact was proved, by this discovery, that the eggs of insects are impregnated with the seed or with the eggs of other insects, and thereby destroyed.

§ 6.—Just consider how small an egg must be which is of the size of the very smallest pin's-head; how, beyond measure, small the little hole therein, out of which the little wasp has crept,—so very small, that it can hardly be detected by the sharpest sight; how uncommonly small the wasp;

and, besides that, beyond all imagination, how unspeakably small the eggs of these wasps, and the holes they make by the ovipositor in the shell of the egg, through which they shove their eggs. Just consider how, in all these trifles, a perfect Omnipotence reigns. But what does it matter to us, some light spirit may ask, that we know and think about this: could we get anything useful out of it? I reply—Yes, certainly! For, first, whenever we contemplate such marvellous wonders, the question forces itself upon us—Who can have brought these all so perfectly to pass, and ordered it so wonderfully? The answer can be nothing else but—Surely an Almighty God! Would not this bear us up, and sustain us when wavering in the faith? In the second place, there flows from this truth that the wonders of God are not less unspeakably great in the smallest trifles than in the greatest phenomena of Nature; so that it may well be said—“EMINET IN MINIMIS MAXIMUS ILLE DEUS.”

Notes on the Macro-Lepidoptera of Lübeck. By ARTHUR W. PAUL, Esq.

On perusing the title of these few remarks, the mind of the reader will naturally revert to the Baltic shores—the home of our Saxon forefathers—and to the fine old town, the capital of the republic, bearing the same name, which some four hundred years ago held an important position amongst maritime cities, by virtue of its being at the head of the Hanseatic League; and the Senate, composed of the deputies from eighty-nine free cities, which met within its walls, assembled to lay down the law,—certainly as far as commerce was concerned,—which was recognized by the sea-ports of Northern Germany and of the adjacent countries. That was a time when Lübeck could look down upon her sister city, Hamburg, with feelings of superiority and pride; but Fate the inexorable, in her dealings with nations, has made Lübeck no exception to the general rule; and the dissolution of the Hanseatic League in 1630, together with the mischievous results of French rule from 1810 to 1813, have done much to humble the once powerful city; and from having a population of two hundred thousand souls, with a position as a sea-coast

town second to none in Europe, it has sunk to a provincial town with barely thirty thousand inhabitants.

This is not, however, the place to enlarge upon the historical features of bye-gone times; and my endeavour now will be to enumerate, as far as the experience of a single season will allow me, the Lepidopterous insects to be met with in the district.

The greater part of Lübeck territory (one hundred and ten square miles in all) consists of forests. These are of two kinds: the pine forests, which consist of large tracts of land planted with the common pine (*Pinus sylvestris*), interspersed here and there with small clumps of larch, and intersected with rough grassy roads; and secondly, woods, more like those we are accustomed to see in England, composed entirely of deciduous trees, with wide breadths of underwood flourishing beneath them. One misses, however, the gigantic form of the lord of the English forest—the oak, which never attains the size it reaches in England; but this is in part compensated for by the magnificent lime trees to be found commonly in the neighbourhood, and of dimensions which we never meet with in this country.

With these few cursory observations I will proceed with my subject; but I would first remark that the list which follows is far from large, and must not be taken by any means as exhaustive of the subject; still, as far as it goes, I think reliance may be placed upon it, as nothing is stated excepting from my own experience, or on authority which I know to be unimpeachable. The Noctuæ named are few in number: this is owing to my not having had recourse to sugaring; had I followed out this method, without doubt the number of species would have been considerably augmented. Commencing then with Diurni, the first on the list is—

Argynnis Paphia.—Abundant in woods. I had the good fortune to capture a specimen of the dark variety, *Valezina*: this is far from common.

A. Aglaia.—Common in grassy openings in the woods; flying only in hot sunshine.

A. Niobe.—Local, and in no particular abundance.

A. Adippe.—Common.

A. Lathonia.—Common everywhere; quite a garden insect; where met with in woods preferring rough pieces of

ground devoid of vegetation, and to all appearance very unattractive.

A. Euphrosyne and *A. Selene*.—Met with in abundance.

A. Ino.—Tolerably common; no doubt often passed by as *Euphrosyne*, which it so closely resembles.

Melitea Cinxia.—Local, and not superabundant.

M. Athalia.—Local, but most profusely abundant where it occurs.

Vanessa Urtica, *V. Polychloros*, and *V. Io*.—Common.

V. Antiopa.—Generally considered a rare insect; but in the autumn of 1872 it put in an appearance in some plenty. I met with some hybernated specimens in the spring of 1873, but none in the autumn of that year.

Pyrameis Atalanta and *P. Cardui*.—Not common.

Limenitis Sibylla.—This beautiful species is to be met with in tolerable plenty.

Apatura Iris.—Not common; only to be found in one wood.

Erebia Medea.—Scarce.

Pyrarga Megæra.—Common.

Epinephele Janira, *E. Tithonus*, and *E. Hyperanthus*.—Common; the last named especially so.

Chortobius Pamphilus.—In abundance.

Thecla Quercus.—Said to be common, but I never met with it.

T. Ilicis.—Very abundant.

Polyommatus Phlæas and *P. Dorylas*.—Common.

Lycæna.—Of this genus I met with few species: *Medon*, *Icarus*, *Adonis*, and *Argiolus*, I believe to occur in tolerable abundance.

Colias Hyale.—Not uncommon.

C. Edusa.—Scarce.

Rhodocera Rhamni.—Excessively abundant.

Papilio Machaon.—Variable; some seasons very common, at others comparatively scarce. The larva is found commonly feeding on carrot in gardens, and it appears to be by no means exclusively a marsh insect, as in England.

P. Podalirius.—This is sometimes common, but I did not meet with any.

Leucophasia Sinapis.—Scarce.

Anthocharis Cardamines.—Very common.

Pieris Daphnidice, *P. Napi*, *P. Rapæ*, and *P. Brassicæ*.—Common.

Aporia Cratægi.—Considered scarce. I caught two specimens only, but no doubt passed by many more, taking them for pale specimens of *R. Rhamni*, which was very abundant at the time.

Hesperia.—Of this genus I know *Malvæ*, *Sylvanus*, and *Linea*, to occur commonly; *Comma* is also said to be met with, but I cannot speak from experience.

Smerinthus ocellatus and *S. Populi*.—Tolerably abundant.

S. Tiliæ.—Very common.

Acherontia Atropos.—Not common.

Sphinx Convolvuli.—As in England,—uncertain.

S. Ligustri.—Common.

S. Pinastri.—Common in pine forests.

Deilephila Euphorbiæ.—Not to be met with in Lübeck territory; but on the Harburg side of the River Elbe, not far from Hamburg, this species is said to occur commonly.

Chærocampa Elpenor and *C. Porcellus*.—Not common.

C. Nerii.—Very scarce.

Macroglossa Stellatarum.—Tolerably abundant.

Zeuzera Æsculi.—Scarce.

Cossus ligniperda.—Not common.

Hepialus hectus, *H. lupulinus*, and *H. Humuli*.—Not uncommon.

Limacodes Testudo.—I caught two specimens.

Zygæna Loniceræ.—Common.

Z. Filipendulæ.—Very common.

Lithosia mesomella.—Common.

L. aureola.—Not uncommon.

L. quadra.—Scarce.

Euthemonia russula.—Common.

Liparis monacha.—Very common. Any quantity might be taken, in the season, at rest on lime tree trunks during the day.

Orgyia pudibunda.—Common.

Bombyx Rubi.—The larva very common in the autumn, feeding on clover.

Endromis versicolor.—Very scarce.

Epione respertaria.—Common where it occurs, but I could find only one locality for this exquisite little "beauty."

- Venilia maculata*.—Very abundant.
Eurymene dolobraria.—Common.
Pericallia syringaria.—Tolerably common.
Selenia illustraria.—One specimen.
Ennomos angularia.—Not uncommon.
Biston hirtaria.—Common.
Amphydasis prodromaria.—Scarce.
A. betularia.—Common.
Cleora lichenaria, *Tephrosia crepuscularia*, *T. extersaria*,
Ephyra porata, and *Acidalia ornata*.—One specimen of
each.
A. emarginata.—Local, and not abundant.
Timandra amataria.—Very common.
Cabera pusaria and *C. exanthemaria*.—Very abundant.
Corycia taminata, *Macaria liturata*, *M. notata*, and
Numeria pulveraria.—One specimen of each.
Fidonia atomaria.—Common.
F. piniaria.—Very abundant in pine forests.
F. pinetaria.—One specimen.
Lythria purpuraria.—Very common.
Lomaspilis marginata.—Common.
Hybernia leucophearia.—One specimen.
H. progemmaria.—Very abundant.
Lobophora lobulata.—One specimen.
Melanthia albicillata.—Common.
M. subtristata.—Abundant.
M. montanata.—Very common.
Anticlea badiata.—Common.
Scotosia certata and *Cidaria ribesaria*.—One specimen.
Eubolia mensuraria.—Very common.
Platypteryx hamula.—Scarce.
Dicranura vinula.—Not uncommon.
Notodonta camelina and *N. Ziczac*.—Common.
Acronycta Aceris.—Very common.
Leucania lithargyria.—Common.
Cerigo Cytherea.—One specimen.
Tryphæna orbona and *T. pronuba*.—Very abundant.
T. fimbria.—Not so common.
Taniocampa miniosa.—One specimen.
Xanthia cerago and *Miselia Oxyacanthæ*.—Common.
Agriopsis Aprilina.—Abundant.

Brephos notha.—Commonly met with in the woods, flying in the sunshine in early spring; it has a partiality for settling on the sandy roads which traverse the woods, and is very easy to capture.

Plusia chrysitis and *P. Gamma*.—Very abundant.

P. Iota.—Not uncommon.

Gonoptera Libatrix.—Common.

Amphipyra pyramidea and *A. Tragopogonis*.—Very common.

Catephia Alchymista.—Scarce.

C. Fraxini.—Used to occur amongst poplars in one locality. I have seen specimens taken there, but in 1872 the poplars were removed, and the insect has disappeared.

C. nupta.—Very abundant.

C. promissa.—Very scarce.

Euclidia Mi and *E. Glyphica*.—Common.

Halias prasinana.—Abundant.

I cannot speak with certainty with reference to the abundance or scarcity of those species of which I took but one specimen.

Many of our commonest English insects are absent from the above list: especially conspicuous by their absence are such as *Caja*, *Lubricipeda*, *Menthastri*, *Auriflua*, *Antiqua*, *Neustria*, &c. I can only say that I never met with them, but I should not like it to be inferred from this that they do not occur.

I imagine that collectors of Neuroptera and Diptera would have a great treat, especially in the pine forests. I was terribly annoyed by several individuals, which I referred to the latter order, some of them inflicting as much pain by their bites as a surgeon's lancet.

ARTHUR WM. PAUL.

Waltham Cross.

[I think the absence of the undermentioned butterflies, so familiar to English entomologists, may also be mentioned:—*Galathea*, *Egeria*, *Semele*, and *Rubi*; as well as the more local *Artemis*, *C-Album*, *Epiphron*, *Lucina*, and *Betulæ*.—*Edward Newman*.]

A Few Days in East Sussex. By W. H. TUGWELL, Esq.

THE early part of this June I spent six days entomologizing in East Sussex. The district is well wooded, and Lepidoptera appeared to abound; for although I was a perfect stranger in the locality, and had to find out the best spots, my captures were very satisfactory. My principal object was to find the rare and pretty *Agrotera nemoralis*, and I succeeded in taking a fine series of that species, as well as many other good things, as the following list will show.

Diurni.—In this family most of the early species were well represented; some, as *Euphrosyne* and *Selene*, were in profusion, three or four on a head of *Ajuga reptans* at a time. *Athalia* was not common; possibly too early for it. Tattered *Rhamni* were trying to make the most of their remaining days, and flew about briskly; I also found half-fed larvæ of this species. *Cardamines* were not numerous. Of the *Lycænæ* only two species put in an appearance, *Agestis* and *Alexis*; and of the skippers, *Alveolus*, *Tages*, and *Sylvanus*, were common.

Nocturni.—In this family my best captures, *Statice* and *Trifolii*, abounded in the meadows. *Nola cristulalis* and *Strigula*, not common. *L. mesomella* and *Aureola*; one larva of *Quadra*; whilst *Rubricollis* were flying in abundance over the taller oaks. *C. Plantaginis* gambolled in the sunshine; two *Villica*, flying in the hottest mid-day, when their bright colours showed off splendidly; and a male and female *Bombyx Rubi*; the sexes of this species appear at different times of the day,—the male may be often seen flying madly along during the afternoon, whilst the female flies at dusk.

The term *Nocturni* always appears, to my mind, a most inapplicable one, as the greater number are most decidedly day-flyers; and the grouping, too, brings strange fellowship, both as to habit and character. The old families, *Sphingina* and *Bombyces*, had a "raison d'être," that was far more natural in general appearance.

Geometræ.—The following species fell to my net:—*E. adornaria*, *Dolobraria*, *Lunaria*, *Bidentata*, *Consortaria*, *Extersaria*, *Porata*, *Pendularia* and *Orbicularia*, *Sylvata*, *Pulveraria*, five species of *Eupithecia*, *M. hastata*, and many of general distribution.

Drepanulæ.—P. Lacertula and Falcula, with C. spinula, represented this small family.

Noctuæ.—The season for Noctuæ had scarcely arrived, and the hot, dry, calm nights, were not propitious for sugar, so that my captures were not numerous. T. Batis, A. Aceris, C. Or, C. Duplaris, a very fine *var.* of G. Trilinea, and a few very common species, were all I observed.

Pyrales.—E. octomaculalis, A. nemoralis, Pandalis, Lancaelis and Fuscalis, with several common species, complete my captures; and, for so short a stay, show that East Sussex is a good entomological locality.

W. H. TUGWELL.

3, Lewisham Road, Greenwich, S.E.

Entomological Notes, Captures, &c.

Migration of Butterflies.—June 4th. This morning very large numbers of white butterflies—of two species, Pieris Brassicæ and P. Rapæ, the latter, however, greatly predominating—came into the North Lincolnshire marshes from the Yorkshire coast of the Humber (which, opposite this point, is from four and a half to five miles across). For an hour that I was near the sea embankment they were constantly passing inland, flying, too, against a rather stiff south-west breeze. Looking towards the centre of the river with a strong glass I could distinguish flights of them far away, flickering in the blaze of sunlight, against the gray background of water, like falling snow-flakes. I remember a very similar immigration of white butterflies into these marshes in the dry summer of 1870.—*John Cordeaux; Great Cotes, Ulceby, June 6, 1874.*

Pyrarga Egeria (Entom vii. 129).—There is a plantation a little distance from this town where, amongst many other things both rare and common, *Pyrarga Egeria* may be met with in some abundance, and, contrary to the experience of your correspondent Mr. Harwood, the insect seems of late to have increased in numbers in this particular locality. In fact, I have always regarded it as one of the common species, and have seldom taken the trouble to procure any. In some pasture-land adjoining the wood, *Melitæa Artemis* was at one time to be found in great profusion; but for the last two or

three years I have searched in vain for it: I am at a loss to account for its sudden disappearance. Latterly cows have been turned into the meadow. Is it possible that they have destroyed the pupæ?—*Joseph Anderson, jun.; Alresford, Hants.*

Variety of Pieris Rapæ (Entom. vii. 140).—The yellow variety of *P. Rapæ* is far from uncommon; I take it frequently here. I think myself it is a food variation, due to the larvæ having fed on turnips, as almost all the specimens I have were found flying over turnip-fields. I have, however, never taken it except in the autumn.—*W. Douglas Robinson-Douglas; Orchardton, Castle Douglas, June 12, 1874.*

Pieris Napi.—Early in May I took a pretty specimen of *P. Napi*, with under hind wings of a clear yellow, and having a pale orange costa.—*Id.*

Is Saturnia Carpini Double-brooded?—I see Mr. Oldfield (Entom. vii. 139) enquires as to the double-broodedness of *Saturnia Carpini*. Like Mr. Oldfield, from eggs deposited in April by this species, I have now young larvæ feeding on whitethorn, and now just changing their skin for the first time. The “verticillate” arrangement of the hairs is well seen in these young larvæ, which at this age closely resemble those of the various Eastern and North American species of *Saturnia*, *Attacus*, &c., in the same stage. As bearing on the possible double-broodedness of *Carpini*, I may state that from larvæ of *Saturnia Pernyi*, a Chinese species, hatched in May and spun up the beginning of August, I have had moths emerge both in September and also in the summer of the next year.—*W. A. Forbes; 35, South Castle Street, Edinburgh, June 4, 1874.*

[I have omitted Mr. Forbes’ reference to Humphreys, confessedly obtained from Haworth, and Haworth confessedly from Fabricius, and his probably from some earlier authority. I imagine Mr. Oldfield’s object, and *certainly mine*, was to get out of this copying groove, and to ascertain what was the result of recent observation,—the observation of living entomologists. I admit this would involve a complete revolution in Entomology, and I think the sooner it comes the better.—*Edward Newman.*]

Acronycta Alni at Doncaster.—In 1872 I had the pleasure to communicate to you the capture of a specimen of

V. Polychloros, an insect which had not been taken here for fifteen years previously. In 1873 I sent you the intelligence of taking a V. Antiopa by myself, and six more by others, not taken for twenty years previously. This year I have the pleasing intelligence to transmit to your subscribers of the capture here of two beautiful specimens of the alder-moth (*Acronycta Alni*), both in first-class condition. This rare fly has not been seen in Doncaster for nearly thirty years. I was out collecting the larvæ of *W-Album*, in company with J. Jackson, Wm. Cook, and Mr. Talbot of Wakefield, on the 30th of June, when one of the *Alni* was taken by Jackson, at rest, on the bole of a tree; the other was brushed out of the elm by Cook. This still shows the wonderful occurrence, that I should like some more experienced naturalist to clear up, how it is that insects reappear after an absence of a quarter of a century, and even longer periods.—*J. Potts*; 19, *Senior Terrace, Doncaster, June 4, 1874.*

Acronycta Alni in Yorkshire.—On the 31st of May I had the pleasure of taking a beautiful specimen of *Acronycta Alni* at rest.—*John Harrison*; 7, *Victoria Bridge, Barnsley, June 17, 1874.*

Acronycta Alni in Yorkshire.—I captured a very fine specimen of *Acronycta Alni* in Deffer Wood, near Nortonthorpe, June 8th, about 8.30 P.M.: it was resting on the trunk of an oak-tree, about four feet from the ground.—*F. Dearnley*; *Nortonthorpe Post-office, near Huddersfield, June 23, 1874.*

Acronycta Alni near Doncaster.—On Tuesday, June 2nd, I took a fine male specimen of *Acronycta Alni*, at rest, in Edlenton Wood, Doncaster; and the woodman, Mr. Atkinson, took a female for me on the 4th of June, at rest.—*W. Cooke*; 10, *Alma Place, Doncaster, June 22, 1874.*

Acronycta Alni and Asthena Blomeraria at Malvern.—I have great pleasure in recording the capture of two fine specimens of *Acronycta Alni* at sugar: the first, on the 28th of May, a female; the second, on the 9th of June, a male. In 1868 I took one specimen in the same wood, on the night of July 4th, and saw two others. I have also taken fine specimens of *Asthena Blomeraria*, by beating, this season, it being a scarce insect in this locality.—*W. Edwards*; 1, *Abbey Terrace, Great Malvern, June 20, 1874.*

Anticlea Sinuata near Dorking.—I captured a fine specimen of *Anticlea Sinuata* on the 19th of this month, near Ranmore Common, Dorking, flying by day.—*W. Thomas; St. Catharine's, Guildford, June 22, 1874.*

Buff Variety of Betularia, Bred.—I have taken a new buff and white variety of *Betularia* at Middleton. We have now had about five or six years breeding the black ones and mingled ones; I can say we have had thousands of them, in various stages, since first they turned up to the Middleton entomologists. I took the first black one and mingled one *in cop.*, and bred from them about seventy, all the black variety; and I believe these have been more common than the mingled ones since they turned up. Most of the members of the Middleton Entomological Society have captured either one or more, or had them brought to them by some friend; we have bred them over and over again, and they have turned out to be the common mingled ones, the dark mingled variety, and the black variety. We have been expecting a white one with either one or other of us, and now we have come pretty near with a buff and white mingled one, with not a black speck on it; and a black male with it. I have got about a hundred eggs from the female, which I intend trying to rear, and see what will come out of them. We have fed the larvæ chiefly on whitethorn; and if any entomologist is aware of a better food, I should be glad to hear what it is.—*T. Lomas; Rochdale Road, Middleton, near Manchester, June 22, 1874.*

Ophiodes Lunar near Brighton.—While sugaring in company with Mr. Hards, near Brighton, on Saturday night, the 20th, I had the good fortune to take a very good specimen of *Ophiodes Lunar*. I have shown it to Messrs. McArthur and Pratt on the setting-board, who both recognize it, although they have never seen one before. It is more strongly marked than the types in Newman's 'British Moths.'—*F. Trangmar; 20, Tidy Street, Brighton, June 23, 1874.*

Eupithecia Consignata.—On the 29th of April last I had the good fortune to capture on the wing a specimen of this rare *Eupithecia* in very beautiful condition, having apparently but recently emerged from the pupa. It was taken on Appledown, a portion of the famous Tichborne estate, about two miles distant from Alresford. Has it been discovered

before in Hampshire, or am I now adding a new locality for it?—*J. Anderson, jun.*

Dianthœcia Albimacula.—Two specimens, a male and a female, of this lovely species, were caught near Folkestone, on the 11th ult., by Mr. Purday, of that town. They are now in my possession, and are not yet dry. No others have been taken up to this date.—*E. G. Meek*; 56, *Brompton Road, S.W.*, June 15, 1874.

Geometer Larvæ Eating Oak-galls.—A day or two ago I happened to find some galls (of which I enclose two specimens), of what I presume is *Cynips lignicola* (s. *Kollari*), in a young state of development, on some oaks near here. On arriving at home I deposited some of these temporarily in a glass jar containing a few Geometrine larvæ, of what species I cannot say. On looking again at them in the evening I was surprised to find these larvæ busy eating into the soft, succulent mass of the young gall, and apparently enjoying this strange repast. Whether this habit has been observed before I cannot say, but I have brought it before the notice of readers of the 'Entomologist' in the hope of acquiring further information on the subject.—*W. A. Forbes*; 35, *South Castle Street, Edinburgh*, June 4, 1874.

Congeries of Diptera.—Reading an article in the 'Entomologist' (Entom. vii. 14), on "Insect Congeries," reminded me of a remarkable instance which came under my observation at Whitmore Park about thirty years ago. In a newly-built wing of this house, in one room, I discovered an infinite number of small flies, of which I preserved some specimens, hoping to obtain a name. So numerous were they, that after fumigating the room with tobacco, which quickly brought down the insects from walls and ceiling, they lay so thickly on the floor that they were removed by shovelfulls at a time. I did not perceive them in any other room in the house, and to my knowledge have never seen the insect since. The specimens, I believe, are damaged by mites; but if you could name it, from those I enclose, I should be much obliged.—*F. J. Phillips*; *Whitmore Park, Coventry*, June 8, 1874.

[The little flies are *Chlorops lineata*. This habit of assembling in vast numbers has often been recorded; indeed, Mr. Walker has mentioned it in his 'Diptera

Britannica,' vol. ii. p. 228. The larvæ which produce this pretty insect are very injurious to corn, more particularly rye. The fly lays its egg on the young stems of the rye, and when it is hatched the larva gnaws its way into the interior, just below the first division or septum, which operation has the effect of immediately stopping the growth of the rye; so that the stem, instead of rising to a height of several feet, is dwarfed for ever at three or four inches, presenting a very singular appearance. Wheat and barley are subject also to this pest, or very similar ones of the genera *Oscinis* and *Chlorops*.—*Edward Newman.*]

A Railway Train Impeded by Locusts.—In Messrs. Kirby and Spence's 'Introduction to Entomology,' many remarkable records of the direct injuries of insects are to be found; many equally astonishing have come to my knowledge since the publication of the Introduction. The late Sir John Hearsey used to relate, with great gusto and humour, the dispersal of a troop of cavalry, when on march, under his command in India. Sir John had entrusted to the care of a mounted subaltern a swarm of honey-bees in a box-hive, when removing to a distant military station: the bee was an Indian species, *Apis dorsata*, the largest known, and also the most pugnacious. The man had the misfortune to drop the hive, which split open: out swarmed the infuriated host, which immediately vented their rage on the troopers, who quickly broke rank and galloped off in all directions, pursued by the maddened honey-bees, who stung man and horse indiscriminately. I write, however, on this occasion, to draw attention to a telegram that lately appeared in several of the London papers, dated—"Algiers, May 20th, 1874. A train arrived here to-day from Oran, six hours behind time: the rails were covered with a thick layer of grasshoppers." We cannot, I think, be at a loss to understand this, and fully comprehend the nature of the obstruction to the train: the wheels of the carriages, crushing a thick layer of locusts, would be much the same as if passing through a layer of fatty matter, which would consequently completely prevent the bite of the metals. This appears to me a circumstance worthy of being recorded in an entomological journal.—*Frederick Smith; 27, Richmond Crescent, Islington.*

A Note on Aphides.—At the beginning of the last week of

May there was not an *Aphis* to be seen on a mostly-shaded row of elder-shoots by a pond. At the end of this week there were many hundreds of thousands, and the usual attendants on clusters of *Aphides* were not wanting—such as the *Aphidius* watching them close by, the *Aphelinus* skipping on them, the ant running over them, the ladybird nibbling them, and various *Muscidæ* feeding on their honey. Few kinds of *Aphis* multiply so quickly as the elder *Aphis*, which is a remarkable instance of the shortness of time in which life is divided and individualised as organisms by means of the abundance of elder sap. The lime *Aphis* is one of the slowest in increasing: it was full grown in April this year, but was not more numerous on the same leaves at the end of a month. At the end of May little specks of honey may be seen on both sides of a lime-leaf, the surface of the leaf being often reversed by a slight wind. These specks are almost always few and irregular, notwithstanding the abundance of upper leaves, and quite resemble the specks, which are much more numerous, on the sycamore. A sycamore-leaf may be seen with one half quite covered with honey, of which substance there is no trace on the other half, the first half being just under a colony of *Aphides* on a leaf above; and at the end of May I saw just the same appearance on a lime-leaf, half of which was under another leaf, on whose under side there was an unusually great number of the lime *Aphis*. I have observed nearly all the species of *Aphides* that have been recorded as British, and in all cases they emit honey, and in every instance there has been no honey without them.—*Francis Walker*.

[The reader is referred to a paper on this subject, reprinted (*Entom.* vi. 463) from the 'Gardener's Chronicle.' Mr. Walker's note appears to have reference to this note, but he does not mention it.—*Edward Newman*.]

Is Heat the Chief Agent in Insect Development?—We naturally answer in the affirmative, and indeed reasonably so, since much or little experience all points to the same conclusion. A warm spring induces early developments, and a hot summer causes a second brood of species, which in ordinary seasons make but one appearance; to these trite assertions every reader of the 'Entomologist' can bear greater or less testimony. And although we sometimes read of the

successful—but often unsuccessful—plan of “forcing,” thus causing a premature development, simply by a heightened temperature, yet the principle of warmth, in some few isolated cases, is open to argument. A short time since a correspondent told me of his taking a specimen of *Macaria Alternata* in the New Forest in May, together with several other species, which in ordinary seasons seldom occur till June, and this notwithstanding the winter-like weather we were experiencing at the time. Doubtless, the heat and almost summer-like atmosphere of a part of April would explain all this, and much more, if we only knew how to read “*Dame Nature’s*” volume more correctly; but it seemed to me a strange coincidence, to be beating an *Aureola* from an oak whose shoots were crisp and black from the effects of frost. It may be argued that the early budding of the tree, as well as the development of the insects, are to be traced to the same cause, namely, heat; and the argument is undoubtedly correct, but the theory of heat is not so amply demonstrated in some cases: take, for instance, the development of the early spring *Lepidoptera*, as the *Tæniocampa*, *Hirtaria*, &c.; if the weather is cold and unfavourable at the time they naturally “come out,” some of them are retarded in their development, and no heat of the subsequent summer awakens them, but they lie over until their “appointed time” the following spring, which seems an extraordinary thing, if heat alone causes development. The abundance of insects in summer, and their comparative rarity in winter, is an ample proof of the great part which heat plays in their development; but it is interesting in some cases to see how Nature, in her wonderful order and design, seems—to our finite understandings—to deviate from her unalterable laws, all for the benefit and well-being of her children.—*G. B. Corbin.*

Larvæ Required for Figuring.—As I am anxious to obtain correct drawings of the larvæ of *Lepidoptera*, from Nature, for publication, perhaps some of your readers possessing any rare species might be inclined to send me one or two for this purpose. If required, any larvæ shall be returned.—*Owen Wilson; Carmarthen.*

Change of Address.—*T. N. Hoey*, from 45, Athearn Road, Peckham, to 1, Cloud Road, Philips Road, Peckham Rye, S.E.

THE ENTOMOLOGIST.

No. 132.]

AUGUST, MDCCCLXXIV.

[PRICE 6d.



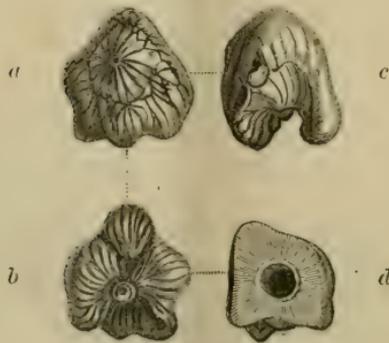
VARIETY OF *ARCTIA LUBRICIPEDA* (FEMALE).

Variety of Arctia Lubricipeda.—The antennæ are simple; the ground colour of all the wings is cream-colour; the fore wings are marked with black, the base, fringe, wing-rays and four blotches excepted; the markings of the hind wings are not so dark as those of the fore wings, and in them the base, wing-rays and fringe alone are cream-coloured; the head and thorax are the same colour as the ground of the wings, and the body is yellow, with six black spots down the middle and on each side.—*G. R. Dawson; June 18, 1874.*

[Mr. Dawson has most obligingly lent the specimen for the purpose of figuring in the 'Entomologist.' The late Mr. John Curtis published a beautiful figure of a very similar variety, under the name of *Arctia radiata*. A similar variety of *Arctia Menthastris* occasionally, but very rarely, occurs.—*Edward Newman.*]

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER née WEISE.

Fig. 12.



CYNIPS CONIFICA.

a. Seen from above.
b. From below.

c. Sideways.
d. In section.

12. *Cynips conifica*.—This rare gall is found on the branches (several years old) of *Quercus pedunculata* and *Q. pubescens*. It is more or less regularly conical, and is much rounded off at the top, and measures ten or twelve millimetres in height and in thickness at the base. The latter has usually some short, stout processes, which are firmly attached to the branch. Its colour is brown, the surface being covered with short, white stellate hairs, intermixed with longitudinal furrows. These latter are somewhat raised, and by them the gall is more or less reticulated. The interior of the gall, when dried, appears to consist of a light brown, spongy reticulation, which closely surrounds the large, whitish yellow woody inner gall, which is situated at the base of the outer one. Hitherto I have received but a single specimen of the perfect insect. It emerged in March.—*G. L. Mayr*.

13. *Aphilothrix serotina*.—Of this delicate gall, which in outward appearance bears a resemblance to that of *A. lucida*, I have only seen two specimens, which were given to me by

Dr. Giraud. It is found either on the branches that are covered with earth or moss, or on the lowest part of the trunk of *Quercus sessiliflora* or of *Q. pubescens*. Like the two preceding galls it consists of an egg-shaped inner gall, which, with a covering as thin as paper, surrounds the large larva-cell, and is half a centimetre in length. The exterior surface, when dry, is covered with a thin, shining yellowish brown layer of bark. Out of this layer emanate a great number of radiating outstretched threads, half a centimetre in length, and covered with scattered hairs, about one millimetre in length. Dr. Giraud found this gall late in the autumn; and the perfect insect emerged in the September of the following year.—*G. L. Mayr.*

Fig. 13.



A. SEROTINA.

a. Two of the threads magnified.

Entomological Notes, Captures, &c.

Argynnis Niobe in Kent.—I beg to submit to your inspection a male specimen of a fritillary, caught in company with *Aglaia* on a very hilly inaccessible spot near here. Would you kindly let me know your opinion of it? I have sent a male and female, also, to Mr. Doubleday. They seem to me to be out before *Aglaia*, as *Aglaia*, specimens of which I have a hundred or more caught to-day, are bright and fresh. Are these varieties, or another species? Shall be happy to furnish the locality.—*W. Wigan*; 8, *Wincheap, Canterbury.*

[Mr. Doubleday allows me to publish the following information:—"I yesterday received from a Mr. Wigan a pair of *Argynnis Niobe*, which he says he caught on some hills near Wye, in Kent, flying with *Aglaia*, of which he took more than a hundred specimens. He states that he took three male *Niobe* on Monday, two of them being much wasted, and a female on Tuesday; this he sent to me, together with the best male; this was dead, but not stiff, and the female was still alive: they are not much more than half the size of my continental specimens, being very little larger

than *Lathonia*; the male is rather worn, but the female is a lovely specimen, with the black spots very large. I have no doubt whatever that these two specimens were captured in Kent; they could not have been obtained from the Continent alive in such dry weather as we have had lately." In a second letter Mr. Doubleday writes thus:—"The butterflies are most certainly *Niobe*, and quite distinct from *Adippe* and *Aglaia*. The moment I opened the box I saw what they were, without looking at the under sides.—*Henry Doubleday; Epping, July 10, 1874.*" I have also examined the specimens so kindly sent to me by Mr. Wigan, and can see no reason whatever to doubt that this is a *bonâ fide* capture. I would ask Mr. Wigan's permission to have a pair drawn and engraved for the 'Entomologist.' I have written to Mr. Wigan soliciting farther information, and have also requested the loan of a pair to figure in the 'Entomologist;' that gentleman has replied very explicitly to my enquiries, and has kindly given me permission to figure the insects.—*Edward Newman.*]

Argynnis Niobe (second letter from Mr. Wigan).—Agreeably to your request I beg to inform you that the living specimens of *Niobe*, forwarded to yourself and Mr. Doubleday, were taken in a hilly district between Wye and Ashford, in Kent. I generally have a day every year about the end of June, and take as many *Aglaia* as I require. Going there a fortnight earlier last year, and paying a visit to my sugaring-grounds, where I take *Leucophæa* (which I do the end of May), I saw several of what I took to be worn-out specimens of *Aglaia*. Knowing that they are not done for till the end of July, or later, I, hap-hazard, took a specimen, and pinned it up; I never set it, but luckily kept it. Going to a pic-nic party a month later, near the same spot (Godmersham), there was *Aglaia*, in all the panoply of his silver armour, glittering in the sunlight, and apparently but just out. Feeling convinced that a few miles could not affect the time of their appearance by nearly a month, I carefully examined the specimen previously taken, on my return home. I think it was the longest day I ever experienced; and had it not been for discourtesy to the ladies, I must have returned by the next train. There it was, and is, and just sufficient to swear by, as being a large

fritillary of some kind. I told the circumstance to Parry, of this town, who showed me two fair specimens that he had taken at the same spot (I may add, there is no collusion between us, only we both possess the knowledge of this locality), and he told me he thought they were Niobe, or a new fritillary. They were thought, however, to be but a variety of Adippe. This year I was again too late to see the first of the males: my impression is they are out the end of May, and the females a month later, or less, perhaps. The female sent to Mr. Doubleday had just emerged when I took it, whilst the males I have are much worn, and Aglaia males bright and fresh, and no female Aglaia. The locality is a huge rent, caused at some remote time by a convulsion of Nature, with almost perpendicular sides, and covered with long grass, amidst which peep out the flowers of the wild heart's-ease, which grow here in great profusion. Upon these steepy slopes, where an alpen-stock would not be despised by any but an entomologist, fly Aglaia, but not Niobe. At the bottom of this trough, which is no more than a few yards wide, grows a kind of rush, and there, within a confined area, is to be found Niobe,—and very few, alas, indeed. Their flight is unmistakably different from Aglaia: they hover with an Athalia-like movement amongst the rushes, and fly with even greater rapidity than Aglaia; but, as a thistle-head will lure back a Paphia, so some herbage attraction (or otherwise) amongst the rushes brings them back to the same spot, and so they are captured. The female I took did not offer to fly; and my man, who collects for me and has taken another, tells me the same thing. In conclusion, let me add that the entomologist, when taking his yearly outing, would do well to work the neighbourhood of Wye and Ashford; and if he does not succeed in finding the haunt of Niobe, he will not for want of sport leave it “all tears;” and I can answer (with favourable weather) that he will take insects commonly here that occur elsewhere as rarities.—*IV. Wigan; Canterbury.*

Argynnis Niobe a British Insect.—Yesterday morning, just before I was leaving town, I received from Mr. G. Parry, of Canterbury, a living specimen of this butterfly taken the day before, and a request that I should come down on the following Friday, when he would take me to the place of its capture, that I might see and take it myself, and thus confirm

the nativity of the species. It was most unfortunate that I had made arrangements to visit friends in the Midland Counties, and was due at Dr. Baly's, at Warwick, at 4 P.M. I had just time to show the species alive to Mr. Cooke, and, on my arrival here, to Dr. Baly, who saw it quite fresh, it having just died. The specimen has evidently been taken on the wing, and is in fair order, but very different in condition to a bred specimen. Mr. P. informs me it flies in company with *Aglaia* on the slopes of one of the highest hills in Kent, and cannot be distinguished from that species till captured.—*Samuel Stevens; Warwick, July 10, 1874.*

[Although *Argynnis Niobe* has been previously recorded as a British insect, by the Rev. W. Hambrough, at p. 351 of the sixth volume of the 'Entomologist,' on the authority of a specimen taken in the New Forest, by Mr. Gerrard, in 1868, and again at p. 30 of my 'Illustrated Natural History of British Butterflies,' these additional captures are particularly interesting.—*Edward Newman.*]

Vanessa Polychloros at Westbury-on-Trym.—I write to inform you that I captured here, on the 31st of May, a specimen of *Vanessa Polychloros* (the great tortoiseshell): it was rubbed and slightly chipped.—*Edward R. Pease; Cote Bank, Westbury-on-Trym, Bristol, June 11, 1874.*

Limenitis Sibylla at Hendon.—I have just taken a specimen of *Limenitis Sibylla* (in fair condition): it was flying along a hedge by the road-side, about half a mile from this place.—*R. South; Goldbeater's Farm, Mill Hill, Hendon, July 14, 1874.*

Thecla W-Album on the Flowers of the Lime Tree.—My pupils and myself took about thirty specimens yesterday of *Thecla W-Album* on the flowers of the lime tree. I cannot say why they should seek this tree particularly, as there are only two in my grounds, and I do not know of any others near. They settled on the flowers, and were at first very easily caught.—[Rev.] *John W. Mills; St. Lawrence Rectory, Maldon, Essex, July 15, 1874.*

Thecla Pruni in Buckinghamshire.—On the 4th July, being at Linford Wood, taking *Trycheris mediana* for a correspondent, I captured several specimens of *Thecla Pruni*, on flowers of the privet, mostly females; and as there is no record of it being taken in Bucks, perhaps you may

think it worth notice in the 'Entomologist.'—*W. Thompson*: 183, *Stantonbury, Stoney Stratford, Bucks, July 13, 1874.*

Leucophasia Sinapis Ovipositing.—On the 13th of June I was in the woods at Grange, North Lancashire, when I observed several wood-whites flitting about and settling on various plants close to me. It then occurred to me I had seen an article in one of our magazines that wood-whites had never been observed to settle, always being seen on the wing. I have seen scores in my time at rest. I stooped down to look whether they were males or females on the ox-eye daisy-flowers: one I watched more carefully than the others, as I could see it was very anxious to find a plant to lay eggs upon; I stood still and watched it within three feet of me, and it was careful among the rough herbage to single out the trefoil to deposit its eggs upon; I noted some of the sprigs, so that I could gather them to look for the eggs, and there was only one egg deposited on each sprig; the shape of the egg is very peculiar, just the shape of a conical shot. I also found young larvæ, about three-eighths of an inch long, on the same plant. It seems as if *Loti* ought to be the name, instead of *Sinapis*.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston.*

Is Acidalia rubricata a Single-[brooded] Species?—I have twice endeavoured to rear this insect from the egg. The first time the only caterpillar that survived the winter died at the commencement of June. This year two caterpillars survived the winter, and one moth has appeared this morning. Now, caterpillars of the August brood ought, by right, to have produced the May brood. I have not yet succeeded in obtaining eggs from the May brood.—[*Rev.*] *A. H. Wratislaw*; *School Hall, Bury St. Edmunds, July 2, 1874.*

Description of the Larva of Eupisteria heparata.—On the 2nd of July last I received a few larvæ of this species from Mr. A. H. Jones, of Eltham, and on the 5th described them as follows:—Slender, length about five-eighths of an inch; head the same width as the 2nd segment, globular, and slightly notched on the crown; body cylindrical, and of nearly uniform width throughout; each segment is plump in the middle, which makes the divisions distinct; skin clothed with a few short scattered hairs. Ground colour bright green; head glaucous-green, with a large black ocellus on the upper

part of each lobe; the mandibles brown. A broad, velvety black band extends throughout the dorsal area, and is intersected by the pale, greenish yellow indistinct dorsal line; it is also edged on each side with a clear yellow stripe, which is again divided into black squares by clear yellow segmental divisions; these black squares vary in intensity in different specimens, in some only occupying the anterior of the segment, the other half being of the ground colour; all have a mark of the ground colour, varying in size, on the posterior part of the segments. The sides are minutely dotted with gray, and there is a very indistinct yellowish line along the spiracular region. Ventral surface, legs and claspers green; of a darker shade than the ground of the dorsal surface. When young the black dorsal band, so conspicuous in the adult larva, is absent. Feeds on alder; and shortly before spinning up the colour entirely changes, becoming dark green with purple tinge, and the segmental divisions purple. My larvæ spun loose cocoons amongst the leaves, &c.; but in a state of nature they probably form them amongst moss, &c., on the trunks and about the roots of alder.—*Geo. T. Porritt; Huddersfield, June 26, 1874.*

Description of Varieties of the Larva of Notodonta Carmelita.—*Var. 1.*—Ground colour white, with a greenish tinge on the back, becoming more perceptible towards the anterior segments. Down the centre of the back is a blue line, extending to the last segment, distinct on the middle of the segments, and becoming fainter, or sometimes entirely disappearing in the inter-segmental divisions. On each side of this line there are scattered a very few, exceedingly small white tubercles, each bearing a hair. On each side of the central line is another of a much lighter blue, and beneath this the ground colour changes to bluish green, or sometimes yellowish green. The spiracles are situated a little below this line, and their colour is black, and each is surrounded by a whitish line, and again a red line around this, the red being more marked round the spiracles situated on the posterior segments. Between the spiracles is a yellow line, which is continued uninterruptedly over the non-spiracular segments. Beneath the spiracles the tubercles are more numerous, and in those segments bearing neither legs nor claspers a belt of tubercles is continued under the belly. The legs and claspers

are red, with a black semilunar mark at the junction of the claspers with the body. On the top of the 12th segment there are two warts, one on each side of the blue line before mentioned, which, as it passes between them, is marked by a dilatation. These warts are red at the upper part, and emit hairs. The head is either bluish green or light yellowish green. The ocelli black. A short black line extends horizontally on each side of the mandibles, which are red, bounded with black. The head emits hairs. *Var. 2.*—Ground colour light greenish yellow, becoming more decidedly green underneath. Otherwise similar. *Var. 3.*—Head a light pinkish brown, emitting not nearly so many hairs as ordinarily. Body, above the spiracles, creamy white between the segments, and with a saddle of pink across the middle of each segment. Warts, legs, and claspers, not so red as in the ordinary varieties. Line down the back and the lines on each side, instead of blue, are pink. Spiracles and inter-spiracular line the same as usual. Beneath the spiracles the colour is very light yellowish brown, darker between the claspers. *Var. 1* is the common condition of the larva, and *var. 2* is also very generally found; but *var. 3* is, I believe, rather scarce. I have only seen it once, when I beat it, then quite small, from oak, 5th September, 1873. I have bred all the moths this year, and there is no perceptible difference between them.—*E. B. Poulton; Victoria Villa, Reading, July 8, 1874.*

Dianthœcia Albimacula and Acronycta Leporina.—I had the pleasure of taking a very good specimen of *Dianthœcia albimacula*, on Tuesday, June 23rd, as it was flying over a small bed of *Silene nutans*, on the Lower Road, Folkestone. Two collectors were present, and one of them—himself the captor of two specimens of this insect, at Folkestone—pointed out the value of my capture. I also caught a fine specimen of *Leporina* at sugar, in a wood about three miles from Folkestone, about a week after the capture of *Albimacula*.—*Id.*

Larvæ of Dianthœcia Albimacula.—I have taken during the last week several larvæ of the above species, feeding on *Silene nutans*: this plant is not so local as it is supposed to be: I have found it in many parts of Kent; also in the Isle of Wight.—*E. G. Meek; 56, Brompton Road, S.W.*

Botys Terrealis Bred.—Last September I found half a dozen larvæ of *Terrealis* on one plant of golden rod: their presence is easily detected, as often all is eaten away but the stalk; they form a light silken web, as a covering from exposure. I have been lucky enough to rear four specimens, quite unexpectedly, as the year before I got two dozen larvæ and did not rear one, although I nursed them well, and attended to all the sanitary arrangements I could think of: they often live through the winter. Those that I have bred were evidently of the “fittest-to-live” class, because they were put into a box, either to live or die, and not cared for in any way; indeed, they were forgotten. I will try to forget more for next year.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston, July 3, 1874.*

Acronycta Alni near *Sheffield*.—I had the pleasure of taking a fine male *Acronycta Alni*, at rest on the trunk of a tree, when out for a walk, in the neighbourhood of Sheffield, on the 14th of June.—*Wm. Sheldon*; *Upper Saint Philip's Road, Sheffield.*

Halonota grandævana at *Hartlepool*.—I have this year taken several specimens of *Halonota grandævana* on the ballast hill here, thus confirming Hartlepool as a locality for this species.—*J. Gardner*; 8, *Friar Terrace, Hartlepool, July 18, 1874.*

Crymodes exulis again taken.—I sugared for sixteen nights lately in the locality where I had before taken this species, but only took one specimen. It came to the sugar near midnight on the 7th July.—*Nicholas Cooke*; *Gorseys Hey, Liscard, near Birkenhead, July 20, 1874.*

Chesias obliquaria and *Anarta Myrtilli*.—In the middle of August, last year, I had six pupæ of *C. obliquaria*, which I placed in my breeding-cage. Although this is a May insect I bred one as early as April 1st, and two others made their appearance between that time and May 7th, but at what precise dates I cannot say, as I was away from home. I thought I had done with the insect, but to my surprise to-day (June 18th) another specimen appeared. June and July are the months for *A. Myrtilli*. Agreeably to this I took the insect at Tillgate, July 13th, 1872. On the 17th of July, last year, the day was very dull, on which we went to the same place, and there was very little to be found.

I believe, however, that my friend took a specimen of Myrtilli; but at any rate we took three nearly full-grown larvæ of that species, for which I find September and October are the reputed months; and from these a moth emerged in my breeding-cage on June 8th.—[Rev.] E. H. Egles; *Enfield, June 18, 1874.*

Platypteryx Sicula near Bristol.—I have to record the capture by myself, in Leigh Woods, on the 6th and 10th of last month, of three examples of this rare hooktip,—a male and two females; and on the 17th a male, by Mr. A. E. Hudd; this latter apparently just emerged. Another fine male was taken on the 27th by a visitor to Clifton. I believe the last recorded capture of *Sicula* was in 1859, when seventeen specimens were taken. Altogether, to the present time, some twenty-five would be in existence in different collections. Perhaps it would not be out of place were I to mention a little adventure, in connection with my above-mentioned capture, which befel me in one of my excursions to these celebrated woods, and which at one time assumed rather a serious aspect. I was forcing my way through some dense undergrowth, when I had the misfortune to walk into one of the many excavations that occur in these woods, and of which I had no previous knowledge. It seems now perfectly marvellous how I could have fallen such a depth (upwards of thirty feet) without sustaining some injury beyond a few trifling scratches, and of course a good shaking; but such was fortunately the case; and the fact of having fallen on my feet, and the bottom of the hole being composed of soft mire, would partly account for my escaping with so little bodily hurt. Had I broken or sprained a limb, in all probability I could not have made any subsequent attempt to extricate myself, and the chance of being heard would have been slight indeed, as I was in a part of the wood seldom visited by the keepers. For nearly two hours was I in this predicament, but at last managed to scramble out with the assistance of a half-rotten pole, which providentially had been thrown into the hole (as I afterwards heard) by a keeper, some seven years previously. My feelings of thankfulness can well be imagined, for without this aid I certainly could not have got out, unless help had reached me from another quarter. This hole was some four feet in circumference at

the top, being hollowed out considerably in the centre, and narrowing again at the bottom. I have frequently visited the spot since the occurrence, but cannot look into the hole without a shudder, and with feelings of thankfulness for such a providential escape. My visit in search of *Sicula* had well-nigh cost me my life.—*William H. Grigg; Bristol, July 22, 1874.*

Apamea Unanimis making up in *Decayed Willow-wood*.—Will you oblige me by naming the enclosed insects? I found the pupæ while seeking Coleoptera in some willows, in April. I enclose a pupa-case that one of them came out of. I have your 'British Moths,' but I can find nothing in it that corresponds with them.—*H. Sims; Howard Street, Wakefield, May 27, 1874.*

[The moth is *Apamea Unanimis*.—*Edward Newman.*]

Nola albulalis, &c., in *North Kent*.—On Monday morning last, the 13th July, I left home for five days' collecting, in company with the Rev. T. W. Daltry, of Madeley, in North Kent. A day or two before, Mr. Daltry, who had been there the week previous, had written me he had found out the locality for *Nola albulalis*, and to collect this species was my principal inducement for going. Monday evening we went to the marshes, and found *Acidalia emutaria* not uncommon; the following morning *A. rusticata* was collected in great abundance from two elm hedges; the afternoon and evening we spent in the *Albulalis* locality, and took the species very freely; Wednesday and Thursday evenings we had equal success, the species flying in abundance: indeed, at one time, standing in one spot, I took them as they flew past as fast as I could box them. Friday evening we went again, but were astonished to find that not a single specimen was to be seen: we could only account for it by the fact that the atmosphere had become colder, and the ground damp; do what we would neither of us could find one. Here we met Mr. Packman, of Dartford, to whose kindness we are indebted for valuable information about several species. *Albulalis* is easily distinguished from the grass, low underwood, &c., in the daytime, and for a short time, just at dusk, flies very freely: it flies slowly, and not far from the ground, its pale colour rendering it so conspicuous that, although so small, the marvel to me is that it has remained a rarity for so long.

Apatura Iris was not uncommon about the oaks in one place, and *Pterophorus rhododactylus* occurred about rose. Amongst the other species noticed or taken were—*Vanessa Polychloros*, *Arge Galathea* (very abundant), *Lycæna Corydon*, *Zeuzera Æsculi*, *Nola cuculatella*, *Lithosia mesomella*, *Angerona prunaria*, *Pseudopterpna cytisaria*, *Iodis vernaria*, *Hemithea thymiaria*, *Acidalia interjectaria*, *A. incanaria*, *A. immutata*, *A. emarginata*, *Timandra amataria*, *Strenia clathrata*, *Scotosia vetulata*, *Cidaria picata*, *Erastria fuscula*, *Rivula sericealis* (abundant), *Botys hyalinalis* and *fuscalis*, *Ebulea crocealis* (abundant about fleabane), *Scoparia cembralis*, *Crambus pinetellus*, *C. perlellus*, *C. Warringtonellus*, *Ilythya carnella*, *Homœosoma eluviella*, *Rhodophæa consociella* and *tumidella*, &c.—*Geo. T. Porritt; Huddersfield, July 20, 1874.*

Hairy Larvæ on the Black Currant.—During the past fortnight I have found several small batches of eggs laid on the under side of leaves of black-currant trees in my garden. Some of these have hatched, and the young larvæ are very hairy, and look like *Menthastri*. I should like your opinion as to whether they can be that common species, as I thought it only fed on low plants.—*H. Wittich; 6, Lansdown Cottages, Dalston, June 22, 1874.*

[Without seeing them I cannot venture an opinion.—*Edward Newman.*]

Field Naturalists' Society. Cnethocampa pityocampa and Anthrocera Loniceræ.—We have formed a Field Naturalists' Society in York, to replace in some measure the Entomological Society, which some few years ago we had in York. Will the reports of our meetings be of any service to either the 'Zoologist' or 'Entomologist?' I have had some larvæ of *Pityocampa* sent me by Mr. Batchelor. Can you tell me anything about them, and whether I may exhibit them as British? It seems strange to me that they have not been found before. Did you make anything out about the *Loniceræ* I sent you last summer?—*Wm. Prest; 13, Holgate Road, York, March 23, 1874.*

[1. If sent regularly I should be glad of reports of the meetings of local societies, but I have never known them continued beyond the second or third meeting. 2. I have no knowledge of *Cnethocampa* beyond what I have published.

3. The specimens of *Zygæna* so kindly sent do not agree with *Loniceræ* in any of the characters noticed by Mr. Doubleday.—*Edward Newman.*]

Names of Moths.—Would you kindly oblige me by naming these three little insects? One I take to be *Erastria venustula*, discovered by Mr. Doubleday in Epping; the bright pink faded very much after death. The other is, I think, *Erastria fuscula*. Both are common here, especially the first. I could have caught a hundred off the heath one evening (Tuesday, June 2nd). The other little black longhorn I cannot find a trace of in my books: they were flying over water in the forest; I took six or seven one evening.—*David M. G. Price; West Street, Horsham, July 21, 1874.*

[Only one wing, that of *Erastria fuscula*, could be recognized. The rest of the insects were literally ground to powder. Please pack more carefully another time. The discovery of *Erastria venustula* at Horsham would be very interesting.—*Edward Newman.*]

The Dor-beetle (Entom. vii. 132).—With regard to my notes, and the editorial remarks thereon, I fear I am unable to offer any very satisfactory materials for judgment. First, respecting the specific name of the beetle I am not sure, and I foolishly did not secure any for identification, but on the first opportunity, after reading Mr. Newman's remarks, I made a journey to the heaths, expecting to find *some* specimens, at least, of the beetles I had seen so commonly on my previous visit. I was, however, doomed to a most grievous disappointment, for not a specimen was visible upon the grassy plot, where, but a comparatively short time ago, hundreds were lying dead and disemboweled. I observed a number of what I suppose were mouse-holes about in the grass, but whether they explain anything with regard to the—to me—mysterious disappearance of the beetles I am not prepared to say, neither can I assign any plausible reason for the mortality which had previously taken place amongst the Coleoptera. Many of the tunnels formed by the beetles were still visible, and as far as a pocket-knife was available I used it in digging into some of them, in the hope of finding one of the beetles. By this examination I obtained one dead specimen (which I send), but I am by no means certain it is the same species I saw working, for, if I mistake not, its

thorax was quite rounded and smooth: memory, however, as we all know, is very treacherous, and specific differences can never reasonably be deduced therefrom. As far as I observed, the beetles confined themselves to the collecting of the pellets of rabbits'-dung, but this single observation cannot, I think, establish the fact of their invariably doing so. There seemed to be no other suitable material at hand for the purpose, and possibly what I saw was but an adaptation of a means to an end, since, as far as I could judge, the locality, and nature of the soil, &c., were peculiarly suited to the beetles' requirements. The depth of the tunnels excavated by these beetles were of comparatively considerable magnitude, as I could probe many of them with a pliant stem of the common braken some ten or twelve inches, and, indeed, with the aid of my knife I enlarged some of them to an equal or even greater depth without finding traces of either beetles or pellets.—*G. B. Corbin.*

[The beetle found by Mr. Corbin is *Typhæus vulgaris*.—*Edward Newman.*]

The supposed Potato-bug.—Will you kindly inform me what the enclosed creatures are? They were sent to me yesterday from Wimborne, where I am told they are doing some amount of damage to the potato crop, by destroying the haulm. I suppose it is the grub of some beetle, and I believe I have seen similar creatures not unfrequently before, yet I am unable to name it. Of course, everything in any form upon the potato cannot (in the eyes of the grower) be less than the "Colorado potato-bug."—*G. B. Corbin.*

[The chrysalides of *Coccinella 7-punctata*. I am quite at a loss to conceive what damage they can do, since in this state they do not feed at all: in the larval and perfect state their food is Aphides, or plant-lice.—*Edward Newman.*]

G. Harvey.—The beetles are *Coccinella septem-punctata*: they feed on Aphides. They have no connection with the potato-bug.—*Edward Newman.*

W. Macmillan.—The larva is that of *Biston hirtaria*. The ichneumon, *Macrogaster alvearius*, so-called from the resemblance of its mass of little cocoons to a honeycomb.—*Id.*

Colonizing Glow-worms.—Can you tell me how we can establish a colony of glow-worms at Woodford? There are

plenty of them here, and we could take them home if we knew on what they feed. Do the females lay their eggs on any plant, or in the ground; and what is that plant? They appear very feeble if kept for a night in confinement, but recover and shine when placed out on the dewy grass.—*A. F. F.; Sea View, Isle of Wight.*

[I have often tried to establish a colony of glow-worms, but have always failed: the light becomes more feeble, night after night, until it dwindles to a spark and disappears. The eggs are attached by means of a kind of liquid glue to a variety of substances, as moss, grass, dead wood, or even earth, apparently without any especial reference to the food of the larva, except that they are generally found in places where its food occurs, as damp ditches and shaded hedge-banks: that food consists of the eggs and young individuals of different species of land-snails; *Zonites cellarius* and *Z. alliarius* are especial favourites. The larvæ attain their full size in April, and then turn into quiescent pupæ, but still retain great muscular power, as evinced by their writhings and twistings when teased or otherwise annoyed: the pupa can also move its head, antennæ, and legs; the female pupa, as in the perfect insect, exhibits no trace of wings or elytra; the male pupa, on the contrary, has the usual representatives of these organs. The universally received hypothesis that the light of the female glow-worm—like a chignon, a pannier, or a crinoline, among ourselves—is a lure to attract the male, requires investigation and consideration. I cannot disprove it; but the presence of this luminosity in the egg, larva and pupa, and also abundantly in the males of some allied species, seems to point to the desirability of some other explanation.—*Edward Newman.*]

Bees Fertilizing Flowers.—I shall be very grateful to any reader who will procure and send me the bees which frequent the bloom of the scarlet-runner or the red clover. It is well known to those who have studied the subject that these plants cannot fertilize themselves, but are dependent on insects for the performance of that office. Our countrymen resident in Central America, where the scarlet-runner would be a most acceptable vegetable, cannot cultivate it to any good purpose, because the natural fertilizer is not indigenous, and has not been introduced. In like manner the

red clover, so largely grown in New Zealand, is raised from English and continental seed, and for the same reason. An annual saving of many hundred thousand pounds might be effected, if, together with the seed, we could export the insect, whose office in the economy of Nature is to render the respective plants productive. During the past and present months I have captured three hundred and sixty-one bees, noting in every instance the flowers they were fertilizing, with a view to ascertain their utility as fertilizers in a commercial point of view.—*Edward Newman.*

Ænistis Quadra.—I took a fine specimen of *Ænistis Quadra*, at lime blossom, in my garden, on the evening of the 10th July. The insect was a male, and appeared to have been out only a few hours.—*A. Harold Ruston; Aylesby House, Chatteris, Cambridge, July 24, 1874.*

Food-plant of Erastria fuscula.—The food-plant of *E. fuscula*, or how to obtain the larvæ, is no longer a mystery to me. Having taken lodgings in the vicinity where the imago was plentiful, I made up my mind, if it was possible, to obtain the larvæ: accordingly in the first week in September last I set to work, and the first night searched the bramble (the food-plant named by M. Guenée) for a long time; afterwards tried ferns, and then the heath: the first two evenings unsuccessfully; the third I tried sweeping, and to my delight obtained about a dozen in the first hour. The question then became, what was the food-plant? and on careful search found it was grass (*Molinia cærulea*). After that I collected them without any trouble, feeding by night, about half-way up the blade of grass. I bred a nice series of the imago this spring, and tried to obtain eggs, but have failed, although I placed several pairs on the food-plant I had growing in a large pot.—*G. C. Bignell; 6, Clarence Place, Stonehouse, Plymouth.*

Names of Insects.—I shall be much obliged if you will be so kind as to name the insects I forward with this. No. 1, one of the Ichneumonidæ, I bred from a mass of long, fusiform, brownish cocoons, found at the base of willow stumps; the little bee, No. 4, I have obtained very commonly by sweeping in grassy places in May and June, whilst the Dipterous insect, No. 5, is the only one of the kind I have seen; from its long, sabre-shaped ovipositor it would appear

to be parasitical on other insects. Is this the case?—*W. A. Forbes*; 35, *South Castle Street, Edinburgh, June 17, 1874.*

[The insects are returned named, with the exception of the little black ichneumon with exuded ovipositor, which I must decline; I have never professed to name ichneumons. The little bees, of the genus *Halictus*, positively swarm on all garden-flowers at this time of year. The pretty fly, No. 5, is a gall-maker, not a parasite; the long ovipositor is for the purpose of penetrating the rind of the twig, in which it deposits its eggs: from this peculiar structure the insect has been named *Stylata*.—*Edward Newman.*]

Acronycta Alni in the *New Forest*.—On returning yesterday with a friend from a New Forest expedition, between Brokenhurst and Lyndhurst, our attention was suddenly attracted by the brilliant yellow and rich dark blue colours of this splendid and unmistakable caterpillar, at rest, in a slightly curved position, on some old palings.—*W. Borrer, jun.; Cowfold, Horsham, Sussex, July 25, 1874.*

Extracts from the Proceedings of the Entomological Society of London, May 4th and June 1st, 1874.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Supposed Albino Solenobia.—Mr. W. C. Boyd exhibited specimens of *Solenobia inconspicua*, taken in St. Leonard's Forest, and amongst them a specimen, taken at the same time, of a remarkably pale colour, which might possibly be an albino variety, but had a very different appearance from the ordinary form.

Brachycentrus subnubilus.—Mr. Boyd also exhibited some leaves of the common comfrey (*Symphytum officinale*), gathered at Cheshunt, the under sides of which were found to be completely covered with specimens of *Brachycentrus subnubilus*. There appeared to be some hundreds of specimens closely packed together, and they were all dead, or in a moribund state, when found. All were said to be males, but on close examination a single female specimen was discovered amongst them. No explanation could be given as to the object of their congregating together. Mr. Stainton remarked that there were many such instances of a habit of congregating amongst insects, which were equally unaccountable, and as an instance he mentioned a fact known to all breeders

of Micro-Lepidoptera respecting the pupation of the greater number of the Nepticulæ, the larvæ of which live solitary as leaf-miners; but if a number of leaves, containing larvæ, are collected and placed together in a box, it is found that the cocoons are constructed gregariously between certain leaves, without any apparent reason for the preference.

Timber-boring Beetle.—Mr. Charles O. Waterhouse read the following note by Dr. Lamprey, Surgeon-Major of the 67th Regiment, on the habits of a boring-beetle found in British Burmah. A specimen of the insect was exhibited, and also two portions of stem which had been operated upon. The insect was one of the Bostrichidæ, belonging to the genus *Sinoxylon*. “On examining the plants in my garden one afternoon, I was struck with what appeared to be an injury done to one of the trees, the name of which I do not know,—this being the winter season, no blossom apparent, and nearly all the plants new to me. The branches of this particular tree are straight, grow upright, and are about half an inch to an inch in their diameter. One of the tallest of these branches, which reached to a height of about eight feet, was apparently broken and lying on the other branches, as if it was cut or broken off in a mischievous way. I was on the point of questioning the gardener about it, when I observed the leaves of another branch quite withered, and, on taking hold of it to bend it towards me, it snapped in a curiously brittle manner. Looking at where it was broken, I found the stem to be completely severed with a clean division, and that it was only kept together by the thin outer layer of the bark. Examining another branch, I found it snapped in an equally mysterious way, but in doing so a small black insect fell out of the broken part; it was too rapid in its movements, and I lost it. On further examination of the broken parts, and putting them into position again, I found a small circular opening, about the size of the hole in the gall-nut, and concluded that the insect I saw had eaten its way into the stem, and by devouring the wood completely round, and not along its long axis, accounted for the fracture in this particular locality. Since then I have been on the watch to discover the insect, and have succeeded in securing two specimens; one was found in the stem on breaking it across in the position of one of the external apertures: this specimen is somewhat injured by the loss of one of its elytra. The other

specimen I found had buried itself so far into the stem as just to leave its posterior part exposed. They are both beetles, about a quarter of an inch in length, black in colour, and have a large head of peculiar shape, well adapted, no doubt, to contain powerful muscles and mandibles for tearing the tough woody fibre of the stem of the plant; but I leave their description to the entomologists. The office these creatures are no doubt intended to fulfil in Nature's economy is to assist in keeping the tropical vegetation in check. They burrow into the stem of the tree, are rewarded by the sap and nourishment it affords, and are liberated, after performing this task, by a gust of wind snapping the undermined and weakened stem across. They are not found in other trees or shrubs than the one alluded to. The beetle turns on his side while boring, his back being towards the bark: in this manner his form suits the circumference of the stem."

White Ant bred at Kew.—Mr. M'Lachlan exhibited specimens of a white ant (*Calotermes* sp.), recently bred at Kew from a sample of the wood of the tree (*Trachylobium Hornmannianum*) that produces the gum copal of Zanzibar.

Deiopeia pulchella in Cornwall.—Mr. Stainton read a letter he had received from the Rev. P. H. Newnham, of Stonehouse, Devon, stating that he had taken two living specimens of *Deiopeia pulchella*, on the opposite side of the river Tamar, in Cornwall. Mr. Stainton remarked on the unusual circumstance of the insect having been captured at such an early season as the month of May.

A Living Mantid exhibited.—Mr. Charles O. Waterhouse sent for exhibition a living specimen of a Mantid (*Empusa pauperata*), in the larva or pupa state, brought from Hyères by the Rev. Mr. Sandes, of Wandsworth. The captor stated that he had supplied it with flies, &c., in the hope of ascertaining the mode in which it seized them, but that he could not induce it to eat anything while he was looking on. Mr. Stainton suggested that if he had put a living spider in the cage it would probably have seized it immediately.

The Coffee-borer of Natal.—The Secretary read the following note, which he had received from Mr. William D. Gooch, of Spring Vale, Little Umhlanga, Natal, respecting the habits of the Longicorn "coffee-borer of Natal":—"The egg, as far as we can determine, is laid about the level of the soil, about the middle of December, at a time when the trees look most

healthy, are making most wood, and the circulation of the sap is most free, it being also during the damp part of the year. I have, however, despite considerable investigation, been unable to get specimens of the egg, and so watch the development of the larva from the earliest stages. Specimens of the larva have already been laid before the members of your Society, but I forward by this post also some specimens. In only three cases, about January or December, have I met with any insect in the bark, between the level of the ground and the roots, at all corresponding to the larger insect found in the wood. On examining those trees with larvæ in, with hardly any exception, we discover the bark eaten away, or rather, I should say, wanting, about the level of the ground; from this place to the entrance-hole of the borer in the forks of the roots there is always to be observed a more or less irregular channel or road cut in the bark leading from one to the other, and in this channel I discovered two of the three small specimens of larvæ mentioned above. The entrance-hole of the larva is very irregularly placed; sometimes it begins as an excavation along one of the roots at a fork in the rootlets; sometimes it enters immediately under the first root, hardly below the ground. I have not noticed the entrance of the larva above ground, except in two instances, when there was a hole below the lowest primary in one case and the second primary in the other. I did not, however, satisfactorily determine that these were the same insect, or, even if so, they may be considered as accidental cases. The excavation of the wood of the tree by the larvæ need not be entered into, as every one must be well aware of their powerful mandibles and their unlimited appetites. How long the insect remains in the larva form I have not yet been able to judge; but in consequence of finding always two and sometimes three distinct sizes in the insects taken out of a hundred trees, I imagine not less than two years, and possibly so long as three. The first transformation at present I have only observed in October; but I am half inclined to think there is a double brood, and another transformation about May: as I was not in the colony at that time last year, having given my attention to the question since July last, I am looking forward next month to deciding this point, as unluckily we have many diseased trees to operate on. I enclosed with the larva formerly sent to you a specimen of the pupa; it was first

discovered about the beginning of October, and was found till the middle of December. The first perfect insects were found in the beginning of December and the last week in November. The imago, from the name, I imagine to be *Anthorea leucotus*, a longicorn, with the elytra covered with very fine down, almost a bloom, and grayish colour, the bases of the elytra being of a reddish chocolate, with a purplish shot on it when newly emerged. The insect, I think, lies torpid after its complete transformation till some 'drying day' comes, when it bores its way out; but what happens to it afterwards I have never been able to discover: only three specimens were found on the whole estate, although I offered sixpence each for them, and we were splitting trees with two and three perfect insects in them each. When I speak of a 'drying day,' I mean one of the 'hot winds' from the north-west, which occur in our spring here, taking the thermometer up to 100° in the shade, and considerably affecting insect-life. I noticed especially that the morning after one of these hot winds, on splitting some of the trees, the insects looked so lively that we left off splitting in haste, and gathering the trees together in large heaps burnt them straight off. I said before that only three insects were found at large on the whole plantation by our people; of these two were *in copulâ* on a primary branch of a coffee-tree, the bark of which had been eaten away. This at once suggested to me whether the female before depositing her eggs may not decorticate a small portion of the trunk for the purpose of depositing? I did not see a single specimen on the wing, and in many cases I found the elytra so hard to open that they seemed soldered; nor could I by exposure to the sun or any other means ever induce the perfect insects to take wing; they always crawled. So far I have dealt with the insects; I may now add, in reply to some remarks communicated by you in your minutes, that Mr. Keit, the Botanical Curator of our Gardens here, recommended by Dr. Hooker, says that he sees no cause whatever to believe the trees die from any want of vitality, nor do they seem specially affected in any way, yielding good crops and looking well till the borer has very often emerged, after which they languish and die rapidly. I hear from other managers, *on strong soils*, that very often on one aspect, N. and N.E., they find the developed grub as much as 90 per cent., but that, in the same valley, the opposite slope, S.W. and S.E. (our cold slopes), the insect is *not*

present above 5 per cent., although the mortality of the trees is about the same. From this I gather either that the insect a secondary cause, or that the cold aspect is not favorable to the development of the insect beyond the stage when they have damaged the bark, and so more or less killed the tree. On slopes it is noticeable that the lowest side of the tree is that attacked, where by washing from rains the more tender bark is exposed, and very likely the drought cracks it a little. My proposed remedies and *modus operandi* for the prevention of this evil are as follows:—1. To remove all trees which are visibly affected before the insect matures. This, through non-comprehension of the cause of disease, was not done, and our estate and the adjoining one have suffered by the presence of so many centres of evil left to take effect upon the surrounding coffee. 2. About the time the egg or young is still in or under the bark, to keep a staff of men rubbing the trees round the roots with iron gloves, or sticks, with sand, so as to crush the insect in its larva-state. 3. About the time the insect emerges, to keep boys hunting for and picking off the beetle as it adheres to the tree. 4. To let the same boys search for newly-made holes of emergence, and pass wires, &c., down them, so as to destroy the insects therein, in case the beetle should have the habit of re-entering the hole as a *cache* during the day. Your member's suggestion as to the non-destruction of insectivorous birds is a very good one; but I am afraid they are too few, or rather the insect-life is so immense, that they will not play a very important part in helping us. No one shoots birds in the bush round us." Referring to one of the modes adopted by Mr. Gooch for killing the larvæ, Mr. Dunning suggested that rubbing the bark of the trees round the roots, as stated, would hardly have the desired effect, and would probably damage the tree more than the insect. Dr. Horn (of Philadelphia) also doubted the efficacy of the remedy of inserting wires in the holes, which he compared to shutting the stable-door when the steed was stolen. He stated that in Philadelphia a public park had been planted with a great many different kinds of exotic trees, and amongst them were some pines, which were all destroyed by two of their native species, *Callidium antennatum* and *Monohammus dentator*. None of their native trees suffered, but the foreign Coniferæ were killed immediately. Dr. Horn also stated that it was his belief that the Longicorns

attack healthy trees, and that the Coniferæ in question had been previously noticed as the finest and healthiest young trees in the park. The lime trees from Europe were also destroyed in a similar manner by hosts of Saperdæ. Mr. McLachlan repeated what he had stated on a former occasion, that European entomologists generally were of opinion that the majority of the European species of Longicorns do not attack living trees while in a perfectly healthy state.

Proceedings of the South London Entomological Society.—The half-yearly meeting took place on the 18th of June, under the presidency of Mr. J. R. Wellman. The secretary's report was read, and proved to be highly satisfactory. Donations of books from Sir John Lubbock, Bart., M.P., Mr. Edward Newman, and Mr. Charles G. Barrett, were thankfully acknowledged. During the half year seventeen volumes have been added to the library, including Walker's 'Diptera,' 3 vols.; Stainton's 'Tineina' (vol. iv. of 'Insecta Britannica'); Rye's 'Beetles;' several volumes of the 'Weekly Intelligencer;' and the 'Transactions of the Norfolk Naturalist's Society—Supplement, Lepidoptera.' Fifteen new members have been elected, and three have resigned. Amongst the most noteworthy insects exhibited at the meetings were—a specimen of *Hydrilla Palustris*, taken at Norwich, 1871; *Macaria alternata*, two specimens, taken near London, June, 1874; *Erastria venustula*, at Loughton, 1874; *Ephyra orbicularia*; larvæ of *L. quadra*, *E. debiliata*, *A. præcox*, *S. Semele*, and many others beautifully preserved, by Mr. Hoey. Mr. Cole also exhibited a fine nest of *Vespa Crabro*, from Thetford, in Norfolk. The Society's first annual excursion will take place on August 3rd, to Three Bridges, for Tilgate Forest.

British Bee-keepers' Association.—This Association was instituted, May, 1874, for the encouragement, improvement and advancement of bee-culture in the United Kingdom, particularly as a means of bettering the condition of cottagers and the agricultural labouring classes, as well as the advocacy of humanity to the industrious labourer—the honey-bee. It will hold its first great exhibition of bees and their produce, hives, and bee-furniture, at the Crystal Palace, September 8th, 9th, and 10th, 1874, being the days of the autumn fruit and flower show.

THE ENTOMOLOGIST.

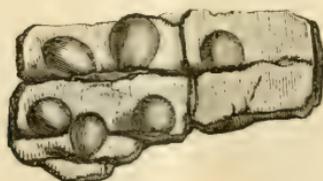
No. 133.]

SEPTEMBER, MDCCCLXXIV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER née WEISE.

Fig. 14.



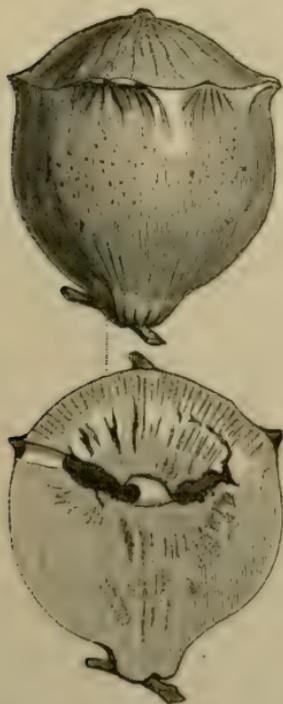
TRIGONASPIS MEGAPTERA.

14. *Trigonaspis megaptera*.—Only once, many years ago, I have found several specimens of this red, berry-like gall, growing between the cracks of the bark at the lower part of the stem of an old oak. It is spherical, of the size of a pea or smaller, red, very sappy, and contains a larva cell. This gall only lasts a very short time, the wasp already leaving it in June. After this escape the gall shrivels up and gets brown.—*G. L. Mayr*.

The associates which live externally or internally with the house-holders of oak-galls are here briefly mentioned: they, and the house-holders, will be noticed more in detail elsewhere, with the help of Dr. Mayr's progressive work on galls and their in-dwellers. Of this work three chapters are published: one on oak-galls, another on *Synergus* and the allied genera, and another on the *Torymidæ*. He states that *Callimome Erucarum*, *C. nobilis* (= *Roboris*), and *C. amœnus*, are parasites of *Aphilothrix Radicis*; that *C. nobilis* is a

parasite of *Biorhiza aptera*; that *C. nobilis* is a parasite of *Aphilothrix Sieboldi*; that *C. Erucarum*, *C. abdominalis*, and *C. regius*, are parasites of *Cynips cerricola*; that *Megastigmus dorsalis* is a parasite of *Dryophanta macroptera* and of *Andricus noduli*; and that *Callimome amœnus*, *C. flavipes*, and *Syntomaspis fastuosa*, are parasites of *Trigonaspis megaptera*. *Synergus pallicornis* associates with *Cynips Hartigi*, *S. pallidipennis* with *Cynips conifica*, and *S. thau-macera* with *Trigonaspis megaptera*. I mentioned *T. megaptera* and some of its parasites many years ago, when I observed the gall on oak trunks, near London; and I saw it again this year in May, near Lanark: it was mostly near the ground, and in no case above the height of six feet. In the beginning of June thirty-six males and females of *T. megaptera*

Fig. 15.



CYNIPS ARGENTEA (and in section).

appeared, and towards the end of this month they were followed by five or six females of *Synergus thau-macera*.—*F. Walker*.

Developed on the young shoots, out of terminal or axillar buds.

15. *Cynips argentea*.—This large, beautiful gall is found in the axils of *Quercus pubescens* (very rarely in those of *Q. sessiliflora*), in the country round Vienna. It is seldom met with there, but occurs more frequently in Southern Europe. It is spherical in shape, and measures seventeen to thirty millemetres in diameter. Around the short-conical, blunt and bossed tip, which is exactly opposite the basal attachment, there is a border or crown, from which the parallel radius to the middle of the gall measures ten to fifteen millemetres. This border is garnished with short blunt points, and is generally less than the greatest circumference

of the gall. The gall is hard, has a slightly flat crown, and is covered with a white tinge caused by a delicate exudation. A section of the mature gall exhibits a dry, spongy, brownish yellow parenchyma, which is cracked across the centre. It contains the inner gall with the perfect insect, and adheres but loosely to the reticulation. Late in the autumn the gall is mature, remains on the branch, and is pierced by the perfect insect in the following February.—*G. L. Mayr.*

I have already published some notes on the inhabitants of this gall, which is called "crowned gall." *Synergus melanopus*, *S. Reinhardi*, and *S. pallicornis*, are stated by Dr. Mayr to keep company with *C. argentea*, and he mentions *Callimome regius* and *Megastigmus stigmaticans* as its parasites. Many years ago several galls of *C. argentea*, from the neighbourhood of Naples, were given to me by the Rev. F. W. Hope, and I obtained from them two specimens of *C. argentea*, one *Megastigmus stigmaticans*, one *Diomorus calcaratus*, one *Osmia*, one *Hylæus*, one other aculeate Hymenopteron, and one *Fœnus*. Most of these insects—perhaps all, with the exception of the first and the second—belong to the second epoch of the gall, or constitute the after-life in it. I found, in June, 1872, a few of these galls at Albano and Terni, near Rome, and shortly afterwards *Synergus pallicornis* came out of them in abundance, and a few females of *Megastigmus stigmaticans*, which I formerly described as *M. giganteus*, that MS. name having been given to it by Kollar. I also procured from these galls *Eurytoma squamea* (?) (smaller than the usual size), *E. coronata*, n., *Pteromalus lucidus* (?), *P. albidipes*, n., *Eupelmus spongipartus*, *Tetrastichus coronatus*, n., and *Chrysis dichrous*,—for this name I am indebted to Mr. F. Smith. Descriptions of the three species here mentioned as new are deferred. *Eurytoma coronata* belongs to the group formerly named *Isosoma*; *Eupelmus spongipartus*, *Foerst.*, hardly differs from *E. urozonus*, except in the slightly longer oviduct,—I am indebted to Dr. Mayr for the name of it.—*Francis Walker.*

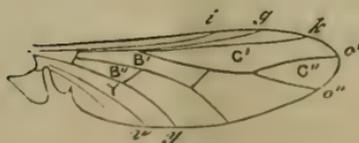
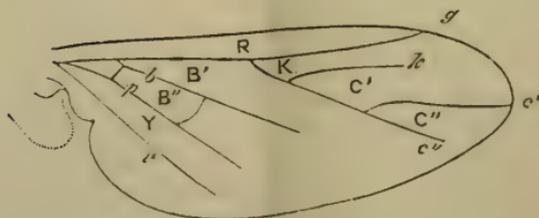
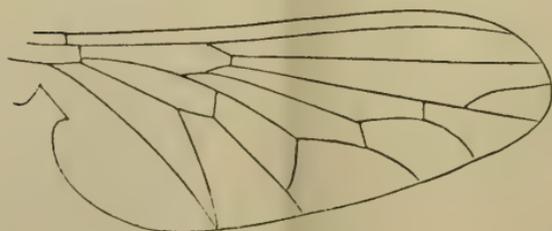
Notes on the *Wing-bones of the Two-winged Flies.*

By FRANCIS WALKER, Esq.

(Continued from p. 149.)

BONES.	AREOLETS.
<i>j</i> Mediastinal.	B Subcostal.
<i>g</i> Subcostal.	K Radial.
<i>k</i> Radial.	C' Cubital, 1st.
<i>c</i> Cubital.	C'' Cubital, 2nd.
<i>c'</i> Cubital, 1st branch.	B' Præbrachial.
<i>c''</i> Cubital, 2nd branch.	B'' Pobrachial.
<i>d'</i> Præbrachial, 1st branch.	D' Subapical, 1st.
<i>d''</i> Præbrachial, 2nd branch.	D'' Subapical, 2nd.
<i>m</i> Pobrachial, 1st branch.	Y Anal.
<i>y</i> Pobrachial, 2nd branch.	V Subanal.
<i>v</i> Anal.	I Discal.
<i>w</i> Subaxillary.	

Fig. 31.—Cyrtus.



Figs. 32 & 32 a.—Acrocera.

Fig. 33.—Henops.

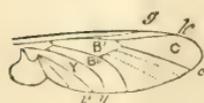


Fig. 34.—Oncodes.

Fig. 35.—Laphria.

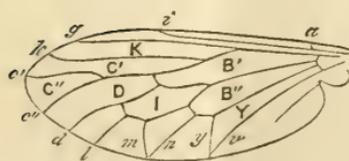
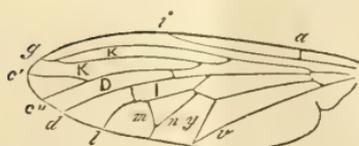


Fig. 36.—Dasypogon.

SEVERAL of the Stratiomydæ, such as *Nemotelus*, are of slow and feeble flight, but *Acrocera*, *Oncodes* and *Henops* are still more weak on the wing, as may be supposed by the structure here represented, and their other movements are also very inactive. In *Cyrtus*, on the contrary, the bones are much more numerous, and extend to the border of the wing: the first branch of the pobrachial joins the bone that is between it and the second branch, and thus there is a closed areolet behind the discal, forming one of the four externo-medial

areolets. The Asilidæ generally, including *Laphria* and *Dasypogon*, are distinguished by the completeness of their wing-structure, by their powerful flight, by their robust bodies, by their thirst for blood, and by their lancet-like mouths, from which the wing-case of beetles is not always a sufficient defence: they chiefly abound in hot regions, where they help to maintain the balance of life, by limiting its excess in some forms. The radial areolet is open in *Dasypogon*, closed in *Laphria* and in *Asilus*; in the first genus the radial and subcostal bones are separate, in the second and third they are united before they reach the border. The resemblance between the wing of *Rhyphus* and that of *Leptis* has been already remarked: in the former there are two radial areolets, one cubital areolet, and the anal areolet is open to the border; in the latter there are one radial areolet, two cubital areolets, and the anal areolet is closed before the border.

FRANCIS WALKER.

Occurrence of Butterflies at Dry Drayton, in the Months of March, April, May, June, 1874. By the Rev. F. A. WALKER, M.A.

1. *Pieris Brassicæ*.—April 7, 23, 25, 27, 28, 29; May 17, 18, 21, 31; June 1, 2, 3, 4, 5, 6, 7, 21, 27. Observed on nineteen different days in April, May, June.

2. *P. Rapæ*.—April 20, 21, 22, 23, 24, 25, 26, 27, 28; May 2, 8, 18, 21, 22, 24, 31; June 2, 4, 5, 6, 7, 21, 27. Observed on twenty-three different days in April, May, June.

3. *P. Napi*.—April 25, 27, 28, 29; May 1, 5, 6, 17, 18, 29; June 5, 9. Observed on twelve different days in April, May, June.

4. *Anthocharis Cardamines*.—April 29; May 16, 18, 21, 22, 24, 26, 30, 31; June 2, 3, 9. Observed on twelve different days in April, May, June.

Total number of appearances of Pieridæ, sixty-six.

5. *Gonepteryx Rhamni*.—Male: March 18, 23, 24, 28; April 3, 20, 21, 22, 27, 28; June 5(?). Observed on ten different days in March and April, one in June; but my eyes might have deceived me concerning this last appearance,

which might have been that of a *Pieris* in the sunlight. Female: March 28; April 23, 27. Observed on three different days in March and April. Total number of appearances of *Gonepteryx*, fourteen.

6. *Vanessa Io*.—March 23, 28, 29 (hybernated); April 3, 7, 8, 22, 23, 24, 27, 29; May 24. Observed on twelve different days in March, April, May.

7. *V. Polychloros*.—March 28 (hybernated); April 11, 21, 22; May 2. Observed on five different days in March, April, May.

8. *V. Urticæ*.—March 24, 28 (hybernated); April 20, 21, 22, 23, 24, 25, 26, 27, 28, 29; June 3, 27. Observed on fourteen different days in March, April, June.

Total number of appearances of *Vanessas*, thirty-one.

9. *Pyrarga Egeria*.—April 23. Observed on one day in April.

10. *S. Megæra*.—May 20, 30, 31; June 1, 2, 4, 9. Observed on seven days in May and June.

11. *Cænonympha Pamphilus*.—May 30. Observed on one day in May.

12. *Satyrus Janira*.—June 19, 22, 23, 25, 26, 27, 29. Observed on seven different days in June.

Total number of appearances of *Satyridæ*, sixteen.

13. *Chrysophanus Phleas*.—April 22. Observed on one day in April.

14. *Polyommatus Alexis*.—June 9, 11. Observed on two days in June. Total number of appearances of *Polyommatus*, two.

15. *Pamphila Sylvanus*.—June 9. Observed on one day in June.

Occurrence of genera:—*Pieridæ*, seen sixty-six times; *Vanessas*, thirty-one; *Satyrids*, sixteen; *Gonepteryx*, fourteen; *Chrysophanus*, once; *Polyommatus*, twice; *Pamphila*, once. Total number of appearances, one hundred and thirty-one.

Of the said diurnal *Lepidoptera*, the three common species of *Pieridæ* would appear to occur most uninterruptedly when they do arrive, but they are by no means the earliest seen. Compare the following:—*Gonepteryx Rhamni*, earliest seen, March 18; latest seen, April 28 or June 5 (uncertain, however). *Vanessa Io*, earliest, March 23; latest, May 24.

V. Urticæ, earliest, March 24; latest, June 27 (disappearing the whole of May). *V. Polychloros*, earliest, March 28; latest, May 2. *Pieris Brassicæ*, earliest, April 7; latest, June 27. *P. Rapæ*, earliest, April 20; latest, June 27. *P. Napi*, earliest, April 25; latest, June 9. *Anthocharis Cardamines*, earliest, April 29; latest, June 9.

The remaining five species were only seen once each; and of the ten, previously mentioned, I noticed five during the first fortnight in July, namely,—*Pieris Brassicæ*, *P. Rapæ*, *P. Napi*, *Vanessa Urticæ*, and *Satyrus Janira*, as well as two additional species that I had not observed from March to June inclusive,—*Satyrus Hyperanthus*, July 3 and 4, and *Thecla W-Album*, July 10.

From the foregoing statistics it will be perceived that of the above fifteen species, so far at any rate as my own observation went, *Gonepteryx Rhamni* (male) was the earliest seen, on the 18th of March, and *Polyommatus Alexis* and *Pamphila Sylvanus* the two latest, on the 9th of June. That the two kinds, moreover, most frequently noticed, were *Pieris Rapæ*, seen on twenty-three days, and *P. Brassicæ*, on nineteen; next to these, *Vanessa Urticæ* and *Gonepteryx Rhamni*, seen respectively on fourteen days; and next, *Pieris Napi*, *Anthocharis Cardamines*, and *Vanessa Io*, which were each observed on twelve days. Also that of the tribe of whites, which, as regards the number of individual specimens, do not appear to be particularly numerous this season, *Brassicæ* occurred nearly a fortnight before *Rapæ*, more than a fortnight before *Napi*, and three weeks before *Cardamines*; that *Rapæ* was seen five days before *Napi*, and *Napi* in its turn four days before *Cardamines*; that the earliest *Satyrid* (*P. Egeria*) was observed nearly a month previous to any of its congeners, on the 23rd of April, later than two species of *Pieridæ*, *Brassicæ*, and *Rapæ*, and earlier than another two, *Napi* and *Cardamines*; that the three remaining species of *Satyridæ* were later than the two latest species of *Pieridæ*; that *Megæra* occurred ten days before *Pamphilus*, and thirty days before *Janira*; that *Pamphilus* and *Egeria* were only seen once each, but *Janira* and *Megæra* seven times in each case,—the appearances of *Janira*, however, being restricted to June, and *Megæra*, on the other hand, ranging over the two months, May and June, being noticed three times in the

former month, and four in the latter; that of the three species of *Vanessa*, *Io* appeared one day before *Urticæ*, and five days before *Polychloros*; that *Polychloros*, the latest of the *Vanessas*, was seen between three and four weeks before the earliest of the *Satyrids*, *Egeria*, and eleven days before the earliest of the *Pieridæ*, *Brassicæ*; that no one of the said fifteen species was seen by me during all the four months in question,—March, April, May, and June, some being seen during the space of three months, some for two, and others during only one; and that as regards the number of specimens seen, *Satyrus Janira* was decidedly the most abundant; and that on no one day were more than seven species observed. Compare also the following:—

March 1st—17th, no species seen; 18th, one species seen; 23rd, two; 24th, three; 28th, four; 29th, one: appearances, eleven. April 3rd, two species seen; 7th, two; 8th, one; 11th, one; 19th, one; 20th, three; 21st, four; 22nd, six; 23rd, six; 24th, three; 25th, four; 26th, four; 27th, seven; 28th, five; 29th, five: appearances, fifty-four. May 1st, one species seen; 2nd, two; 5th, one; 6th, one; 8th, one; 16th, one; 17th, two; 18th, six; 20th, one; 21st, three; 22nd, two; 24th, three; 26th, one; 29th, one; 30th, five; 31st, four: appearances, thirty-five. June 1st, two species seen; 2nd, four; 3rd, three; 4th, three; 5th, four; 6th, two; 7th, two; 9th, five; 11th, one; 19th, one; 21st, two; 22nd, one; 23rd, one; 25th, two; 26th, one; 27th, four; 29th, one: appearances, thirty-nine. Aggregate of appearances:—March, eleven; April, fifty-four; May, thirty-five; June, thirty-nine. So that in March butterflies appeared only on five days out of thirty-one; also that in the ninety-one days of April, May, and June, butterflies were seen on forty-eight days; not seen on forty-three. Also that on fifteen out of the thirty days of April butterflies were noticed, on sixteen out of the thirty-one days of May, and on seventeen out of the thirty days of June. In the first half of May the cold weather contributed greatly to their disappearance.

The average number of species witnessed, moreover, is higher in April than either May or June: as in April seven species were seen once; six, twice; five, twice; four, three times. In May six species were seen once; five, once; four, once. In June five species were seen once; four,

three times. Allowance must be made as regards the accuracy of the above, deductions for a few days absence, as well as engagements, precluding the power of observation.

In reference to the flowers especially frequented by the butterflies recorded may be mentioned:—In the early part of the season: wild hyacinth,—a favourite blossom for *Io*, *Rhamnii*, *Rapæ*, *Cardamines*, and *Phlæas*; fruit-tree blossoms,—*Io*, *Polychloros*, and *Urticæ*; periwinkles,—*Rhamnii* and *Io*. Later on in the year: *Virginian stock*,—*Pieridæ* and *Janira*; thistle blossoms,—*Janira* and *Urticæ*; species of dead nettle in the hedge-rows likewise much frequented by *Pieridæ*. I may also state that the caterpillars of *Vanessa Io* and *Urticæ* have been very abundant this year on the nettles in this parish and neighbourhood. I have already bred many specimens of the latter; those of the former are still in the pupa state. I subjoin the following dates:—

Vanessa Urticæ.—Butterfly on nettles; April 27th and 28th, supposed period of eggs deposited. Caterpillars taken on same nettles; June, first week. Chrysalids; June 13th to June 25th inclusive. Butterfly; July 2nd to July 10th; the perfect insect emerging in numbers during the last three of days specified.

V. Io.—Butterfly in neighbourhood of nettles; April 23rd and 24th, supposed period of eggs deposited. Caterpillars taken on same nettles; June 15th. Chrysalids; July 6th, 7th, 8th, 9th, and 10th. A large number still in the larva state.

In conclusion I have only to state that as regards the discovery of the caterpillars of *Vanessa Io* and *Urticæ*, I have given the dates of the earliest found, and where I could more certainly connect them with the presence of the butterflies, which I had previously seen fluttering in the locality. I continued to find the caterpillars of *V. Urticæ* up to the 19th of June, and those of *V. Io* up to the 3rd of July, and a few even on the 10th, on which I am writing.

F. A. WALKER.

The Rectory, Dry Drayton,
July 10, 1874.

Entomological Notes, Captures, &c.

A New(?) Food-plant for Melitea Artemis.—I have tried for the last three seasons to breed *M. Artemis*, on what I have always understood to be their usual food-plants, namely, *Plantago lanceolata* and *Scabiosa succisa*, but have never been able to succeed in getting a single larva to feed on these plants. Having obtained a few dozen larvæ in the spring of this year, I resolved to try a new food-plant: I supplied the larvæ with honeysuckle, on which, to my surprise, they fed up rapidly, and in due course attained the pupa state. From these pupæ I have bred a series of very dark imagos, varying both in size and colouring, not only from those I have taken in Sussex and Kent, but also from any that I have received or seen, either from the western and northern counties of England, or from Ireland or Scotland.—*H. Goss; Brighton, August 20, 1874.*

Apatura Iris in Monmouthshire.—Last week a friend of mine brought me two specimens of *Apatura Iris*, both males, which were taken in this neighbourhood: one was captured in the kitchen, and the other outside, but close to a house in the country. This insect was caught and seen very frequently near here some five or six years ago. The county is omitted from the list in your work on 'British Butterflies.'—*H. Stafford Gustard; Usk, Monmouthshire, August 1, 1874.*

Melanagria Galathea in Lincolnshire.—In your 'History of British Butterflies,' p. 79, you remark that hitherto you have no record of the occurrence of the marbled white, *Melanagria Galathea*, in this county. The following note may, therefore, be of interest:—On the 18th of July, when driving across the wolds between Rigby and Caistor, and near the highest part of the wold, I noticed numerous examples of *M. Galathea* flitting in rather a lazy, undecided manner along the hedge-banks bordering the road. Returning some hours later by a parallel road to this, about one mile to the eastward, and on the summit of the wold, I again came across numbers of this butterfly, both along the road-side and in old disused chalk-pits contiguous. They seem very partial to settling on blossoms of the thistle and knobweed (*Centaurea nigra*). Altogether, on both roads, I must have seen several scores. I only took one example, as I was not aware, at the

time, of its rarity in Lincolnshire. I never remember butterflies so scarce as they are this year, and this has generally been remarked in this neighbourhood. I spent ten days last month on the highest part of the Shap Fells, in Westmoreland, and although I sometimes walked twenty miles a day, and was constantly out of doors, scarcely came across a single butterfly of any description. One of my boys is collecting butterflies and moths, so that I was constantly on the look out, and did not overlook any.—*John Cordeaux; Great Cotes, Ulceby, Lincolnshire, August 4, 1874.*

Hepialus Velleda at Horsham, Sussex.—It may be interesting to entomologists to know that on the 15th August I found in the house a fine specimen of a female of the above species, which had been observed fluttering upon the blind of an open window the previous morning, and had probably flown in. I had always understood this to be quite a northern insect. The common brake is very abundant in the neighbourhood.—*David Price.*

Food-plant of Orgia gonostigma.—I wish to set right a small mistake in respect to the food-plant of *Orgia gonostigma*. It states in some works that this species feeds on oak, but I find it feeds on blackthorn and hawthorn, the latter being preferred.—*Henry Robinson; 23, Court 6 House, Gosford Street, Coventry.*

Deiopeia pulchella in Sussex.—A young lady friend, who was looking over my collection of Lepidoptera a week or two back, noticed a specimen of this insect in my collection, which was taken in Somersetshire, September, 1848, and observed she had taken a moth like it about a month back. I asked her if she was quite certain, and she said she was, and sure enough she was right, for on my calling to see the specimen found it to be in fair condition and perfect, but a pale example. She took me to the spot two days ago, which is in a field of mixed herbage, surrounded by ditches, lying between Poling and Little Hampton, in Sussex, and not, I should have supposed, a very likely spot. She has kindly added the specimen to my collection. On referring she finds it was taken on the afternoon of the 28th of June: it flew up out of a patch of the *Lotus corniculatus*, and settled on a thistle. Being only a young collector she was not aware of the rarity at the time, so did not search for more. It must be

a specimen of the first brood; most of the recent records of its capture in England, if I recollect rightly, have given August and September. It will be curious if it turns up again this autumn, as it did two or three years ago.—*Samuel Stevens*; 28, *King Street, Covent Garden, August 18, 1874.*

Nola centonalis at *Sittingbourne*.—I have taken a few specimens of *Nola centonalis* at *Sittingbourne*, flying in the manner as described by Mr. Dalton in his taking of *Albulalis*, and in company with *Acidalia Emutaria*. Is not this a new locality for the species?—*W. Wigan*; *Wincheap, Canterbury.*

Eupithecia plumbeolata and *E. valerianata*.—A fortnight ago I had a ramble to *Pilling Moss*—and a long one it is—to look for *Elachista Serricornella*: on the middle of the moss grows in plenty *Malampyrum arvense*; I collected a bag-full of the flowers, hoping that eggs were laid upon them. Yesterday I had a collecting day in my bag, and found about thirty larvæ in all stages, and a few pupæ as well; and from my bag-full of *Valerian* I should think quite one hundred larvæ, mostly full fed, of *Valerianata* (*Viminata*); there were plenty of *Endorea pallida* and *Phycis carbonariella*: which was my reward for a long walk, a run with a bull, a good sweating, worried with flies and midges, as well as a great viper hissing at me amongst the long grass, before my stick went at it.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston, August 10, 1874.*

Tapinostola Bondii at *Lyme Regis*.—I have taken *Tapinostola Bondii* at *Lyme Regis*, an entirely new station for it.—*W. H. Tugwell*; 3, *Lewisham Road, Greenwich, August 1, 1874.*

Acronycta Alni at *Lyndhurst*.—A fine, full-fed larva of this species was brought to me yesterday, by a man who had found it on some palings close to my house.—*H. Goss*; *Lyndhurst, July 30, 1874.*

Noctua sobrina in *Rannoch*.—I have had the good fortune to discover a new locality for *Noctua sobrina*, in a heathy place, some distance south of *Loch Rannoch, Perthshire*. Last spring I accidentally found an injured larva, which shortly afterwards died: it was so suggestive of the description given in Mr. Stainton's 'Manual' of *N. sobrina*, that I determined to work for the perfect insect when due. I was rewarded by taking several specimens, and also by obtaining a few eggs.

I find this species exceedingly local in its habitat.—*John T. Carrington*; *Poole Road, Egremont, Birkenhead, August 1, 1874.*

Pachnobia alpina in Rannoch.—I had the pleasure of capturing a specimen of this fine and rare species this summer in Perthshire: it was taken in the Breadalbane division (as divided by Dr. White in his 'Fauna Perthensis'), close to the summit of a mountain of upwards of three thousand feet in height. It may interest some of your readers to know that this was the only result of fourteen whole nights and several days spent at that height: I sugared each night, but it produced nothing but an occasional *Noctua festiva*. The nights spent at this altitude were alternate ones; the other evenings were occupied by sugaring in the valley where I stayed: these latter sugarings produced many moths, so that the paucity of insects at sugar on the mountains could not be the result of the bad season we have had in Scotland this year. Considering the result, and the extreme discomfort of mountain-tops at night, for I was many times enveloped in thick clouds for hours together, I do not think it worth while to work again for this cloud-loving species. I believe there are only four previous records of this species being taken in Great Britain, namely, the two named in the 'Manual,' a third taken by Mr. Eedle, on Schiehallion, in 1870, and one bred from a pupa found while hunting for Coleoptera, in Braemar, by Mr. Allin: these may be called accidental captures; so I feel the more pleasure in having gone for, and obtained, the species.—*Id.*

Pachnobia alpina in Rannoch.—I have again had the pleasure of taking this rare species in Scotland, on the same mountain that I took one in 1870. In the same week I had the misfortune to miss another in Glen Sassenach, on a mountain called Squapen. I believe this species occurs on all the high mountains in Scotland if they could only be well collected over; but the great difficulty is wind and rain, that prevent you doing much on the tops of the higher mountains.—*T. Eedle*; 40, *Goldsmith Row, Hackney Road, N.E.*

Erastria venustula at Horsham, Sussex.—On June 2nd I took eight of the above insect in St. Leonard's forest, at a part called "Roost Hole," about three miles from the town. I might easily have caught a hundred settled on the heath:

they flew very little before sunset, but about dusk they began to fly straight down the different paths by dozens, and I did not see any settled after this. I should have taken more, but I ran short of pins. I went again on June 6th, and took fifteen more,—all I saw then; and on June 9th I again took nine, some of which were very much faded, and I have not seen any since.—*David Price; West Street, Horsham.*

Captures in Sutherlandshire.—Thinking it may interest some of the readers of the 'Entomologist,' I beg to give you the names of the Lepidoptera that I took in Sutherland last month:—*Cænonympha Davus*, plentiful on the bogs; *Melanippe tristata*, very plentiful on the side of the "burns;" and one specimen of *Plusia Chrysitis*. The *Tristata* were not black, but a dark dusky brown. Being on a fishing excursion I unfortunately only got a few specimens of these species.—*C. L. Adams; Walford Manor, Shrewsbury, Aug. 15, 1874.*

Machærium maritimum (Fam. Dolichopidæ).—*Machærium maritimum* was first named and described as a new genus and species by A. H. Haliday, in 1831; and its economy has been lately observed by Mr. Joshua Brown, of Bartonbury. The cocoons were found in the beginning of June, on the sands at a bay about two miles beyond the town of Weston-super-Mare: Mr. Brown kept them moist with a little salt water, and the flies came out during a week about the middle of June. The pupa is pale, about three and a half lines in length, decreasing in breadth from the head to the tip of the abdomen; the head and the thorax are large, and closely connected; there are eight abdominal segments, and the legs and rudimentary wings are distinct; the antennæ are two-thirds as long as the body, and much longer than those of the developed fly; the scape is thick; the flagellum is setaceous and black at the base. The cocoon is pale gray, elongate-oval, about six lines in length, smooth without and within, and appears to be composed of fine mud.—*Francis Walker.*

Microgaster in Brazil.—In Hymenoptera and Diptera there are often examples of nearly allied species inhabiting wide-apart districts of the earth. *Microgaster*, whose larvæ form little yellow cocoons attached to the skins of caterpillars, are well known in Europe, and I am indebted to Mr. F. Smith, of the British Museum, for a mass of white cocoons

from Catagalla, in Brazil. They are accompanied by an abundance of *Microgaster* that does not seem to differ from the one of Europe, but the cluster is much larger and more closely united, and looks like a compact tuft of cotton.—*Francis Walker.*

Note on Phylloxera Quercus.—*Phylloxera Quercus* will probably be soon observed more than hitherto in England, on account of the observations of Balbiani with reference to it, and on account of its affinity to the much-dreaded *Phylloxera vastatrix*, on which Riley has this year bestowed fifty-six pages in the sixth annual report on the 'Insects of Missouri;' yet he remarks that the full history of *Phylloxera* has yet to be written. *Phylloxera* is nearly allied to *Chermes*, on which Leuckart long ago made some interesting researches; and *P. Quercus* agrees with *Chermes* as to the mode of life in the winter generation. The appearance of *P. Quercus* this year was somewhat earlier than usual: it was abundant in the beginning of July, when, in addition to the generally-distributed whitish blotches caused by *Orchestes Quercus*, oak trees may be seen here and there with leaves covered by yellow spots, each of which, sometimes fifty in number on one leaf, shows the presence of a *Phylloxera* on the under side. There the mother sits, surrounded by concentric circles of eggs, sometimes one hundred in number, and in that case there might be five thousand eggs under one leaf; but this, perhaps, never happens: sometimes the mother has no eggs about her, and then the yellow spot is limited to the size of her body; sometimes the mother has disappeared from the eggs; sometimes a *Scymnus*(?) larva appropriates one by one the whole cluster of eggs, and then the mother has desolation all around her. *Callipterus Quercus* and *The-laxes dryophila* appear now and then in company with the *Phylloxera*: the *The-laxes* not only frequents oak-apples, but also feeds on incipient acorns, and on incipient galls of *Dryophanta folii*.—*Id.*

Rearing Larvæ in Earthenware Pots.—I suppose most entomologists have found jam-pots, or the ordinary garden-pots, covered with lino or muslin, and with a little earth at the bottom if the habits of the species require it, to be convenient in many respects for the rearing of larvæ not too young. They are especially suitable when twigs or stems of the

food-plant can be given, and where a daily supply can be had, rendering it unnecessary to place these in water, for many larvæ are apt to thrive badly on twigs so supported, and I think a daily turn-out, and a fresh supply of food is more healthful; in very hot weather it may be needful to renew the food twice a day. But I find one drawback, which I have not succeeded in removing, and which is particularly operative in the spring and autumn: larvæ are liable to crawl occasionally on the earthenware sides of the pots, and as these get cold they seem to chill the feet and claspers of young larvæ, and produce a species of cramp, or perhaps it may be a rheumatic ailment. Lining the pots with paper does not answer very well. Perhaps some other entomologists have noticed this annoyance, and devised a remedy. The rearer of larvæ cannot be too watchful for the appearance of several of the moths of the genus *Tinea* in his breeding-house; it is not sufficient merely to exclude the imagos from boxes and cages: guided by instinct, they deposit eggs on the gauze or zinc, and the larvæ, dropping through, prey upon the pupæ that may be below; should there be none, they will devour moss. I will not say that, in lack of other food, they may not even eat earth, like niggers of certain races, often discoursed upon by travellers.—*J. R. S. Clifford.*

Emelesia unifasciata at *Cheltenham*.—I took four specimens of *Unifasciata* here on the 19th. I think it is new to this district.—*W. C. Marshall*; 8, *Spa Buildings, Cheltenham, August 22, 1874.*

Death through the Sting of a Hornet.—The deputy coroner for the Reading division of Berkshire has held an inquest at Mortimer, a village near Reading, touching the death, under extraordinary circumstances, of Mrs. Sarah Merrett, a labourer's wife. Deceased was standing in the road near her house, when a hornet flew out from a nest in the bank and stung her on the right side of her neck. She went indoors, and a neighbour bathed her neck with water and vinegar. However, she fainted almost immediately, and expired in a few minutes, before a medical man could reach the house. Mr. G. H. Davis, surgeon, stated at the inquest that he knew Mrs. Merrett as a nervous, excitable woman, and he believed the immediate cause of her death was syncope, the result of a nervous shock caused by the sting of

the hornet. The jury returned a verdict in accordance with that opinion. Deceased was fifty years of age.

[This is one of the best authenticated instances of death from the sting of a hornet that I have ever met with, and I think admits of no doubt. The medical question of *shock* or *poison* is scarcely within my province, but I shall have occasion to say something of another sting shortly.—*Edward Newman.*]

Peat Insects.—If any of your readers could give me the names of any insects, Myriapods, or Arachnida, that have been found in peat, marl, or any of the later tertiary deposits of the United Kingdom, I shall be thankful. I am about to publish a list of all the fossils of the Upper British Tertiaries, and have only the following in my list, gathered from many sources:—*Atopa cervina*, *Buprestis* sp., *Casida* sp., *Chrysomela* sp., *Cimex* sp., *Coccinella* sp., *Copris lunaris*, *Cossyphus* sp., *Curculio* sp., *Donacia linearis*, *Dytiscus* sp., *Elater lineatus*, *Harpalus* sp., *Licinus* sp., *Oiceoptoma dispar*, *Oreina* sp., *Phryganea* sp. The locality and matrix in which the forms are embedded is requested, as well as the names of the organisms.—*Alfred Bell*; 5, *Grafton Street, Fitzroy Square, July 25, 1874.*

Answers to Correspondents.

Miss A. Steele Perkins.—In the pursuit of moths and butterflies I am continually meeting with other beautiful or curious insects, about which I can obtain no information in this decidedly unentomological part of the country. I therefore write to ask if you will let me know whether there is such a thing as a beginner's book on Entomology, containing information as to the number, names, and natural order, of the great divisions of British insects; the habits, metamorphosis, &c., of the different classes; the number of species in each class; and the manner of collecting and preserving them.—*Anne Steele Perkins*; *Ashgrove, Ruabon, April 21, 1874.*

[As a *first* book, *quite for beginners*, the 'Insect Hunters,' price 2s. 6d.; as a complete introduction to the Science, Newman's 'Familiar Introduction to the History of Insects,'

price 12s.; for collecting and preserving only, Greene's 'Insect Hunter's Companion,' price 1s. 6d. There are a great many others, but they are either profound and learned books, unintelligible to beginners, or pleasant compilations by authors who have little or no practical acquaintance with the subject. The above three books are published by Mr. Van Voorst, and have been prepared especially to supply a want felt by all learners.—*Edward Newman.*]

C. Le Merle Adams.—*Palpi* (or feelers)—organs attached to the jaws of insects; *ciliated*—fringed with a series of parallel hairs; *pectinated*—furnished on one side with a number of stiff parallel branches resembling the teeth of a comb; *costal*—near or on the upper edge of the wing; *reniform*—kidney-shaped; *discoidal*—in the middle of the wing, not near its margin; *orbicular*—round; *glabrous*—smooth and shining; *dorsal*—on the back or upper surface; *isabelline*—the colour of a fawn; *lateral*—on the side; *reticulations*—fine marks like net-work. For explanations of this kind I may also refer to the books recommended in the previous note. There is no English work containing illustrations of most of the Lepidopterous larvæ.—*Edward Newman.*

Thomas Eedle and others.—I believe the nests sent this summer from Scotland to be those of *Vespa sylvestris* of Scopoli ('Sp. Insectorum,' vol. i. p. 460). I have particularly examined the series of perfect insects, males and workers, just brought by Mr. Eedle on his return from Rannoch. Entomologists, who are desirous of studying the species of British wasps, would do well to take the entire nest and all its contents, and, after having allowed the cyanide to do its work, to set and preserve every specimen, labelling them and their nests with a similar number, and not introducing a single specimen that was not actually killed *in* the nest. Mr. F. Smith, of the British Museum, and subsequently Dr. Ormerod, of Brighton, have laboured industriously to make the species intelligible: the discriminative remarks of the former, and the figures of the last-named author, are most praiseworthy. The difficulty of the subject, however, is very manifest, from the conflicting synonymy in Mr. Smith's own various papers. An unmistakable figure of the nest of this wasp will be found on plate vi. of Dr. Ormerod's 'British

Social Wasps,' and another on plate x. Mr. Eedle's specimens closely resemble the latter: they are attached to the common ling and heather so firmly that it would be next to impossible to remove them without injury. This species has the abdomen distinctly banded with black and yellow. I commonly find this species of wasp at the blossoms of the figwort (*Scrophularia aquatica*), and, by a singular coincidence, the *Tenthredo Scrophulariæ* of Linneus, a species similarly banded with black and yellow, and equally conspicuous, is also confined to the same genus of plants, the larva feeding on its leaves, the wasp on its nectar. Can the theory of mimicry help us here? Turning to Mr. Smith's 'Catalogue of Fossores,' I observe he says this wasp is very partial to the flowers of *Ballota nigra*; a fact I have never noticed.—*Edward Newman.*

H. J. H.—The hair-worm (*Gordius aquaticus*) is the adult, and not the larval state, which is singularly unlike the specimen sent: it is very short, being described as $\frac{1}{450}$ of an inch in length. I cannot pretend to any knowledge of this from personal observation. The female *Gordius* deposits her eggs in the water in long strings. I have lately seen specimens of this strange creature six inches in length, and not much thicker than a horse-hair: indeed, country people have often supposed, and asserted, these hair-worms to be horse-hairs, which had fallen into the water, and so become animated. When the rain came, after the late dry weather, I found these *Gordii* on strawberry-leaves, currant-bushes, rose-bushes, &c. very abundantly, tying themselves in most marvellous knots; and I have attempted in vain to explain that they did not fall from the clouds.—*Edward Newman.*

A. Hamilton.—In the 'Entomologist' (Entom. vii. 137) I find mentioned the parasite of the owl, and having caught a specimen this morning on a fern owl, I have great pleasure in forwarding it to you: the shuffling disappearance of the creature, remarked by your correspondent, describes its movements accurately. As I shall most likely have many opportunities of searching owls, I should like to know if you would like the specimens in spirit, or as I have sent the present one.—*A. Hamilton; 13, Park Street, Windsor, August 18, 1874.*

[The insect is *Ornithomyia avicularia*: it seems a very

general bird-parasite. Any specimens of this Dipterous parasite, sent like the present one, will always be acceptable, and very thankfully received.—*E. Newman.*]

W. J. Cope.—I enclose you an insect, which I shall be glad if you will name. It was found to-day in a coal-mine (Church Lane Colliery), near Barnsley, by a man called Timothy Naylor. I suppose it must have come in the timber used for props, which is foreign, and comes mostly from Norway. It probably would be in either the pupa or larva state. It settled on the neck of the man as he was knocking out the timber that supports the roof of the workings. It was injured in pulling it from his neck.—*W. J. Cope; Barnsley, August 21, 1874.*

[The beetle is *Acanthocinus ædilis*; one of the family of longicorn or capricorn Coleoptera.—*E. Newman.*]

L. D. J.—The minute animal attached to the butterfly, *Epinephele Janira*, is an *Acarus*. I believe it is the same as that found by the late Dr. Leach on the larger *Tipulidæ*, and named by him, *Ocypete rubra* (Linnean Transactions, vol. xi.). I cannot, however, feel certain of this, as it is very probable different parasites are attached to different genera. My knowledge of these minute *Acari* is very limited indeed.—*E. Newman.*

A. H. Bright.—Can any of your readers inform me whether *A. Atropos* appeared in England prior to the introduction of the potato by Sir W. Raleigh.—*A. H. Bright; Knotty Ash, Liverpool.*

[It is scarcely probable that the occurrence would be recorded before the moth had a published name, and, this being so, I fear we cannot expect much information.—*E. Newman.*]

W. Thomas.—The caterpillar is that of *Acronycta Psi*, the dagger moth.—*E. Newman.*

H. Jones.—The moth is *Hadena dentina*, the stone fly—*Phryganea grandis*.—*E. Newman.*

Metal Drawers for Insect Cabinets.—Can you, or any of your readers, tell me if any attempts have been made to construct cabinet drawers of metal? Wood, however well seasoned, being liable to shrink, is not a quite satisfactory material. Some time ago I had a box made of tin: the edge of the sides was bent over to hold an India-rubber tube,

against which a plain sheet of glass was pressed by clips; this was quite air-tight, but cumbrous, and not suited for a sliding drawer. It has since struck me that a very simple drawer might be made with an India-rubber band fastened all round the edge,—as in the tin tops made for jam-pots, which would fold over the glass and make an air-tight junction. I shall be much obliged for any suggestions.—*W. C. Marshall*; 8, *Spa Buildings, Cheltenham, August 22, 1874.*

[Practically I know nothing of the wood shrinking. I have three cabinets, aged respectively forty, thirty, and twenty years; neither has begun to shrink. If you pay a proper price (twenty-one shillings per drawer,—they cannot be made under), cabinets, I believe, never shrink. I do not write thus to exclude suggestions, but to inform beginners who may wish to avail themselves of my experience.—*E. Newman.*]

Extracts from the Proceedings of the Entomological Society of London, July 6th, 1874.

Sir Sydney Smith Saunders, C.M.G., President, in the chair.

Haltica ærata—*Walnut eaten by a Lepidopterous larva.*
—Professor Westwood exhibited specimens of *Haltica* (*Batophila*) *ærata*, which he had found to be very injurious to young rose-leaves. Also a portion of a walnut attacked by a Lepidopterous larva, probably a Tortrix, but he was unable to name the species, as it produced only an Ichneumon. It was the first instance he had known of a walnut being attacked by any insect in this country. Mr. M'Lachlan suggested that the larva might be that of *Carpocapsa splendana*, a species which usually feeds on acorns; and Mr. Moore stated that he had bred that species from a walnut.

Yucca Moth.—Professor Westwood made some remarks on the *Yucca Moth* (*Pronuba Yuccasella*, *Riley*), of which some fifty specimens had been sent to him, in the pupa state, by Mr. Riley; but he had only succeeded in rearing three of them. He exhibited a drawing of a portion of the insect, showing the peculiar form of the palpi, which were specially adapted for collecting the pollen, which it transferred to the

stigmatic surface as the insect passed from flower to flower. He pointed out the great importance of the insect in the economy of nature, as it appeared to be the only agent by which the plant was rendered fertile. He directed attention to a description of the insect and its habits by Mr. Riley, in his 'Sixth Annual Report of the Insects of Missouri.'

Black Hive Bees.—Professor Westwood also exhibited some bees, which had been sent to him from Dublin, having been found attacking the hives of the honey-bees. They were smaller than the honey-bee, and black, and he considered them to be merely a degenerated variety of *Apis mellifica*. He suggested the probability of their being identical with the "black bees" mentioned by Hüber. Hüber also had spoken of bees, which he called "Captains," which were furnished with "coronets" on their heads; but he suspected that these coronets might have been merely the pollen which the insects had collected.

Scotch Coleoptera.—Mr. Champion exhibited *Amara alpina* and other beetles, taken at Aviemore, in Inverness-shire.

Turkey Carpet eaten by a Dipterous larva.—Mr. Grut exhibited larvæ, pupæ, and imago, of a Dipterous insect, which had been found, in the larva state, in an old Turkey carpet. The larva was very long, slender, and serpentiform, white and shining, and had somewhat the appearance of a wireworm, only much longer, and without feet. Professor Westwood thought it might belong to the genus *Scenopinus*.

Parasites of a Bat.—Mr. Bond exhibited some minute parasites from a bat, probably identical with *Argas Pipistrellæ*; and also some Acari from a small species of fly: both were from the Isle of Wight.

Variety of Thecla Rubi.—Mr. W. C. Boyd exhibited two specimens of *Thecla Rubi* from St. Leonard's Forest, differing from the ordinary type in having a pale spot in each fore wing.

Ash-leaves affected by a Dipterous Insect.—Mr. W. Cole exhibited leaves of ash affected by some small Dipterous larvæ (probably *Cecidomyia*), which caused the two edges of the leaflets to turn upwards and meet above, thus assuming a pod-like form. They were from West Wickham Wood.

Machærium maritimum.—Mr. F. Smith exhibited some earthen cocoons found in a salt marsh, at Weymouth, by

Mr. Joshua Brown. They proved to belong to a Dipterous insect (*Machærium maritimum*), one of the Dolichopidæ. They were found lying on the wet, salt sand or mud, and mostly fell to pieces when touched. [See p. 207.—*E. Newman.*]

Agrotera nemoralis.—Mr. S. Stevens exhibited specimens of *Agrotera nemoralis* and other Lepidopterous insects from Abbot's Wood, Lewes.

Death of Mr. Alfred Owen.—It is with the deepest regret I announce to the readers of the 'Entomologist' the death of my much-loved and valued friend, Alfred Owen. He died at Llanfairfechan, North Wales, on the 31st of July last, aged forty-two, after a few days' illness, brought on through taking cold, which ended in an attack of congestion of the lungs. My acquaintance with him commenced about eight years ago, through our mutual liking for Lepidoptera; and since then we have passed weeks together at a time in the New Forest, Hampshire, and other localities, in pursuit of this study. Mr. Owen was in every sense of the word a thorough gentleman, an ardent lover of Natural History, and a most interesting and well-informed companion. He leaves behind him a most valuable collection of Lepidoptera, rich in varieties, in which he took peculiar delight. The last month of his life was passed at Llanfairfechan, with myself and family. He was anxious that I should record the capture of *Acidalia contiguaria*, at Penmaenmawr, by my son Henry, and afterwards both by himself and myself on the rocks between Penmaenmawr and Llanfairfechan. The locality of this insect I understand has not been before discovered, and those who possess specimens are indebted for them to my friend, Mr. Greening, of Warrington, who was fortunate in rearing and keeping up a breed from the eggs laid by a moth taken some years ago at Bangor, which moth is in the cabinet of my late friend. We also captured *A. Ashworthii* at the same spot, and *Cucullia Absinthii* in the garden of the house where we resided. The intelligence of the death of Mr. Owen will, I am sure, cause deep sorrow to many of your readers. As regards myself, in him I have lost a friend and companion such as can never be replaced.—*Samuel James Capper; Huyton Park, Huyton, August 6, 1874.*

THE ENTOMOLOGIST.

No. 134.]

OCTOBER, MDCCCLXXIV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER née WEISE.

16. *Cynips hungarica*.—This species produces a spherical, rather hard yellowish brown gall, thirteen to thirty-five millimetres in diameter. Over the whole surface are scattered small conical excrescences: these are generally short, and either obtuse or slightly pointed; they are united by raised keels, which are more or less obtuse, and often rather indistinct. In some specimens the excrescences are strongly developed, while in others they are very indistinct. A section of the mature gall exhibits a brown spongy parenchyma, which has an irregular cavity in the centre; the thin-walled inner gall is seated there on a stalk proceeding from the reticulation. This, which is the largest one-chambered gall observed by me in the country near Vienna and in Hungary, occurs on *Quercus pedunculata*, falls off in the autumn, and is

Fig. 16.



CYNIPS HUNGARICA (and in section).

pierced by the perfect insect in the ensuing spring. However, I am not quite certain about this matter.—*G. L. Mayr.*

Synergus melanopus, *S. pallicornis*, and *Ceroptres arator*, are mentioned by Dr. Mayr as the inquilines of this gall; they all appear in May, the second year.—*Francis Walker.*

Fig. 17.



CYNIPS TINCTORIA
and in section).

17. *Cynips tinctoria*.—This species furnishes the Levantine ink-galls of commerce, but the galls we receive from Turkey differ in size and colour from those which grow in Central Europe. The gall in this neighbourhood is very much like small specimens of the last-described gall. It is from ten to fifteen millimetres in diameter, of a reddish brown colour, bare, and beset with subglobular, wart-like excrescences. It consists of a dense reddish brown reticulation, and grows together with the inner gall, which is woody, of a light yellowish colour, and well defined. It grows out of the axils of a shrubby form of *Quercus subsessiliflora* and *Q. pubescens*. In the latter end of autumn it is no longer firmly attached to the branch; therefore a great number are

detached by the winter winds; nevertheless, some remain on the twigs until the spring. The perfect insect emerges in the spring.—*G. L. Mayr.*

Six species of *Synergus* are enumerated by Dr. Mayr as the associates of *Cynips tinctoria*, *S. melanopus*, *Reinhardti*, *pallidipennis*, *Hayneanus*, *pallicornis*, and *vulgaris*. The three following appear in the second year:—*S. Reinhardti* in June, *S. pallicornis* in May, *S. vulgaris* in March. Dr. Mayr mentions *Callimome regius* as the parasite of *Cynips tinctoria*.—*Francis Walker.*

Sphinx Convolvuli at Maidenhead.—It may interest some of your readers to learn that I took a fine male *S. Convolvuli*, on the morning of the 9th of September, at Maidenhead. I have never heard of one being caught here before.—*W. Harper; Norfolk Road, Maidenhead, Berks, Sept. 12, 1874.*

Notes on the Wing-bones of the Two-winged Flies.

By FRANCIS WALKER, Esq.

(Continued from p. 149.)

BONES.	AREOLETS.
<i>j</i> Mediastinal.	B Subcostal.
<i>g</i> Subcostal.	J Mediastinal.
<i>k</i> Radial.	K Radial.
<i>c</i> Cubital.	C' Cubital, 1st.
<i>c'</i> Cubital, 1st branch.	C'' Cubital, 2nd.
<i>c''</i> Cubital, 2nd branch.	C''' Cubital, 3rd.
<i>d'</i> Præbrachial, 1st branch.	B' Præbrachial.
<i>d''</i> Præbrachial, 2nd branch.	B'' Pobrachial.
<i>m</i> Pobrachial, 1st branch.	D' Subapical, 1st.
<i>y</i> Pobrachial, 2nd branch.	D'' Subapical, 2nd.
<i>v</i> Anal.	Y Anal.
<i>w</i> Subaxillary.	V Subanal.
	I Discal.

Fig. 37.—Leptis.

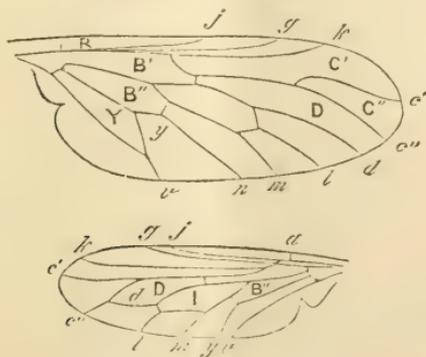


Fig. 38.—Bombylius medius.

Fig. 39.—Toxophora.

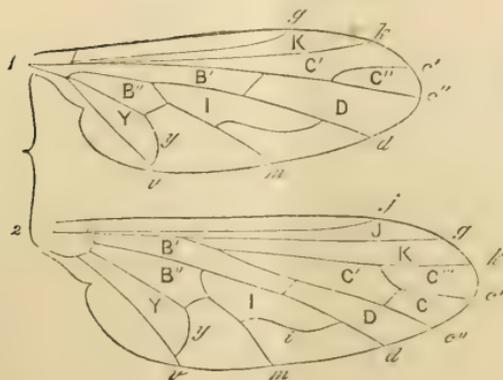


Fig. 40.—Nemestrina.

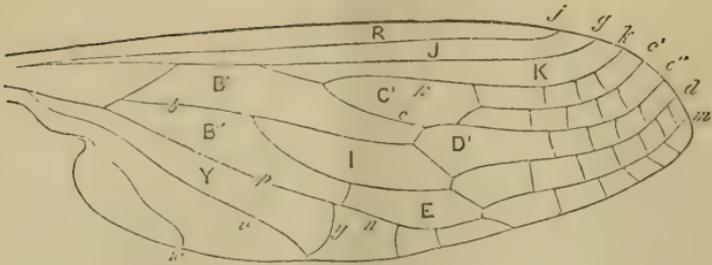


Fig. 41.—Scenopinus.

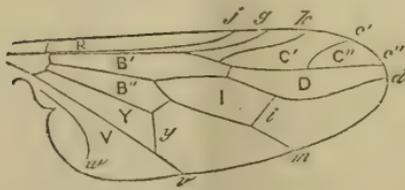
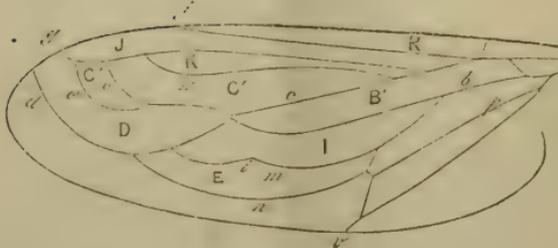


Fig. 42.—Hirnoneura.



THE Tabanidæ and Asilidæ are distinguished by their powerful flight, and the Bombylidæ (figs. 38, 39) are remarkable on account of their extreme quickness on the wing. In fig. 38 the first branch of the præbrachial bone joins the second branch of the cubital, and thereby the subapical areolet is closed far from the border of the wing. There is an

externo-medial bone in fig. 38, between the second branch of the præbrachial and the first branch of the pobrachial. In fig. 39 the subapical areolet is open, and the externo-medial bone, noticed in fig. 38, does not extend to the border, but closes the discal areolet at some distance from the border. In this figure there are three cubital areolets connected by means of a short additional transverse bone, and the mediastinal bone is apparent, so also the mediastinal areolet. In fig. 40 there is an extraordinary multiplication of bones, so that the wing has a dragonfly-wing appearance. The family represented in this figure has its highest development in South Africa, and several species of it occur in Central Asia, and among its relations it is especially suggestive of heat and of dryness of soil. In passing from fig. 40 to fig. 41 there is a transition from the greatest activity to the greatest inactivity of flight in the Diptera. The structure of the wing-bones is comparatively simple in fig. 41, yet not more so than in many genera whose flight is strong. In fig. 42 there is a great change in wing-bone structure: some of the bones are curved forward, the cubital bones do not extend to the border, the discal areolet is very long, and has behind it the second pobrachial areolet; the first and second cubital areolets are closed. The family Bombylidæ are well known by the great variety of structure of their wing-bones, and by the elegance of the markings in the bodies and in the wings. In some other more extensive families there is a comparative sameness of wing-structure, and consequently less variety of flight.

There is much interest in observing the very numerous modes of flight in the Diptera, and in comparing them with the differences of wing-structure by which they are occasioned. When the flight is most quick or powerful there are generally many wing-bones, but in some cases there is much strength of wing with few bones, and much weakness of the same when the bones are numerous. The bones are subservient to the muscles at the base of the wing and to the structure of the body, and all these are secondary to the electric currents, which, when active by heat, are the means of flight, the wing-bones being as conductors to them.

FRANCIS WALKER.

Our Common Wasps. By HENRY REEKS, Esq., F.L.S.

THERE are four species of wasps, besides the hornet (*V. Crabro*), which I presume are very common, and generally distributed throughout the British Isles, namely, *Vespa rufa*, *V. germanica*, *V. sylvestris*, and *V. vulgaris*. Of these *V. sylvestris* is the connecting link between the ground-building and the tree-building wasps, as it does not confine itself particularly to either situation, although it is more frequently found building under the thatch, or tiles of walls, outhouses, &c.

I quite agree with you in advising your readers (*Entom.* vii. 211), where practicable, to take the whole nest, and examine and pin out at least a good series of the inmates: this is certainly advisable, and absolutely necessary with new or little-known species; but with the above-mentioned common species there cannot be much confusion,—unless books tend to make such confusion,—for they are so very distinctively marked, that when once known they can scarcely ever be mistaken again. I have no work on wasps, nor any specimens by me for scientific comparison, but I trust the following general remarks will enable most of your readers to recognize at a glance the common forms mentioned above:—

V. rufa has a black anchor-shaped mark down the middle of the face, without a dot on either side of the lower end of the mark. The abdomen is banded, as usual, black and yellow, with a dash of rufous on the 1st and 2nd segments, but most plainly on the 2nd. The black bands are very narrow, with a tongue-like mark of the same colour beneath and joined to each band, and with a conspicuous black dot on each side of the tongue-like projection. This species is the smallest of the four here mentioned, and builds its nest under ground, using sound wood for its construction, and working until very late in the autumn, even to the beginning of November.

The species most resembling *V. rufa* is *V. germanica*, but this is easily distinguished by its never having a perfectly-formed anchor-shaped mark on the face, and also by always lacking the rufous markings on the 1st and 2nd segments of the abdomen. The face of *V. germanica* is most commonly

marked with a black line, and with a dot on either side of it (thus .l.), but occasionally the line is wanting, and replaced by a third dot (thus .:.); otherwise the insects are much alike, in habits as well as appearance: both build underground, use sound wood, and work on until late in the fall. Both species may now be taken in abundance at out-door grapes, pears, fallen apples, &c., as well as in grocers' shops, and windows generally.

V. sylvestris has a clear yellow face, with one minute central black dot scarcely larger than the point of a pin, and in some specimens scarcely visible at all. The bands of black and yellow on the abdomen are of nearly equal width throughout, and wanting the tongue-like projections so observable in *V. rufa* and *V. germanica*, but the two small black dots in each yellow band are generally present, especially on the first three segments of the abdomen nearest the thorax. This species is therefore best known by its clear yellow face. It builds, as stated above, occasionally underground, but generally suspended from trees, roofs, &c., and uses sound wood; but the nests are deserted, and the males and workers dead, by the middle or latter end of August, so that the species could not be found now unless a queen were disturbed from her hybernaculum.

V. vulgaris very closely resembles *V. sylvestris* in the markings on the abdomen, but may always and easily be distinguished from that species by its well-defined anchor-shaped mark on the face. It builds its nest of rotten wood generally underground, but sometimes in hollow trees or in thatch, but never suspends it in the open air. The males and workers are never seen after August.

To sum up, *V. vulgaris* and *V. sylvestris* have the bands on the abdomen resembling each other, but the faces very different. *V. vulgaris* and *V. rufa* have both well-defined anchor-shaped marks on the face, but the abdomens are very differently banded. *V. germanica* and *V. sylvestris* occasionally approach each other in the markings of the face, but the markings on the abdomen will at all times distinguish them.

I would therefore advise your readers to collect a few specimens of *V. germanica* and *V. rufa* this autumn, before the males and workers die off; and next summer they may probably obtain *V. sylvestris* and *V. vulgaris*.

Of *V. norvegica* and *V. arborea* I know nothing practically, except that I met with the former, I believe, in Newfoundland.

HENRY REEKS.

Thruvton, September 8, 1874.

Entomological Notes, Captures, &c.

Captures at or near Eastbourne during the latter part of July.—*Sesia chrysidiformis*, one; worn. *Spilodes palealis*, about twenty; many much worn. *Stenia punctalis* perfectly swarmed the first day I was out (July 16th), and in good condition; but having only a few boxes, which I was reserving in the hopes of meeting with more *Chrysidiformis*, I only took some half a dozen; and when I went again about a week afterwards, during which it had been rather windy weather, I could only find a few very worn examples. The same remarks apply precisely to *Xanthosetia Zoegana*, *Cochylis Francillana*, and *C. Dilucidana*. I also took specimens of *Lithosia complana*, *L. griseola*, *Pyrausta punicealis*, *P. purpuralis*, *Odontia dentalis*, *Endotricha flammealis*, *Cataglyphis lemnales* (swarming), *Botys fuscalis*, *B. asinalis*, *Spilodes cinctalis*, *S. sticticalis*, *Pionea stramentalis*, *Scopula ferrugalis*, *S. olivalis*, *Bryophila glandifera* (commonly), *Ephyra porata*, *E. pendularia*, *E. omicronaria*, and *Aicialia trigeminata*. I never saw *Lycæna Corydon* in such abundance, whereas of *L. Adonis*, which I have before found plentifully there, I did not see a specimen.—*Geo. P. Shearwood; Cedar Lodge, Stockwell, S.W., September 6, 1874.*

The Butterflies of Dry Drayton.—I am sure all those who take an interest in our British butterflies will duly esteem the valuable observations published by the Rev. F. A. Walker; and it is much to be wished that entomologists who are resident in country districts would follow this good example, and tabulate each season the times of appearance of such butterflies as come under their observation,—no difficult matter, as few have in any district more than fifty of our species. Such chronicles will not only add to our entomological lore, but throw light on the connexion between weather phenomena and insect life. If there is an omission in the

paper on the butterflies of Dry Drayton, it is that of information as to the nature of the district, how much of the land is cultivated or pasture, &c., the prevalence or absence of wind, the elevation, soil, and the character of the Flora. Should similar papers be hereafter prepared, some brief particulars of that kind would be acceptable.—*J. R. S. Clifford.*

Vanessa Antiopa near Newcastle.—*Vanessa Antiopa* has been seen, but not captured, by the person to whom I am indebted for the specimen I possess. It appeared on the 11th of September, within a few yards of the spot—in Jesmond Dene, near Newcastle—where he made the capture two years ago; willows abound in the neighbourhood.—*W. Maling*; 22, *Jesmond Road, Newcastle-on-Tyne, September 17, 1874.*

Argynnis Niobe in Kent.—Your correspondent, Mr. Wigan, thought it necessary, I presume in his own defence, to indicate the locality, though not with precision, where he took this butterfly; still, it is to be regretted that the result will be a hunting-up of the spot, and a hunting-down of the luckless *A. Niobe*, which is likely to have a short history, though an interesting one, as a British species; for though ravines or hollows, such as the one described, occur in other parts of Kent, the insect is so closely connected with the wild heart's-ease that it is not probable we shall find it where that plant does not grow pretty freely; and, as far as I have observed, it does not appear to be common in the county. However, I will venture to express a hope that the next captor of *A. Niobe* will keep the exact spot a profound secret; for as Carlyle observes:—"He who has a secret must not only hide it, but he must hide that he has it to hide."—*J. R. S. Clifford.*

Postscript, September 19th.—Some entomologists are much "exercised in spirit," as the old authors used to say, over the recent capture of this butterfly in Kent, and seem to fancy there is still a loophole for doubt. I would suggest an easy settlement of the question. It may be premised that the captures made this year in the place named could not have exterminated the species, as it had, according to the account published, been on the wing some time. There must, therefore, be larvæ in the locality, and within a limited range of the spot where the imago were

taken. If the gentlemen who have made acquaintance with *Argynnis Niobe* will associate with themselves one or two entomologists of known skill in larva-hunting, and, without indicating the precise position of the valley or hollow between Wye and Ashford to the entomological world generally, arrange to make a careful united search for the larvæ of *A. Niobe* during the spring, we may possibly get a result conclusive enough to satisfy all sceptics.—*J. R. S. Clifford.*

[I think Mr. Clifford can never have hunted for the larvæ of *Aglaia* or of *Adippe*, or he would scarcely have proposed so hopeless a task as seeking for those of *Niobe*.—*E. Newman.*]

Food-plant of Orgyia gonostigma.—May I venture to remind my friendly correspondent, Mr. Robinson, of the old saying, that “latet dolus in generalibus.” Had I been disposed to generalise a short time ago, with reference to the food-plant of the species cited, I should have said, speaking of it from a knowledge of its habits in the Wimbledon locality, that probably its proper food-plant was oak, though it might occasionally be found on the hazel in summer, and on sallow in spring. I know that in confinement Wimbledon larvæ take oak by preference. Now, at Coventry, *O. gonostigma* chooses, as Mr. Robinson finds, blackthorn and whitethorn, preferring the latter. And my friend, Mr. Barrett, of the South London Entomological Society, who was acquainted with the Doncaster locality, tells me that there the larvæ were taken on the whitethorn. Were the species to become more common with us, we might discover that—like its near relative, *O. antiqua*—this is inclined to be a general feeder. The apparent difficulty in the way of its increase in England is the peculiarity of its life-history; the hybernation, which carries it through the cold months, endangering the lives of many of the larvæ, as they seem to protect themselves very slightly. As most breeders know, by a little management, the larvæ of *O. gonostigma* may be got to feed up the same year in which they are hatched; but I have been pursuing an investigation of some slight interest, namely, to ascertain if, at any point we please during the larval growth, we can, by placing them in a lower temperature and withdrawing the food, induce individuals to become torpid. Though hardly able to say as yet that my experiments are conclusive, so far as they have gone they would show

that, after the last ecdysis is passed, the larvæ must then either attain maturity in the autumn, or, if not allowed to do that, they will die off. I should much like to be informed what reasons subsist in proof of the theory, propounded by the old naturalists, that the female of *O. gonostigma*, like that of *Liparis auriflua* and other species, clothes her eggs with down, because the scorching rays of the sun might prove injurious to them.—*J. R. S. Clifford.*

Food-plant of Orgyia gonostigma.—In the last number of the 'Entomologist,' Mr. H. Robinson, of Coventry, kindly gives us other food-plants on which the larvæ of *O. gonostigma* will feed, namely, blackthorn and whitethorn; but I do not see how he can state that oak as a food for this larva is a mistake: we have always found it feed more freely on this than anything else. This season I have been very successful in getting all the larvæ of this species, that I had from eggs deposited by the first brood, into the imago state (unfortunately small specimens). These larvæ I supplied with oak and willow, and I found that they fed very little on the former, while any of the latter was to be obtained. I certainly think that my success in getting all my larvæ to change into pupæ was on account of giving them a constant supply of fresh willow. On one occasion I placed a few young larvæ of *Gonostigma* in a jar, with some other larvæ I had feeding on beech, and was not a little surprised to find that they ate this rather freely. I certainly, therefore, think that the larva of *Gonostigma* is, like that of *Antiqua*, a universal feeder.—*J. R. Wellman; 14, Portland Place North, Clapham Road, S.W., September 23, 1874.*

Do some of the Larvæ of Saturnia Carpini Hybernate?—Has it before been noticed that some of the larvæ of *Saturnia Carpini* apparently hibernate? In June I took a young brood, newly emerged, on the top of a little tuft of heather. They gradually came to grief, one way or another, all but two. Of these one is now full fed, and thinking about making its cocoon; the other is only about eleven lines long, and very small altogether: it has remained this size, and in the penultimate stage of colouring (yellowish green, and black markings), for the last five weeks; yet it eats, and seems quite healthy.—*W. D. Robinson-Douglas; Orchardton, Castle Douglas, N.B., September 3, 1874.*

Leucania albipuncta and *Catocala Fraxini* at Folkestone.

—This year I have again had the pleasure of taking *L. albipuncta* at Folkestone, namely, single specimens on the 1st and 2nd of September respectively. I also had the unexpected good fortune of capturing at Folkestone, on the 5th of September, a worn example of *C. Fraxini*.—*Charles Oldham; Newton House, Amhurst Road, Hackney, September 21, 1874.*

Is not Dianthæcia Capsincola Double-brooded?—I took fresh specimens of *D. Capsincola* last May, and bred a long series last month from larvæ collected during July. I am taking the larvæ again now. Only one brood is mentioned—the August one—in Newman's 'British Moths.'—*J. A. Lilly; Paignton, September 19, 1874.*

Epunda nigra and *Noctua glareosa* at Sherwood Forest.—

On the 27th of August I took a fine specimen of *E. nigra* at sugar: I took it when the moths were swarming, just after (or rather during) a thunder-shower. On the 7th of September I took *Noctua glareosa* in profusion on the heather: a friend was with me, and for several succeeding nights we found their numbers, to all appearances, undiminished.—*S. L. Mosley; Edwinstowe, September 12, 1874.*

Noctua sobrina and *Pachnobia alpina*.—In your notice of these moths from me in last month's 'Entomologist,' you say, at the head of each, "In Rannoch." That is an error, as neither species were taken in Rannoch, but both in Breadalbane, much to the south of Rannoch, where I did some successful collecting.—*John T. Carrington.*

Notes on Trichiura Cratægi.—The information we gain from books on the economy of this species is somewhat meagre and unsatisfactory, and it is probably owing to this that we find many cabinets without this insect. As far as my experience and information go, this species seems to occur pretty generally throughout the south-eastern counties of England. The moth leaves the pupal state from the 20th of August to the middle of September: it seems to emerge invariably between five and seven in the evening; the females remain almost motionless, but the males dash about excitedly for an hour or so between six and seven in the evening. They have, doubtless, a second flight in the small hours of the morning, though I cannot vouch for this. It is, however,

more than probable, from the fact that copulation does not take place till after midnight. The moths remain paired till five o'clock in the morning, a circumstance the most remarkable from the fact that the (British) species most closely allied to this remain in copulation but a very short time. The female does not begin to lay till the next day. The number of eggs deposited varies between one and two hundred: they are of a pale brown tint, thickly covered with dark-coloured down. The eggs hatch in the succeeding spring; some in my possession hatched this year, on March 24th. The larvæ feed on both whitethorn and blackthorn, but seem to prefer the former in a state of nature: they are generally full fed from the 10th to the 20th of June, when they may be found on the road-side hedges in company with *Neustria*, &c. The larvæ are very variable, and strikingly handsome. The cocoon of this species is composed of fine particles of earth, and is lined inside with a coating of white silk: it is very compact, resembling closely that of *Pæcilocampa Populi*.—*G. H. Raynor; Hazeleigh Rectory, Maldon, Essex, Sept. 12, 1874.*

Life-history of Ligdia adustata.—The eggs were laid during the third week in July; the caterpillars were hatched on the 1st of August. When full grown they usually rest in a straight position along the stem of their food-plant, *Euonymus Europæus* (common spindle tree), to which they have a marked resemblance in colour. The head is slightly larger than the 2nd segment; the face almost white, mottled with reddish brown, and surrounded by a band of very dark brown, which becomes lighter in shade as it approaches the 2nd segment; on each side of the head, in a line with the spiracles and adjoining the 2nd segment, is a patch of very dark brown. The 2nd segment is smaller than the 3rd, and the 3rd smaller than the 4th, from which to the 11th the body of the caterpillar is of uniform size, and then decreases. On the anterior dorsal area of the 5th, 6th and 7th segments there is a small square brown patch, edged on both sides with white; this marking occurs again, but very indistinctly, on the 10th segment. The sides of the 5th and 6th segments are ornamented with an irregularly-shaped patch of various shades of brown, interspersed with small white marks. The legs are brown; the first pair of claspers, together with the skin-fold above them, are also brown, the latter variegated

slightly with white; the anal flap and second pair of claspers are tinged with the same colour. The spiracles, which are very indistinct, are white, edged with brown. The caterpillars descended to the earth about the 25th of August, and spun a slight cocoon just below the surface.—[Rev.] P. H. Jennings; 11, *Maison Dieu Road, Dover, September 7, 1874.*

Life-history of Cidaria picata.—The eggs were laid in confinement, singly, on the leaves and stems of *Alsine media* (common chickweed), the last week in July. The young caterpillars were hatched on the 9th of August, and moulted three times, about the 16th, 23rd and 30th of the same month. When at rest they lie extended on the stem of the food-plant, and when disturbed assume the form of an Ionic volute. The body is nearly uniformly cylindrical throughout its length, slightly increasing towards the extremities. The head and face are of a light yellowish brown, marked with spots and short lines of a deeper shade. The colour of the back between the spiracles varies in different individuals from pale olive-green to reddish brown. The whole of this space is of two shades, the lighter represented by very irregular lines, at one time confluent and then separate, with very irregular edges. There is a black patch in the middle of the 7th, 8th and 9th segments: this becomes less distinct as the caterpillar increases in size, and in some cases altogether disappears. The sides below the spiracles and the ventral space are of a lighter shade than the back, the line of demarcation being well defined. The whole of this portion bears a considerable resemblance to the back, as far as the markings are concerned, being made up of very irregular lines of alternate lighter and darker shades. The legs and claspers are of the lighter shade. At the sides of the junctures of the segments there are spots of a much darker colour. The spiracles are black. The caterpillars disappeared about the end of the first week in September, making a slight cocoon on the surface of the earth, and changing to a chrysalis of a light reddish brown.—*Id.*

Cidaria picata Double-brooded in Confinement.—During the second week in this month (September) I had a few imagos of this insect emerge from the pupæ of a brood which fed up about the middle of August.—*Id.*

The Food of Arctia Menthastræ.—I have seen larvæ of this

species on the currant-bushes in gardens, and often on the common lilac. It is not by any means restricted in its food to low plants; and hardly an entomologist has not, at some time or other, beaten it from the sloe or oak in the course of his researches. Young individuals of *A. Caja* will sometimes feed on various bushes in gardens during the autumn, taking to the low plants in the early spring. The individuals noted by Mr. Wittich may belong to the latter species.—*J. R. S. Clifford.*

Eupithecia Pygmeata.—On the 23rd of August I took a fine specimen of this insect at Witherslack. I also took it flying along with *Grapholita obtusana* the last week in May, which is the usual time of its appearance in this district. It seems quite strange to see the *Helianthemum* in full flower again, as well as the wild thyme: the hot weather soon burnt them up on the limestone, and since the rain has come on all seems fresh again. There were very few insects: *Argyresthia spiniella*, *Coriscium cuculipennella*, *Gelechia similella*, *Laverna miscella*, were among the best species I saw. The intense heat has quite killed lots of plants: I could not see a single gentian for *Asychna profugella* to feed on.—*J. B. Hodgkinson; 15, Spring Bank, Preston, September 6, 1874.*

Bombus Lucorum.—One evening last week, being on Shirley Common mothing, at about 11.30 p. m., I netted what seemed to be, by the light of the lantern, a moth hovering over the flowers of the bramble. On examining my captive more closely I found, to my surprise, that it was not a moth, but a humble-bee (*Bombus Lucorum*). Can any of your readers say whether it is usual for these insects to fly by night? I never before remember to have seen, or heard of such a habit.—*W. A. Forbes; West Wickham, Kent, September 11, 1874.*

Death from the Sting of a Hornet.—You certainly have some entomological readers in the neighbourhood of Reading. Could you not get them to investigate this case more thoroughly? Not that I think it at all improbable that a nervous, excitable person may die through the sting of a hornet, wasp, or bee; in fact, if I remember rightly, the Hon. Grantley F. Berkeley, some few years ago, recorded in the 'Field' newspaper the death of an old man from the sting of a bee. This occurred in the garden of Mr. Lovegrove, Waldron, near Lambourne,

Berks,—I think. What I want to know is this,—Was it a hornet or a wasp? I ask this because I never yet saw a hornet's nest in the ground, and never heard of an authentic instance of one being found in that situation. But then, on the other hand, I have never resided anywhere where hornets may be said to be very common; still I have known of some dozen nests within a radius of two miles, but none of them were in or very near the ground, but in roofs of cottages, outhouses, and in hollow trees; and these are decidedly the favourite resorts. Perhaps, however, Mr. F. Smith, or some other Hymenopterist, will kindly say if I am wrong. Anyone would think that even a child, who had once had a hornet shown him, could never again confound it with a wasp, or *vice versâ*; but you would be surprised at the ignorance, in this matter, of many well-informed persons, who certainly ought to know a wasp from a hornet, there being quite as much difference in size as between a hive-bee and a humble-bee (*Bombus terrestris*). Some years ago my friend the late Mr. S. Stone, wrote to me to find out some hornets'-nests, and I made several inquiries for him in the neighbourhood. One intelligent(?) keeper said that he did not *then* know of a hornet's-nest, but he had seen dozens of them in previous years; and he perfectly remembered one very strong colony, that attacked everyone who passed near the nest, which, he said, *was suspended from the under side of a fir-bough*. This statement at once floored all my previous faith in his tales of hornets, their nests and stings; and he likewise told me that on another occasion one crawled into his boot and stung his foot. That the hornet could raise a colony from a nest suspended in the open air is a simple impossibility; the first rough wind would blow its frail, but beautiful nest, constructed of rotten wood, to atoms. Even when taken for the cabinet it requires most careful handling, or it will crumble to pieces in the hand with only a very slight pressure. The sting of a bee or wasp has not the slightest effect on me, and yet I have a dread of being stung; but my youngest brother—who is very fond of bees, and can do almost anything with them—suffers severely if one stings him, causing him to turn purple all over, and with a dangerous swelling of the tongue; and yet the sting of a wasp has no ill effect upon him whatever.—*Henry Reeks; Thruxton, September 7, 1874.*

Argynnis Lathonia at Broadstairs.—I sent you *Lathonia* in great haste on Saturday evening, and may I beg your acceptance of it. I have taken five near Broadstairs, all in one field, between St. Peter's and Broadstairs. I took one three weeks ago in the same spot, which I sent to the Rev. P. H. Jennings, of Longfield Rectory. I do not know how they will travel, but they were all in good condition when caught.—*W. Wigan; Wincheap, Canterbury, September 18, 1874.*

[Mr. Wigan has my sincere thanks for this valuable present: it arrived in the finest state of health and activity. I trust that notice of any other captures of this butterfly will be sent as soon as made.—*E. Newman.*]

Smerinthus ocellatus emerging in September.—I had the larvæ of *S. ocellatus* feeding on apple through July: one turned to a pupa on the 31st July, and scarcely buried itself; it could be seen just under the surface of the earth, and came out on the 1st of September quite perfect, and the colours very clear and rich; a male, but certainly smaller than usual. Is it not an uncommon occurrence? I ought to have said that the cage was kept in a room with windows looking to the north and east, and the cage quite away from any sunlight.—*H. C. Hodges; The Cottage, Walton-at-Stone, near Hertford, September 12, 1874.*

[This is unusual, but I have known other instances.—*E. Newman.*]

The Plague of Ants.—Since so much has been written in the newspapers lately concerning the so-termed "plague of ants," perhaps the following may be of some interest:—When travelling from Plymouth to Falmouth a gentleman mentioned in the course of conversation that a remarkable incident had occurred to some friends of his, on the 20th of August last, when cruising in their yacht off the Longships Lighthouse, on the coast of Cornwall, about seven or eight miles from Falmouth. They said that they had sailed through millions upon millions of winged ants, and that the sea was for a long distance black with them; indeed, that they amused themselves for a long time in dipping them up in buckets, and that the waves that the vessel threw off from her bow in dividing the water were black instead of white. The following I copied from a Plymouth newspaper:—"The Ant

Invasion.—The ant invasion, described by so many, was observed in the north of Cornwall on Wednesday. Driving with my family and some friends to Redruthan on that day, we were surprised by a sudden gust of wind, bringing with it an immense swarm of winged ants, too many of which, for our comfort, located themselves upon us, and it was no easy task to get rid of them. Upon our arrival at Redruthan we found a large portion of the sand darkened with dead ants, evidently drowned; each receding wave left a wide mark along the beach.”—*J. Galcombe; Stonehouse, September 5, 1874.*

[I have described in my ‘Familiar Introduction’ how the male and female emerge from the pupa state at the end of August, furnished with wings. A report of this “extraordinary occurrence” and “unheard-of phenomenon” appears annually in our newspapers, just before the autumnal equinox.—*E. Newman.*]

Correction of an Error.—I am sorry to say that I was wrong in saying the galls, mentioned by me in the July number (*Entom.* vii. 165), were those of *Cynips lignicola*. A day or two after I sent you the notice the perfect insects emerged, thus showing that the gall had arrived at maturity. This gall, of which I enclose specimens, was very abundant on some oaks, near Edinboro’, during the past summer. When fresh it is soft, succulent, of a green colour tinged with pink, and, unlike other galls, was by no means unpleasant to the taste. Can you tell me the name of its maker?—*W. A. Forbes.*

Answers to Correspondents.

*Miss L*****: Pollen Masses of Orchids.*—The “strange-looking objects” attached to the “tongue” (more properly maxillæ) of a moth are neither Fungi nor Acari, but masses of pollen from the blossom of some Orchid. These curious objects have frequently puzzled me in my early collecting days; but on one occasion in Birch Wood, being in company with the late William Christy, that accomplished botanist explained the seeming mystery. Long after this, and indeed until I read an abstract of Mr. Darwin’s really wonderful observations, I had formed no conception of the meaning of this phenomenon. However, since the publication of his book, ‘On the various

contrivances by which British and Foreign Orchids are fertilized by Insects,' I have given a good deal of attention to the subject, and examined a great number of insects whose mouths have been thus encumbered, and hope before long to print rather a long paper on fertilizing insects in the 'Zoologist,' as there certainly is not space enough for it in the 'Entomologist.' In the meantime I may give a few particulars here, leaving the general subject for a future paper. It appears from Darwin's work that scarcely any flower possesses the power of fertilizing itself; probably it will hereafter be shown that no flower or species has this power in perpetuity; but this subject need not be discussed here. It will be sufficient to explain that in Orchids there are but two stamens, and each of these contain one pollen-mass, or pollinium, as it is called by Darwin. The moths, attracted by the sweet scent of the flowers, and being thereby apprised of the nectar-banquet contained in the flower, often crowd around it, and, in their eagerness to get at the sweets, press their heads against the stamens, and thus the cuticle of the anther probably gets ruptured by the pressure, and the pollinium then comes out of its retreat, and being furnished at the lower extremity with a circular adhesive disk,—very much like those round pieces of wetted leather which boys play with on the flag-stones of our pavements,—these disks attach themselves to the head, eyes, or mouth of the moth, and, thus fixed, they project like little clubs, and are carried to another flower, to which the moth flies as soon as it has rifled the sweets of the first, and to this second flower it imparts the pollen it had taken from the first. The bright colours of flowers are given them to attract butterflies, bees, and flies, by day; the sweet scents of flowers are given them to attract moths by night: and, as though conscious of this duty, a great number of flowers—such for instance as the "night-flowering stock," the "night-flowering Cereus," the "night-smelling evening-primrose," &c.—only emit their fragrance when moths are on the wing. This is the case with Orchids,—those which have large, bright and beautiful, scarlet and yellow and purple flowers, and no scent—attract day-flying insects; those which have minute, and green or dull-coloured flowers have no beauty, but are almost invariably sweet-scented, and thus attract those moths which fly by night. Mr. Darwin has mentioned a specimen of *Caradrina*

that had eleven pairs of these pollinia attached to its maxillæ, and another of *Acontia luctuosa* that had seven pairs; each blossom possesses a pair, but they are frequently robbed of only one. I shall be very pleased to give any further information on this most interesting subject.—*E. Newman.*

F. W. White.—I shall feel much obliged by your kindly naming the accompanying larvæ, which were found feeding on pear-trees in a friend's garden at Cainscross. He also noticed them both last year and this. It appears that they become of a green colour after their last moult, and then pass into the ground to undergo their transformation.

[The insect produced from the grub is a sawfly, *Bleuncampa Cerasi.*—*E. Newman.*]

Rev. John A. Kerr; Belfast.—The insect sent is *Necrophorus interruptus*, one of the burying-beetles.—*E. Newman.*

G. A. S.—The facts are interesting, but I cannot publish them anonymously. The mites are still alive, and apparently healthy. I cannot distinguish them from the so-called *Acarus domesticus*, which occurs in all our houses. It is very extraordinary that it should occur on living moths.—*E. Newman.*

W. Claxton.—Would you be kind enough to inform me whether it is necessary to remove the interior of beetles before placing them in the cabinet?

[I have never done anything of the kind. I place the drying-cage in the thorough draught, and do not find any inconvenience arise from the smell.—*E. Newman.*]

Haggerston Entomological Society.—The annual exhibition of this Society will be held in their room at the "Brownlow Arms," Brownlow Street, Haggerston, on the evenings of Thursday and Friday, November 12th and 13th, from 7 to 11 P.M. All entomological friends are invited to attend; and any entomologists wishing to exhibit will kindly send their exhibitions on or before Thursday evening, November 5th, to the Secretary, Mr. Bartlett, at the above address.

Death of Mr. Crotch.—George Robert Crotch, a Coleopterist of great eminence, and still greater promise, died at Philadelphia on the 16th of June of the present year, apparently in the very zenith of an undertaking, which—in

its ambitious programme, and the known zeal, perseverance, and energy, of its projector—perhaps has no equal in the annals of entomological Science. Mr. Crotch was the grandson of Dr. Crotch, so celebrated as a musical composer; the son of the Rev. Mr. Crotch, of Uphill House, Weston-super-Mare; and the brother of Dr. W. D. Crotch, who has attained a European celebrity by his labours in Natural History, more especially in Coleopterous insects, of which he discovered numerous new species,—forty-four in the Island of Canary alone,—as recorded by Mr. Wollaston in his ‘Catalogue of the Coleopterous Insects of the Canaries,’ published in 1864. Mr. G. R. Crotch was born in the year 1811, and very early exhibited the characteristics which so eminently distinguished him in after life: indefatigable industry in pursuit of a beloved Science, and perfect disregard of his own personal comfort, and even health. These attributes were so remarkable as to take the form of an eccentricity,—meat, drink, and rest, seemed to him matters of indifference: if night found him on what he considered good collecting ground, rather than leave it, with the intention of returning on the morrow, he has been known to lie down under the shelter of a hay-stack or sedge-stack in the fens, and there remain, until the return of daylight enabled him to resume his labours. This devotion to Entomology continued and increased, until it became the absorbing passion and occupation of his life. At first he seems to have given his attention more especially to British Lepidoptera; and his first contribution to entomological literature was on a butterfly, generally esteemed of rare or accidental occurrence, *Thecla Betulæ*, which he observed in great abundance flying round the tops of high trees in company with its congener *T. Quercus*. This was in 1856, and three years later he searched the fen districts of Cambridgeshire: here he discovered *Leucania Elymi*; and here, too, he gave the first instance of that perseverance, skill, and thoroughness, in collecting Coleoptera, which subsequently became his distinguishing characteristic.

In 1862 he published his first notice of ants’-nest beetles, and from that time he seems to have given no rest to his hands, to his pen, or to his mind.

In 1863 he published the first edition of ‘Catalogue of

British Coleoptera,' a labour which at once exhibited him as a most careful and judicious compiler: yet he was never satisfied with this production, but was constantly finding something that required emendation and improvement, which he introduced in a second edition, published soon afterwards, but without date.

This appears the right place to introduce, in chronological order, a list of the papers sent to myself, during a period of fourteen years (1856—1870), for publication in the 'Zoologist' and 'Entomologist.' The list speaks for itself, and shows what an extensive range was covered by his researches. The papers themselves exhibit, at the same time, what has been been aptly termed, "a lynxian eye for specific differences," and a wonderful aptitude for expressing those differences in words,—a gift of excessive value, in proportion to the rarity of its occurrence.

IN THE 'ZOOLOGIST.'

1856. Extraordinary Abundance of *Thecla Betulæ* in Montgomeryshire, p. 5291.

1859. Is *Micra parva* Double-brooded? 6385.

1861. *Leucania Elymi* in England, 7717. Capture of *Sphærius acaroides*, *Hydrochus carinatus*, &c., in the Fens, 7724.

1862. Notice of Two Species of Coleoptera New to Britain, 8083. Coleoptera found in Company with *Formica fuliginosa*, 8139. Coleoptera in the New Forest, 8301.

1863. *Cryptocephalus Wasastjernæ* discovered in Britain, 8413. The British Species of *Helophorus*, 8610.

1864. On some New or Rare British Coleoptera, 8998. Addendum to the paper On some New or Rare British Coleoptera, 9057.

IN THE 'ENTOMOLOGIST.'

1864—5. Revision of the Genus *Telephorus*, as far as regards the British Species, vol. ii. p. 167. *Phlæotrya rufipes*, ii. 178. *Latridius testaceus*, *Ceuthorhynchus inornatus*, *Monotoma 4-foveolata*, ii. 179. Notes of the Genera *Malthinus* and *Malthodes*, ii. 181. *Anisonyx fuscula*, a Genus of Coleoptera New to Britain, ii. 189. *Borboropora Sauleyi*, a New British Coleopteron; Notes on certain Alterations of Nomenclature in the Genus *Malachius*; Notes on the Genus *Telmatophilus*, with Descriptions of a New British Species; Notes of some Species New to Britain, ii. 209 *et seq.* Notes on the Melyridæ, ii. 213. Extract from the Monograph on *Gymnetron*, by W. H. de Barneville (a translation), ii. 216. Remarks on Synonymy

of the Genus *Dasytes*, ii. 225. Remarks on the Genus *Ceuthorhynchus* and its Allies, ii. 259. Some remarks on the Genus *Nothus* of Olivier, ii. 261. Captures in Monk Wood, Huntingdonshire, ii. 268.

1866—7. Observations on the Genus *Anaspis*, iii. 31. Further Notes on the Telephoridae, iii. 47. Notes on a Species of Homalidae New to Britain, iii. 60. Observations on concluding portion of the Curculionidae, iii. 63. Prior Appearance of Male of Female, iii. 67. Mould on Lepidoptera, iii. 72. Revision of the 'Catalogue of British Coleoptera,' iii. 105, 119, 133, 173.

1868—9. Notes on some Doubtful British Coleoptera, iv. 47. Notes on recent Continental Publications on Coleoptera, iv. 65. New Method of Preserving Coleoptera, iv. 229. Contributions to a Synopsis of British Coleoptera, iv. 307.

1870. Notes on British Coleoptera, v. 7.

In 1864 Mr. Crotch visited the Canary Islands, in company with his brother, the doctor, whose success there two years previously I have already mentioned. I find no separate record of the result of this most laborious journey; but the new species obtained, seventy-seven in number, have been described by Mr. Wollaston in the Appendix to his 'Coleoptera Atlantidum.' This year also he obtained an appointment as one of the assistant librarians in the Public Library at Cambridge, and received the degree of M.A. in Natural Science.

In 1865 he visited Spain in company with several French savans, and by their united exertions some of the finest collections of Spanish Lepidoptera were made in that country, of which previously to this visit little was known entomologically.

"In the year 1867 Mr. Crotch published, in the Proceedings of the Zoological Society of London, a complete enumeration of the Coleoptera of the Azores, accompanied by descriptions of new species found there by Messrs. Godman and Brewer. Although his collections had by this time become very considerable and required much of his time, Mr. Crotch pursued with untiring industry his studies of the literature of Entomology, and published, besides a large number of corrections of the Catalogue of Coleoptera of Gemminger and Von Harold, a list of all the Coleoptera of the group Adephaga, described from the year 1758—1821, referring them to their modern genera; this he did with the hope of assisting others who, like himself, were engaged in attempting to cleanse the Augean stable of entomological nomenclature. This work was published at Cambridge in 1871, and

by this time he was recognized by the best judges to be the man who had a more detailed acquaintance with the ancient literature of Entomology than any other living student. This paper had, indeed, been preceded by one published in the Transactions of the Entomological Society of London, intitled 'The Genera of Coleoptera studied Chronologically (1735—1801),' which was, and probably will long continue to be, of great use by pointing out to zoologists the great difficulties that encumber any attempt to deal in a systematic manner with entomological nomenclature. In 1871 he also published a synopsis containing abbreviated descriptions of all the new species of Coleoptera belonging to the European and Mediterranean faunas that had been described during the year 1868; this little production cost a vast amount of investigation; and it is much to be regretted that it has not been continued by some other student, as he hoped it would have been. By this time Mr. Crotch, whose enthusiasm for the study of Entomology seemed to take always wider and wider limits, had engaged himself in the investigation of the Coccinellidæ and Eurotylidæ of the whole world."—*Entomologist's Monthly Magazine* for August, 1874.

In 1870 he visited Spain a second time, with a view of completing his own and other collections of the Coleoptera of that rich and interesting country, and a second time added enormously to our knowledge of its insect fauna.

He now seems to have turned his attention to the great object of his life, a coleopterous voyage round the world, and collecting in all countries of which the beetle population was little or imperfectly known: he embarked in this gigantic enterprise in 1872, and made rich collections in California, Vancouver's Island, Oregon, and other states of the union, thence returning across the continent of North America, arrived at Philadelphia, and there finished his laborious career.

In 1873 he completed his 'Check List of the Coleoptera of America, north of Mexico,' and it was published the same year at Salem, Mass., U.S., by the Naturalists' Agency. His last work was a 'Revision of the Coleopterous Family Coccinellidæ:' this is all printed, and I hope to obtain complete copies in a few days.

It may be stated as conclusive evidence of the high estimation in which his labours in the cause of Science were held, that on two occasions sums were granted by his University to assist in enabling him to persevere in the course he had chosen.—*Edward Newman*.

THE ENTOMOLOGIST.

No. 135.]

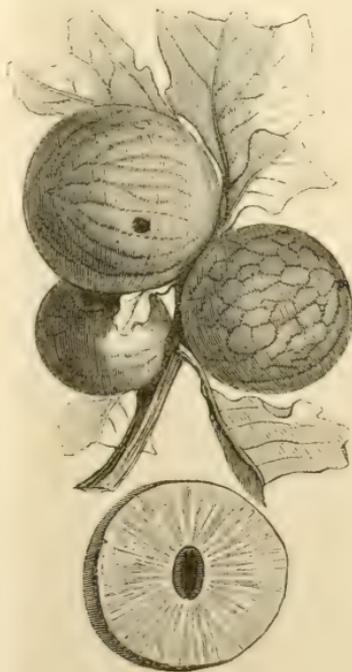
NOVEMBER, MDCCCLXXIV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT HERKOMER née WEISE.

18. *Cynips Kollari*.—The gall of this species appears on the oaks in the same way as that of *Cynips tinctoria*, from which, in many instances, it cannot easily be distinguished. It is perfectly spherical, from twelve to twenty-three millimetres in diameter, of a brownish yellow colour,—rarely of a brownish red-yellow,—naked, smooth, and often without any unevennesses, but it has sometimes such isolated and minute warts as occur on the gall of *Cynips tinctoria*. The section exhibits a brownish yellow reticulation, consisting of thin-walled parenchyma and parenchyma-cells, so that the gall may be easily cut with a knife. No proper inner-gall, like that of *Cynips tinctoria*, is to be found, although the gall-substance surrounding the oval larva-cell in the centre of the gall is harder, and has a radiate-striated

Fig. 18.



CYNIPS KOLLARI (and in section).

appearance. When parasites develop themselves in the larva-cell we sometimes meet with a stronger and rather hard condensation of the gall-substance which surrounds the cells. The gall, green in summer, becomes yellowish in September, and is pierced by the imago towards the end of this month. Most of the parasites and inquilines, however, do not come forth till the following winter or spring. It adheres so firmly to the twigs that we often meet with galls two or three years old still attached to the twigs. Many of these galls may be mistaken for those of *Cynips tinctoria*, yet are to be distinguished by their brownish yellow colour and obscure reticulations on the surface, by the absence of any distinctly-pronounced interior gall, and by the earlier emergence of the perfect insect. The gall of *Cynips tinctoria* occurs in the southern half of Europe, though near Vienna it is no longer frequently met with; that of *Cynips Kollari*, however, is found as far as the German Ocean.—*G. L. Mayr.*

The occurrence in England of this gall, which has received the name of Devonshire gall,* has been a prolific source of entomological correspondence, and I may say of entomological literature. Probably many early records of such occurrences have escaped entomologists, from their being published in newspapers and other periodicals neither exclusively nor chiefly devoted to subjects in any way connected with Natural History. Entomologists who have read such sensational paragraphs on the subject of oak-galls, and the loss they are likely to bring on the farmers and landowners, may reasonably be excused for disregarding them, as we certainly do the "unparalleled phenomenon" of multitudes of winged-ants making their appearance at the end of August, or the "unprecedented event" of a "mosquito" (*Culex pipiens*) having attacked a slumbering traveller in the best bed-room of the best hotel in London. It is not that we call in question the existence of the galls, or of the winged-ants, or of the mosquito, or any of the concomitant circumstances: these are indisputable, but, like the historical gray horse one always meets on London Bridge, they are facts that make no impression on our visual organs, and

* Throughout this note I shall retain the name *Lignicola* for the Devonshire gall, although Dr. Mayr has given it to another species.

therefore none on our mental perceptions or memory. Such paragraphs form no part of gall-history, or ant-history, or guat-history: for these we must investigate more methodical and more reliable sources of information. The authentic history of the Devonshire gall, as British, commenced on the 6th November, 1854, with Mr. Rich, who was present as a visitor at the meeting of the Entomological Society of London, and exhibited "some sprays of oak thickly covered with large galls. He observed that in Somersetshire, and in part of Gloucestershire, they were so abundant that the oaks were completely covered with them, to the extinction of the acorns,* the loss of which, for feeding their pigs, the farmers greatly regretted, although he believed that in the value of these galls they had more than an equivalent, seeing that the chemical properties of these galls were nearly equal to those of the Aleppo galls, imported for the manufacture of ink. Mr. Curtis said that Mr. Rich had given him an example of this gall, and that he had also recently received some similar galls, with a specimen of the fly, from his friend Mr. Walcott, of Bristol, who obtained them from an oak growing near the Hotwells, Clifton. Having paid great attention to the Cynipidæ, and bred most of those which are produced from oak-trees, he (Mr. Curtis) had often been doubtful respecting the true *Cynips Quercus-petioli* of Linneus; but he was convinced the specimen he now exhibited—which he had bred, with a few others, from the galls alluded to—is the Linnean species. *Cynips Quercus-petioli* is described by Linneus in his 'Fauna Suecica,' No. 1523, where he refers to Ræsel, who has given good figures of the galls, fly, &c. ('Insecten Belustigung,' iii. Sup. tab. 35 and 36). The flies are much larger than any other species which had been described as British, and are nearly allied to those produced from the galls of commerce, the *Diplolepis Gallæ-tinctoriæ* of Olivier. Mr. Stainton said that for the last four or five years he had noticed these galls in Devonshire, but not in such profusion as now stated. The President had some doubts whether this was the *Cynips Quercus-petioli* of Linneus, for

* At p. 155 of the fourth volume of the 'Entomologist,' Mr. Bignell states that he finds galls and acorns on the same tree, and offers to send a piece of oak with both on it. This scarcely militates against the fact that galls are generally produced where acorns do not grow.

the galls were situated in the axils of the leaf, and not on the petiole." (Proc. Ent. Soc. Lond.: reported Zool. 4567.) It is further reported, at p. 4571 of the 'Zoologist' (dated, December, 1854), that at the following meeting Mr. Jordan stated that he had known these galls for twenty years, and that a medical man at Lympstone, near Exmouth, "used them always to make his ink, and tried to impress upon the country people the use that might spring from making them an article, so to speak, of exportation." The pecuniary advantage of exporting these galls, at a time when we were importing the Aleppo galls for the very purpose of ink-making, does not seem very obvious. Still the project of utilizing the galls in the manufacture of ink was praiseworthy, but it was doomed to undergo a decided discouragement from the careful analysis of Dr. Hart Vinen (reported Zool. 5025), from which it appears that these galls contained but 17 per cent. of tannin, whereas the Aleppo galls, the well-known ink-gall of commerce, contained 56 per cent. "Dr. Vinen," commenting on this great disparity, "thinks it possibly in some degree attributable to the fact that whereas all the Aleppo galls were entire, those from Devonshire were all perforated by the Cynips in escaping: it was a well-known fact that a sample of the galls of commerce were depreciated in value by the presence of any that were perforated. Dr. Vinen, however, wished to call the attention of the Society (the Linnean) to the extraordinary discrepancy existing between the various published analyses of the Aleppo galls, which was greater even than that between his own analyses of the Devonshire and Aleppo galls: Sir Humphrey Davy's analysis yielded 26 per cent. of tannin; Pelour's, 40; Leconnet's, 60; Guibourt's, 65; Mohr's, 72; and Buchner's, 77." I assume that tannin is the element required in ink-manufacture, and, this being so, it is most desirable that experiments, for testing the amount of this element, should be made on galls in a precisely similar condition as to age and maturity. I am uncertain whether this vegetable dye is still a necessity in the manufacture of ink, or whether minerals have not superseded its use. Continuing the English history of this species, we find that at a meeting of the Entomological Society in February, 1855, Mr. Stainton read a letter on the subject, without giving the

name of his correspondent, which contained much valuable information; but, as it appeared, that letter was written by Mr. Parfitt, of Exeter, who has subsequently written me a more amplified paper for publication in the 'Zoologist.' I have preferred giving this further on, seeing it will be found to embrace all the points mentioned in the letter to Mr. Stainton, and others equally interesting. At a meeting of the Entomological Society, on the 5th November, 1855, Mr. Curtis read the following note from the late Mr. Haliday, who had collected a great number of these galls at Glanville's Wootton, the seat of the late Mr. Dale, in Dorsetshire:—"I cannot identify it with any Linnean or Fabrician species, but it is the *Cynips Lignicola* of Hartig, and the only one of that group to which the ink-gall belongs, that occurs so far north as England, or even Northern Germany." (Zool. 4964.) It should be stated in this place that, at p. 7 of the fourth volume of the 'Entomologist's Monthly Magazine,' the Rev. T. A. Marshall—who is indefatigable in the study of the British Cynipidæ, and in every respect competent to speak with authority on the subject—says that the *Cynips Quercus-petoli* of Linneus is a species of *Synergus*, and a parasite on *Cynips Lignicola*. I have no precise recollection of the date when this gall first became known to myself: the observations above quoted would seem to indicate its having been established in Britain at least half a century; but I cannot refer to any evidence of its non-existence here at an earlier period. The absence of a record is the only reason we can possibly assign for supposing the absence of the gall; and when we consider how very recently galls have been observed by us at all, and how very small is the number of observers even now, we must not lay too much stress on the silence of our predecessors. This gall certainly now forces itself into notice, and it does not appear thus to have intruded itself on the notice of our entomologists during the half century previous to that in which we are now living: this is, perhaps, in favour of its absence at an earlier date. Then with regard to its economical bearing on our country. The alarmists prophesied the speedy destruction of the oak,—a tree that is metaphorically considered the bulwark of British safety. Now I have yet to learn that it does any appreciable injury to the adult oak. Its effect upon the sapling, so often

mentioned, is observable; but even on these it is not very serious, and has never been carefully observed or accurately estimated. Many newspaper writers took up the cause of the pigs, who were supposed by Mr. Rich, in the passage I have cited, to be on the point of losing a favourite esculent through the agency of this gall; and the watchword sounded far and wide,—“Rally round the pig.” “Stand by the pig” was the war-cry throughout the West of England. The farmers girded themselves for the combat; but, alas, could not discover the enemy. Willing, aye, eager, to fight by the side of their favourite, his enemy was nowhere to be seen,—was too small to contend with; fighting was out of the question; the war-cry was abandoned, and the helpless wail arose from every Western press, “Pity the poor pig.” And those entomologists who, like myself, are ever on the look-out for the protection of crops from insect-enemies, were continually appealed to, to recommend some powder or chemical that should be a remedy against the galls. But here I must introduce Mr. Parfitt’s letter, which embraces the whole subject, and, I think, shows, amongst other things, that the remedy was not required. This accomplished naturalist begins by objecting to the statement that these galls were first brought into notice by Mr. Rich, and then proceeds, thus:—“I was the first to take particular notice of them. I sent some of the galls to Mr. Westwood as far back as 1848 or 1849, to ask the name of these excrescences. I sent to him through one of the gardening periodicals, and received from him the name of *Quercus terminalis*. This was stated in a letter I wrote to Mr. Stainton some moths ago, which was read at one of your meetings [meaning the meetings of the Entomological Society], and caused rather a sharp discussion. Mr. Westwood was present, but took no part in it; he no doubt considered that the name he had given was the correct one; but in this he was in error,* as the gall now appears to be the *Cynips Lignicola* of Hartig. Had it been new, or should a specific difference between our insect and *Lignicola* be hereafter

* Subsequently Mr. Westwood seems to have altered his opinion, for he is reported (*Zool.* 4708) to have said, at a meeting of the Entomological Society, on the 2nd April, 1855:—“I determined the specimens to be *C. Quercus-petioli* so long ago that the ink with which the name was written on the label has faded.”

detected, I would suggest the name of *Cynips Quercus-gemmæ*,* as the parent insect deposits its eggs in the buds themselves, and the galls are produced at the expense of the buds. I do not see cause for such alarm as one would be led to suppose through reading an article in the 'Gardener's Chronicle' some short time since. It is true the insect is very injurious to the young trees in particular. In the two large nurseries in Exeter the young trees are sadly distorted, and they cannot make headway against the enemy; but once turn the galls into use, and they will disappear much faster than they have been produced. I before stated, in the letter read by Mr. Stainton, that it is rare to see the galls above ten feet from the ground, but the nearer the ground the thicker the galls, and on the little twigs lying on and just above the surface of the ground nearly every bud has been metamorphosed into a gall; as you ascend they gradually diminish in number, until the line may be drawn at ten feet, above which only a few stragglers can be found. The winter before this last the tomtits had found out the secret of what was in these galls, for they were never at a loss for a meal. When the ground was covered with snow I have seen numbers of the blue-headed titmouse† working away at the galls in search of the fine fat larvæ of the *Cynips*; and this winter the titmice appear to have been more destructive to the larvæ, for now in a short walk you may find hundreds, nay, thousands, that have been picked to pieces to get at the insect within.‡ Should these galls be turned to account for the manufacture of ink, being so near the ground they could be easily gathered by children, so that the cost would be very trifling. It is said by the writers in the 'Gardener's Chronicle' that the galls diminish the crop of acorns: now I cannot believe this, because, as I said before, it is uncommon to find them on

* This is the Linnean name for another species.

† In the 'Field' newspaper, September, 1871, Mr. H. B. Murray informs us that the galls in question "are opened by squirrels, and not by titmice, as stated by Mr. Parfitt;" adding:—"I have myself seen the ground under the oak-trees strewn with the fragments of these galls, and there could be no doubt of squirrels being the operators, as they were seen in the act." I have no ground for differing from Mr. Murray as to squirrels; but I entirely agree with Mr. Parfitt as to titmice: I have seen titmice of the species *Cæruleus*, *Ater*, and *Palustris*, engaged on them.

‡ I have written rather a long paper on this subject—"Titmice and Galls"—in the 'Field' newspaper.

large trees, and it is well known that it is only the large—I may call them mature—trees that produce acorns, so the injury done to them cannot be great. As regards the species of this *Cynips* it is certainly not the *C. Quercus-folii* of Linneus; though the figure of the perfect insect, given by J. Ræmur in the ‘*Genera Insectorum Linnei et Fabricii*,’ agrees pretty well, the description does not agree at all with our insect.” (Zool. 5074.)

There is a phase of the subject which would demand a detailed investigation here, had I not so recently urged my views on the readers both of the ‘*Entomologist*’ (vol. vi. p. 275) and ‘*Field*’ newspaper. There is a constant struggle going on between the oak and the *Cynips*, the aim of the oak being to reproduce its kind by seed, the aim of the *Cynips* to utilize the oak as a nidus and a provision for its progeny; but oak-timber or oak-leaf in a normal, natural or healthy state, is not precisely the provision that the infant gall-fly would require, so the parent punctures the oak, its rind, or its leaf, or its leaf-stalk, or its flower, and injects a sap-poison, which totally alters the condition and qualities of the sap: this in sufficient abundance would kill the oak; but when we glance at the comparative magnitude of the oak and its enemy, we see that such a result is improbable; still the effect is deleterious: the oak struggles against it, and strives to perfect its normal produce; the *Cynips* also struggles to maintain its ground: each holds its own, and neither, during its brief historical existence, has gained any advantage over the other; and so the contest ends in a compromise. These galls are not acorns, as the oak would have willed that they should be, but are the nearest approach to acorns that the oak can produce* under its affliction. I have examined hundreds, perhaps thousands, of these objects during the past and present autumns, and invariably with the same result. The gall consists of two parts,—the larger is spherical, the smaller

* Mr. Inehbald, in the ‘*Field*’ newspaper, strenuously opposed the doctrine (first introduced to public notice by the editor of that newspaper), that these galls are produced at the expense of the acorns. In a subsequent paper, reprinted in the sixth volume of the ‘*Entomologist*,’ p. 338, Mr. Parfitt expresses an opinion opposed to that of Mr. Inehbald, and argues that the solution there suggested is the correct one: Mr. Parfitt’s reply is logical, and extremely well argued. Of course I cannot reprint a paper so recently published in this journal.

saucer-shaped and situated beneath the larger, and between this and the twig to which it is attached; the spherical body represents the carpel of the acorn, or the acorn proper, and the saucer-shaped cushion, on which it rests, represents the cupule or cup, or calyx. Having ventured to call the entire gall a pseudo-balanus, or false acorn, so will I call the spherical portion the "pseudo-carpel," and the cushion the "pseudo-calyx." On carefully examining the pseudo-carpel—projecting from it exactly opposite the point of attachment, and therefore on its summit—will be found a small pointed process, which represents the persistent stigma of the acorn; and the exterior covering of the pseudo-carpel—tough, leathery, and smooth—represents the pericarp of the acorn. I fail to discover, either on the real or false acorn, the markings so clearly expressed in Dr. Mayr's figure. The resemblance or mimicry of the true cupule by the false one is not very evident; the relative magnitude of acorn and cup are very different, but the composition is the same. If I understand that of the true acorn correctly, it is made up of a number of involucreal scales or bracts, soldered, ankylosed, and compressed together into a cupular form; and this I believe to be equally the explanation of the mimetic cupule. As in the true acorn, a vertical section will bisect the stigma, the carpel, and the cupule, showing that there is the same method in the arrangement of the parts of the false and true acorns. Until a year or more has elapsed I can find no tendency to dehiscence at the base of the pseudo-carpel, but during the second year I have repeatedly observed this dehiscence, the pseudo-carpel falling to the ground like an acorn, and exhibiting a cicatrix at its base, while the cushion, cupule or pseudo-calyx, retains its adhesion to the twig. This is also the case with the Aleppo galls, *Cynips gallæ-tinctoriæ*, which dehisce and fall in numbers every autumn.

This is emphatically the species on which the most careful observations have been made, with a view to settle the doubtful point, whether or not the species is continued from year to year by a succession of females only, or whether males do exist in alternate generations or in some undiscovered form. The latter seems the more reasonable conjecture, and I think was first promulgated by the late Mr. Walsh, at p. 320 of the second volume of the 'American

Entomologist,' as already incidentally noticed in this journal. More recently Mr. H. F. Bassett—a most careful observer—states, at p. 91 of the fifth volume of the 'Canadian Entomologist,' that "Cynips quercus-operator, an American species, is double-brooded, one brood of females ovipositing in the buds of the oak, and again some of a second brood ovipositing in the young acorns of *Quercus ilicifolia*. From these and other facts he infers that all the American species, that are found only in the female sex, are represented in another generation by both sexes, and that the two broods are, owing to seasonal differences, produced from galls that are entirely distinct from each other." Whether this is only an ingenious conjecture, or an absolute discovery, I am unable to say; if the latter it may (in the hands of such painstaking men as Mr. Inehbald, Mr. Smith, Mr. Parfitt, Mr. Marshall, and Mr. Fitch) supply a clew to the eventual discovery of the males of *Cynips Lignicola*. In the meantime the weight of evidence is thrown into the other scale. I know not when or where the statement originated, but I find myself in 1835, in the 'Grammar of Entomology,' describing the female *Cynips* (p. 210), as though a male had never been seen or thought of; and again, in my little pamphlet on the 'Physiological Classification of Animals,' I have plainly stated that no male is known. In 1861 Mr. F. Smith, of the British Museum, sent me a paper on the subject, which, so far as negative evidence can go, seems completely to decide the question as to the non-existence of a male in *Cynips Lignicola*. I will cite portions of this paper:—"In the year 1857 I felt desirous of satisfying myself as far as possible, by my own observations, of the truth of the opinion at that time put forth by more than one eminent entomologist, that in the genus *Cynips* there is only one form of sex; in other words, that in the genus *Cynips* there is *no male*. In order to carry out my experiments I obtained from Devonshire a large supply of the galls of *C. Lignicola*, somewhere about a bushel and a half: every gall was tenanted by the *Cynips* or its parasite, *Callimome Devoniensis*. About the beginning of April, 1858, the *Cynips* began to issue from the galls, and continued to do so up to the end of May, at which time I could not have obtained less than twelve thousand examples, and many hundreds of its parasite. By examining the galls daily during the progress

of the development of the flies, I was enabled to examine the whole of the latter, and to satisfy myself that all of this immense number were females. I also placed about sixty galls in as many separate boxes, and when the *Cynips* came out I carried them to different localities in the vicinity of London, placing them upon low oaks in woods and hedges. In the month of August I revisited the various localities, and in about eight cases out of twelve I found galls upon the very trees on which I had placed the *Cynips*, but on none in their vicinity. From these galls I again obtained *Cynips*, and this brood I also placed in isolated situations; and again I found galls formed in about the same proportion as in the previous instance. In neither of these cases could there have been any connection with the male sex, unless that sex be of microscopic dimensions." (Zool. 7332.) And again:—"Every observation which has been made on the genus *Cynips* is against the possibility of the existence of an active male: it is proved that females, which could not have been fertilized by copulation, deposit eggs which are fruitful." (Zool. 7332.) Mr. Smith then quotes Léon Dufour, who reared *Cynips* by thousands from different species of galls without discovering a male; and Hartig, who obtained twenty-eight species of *Cynips*, all females, from different kinds of galls; in one case that of *Cynips divisa*, at least ten thousand females, and about four thousand of *Cynips Folii*. Hartig has also observed "the female *Cynips* issue from the gall, and immediately proceed to deposit her eggs." To this Mr. Smith says:—"I may also add that during the past autumn I have bred numbers of *Cynips Folii* from the cherry-gall of the oak-leaf, all being females;" and he concludes in these words:—"In fact, all observation is opposed to the existence of an active male in the genus *Cynips*."

I was expecting Mr. Walker's notes on the parasites of *Cynips Lignicola*, when the mournful intelligence reached me that his labours were ended, and his observations had ceased for ever. I have thus lost the most able of coadjutors.

I copy two notes, which have already appeared in the 'Entomologist,' because containing all the information I have at hand respecting the parasites of the Devonshire gall. The first is by Mr. Walker:—

“*Note on Cynips Lignicola.*—Two supposed parasites, a Callimome and a Decatoma, have long been recorded as inhabiting the Devonshire gall. I have lately received from Mr. Newman two other species reared from these galls. They have not yet been recorded as British, and may be new species. One is a Eurytoma; the other, a Callimome, has also been reared by Mr. Fitch.—*Francis Walker.*” (Entom. vi. 101.)

The second note is by Mr. Fitch:—

“*Additional Parasites of Cynips Lignicola.*—I have lately bred seven different species of parasites—not including the well-known Callimome Devonensis of Parfitt and Decatoma—from some dwarfed specimens of *C. Lignicola*, which I collected at Burnham, Essex, last February. Mr. Walker has kindly examined the insects, and finds some new to Britain, if not altogether new species. The insects are—*First*, ten specimens of *Ormyrus punctiger*; emerged from 18th June to 29th July. *Second*, one male *Eurytoma* (n.s.?) emerged 18th April. *Third*, one *Pteromalus*; emerged 13th May. *Fourth*, numerous specimens of a Callimome, nearly allied to *C. inconstans*; emerged between 28th April and 20th June. *Fifth*, several females and one male of Callimome, n.s.; emerged between 3rd and 17th April. *Sixth*, nine specimens of a small black Hymenopteron, quite unknown to Mr. Walker,—seven females and two males; emerged from middle to end of March. *Seventh*, one specimen; emerged 25th June; returned by Mr. Walker as n.g., allied to *Entedon*. All these were bred from a small cluster of galls on a single twig.—*Edward A. Fitch.*” (Entom. vi. 243.)—*Edward Newman.*

Life-histories of Sawflies. Translated from the Dutch of M. S. C. SNELLEN VAN VOLLENHOVEN. By J. W. MAY, Esq.

(Continued from vol. vi. p. 134.)

NEMATUS LATIPES, *Villaret.*

Imago: Foulques de Villaret, Mémoire sur quatre nouvelles espèces de Tenthredines, dans les Ann. de la Soc. Ent. tome i. p. 303, pl. xi., figs. 4—6; *Hartig, Blatt-und Holzwespen*, p. 185, No. 3.

Larva undescribed.

Nematus niger, palpis pallidis, abdominis medio et femorum posteriorum parte inferiori rufis, tarsorum posteriorum articulo primo dilatato.

Two species of *Nematus*, having the first joint of the posterior tarsi dilated, have already been described in this journal, namely, *Septentrionalis*, *L.*, in the second volume, and *Varus*, *De Villar.*, in the sixth, and I had no expectation of being able to add a third species, as I regarded the two others, mentioned by Villaret, as restricted to the south of Europe. When I first saw the imago of this new species, running about in a confectioner's glass, in which some *Nematus* larvæ had been placed, I thought that a larva of *Septentrionalis*, which also lives on the birch, had, by some mistake, got among them; but I soon saw, to my delight, that I had before me a species with which I was hitherto unacquainted in the free state. I am again indebted for this discovery to the kindness of Mr. de Roo van Westmaas. I had, indeed, myself met with the larva in the wood near Zeist, and had taken it home and made a drawing of it, but I had failed in rearing it. Afterwards, in 1861, I received some larvæ from my friend De Roo, with which I was equally unfortunate; but at the end of September, last year, he sent me a large number of larvæ, which I at last succeeded in rearing, so that I have both sexes of the imago. I am, however, still unacquainted with the egg. The youngest larvæ which I saw had the appearance represented at fig. 1, pl. 8,—very dark brown, almost black, with shining brown head and yellow legs. In my earliest notes on this species (written at least twenty-two years ago) I make the observation that the smallest larvæ were entirely shining dark brown, with yellow anal legs or claspers, and that the yellow colour of the anterior and intermediate legs was only acquired after the larvæ had moulted on the 29th of August. The nearly full-grown larvæ are of the size and appearance of figs. 2 and 3. The head was depressed anteriorly, shining, of a dark brown colour, approaching black, and covered with very short gray hairs; the parts of the mouth were yellow. The four anterior abdominal segments yellow underneath; the body strongly wrinkled, black, with a shade of brown; the

margin of the anterior segment and the borders of the spiracles yellowish. The thoracic legs were yellow, with brown claws, and had a black mark on the last joint. The folds at the side were slightly hirsute. There were six pairs of abdominal legs, yellow, with a small transverse black line on the outside. The anal valve was brownish black, having a small spine on either side (fig. 4). Lastly, the ventral surface of the last segment and the two anal legs were deep yellow. These larvæ, which fed on the birch, were of a restless nature, frequently raising the abdomen and curving it over the back, in which position they would remain for some time. Hardly had the colony returned to a state of rest, and each individual assumed a natural position, when one of the number became restless, and commenced waving about from side to side, its example being followed by all the others, and some time elapsed before there was another pause. In their restless habit, as well as in their gregarious mode of living, they more nearly resembled *Septentrionalis* than *Varus*. On the apodal 4th segment, and on the 5th and 6th, between the legs, were greenish gray dermal processes, which could be reverted like the horns of the snail: these organs (fig. 5), which could be protruded to three times the length of the legs, were open at the extremity, whence a viscid and fetid fluid could be ejected. We have already observed similar glandular openings in nearly allied species.

In the beginning of October the larvæ took to the earth, and buried themselves as deeply as they could in the jar: the cocoon, which was single, was black and tough, very smooth within, and rough exteriorly, and curled up; in these the larvæ passed the winter. They passed into the pupa state at the end of April, being probably at first white and afterwards coloured. On the 5th of May of this year I found one which had already acquired its full colouring; of this I made a drawing (fig. 7), which calls for no special remark, excepting that the insect in question had so nearly reached the time for shedding the thin pupal membrane that the antennæ were no longer lying along in front of or between the legs, but were being moved about; in fact, the first imago, a female, appeared on the 4th of May, and was soon followed by others; a male appeared later. The female (fig. 8) had the head, thorax and antennæ black; palpi gray; cenchri white;

the abdomen was shining red, with the exception of the 1st segment, the sides and ventral surface of the 7th and the whole of the 8th, including the anal processes,—all which parts were black. The anterior legs were black nearly as far as the knee; further, obscure reddish gray, becoming of a darker tint to the claws; both the following pairs were black as far as the knee, then followed a white band, the remainder being brown or nearly blackish; the coxæ of the last pair were black, the extreme point, together with the apophyses, being white; femora shining black above, bright red on the under side; tibiæ black, with a white band at the base, finely hirsute, flat, and dilated towards the extremity, having long black spines with red tips; tarsi black, the first joint broad and flattened, and somewhat hairy; wings transparent, with a little faint smoke-coloured band on the upper wings past the stigma, which is dark brown, and over the tip of the under wings. Length, nine millemetres; expanding seventeen millemetres.

The male, in addition to the usual sexual characteristics, differed in the colour of the antennæ, the first two joints of which are black, the seven remaining joints being dark brown above and pale brown on the under side; and this sex also differed in having the apex of the abdomen entirely red, or at least brownish red. The intermediate legs are also paler in colour, and on the middle of the posterior tibiæ a red glow is perceptible between the white and black portions. Figures 9 and 10 are intended to show these points of difference; the first represents the ventral surface of the abdomen of the male, with the second and posterior pair of legs; and the other, the under surface of the left antenna.

It is highly probable that this species has more than one brood in the year. It has only hitherto been observed in the provinces of Utrecht and Gelderland.

Description of a Eupithecia New to Science; together with Notes on its Life-history. By C. S. GREGSON, Esq.

Eupithecia Knautiata.—Expands ten to eleven lines. Head, thorax, abdomen, and fore wings, deep rich cold-brown; without striæ. On the costa there are three or four

darker brown markings, and below the two outer marks a large, dark, oval spot, placed rather high up, beyond which is a very faint indication (often invisible) of a whitish spotted line, terminated by a twin-spot near the anal angle, and edged with dark brown; wing-rays dark and well defined; abdomen smooth; hind wings large, dark cold-brown, having a marginal line of long dark streaks, terminated with a distinct light anal spot.

Larva:—Form, when young, slender, cylindrical; when older, rather stout, attenuated to both extremities, much appressed in the central segments, and somewhat rugose. Colour, from French-white, pale straw-colour, ashy gray, to light pea-greens and faint purplish peachy browns, and dirty dim colours of various shades. With numerous specimens before me, no two are alike, but shade away in every direction from the above colours: a pale pea-green ground predominates, dark ashy grays are plentiful, and a few with light purplish pink grounds may be seen, while in some the ground colour is reddish brown of various shades; altogether they are not elegant or attractive in their variations, and only a few of the varieties could be called pretty. Size, three-fourths to seven-eighths of an inch. Head horn-like, very small, ornamented with various marks and shadings; corslet small and dull, distinctly striate. On the central segment there is a well-defined, spade-shaped dark mark, pointing forwards, through which the light dorsal streak is often conspicuous; this mark appears as a broad-arrow head, in some positions edged with a light, rough, raised line, which passes down slantingly to the spiracular region through the subdorsal line, which is often well defined. In this species the central markings are lost on the anterior and anal segments, merging into the ground colour, as they usually do in other closely-allied species of this group of the genus *Eupithecia*, as at present constituted. Spiracular line wavy and well defined; spiracles dark, with a distinct light ring round each; under side light, and generally inclined to ashy green; feet light, horn-like. General appearance rather coarse, rough, and somewhat hairy. Not so stout as the larvæ of *E. absynthiata* or *Minutata*, and larger than the heath-feeder relatively. Whilst some remind you of *Expallidata* larvæ, others recall those of *Succenturiata*; but we see the subdorsal line in

Knautiata larva distinctly, whilst we fail to find it in its allies.

Some of our "quid nuncs," without seeing its larva, set it down as *E. absynthiata*, whilst others go in for its being *Minutata*; but, with considerable experience of this genus, both in the larval and imago state, I am quite sure it is not the former; and from its larval differentiation and larger size, distinctly different, and darker colour and habit in the perfect insect, we can hardly construe it into the latter well-known heath-feeder. I therefore propose the specific name of *Knautiata* for it.

The insect was first bred from the flower and seed of *Knautia arvensis* by Mr. Porter, of Bolton, who discovered it feeding in October, a few years ago, and who not only supplied me copiously with it in its early state, but directed me to his localities, where I took its larva freely on the 19th of September, and again on the 27th, full fed. It feeds on the flowers and seeds of the *Knautia arvensis*, which grows in profusion on the banks of Ball Hill Lodges, near Bolton, burrowing down into the flower and seed, until only one-half of the larva is visible: it turns to a large, light, rich, golden brown pupa. I may say, *en passant*, that I have fed a few of these larvæ from the young state on heath-flowers, to see if I could make them assume the beautiful pink colours of *E. minutata*; but my experiment has failed.

C. S. GREGSON.

September 30, 1874.

Entomological Notes, Captures, &c.

"*Do Hornets ever Build in the Ground?*"—This question is asked by Mr. Henry Reeks in the last number of the 'Entomologist' (Entom. vii. 232). I can, from personal observation, assure him that they do so. In the month of August, 1871, I found a hornet's-nest in a bank at a wood side, near Sidmouth: it was at the latter part of the month, when the colony was numerous. I stood within two yards of the entrance to the nest for some time, the hornets passing in and out, but exhibiting no dislike to my close observation: I was anxious to ascertain whether hornets posted a sentinel within the mouth of the burrow; I failed, however, to detect one. In the fifth volume of the 'Entomological Magazine' (p. 479)

will be found a record of the hornet building in a perpendicular bank at the side of a river. Mr. Reeks' observations on "Our Common Wasps," in some particulars, do not accord with the results of my own observations and experience. Their number is said to be four; this applies, I conclude, to the species found in the neighbourhood of Thruxton. In the northern counties, and also in Scotland, their number would be five, *Vespa norvegica* being much more common than *V. sylvestris*. Of *V. rufa*, Mr. Reeks observes that he has found it working until very late in the autumn, even to the beginning of November. This is a circumstance quite unknown to me previously. In all the nests that I have watched, the wasps have concluded their labours by the latter part of August, and I do not remember ever to have met with *V. rufa* later than the end of that month. My observations on *V. vulgaris* differ widely from those of Mr. Reeks, who says, "The males and workers are never seen after August." This will not apply to the neighbourhood of London, where I have seen both these sexes plentiful up to the end of September, and workers I saw on the wing ten days ago, near Highgate. On the 29th of September last, being in Yorkshire, I saw both males and workers in plenty, feeding on ripe pears, to the great disgust of a reverend friend of mine. *V. germanica* was equally common. Mr. Reeks, no doubt, is thoroughly well acquainted with all the sexes of the four species common in his own neighbourhood, but I have considerable doubts of anyone being able to separate the males correctly of the two commonest species, *V. vulgaris* and *V. germanica*, without an examination of the sexual organs; colour or markings, I am certain, from long experience, will not enable anyone to do so, and the workers of those species are also extremely difficult to separate: if whole colonies are examined, it will be found that the markings on the face are by no means constant. I have endeavoured to point out what I consider to be the best guides, in my work on the 'Fossore and Vespidae,' published by the Trustees of the British Museum. The females of all the species are readily distinguished, as are also all the sexes of *V. rufa*, *V. sylvestris*, and *V. norvegica*. I never met with the male of *V. arborea*, but have received what I believe to be it from Northumberland and Carlisle: this species is very like *V. rufa*, but is rather larger, and also is a stouter insect, the legs being thicker,

and the entire insect much more pubescent.—*Frederick Smith*; 27, *Richmond Crescent, Islington*.

Deiopeia pulchella in *Hampshire*.—I took two very good *D. pulchella* a few days ago, but have not been able to get any more.—*George Gulliver*; *Brockenhurst, near Lyminster, Hants, October 18, 1874*.

Deiopeia pulchella near *Christchurch*.—I have much pleasure in recording the capture of a fine male *D. pulchella*, by myself, on the 1st October, 1874, near Christchurch.—[*Rev.*] *A. C. Hervey*; *Pokesdown, Bournemouth*.

Deiopeia pulchella in *Cornwall*.—The *D. pulchella* I sent you a fortnight since was captured on the 26th September last, in the same field in which they were found three years since. Mr. Hearle took two in the same field on the preceding day. Having heard of his captures I went the following day, which was a bright, sunny, and very hot one, and had given up all hopes of finding any, when I saw coming towards me what I supposed to be a white butterfly, but on its near approach found it to be *D. pulchella*, when I gave chase, and after a long run succeeded in boxing it. I have searched the same locality many times since, but have not seen any more. Precisely similar captures were made in the same field three years ago, Mr. H. taking two on September 13th, and the following day I took one, but saw none after that, although none were taken during the intervening years. I think we may now look on it as having become established there.—*Stephen Clogg*; *East Looe*.

Deiopeia pulchella near *Hastings*.—On Monday morning last (September 28th) I caught a specimen of *D. pulchella* on the East Cliff, Hastings: the insect had a good flight. I identified it by a specimen belonging to Mr. Gardner, of 52, High Holborn. As the moth is scarce, and September an unusual time for its appearance, I thought the capture worth noting.—*Constance Garlick*; 33, *Great James Street, W. C. September 30, 1874*.

Deiopeia pulchella at *Brighton*.—As Mr. Newman, in his 'Natural History of British Moths,' gives July as the month for *Deiopeia pulchella*, it may interest some of your readers to know that I took a specimen on a low wall on the 5th of October, at Brighton, at nine o'clock in the morning.—*C. Hamlin*; 14, *Windsor Terrace, Preston, Brighton, October 26, 1874*.

Emmelesia unifasciata, Haw.—In September, 1872, my friend Mr. F. O. Standish kindly sent me a number of larvæ of this species. I put them into a pan which had silver sand at the bottom about three inches deep, and fed them with the seed-vessels of the red eyebright (*Euphrasia Odontites*). In August, 1873, about a dozen moths appeared, and in August this year three or four more. A few days since I examined all the cocoons, and found thirty-seven living pupæ. Of course no more of the perfect insects will emerge till August next year, and it is impossible to say how long some of them may remain in the pupa state. I believe this uncertainty of the time in which many species of Lepidoptera remain in the pupa state will, in a great measure, account for the abundance of certain species in some years, and their scarcity in others.—*Henry Doubleday; Epping, October 12, 1874.*

Sterrha sacraria, Xylina conformis, &c., near Neath.—The following captures may be interesting to you:—In the spring of this year *Xylina conformis* and *Brephos Parthenias*, near to our locality; and in the autumn several specimens of *Plusia Festucae*, a fine variety of *Agrotis saucia*, several specimens of *Epunda nigra*, one of *Sterrha sacraria*, and one of *Hoporina croceago*.—*John T. D. Llewelyn; Ynisygerwn, Neath, October 17, 1874.*

Death of Mr. Walker.—It has become my painful duty to record that Francis Walker, the most voluminous and most industrious writer on Entomology this country has ever produced, expired at his residence, Elm Hall, Wanstead, on the 5th of October, 1874, sincerely lamented by all who enjoyed the pleasure and advantage of his friendship. He was the seventh son, and the tenth and youngest child, of Mr. John Walker, a gentleman of independent fortune, residing at Arno's Grove, Southgate, where the subject of this memoir was born on the 31st of July, 1809. Mr. Walker—the father—had a decided taste for science, especially Natural History: he was a fellow of the Royal and Horticultural Societies, and vice-president of the Linnean, so that his son's almost boyish propensity for studies, in which he afterwards became so eminent, seems to have been inherited rather than acquired.

Mr. Walker's decided talent for observing noteworthy facts

in Entomology was first exhibited at home, when, as a mere child, his attention was attracted by the butterflies, which, in the fruit season, came to feed on the ripe plums and apricots in his father's gardens: *Vanessa C-Album* is especially mentioned; and *Limenitis Sibylla*, another species no longer found in the vicinity of London, was then common at Southgate.

In 1816 Mr. Walker's parents were staying with their family at Geneva, then the centre of a literary *côterie*, in which they met, among other celebrities, Lord Byron, Madame de Stael, and the naturalists De Saussure and Vernet. They spent more than a year at Geneva and Vevey, and in 1818 proceeded to Lucerne, from which place Francis, then a boy nine years of age, made the ascent of Mont Pilatus, in company with his elder brother Henry; their object, in addition to the ever-delightful one of mountain-climbing, being the collecting of butterflies. The family afterwards visited Neuwied, and returned to Arno's Grove in 1820.

In 1830 the two brothers, Henry and Francis, again visited the Continent, and now it was purely an entomological tour, the late Mr. Curtis, the well-known author of 'British Entomology,' being their companion. This party collected most assiduously in the island of Jersey, and afterwards at Fontainebleau, Montpellier, Lyons, Nantes, Vaucluse, &c., the French *Satyridæ*, of which they formed very fine collections, being their principal object.

Mr. Walker's career as an author commenced in 1832. He contributed, to the first number of the 'Entomological Magazine,' the introductory chapter of his 'Monographia Chalciditum,' a work on the minute parasitic Hymenoptera,—a tribe of insects which he ever afterwards studied with the most assiduous attention, and one on which he immediately became the leading authority. He was then only twenty-three years of age; but his writings exhibited a depth of research and maturity of judgment which have rarely been excelled, and which abundantly evince the time and talent he had already devoted to these insects. It is worthy of notice that he now descended from the largest and most showy to the smallest and least conspicuous of insects, doubtless feeling that whereas among the magnificent butterflies there was little opportunity for the discovery of novelties, among the Chalcidites everything was new,—everything

required that minute, patient, and laborious investigation, in which he seemed so especially to delight. Only two authors, Dalman and Spinola, had preceded him in devoting their attention to the structure of these atoms of creation; and even these two had described comparatively a very small number of species.

In 1834 Mr. Walker, somewhat reluctantly, consented to undertake the editorial management of the 'Entomological Magazine,' and resigned this office the following year, yet continued a constant contributor to its pages. The same year he visited Lapland, in company with two of our most distinguished botanists; and in this extreme north of Europe, and especially at Alten and Hammerfest, he assiduously collected insects, more particularly the northern Diptera, the Satyridæ among Lepidoptera, and the Chalcididæ amongst Hymenoptera. During this journey we have the first and only notice of his prowess as a sportsman: he shot willow grouse and ptarmigan; and on one solitary occasion was accessory to the death of a reindeer; but as other rifles besides his own were simultaneously discharged, it is difficult to say whose was the effective bullet. I am glad to be able to record that Mr. Walker declined to give the poor creature the *coup de grâce*, and, for this especial purpose, resigned to another his *couteau de chasse*.

In May, 1840, he married Mary Elizabeth, the eldest daughter of Mr. Ford, of Ellell Hall, near Lancaster, and spent the summer on the Continent, again collecting in Switzerland with his customary assiduity.

In 1848 he explored the Isle of Thanet, the following year the Isle of Wight, and succeeding years, 1850 and 1851, he visited Geneva and Interlachen; and during the former year commenced his great work on Diptera. This formed part of a projected series of works on British insects, to be called 'Insecta Britannica,' a project in which the late Mr. Spence took a deep interest.

During the year 1851 was published the first volume of the 'Diptera.' This work is printed in 8vo, and contained 314 pages; the second volume appeared in 1853, and contained 298 pages; and the third volume in 1856, and contained 352 pages. Thus the entire work comprised nearly 1000 pages of closely-printed descriptions.

Another tour on the continent occupied a considerable

portion of 1857; Mr. Walker visiting Calais, Rouen, Paris, Strasbourg, Baden-Baden, Heidelberg, Wiesbaden, Frankfurt, Mayence, Cologne, Brussels, Aix-la-Chapelle, and Antwerp. During the journey he collected in the Black Forest; and this is the only scene of his scientific labours, during the tour, of which I have any intelligence.

The summer of 1860 was devoted to a thorough exploration of the Channel Islands. Dr. Bowerbank was his companion during a portion of the time; and, as a consequence, the sponges of these islands, were a main object of research,—the Gouliot caves in Sark, so celebrated for their marine productions,—were a great attraction to both naturalists.

In 1861 Mr. Walker's excursions were chiefly confined to North Devon; he visited Linton, Clovelly, Ilfracombe, Bideford, and Barnstaple: and now his attention seems to have been again chiefly occupied with Lepidoptera, at the scarcity of which he was greatly disappointed, having expected, from the extensive woods, to have found moths particularly abundant.

In 1863 he toured the English lakes; and, in the spring of 1865, North Wales and Ireland; and in the autumn he again visited Paris, Geneva, Lucerne, Interlachen, and Altdorf, ascending the Righi, Mont Pilatus and the Mürren, and proceeding to Kandersteg, the Oeschinen See, and the Gemmi Pass.

In 1867 we find him again in France and Switzerland, ascending the Col de Voza, and examining the Jardin of the Mer de Glace; thence over the Tête Noir to Martigny, Sion, and the Great St. Bernard; returning by St. Maurice and the Villeneuve to Geneva.

In 1869 he made the tour of the Isle of Man, and returned by Holyhead; in 1870 he paid another visit to Llanberis, as well as to all the more beautiful scenery in North Wales, crossing over to Ireland, and touring that island from south to north; and in 1871 he examined entomologically the Scilly Islands, and the districts of the Lizard and the Land's End.

In 1872 he turned his attention to Italy, visiting Rome, Pisa, Lucca, Florence, Naples, Sorrento, Capri, Milan, and Venice, as well as the Lakes of Como and Maggiore.

And, finally, in the present year, he had again proceeded as far as Aberystwith, on his way to Ireland, when his intention was frustrated by illness, which terminated fatally

on the 5th of October. He died in the most perfect peace of body and of mind. For many years Mr. Walker was a member of the Linnean and Entomological Societies of London, but resigned his membership in both some time before the close of his life.

It might be excusable in a man of such incessant bodily activity,—so locomotive by inclination, so devoted to the study of Nature in all her aspects, so diligent a collector of the objects of his favourite study,—had he allowed his pen to rest while his hands were engaged in forming and arranging his collections. But this was not the case with Mr. Walker, as his Catalogues of the National Collection abundantly testify. Of the Lepidoptera Heterocera, alone, Mr. Walker catalogued and described upwards of twenty-three thousand species; in addition to which he prepared similar catalogues, although perhaps not to the same extent, of the Diptera, Orthoptera, Homoptera, Neuroptera, and part of the Hymenoptera: such an amount of labour, as is testified by these catalogues, has seldom, if ever, been accomplished by one individual. But this statement by no means represents the whole of his literary labours. He contributed shorter or longer papers to the Transactions of learned societies, and to the periodicals of the day, especially to the 'Zoologist' and 'Entomologist;' by the indexes of the latter I find he sent thirteen communications to the first volume, three to the second, one to the fourth, thirteen to the fifth, and forty-three to the sixth; during the present year his writings appear in every number. I intended to catalogue these, and his other labours, to give some idea of the number of pages, number of species, and dates of each; but I can scarcely now venture to look forward to the accomplishment of this labour of love.

A word remains to be spoken of the man apart from the scientific and accomplished naturalist. Throughout my long life I have never met with anyone who possessed more correct, more diversified, or more general information, or who imparted that information to others with greater readiness and kindness; I have never met with anyone more unassuming, more utterly unselfish, more uniformly kind and considerate to all with whom he came in contact. It is no ordinary happiness to have enjoyed the friendship of such a man for nearly half a century.—*Edward Newman.*

THE ENTOMOLOGIST.

Nos. 136 & 137.] DECEMBER, MDCCCLXXIV.

[PRICE 1s.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER née WEISE.

19. *Cynips Lignicola*.—This gall, which is extremely abundant in Austria and Hungary, is usually developed from the axillary buds of *Quercus sessiliflora* and *Q. pedunculata*, and sometimes, although less frequently, from terminal buds also. It is generally rather larger than a pea, measuring more than a centimetre in diameter; but we have occasionally met with specimens no more than five millimetres in diameter. It is of a spherical form, and usually of a ferruginous-red colour, less commonly brown-yellow or blackish red-brown: it is enclosed in a hoary encasement, which, however, is wanting in some parts, having been ruptured by the enlargement of the gall. In other specimens, especially larger ones, portions only of this hoary encasement remain at the base of the gall, in which case certain markings, usually concealed beneath the margin of the encasement, become visible. The interior of the gall consists of a tolerably hard, rust-coloured substance or

Fig. 19.



CYNIPS LIGNICOLA.

parenchyma, closely adherent to the wall of the contained larva-cell, which is situated near the basal attachment of the gall; the wall of the larva-cell is of a yellowish white colour. The gall attains its maturity late in the autumn, but is not deciduous. When kept in-doors during the winter the perfect insect emerges in April, but in the open air it does not make its appearance until May or June.—*G. L. Mayr.*

Fig. 20.



CYNIPS CONGLOMERATA (and in section).

20. *Cynips conglomerata*.—This gall generally occurs in clusters on dwarf bushy plants of *Quercus sessiliflora* and *Q. pedunculata*, and less commonly on similar plants of *Q. pubescens*. Each gall is about the size of a large pea, and, especially when solitary, is spherical in form, but when a number are clustered together, and appressed to one another, the sides of each separate gall become flattened where they meet, and the galls often become somewhat confluent at the base: in such instances they frequently

deviate more or less from a strictly spherical contour. These galls are not very hard; they are smooth, and of a green colour, but become dingy yellowish brown towards autumn. When of normal form each gall has a small pseudo-stigma [ombilic] exactly opposite the point of attachment at the base: similar processes, however, frequently make their appearance on other parts of the surface; and again sometimes they are entirely absent. In section these galls, when recent, exhibit a layer of green bark, which subsequently becomes hard and brown. The interior consists of a spongy parenchyma, which, in recent specimens, exhibits a greater or smaller number of green spots. The inner gall is situated under the pseudo-stigma [ombilic], when this exists, and is closely adherent to its surroundings. The perfect insect generally emerges in November. In many cases the galls of *Cynips conglomerata* may be mistaken for those of *C. Lignicola*, but are always to be distinguished by their green colour until late in the autumn, when they become of a somewhat yellowish brown tint: the frequent presence of the pseudo-stigma, the two different kinds of reticulation in the interior, and in many instances the position of the inner gall close to the pseudo-stigma, serve to distinguish it from that of *C. Lignicola*. This gall is sometimes so abundant that the young crippled shoots of the oak-bushes are thickly sprinkled with them.—*G. L. Mayr.*

Life-histories of Sawflies. Translated from the Dutch of
M. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from p. 255.)

SELANDRIA ANNULIPES, *Klug.*

Imago: Klug, die Blattwespen nach ihren Gattungen und Arten in Der Gesellsch. Naturf. Freunde zu Berlin Magazin, &c., 8er Jahrg. p. 70, No. 49; *Hartig, Blatt- und Holzwespen*, p. 279, No. 46.

Larva: Ratzeburg, Die Forstinsecten, Th. iii. p. 130, No. 39; Taf. iii. f. 7.

Selandria parva, nigra, nitida, tibiaram tarsorumque basi alba, alis fusco-nigris, apice hyalinis.

A glance at our engraving will show that we have here to do with an insect related to *Selandria æthiops*, *L.*, the well-known caterpillar of the pear-tree; indeed, Ratzeburg's description of the one follows immediately upon that of the other. In a systematic arrangement, however, they would not be placed so near together; they are in the same genus of Hartig, but, on account of the difference in the neururation of the wings, not in the same division: this may suggest the question whether the divisions of this author, according to the neururation, are always equally natural,—a question which I hope to answer, if I succeed in rearing a third species of caterpillar (nut-brown, living on the oak).

At the end of May, 1866, I took a female of *Selandria annulipes*, on a lime-tree in my garden, after the insect had been flying about for some time in the sunshine among the large leaves of that tree. On the 8th of June following I perceived some very small caterpillars on the under side of a leaf of the same tree (see fig. 1, *a, a, a*): not far from each of these larvæ was a little pocket, formed of the skin of the leaf (fig. 1, *b, b, b*), of a very pale green, and having a little hole bitten out of the middle; in these pockets the eggs had been placed, from which the larvæ had emerged. Ratzeburg has made precisely the same observation, as appears in his work, referred to at the head of this paper. The larvæ gnawed little pieces out of the under epidermis and parenchyma of the leaf, as represented at fig. 2, magnified, so that the leaf on which they lived was speedily covered above and below with little brown spots, where the cuticle only was left. Afterwards, when many larvæ have damaged the leaf in this way, it dies and curls up, which has induced Ratzeburg to class *Selandria annulipes* as specially injurious in gardens.

My young larvæ were very shining, as if they had been covered with varnish: they were of a very pale gray, with nut-brown heads; the anterior segments of the body were broad, narrowing posteriorly; the broad intestinal canal, which was of a green colour, showed through the body, and had a black longitudinal line at the end, which was simply the excrement seen through the skin. I counted twenty-two

legs:* the thoracic legs had gray rings at the base; the abdominal legs were moderately large, becoming smaller towards the tail; but the last pair in these young larvæ was only to be detected with difficulty.

On the 14th of June the largest larva had grown to the length of a centimetre (fig. 3); figs. 4 and 6 represent it somewhat magnified. The colour of the little animal, which was very viscid, was a sordid yellow, in which the dark green intestine showed out distinctly. When viewed from above, the head appears of a purplish tint, and at the same time one seems to see an indication of two legs on either side, in consequence of the transparency of the skin at the side of the anterior segments. Looked at from the front, while it feeds, the larva has the appearance of fig. 6: it moves its head right and left for the purpose of eating, and looks then something like a grazing cow lying on its belly. The head is nut-brown, flat anteriorly, and covered for a great part by the skin of the 1st segment; the vertex is blackish, and, as the skin by which it is covered is yellowish, it shows through purple, according to the law of complementary colours. The eyes are in oval black spots at the sides; the horns, or feelers, below the eyes, are pretty long. The first pair of legs is of a yellowish colour; the second and third gray, with white rings; the claws were placed at right angles on the last joint of the tarsi.

The beautiful appearance of the white air-tubes, which could be seen through the skin, was very remarkable: this was specially visible in the last two segments, when the branching of the tracheæ appeared, as represented at fig. 5, somewhat more highly magnified. When they were not feeding they bent the head forward, nearly flat against the surface of the leaf, which almost entirely deprived them of the appearance of living animals. No trace of hair was to be seen; and in the examples which came under my observation I could perceive nothing of the stellate brown hairs, which Ratzeburg states that he observed in the case of a single individual of the autumn brood. The larvæ crept into the ground to undergo their change; and I am unaware whether they made cocoons or not.

* I may here mention that the brown caterpillar of *S. æthiops*, which, according to Réaumur, De Geer, and Hartig, has twenty legs, has in like manner twenty-two, but often retracts one or two pairs under the skin.

The development of the imagos followed pretty speedily. On the morning of the 6th of July I found two males had come out; another appeared on the 7th, two on the 9th, and so on up to seven,—these were all males: they were all much smaller than the female I had taken on the lime-tree just after she had deposited her eggs, or, to speak more precisely, just before I saw the freshly-produced larvæ; as to colour and other characteristics they completely resembled the females.

The female in question is represented at fig. 7. Head and thorax shining black, clad with a fine brown pubescence; mandibles ferruginous, with black tips. The antennæ are black, somewhat hairy; the first two joints cup-shaped, not very small; the third nearly half as long again as the first two joints together, ending obliquely at the apex; the fourth not more than two-thirds of the preceding joint, the remainder diminishing regularly in length and breadth; the last joint conical. The abdomen rather broad, shining black, without hair. As regards the legs, the coxæ and trochanters are black; the femora of the first pair black, with a rather broad pale red spot on the knees; those of the second pair have the spot smaller; the femora of the last pair are entirely black. The anterior tibiæ are brownish yellow, white at the base; those of the second pair somewhat darker at the apex; the tibiæ of the last pair are black, with the base obscure white; the tarsi are respectively of the colour of the tibiæ to which they belong. In the living insect the wings are purplish black; in the dead insect brown, with the exception of the apex, which is white and transparent. In the second and third submarginal cells are some black horny dots; the anterior portion of the anal cell (*area lanceolata*) has an oblique transverse nervure. The insect was only six millimetres long, expanding to eleven millimetres.

The males only differed in being much smaller (four millimetres), having proportionately longer antennæ, and in having merely narrow white rings on the tibiæ and tarsi of the posterior legs.

Ratzeburg considers that in favourable years this species may produce three generations; and I am quite of his opinion. Supposing the first imagos to appear, in warm seasons, in the beginning of May, then the second brood

would appear by the middle of June, and the third in August. I do not even see why there should not be four generations, although I admit there is little chance of it in our climate.

In conclusion, I must remark that Ratzeburg has made a slip of the pen in stating that the "black-gray smoky wings are lightest at the base and darkest at the apex:" it must evidently be just the reverse. It is, moreover, somewhat singular that, having reared the insect, he makes no mention of the male. Can it be that my having reared a brood of males is to be regarded as a rare occurrence? It is well known that in the case of the sawflies the females occur in much preponderating numbers; even in some not rare species the males are to this moment quite unknown.

Netherland Insects. Translated from the Dutch of CHRISTIAN SEPP by EDWIN BIRCHALL, Esq.

(Continued from p. 154.)

"DE KLEINE GESTREEPTE WITJES-VLINDER."

The small, striped, white butterfly (*Pieris Napi*).

HAVING now before me the task of describing a butterfly of the second order, it seems to me best to state something beforehand about the character of these insects. In the first section, about the butterflies of the first order, I named the common character, which all butterflies have in caterpillar and pupa, both in the first and second orders; consequently it is unnecessary to repeat this in the present chapter; but, as I then gave the peculiar character of caterpillar, pupa, and fly, of the first order, so now I give herewith the character of caterpillar, pupa, and fly, of the second order:—

(1) The eggs, out of which these insects take their beginning, have not all the same form: some are longish, and pointed at the upper end, others round; and of these some are round like a ball, others round like a plate, some smooth, and others rough; in colour they incline to white and yellowish chiefly.

(2) The caterpillars of this order have no spikes, but mostly very fine, short hairs.

(3) Their heads are round.

(4) The especial character of this order is the way in which the caterpillars prepare themselves for the change into the pupa, as in this they differ from all other caterpillars, either of day or night moths; for, besides, like the caterpillars of the first order, attaching their hinder part firmly by means of a fine web to the place where they are about to undergo the change, they stretch across the middle of their body a thread, which they attach firmly on the other side of their body: and this cross-thread, or band, is an unfailing characteristic by which these caterpillars, when undergoing the change, can be distinguished from all others.

(5) The pupæ of this order are not all of one shape: some have points or projections, and are thus similar to those of the first order, although the points of the former are differently placed from those of the latter; others are without points, and thus resemble more the pupæ of moths.

(6) But the surest characteristic of the pupæ of this second order is the above-named cross-thread, or band, by which they may be distinguished from all other pupæ of day and night moths.

(7) The butterflies of the second order have six perfect feet, and are by this means easily to be distinguished from the butterflies of the first order.

(8) Their under wings are proportionately smaller than those of the butterflies of the first order, as the latter always cover their bodies with their wings when in a state of rest, but the former only very seldom, if at all.

§ 1.—Let us now proceed to the description of the present example,—the small, striped, white butterfly. But some will say—Is it worth while to trouble oneself with such a trifle? Is it fitting that man should make for himself work by enquiring about vermin? Fie! away with this excrement of Nature! Should we occupy our leisure hours with such trash? It may be said that vermin are found amongst the works of the Creator, but what need is there to honour them by curious research and description? Such, alas, is the evil talk of some, whenever they are asked to contemplate the works of God, and especially those works which, according to their narrow notions, are despicable. What a lamentable way of talking! No wonder that that great zealot for the

honour of God, the highly-gifted Brocks,* has alluded to such people in a trenchant, though short, poem, in order, if possible, to bring them to repentance.

“ Saint John says well, that if a man shall say,
 ‘ I love the Lord,’ and yet shall love his brother not,
 He is indeed
 Most worthily
 A liar called ;
 For he who hates his brother whom he sees,
 And whom before his eyes for proof has got,
 How can he then love God, whom he sees not ?

And Nature’s book, too, says, if any say,
 ‘ I honour God,’ whom in His works he honours not,
 He is indeed
 Most worthily
 A liar called ;
 For he who holds the works of God unfit
 For careful thought, although he sees them plain,
 How can he honour God, whom he sees not ? ”

Truly, the contempt which a man has for the creature is a clear proof of contempt for the Creator himself: for whosoever shall despise the Master’s work, which is wrought out in every part perfect and with excellent wisdom, he despises indeed the Master himself. Let no man advance here the argument that a difference must be made between one creature and another, and that the most despicable need not be regarded. Nothing throughout Nature is low. I say that the great Creator has made nothing which is unworthy of our observation and admiration. Is there a lower object than a grain of sand? And yet what a wonder-work of the Most High; for no mortal, however ingenious and powerful he be, can make even that out of nothing. How much rather should we wonder in abasement whenever we attentively observe a despised insect? A thoughtful mind perceives as much art, wisdom, and might, in the construction of the smallest fly, as in that of the largest elephant; for it would be more possible (or it would at least seem more easy of comprehension) for a man to make an elephant than to produce a minute animal, such as a fly, and supply it with eyes, mouth, heart, lungs, belly, and other internal and outward parts, and everything else most perfectly prepared. But why do I talk of the smallest fly or other insect? The

* In his ‘ Irlisch Vergnügen in Gott,’ p. 534, of the fourth Hamb. edition.

sharp-sighted Lewenhoeck has discovered insects, through his microscope, each of which is a hundred million times smaller than a grain of sand. But far, very far, be it from any man to consider such a seemingly unimportant creature unworthy of his observation, for it might serve to turn our thoughts back from it to its Almighty Creator. Is it not true that men admire much the buildings of princely houses and courts: men have the greatest esteem for their architects, and willingly concede to them art and ingenuity; but sound reason proves to us that all the most glorious palaces of the whole world, nay, all works of art and science, made by man, are not at all to be compared to the construction of one such animal; for from them streams forth a wisdom and omnipotence, before which all man's wisdom and power dwindles into a shadow. Is it not, therefore, very becoming that a man should spend his leisure time, or, at any rate, some of it, in contemplation of the animal kingdom? Let a man, I say, fix his attention upon these wonders of the Highest Wisdom. But consider, that such a living speck of dust,—what do I say?—that such a living being, many thousand times smaller than a speck of dust, is supplied with the utmost perfection, not only of the outward parts,—with their skins, joints, tendons, &c., and thus placed in the position of a being able to move quicker than many of the largest animals,—but also with everything that is necessary to the internal arrangement and the circulation of the fluids, without which no organized being can exist: and still the whole animal above named is a hundred thousand times smaller than a grain of sand; but think how many million times smaller than the animal must that be out of which it was made. Let us observe, also, in considering this amazing, this unspeakable smallness, that care is taken for the continuation of such (as it were) invisible creatures, and our thoughts must be silenced in amazement. What think you, worthy reader, are they not the works of art of a boundless omnipotence, conceptions of an unsearchable wisdom, proofs of an endless goodness? Do we not find in these trifling things a most convincing proof of the infinite greatness of Him who made them out of nothing? In short, do they not convince us of the truth that there is a God? Now, I ask whether the contemplation of such seemingly

insignificant creatures is trifling and useless? and whether they do not lead us up to a knowledge of our adorable Creator? Let us, then, following the steps of those who honour God in his works, walk boldly forward to inspect the insect-world. Behold, here, the history, or way of life, of an insect, in the person of a butterfly of the second order.

§ 2.—Of the white butterflies, four sorts are known to me, namely:—the large butterfly, *Pieris Brassicæ*; the small butterfly, *P. Rapæ*; the great striped butterfly, (?) *P. Daplidice*, which I have not seen in this country, but Dr. Rösel has described and drawn it in the first part of his ‘*Insecten-Belustigung*,’ p. 45, of the second collection; and the small striped butterfly, *P. Napi*, which that author has not in his work. The last-named insect shall for the present occupy my pen. This butterfly is one of the first to show itself in the spring, but not one of the commonest, as it is not found nearly so frequently as the large and small butterfly. It lays its eggs singly, and leads a lonely life in the caterpillar state. During all the time that I have occupied myself with the study of insects, it has only once happened that I have been able to secure a single egg of this insect. My son found it, about the end of May, on the downs, near Haarlem, on a leaf of one of the wild kails. I am strongly of the opinion that the insect deposits its eggs on other plants. The egg above named was placed on the under side of the leaf. Its shape is longish, inclined towards a point at the top; by the under or broader side it is gummed on to the leaf; and thus, like pretty nearly all butterfly-eggs, it has the point always turned away from the leaf. It has twelve ribs, of which six run out nearly at the top, and the other six alternately a little lower. Cross over, in the circumference from the top to the bottom, it is banded with a great number of slightly-embossed stripes. It is shiny, and of a whitish yellow colour, having thus, when seen through a microscope, a beautiful appearance.

§ 3.—A couple of days after I got the egg I observed that its brightness quite disappeared, and that it became dull in colour; whereupon, in about the course of one day, the caterpillar appeared, and in the first place ate up the top of its egg half-way. The little animal was thus of a whitish colour, and, through the microscope, appeared all over shiny

and transparent, stuck over with a few fine hairs. As soon as the caterpillar began to graze upon the leaf it became a little greener; and when it had become one or two days old it gave up eating the leaf anywhere but on the edge, or else it made holes in it. Four days after its birth it moulted for the first time, and shortly afterwards ate the skin thrown off; and this it did on every following occasion. Then it still appeared, under the microscope, quite shiny, as before, especially its head, was as transparent as glass; and that, as well as the whole caterpillar, set with single, black, stiff, little hairs, standing chiefly on white knobs, and the rest on black spots. Moreover, it had round about it a great number of black spots, following the course of the above-named rings; but these and the white knobs were so uncommonly fine that one could only distinguish them by aid of the microscope, melting away, as it were, into the green ground of the colour of the caterpillar, whereby the animal appeared to the naked eye of a pale green, and became paler as it grew larger and older. Our caterpillar, after having moulted three times more, at intervals of about four days, remained, after the last moult, six days eating and growing, and reached its maturity on the twenty-second day. . . . Here I beg to remark that, at first sight, there is such a great likeness between this sort of caterpillar and that of the ordinary small butterfly, *P. Rapæ*, that one can hardly distinguish one from the other, unless one pay attention to two characteristics, which do not at all strike the eye at first, to wit—over the back of the small butterfly caterpillar runs a very faint, pale yellow stripe, which is not the case with the caterpillar under discussion; further, the spiracles of this caterpillar are surrounded by a little yellow ring, which is wanting in the kind before named, but in the same place both of them have a short yellow stripe near the spiracle. In all other respects these two kinds of caterpillar are exactly alike.

§ 4.—Our caterpillar having, as we said, reached the age of twenty-two days, forsook its usual haunts and food, seeking a suitable place for its coming change; and, having found this, it remained quiet for half a day. After that it spun itself fast, the same day, in the usual manner of the butterfly caterpillars of the second order, to wit—having fastened its hinder end, by means of a fine web, it spun across its body a

thread, which, though composed of several threads, was uncommonly fine, and thinner than a hair; thus it lay, patiently waiting for its change. Meanwhile it curled itself somewhat more together, or became a little shorter and thicker, and the following day changed itself into a pupa. . . . Between this pupa and that of the small white butterfly there is likewise scarcely any difference, but the former is somewhat more yellowish and less speckled than the latter. In the course of eight days our pupa changed in colour, and was strikingly yellower: at last the wings of the butterfly began actually to appear through the pupal case.

§ 5.—Finally, after our insect had passed ten days in the pupal state it appeared in its last, or glorious form, being now a perfect butterfly, which, although it had no gleaming colours, charmed the eye by its beautiful whiteness, coupled with modest yellow, which set off strongly its black ornaments; or with its wings folded over its back, with their under side striped with a greenish gray; which has given occasion to the name of the insect. I beg further to make the observation, that this insect is found twice a year, namely, spring and summer.

*The Classification of the Rhynchophorous Coleoptera.**

By JOHN L. LECONTE, M.D.

[Reprinted from the 'American Naturalist' for July, 1874.]

AT a meeting of the Academy held in Washington, January, 1867, I had the honour to offer some remarks † upon the systematic value of the great complex of Coleopterous insects known as Rhynchophora.

It was my intention, as then stated, to follow the memoir just mentioned with another, in which the classification of the Rhynchophora and separation into families should be discussed, in the hope of developing a more satisfactory system of arrangement than had been thus far obtained.

Circumstances have prevented me from following this particular line of investigation, to a definite result, until

* Read before the National Academy of Sciences, Washington, April 21, 1874.

† 'Am. Jour. Science and Arts,' xlv.; July, 1867.

within a short time, though it has frequently occupied my attention for brief intervals. The time, however, has not been altogether lost, for I found that, with each return to the investigation, I obtained an additional, though small, insight into the constitution of this complex, which has been the subject of repeated efforts by the most laborious and successful students of Entomology in Europe.

The bases of the classification of the Rhycho-phora, which have been proposed, are briefly these:—

I. Schonherr* treated the great mass of these insects (excluding only the Scolytidæ) as constituting a single family, divided as follows:—

- | | | |
|--|-----------|-----------------------|
| A. Antennæ not geniculate; antennal grooves wanting. | - - - - - | ORTHO-CERI. |
| Bruchides, Anthribides, Camarotides, Atelabides, Rhinomacerides, Ithycerides, Apionides, Rhamphides, Brenthides, Cyclades, Ulocerides, Oxyrhynchides. | | |
| B. Antennæ geniculate; grooves almost always distinct. | - - - - - | GONATOCERI. |
| a. Rostrum short, deformed; antennæ subterminal. | | |
| | - - - - - | <i>Brachyrhynchi.</i> |
| * Antennal grooves extending below the eyes; Brachycerides, Entimides, Pachyrhynchides, Brachyderides, Cleonides, Molytides, Byrso-pides (the last with the rostrum received in aprosternal excavation). | | |
| ** Antennal grooves directed towards the eye; Phyllobiides, Cyclomides, Otiorhynchides. | | |
| b. Beak cylindrical, slender; antennæ inserted far behind the tip. | | |
| Eriirhinides, Cholides, Cryptorhynchides, Cionides, Rhyncho-phorides, Conoderides, Cossonides, Dryophthorides. | | |
| | - - - - - | <i>Mecorhynchi.</i> |

In the gradual progress of the work this last legion, the Mecorhynchi, were divided into Synmerides, having the front coxæ contiguous, and Apostasimerides, having them distant. The distinctions between the tribes above mentioned were founded mostly on insignificant and evanescent modifications in the form of beak and antennæ; so that with the

* 'Genera et Species Curculionidum;' Paris, 1833—1844.

immense mass of genera and species described, it became quite impossible to determine either from the work itself.

II. Although the faults found with this artificial system were neither few nor vaguely expressed, yet it was not until the progress (1863) of his admirable work on the 'Genera of Coleoptera,' by my deceased friend Prof. Lacordaire, required this immense labour to be done over again, that any attempt was made at a new arrangement. The system of Lacordaire was essentially this:—The series was divided into six families,—Curculionidæ, Bruchidæ, Anthribidæ, Brenthidæ, Uloceridæ, and Scolytidæ: of these the Bruchidæ were recognized as having scarcely any relations with the other families, and pertaining rather to the Chrysomelidæ, with which they have since been associated by most authors. The Bruchidæ and Anthribidæ were characterized by having a distinct labrum; the Scolytidæ by the compressed and dentate tibiæ; while the Brenthidæ were separated rather by form than by any distinct structural character. The Curculionidæ were then divided, according to the size of the mentum, into—

- | | |
|--|-------------------------|
| I. Mentum closing the buccal space, and concealing the maxillæ. - - - | ADELOGNATHI. |
| Eyes rounded; prothoracic lobes indistinct. | <i>Cyclophthalmes.</i> |
| Eyes large, depressed, transverse, narrowed below; prothoracic lobes well marked. - | <i>Oxyophthalmes.</i> |
| II. Mentum smaller; maxillæ visible. - - | PHANEROGNATHI. |
| A. Front coxæ contiguous, or nearly so. - | <i>Synmerides.</i> |
| a. Pygidium covered by the elytra; claws not appendiculate. | |
| Metasternum short; episterna narrow. | |
| Gular peduncle wanting. | |
| Gular peduncle distinct. | |
| Metasternum long; episterna rather wide. | |
| Antennæ geniculate. | |
| Antennæ straight. | |
| b. Pygidium exposed, or claws appendiculate. | |
| Ventral segments not angulated at the sides. | |
| Ventral segments angulated. | |
| B. Front coxæ separated by the prosternum, which is frequently channelled for the reception of the beak. | <i>Apostasimerides.</i> |

- a. Oral organs normal. Club of antennæ annulated; third joint of tarsi bilobed.

Mesothoracic epimera not ascending.

Mesothoracic epimera ascending.

- b. Oral organs abnormal; first joint of antennal club usually very large, corneous; third joint of tarsi rarely bilobed.

Pygidium exposed.

Pygidium covered by elytra.

Each of these divisions contains several tribes differentiated by characters of smaller importance, and not unfrequently indefinite.

III. The next attempt at a general classification was made by Mr. H. Jekel.* This excellent author recognized with great clearness, and defined with tolerable precision, the following eight principal types among the Rhynchophora:—Bruchides, Anthribides, Attelabides, Curculionides, Calandrides, Cossonides, Scolytides, and Brenthides. The last-cited memoir is occupied chiefly with a further development of the classification of the largest of these, the Curculionides proper; and in it he proceeds to separate, as sub-families,†—Brachycerides, Brysopides, and Amycterides: epigeal forms, in which the tarsi are not dilated, and not furnished with brush-like hairs beneath. Having thus isolated them, the great mass remaining is divided into—

Body dissimilar in form, male and female; narrower

in male. - - - - - PLATYGNES.

Beak similar in both sexes. - - - - - *Homorhines*.

Beak dissimilar. - - - - - *Heterorhines*.

Body nearly or quite of the same form, male and female.

Pygidium covered by the elytra; body pollinose or pubescent. - - - - - ISOGYNES.

Pygidium exposed or covered; body squamose, &c. - - - - - METRIOGYNES.

* Annales Ent. Soc. France, 1864, p. 537; Ins. Saundersiana, 155 sqq., 1860.

† Mr. Jekel gives to the anomalous groups this subordinate position, rather, as he says, "Pour ne pas heurter les idées généralement admises," than in accordance with his own views, which would lead him to regard them as I have done,—as genuine families.

Pygidium covered.	-	-	-	-	<i>Cryptopyges.</i>
Pygidium exposed.	-	.	-	-	<i>Gymnopyges.</i>

The principal types contained in each of these three grand divisions are then characterized in a very clear manner; but for a proper understanding of this system, a vast improvement on all that preceded, the reader must refer to the original memoir. In developing the arrangement of the tribes represented in our Fauna, I shall be largely indebted to the views expressed in this most valuable memoir of Mr. Jekel. There remain to be mentioned two Faunal contributions to the history of this subject:—

1. A series of remarks by Mr. Suffrian,* in which the German species of several genera, not before carefully studied, are more fully elucidated, and various criticisms upon Schönherr's system made.† The necessity of a more careful study of the tibiæ and tarsi, almost neglected by Schönherr, is insisted on, and an arrangement of the German genera in groups upon these characters is given.

2. That most admirable work of Prof. C. G. Thomson,‡ to which no entomologist ever refers without finding original material by which he can profit; a remarkable instance of the good results to be obtained by a careful and intelligent study of a very limited Fauna. The Rhynchophorous series is divided as follows:—

Segments of the abdomen immovable; 2nd and 3rd nearly equal.	-	-	-	-	ISOTOMA.
Bruchidæ, Anthribidæ (including Urodon), Rhinomaceridæ, Attelabidæ.					
Abdomen with the 1st and 2nd segments connate; the remaining three movable; the 2nd usually much longer than the 3rd.	-	-	-	-	ANISOTOMA.
Apionidæ, Curculionidæ, Cossonidæ (including Calandra), Tomicidæ.					

From a survey of the different schemes of arrangement, which have been thus briefly reviewed, it is evident that while the principal types of the Rhynchophorous series, and the main divisions of the great family Curculionidæ have

* 'Bermerkungen über einige deutsche Rüsselkäfer: Stettin, Ent. Zeitsch,' i.—ix.

† See specially *op. cit.*, 1847, 157.

‡ 'Skandinaviens Coleoptera,' vii., Lund, 1865.

been clearly perceived, the attempts to define these important forms have failed in a greater or less degree, on account of the want of proper subordination in the characters made use of: all of them natural, all of them important, though in a less degree than supposed by the expounder of each particular system.

To supplement the memoirs above referred to, there came, in more recent times, the beginning of a systematic study of our species of Curculionidæ, by Dr. George H. Horn, a careful and conscientious study of the Calandridæ and Cossonidæ, and of some Mecorhynch genera of the United States.* In the introductory remarks he observes:—"One character is mentioned in the following pages that appears to have escaped notice. In most, if not all, of the genera of Mecorhynques, the males have eight, and the females seven dorsal abdominal segments. The Calandrides and Cossonides appear not to possess this character, as also all the Brachyrhynques which I have had time to examine."

The value of this original observation of Dr. Horn is very great, but the limitation which he has placed upon it, though correct as regards the Calandride and Cossonide types, is erroneous as regards the Brachyrhynes, which have the abdominal sexual characters precisely as in the genera in which he first observed them. So, too, have the Brenthidæ, and all the anomalous sub-families of Curculionidæ in the Jekelian system. It appears, therefore, that this peculiarity of structure is of much more importance than was supposed by Dr. Horn, and, that it must in reality be the defining character for the division of the Rhynchophora into primary series, of more than family value. I therefore prepared a series of dissections of each of the well-recognized Rhynchoporous types within my reach, and have come to the conclusion that they may be arranged in three sets, each of which has a corresponding value to the individual series of normal Coleoptera (*e. g.* Adephaga, Clavicornia, Lamellicornia, &c.); and upon subordinate characters (some of which have been already employed in the classifications above mentioned, though in an empirical manner) into families, as follows.

* "Contributions to a Knowledge of the Curculionidæ of the United States." (Proc. Am. Philosophical Soc. 1873, 407.)

Series I. HAPLOGASTRA.

Abdomen alike in both sexes; dorsal segments seven, coriaceous, with the exception of the 7th, which forms the pygidium, and which is small and corneous; ventral segments not prolonged upwards into a sharp edge; elytra without lateral fold on the inner surface; epipleuræ usually distinct; antennæ straight, 11-jointed; ungues usually bifid or toothed, rarely (*Rhinomacer*) simple; front coxæ conical, prominent; prosternum very short in front of the coxæ; the beak varies in length and thickness, but not according to sex, so far as I know; the front coxæ are contiguous, except in one genus of *Rhynchitidæ* (*Pterocolus*); the ventral sutures of the abdomen are straight; the mandibles and tibiæ vary in form, and furnish convenient characters for division into families:—

- | | | |
|---|----------------|----------------|
| A. Ventral segments nearly equal in length;
epipleural indistinct; tibial spurs small;
claws simple (always?). Mandibles simple,
flat; labrum distinct. | - - - | RHINOMACERIDÆ. |
| B. Ventral segments diminishing in length;
epipleuræ distinct; labrum wanting;
claws bifid, or appendiculate.
Mandibles flat, toothed on each side; tibial
spurs small. | - - -
- - - | RHYNCHITIDÆ. |
| Mandibles stout, pincer-shaped; tibial spurs
large. | - - - | ATTELABIDÆ. |

The affinities of this series are in an ascending direction with the rostrated *Heteromera* (*Oedemeridæ* and *Pythidæ*): this is indicated by the softer tissues in *Rhinomaceridæ*, and certain *Rhynchitidæ*, and also by the presence of a labrum in the former. In a descending direction the *Attelabidæ* lead to the true *Curculionidæ*, and the *Rhynchitidæ* to the *Belidæ*, the last family in the third series of *Rhynchophora*. The habits of the species of this series are peculiar, and quite different from those of the next series, and indicate, as is wisely observed by Lacordaire,* for the care of their progeny, an industry which appears here for the first time in the family. I cannot describe the results of this instinctive or intelligent industry better than by

* Gen. Col. vi. 543.

condensing the account of the author just cited, referable, however, to European species.

1. *Rhinomaceridæ*.—The European species deposits the eggs in the male flowers of *Pinus maritimus*, the development of which is thus prevented. I may be allowed to observe that this synthetic genus, the nearest approach in the Rhynchophora to the lower Heteromera, and therefore the representative of old forms clings to an old and synthetic type of vegetation.

2. *Rhynchitidæ*.—Some of the species of *Rhynchites* roll leaves in the manner of the next family; others deposit their eggs in young fruit, the kernel of which is eaten by the larva; others, again, place the eggs in the undeveloped buds of trees, which are thus destroyed.

3. *Attelabidæ*.—In the spring the females roll up the leaves of the trees, and deposit in each an egg. After emerging from the egg the young larvæ eat the inside layer of the case which covers them, which they probably leave at a later period, when their growth is complete, to perfect their metamorphosis under ground.

These three families are of small extent, and but little need be said regarding their classification.

RHINOMACERIDÆ.

This family is represented in our Fauna by two species,—one on each slope of the Continent,—and is easily recognized by the depressed, curved, and acute mandibles, and distinct labrum. The pygidium is covered by the elytra, which are punctured, without any appearance of striæ. On the inner face there is no trace of a lateral fold; the epipleuræ are indistinct.

ATTELABIDÆ.

Four species of *Attelabus* on the Atlantic slope are the only representatives thus far known in our Fauna. The beak is stouter than in the preceding family, and the mandibles thicker and stronger; the epipleuræ are quite distinct, and there is no trace of a lateral fold on the inner face of the elytra; the pygidium is not covered by the elytra, and is impressed along its upper margin for the reception of the

apical edge of the elytra;* the tibiæ are armed with large spurs.

RHYNCHITIDÆ.

The peculiar form of the mandibles requires the separation of these genera as a distinct family. The teeth on the inner side are well developed, as usual, but, in addition, the apex is prolonged outwards into an acute process, behind which is another large tooth;† the front coxæ are usually contiguous, large and conical,—in one genus (*Pterocolus*) widely separated; the pygidium is either exposed (*Rhynchites*, *Pterocolus*) or covered by the elytra (*Eugnamptus*, *Auletes*); the epipleuræ are narrow, but distinct; and on the inner face of the elytra, remote from the margin, may be seen a short, straight fold, the homologue of the well-defined fold, which limits the lateral groove for the reception of the side margin of the ventral segments, observed in all the following families.

(To be continued.)

Mode of Oviposition in certain Lepidoptera. By the Rev. P. H. JENNINGS.

I HAVE much pleasure in sending you a few notices of the manner in which some moths deposit their eggs, together with other items concerning them. If they are acceptable to you, and you think will tend to general edification, I shall be happy to send you more as occasion may offer. At the same time, I should be very glad if others, interested in our favourite pursuit, would give us the benefit of their experience. While we all admire the beauty of the perfect insect, and desire to store our cabinets with specimens in the finest condition possible, yet how much more do we learn of the wonderful in Nature from an acquaintance with the habits given to the insect by its Almighty Creator, and exhibited both in the larval and perfect state.

Crocallis elinguaris.—A wasted female, taken in August, deposited forty-six eggs, of which some were laid on a sprig

* Compare in this relation the curious notch in the front part of the pygidium of Anthribidæ, for the reception of the sutural angles of the elytra.

† This character was first observed by Thomson, who observes (*Sk. Col.* vii. 28), concerning his tribe *Rhynchitina*, "*Mandibulæ depressæ, extus excisæ, intus dentatæ.*"

of the food-plant, and some on the ground: they were in patches, placed closely side by side. Those on the food-plant were on the upper edge of the leaf, with one end projecting outwards. In shape they resemble a brick, with its edges and corners rounded off, perfectly smooth, and of a dirty white colour.

Phyalapteryx vitalbata.—A female, taken on August 27th, deposited twenty eggs on the food-plant, *Clematis vitalba*, of which fifteen were laid on the under edge of the leaf, four on the upper edge, and one on a foot-stalk. In shape oval, flattened on the upper and under sides. They were placed generally lengthwise along the edge of the leaf, sometimes attached end to end, slanting just sufficiently to allow of the egress of the caterpillar, sometimes almost side by side, and sometimes singly; the colour a very pale stone; large, for the size of the insect, and perfectly smooth. The caterpillars emerged in nine days, and have now (October 16th) all disappeared but two.

Melanippe fluctuata.—A fresh female deposited, from September 14th to 18th, seventy-three eggs, only three of which were laid on the food-plant, seven on the glass-cylinder, and the rest on the muslin cover. Those on the food-plant were on the edge of the leaf, two on the under side, and one on the upper. In shape oval; perfectly smooth and almost white, soon assuming a yellowish tinge. The caterpillars emerged on the 24th, and have now, October 16th, just moulted for the last time.

Tryphæna fimbria.—A wasted female, taken at sugar, September 12th, deposited, on the night of the 14th, three hundred and forty-nine eggs, beautifully arranged side by side on the under surface of a leaf of common sallow (*Salix caprea*). Approaching the edge of the leaf, she discontinued with the greatest regularity about the sixteenth of an inch from it. The space towards the interior was entirely filled up until the midrib was reached, which was carefully passed over; with the exception of those laid on the other side of it, not an egg was disconnected from the mass. They were Echinus-shaped and longitudinally ribbed; in colour a very faint yellow-green. The caterpillars emerged in about ten days.

Epunda lutulenta.—A female, taken at sugar, September 12th, deposited on the 13th one hundred and twenty-four

eggs, sixty-four of which were on the ground, and the rest on the food-plant, common gromwell (*Lithospermum arvense*). Those on the food-plant were almost all on the under side of the leaf, and often in pairs or triplets, but otherwise very much at random, there being no apparent order. Echinus-shaped, longitudinally ribbed. When fresh laid pale yellow in colour, assuming a streaked reddish appearance on the second day.

Orthosia Litura.—A female, taken at sugar, September 21st, deposited on the night of the 23rd one hundred and forty-seven eggs, in a compact and orderly-arranged mass, on the under surface of a leaf of common birch (*Betula alba*), very similar in size and shape to those of *E. lutulenta*. In colour, white when fresh laid; in a few hours the centre assumed a shade of reddish brown, and a ring of the same colour appeared round the middle. The caterpillars emerged the first week in October.

Miselia Oxyacanthæ.—A female, taken at sugar, October 12th, deposited twenty-nine eggs on the night of the 13th on its food-plant, common whitethorn (*Cratægus Oxyacantha*). In colour a faint yellow-green. Echinus-shaped; longitudinally ribbed; eight long and eight short ribs, the longer terminating in a point, and giving the eggs a conical shape, and forming an edge round a small crater. Most of them were laid indiscriminately on the upper and under sides of the leaves, singly, and near the edge; a few on the foot-stalk, just at the base of the leaf, or at juncture with the twig, or just on the twig itself.

Phlogophora meticulosa.—A female, taken at sugar, October 14th, laid one hundred and thirty-three eggs on the night of the 15th. In colour a faint yellow. Echinus-shaped; longitudinally ribbed; rather depressed at the top; ribs running up to the circumference of a small convexity. All deposited at random: eighty-one on the muslin cover, forty on the leaves of the food-plant, and twelve on the ground. Those on the food-plant without any order: some on the upper, some on the under side of the leaves, some on the edge, some on the inner surface, and some on the foot-stalk.

P. H. JENNINGS.

Longfield Rectory, Gravesend,
October 16, 1874.

Entomological Notes, Captures, &c.

Argynnis Niobe in Kent.—I should like to make a few remarks in reference to the plan suggested by Mr. Clifford, in the 'Entomologist' for October (Entom. vii. 225), for dissipating the doubts, which he says are still entertained by some entomologists, as to the recent capture of *Argynnis Niobe* in Kent. Mr. Clifford says:—"If the gentlemen who have made acquaintance with *Argynnis Niobe* will associate with themselves one or two entomologists of known skill in larva-hunting, and, without indicating the precise position of the valley or hollow between Wye and Ashford to the entomological world generally, arrange to make a careful united search for the larvæ of *A. Niobe* during the spring, we may possibly get a result conclusive enough to satisfy all sceptics." Now it seems to me that if this plan were to be adopted no satisfactory result could possibly be arrived at; for if the larvæ were not found, there would be no proof that they were not there; and if found, there would be no evidence how they came there. Some three or four years ago, while beating for larvæ in the High Woods here, I beat from an oak-tree a very large, handsome larva, that evidently belonged to a species not included among our native Fauna. For a moment I was completely puzzled, but immediately afterwards remembered that Dr. Wallace had been turning out a number of specimens of *Bombyx Pernyi*; and the mystery was at once solved. Another collector shortly afterwards beat three larvæ of this species, and later in the season several cocoons were found on oak-trees in the same locality. This seems to indicate that finding larvæ in a given locality is not in itself a sufficient proof of their British origin. Even if the eggs of *Argynnis Niobe* could be found laid naturally on the wild heart's-ease in the locality where the captures are reported to have been made, the question of the authenticity of the species would still remain exactly where it is now. Here, the only locality for *Melitæa Athalia* is being rapidly destroyed; and, fearing this pretty species should disappear from our neighbourhood altogether, I employed a man, three or four years ago, to collect all the larvæ he could find, and turn them down in another locality, about a dozen miles off, where the insect did not previously occur, but where the

food-plant abounds. In its new home the species has increased to such an extent that this season I found it quite common, and have no doubt that it will go on increasing rapidly. Of course it could not do so without laying eggs; and if eggs were found, would Mr. Clifford, or anybody else, consider that fact a sufficient proof that the species was native to the locality? Again, when collecting at Old Hall Wood, near Ipswich, some time ago, I was told by an Ipswich collector, whom I met there, that *Limenitis Sibylla* did not occur in that particular wood till it was introduced by an old collector, named Seaman, who brought a number of living specimens from St. Osyth, and turned them down there. Now, is it not possible that somebody may have "turned down" continental *Niobe* in Kent, which have been "turned up" by somebody else? People on the Continent could probably supply their English correspondents with eggs or larvæ; and if these were placed in favourable situations the perfect insects might reasonably be expected in due season. I do not, however, wish to express any definite opinion as to this particular case of *Niobe*; for, notwithstanding the scepticism to which Mr. Clifford alludes, its occurrence in Kent may possibly be quite genuine; and my object in writing is to warn entomologists against allowing themselves to be deluded by sham "proofs."—*W. H. Harwood; St. Peter's Colchester.*

Argynnis Lathonia and *Catocala Fraxini* near Canterbury.—I took a very fine specimen of *Lathonia* on the 3rd of August, also one on the 13th, three on the 23rd, one on the 1st of September, two on the 7th, and two on the 15th, at Pelhatham and Swarling Downs. Also one specimen of *C. Fraxini* in Pine Wood, where I have taken, in all, six in seven years, but none good till this one, which I took on the 26th of September, almost equal to bred. I have showed it alive to three or four gentlemen.—*G. Parry; Church Street, St. Paul's, Canterbury.*

Do the Larvæ of Saturnia Carpini Hybernate?—In reference to the query in the October number of the 'Entomologist' (Entom. vii. 227) by Mr. Robinson-Douglas, as to whether the larvæ of *Saturnia Carpini* hybernate, I may state that in the spring of this year I had cocoons of *S. Carpini*, from which the perfect insect emerged, and that I obtained

eggs, and finally larvæ, about the 15th of April, and I would suggest that the larvæ found by Mr. Robinson-Douglas in June were hatched from eggs laid in the spring, and not hibernated larvæ. I may also mention that I have two chrysalids from the larvæ I had hatched in the spring, from which I expected the perfect insect to emerge last August or September, but there seems no sign of such an occurrence even now; and I suppose I must expect the perfect insect to emerge next spring. But is not this very unusual? as I shall have no autumn brood of *Carpini*.—*George W. Oldfield; Castle House, Shrewsbury, October 2, 1874.*

Deiopeia pulchella in Hampshire (Entom. vii. 259).—“I am the captor of *D. pulchella*, on the 1st of October, 1818, at Hurne, near Christchurch. It is the only one I ever took, but I believe I saw two previously in September of the same year, and passed them as common white moths, and indeed was nearly passing the other, till it settled on the stubble so often that I was induced to look at it, and was most wonderfully surprised, as it was an insect I could not fancy was British. This was at six o'clock in the morning, and I immediately returned to the house, and, having set out the moth, I wrote to Dr. Leach, who put it in Samouelle's ‘Entomological Calendar.’”—*The late J. C. Dale.*—[In a letter addressed to Mr. Corbin, who remarks:—“Fifty-six years, to the very day, have elapsed between the two captures.”—*Edward Newman.*]

Deiopeia pulchella and Chærocampa Nerii near Lewes.—On Friday, the 5th of June last, I took a fresh, though rather pale specimen of *Deiopeia pulchella* in a field of trefoil; and on the 3rd of September a relative of mine gave me a damaged specimen of *Chærocampa Nerii*, which he had taken at rest in his garden in the middle of the town of Lewes. Is not the capture of *Pulchella* in June a rather uncommon event?—*Thomas Hillman; Delves House, Ringmer, near Lewes, November 11, 1874.*

Eupithecia Knautiata of Gregson (Entom. vii. 255) = *E. minutata of Hübner.*—I have read with considerable astonishment Mr. Gregson's note on his supposed new species of *Eupithecia*, which he proposes to call *E. Knautiata*. I am wholly at a loss to know by what process of reasoning Mr. Gregson has arrived at his conclusions. All I can say is this,—I have had the Bolton insect in all its

stages, from the egg up to the moth; and, after the most careful consideration, I am convinced that it is nothing but *E. minutata*. In this conclusion, I believe I am right in saying, that Mr. Doubleday, Mr. Hellins, and Mr. Buckler, who are no mean authorities, entirely concur.—[Rev.] *H. Harpur Crewe*; *Drayton Beauchamp Rectory, Tring, November 2, 1874.*

[I have received from Mr. Doubleday an opinion exactly corresponding with Mr. Crewe's.—*E. Newman.*]

Food-plant of Eupithecia innotata.—In the 'Entomologist' for March of the present year (Entom. vii. 68), Mr. Gregson states that he has for some time been acquainted with the true *E. innotata*, and that he has taken both the larva and the perfect insect at Wallasey: the former he says feeds on mugwort (I suppose he means *Artemisia vulgaris*). It may be so; but why does not Mr. Gregson send specimens to Mr. Buckler, who has drawings of the larva of the true *Innotata*, from specimens which I received from the Continent and forwarded to him. Assertions of this kind, without positive, ocular demonstrative proof, go for nothing at all. On the Continent the food-plant of *E. innotata* is *Artemisia campestris*: this plant is rare in England; it is, in fact, I believe, confined to the sandy heaths of Norfolk and Suffolk, where it grows in some abundance. During the last week in August of the present year, Lord Walsingham, with whom I was staying, kindly drove me over to Brandon, which is one of the head-quarters of the plant. I carefully beat about half a mile of flowers, but failed to find anything, except a few larvæ of *E. centaureata* and *E. absinthiata*. Since my return home, Mr. Williams, the rector of Croxton, near Thetford, has, at my request, carefully searched the *Artemisia campestris* in the neighbourhood of Thetford, but with no better success. In the absence of further proof I am compelled, with much reluctance, to come to the conclusion that *E. innotata* has not yet been ascertained with certainty to occur in England. If Mr. Gregson will send me larvæ next year, I shall be delighted to own myself mistaken.—[Rev.] *H. Harpur Crewe.*

Contribution to the History of certain Lepidoptera: Lithosia sericea, Hyria auroraria, Acidalia circellata, A. subsericeata, and A. fumata.—*Lithosia sericea* (? *Molybdeola*): obtained a fine batch of eggs on the 6th of July;

hatched in ten days; fed on knot-grass and lettuce; did not thrive well, and when about half grown began to die off. *Hyria auroraria*: eggs deposited on the 6th of July; hatched in about nine days; larvæ fed on knot-grass; one imago appeared on the 13th and one on the 16th of September. I have a number of larvæ hibernating, some of which are apparently full grown. *Acidalia circellata*: obtained five or six eggs on the 6th of July, from which I bred four imagos; eggs hatched in about eight days; larvæ thrive well on knot-grass; the first moth emerged on the 7th September, the others a few days later. *A. subsericeata*: eggs deposited freely 6th June; hatched in ten days; food, knot-grass; commenced pupation about 18th July; the first moth appeared 30th July; bred a fine series. I have still a number of larvæ, apparently full grown, obtained from the same supply of eggs. *A. fumata*: obtained a few eggs on the 6th July, which hatched in seven days; fed on knot-grass; most of the larvæ died when full grown; a few are still alive. I have made several attempts to carry this larva through the winter without success.—*R. Kay*; 2, *Spring Street, Bury, Nov. 6, 1874.*

Tapinostola Bondii at *Lyme Regis*.—In the September number of the 'Entomologist' (Entom. vii. 205) Mr. Tugwell records the capture of this species at Lyme Regis, saying that he thinks it a new locality for it. In this, however, he is mistaken, as I met with the species there in July, 1863 (eleven years ago), and recorded its occurrence there in the 'Zoologist' for that year (p. 8861). Mr. Tugwell's notice of this insect is, however, of considerable interest, as it serves to prove that it is still to be found at Lyme Regis as well as at Folkestone, and probably at other places on the south coast.—*P. C. Wormald*; 2, *Clifton Villas, Highgate Hill, N., November 5, 1874.*

Abundance of Polia flavocincta at Huddersfield.—On the 2nd and 3rd of October, *Flavocincta* was unusually numerous at sugar here. The weather then became cold and wet, and sugar was of no use. Last week *Flavocincta* appeared again at sugar, but not in such large numbers.—*George Brook*; *Fernbrook, Huddersfield, October 19, 1874.*

Lycæna Argiolus Ovipositing.—Early last April I had the pleasure of watching a female of *Argiolus* apparently depositing her eggs on the flower-buds of the holly, in a garden near

to Vauxhall Bridge: thus London is not quite bereft of butterflies.—*T. P. Lucas.*

Honey Bees.—On Sunday morning last, shortly before ten o'clock, a swarm of bees issued from one of my hives. After remaining in the air for a few minutes, making the usual humming noise, they suddenly returned, clustering round the entrance of the hive for a little time before re-entering. The hive is not more than a third full of comb, and the stock is very small, being a late and weak cast. Can you assign any reason for this strange proceeding on the part of the bees? For some time after their return the noise within showed that they were still in a state of great excitement. I turned up the hive within a few minutes after their re-entrance, but could discover no cause for the unusual commotion.—*Joseph S. Baly; Warwick, October 13, 1874.*

[Will some apiarian correspondent kindly reply.—*Edward Newman.*]

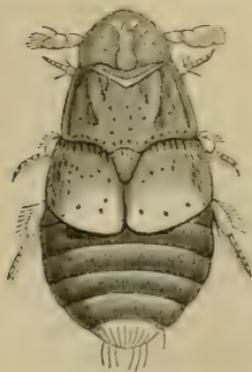
Cynips lignicola, Hart.—Six species of *Synergus* are known to inhabit the galls of this species, namely,—*Melanopus*, *Hayneanus*, *Pallidipennis*, *Apicalis*, *Pallicornis*, and *Vulgaris*: for a translation of Dr. Mayr's interesting note on its parasitism, see 'Entomologist,' vii. 55. *Ceroptres arator* has also been bred from the very small, stunted galls of *Cynips lignicola*. All the above inquilines pass the winter in the gall, emerging in the spring of the following year.—*E. A. Fitch; Downe Hall, Rayleigh, Essex.*

[I regret that this and the following note were not in time for insertion at p. 266.—*Edward Newman.*]

Cynips conglomerata.—*Synergus melanopus*, *S. apicalis*, *S. pallicornis*, and *Ceroptres arator*, are dependent on the galls of *Conglomerata*. Neither this nor the above species has been recorded as British.—*E. A. Fitch.*

An Epizoic Beetle.—Dr. Le Conte describes, in the 'Proceedings of the Zoological Society of London,' November 5th, 1872, a new family of Coleoptera, under the term *Platypsyllidæ*, founded on *Platypsylla Castoris*, made known by Ritsema, who discovered it on specimens of the American beaver in the Zoological Gardens of Amsterdam. A little later Prof. Westwood described it under the name of *Platypsyllus castorinus*, a singular coincidence as regards the scientific name. Ritsema regarded it as representing a

family of the Aphaniptera, equivalent in value to the Pulicidæ, *i.e.*, dipterous. Westwood thought it to be a type of a new order of insects, the Achreioptera. Dr. Le Conte,—and we are fortunate in having in our country one who easily leads the ranks of Coleopterists,—after a hasty examination, regarded the insect as coleopterous, a conclusion confirmed by further careful study, the results of which are presented in the beautiful paper before us. In this singular insect the body is long-oval, flattened, spiny on the exposed portions, resembling at first sight a minute cockroach, and of the same colour. The



Platypstylla Castoris.

the prothorax, and the head is nearly semicircular; the eyes entirely wanting; the antennæ nine-jointed, clavate; the maxillæ large, with four-jointed palpi; the mentum large; the ligula broad; and the labial palpi short and three-jointed; while the labrum is peculiar. After comparing this beetle with those of other families, the author decides that 'the affinities of this insect are very composite, but all in the direction of the Adephagous and Clavicorn series, though chiefly with the latter. The most convenient position of the family will probably be between Hydrophilidæ and Leptinidæ as the families are now arranged, though its tendency to Trichopterygidæ and Corylophidæ is equally strongly manifested. It is, therefore, a very peculiar and extraordinary synthetic type, which is almost equally in and out of place in any linear arrangement of the series with which it is allied.' As this parasite occurs on our native beaver we hope our naturalists will be on the look-out for specimens, and carefully examine the fur of these animals for that purpose.—'American Naturalist' for July, 1874.

Answers to Correspondents.

John T. D. Llewelyn.—*Bluebottles on Leaves.*—For the last few days we have noticed the bluebottle-flies settle on rose, cabbage, pear, and other leaves. The flies there die,

and very shortly a fungus joins the body to the leaf. The enclosed specimens have been dead two or three days. The fungus apparently originates in the body of the fly. Would you kindly give it your attention, and let me know your opinion?

[I have nothing to add to the case so distinctly stated by Mr. Llewelyn, except that the same phenomenon has frequently been observed, and that no satisfactory explanation has been given. When flies are thus fixed on the surface of glass, there is an excellent opportunity for examining the fungus with a lens.—*Edward Newman.*]

Joseph Anderson, jun.—The insects are *Pterochlorus longipes* of Passerini, and probably also the *Lachnus fasciatus* of Burmeister. Kaltenbach found them feeding on the trunks of *Pinus Strobus*, or Weymouth pine; and Zetterstedt found them also on the spruce. They have a remarkably long rostrum, although perhaps not quite equal to that of *Lachnus Roboris*, constituting the genus *Stomaphis* of Walker. Mr. Buckton has examined the specimens, and has most kindly supplied this information.—*E. Newman.*

Mrs. Rawlinson.—The moth is probably a small specimen of the death's-head hawk moth, *Acherontia Atropos*.—*E. Newman.*

William Thomas.—I captured a specimen of a beetle on August 31st, on some palings, near this place, which exactly agrees with the plate given in the 'Annual' of *Athous difformis*: it uttered a kind of hissing sound when moved. It is the only example I have captured. The following is the colouring:—wings, legs and antennæ coppery brown, looking quite transparent when exposed to the sun; the antennæ seem to be kept constantly quivering; the thorax with two yellowish transverse bands above; it is woolly below, like willow-down: there are no other markings about the body. I think there can be no doubt as to the species.

[I must forbear to express an opinion. (2) The drawing is a very good representation of the larva of the dagger-moth, *Acronycta Psi*. (3) The beetle is *Anchomenus prasinus*, and is very common.—*Edward Newman.*]

James Hooper.—The creeping insects on the willow, whether winged or apterous, are a species of *Aphis*, or plant-louse. The black spots are caused by the dropping of a saccharine secretion from the Aphides: the bluebottles

congregate to feed on the sweets. All these nuisances will have disappeared with the first frost. All attempted remedies are inefficient.—*Edward Newman.*

Haggerston Entomological Society.—The Seventh Annual Exhibition was held at their rooms, 10, Brownlow Street, Dalston, on the evenings of November 12th and 13th, and was largely attended. Among the rarer species exhibited were—*O. Lunaris*, by Mr. J. Moore; *D. Albimacula*, from Folkestone, by Mr. Purday; *L. Vitellina* (taken at Glynde, near Lewes, September 30th, 1874), *Z. Conformis*, and hybrids between *S. Ocellatus* and *S. Populi*, by Mr. E. G. Meek; *C. Fraxini*, by Mr. Lepelley; *L. Purpuraria*, by Mr. Harper; *M. Salicalis*, *S. Emortualis*, *D. Literalis*, and a fine collection of knot-horns, by Mr. Machin; a new *Coleophora* (with larva-case), *D. Obfuscata* and *C. Munitata*, by Mr. Eedle. The following noteworthy varieties were shown:—*V. Urticæ*, by Messrs. Packman and Lepelley; *A. Caja*, by Messrs. Eedle and Packman; a splendid banded specimen of *S. Certata*, by Mr. Packman; *C. Immanata*, *M. Schulziana*, *M. Rubiginata*, *A. Cardamines* (with the fore wings only, and those of a peculiar shape), by Mr. Eedle; and last, but not least in importance, a specimen taken by Mr. Macqueen at light, in the New Forest, whose identity is doubtful, though the preponderance of opinion seemed to be in favour of *M. Unangulata*. The following species were also represented, generally rather commonly:—*S. Chrysidiformis*, *L. Albipuncta*, *A. Cinerea*, *C. Gnaphalii*, *E. Venustula*, *C. Absynthii*, *C. Glabraria*, *M. Alternata*, *H. Asellus*, *S. Palealis*, *Staintoniana* and *Irriguana*, *C. Cosmophorana*, &c. Five microscopes, which were placed in one of the rooms, were a constant source of amusement and instruction to many of the visitors. One of the objects, exhibited by Mr. Elisha,—a bouquet of flowers, composed of the scales of butterflies,—was much admired.—*Henry Bartlett; Secretary.*

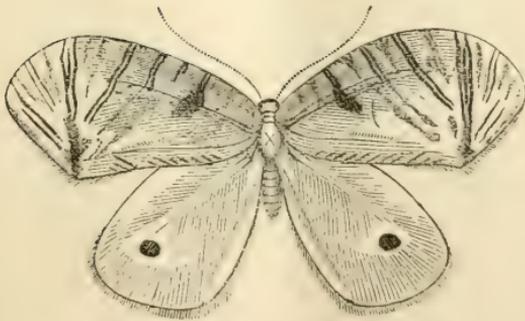
West London Entomological Society.—The Second Annual Exhibition of this Society will take place in the church-room, adjoining St. Mark's Institute, George Street, Oxford Street (near Grosvenor Square), on December 3rd and 4th, 1874, between 6 and 11 P.M. The company of entomologists is solicited.—*E. W. Timms; Secretary.*

THE
ENTOMOLOGIST

CONDUCTED BY

EDWARD NEWMAN.

VOLUME VIII.



PSYCHOPSIS MIMICA.

LONDON:
SIMPKIN, MARSHALL, & CO., STATIONER'S HALL COURT.

1875.

“Insects are usually pointed out to us by those who are about us as ugly, filthy, and noxious creatures; and the whole insect-world—butterflies, perhaps, and some few others excepted—are devoted by one universal ban to proscription and execration, as fit only to be trodden under our feet and crushed; so that, often, before we can persuade ourselves to study them we have to remove from our minds prejudices deeply rooted and of long standing.”
—KIRBY AND SPENCE.

“The importance of insects to us, both as sources of good or evil, I shall endeavour to prove at large hereafter; but for the present, taking this for granted, it necessarily follows that the study of them must also be important: for when we suffer from them, if we do not know the cause, how are we to apply a remedy that may diminish or prevent their ravages? Ignorance in this respect often occasions us to mistake our enemies for our friends, and our friends for our enemies; so that when we think to do good we only do harm, destroying the innocent and letting the guilty escape. Many such instances have occurred. Middleton, in his ‘Agriculture of Middlesex,’ speaking of the plant-louse that is so injurious to the bean, tells us that the ladybirds are supposed either to generate or to feed upon them. Had he been an entomologist he would have been in no doubt whether they were beneficial or injurious; on the contrary, he would have recommended that they should be encouraged as friends to man, since no insects are greater devourers of plant-lice.”—ID.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- Adams, C. Lemesle 112
Anderson, Joseph, jun. 159, 221, 236,
237, 281, 282
Ashby, James 43
Aspinwall, J. H. 229
- Baker, George 109
Barrett, Arthur A. 278
Barrett, J. Platt 283
Battersby, Mrs. F. I. 55
Benson, John M. 54
Benson, T. 143
Bentall, S. R. 182
Biggs, C. J. 223, 275
Bignell, G. C. 55, 89
Bird, George W. 87
Birkin, Stanley 221, 228
Bisshopp, E. F. 160
Bliss, Arthur 230
Boden, Charles 226
Borrer, W. 164
Boswell, John T. 161, 165
Bridgman, J. B. 112, 113
Briggs, T. R. Archer 233, 236, 299
Bristow, John 220, 284
Brook, George 199, 240
Brown, Benjamin 164
Browne, D. G. Lathom 276
Brunton, T. 222
Butler, E. A. 300
- Cansdale, W. D. 221, 223, 231
Cave-Browne, Rev. J. 225, 300
Channon, C. 228
Channon, H. J. 193, 233
Clark, John 277
Clifford, J. R. S. 20, 22, 23
- Clifton, Charles 58
Cole, B. G. 125
Cooper, Bernard 84, 224
Corbin, G. B. 137, 139, 268, 280
Cowan, D. G. 223
Cox, H. Ramsay 103, 106, 134, 179
Crallan, Rev. Thomas E. 53, 88
Crewe, Rev. H. Harpur 295, 302
- Deane, James 235
Digby, Cyril 197
Dobrée, N. F. 133
Doubleday, Henry (the late) 37, 41,
106, 108, 110, 135, 141
Duprey, Frank W. 225
- Eales, Christopher 196
Evan, John 161
- Farn, A. B. 135
Fitch, E. A. 75, 76, 98, 99, 121, 122,
144, 146, 147, 169, 170, 221, 233,
236, 254, 289, 302
Forbes, W. A. 41, 89
Frere, John Tudor 220
Frohawk, W. 277
Fust, H. Jenner, jun. 234
- Gill, Battershell 229
Gregson, C. S. 38, 82, 199
Greville, E. Erskine 115
Grubb, John 270
- Haggar, G. 227, 234, 300
Hammond, W. Oxenden 239
Harris, C. 224, 239
Harrison, John 219

- Harwood, W. H. 185, 198, 199, 200
 Hawkins, J. 300
 Herkomer, Mrs. Hubert 73, 97, 121,
 145, 169
 Herve, Rev. A. C. 183
 Hodgkinson, J. B. 42, 55, 184, 197
 Howe, T. L. 283
 Hunter, A. E. 160

 Jackson, J. 199
 Jagger, W. 182
 Jennings, Rev. P. H. 109, 130, 147,
 172, 180, 183, 217, 223
 Johnson, William 22
 Jones, H. 223
 Jones, J. 142

 Kay, R. 195, 198, 302
 King, J. 226

 Laddiman, R. 198, 220, 231, 277
 Langley, Alfred F. 161
 Law, John 222, 277
 Leconte, John L., M.D. 8
 Lewis, W. Arnold, F.L.S. 127
 Lilly, J. A. 226, 279
 Livett, H. W., M.D. 278, 294
 Lockyer, Bernard 160, 163
 Long, C. F. 200, 271
 Ludlow, Walter 270
 Luff, W. A. 29, 111, 131, 271

 Machin, W. 80, 113
 Macmillan, W. 118
 Madden, Rev. G. C. B. 223
 Majendie, S. R. 197
 Manders, L. 271
 Mann, Charles 92
 Mann, W. K. 222
 Mathew, Gervase F., R.N., F.L.S. 12,
 89, 99
 Matthews, T. 237
 May, J. W. 5, 26, 49, 76, 123
 McRae, W. 278
 Meade, R. H. 188
 Meek, E. G. 231, 283, 288
 Melville, J. Cosmo 133
 Mercer, J. W. 198
 Michael, Annie 279
 Mills, Rev. J. W. 166, 276
 Milne, Oswald 271
 Mosley, S. L. 19, 21, 22, 54, 167

 Newman, Edward 1, 22, 23, 24, 25,
 30, 37, 42, 43, 46, 58, 59, 67, 91,
 92, 93, 107, 108, 110, 111, 113,
 114, 115, 116, 117, 118, 132, 134,
 135, 137, 141, 142, 143, 144, 150,
 162, 167, 175, 185, 186, 188, 189,
 190, 192, 193, 195, 200, 216, 234,
 236, 237, 238, 240, 241, 258, 272,
 275, 286, 287, 296, 298, 301, 303,
 304
 Nicholls, H. 222
 Nicholson, W. N. 114

 Parker, E. C. 228
 Parker, J. 283
 Parry, G. 183, 229
 Parsons, W. E. 224, 226
 Paul, Arthur W. 280
 Pearson, J. H. 276
 Pease, T. H. Ormston, 224
 Peters, John 221
 Phillips, F. G. 167
 Phillips, F. J. 117
 Porritt, Geo. T. 55, 56, 183, 218, 285,
 294
 Povall, James 277
 Potts, John 180
 Pratt, D. 37
 Preston, J. 220
 Purday, William 225
 Purdue, J. 280

 Randall, W. Sidney 32
 Raynor, Gilbert H. 132, 164, 230, 276,
 300
 Reeks, Henry 165, 186, 268
 Richardson, Nelson M. 21
 Ridley, H. N. 223
 Robinson, Isaac 228
 Rope, H. J. 270
 Ruston, A. Harold 86, 228
 Rydon, Arthur 91

 Sarll, John T. 228, 282
 Sawyer, James 132
 Seabrook, C. 282
 Service, Robert 282
 Sharp, J. E. 220, 285
 Sidebotham, Joseph 163
 Simmons, C. W. 181, 199, 229
 Slack, Henry J. 286
 Smallwood, Rev. G. A. 194, 224, 238,
 240
 Smethurst, C. 277
 Sotheby, Rosa M. 276

South, R. 271, 282	Vicary, Charles G. 224, 227, 278, 281
Spiller, A. J. 281	Vine, A. 282
Standish, F. O. 23	Wailly, Alexander 197
Stansell, Frederic 158	Waldegrave, Right Hon. Earl 270
Stürmer, S. von 239, 287	Walker, Francis (the late) 15
Sumner, John 161, 166	Walker, Frederic 4, 182
Talbot, William 89	Wassermann, J. C. 19, 38, 181, 224
Thomas, W. 132, 143, 219, 229, 283	Webb, Sydney 184
Thomson, Edward 141	Wileman, A. E. 226
Thorpe, John 188	Wilson, A. R. 141
Threlfall, J. H. 105	Wilson, Henry F. 198
Thurnall, A. 52, 135, 200	Wilson, Owen 232
Trafford, F. A. 277	Wittich, H. 134
Tuely, N. C. 160	Wood, Alfred 232
Tugwell, W. H. 164, 291	Worthington, Thomas 221
	Wright, Charles 143

ALPHABETICAL LIST OF SUBJECTS.

Acentropus niveus at Sheerness 283	Aphilothrix autumnalis 255
Acherontia Atropos in Parliament Street 225	" callidoma 290
Acidalia aversata 173	" collaris 289
" emarginata, life-history of	" gemmæ 146
180	" globuli 254
" remutata 148	" lucida 145
Acids, effect of on insects 236	" solitaria 169
Acronycta Alni near Nottingham 228;	Arachnida, notes on the 32
at Chatteris <i>id.</i> ; larva of 285	Arctia Isabella 38
Agrianisa myrmecoides 17	Argynnis Niobe, capture of in North Lancashire 82; near Canterbury 183
Agrotis crassa in Guernsey 111	" Selene, variety of 25
" Helvetina 135	Aspilates citraria 149
Allogastra 8	Asthena candidata 130
Amara continua at Caterham and Mickleham 118	" luteata 148
Amphydasis Betularia 166	Astynomus ædilis at Cardiff 283
Anarta Myrtilli, economy of 23	Bait for Apatura Iris 159
Andrena atriceps, Stylops taken in 210	Beating-tray, the Bignell 89
" Trimmerana, living larva in 213	Bee-keeping 68
Anticlea badiata 130	Bees, stingless honey, economy of 69;
" rubidata 218	honey 234; destruction of fruit by 298; export of to New Zealand 304
" sinuata, 183	Beetle destructive to mangold-wurzel 135, 186; name of a 143, 239;
Ants, white, economy of 69	Colorado or tiger <i>id.</i>
Apatura Iris, bait for 159, 182; larva of 160	Beetles in tea 43, 59

- Bombyx Pernyi*, larvæ of 22
 „ *Quercus*, pale male of 161;
 female pupæ of attractive to males
 227
Bottle, cyanide, improved 113
Butterfly, blue, in April 112; vitality
 in leg of 233
Byrsopidæ 11

Cabera exanthemaria 217
 „ *pusaria* 149
Callidium violaceum, abundance of 185
Captures of Lepidoptera in 1874 19;
 in May and July, 1874, in the New
 Forest 84; in Somersetshire 158;
 near Buxton 197; in Kent 218; of
Lepidoptera 219; at sugar 281; at
 Newton Abbot *id.*
Catephia alchymista in Sussex 164;
 near Colchester 185
Catocala electa at Brighton 282
 „ *promissa* near Ipswich 200
 „ *sponsa* near Petersfield 270
Catoptria Aspidiscana at Grange 184
Centipede, luminous 115
Cerambycidae 61
Chorocampa Celerio at Hayward's
 Heath 53
 „ *Elpenor*, &c., at sugar 183
 „ *lineata* in Glamorgan 161
Chekanops under the elytra of a
Passalus 211
Chelifer cancrroides 185
Chelonia villica 166
Chrysomela cerealis 215
Cidaria corylata 174
 „ *miata* 130
 „ *populata*, description of the
 larva of 294
 „ *Silaceata*, unusual appearance
 of 23
Cimbex Lucorum 5
Cirroëdia xerampelina, larvæ of 135;
 at Grantham 228; near Manchester
 229; variety of 238; at Hendon
 282; in Scotland *id.*
Cladius difformis 26
Cleora glabraria, description of the
 larva of 193
Clostera curtula, variety of 134
Cockchaffer, colouring matter from
 the 119
Cocoon of Tenthredo Cratægi 143

Coleophora new to Britain: *Coleo-*
phora Tripoliella 55
Coleophora deauratella near Witham
 231
Coleoptera, Rhynchophorous, classi-
 fication of 8; rare British 48; Lon-
 gicorn, synonymical notes on 60;
 parasitic 214
Colias Edusa on the wing 198; near
 Long Stratton and Nocton *id.*; in
 Norfolk *id.*; near Chepstow 220;
 near Hendon and Hampstead *id.*;
 near Norwich *id.*; at Darlington
 221; at Nottingham *id.*; in Suffolk
id.; at Maldon *id.*; near Alresford
id.; near Petersfield 270; at Hit-
 chin *id.*; at Hendon 271; at Ips-
 wich *id.*; near Maldon 300; at
 York *id.*
 „ *Helice* at Alresford 221
 „ *Hyale* in May 160; early ap-
 pearance of *id.*; near Long Stratton
 198; in Norfolk *id.*; in Suffolk 221;
 at Maldon *id.*; near Witham *id.*;
 near Alresford *id.*; at Maidstone
 225; abundance of in Suffolk 270;
 near Petersfield *id.*; near Birming-
 ham *id.*; at Hitchin *id.*; at Ips-
 wich 271; abundant 300
Collecting in the Lake District 19;
 as it was and as it now is 103; and
 collectors, some remarks on 127
Collecting, Herrich-Schæffer's 45
Collectors, a few remarks on 179;
 and localities 139
Colletes cunicularis, a colony of,
 founded at Shirley Common 119
Coremia quadrifasciata, description of
 the larva of 109
Corycia taminata 174
 „ *temerata* 173
Cosmia pyralina 230
Cotoneasters, moths at 164
Cucullia Gnaphalii at Hayward's
 Heath 53; near Seal, in Kent 229
 „ *Scrophulariæ* 37, 54
Curculio attacked by a fungus 214
Cynips amblycera 121
 „ *calyciformis* 99
 „ *coriaria* 75
 „ *galeata* 121
 „ *glutinosa* 73
 „ *lignicola* on *Quercus Phellos* 4
 „ *polycera* 97

- Cynips polycera* var. *subterranea* 97
- Davis, Mr., death of 144
- Deformities and varieties 268
- Deilephila Galii* near Norwich 198; at Weybridge 271
- Deiopeia pulchella* 45; near Scarborough 54; at Budleigh-Salterton 226; at Biggleswade *id.*; near Kingsdown *id.*; near Paignton *id.*, 279; at Eastbourne 226; at the Land's End 279; at Bournemouth 280; at Waltham Cross *id.*; in Devonshire *id.*; at Hastings 300; in India *id.*
- Dianthœcia capsicola* at sugar 200
- Dicrorampha Tanacetana* at Grange 184
- Diloba cæruleocephala*, variety of 62
- Diptera 167, 188
- Dog-tick 285
- Doubleday, Mr., death of 192, 213, 240
- Dragonflies, to keep the colour of 237
- Dryinoidæ* 15
- Economy of *Anarta Myrtilli* 23; of white ants 69; of stingless honey-bees *id.*
- Emmelesia decolorata* 217; description of the larva of 194
- " *unifasciata* at West Wickham 41, 89
- Emphytus serotinus* 123
- Ennomos fuscantaria* 282
- Entomological correspondent, English, desired for Wisconsin, U.S. 92
- Entomological Society, removal of 216
- Entomological Society's Proceedings 45, 59, 118, 190, 207
- Entomologising in North Kent, a month's 291
- Entozoa in ox-beef 239
- Ephippiphora ravulana* 184, 231
- Ephyra omicronaria* 148
- " *punctaria* and *E. pendularia*, notes on 125
- Epione vespertaria* at Waltham Cross 286
- Epunda lutulenta* 281
- " *nigra* at Newton Abbot 278
- Epping Forest, recovery of 1, 36
- Erebia Ligea* at Margate 198
- Eremobia ochroleuca* in Cambridge-shire 282
- Eubolia peribolata*, description of the larva of 107
- Eupithecia consignata* at Cambridge 132
- " *extensaria* taken in Yorkshire 108, 132, 133
- " *Knautiata* of Gregson 22, 38, 87, 133, 199
- " *minutata* larvæ feeding on *Achillea millefolium* 109
- " *togata*, description of the larva of 297
- Eurytomidæ* 15
- Euthemonia russula* reared from the egg 227
- Fells, over the, in summer 82
- Flea attached to the neck of a fowl 213
- Fleas in rabbit's ears 119, 120
- Flies sticking to glass 234
- Flowers, fertilization of by insects 72
- Fidonia atomaria* 21
- Fireflies 188
- Food, difficulty of procuring for young larvæ when hatched 91
- Food-plant of *Gonepteryx Rhamni* 141, 160, 231, 302; of *Phigalia pilosaria* 161; of *Setina irrorella* 234, 302
- Fowl, flea attached to the neck of a 213
- Fungus, *Curculio* attacked by a 214
- Gall, name of 144; *bramble id.*; singular 167; on *Hypochoeris radicata* 233; on *Potentilla reptans* 236; on *Hieracium umbellatum* 299
- Gall-flies, breeding of 170
- Glæa erythrocephala* at Wells 278
- Glass, flies sticking to 234
- Gonepteryx Rhamni*, food-plants of 141, 160, 231, 302
- Grapholita grandævana* 41
- Gray, Dr., death of 93
- Gryllus viridissimus* 231
- Habits of social Hymenoptera 70
- Hadena peregrina* at Kingston, Surrey 229 (an error, read *Proteus* 283)
- " *satura* in Kent 229
- Haggerston Entomological Society 239, 288

- Hair-worm 188
Halias prasinana 174; sound produced by 213
Heliophobus popularis at Horley 237
Heliopsis Scutosa 42
Hemiptera of the Mediterranean 59
Hepialus sylvinus, larva of 225
Hibernia defoliaria, variety of 62
Hieracium umbellatum, gall on 299
Hydrœcia Petasitis 195; description of the larva of *id.*
Hylesinus Fraxini 186
Hymenoptera, Indian 62, 119; social, habits of 70; in 1874, scarce at Norwich 112; on capturing, killing, and setting 256
Hypochoeris radicata, gall on 233

Idarnes orientalis 17
Insect, name of 89
Insects, list of the best taken at Whittlesford during the past season 52; fertilization of flowers by 72; New Forest 106; of Kerguelen's Island 210, 212; effect of acids on 236
Iodes vernaria 173
Isanisa decatomoïdes 16

Julus sabulosus 114

Knautia or *Scabiosa* 163

Larva of *Noctua baja*, description of 55; of *Notodonta cucullina*, description of 56; of *Eubolia peribolata*, description of 107; of *Coremia quadrifasciata*, description of 109; of *Apatura Iris* 160; of *Phigalia pilosaria*, description of 162; of *Pterophorus rhododactylus* 183; of *Cleora glabraria*, description of 193; of *Emmelesia decolorata*, description of 194; of *Hydrœcia Petasitis*, description of 195; living, in *Andrena Trimmerana* 213; of *Hepialus sylvinus* 225; of *Acronycta Alni* 285; of *Eupithecia togata*, description of 295
Larvæ, abundance of, near Plymouth in June, 1872 12; of *Bombyx Pernyi* 21; of a Mantis 62; young, difficulty of procuring food for when hatched 91; of *Eupithecia minutata* feeding on *Achillea millefolium* 109; feeding on turnip-seed 113; of *Cirroœdia xerampelina* 135; of *Xylophasia scolopacina* 163, 199; of *Lithosia complana*, depraved taste of 198; duplicate descriptions of 285
Leeds Naturalists' Field Club, and Scientific Association 288
Lepidoptera, captures of, in 1874 19; rare British 45; rare, near Limerick 89; forcing the emergence of from the chrysalis 91; at Rannoch 181; taken at South Shields 196; captures of 219; captive, obtaining eggs from 268; near Folkestone 300
Lepidopterous and Coleopterous larva, distinction of the 303
Lepismodes inquilinus 91, 120, 142, 190
Letters, printers' wooden, perforated 46
Leucania albipuncta at West Wickham 228; at St. Leonard's-on-Sea *id.*
" *unipuncta* or *extranea* at Lyndhurst 110, 134; whereabouts of the specimen of 228
Leucophasia Sinapis 21, 37, 54
Life-histories of saw-flies 5, 26, 40, 76, 123
Life-history of *Acidalia emarginata* 180; of the pear-tree slug 258
Ligdia adustata 174
Lipura corticina 190
Lithosia complana, depraved taste of larvæ 198
" *quadra* at Redcar 199; in Yorkshire *id.*
Localities and collectors 139
Locusts, plague of in America 150, 175, 200; American, and army-worm 215
Luminous centipede 115
Lycœna Acis near Cardiff 161, 271
" *Alsus* 132
" *Arion* near Kingsbridge 222
" *Icarus*, hemigynous specimen of 237
" *Phlœas*, variety of 86
Lyndhurst, the season at 134

Macaria alternata at Christchurch 278

- Macro-Lepidoptera inhabiting Guernsey and Sark, additions to the list of 29
- Mangold-wurzel, beetle destructive to 135
- Mantis, larva of a 62
- Melanippe montanata 149
 „ procellata 218
 „ rivata 149
 „ tristata? 141
- Micranisa 18
- Micro-Lepidoptera taken or reared in 1874 80
- Millière's Work 287
- Moth, winter, attracted by gas-lamps 62; name of 143, 232; with perforating maxillæ 286
- Moths, sugaring for 58, 88, 106, 180; at Coneasters 164; visitors to the trees sugared for 165
- Musca pluvialis 235
- Names, English 285
- Nematus abbreviatus 49
 „ appendiculatus 76
 „ Solea 79
- Neuroptera, collection of, from Yokohama 211
- Neuropteron, new, from Swan River *id.*
- Noctua baja, description of the larva of 55
 „ glareosa, variety of 118
- Nonagria brevilinea 41
- Notes from Witherslack, near Grange 105; on *Ephyra punctaria* and *E. pendularia* 125; on oviposition 130, 147, 172, 217
- Notodonta cucullina, description of the larva of 56
 „ palpina, variety of 199
- Oak-galls, British 59; descriptions of 73, 97, 121, 145, 169, 254, 289
- Ophiodes lunaris in Sussex 164
- Ornithoptera, new species of 207; from Cochin 214
- Osmia nesting in a lock 214
- Oviposition, notes on 130, 147, 172, 217
- Ox-beef, Entozoa in 239
- Papilio Machaon, are there two broods of in a season? 301
- Parasites, descriptions of new genera and species of, belonging to the families Proctotrupidæ and Chalcididæ, which attack insects destructive to the fig in India 15
- Parasitic Coleoptera, &c. 214
- Passalus, Chekanops under the elytra of a 211
- Pear-tree slug 258, 284
- Pears, fallen 167, 189
- Phigalia pilosaria—does it feed on anything but oak? 142; food-plant of 161; description of the larva of 162
- Phoxopteryx paludana 231
- Phycis Davisellus 41
- Phylloxera plague, explanation of 57; of the vine 63
 „ Vastatrix in Switzerland 59
- Pieris Napæ, pupæ of required 120
- Plague of locusts in America 150, 175, 200
- Plusia interrogationis 199
- Podura found on snow 213
- Polanisa lutea 18
- Polistes gallicus utilizing play-bills in the construction of its cells 118
- Polydrosus sericeus 165
- Potato-beetle, Colorado 209
- Potentilla reptans, gall on 236
- Prionidæ 60
- Proceedings of the Entomological Society 45, 59, 118, 190, 207
- Pselaphidæ and Seydmænidæ from Australia 46
- Pseudisa smieroides 15
- Pterophorus rhododactylus, larva of 183
- Pupa, protective colouring in 47
- Pupæ of *Pieris Napæ* required 120; female, of *Bombyx Quercus* attractive to males 227
- Pyrarga Egeria, scarcity of 20
- Quercus Phellos, *Cynips lignicola* on 4
- Roslerstammia pronubella at Salcombe 55
- Rumia cratægata 147
- Sallows, doings at 99
- Sarrothripa Revayana 200
- Sarrothripus Revayanus at Killarney 55

- Sawflies, life-histories of 5, 26, 49, 76, 123
- Scotosia dubitata 130
 „ undulata 218
- Seydmænidæ and Pselaphidæ from Australia 46
- Selenia illunaria 130
 „ lunaria 172
- Setina irrorella, food-plant of 234, 302
- Slug, pear-tree 284; life-history of the 258
- Smerinthus Tiliæ, variety of 193
- South London Entomological Society 24, 239
- Sphinges, Boisduval's 190
- Sphinx Convolvuli at Darlington 222; in the North of Ireland *id.*; at Bristol *id.*; at Witham 223; at Hawley *id.*; at Gravesend *id.*; at Huddersfield *id.*; at Hammersmith *id.*; near South Hackney *id.*; at Barrow-on-Trent 224; at Eastbourne *id.*; in Dublin *id.*; at Cullercoats *id.*; at Tottenham *id.*; near Stoke Newington *id.*; near Newton Abbot *id.*; at Maidstone 225; at Bowdon 239; near Petersfield 270; near Birmingham *id.*; at Hitchin *id.*; at Hendon 271; at Ipswich *id.*; in Guernsey *id.*; description of the larva of 272; abundance of 275; at Maldon 276; at Winchmore Hill *id.*; in the West of Scotland *id.*; at Hazeleigh, Essex *id.*; at Hastings *id.*; at Sheffield 277; at Leeds *id.*; at Darlington *id.*; at Birkenhead *id.*; at Lincoln *id.*; at Croydon *id.*; at Norwich *id.*; at Peckham 278; at Christchurch *id.*; at Newton Abbot *id.*; at Wells *id.*; at Newport, Isle of Wight 300
- Spider, remarkable 249; trap-door, a new genus and species of from South Africa 252
- Spider's nest, drawing of a 48
- Spiders, trap-door, in the bark of trees 215, 241
- Spilodes palealis 181; in Norfolk 229; at Brockley 230
- Strenia clathrata, variety of 119
- Stylops taken in Andrena atriceps 210
- Sugar, captures at 281
- Sugaring for moths 58, 88, 106, 180
- Sugaring, recreations of a country doctor concerning 294
- Sycophagoidæ 16
- Tea, beetles in 43, 59
- Tenthredo Cratægi 117; cocoon of 143
- Terias, remarks on the genus 191
- Tester, Mr. Charles, death of 288
- Thera variata 237
- Tryphæna interjecta 199
 „ subsequa at Redcar *id.*
- Turnip-seed, larvæ feeding on 113
- Urapteryx sambucata 217
- Valeria oleagina in Hertfordshire 164
- Vanessa Antiopa near Ashford 197; near Wells *id.*; at Chertsey *id.*; at Edlington, near Doncaster 219; in Norfolk 220; in Ireland *id.*; near Berkeley Road Station *id.*; near Norwich 283
 „ Atalanta 131
 „ Urticæ in 1874 20
- Variety of Lycæna Phlæas 86; of Noctua glareosa 118; of Strenia clathrata 119; of Clostera curtula 134; of Bombyx Quercus 161; of Smerinthus Tiliæ 193; of Notodonta palpina 199; of Cirrædia xerampelina 238
- Varieties of Diloba cæruleocephala and Hybernia defoliaria 62; and deformities 268
- Venilia maculata 148
- Visitors to the trees sugared for moths 165
- Wasp, name of a 118
- Wasps, paucity of 296
- West London Entomological Society 287
- Worm, army, and American locusts 215
- Xanthia aurago 281; near Willesden 282
- Xylina petrificata at Newton Abbot 278
 „ rhizolitha 131
- Xylomiges conspicillaris at Dartford 135
- Xylophasia scolopacina in Yorkshire 199; larvæ of *id.*
- Zygæna Filipendulæ, note on 21
 „ Meliloti 211
 „ Trifolii *id.*

THE ENTOMOLOGIST.

No. 138.]

JANUARY, MDCCCLXXV.

[PRICE 6d.

Recovery of Epping Forest.

AT a late meeting of the Coal, Corn and Finance Committee of the Corporation of London, Mr. R. Cox, Chairman of the Committee, presented a report of the judgment of the Master of the Rolls in the suit instituted by the City Commissioners of Sewers against all the lords of manors of Epping Forest. It was received with cheers.

Mr. J. T. Bedford, a leading member of the Court, addressing the Lord Mayor, said, as he had been looking forward to that day for the last two years, he might be allowed to inform the Court what the Corporation had actually done in this matter. In May, 1871, the Corporation, on his motion, unanimously agreed, at any cost, to try by all legal means to preserve Epping Forest for ever as a recreation ground for the people. His committee had an interview with the Government, and were referred to Mr. Ayrton, who showed them a Bill he had prepared, appointing a Commission to prepare a scheme for preserving the Forest. He [Mr. Bedford] suggested the propriety of introducing a clause preventing further enclosures or waste until the commission had reported. This Mr. Ayrton flatly refused to do. The Bill was passed, and Parliament rose for the recess. Meanwhile, in August, the Corporation filed their first Bill in Chancery, and then the vacation stopped further progress. Directly it was discovered that the Bill contained no clause preventing further enclosures, the lords of the manor went to work with a will, and recommenced felling timber, building houses, cutting turf, and even ploughing up some of the most beautiful parts of the Forest. Then the Corporation set to work with its customary vigour, and, although it was vacation time,

they found a Vice-Chancellor, fetched up to town a Registrar from his sea-side holiday, obtained an injunction, and thereby stopped further proceedings for that year. In the meantime the old Forest Court of Verderers had been assembled, and he had the pleasure of listening to nearly a hundred presentments of illegal enclosures, ranging from one acre by a right reverend prelate, to a hundred acres enclosed by the clergyman of the parish,—the shepherd of the flock,—who, in a sermon preached by him a few days afterwards, actually took for his text—"The love of money is the root of all evil." There was also a case of enclosing five hundred and seventy acres by a noble earl, whose agent afterwards indignantly denied the charge, saying he had only enclosed five hundred and sixty-three, and left seven for the people. A gallant admiral had likewise marked one thousand one hundred and thirty trees to be felled at High Beach, the most beautiful part of the whole Forest. In 1872 the Corporation Bill came on in Chancery, and their usual leading counsel was taken away from them on the ground that, being a Q.C., he was at the call of the Crown when it chose to exercise its right. The result was that he appeared against them, and took the only objection on demurrer that was fatal to the Corporation Bill, and they had to pay about £580 in costs. Nothing daunted they began again, the Government charging them with double costs. In the meantime a second Bill was introduced into Parliament by the Government, remedying the former defect, and empowering the Commissioners to issue orders preventing further enclosures. That was introduced into the House of Lords, but, thanks to Lord Salisbury, a clause staying all legal proceedings was altered, so as to make the case of the Corporation an exception. Meanwhile the second Bill of the Corporation in Chancery came on for hearing, and was again opposed on demurrer; but they were successful on that occasion, and an appeal to the Lords Justices failed to alter the decision. The legal cobwebs being now swept away, their cause stood ready for argument. When Parliament rose the agents of the lords of the manor discovered that, although the Commission had power to issue orders forbidding further enclosures and waste, it had no power to enforce them. Again the Corporation came to the rescue, and in no less than fourteen different cases—by threat,

or remonstrance, or by legal process—succeeded in preventing fearful waste and damage. By that time many important public meetings were held, in which the services of the Corporation were most gratefully and enthusiastically recognized, and at one of which they were denounced, in a letter by Mr. Ayrton, as intriguers,—a term he might as well have applied to the Good Samaritan. Their cause at length came on for hearing; and after twenty-two days of patient and unwearied attention, by the most learned Judge who presided in the Rolls' Court, the judgment was delivered, with which the Common Council and the public were now familiar, giving the Corporation, in fact, all they ever asked, and preserving five thousand acres of the Forest for ever for the enjoyment of the people. That old Corporation of London had done many a good deed in the course of its long existence, but he believed it never did a wiser, a more generous, or a more disinterested and patriotic act than when it resolved, at any cost, to preserve that beautiful Forest for the healthful enjoyment of the community at large for all time.

The speech of Mr. Bedford was received with marked approbation; and subsequently, on the afternoon of Saturday, the 28th of November, 1874, the Corporation of London, as represented chiefly by members of the Corn, Coal, and Finance Committee, celebrated—by a tour of the Forest, and a dinner at the Castle Hotel, Woodford—what Mr. Richard Cox, presiding at the dinner, declared to be “one of the best and greatest victories ever achieved by the Corporation,”—to wit, the deliverance of Epping Forest from the encroachments of the lords of the manor.

It will be observed that this event—I mean this triumphal visit to the recovered Forest—took place on the very day on which the last number of the ‘Entomologist’ was issued, and that thus a notice of these proceedings was excluded from its pages. The proper time has now arrived for me to recur to the important fact that, when the subject of encroachment was first under discussion, the members of the HARGERSTON ENTOMOLOGICAL SOCIETY were the only entomologists in Britain who raised a finger, who entered the slightest protest, against the hateful enclosures then in progress.

I regret to say the people generally did not then take, and have not since taken, the decided part they ought to have

done in resisting the aggression. They have held a few meetings, certainly; but for the most part have submissively allowed the depredator to enter and despoil their property. This should not have been so. Englishmen should have some feeling of a community of interest in property bequeathed to them by their ancestors, and of which they had held undisturbed possession from time immemorial: they ought to stand shoulder to shoulder in defence of their common right. It were a cowardly and contemptible policy to argue—"This is no business of mine; the injury is done to thousands of others quite as much as to me; I am but an individual; single-handed I am impotent against the overwhelming influence of wealth." Such were the arguments advanced in defence of apathy and indifference. I fear we are a degenerating, an ease-loving people. I see Germans, Russians, French, Americans, going ahead of us—in arts, manufactures, and commerce—all the world over. We want self-respect, self-reliance, tenacity and unity of purpose. The man who will sit by with folded hands while his wealthier neighbour runs a fence across his potato plot, or the common where his horse or his cow feeds, is not likely to resist, or even to object, when a more powerful neighbour seeks, in the lust of conquest, to annex his country.

But there is another point for me to notice; and I must render honour where honour is due. The Corporation of London has too long, perhaps undeservedly, been regarded as an organization for eating and drinking, and taxing its fellow-citizens. It has now nobly redeemed its character. If these charges were ever true, they are true no longer. The Corporation now stands forth as the Protector of the People's property, and will be honoured hereafter by all good and just men.

EDWARD NEWMAN.

Cynips lignicola on *Quercus Phellos*.—I have frequently noticed the Devonshire gall on a willow-leaved oak (*Quercus Phellos*) at Southgate, which, as the tree is rather scarce, may not have been remarked elsewhere. It is singular that the insect should recognize in this tree, so different in appearance from others of the same genus, a fitting place for the growth of the future gall.—*Fredc. Walker; Oakley House, Abingdon.*

Life-histories of Sawflies. Translated from the Dutch of
M. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from vol. vii. p. 271.)

CIMBEX LUCORUM, L.

Imago: Linn. S. Nat. 12 ed., No. 1527; Fabr. Ent. Syst. ii. 105, No. 2; Klug. Vers. Cimb. p. 85, No. 4; *Hartig, Blatt-und Holzwespen*, p. 68, No. 3.

Larva: Brischke und Zaddach in *Schrift d. K. Phys. Oekon. Gesells. zu Königsb.* iii. p. 257, No. 7; pl. ii. fig. 7.

Cimbex nigra fusco villosa, antennis rufo annulatis, tibiis tarsisque fulvis.

I have at last succeeded in rearing the larva of *Cimbex Lucorum*. It may, perhaps, be remembered that in the year 1843 I published, in the 'Tijdschrift voor natruulijke Geschiedenis en Physiologie' of Messrs. Van der Hoeven and De Vriese, a paper on the larva of *Cimbex Lucorum*, and that some years later I explained, in the second volume of this publication ('Tijdschrift voor Entomologie'), that I had been mistaken in the name. I have since reared many species of the same genus, some of which have been figured and described, but I had not succeeded in obtaining the species, whose name I had misapplied, until last year, when the larva was sent to me from Gelderland. It is again to my friend, De Roo van Westmaas, that I am indebted for my acquaintance with this larva. At the end of June, 1867, he kindly sent to me two young larvæ, taken near Velp on birch. In colour and appearance they exactly resembled the larva of *Betuleti* (see vol. ii. pl. 3, fig. 1); but as the latter feeds exclusively on hawthorn,—and I had learned from the paper of Prof. Zaddach, referred to at the head of this description, that *Cimbex Lucorum* fed on the birch,—I determined to wait and see whether a subsequent moult would reveal any difference between it and the species I had already described; and this proved to be the case. After the last moult a considerable difference was observable: the larva was paler, and of a more bluish green than that of *Betuleti*; the skin was smoother, and not so thickly granulated with white points; the shape, and colour, of the spot on the head was different;

and the stigmata (fig. 3) were elliptical, with a slight undulation of the sides. Although there was no difference in the shape of the head of my two larvæ, the ground tone of the colour was different, as was also the appearance of the pale, sepia-coloured spot on the vertex. In one the colour was faint reddish yellow, with two wedge-shaped transverse spots separate from each other; in the other the head was yellow, of the colour of wax, with a large transverse spot on the vertex, terminating in a point at either end. In both, the eyes, which were small, were placed in very deep black round spots. The head of the first-named species is represented at fig. 2.

Fig. 1 was drawn about a week too soon, as the larva was not then full grown. They grow nearly to the size of fig. 2, on plate 3 of the second volume, and then the little wart-like eminences on the sides are more projecting, and are of a still paler tint. Further, it will be hardly necessary to add that the larva had twenty-two legs, but it is worthy of record that the claws of the anterior legs were black.

I have not been able to observe that the larvæ in question had the faculty of ejecting fluid from their sides, as is the case with other *Cimbices*; I also failed to perceive any openings or valves above the stigmata: the same negative observation is made by Brischke.

On the 25th of July the larvæ began to spin up among the twigs of the birch. The cocoon (fig. 4) was hard, and of a brown colour. As I had only two cocoons I did not like to open one, and so I am unable to say anything about the pupa, which, in all probability, strongly resembles that of the so nearly allied species.

On the 9th of April of this year (1868) I found two males alive in the box in which I had kept the cocoons, from which a little round piece had been cut out in the usual way; we had had rather warm and very sunny days towards the end of March and the beginning of April.

The following is a description of these two males, one of which is represented, with the wings extended, at fig. 5; the other, at rest, at fig. 6:—

At the first glance the whole body appears to be black, but on closer examination it is seen to be of a dark, bronzy earth-colour. The head below the antennæ, the clypeus,

together with the jaws, as also the eyes and ocelli during life, are shining black. The antennæ (fig. 8) are slender, and consist of six joints: the first two basal joints are short, somewhat thick and compressed together, black; the third is a little longer than the three following together, somewhat curved, black, dark red at the tip; the fourth and fifth joints are red or reddish brown, both being dilated towards the apex; while the sixth—probably formed of the sixth to the ninth anchylosed, at all events showing the suture between the sixth and the seventh—forms a black pear-shaped knob. In one of the individuals I reared, the parts of the mouth seem somewhat turned up anteriorly. The head is richly clothed with rather long black hairs, excepting below the cheeks, where yellow-gray hairs occur. The entire thorax, above and below, is covered with a similar thick gray fur. The abdomen also has a similar clothing, only thinner and more woolly. The wings are tinted with orange, and have a narrow smoke-coloured border running inwards in each cell. The main trunks of the nervures are orange; the smaller divisions and terminations, brown. The stigma is very elliptical, and brownish black. The coxæ, trochanters, and femora are shining black, but slightly punctured; the posterior femora not particularly thickened, and having merely a trace of a spinous projection. The tibiæ are of a brownish orange colour; the tarsi somewhat less brown, or more yellow, both being covered with fine hairs of a golden yellow. The inner side of the anterior tibiæ is completely covered with a close row of short bristly hairs of a golden colour. The claws are of a red-brown colour, and black at the tips. The pulvilli fuscous.

In addition to the difference in the organs of generation, the females are only distinguished from the males in having the body coarser and larger; and, on the other hand, the jaws, together with the upper lip and the spine on the posterior femora, smaller.

Cimbex Lucorum appears to be not very common with us, examples being only occasionally observed. I remember, however, having observed a considerable number of these insects some years ago in a copse, near Voorschoten, flying after each other among the fresh green leaves of the birch trees; and I fancy that anyone passing the early spring in

the country might expect sometimes to meet with many individuals of this species together.

I have now described the following species of the genus *Cimbex* in the pages of this journal: *—*C. connata*, *Schr.* (vol. vii. p. 59, pl. 1 and 2); *C. axillaris*, *Panz.* (vol. v. p. 49, pl. 1); *C. Lucorum*, *L.*; *C. Vitellinæ*, *L.* (*C. lateralis*, *Leach*, vol. vi. p. 65, pl. 4); *C. Betuleti*, *Hart.* (called by Zaddach, *C. Cratægi*, vol. ii. p. 63, pl. 3); *C. Amerinæ*, *L.* (vol. iii. p. 104, pl. 8); and, of the very nearly-alled genus *Abia*, the species *A. ænea*, *Kl.* (*A. nigricornis* of *Leach*, vol. i. p. 144, pl. 5). There thus remain for me to describe *Cimbex Saliceti*, *Zadd.*, observed by Lyonet and Voet in the Netherlands; *Cimbex Sorbi*, *Hart.*, if the species, as I suspect, occurs in this country; together with *Abia fasciata*, *L.*, and *Abia sericea*, *L.*, of both of which the imagos have been observed here.

The Classification of the Rhynchoporous Coleoptera.

By JOHN L. LECONTE, M.D.

(Continued from vol. vii. p. 285.)

Series 2. ALLOGASTRA.

Abdomen dissimilar in the two sexes; dorsal segments, 1st to 6th, coriaceous or membranous, 7th large, corneous, undivided in the female, divided into two in the male; ventral segments prolonged upwards, forming a sharp edge, fitting into a corresponding groove on the inner face of the elytra, which are without epipleuræ. The beak and oral organs vary greatly in form, as do also the antennæ, the tarsi, the ungues, and the position of the coxæ; the 1st and 2nd ventral segments are most frequently connate, and the 3rd is always shorter than the 2nd; the 5th is longer than the 4th. The following families seem to be indicated by the material I have examined:—

A. Antennæ with a solid annulated club.

a. Tarsi narrow.

Gular margin very prominent; mentum retracted.

Prosternum not excavated.

- AMYCTERIDÆ.

* 'Tijdschrift voor Entomologie.'

Prosternum excavated. - - -	BYRSOPIDÆ.
Gular margin not prominent; mentum large, concealing the mandibles, which are not scarred at the tip.	BRACHYCERIDÆ
b. Tarsi dilated, usually with a brush of hair beneath.	
Mandibles with deciduous tip, leaving a scar. - - - -	OTIORHYNCHIDÆ.
Mandibles simple, usually pincer- shaped. - - - -	CURCULIONIDÆ.
B. Antennæ with eleven separate joints. -	BRENTHIDÆ.

Concerning Amycteridæ and Brachyceridæ but little need be said: they are very peculiar and easily-recognized forms, not represented in our Fauna.

The first is Australian: the antennæ are slender and geniculated; the beak short and stout, deeply emarginate at tip, alike in both sexes; the buccal opening is very large, and the cavity is filled almost completely by the mandibles, which are convex, hairy on the greater part of the front surface, deflexed, deeply concave beneath; the gular margin is thickened and prominent, so that a deep cavity is seen between the gula and the mandibles, in which the mentum and oral organs are concealed from view; the eyes are small, and nearly round in some, narrowed beneath in others; the front coxæ are contiguous; the prosternum very short; the elytra are connate, and extend far over the flanks, so that the side pieces—both of the mesothorax and metathorax—are concealed; the dorsal segments of the abdomen are membranous, except the last, which is very large, corneous, and convex, more so in the male than in the female,—in the former it is truncate behind, exposing a semicircular 8th segment, from under which protrudes (Psalidura) a very powerful and complex genital armature, consisting of a large pair of forceps, conical-obtuse, punctured, and hairy, under which, and seen only from below, is a pair of transverse, thin, polished, corneous plates, also meeting on the median line; between them and the forceps is a large deep cavity; the ventral segments are scarcely less singular; the 1st and 2nd segments large, flat, connate, united by a sinuate suture; 3rd and 4th very short, separated by deeply-excavated straight sutures; 5th much

larger; in the male very deeply and semicircularly excavated, almost to the base, with a tuft of stiff bristles each side at the front edge of the excavation; in the female this segment is flat, and meets the last dorsal at tip in the usual manner; on the sides the lateral upward extension of the 5th ventral is very large, but the spiracle is visible; the extension of the 4th and 3rd segments are much smaller, and imbricated upon the 5th and 4th respectively; the side margin of the 1st and 2nd is very narrow, and the side pieces of the metasternum are scarcely visible; the elytra are connate, with the lateral groove of the inner face narrow and sharply defined, becoming broader and indefinite at the posterior 4th; on the inner face are seen eight rows of punctures, corresponding to ridges of tubercles on the back; the tarsi are 4-jointed, narrow, or at least the third joint not wider than the others, deeply grooved beneath; the tibiæ are truncate, without spurs, the front pair a little incurved at tip in both sexes; claws simple, not contiguous. The genera of this family are stated by Mr. Jekel* to differ by the form of the eyes, some being Cyclophthalmes, others Oxyophthalmes; also, in the antennal grooves, some being Obliquiscrobes, others Lateriscrobes. The vestiture of the under surface of the tarsi varies in different genera: in *Psalidura* they are spongy sericeous beneath; in others, ciliate or spinous. In other genera the sexual characters are less remarkable than in *Psalidura*, and will be found to consist chiefly in the division of the last dorsal segment into two, as in the other families of the series.

The *Brachyceridæ* are restricted to Africa and the neighbouring parts of Europe and Asia: they are stout insects, with ventricose elytra, suddenly deflexed behind, and extending far upon the flanks, like the first tribes of *Tenebrionidæ*, which they also resemble in the large mentum, flat, filling the whole of the buccal cavity; the beak is short and stout, thicker at the extremity, alike in both sexes; the antennal grooves are wanting (*Épisus*), or deep and directed downwards, almost confluent in the gular region (*Brachycerus*, *Microcerus*); the antennæ are short, straight, or feebly geniculate, scape forming less than one-third the length; joints of the funiculus seven, rather short; club solid, obconical, truncate or subacuminate at tip; eyes rounded or

* *Ann. Ent. Soc. France*, 1864, 544.

transverse, and acuminate at the lower end; mandibles stout, short, more prominent in *Brachycerus*, where they have the lower margin more produced into a cutting edge; the front surface is rough and somewhat angular, but without any trace of the rounded scar seen in *Otiorrhynchidæ*; the scutellum is scarcely visible; the elytra, as above mentioned, are ventricose, irregularly tuberculate or costate, very much extended on the flanks, so as to cover the side pieces of the mesothorax and metathorax, greatly deflexed behind; the lateral groove of the inner face is deep and narrow, becoming wider and obsolete behind; the dorsal segments are membranous, except the last, which is corneous, and divided in the male into two, as in *Curculionidæ*; the ventral segments are separated by deep sutures, of which the first is sinuate; the 3rd and 4th segments are shorter than the others; the lateral extension upwards is narrow, and but slightly wider behind; the front coxæ are contiguous, prominent, and subconical; the tibiæ are not dilated; the spurs are small, fixed, projecting inwards; the tarsi 4-jointed, narrow, setose, and feebly concave beneath (*Brachycerus*); pubescent, concave, and emarginate beneath (*Microcerus*); claws large, simple, distant.

BYRSOPIDÆ.

The third of the anomalous families has a more general distribution, and is represented in our Fauna by the genus *Thecesternus*, which forms a separate tribe, distinguished from the other tribes by the prosternal groove for the reception of the beak, not extended as far as the front coxæ. These insects are epigeal, rough, and dull coloured, with the elytra widely embracing the flanks, but not strongly deflexed behind, concealing the side pieces of the trunk; the beak is very short, not thickened at tip, nor emarginate at the middle; the antennal grooves descend perpendicularly, and form a gular constriction; the antennæ are unusually short, imperfectly geniculate; the scape as long as the first and second joints of the funiculus; the club elongate-oval, pointed, distinctly annulated; eyes transverse, pointed beneath;* mandibles stout, short, front surface curved and

* Jekel, l. c. 1864, 543, describes the group as being *Adelognathes cyclophthalmes*. Lacordaire (*Gen. Col.* vi. 293 sqq.) places them in *Phanero-gnathes*, and describes the eyes as acuminate below, in which he is correct.

roughly punctured; mentum very small, not placed on a gular peduncle; maxillæ exposed; prothorax widely lobed in front at the sides, so as to conceal the eyes when the head is deflexed, deeply excavated beneath for the reception of the beak; cavity closed behind in *Thecesternus* by a triangular plate of the prosternum, but by the front coxæ in the other genera; coxæ small, globose, contiguous; elytra connate, widely extended on the flanks, declivous behind, rough; lateral groove of inner face narrow and well defined; scutellum not visible; humeri in *Thecesternus* prolonged forwards, so as to extend along the sides of the prothorax; dorsal segments membranous, last one large, corneous, divided into two in the male; ventral segments unequal; 1st and 2nd very large, more closely connected, suture arcuated; 3rd and 4th short, sutures deep; 5th as long as the two preceding; lateral extension moderately wide, wider behind; pygidium articulating with both 4th and 5th ventrals; legs slender; tibiæ truncate; spurs small; tarsi 4-jointed, narrow, setose beneath. Several species of *Thecesternus* are found in the interior regions of the continent, from Illinois to Utah, under dried buffalo excrement, and similar objects.

JOHN L. LECONTE.

Abundance of Larvæ near Plymouth in June, 1872. By
GERVASE F. MATHEW, Esq., R.N., F.L.S.

A FEW days before I left Plymouth, in 1872, I went with my friends, Messrs. Bignell, Bishop, Gatcombe, and Jones, for a farewell entomological ramble in the woods in the neighbourhood of Bickleigh Vale; and, as I have seen no account of this day's expedition in the 'Entomologist,' I send it to you now, in the hope that it may be interesting to some of your readers at this time of the year, when so little out-door work is doing.

The 28th of June, 1872, was a delightful day in every respect,—bright, warm, and fresh,—one of those days we so often get in Devonshire at that time of the year, when everything looks joyous, and all living creatures seem to possess twice the amount of vitality they usually have. We left

Plymouth by an early afternoon train, and soon found ourselves at Bickleigh Station, from whence we descended to the valley below, crossed the river Plym, and walked up the hill on the other side towards the Caun Quarry Woods,—the locality we had previously fixed on for beating for larvæ, which were to be the chief object of our pursuit. On our way we turned our attention to the hedges on each side of us, and many common species of Geometræ were soon dislodged, *Larentia pectinitaria* being perhaps the most abundant: what a pest this is when one is mothing at dusk; I have often filled a dozen boxes or more with them, thinking they were something else. It is, however, a very pretty moth, and how nearly it resembles a piece of lichen as it sits with expanded wings on a block of moss-covered granite. A little distance further up the hill we came to a small patch of waste ground, where a few stunted sloe-bushes grew, and these were beaten in the hopes of obtaining larvæ of *Thecla Betulæ*, but none were found, as it was rather too late in the year for them, and the same bushes had been tried by one of our party only a few days before, and three or four larvæ taken. Presently a strange-looking moth responded to the rattle of my stick, flew across the road, and settled in the opposite hedge. I walked carefully towards it, and then saw for the first time alive a beautiful specimen of *Eurymene dolobraria*: it was a female, and was soon boxed, and I was much pleased to make its acquaintance. Subsequently it laid some eggs, which, on leaving Plymouth, I turned over to my friend Mr. Bignell, but I have not heard whether he succeeded in rearing any of them. Just before we reached the woods we had to cross a small extent of heathy ground, and here *Bombyx Rubi* was flying about freely in its usual headlong manner, and we certainly thought it was rather late in the season to find this species still on the wing. The woods, at the point where we entered them, were composed chiefly of young pollard oaks of about six or seven years' growth, with here and there a few birch and buckthorn bushes, and, in the whole course of my entomological career, I never saw such a sight as presented itself to our astonished gaze when we first plunged into this wood. In many places large patches of oaks were literally stripped of every leaf, and innumerable larvæ were to be seen wandering over the

branches in search of food. If we stood still and listened we could plainly hear the jaws of this countless host at work as they were ravenously feeding, and their frass dropping on the dead leaves below sounded like falling hail. We soon commenced beating, but it was fearful work, every blow of the stick actually bringing quarts of larvæ into our calico-trays (a most ingenious invention of Mr. Bignell's), and as we walked we could not avoid treading on larvæ which were crawling on the ground, besides which we were soon covered with them ourselves. The four most abundant species which were causing all this destruction were *Tæniocampa stabilis*, *Hybernia defoliaria*, *Oporabia diluta*, and *Cheimatobia brumata*; but occasionally we got something better, for in a little while Mr. Bignell's cheery voice rang out with—"Hullo, here's something good! Surely not *Chaonia*? Yes, it is, though; and a beauty, too!" This raised our hopes and strengthened our arms, and the bushes were thwacked more vigorously than before; and presently Mr. Gatcombe exclaimed he had a lovely *Ridens*; and I quite agree with him, for it is a handsome larva: I afterwards took one or two crawling about the bare branches in a most forlorn manner, as they had evidently been eaten out of house and home. We continued beating and had very good luck, obtaining about three dozen each of *Notodonta chaonia* and *Cymatophora ridens*; and, in addition to these, we also captured larvæ of *Thecla Quercus*, *Demas Coryli*, *Tæniocampa miniosa*, *Hoprorina croceago*, *Himera pennaria*, *Crocallis elinguarina*, and a great many other common species, and a few that were unknown to us; and returned to Plymouth in the evening, much pleased with our day's outing. I have often remembered this delightful day when I was many thousands of miles away in the Pacific.

Mr. Bignell has since informed me that larvæ were almost equally abundant in the same locality last year.

GERVASE F. MATHEW.

H.M.S. "Britannia;" Dartmouth,
November 13, 1874.

Descriptions of New Genera and Species of Parasites, belonging to the Families Proctotrupidæ and Chalcididæ, which attack Insects destructive to the Fig in India. By the late FRANCIS WALKER, Esq.

[Communicated by F. SMITH, Esq.]

Genus PSEUDISA, n., *Walker*. Fam. DRYINOIDÆ?

Body convex. Head and thorax very finely squamous. Head large, transverse, subquadrate, a little broader than the thorax; front perpendicular. Mandibles very short. Eyes large. Ocelli three, in a curved line on the vertex. Antennæ pubescent, filiform, 12-jointed, shorter than the thorax; first joint long, stout; second elongate-cyathiform; third and fourth extremely short; fifth and four following long, linear, equal; tenth, eleventh and twelfth forming a fusiform club, which is a little less than twice the length of the ninth. Prothorax large, quadrate. Mesothorax well developed; sutures of the parapsides distinct, converging hindward; scutellum with a slight longitudinal furrow. Metathorax large, tapering. Petiole slender, cylindrical, about two thirds of the length of the abdomen. Abdomen smooth, compressed, with four nearly equal segments; tip obtuse in the male, aculeiform in the female. Legs stout, setose; femora incrassated; tibiæ curved; tarsi 5-jointed; claws moderately long. Fore wings moderately broad, with a setose subcostal vein proceeding from the base to a large stigma, which emits a short branch or cubitus.

PSEUDIA SMICROIDES.

Luteous, with some black marks, which vary in number, and occasionally are wholly wanting. Wings cinereous-hyaline; subcostal vein tawny; stigma black. Length of the body $1\frac{1}{2}$ —3 lines. One specimen, which is much larger than the other, has a ferruginous stigma. Thirty-six specimens.

The number of specimens of this species indicate that it is especially an agent in caprification. It may deposit its eggs in some larvæ that feed within the fig, near the surface. It is very different from all genera hitherto described.

Genus ISANISA, n., *Walker*. Fam. EURYTOMIDÆ.

Body convex. Head and thorax very finely squamous. Head transverse, subquadrate, as broad as the thorax. Parts

of the mouth very small. Antennæ subclavate, 11-jointed, not longer than the thorax; first joint long, slender; second cyathiform; third very minute; fourth to eighth successively decreasing in length; club fusiform, a little broader than the eighth joint, and more than twice its length. Prothorax elongate, well developed. Mesothorax with the sutures of the parapsides distinct. Petiole about one-sixth of the length of the abdomen. Abdomen smooth, slightly compressed, with four distinct segments. Oviduct springing from the base of the abdomen, and extending just beyond its tip. Fore wings moderately broad; humerus extending to a costal stigma; no ulna nor radius.

ISANISA DECATOMOIDES.

Luteous, with the abdomen more or less piceous, or with the body wholly piceous. Wings cinereous-hyaline. Fore wings with a black stigma, and with a large brown spot in the disk adjoining the stigma. Length of the body 2 lines. Eight specimens.

The mimicry of this species with regard to the preceding one is probably subservient to its habits or economy. The larvæ on which it is parasitic probably live within the fig, near the surface.

Genus *AGRIANISA*, n., *Walker*. Fam. SYCOPHAGOIDÆ.

Body slender, flat, smooth. Head horizontal, oblong-quadrate, more than half the length of the thorax. Eyes narrow, lateral. Ocelli three, in a triangle on the hind part of the head. Mouth setose. Mandibles curved, falcate, very long, crossing in front of the head. Antennæ clavate, 11-jointed, a little longer than the head; first joint long, stout; second clavate; third to eighth short, successively decreasing in length; club fusiform, 3-jointed, as long as the four preceding joints. Prothorax very long, tapering in front. Mesothorax with the sutures of the parapsides distinct, converging hindward; paraptera large; scutellum rather small. Metathorax long, subquadrate. Petiole extremely developed, longer than the metathorax. Abdomen oval; first segment a little shorter than the four following together. Oviduct tubuliform, as long as the first segment. Fore legs slender; posterior legs incrassated; tarsi 5-jointed; claws distinct. Fore wings narrow; ulna about one-sixth of the

length of the humerus; cubitus curved, much shorter than the ulna; no stigma; radius rudimentary.

AGRIANISA MYRMECOIDES.

Luteous; wings pellucid; veins luteous. Length of the body 2—3 lines. Four specimens.

This genus differs much in structure from *Agaon*, *Blastophaga*, and *Sycophaga*, the other described genera of the family. It has some resemblance to the genus *Bethylus*, and to the *Formicidæ*.

IDARNES ORIENTALIS, *Walker*.

Female.—Metallic-green, slender. Head and thorax very finely squamous. Head transverse; face perpendicular. Trophi small. Antennæ inserted in the middle of the front, 10-jointed, piceous, clavate, nearly as long as the thorax; first joint pale yellow, long, slender; second cyathiform; third to seventh transverse; club fusiform, a little broader than the seventh joint, and full twice its length. Thorax not much developed. Prothorax and metathorax less developed than the mesothorax. Abdomen smooth, lanceolate, much longer than the thorax, pale yellow beneath towards the base. Oviduct tawny, about thrice the length of the body, slightly incrassated at the tip, which is black. Legs slender, pale yellow; tarsi 5-jointed. Wings pellucid. Fore wings narrow; veins pale luteous; ulna more than half the length of the humerus; radius a little longer than the ulna; cubitus extremely short. Length of the body $\frac{3}{4}$ line. Two specimens.

The genus *Idarnes* hardly belongs to the *Agaonidæ*. The only species hitherto described is a native of the West Indies. The long ovipositor indicates that it is parasitic on larvæ that feed quite in the interior of the fig.

Genus POLANISA, *Walker*.

Female.—Body slender, smooth. Head oblong. Trophi small. Antennæ 10-jointed(?), inserted near the mouth, nearly filiform, much shorter than the thorax; first joint long, stout; second elongate-cyathiform; third and following joints elongate, linear; club composed of three transverse joints. Prothorax very long, nearly flat. Mesothorax short. Metathorax well developed. Petiole very short. Abdomen more

than twice the length of the thorax, tapering to nearly half its length, compressed and aculeiform from thence to its tip. Oviduct longer than the body, emerging from the base of the abdomen; sheaths proceeding from the apex of the abdomen, slightly incrassated. Legs moderately long; femora incrassated; tibiæ slender; tarsi 5-jointed, very long and slender. Fore wings narrow; ulna much shorter than the humerus; radius and cubitus long.

POLANISA LUTEA.

Female.—Pale luteous. Antennæ tawny; first joint pale luteous. Oviduct pale luteous; sheaths black. Wings pellucid; veins pale yellow. Length of the body $1\frac{1}{4}$ line. One specimen.

This genus, with *Idarnes* and *Micranisa*, may be said to constitute one group, though it differs from them much in structure. The form of the abdomen indicates that in the act of oviposition the apical half of it is inserted as well as the sheaths of the ovipositor.

Genus MICRANISA, *Walker*.

Body rather slender. Head and thorax very finely squamous. Head transverse, broader than the thorax. Eyes very large and prominent. Trophi very small. Antennæ 10- or 11-jointed, subclavate, shorter than the thorax. Thorax not much developed, much like that of *Idarnes*. Petiole very short. Abdomen smooth, compressed, longer than the thorax. Oviduct slightly exerted; sheaths not more than one-sixth of the length of the abdomen. Legs slender; tarsi 5-jointed; hind femora slightly incrassated; hind tibiæ slightly curved. Fore wings narrow; ulna much shorter than the humerus; radius more than half the length of the ulna; cubitus shorter than the radius; stigma moderately large. Metallic-green, shining. Antennæ tawny. Sheaths of the oviduct black. Legs luteous; hind femora green. Wings pellucid; veins pale yellow. Length of the body 1 line. One specimen.

The short ovipositor of this genus shows that it is not parasitic on larvæ that feed within the fig.

Entomological Notes, Captures, &c.

Collecting in the Lake District.—I spent nearly the whole of the last week of June in Wastdale, and made the ascent to the Sty-Head tarn daily; but although the season had been very dry it had been cold, and I never saw Cassiope. Wastdale itself was singularly bare of Lepidoptera. The only insect at all common was Pamphilus, which flew in swarms about one-third of the distance up the Sty-Head Pass. After having given the Sty-Head up as a failure I went through Keswick to Wythburn, at the foot of Helvellyn, and made the ascent of that mountain twice. The vegetation is exactly like that at Sty Head, and Cassiope will be sure to turn up there some day. At the foot, and for a short distance up, flew Pamphilus; and when about half-way to the top I noticed a small insect flying, of which I took two or three. This has been identified, by my friend Mr. Birchall, as undoubtedly *Sericoris irriguana*. This, I believe, is the first time it has been found in England, the other specimens being Scotch. After leaving the long grass, and when I had reached the weather-worn, scanty turf which covers the highest parts of Helvellyn, I began to take *Crambus furcatellus*, of which I managed to secure perhaps twenty. On the very brink of the precipice, which is on the Patterdale side of Helvellyn, *Salicata* was flying in some numbers, but as it flew principally over the abyss it was not to be had in any quantity. I took one on the very top, close to the cairn that marks the highest point. It was strange that ten yards from the edge not one was to be seen, while when on the edge and looking down, about two or three were to be seen at a time flying about the face of the precipice. I was much disappointed with the result of my trip, for the store-box I had brought home from Rannoch last year nearly full was ludicrously empty. Let us hope this year's trip will prove more productive.—*J. C. Wassermann; Beverley Terrace, Cullercoats, Dec. 9, 1874.*

Captures of Lepidoptera in 1874.—The following are amongst my best captures during the past season:—*L. Sinapis*, *A. Paphia*, *Aglaia* and *Adippe*; New Forest. I also took a fritillary, which appears to be quite distinct from either of the latter. *L. Sibylla*; New Forest. *A. Galathea*; very common; Barnwell Wold. *T. Quercus*; New and

Sherwood Forests. *T. Pruni*; common; Barnwell Wold. These hairstreaks seemed very fond of the bramble and privet blooms, and we found that the best way to take them was to stand near a good batch of bloom, and wait. *L. Asellus*; one, by beating sallow; New Forest. *Z. Meliloti*; not uncommon in one particular ride in Stubby Copse; New Forest. *C. miniata*; Barnwell Wold and New Forest. *L. mesomella*; New Forest. *E. dolobraria*; Sherwood Forest. *N. zonaria*; Wallasey. *P. Cytisaria* and *M. Euphorbiata*; New Forest. *C. Populata*; common; Huddersfield. *E. lineolata*; Wallasey. *A. Aceris*; Southampton. *X. Hepatica* and *M. anceps*; Barnwell. *L. Cespitis*; Sherwood Forest. *X. Polyodon*; one or two, very dark; Muker, North Yorkshire. *A. caliginosa*; New Forest. *N. glareosa*; in profusion; Sherwood Forest. *T. opima*; Wallasey. *E. Fulvago*, *E. nigra*, and *M. Oxyacanthæ* (dark *var.*); Sherwood Forest. *H. Atriplicis* and *C. Scrophulariæ*; Whittlesea. I also saw one specimen of *C. promissa* at the New Forest, but unfortunately missed it.—*S. L. Mosley; Edwinstowe, November 16, 1874.*

Vanessa Urticæ in 1874.—It would be interesting to have some account of what was observed by entomologists last year in the matter of the appearances of this insect. In the vicinity of Gravesend there were certainly a few stragglers about on the wing during April and May, but, though I examined nettles in many spots, I saw no broods of larvæ in the early summer, at the time they are usually noticeable, and from these fresh specimens ought to appear some time in June. I do not know how it may have been elsewhere, but I strongly suspect that about this part of Kent there was only one brood of *V. Urticæ*, the larvæ of which I saw in July: this would be consequent upon the cold and dry weather of the spring months retarding oviposition, or killing, possibly, some individuals before that could take place.—*J. R. S. Clifford.*

Scarcity of Pyrga Egeria (Entom. vii. 129).—I much incline to your correspondent's opinion that *P. Egeria* has been written about in books as being much commoner in Britain than is actually the case, though in some localities it may be abundant. Of course it is possible that the species may have been more generally abundant before so wholesale

a demolition of wood and forest was carried out, as has been seen during the last seventy or eighty years. And yet I scarcely know why it should be, as the larva does not feed on plants in woods; but the imago is certainly more partial to such places than others of the satyrs, excepting *S. Hyperanthus*. Wherever I have seen and taken *P. Egeria* in Middlesex, Kent, and Hertfordshire, in point of plentifulness it would be put far below such a species as *A. Euphrosyne*, for instance. It is a butterfly that I have very rarely seen in the act of settling on any flower.—*J. R. S. Clifford.*

Leucophasia Sinapis.—In taking *L. Sinapis* at the New Forest, during the fore part of July, I took one without the black tips. Is this the female, as stated in Newman's 'Butterflies;' or is it a variety, as stated by other entomologists?—*S. L. Mosley.*

[Of course the duty of replying must devolve on others. Will Mr. Doubleday, Mr. Birchall, or Mr. Weir, kindly reply? I retain the opinion I have already expressed; but am by no means confident.—*Edward Newman.*]

Note on Zygena Filipendulæ.—I wish to bring under your notice a curious fact in relation to the time of appearance of *Z. Filipendulæ*. This year, in a field sheltered by woods, and in a low situation, about four miles from Winchester, I took, on June 9th, two specimens of *Z. Filipendulæ* in good condition, and apparently but lately emerged, in company with *Z. Trifolii*, which was in very bad condition. At this time *Z. Filipendulæ* (which is common on many of the downs in the neighbourhood of Winchester) had not there, in those higher and more exposed situations, even assumed the pupa state, nor did it begin to do so for some time after this date. The first imago I saw was on July 10th, just a month after the appearance in June. Should you think that the difference of the times of appearance was simply owing to the difference of situation; or is there any other explanation of it? I do not suppose there can be any mistake as to the identity of the earlier moth, as the two are exactly similar, as far as I can see. The yellow variety appeared again, though sparingly, on the downs, with the later insects in July; but I have not heard of its having been taken in June with the moths that appear at that time.—*Nelson M. Richardson; 4, Upper Queen's Terrace, Southampton, September 29, 1874.*

[I can offer no explanation of the discrepancy in time of appearance.—*Edward Newman.*]

Larvæ of Bombyx Pernyi.—These larvæ manifest some disposition to attack each other when in confinement,—a circumstance rather unfavourable to attempts to breed the species on a large scale, with a view to an economic use of the cocoons. The time of inactivity during the ecdyses is remarkable, in the case of some individuals, extending occasionally to seven days. It is compensated for by brisk jaw-work afterwards; for, through the latter part of their life, these larvæ seem to eat both by day and night. On the day before the cocoon is commenced they discharge from the mouth a good quantity of fluid, which is not, however, of an acrid character, but rather glutinous. It is sometimes emitted in less quantity, at an earlier period, if a larva is irritated.—*J. R. S. Clifford.*

[Notwithstanding my earnest desire to promote the science (if I may so call it) of Economic Entomology, I would venture to caution entomologists against attempting to rear the various Asiatic silkworms, which have verticillate larvæ and pyriform cocoons, on too extensive a scale: it is well to be certain that you are able to walk safely before you attempt to run. I have become cognizant of such repeated failures in the attempts to rear these silkworms that it seems needful to offer this caution. No sufficient cause for the mortality among these magnificent larvæ has yet been discovered. Such cause must not only be discovered, but removed, before extensive operations can be successful.—*Edward Newman.*]

Fidonia atomaria.—On Sunday, October the 11th, while walking through Sherwood Forest, an insect flew across the path, which I took to be *Cheimatobia brumata*; but as I had not taken that species here I netted it to make certain, when it proved to be a male specimen of *Fidonia atomaria*. Is not that unusually late for this species to be on the wing?—*S. L. Mosley; Edwinstowe, October 20, 1874.*

Eupithecia Knautiata of Gregson.—Seeing Mr. Gregson's description in the 'Entomologist' (Entom. vii. 255) of a pug new to science (*E. Knautiata*), it may not be out of place to remark that I have known the locality where it is taken ever since I was a schoolboy, and remember, when birds-nesting on Bullshill, that heath grew there in abundance; and at a

later period when, as an angler, frequenting the Bolton and Bury canal, heath grew on the off-side of the canal, above Holker's Bank, the other locality where this pug larva is taken. At the present time, what with coal mines, chemical works, &c., the heath appears to be entirely destroyed. Is it not just possible that *Minutata*, finding its natural food-plant diminishing, has taken to *Knautia arvensis*, and, by so doing, has produced itself in a more enlarged form? It would be worth the trial to feed the heath *Minutata* from the egg on *K. arvensis*, and note the result. In referring to my diary I find, on October 2nd, 1870, when on a visit to Bolton, my friend Mr. Porter told me of this larva, and we went and found it in abundance. I have taken it since; but not this season.—*Wm. Johnson; 66, Upper Warwick Street, Park Road, Liverpool, November 29, 1874.*

[I greatly desire the addition of a new British species to the interesting genus *Eupithecia*; but I cannot think that Mr. Gregson has published any characters in the 'Entomologist' which will induce his readers to admit *E. Knautiata* as being so. If Mr. Gregson will kindly send me for publication a specific description, and append a memorandum contrasting the species, or, as I should say, differentiating it from the most nearly-allied species, he will be doing a real service to Entomology. I have received Mr. Gregson's second letter on the subject, but this does not seem to meet the case. I am unable to find *any* distinctive character in what he has hitherto written; but I confess this may be owing to my imperfect knowledge of the genus.—*Edward Newman.*]

Unusual appearance of Cidaria Silaceata.—On the 10th of December (weather being frosty) I was surprised to see a fine female specimen of this moth in my breeding-cage, reared from a larva obtained in the autumn. The cage stood in a natural temperature; and having expected *Pæcilocampa Populi* to make its appearance I had been looking in the cage daily, so that there can be no mistake about the time of appearance of *C. Silaceata.*—*F. O. Standish; 402, High Street, Cheltenham, December, 1874.*

Economy of Anarta Myrtilli (Entom. vii. 178).—On Shirley Heath, where, in former years, I have spent three or four hours at a time in August and September hunting for the

larvæ of this insect, it used to occur in the spring as well as in the autumn,—in larger proportion at the latter season. It is not easy to obtain, as it falls from the heath if alarmed, even perhaps by the sound of a footstep. The best way is to sweep the plants with a circular net; beating them into an umbrella is not so effective, as, from the mode in which the larvæ rest, they slip by the edge of the umbrella. Of the larvæ thus taken in autumn all will not feed-up the same season, even in confinement; but few survive until the spring. They appear to eat at intervals, which renders it more difficult to manage them. The insect occurs also on Wimbledon Common, on the side near the park.—*J. R. S. Clifford.*

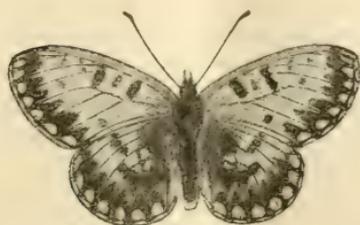
South London Entomological Society.—The third annual exhibition of this Society was held on Wednesday evening, December 9th, in the Girl's School-room, St. Mary's, Newington, which had been kindly lent by the managers. There was that variety of objects which always gives its charm to meetings of this kind. All orders of insects, and those of all climes, were abundantly represented. One of the most interesting cases was exhibited by Mr. Weir, the Comptroller-General of H.M. Customs. It was labelled "Mimicry," and contained specimens of butterflies which possess the marvellous power of changing colour when pursued by a certain bird that has a peculiar liking for their flavour, and contemplates them with an ardent affection akin to that with which an alderman may be supposed to regard real turtle. No sooner, however, is the insect aware of its pursuer, than it transforms itself into the similitude of another butterfly, for which the bird has no taste at all, but rather holds in abhorrence. So the accomplished harlequin of the pantomime escapes, unscathed, to practice the same clever deception over and over again. Mr. Hoey exhibited a case of larvæ admirably preserved. Mr. Wellman (the President), Mr. Champion, Mr. Tugwell, Mr. Williams, Mr. Power, and many others, were also contributors; and I must not omit Mr. Barrett, the indefatigable Secretary, to whose courtesy, unwearying assiduity, and excellent arrangement, the exhibition was mainly indebted for its success.—*Edward Newman.*

THE ENTOMOLOGIST.

No. 139.]

FEBRUARY, MDCCLXXV.

[PRICE 6d.



ARGYNNIS SELENE (VARIETY).

Variety of Argynnis Selene.—On the upper side the fulvous colour is paler than usual; in the fore wings the subcostal series of transverse black markings in the median cell is much altered; the first, third and fifth of these markings are absent, but their site is faintly indicated in each instance by a minute black cloud; the second and fourth are present, distinct, and nearly of the usual size and shape; the black lunules, which usually form a continuous and complete series within the hind margin, want the usual definition, and are fused with, and united to, the nearly circular black spots, which, in normal specimens, form a transverse series parallel to these lunules, but nearer the base of the wing; the other black markings are absent; the submarginal series of fulvous spots is regular and conspicuous; each spot is large and distinct. In the hind wings a very similar change of markings has taken place, as shown in Mr. Willis's admirable figure. The under side is remarkable, in having nearly all the markings confused; in the hind wings the silvered districts have overflowed, and have more or less tinged the whole of the wing

with silver; the wing-rays have, however, retained their distinctness, and their median area has a circular and clearly-defined black spot. The other markings call for no especial mention. This specimen is in the possession of Mr. Bernard Cooper, who has kindly lent it me purposely for figuring in the 'Entomologist.'—*Edward Newman.*

Life-histories of Sawflies. Translated from the Dutch of M. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from p. 8.)

CLADIUS DIFFORMIS, *Panz.*

Imago and larva: Panzer, *Fauna Germ.* 72, fig. 10; Lepeletier de St. Fargeau, *Monogr.* p. 57, No. 165; Brullé in *Ann. de la Soc. Ent. de Fr.* 1, p. 308, pl. 11; *Hartig, Blatt-und Holzwespen*, p. 175, No. 1.

Cladius niger, alarum tegulis, genubus, tibiis, tarsisque exceptis tarsis posterioribus, flavescenti-albis, antennis maris ramosis.

Cladius difformis is distinguished from all the *Tenthredinæ* with which I am acquainted by the singular and beautifully branched form of the antennæ in the male. It is true that in the work of Lepeletier de St. Fargeau, *loc. cit.*, at No. 166, a second species, having this peculiar structure, is described under the name of *Cl. Geoffroyi*; but this species, which I have not yet met with, appears to be merely a variety of the former, and one which Lepeletier himself had never observed. *Cl. Geoffroyi* differs in having the legs yellow, and the pectination of the third joint of the antennæ white, perhaps in consequence of imperfect development.

The peculiarity of the structure of the antennæ of *Difformis* (male) strikes one at the first glance; the species is by no means scarce, so that an opportunity is frequently afforded of seeing these curious antennæ in motion. The insect lives on many species of rose, perhaps on all. I have not yet succeeded in finding the egg, nor in discovering the place of its concealment; I suppose that it is simply deposited in a slit of a leaf-vein, and probably each egg by itself on a separate leaf, as the larvæ are seldom met with in pairs on the leaves.

I find the larvæ on the roses as early as May, and so on through the whole summer until the end of August; and in warm summers, as that of 1846, up to the middle of September. They always frequent the under side of the leaves, and eat out patches of the parenchyma, so that the leaves have a blotchy appearance, as I have represented at fig. 1. Afterwards, when the larvæ have moulted for the third time, they proceed to eat holes in the leaves and to gnaw the edges.

The larva grows to a length of thirteen millemetres. Like the other Cladii, with the exception of *Cladius viminalis*,* it is flatter and broader than is usually the case with the larvæ of sawflies, and has twenty legs, the 4th and 11th segments of the body alone being apodal. In young larvæ the head is brown; in full-grown individuals it is really green, but covered with hundreds of minute brown points, so that, when observed without a lens, it appears of the latter colour; it is covered with comparatively long gray hairs; the eyes are placed in round black spots, and the trophi are brown.

The body, which somewhat decreases in diameter towards the tail, is yellowish green, with a stripe of a darker tint along the back (fig. 2). On each segment there are three rows of little knobs (fig. 3) covered with very fine white hairs, those of the last row being longer and of a darker tint than those of the other two. Above each leg there are also two little knobs of a more elliptical shape, and likewise hirsute; these are placed the one obliquely below the other. The abdominal legs are entirely green; the more horny thoracic legs are glassy green, with brown claws.

A few examples were green on the upper surface of the back, and pale sordid yellow at the sides, with two lines of a darker tint along the neck; one was entirely of a dull, ochreous gray colour, but appeared to be sickly, and in fact died before it had begun to spin up. As a rule the larvæ of this species are slow in their movements, and appear to crawl with difficulty. They spin up among fallen leaves, or in the cracks and crevices of the rose stems. The cocoon is double, as represented at fig. 4; *a* being the outer, transparent loose tissue, and *b* the interior one, which is always oval and somewhat thicker, and is of a pale gray colour, or white. I

* See 'Tijdschrift voor Entomologie,' vol. i. p. 176, pl. 10.

have observed the same in the case of *Cl. albipes* and *Cl. uncinatus*.

The length of time passed by the insect within the cocoon depends upon the time of year in which the larva spins up; when this takes place in the spring or summer the period of inclusion is not longer than a fortnight or three weeks; but when the larva spins up in September the imago does not appear until the following spring. One larva, which spun up on the 23rd of May, produced the imago on the 14th of June; and from full-grown larvæ, taken on the 3rd of August, I obtained three imagos by the middle of the month, all males.

On cutting open one of these cocoons—a little before the time the imago is ready to appear, that is to say on the sixteenth or seventeenth day—the pupa is found to be fully, or very nearly fully, coloured, having the appearance of our fig. 5, which represents a pupa so nearly ready to come out that it begins to move about the antennæ and the palpi, and the last joints of the tarsi. When this drawing was made the insect was already black, with obscure white legs, and a gray stripe on the side, being the membrane between the dorsal and ventral plates. Brullé found the imagos developé in thirteen days, during the month of July.

The perfect insects (see figs. 6 and 7) are black; the legs being partly obscurely white, or pale ochreous. The males are four or five millemetres long; the females from five to seven millemetres. Head nearly as broad as the thorax, shining black, scantily clothed with very short gray hairs; in both sexes the palpi are obscure white. Thorax black, with scanty gray pubescence; sometimes, in the female, with a tint of very dark sepia. Cenchri obscure white. Abdomen shining black. Legs shining black as far as the knee, and from there dirty white, or, in some males, pale ochre-yellow; the last three joints of the posterior tarsi, sometimes all, together with the point of the tibiæ, sordid brown. The wings, for more than the half of their extent from the base, are smoke-coloured, with brown nervures. Costa obscure white, or pale reddish brown. Stigma of the same colour, or faded brown. The antennæ are a little longer than the head and thorax, black, and of a very peculiar form in the male (Hartig's figure, plate 2, f. 20, is not quite exact; see our

fig. 8, male). The first two joints are short and thick, annular; on the under side of the third is a small hairy knob, and on the upper side, at the apex, a branching process covered with hairs, like that of a stag's horn, and half as long again as the joint itself; similar processes are found on the fourth, fifth, and sixth joints, decreasing successively in size, so that that on the sixth joint only just projects from the apex; the seventh joint is, at the end, somewhat more pointed above than below; the eighth is simply cylindrical; and the ninth awl-shaped. Both the knob and the branches are wanting in the female (fig. 8, female); but the third, fourth, fifth, and sometimes the sixth, joints are somewhat expanded above: they terminate obliquely at the apex, and have a fine pointed spine on the projecting upper side.

The saw and ovipositor of the female are very similar to those of *Cladius albipes*, but are a little broader, and the points with which the former is armed are finer and sharper. *Cladius difformis* has been taken with us in various localities, and will probably be found to be common wherever roses are cultivated.

Additions to the List of Macro-Lepidoptera inhabiting Guernsey and Sark. By W. A. LUFF, Esq.

(Continued from vol. vii. p. 42.)

I BEG to offer the enclosed additions to my former lists of Guernsey insects for publication in the 'Entomologist.' The following were, when not stated to the contrary, captured during 1874.

Lampides Bætica.—A single specimen was captured by Miss L. Renouf in her garden, St. Peter Port, Guernsey, at the end of August, 1872. This lady also captured eight specimens at the same place in the autumn of 1859.

Sphinx Convolvuli.—Several have occurred in Sark.

Deilephila Euphorbiæ.—I am sorry I cannot now record this as a Guernsey insect. Many years ago the larvæ were to be found in abundance on the sea-spurge growing near the coast of L'Anresse Bay, but greedy collectors have long since exterminated the species.

Zygæna Trifolii.—It is this insect and not *Z. Lonicæræ*, as mentioned in my previous list (Entom. vi. 352) which is so

abundant on the Guernsey coast; it is also very abundant in Sark and Herm. The imagos usually make their appearance towards the end of June; but on visiting Herm, on July 30th, I was surprised to find a great number of cocoons, from which the perfect insect had not yet emerged. The moths kept coming out for a fortnight after this date. On August 11th one emerged, still bearing the head of the larva: this is a very rare form of monstrosity (see Entom. v. 268). I think *Z. Loniceræ* is absent from Guernsey and Sark.

[Great care is necessary in deciding between the two species here mentioned. I willingly admit that I am totally unable to differentiate them in print; moreover I have almost invariably found that the specimens so kindly sent me by correspondents in the north as one species, when submitted to the highest authority in the south are returned to me as the other. Can any reader of the 'Entomologist' give any information as to the pupation of *Trifolii*? Have Mr. Luff's cocoons been submitted to a critical examination by Mr. Birchall, Mr. Doubleday, or Mr. Weir? I should feel really gratified, not only on my own account, but on that of those who so kindly favour me with their company on Friday evenings, if entomologists would send either specimens or information concerning the pupa or cocoon of *Trifolii*. It may seem a strange confession, but I am in a state of positive ignorance whether this species spins a shuttle-shaped cocoon on the culms of grasses, or an oval cocoon low down in the herbage, or absolutely enters the earth to undergo its transformation under ground. In this case, as in that of the almost equally common insect, which I have described under the name of *Davisellus*, and which possessed at least three prior names on the Continent, I feel the humiliation of exhibiting such gross ignorance. It is no excuse that this ignorance is shared by my fellow-countrymen. In both cases it is totally inexcusable; and the plea that others are equally ignorant is, to say the least, puerile and unavailable.—*Edward Newman.*]

Sesia Ichneumoniformis.—I took one at rest, July 6th, at the top of the cliff, near Doyle's Monument, Guernsey.

Nola cucullatella.—Not uncommon in Guernsey; end of June.

Nudaria mundana.—Miss Renouf informs me that she

has found the larvæ, near Bordeaux Harbour, Guernsey, feeding upon lichens growing on stone walls.

Lithosia rubricollis.—I have taken several specimens in Sark. The larvæ are abundant in some four or five localities in Guernsey: they are found full grown at the end of October, in every instance feeding on lichens and mosses growing on elm trees, and on the walls near these trees. Hundreds of the perfect insect were resting on the trees, walls, &c., on June 10th, and fresh specimens were to be found on July 5th.

Lithosia quadra.—A lady collector had two larvæ brought her, from which she succeeded in breeding one moth. The larvæ were found under some old lichen-covered apple-trees in a garden, near Moulin Huet Bay, Guernsey.

Liparis chrysorrhæa.—Rare in Guernsey.

Cleora lichenaria.—One specimen, bred by Mrs. Boley, from larvæ taken in Guernsey.

Timandra amataria.—Not uncommon in Guernsey and Sark.

Hybernia progemmaria.—I took one specimen at willow bloom, on March 20th, in Guernsey.

Cheimatobia brumata.—Occurs in Guernsey, though not commonly.

Eupithecia linariata.—The larvæ not uncommon in the flowers of *Linaria vulgaris*. Guernsey.

E. exigua.—Common in Guernsey and Sark.

E. rectangulata.—Took several in Guernsey.

Thera juniperata.—One specimen taken in Guernsey.

Melanippe rivata.—Took two, near Fermain Bay, Guernsey, in July.

Eubolia peribolata.—Mr. Doubleday informs me that the insect, named as *Anaitis præformata* (Entom. vi. 357), is the *Eubolia peribolata* of Hübner. The true *Anaitis præformata* is a much larger and altogether different insect. *Peribolata* is on the wing during September, and flies amongst furze bushes in the daytime; it also comes to sugar and ivy blossom. The eggs are hatched in the autumn, and the larvæ feed upon furze.

Calamia lutosa.—First noticed a specimen crawling up a reed-stem, at the Grande Mare, Vazon, whilst searching for plants, on October 10th: it had just emerged from the

chrysalis, and its wings were yet limp. About a week later I searched the reeds at night with a lantern, and secured eight specimens; most of these were rather worn.

Gortyna flavago.—The larvæ are to be found in thistle-stems. Guernsey.

Hydræcia micacea.—Mrs. Boley has taken one specimen. Guernsey.

Caradrina blanda.—Common at the flowers of wild mint. Fermain Bay, Guernsey; end of August.

Agrotis lunigera.—Several taken in Sark at sugar; end of August.

A. porphyrea.—Common on heather bloom. Guernsey.

Noctua Rubi.—Common at sugar in the autumn. Guernsey.

Teniocampa rubricosa.—Not uncommon at willow bloom. Guernsey.

Dianthæcia conspersa.—Miss Renouf has taken this insect in Guernsey; and Mr. Doubleday informs me he took specimens in Sark more than twenty years ago.

Epunda nigra.—This has been met with at ivy bloom rather commonly in Sark.

Trigonophora empyrea.—Several specimens taken at ivy bloom, in Sark, during September.

Heliothis peltiger.—Miss Renouf has frequently bred this insect; the larvæ were found feeding on marigold in her garden.

H. armiger.—One specimen taken in Sark at sugar.

Catocala nupta.—One specimen taken in Sark.

W. A. LUFF.

Mansell Street, Guernsey,
December 17, 1874.

Notes on the Arachnida. By W. SIDNEY RANDALL, Esq.

THE following observations, from my note-book for September last, on the habits of certain Arachnida, chiefly with reference to some of the different methods employed by them to secure their prey, may be interesting, not only to Arachnologists, but also to your general readers.

I noticed that a number of spiders had taken up their abode on the panes of my workshop window, just above my lathe, so that I had very good opportunities for observing

them, especially as there was no one likely to interfere with their webs by the use of dusting-brush or otherwise.

Sept. 8th.—One of the *Epëiræ* having constructed a web on a lower pane, I determined to make some experiments with it: accordingly, by way of commencement, I placed a dead house-fly, just killed for the purpose, in the upper part of the web, close to the spider, which, however, took no notice of it during the whole afternoon. In the evening I tried once more, this time placing a living fly in the centre of the web, but with the same result, although the fly in its struggles shook every portion of the net. Thinking that my presence had something to do with the cause of such apathy, I turned down the gas to await the result. In a few seconds I heard the sound of the fly's wings, so I turned up the light at once, but immediately the spider made off, leaving the fly to continue its struggles again. Seeing the effect either of the light or of my presence, I again lowered the gas; but, after waiting some time without any apparent result, I raised the light, and to my surprise saw the spider feeding on the dead fly, which had been neglected during the greater part of the day; but it ran back to its hole as before.

Sept. 13th.—During the last few days the *Epëira* has refused to eat or take any notice whatever of a fly, so I turned it out to see whether it would return or not to its abode, which I preserved intact. But it never has returned, and the web remains unoccupied. Then I turned my attention to a small colony on the upper panes of the window, and finding a very small straw-coloured spider, in a large irregular web, I tested its capabilities by putting a living fly in the middle of the meshes, with the following result: almost before my hand had left the fly the little spider ran down, and with its falcæ seized its prey's fore leg by the foot, and, fixing itself firmly, held on until the struggles of the fly had ceased so far as to enable it to complete the capture by the additional security of a few threads. My next experiment, with another very small spider of a dirty brown colour, was more interesting. It had a very small web in the lower corner of a pane in the middle of the window, and with some difficulty I entangled the legs of a fly in it, but its weight and struggles caused it to fall over the ledge, where it hung suspended by the fore legs. I left it alone to see what steps the spider

would take to recover its prey, and the result was very interesting, the more so because to get at a fly in such a position again would be very difficult, if not almost impossible. The spider ran down the thread attached to the fly, and proceeded to strengthen it by others, which it fastened high up in the web; after this it went down the back of the fly and fixed a thread to the extremity of each wing, taking them up as before. When this was accomplished two more threads were attached to the hind legs, and, lo, the preparations were complete; but the most difficult part of the task remained to be accomplished, for the fly, although securely bound, was some distance below the web. The little spider was, however, equal to the occasion: it drew each thread tighter, and slowly hauled up the fly, not only to the ledge, but over it, and into the web. A very clever feat, when the great disparity in size between the spider and its prey is taken into consideration.

Before leaving my workshop I placed another fly in the web of the little straw-coloured spider, mentioned above. This gave rise to an incident which was both amusing and instructive. The little spider ran down and seized its victim by the leg, as before, and would no doubt have succeeded in effecting another capture, but for a slight interruption, that might have been attended with serious results. A much larger spider, inhabiting the corner of the window two panes removed, had evidently seen the struggle going on, for it suddenly darted from its hole, and, rapidly clearing the two intervening panes, made for the fly, which it promptly seized. This put an end to the fly's struggles for life, but commenced a trial of strength for its possession. The small spider had never relaxed its tenacious grip,—not even when the larger one had appeared; and it stoutly resisted all efforts to deprive it of its prey. Instead of attempting to carry off the fly bodily, the large spider attached a thread to it, and then tried to drag it away from the little one, but without avail. After watching this contest for some little time I was surprised to see the invader suddenly relax its efforts, and retreat as rapidly as it had come, leaving the little one to secure its prey unmolested.

I then offered two flies in succession to the disappointed spider, both of which it seized most eagerly out of my hand;

rather an unusual proceeding, at least with the majority of the Arachnida, for, as a rule, I find them very shy, especially the larger specimens.

Sept. 14th.—During the night a change had taken place among the spiders, and I found that the plucky little straw-coloured fellow had been either turned out or devoured by a new comer. This was a very much larger specimen, and seemed very shy, making off as soon as my hand came near the web; it also refused all my offers of food, and allowed more than one fly to get away without even attempting to capture them. I next tried to induce the spider in the corner to seize another fly, but without success; although the day before it had been so eager to take them, even from my hand. From this it would appear that certain of the Arachnida, after their appetite is satisfied, are disinclined to make any efforts to secure their prey, until hunger compels them to do so. But that it is not the case with all may be shown by the readiness of some of the *Epëiræ* to lay in a large stock of provisions. On one occasion a specimen of *Epëira Diadema* took from my hand six flies, one after the other, winding them all up, and securing them in the usual manner to the web. This reminds me of an interesting fact mentioned to me lately by a friend of mine, who is a close observer of spiders and their habits. Certain spiders, if they kill a number of flies that they cannot readily dispose of at once, will devour them one by one, as they require food, but keeping to the order in which they were killed; the fly captured first being eaten before any of the others, and so on in order.

Sept. 25th.—I noticed that numbers of ladybirds (*Coccinellæ*) had made their appearance, most of them being clustered in little groups in the corners of the window panes. The day before not one of them was visible. I placed one in the web of a large spider, located under the gas-pipe, to see what would be the result. The spider ran out at once, but cautiously approached the little red insect, and then made a sort of peck at it with its falces, drawing back at once: this was repeated two or three times; then the spider slowly put forward one leg and touched the *Coccinella* on the back, but immediately withdrew it, and with that sudden erratic movement so noticeable in the Arachnida, turned round and

bolted into its hole again. The *Coccinella*, left to itself, managed in a very short time to extricate its legs from the meshes and walk out of the web.

Before concluding this paper I should like to draw attention to a question suggested to me by Mr. W. R. Hughes, of Handsworth, as to whether some of the Arachnida are not nocturnal in their feeding. The fact I have mentioned of a spider refusing to touch its prey while a light was burning, but seizing it the moment that light was extinguished, led Mr. Hughes, when I told him of it, to draw this conclusion, which is, I think, worthy of consideration. I do not remember to have met with a work in which such a question is even noticed; and Kirby and Spence, in Letter 13, which is chiefly devoted to spiders, have no remarks on the subject. But it is, I believe, a well-known fact that the Arachnida very often construct their webs during the night.

W. SIDNEY RANDALL. .

Handsworth Rectory, January 12, 1875.

Entomological Notes, Captures, &c.

Epping Forest.—In your article on Epping Forest (*Entom.* viii. p. 3) you state that “the Haggerston Entomological Society were the only entomologists in Britain who entered the slightest protest against the hateful enclosures.” I beg to call attention to the ‘*Entomologist*’ for 1867, Vol. iii., Nos. 37, 38, where you acknowledge a contribution, for the benefit of the imprisoned wood-cutters, from the Eastern Entomological Society, now known as the East London Entomological and Botanical Society. We have at all times done our best to resist the enclosures. We have petitioned Parliament, which petition was most respectfully listened to by the House of Commons. I also send you the following copy of a letter we received from Professor Fawcett, M.P., who presented it:—“I will most gladly present your petition. I most cordially endorse all the opinions you express with regard to the importance to the working classes of preserving Epping Forest. It ought to be looked upon as a great social and educational question. I think the working men would do well to make it a test-question at the next election. I would vote for no man,

whatever his political opinions might be, if he were not prepared to do everything in his power to resist those who have striven so hard to deprive the poor of those open spaces, where they can not only obtain health, but where they can enjoy the highest kind of recreation. Yours very truly,—HENRY FAWCETT; 42, *Bessborough Gardens, S.W., March 16, 1872.*—*D. Pratt, Secretary; 333, Mile End Road, E., January 18, 1875.*

[It is always unpleasant to have incurred the necessity of such a correction as this; but the unpleasantness in the present instance is abundantly compensated by the gratification I feel in performing an act of obvious justice in placing the Eastern Entomological Society in its right position. It is also with feelings of sincere admiration that I have read, and now publish, Professor Fawcett's kind and characteristic letter.—*Edward Newman.*]

Leucophasia Sinapis (Entom. viii. 21).—My friend Edward Newman, having requested me to reply to Mr. Mosley's question about this species, I may say that the female is generally rather smaller than the male; the anterior wings are more rounded at the apex, and the dusky spot is obsolete or altogether wanting. In the northern parts of Europe the individuals of the autumnal brood only differ from the vernal ones in being rather smaller, but in the southern parts of Europe they differ so much from the spring brood that they were formerly considered by many entomologists to be a distinct species. The ground colour of the wings is pure white, and the male has a circular black spot at the apex of the anterior wings, which does not extend to the margin; the under surface of all the wings is pure white, but in some individuals there are a few very faint marks. This variety occurs in the New Forest, and also in Tilgate Forest. I have never seen a British female, but I have Sicilian specimens, given to me by M. Bellier de la Chavignerie, which are pure white on both surfaces, without any markings.—*Henry Doubleday; Epping, January 14, 1875.*

Cucullia Scrophulariæ (Entom. viii. 19).—Mr. Mosley states that he took this species at Whittlesea. It is extremely rare in this country, and I only know one person who has met with the larvæ, which feed on *Scrophularia nodosa*. Those found upon *Scrophularia aquatica* are *S. Verbasci*. Is

Mr. Mosley quite sure that his insect is the true *C. Scrophulariæ*, which closely resembles *C. Lychnitis*, but is very different from *C. Verbasci*?—*Henry Doubleday; Epping, January 14, 1875.*

Arctia Isabella.—An American friend sent me a lot of *Arctia Isabella* larvæ over from Illinois. They seem to have borne their journey remarkably well, for they were alive and in pretty good health on arrival, after a journey of about a fortnight through the post.—*J. C. Wassermann.*

Note on Eupithecia Knautiata, mihî.—

"I understand thy kisses, and thou mine; and that's a feeling disputation."—SHAKESPEARE.

At page 290, vol. vii., of the 'Entomologist,' Mr. Crewe says he has read with "considerable astonishment" my note on an *Eupithecia* I have called *Knautiata*, and is wholly at a loss to know by what process of reasoning I have arrived at my conclusions; and that he has had the Bolton insect from the egg up to the moth, and, after careful consideration, he is convinced that it is nothing but *E. minutata*.

In reply to all this, first, I ask him to re-read my note without any "considerable astonishment," and then compare my description of its larva with his own description of the larva of *E. minutata*, as copied into Newman's beautiful 'British Moths,' p. 137, by his permission, and if he is not considerably astonished at the great difference in the descriptions, and if he can then make them identical, I shall read *his* report with *considerable surprise*; secondly, I arrived at my conclusions, as I usually do in natural history, from facts, not *reasonings*. I am not a speculative naturalist, and in this case I personally ascertained that this larva fed on *Knautia arvensis* alone, at Bolton, and of course knew, as well as Mr. Crewe, that *E. minutata* fed on heath. I then went ninety miles (to North Lancashire), where I knew *Knautia arvensis* grew on a fell amongst heather, failing to find a pug larva on the *Knautia*, where plenty of *Minutata* were feeding on the ling. I went pike fishing, on Eastwaite Lake, next day; I walked some twenty-five miles over the fells to Moss End, Witherslack, where I knew plenty of *Knautia* grew on the moss amongst fine heather;—no results. Proceeding to Grange-in-Cartmel I got the last train for the South, and got home after midnight. Not satisfied, I went to

Formby Moss, where I knew this plant grew in profusion on one ride (though it does not appear in the 'Liverpool Flora,' recently issued): here I examined every flower of the *Knautia* without seeing a pug larva upon them; and if I did not base my conclusions on facts positive or negative, it may case Mr. Crewe's mind to think other of your readers may draw different conclusions from the following "process of reasoning:"—*Knautiata* feeds on *Knautia arvensis* at Bull Hill, where no heath grows, and *Minutata* feeds on heath at Hawkshead, at Witherslack, and at Formby Moss, where plenty of *K. arvensis* grows amongst the heath, but never once touches the Bull Hill food of *Knautiata*, when it can get heather, otherwise the *Knautia* feeder is a new species; and since *Minutata* has a pink larva, and this has not, so I assert *E. Knautiata* is distinct from *Minutata*; or, reasoning another way (but, as I said before, I am no *reasoner*). Mr. Crewe says of *Minutata* larva (see 'Zoologist,' p. 8174):—

1. "It is stout."
2. "It is thick."
3. "It is stumpy."
4. "Its ground colour is dull pink, or flesh-tint."
5. It has a series of dusky Y-shaped dorsal spots.
6. Each dorsal segment (whatever that may mean) is studded with four yellowish tubercles.
7. The spiracular line is yellowish.
8. The head is dusky olive.
9. The belly is dusky, or pinkish white.
10. It feeds upon the flowers of the common ling (*Calluna vulgaris*).

And, as I am quite willing to let my species *Knautiata* stand or fall, on the description I have published (*Entom.* vii. p. 256), against Mr. Crewe's description of the larva of *E. minutata*, as given in Newman's 'British Moths' (p. 137), let us see how they agree, and leave your readers to decide between us. I say of *E. Knautiata* larva:—

- 1st. When young, slender, cylindrical. Not "short."
- 2nd. Rather stout, attenuate to both extremities. Not "thick."
- 3rd. Much appressed in the central segments. Not "stumpy."
- 4th. Varies from French-white, pale straw-colour, ashy

gray, light pea-green, faint purplish and peachy grounds, and dirty dim colours of various shades, &c. Not "pink, or flesh-tint."

5th. On the central segments there is a well-defined spade-shaped mark, &c. Not a "Y-shaped mark."

6th. I fail to find that each dorsal segment has four yellowish tubercles.

7th. Spiracular line wavy, spiracles dark, with a distinct light ring round each. Not "yellowish."

8th. Head very small, horn-like; corslet small, striate, &c.

9th. Under side light, inclined to ashy green. Not "pinkish white."

10th. It feeds exclusively on *Knautia arvensis*. Not on "ling."

Does Mr. Crewe like the reasons, now some of them are put before him? But, as I said before, I am not a speculative naturalist, and have no particular process of reasoning: I am guided by facts alone; hence I am so little understood by people who sit at home and speculate, whilst I am burning oil on the moss, the moor, or upon the mountain; or they at best go out for a few hours in the sunshine, twiddling into an umbrella, or sit twaddling about the dreadful havoc ichneumons make with their larvæ; whereas, I take it, the death-rate amongst the few larvæ they can hope to beat off in the day-time is mostly caused by the injury they receive as they fall, or they are the sickly larvæ which could not hide away until feeding time.

The tone of the second note (Entom. vii. 291) is such as to preclude a lengthened reply from me. I will, however, show how utterly its logic fails when applied to both notes. In one case Mr. Crewe makes a *Knautia*-feeding species a heath-eater, though its food belongs to the natural order *Dipsacæ*,—three or four natural orders removed from the natural order "*Ericacæ*," on which his heath-feeder lives,—*yet he doubts the possibility* of the other species eating the very next plant in the same genus to the one he, and I, have been told it feeds upon on the Continent. I recently saw a cabinet, twenty miles from here, which requires more drawers to contain the pugs therein than would accommodate all Mr. Crewe's British *Geometrinæ*, pugs included; and yet, forsooth, we, who breed pugs by the hundred,—shall I, for

accuracy, say by the thousand, and keep from forty to fifty as our series in our cabinets,—are not to know a species when we see it, but are to send “positive, ocular demonstrative proof” to people who commenced a study where we almost left off. Grant this claim, and by a parity of reasoning I must have “positive, ocular demonstrative proof” that Mr. Crewe went out in the carriage of his friend, and beat *half a mile* of a *rare* plant, where it was *abundant, unsuccessfully!* Where, on his own rule, is the “POSITIVE, OCULAR DEMONSTRATIVE PROOF” that he was ever there at all? He has my word for what I said,—*he does not believe me; I have his word,—am I to believe him?* But I am no logician. Mr. Crewe may, however, sit on which horn he likes,—only on to one he must go; or there is an end to all papers on Natural History,—and so ends our “feeling disputation.”—*C. S. Gregson; Rose Bank, Fletcher Grove, Edge Lane, Liverpool, December 18, 1874.*

Emmelesia unifasciata at West Wickham.—I took a single specimen of *E. unifasciata* at light, at West Wickham, on the 14th of August last (1874). This is, I believe, a new locality for this scarce species, though it has been before recorded from Forest Hill, and lately by Mr. Marshall (*Entom.* vii. 209) from Cheltenham.—*W. A. Forbes; 35, S. Castle Street, Edinburgh.*

Nonagria brevilinea, *Phycis Davisellus*, and *Grapholita grandævana*.—A short time since I forwarded specimens of *Nonagria brevilinea*, *Fenn*, *Phycis Davisellus*, *Newman*, and the supposed *Grapholita grandævana* of *Zeller*, to my friend *Dr. Staudinger*, and have received his remarks upon them. He says:—“*Nonagria brevilinea*, *Fenn*.—I never saw it before; it is a very good species, very distinct from all others known. *Phycis Davisellus*, *Newman*.—This species has now been described four times: it is, without any doubt, *Nephoteryx genistella*, *Duponchel* (vol. x. fig. 278). *Herrich-Schæffer* was the second who described and figured it under the name of *Ulicella* (*Pyr.* fig. 149), from two males, found by the late *Julius Lederer* in *Andalusia*: the originals are now in my collection. Then I reared a single specimen in *Andalusia* from *Ulex*, and, as at that time I did not know much about the *Micro-Lepidoptera*, I sent it to *Professor Zeller*, who said that it might be a new species; so I described

it the third time as *Albilineella* (Stett. e. Z. 1859, p. 223); and Mr. Newman has described it a fourth time as *Davisellus*. The English specimens are a little darker than the southern ones. I have also received it from Montpellier. *Grapholita grandævana*, Zeller.—Doubtless this species, but not a reared specimen. A friend of mine reared it on the sea-coast, near Stettin, in great numbers. The larva feeds on Tussilago, and makes very long, curious tubes in the sand.”—*Henry Doubleday; Epping, January 8, 1875.*

[I confess to a feeling of intense humiliation at receiving this intelligence. Where are our Micro-lepidopterists? The specimens of this insect were posted from one to another in the hope of proving that it had been previously described, and thus superseding my name of *Davisellus*; but, alas, all this energy, all this outlay of postage and packing, culminated in a ludicrous attempt to show that the species was *Albariellus*. My own ignorance was to be expected: I never professed any knowledge of the tribe; and so sent it on its travels immediately I received it, begging for a name. With how little success the result has shown.—*Edward Newman.*]

Heliothis Scutosa.—Having received several lists with *Scutosa* crossed out, I may as well say, before everyone dies out that can give evidence about the captures of *Scutosa*, that four or five such persons, one of the captors included, still live; and the gentleman that took three specimens, at least (and it is singular), lives now at Epping. Well, the history of *Scutosa* I will now narrate, and let sceptics read:—In 1834 or 1835 (not sure) the gentleman that now lives at Epping, Mr. R. R. Rothwell, was at Green Row Academy, on the Solway (now the port of Silloth). He was fond of collecting; and at the midsummer holidays he brought home his boxes to Carlisle, and in them were three *Scutosa* (certain): one my father sent—through Mr. Cooper, now living—to Mr. Heysham to name; he kept it, and thought it was sent to Mr. Curtis. Well, at his death, I got this specimen back; and the Rev. H. Burney has it now. A second specimen my father sent to Mr. Edleston, and it is still in his collection; now in Mr. Sidebotham's hands. There was a specimen left in Mr. Rothwell's collection, which got destroyed after he left home to go abroad. Another specimen, which Mr. Heysham noted as taken on the banks

of the Calden, twenty miles away from Silloth, may also be noted; and another still was taken by my father to the late Mr. Heysham to name; but many insects never came back again,—I can trace four or five specimens. I may further add my father and brother, who went back with Mr. Rothwell to see if any more could be got, still live, and the writer was there, too, and saw the last specimen carried away with the wind and lost to view. Now here we have a vast deal more evidence than many species which pass muster on the faith of a specimen or two.—*J. B. Hodgkinson; 15, Spring Bank, Preston, October 10, 1874.*

Answer to Correspondent.

James Ashby.—Beetles in Tea.—I send herewith some beetles and two or three maggots found in some chests of tea. The entire parcel of a hundred chests, or so, is more or less affected. Although the specimens I send you are dead, there are plenty of living ones to be found. The tea has been in the bonded warehouse three or four years. Do you think the insects have got into the tea since its arrival in this country, or were they imported with it? The tea is very common, in fact, rubbish, which no respectable dealer would buy, and it will probably be destroyed or exported; therefore the lovers of “the cup that cheers, but does not inebriate,” need not be in fear of having a decoction of beetles.

[These beetles are perfectly familiar to entomologists, and are generally known by the name of *Niptus hololeucus*. In the year 1838 I found them abundantly in an old cupboard, at Deptford, in company with sundry and divers boots and shoes that had been laid aside as leaky, and therefore useless. Not knowing the insect, and being desirous of obtaining its name, I took a sample set to the late J. F. Stephens, then the highest authority on beetles, and a gentleman who devoted every Wednesday evening to the enlightenment of his less-informed brethren of the net and beating-stick. Finding it unknown to Mr. Stephens I wrote a paper on my discovery, and read the same at a meeting of the Entomological Club, held at the late Mr. Walton's, calling my new insect *Ptinus holosericeus*. This paper was never published, and had it

been so the proposed name must have given way to the prior name of *Hololeucus*, proposed by M. Falderman. In 1839 the insect appeared in the Appendix to Stephens' 'Manual of British Coleoptera,' p. 433, as under:—

"1581 b. *Ptinus hololeucus*, *Falderman*?—Pale ochreous-red; densely clothed throughout with a pale ochreous, silky down. (L. $1\frac{1}{2}$ —2 lines.) Houses, London: whitethorn hedge, Ryde, 6, but probably introduced."

For further information I am indebted to my kind friend Dr. Power, who now occupies the same position in Coleopterology which Mr. Stephens occupied in 1839, when his Manual was published. The insects in tea differ in some respects from Dr. Power's ample series of *Niptus hololeucus*, by which name the insect is now known, and under which it appears in Mr. Crotch's '*Catalogue of British Coleoptera*:' it is rather larger, and the punctures on the elytra are rather more distinct, especially where the ochreous pubescence is rubbed off, and the insect has become smooth and shining in every part. Dr. Power cannot agree to consider it on this account a second species of *Niptus*, although he thinks some of our modern entomologists would incline to do so, and there is no other *Niptus* in the European list except *Niptus Gonospermi*, which is entirely different. If this tea beetle prove really a different species it is still without a name, and of course requires one. To this information Dr. Power adds the following:—"It so happens that I have had a little experience in this creature. Some years ago my friend Dr. Dupré gave me some meal, which had been sent him to analyse, and it contained an immense number of the insect. The meal was in a bottle with a glass stopper, which I never took out. The insects died, but the next year the bottle contained about fifty similar ones, produced from larvæ identical with those which you have sent me in the tea: each formed a sort of cocoon, and in that underwent its transformations. The third year there were about ten or a dozen, and the fourth year none: they had disappeared altogether. I have no doubt that if the bottle had been opened, so as to admit air, the breed might have been continued." The beetle is now very common in all our houses. It is said to have been introduced into England from Persia *viâ* Turkey. It is as omnivorous as *Dermestes lardarius*, feeding on any vegetable substance,—as tea, meal, linen. I may state—

1. That the grub, or larva, and the beetle, are identical, the latter being the mature or perfect state.

2. That the name is *Niptus hololeucus*; the slight difference between those found in tea and those in meal, or other substances, may possibly arise from a difference of food.

3. It is certainly an imported insect, scarcely known in Britain before 1839, but now thoroughly naturalised.

There is no evidence to show whether it exists in China, so as to get into the tea at its first source; but seeing that it thrives on tea, is already abundant in Britain, and that British individuals have enjoyed the opportunity of founding colonies in the tea-chests that have "been three or four years in bonded warehouses," it seems highly probable that they have done so. Were the beetle known in China as a feeder on tea, or even as a native, it might perhaps fairly be inferred that it originally reached us from that country; but that is not the case.—*Edward Newman.*]

Extracts from the Proceedings of the Entomological Society of London.

November 2, 1874.—Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Deiopëia pulchella.—Mr. Stevens exhibited three specimens of *D. pulchella*, taken at Arundel and Deal, and a *Noctua* from Dover that he had not been able to identify. Prof. Westwood remarked that the late Lieut-Gen. Sir J. B. Hearsey had frequently observed *D. pulchella* to be very destructive in gardens in different parts of India.

Herrich-Schæffer's Collection.—Prof. Westwood remarked that he had recently seen the collection of *Lepidoptera* of Herrich-Schæffer, now in possession of his son Dr. Schæffer, of Ratisbon, but that, unfortunately, they had been so much neglected that the greater part were in the worst condition. The collection of *Tortrices*, formed by the late Herr Fischer v. Röslerstamm, were, however, still in good preservation.

Rare British Lepidoptera.—Mr. Bird exhibited specimens of *Sesia culiciformis*; bred from pupæ obtained at Rowhill Wood, near Bexley. The usual type with the *red* band across the body is not uncommon, but those exhibited had the band yellow. Mr. Bird had bred several this and last

year, and in both years the proportion was almost exactly the same, namely, one yellow to every twenty-five with the red band. *Limacodes asellus*, with pupa-case; bred (for the first time) from pupæ found at Marlow, Bucks, attached to the leaves of the beech. *Nola albulalis*; taken near London. *Nonagria brevilinea*; taken at Horning Fen, Norfolk. Two of the specimens exhibited were without the characteristic short line at the base of the wing. *Pterophorus rhododactylus*, with pupa-case; bred. Mr. Weir exhibited specimens of *Mantis religiosa*, with two of the egg-cases; found by himself at Meran, in the Tyrol, in September last.

Printers' Wooden Letters Perforated.—Mr. M'Lachlan exhibited a printer's wooden letter, such as is used for printing posting-bills, perforated by a species of *Anobium*, and he was informed that the insect was causing serious damage to the printer's stock of these letters. The wood was believed to be pear-tree. He had recommended soaking the letters in a mixture of carbolic acid and water.

[This is a very common occurrence, and an evil very difficult to remove. It is not confined to letters, but extends to, and is infinitely more injurious to, frames and cases (I use printer's phraseology). The genera *Ptinus*, *Ptilinus*, *Niptus*, *Anobium*, *Gibbium*, and *Mezium*,—in other words, beetles of the families *Ptinidæ* and *Anobidæ*,—seem to confine their attention to old and well-seasoned wood, and to require strong measures, whether for prevention or cure. Kyanising is effectual for both purposes, but impossible to apply in small doses; boiling, spirits of turpentine, camphine, and benzole, are effectual for the latter; carbolic acid is useless. I have previously remarked that longicorns (*Cerambycidæ*) attack only living and growing wood, and this also may possibly be the case with *Buprestidæ*. *Lucanus*, *Dorcus*, *Sinodendron* (*Lucanidæ*), devour wood in a dying state, and hasten its decay. *Cetonia*, *Gnorimus*, and *Trichius* (*Cetoniidæ*), eat dead, actually rotten, wood. Of course in all these instances I allude to those beetles in the larval condition. For the *Cerambycidæ* no cure or preventive has yet been found. The *Lucanidæ* and *Cetoniadæ* do us little or, perhaps, no injury; and therefore a remedy is not required.—*Edward Newman.*]

Pselaphidæ and Scydmanidæ from Australia.—Dr. Sharp

communicated "Descriptions of New Genera and Species of Pselaphidæ and Scydmanidæ from Australia and New Zealand." The paper contained descriptions of forty-four new species, three of them belonging to the family Scydmanidæ. Of the forty-one species of Pselaphidæ, twenty-six were from Australia and fifteen from New Zealand, the latter being the first specimens of Pselaphidæ that had, as yet, been obtained from New Zealand. He believed that the islands would prove to be rich in Pselaphidæ, and alluded to the great scientific importance of an accurate knowledge of the New Zealand fauna, and to the special importance of gaining as rapidly as possible a knowledge of the existing Coleoptera, as such knowledge would contribute largely to the solution of many important scientific questions; and, as a large proportion of the species were confined to small areas of distribution, there was great reason to fear they would be easily exterminated, and thus the fauna itself would disappear with the changes caused by colonization and the cultivation of the soil.

Protective Colouring in Pupa.—Mr. Darwin communicated a paper containing remarks by Mrs. Barber, of Griqualand, South Africa, on the colour of the pupa of *Papilio Nireus*, in connection with the surroundings of its place of attachment, the pupa appearing to assume a protective resemblance to the surface to which it is fixed, and suggesting that some photographic influence might be at work. A discussion ensued, in which Prof. Westwood, Mr. M'Lachlan, and others, took part; and Mr. Meldola remarked, in reply to Mr. M'Lachlan, that the action of light upon the sensitive skin of a pupa had no analogy with its action on any known photographic chemical. No known substance retained permanently the colour reflected on it by adjacent objects. Mr. Meldola further observed that there was no difficulty in believing that larvæ might become affected in colour by the colouring matter of the food-plant, since chlorophyll in an unaltered condition had been found in the tissues of green larvæ. Facts of this nature did not, however, exclude the possibility of the action of Natural Selection in such cases, for the property of showing the colour of the tissues through the skin, if of advantage to the species, would be preserved through this agency.

Drawing of a Spider's Nest.—The Secretary read a letter he had received from Mr. Ogier Ward, enclosing a drawing of a spider's nest, with some remarks thereon by Mr. Charles O. Waterhouse. Mr. Ward had found the nest attached to some long grass in a quarry, near Poissy, on the Seine. Mr. Waterhouse, on examination, found it to be nearly filled with sand, but in the centre he found "a dry, rough, flat piece" attached to the base, which, on soaking in water for some hours, he discovered to be filled with a number of minute spiders, measuring one-twelfth of an inch. The granules of sand were held together and to the inner-bag by fine threads of web. He believed the object of the sand was to prevent the case being blown away, but he was not aware to what species the nest appertained.

November 16, 1874.—J. W. Dunning, Esq., M.A., F.L.S., Vice-President, in the chair.

Drawing of a Spider's Nest.—The Rev. O. Pickard Cambridge sent a note on the curious spider's nest exhibited at the last meeting. It was unknown to him; and had it not been for a remark in Mr. Ward's letter, implying that the nest he found belonged to a symmetrical (geometrical) web, he should have conjectured that it was the work of an *Agelena*. If, however, the nest was appurtenant to a symmetrical web it must belong to a spider of the family *Epëirides*. He did not think the sand in the nest was at all designed as ballast, but as a protection against the heat of the sun (sand being a non-conductor), and also against parasites. Mr. Smith remarked that the mud-coating of the nest of *Agelena brunnea* did not preserve that species from parasites, as he had often bred a species of *Pezomachus* from the nests, and he believed, in those instances, the spider's eggs had been attacked before the mud-coating was added.

Rare British Coleoptera.—Mr. Champion exhibited some rare species of British Coleoptera, namely:—*Apion Ryei*, taken by Mr. Lilley in Shetland; *Abdera triguttata*, from Avienda, Inverness-shire; *Limexylon navale*, taken by Messrs. Sidebotham and Chappell at Dunham Park, Manchester; *Athous subfuscus*, taken by the Rev. T. Blackburn in Shetland; and *Apion sanguineum* and *Silvanus similis* from Esher.

THE ENTOMOLOGIST.

No. 140.]

MARCH, MDCCCLXXV.

[PRICE 6d.

Life-histories of Sawflies. Translated from the Dutch of
Dr. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from p. 28.)

NEMATUS ABBREVIATUS, *Hart.*

Imago: *Hartig, Blatt-und-Holzwespen*, p. 205, No. 38.

Larva hitherto undescribed.

Nematus fusco-niger, crassus, abdomine contracto, prothorace supra, trochanteribus, femorum apice, tibiis tarsisque anterioribus luteis, tibiis tarsisque posticis variegatis.

The genus *Nematus* of Jurine, which was, in fact, first precisely defined by *Hartig*, is, like all the divisions of the last-named author, made to depend principally on characters derived from the course of the nervures of the wings, and the genus so defined contains groups differing considerably in the structure of the body: some are slender, and more or less attenuated; and to this group belong *N. Salicis* and *N. septentrionalis*, and similar species, the larvæ of which have twenty legs, seldom, however, making any use of the last pair, and have the habit of almost incessantly alternately raising and depressing the abdomen. Others, to which our species *Abbreviatus* belongs, are short and compressed in form, and apparently proceed from larvæ having only eighteen legs. If this obtained as a rule, which I am far from being able to assert, it would, I think, tend to prove that divisions, depending exclusively on differences in neuration, are artificial and not natural; it would, however, be rash to attach too much weight to an observation made upon the metamorphosis of a single species.

The imago of *Nematus abbreviatus* is seldom met with. It may, of course, have been overlooked as belonging to the inconspicuous mass of sawflies with white, yellow, or reddish knees and anterior tibiæ, found nearly everywhere; but it is also possible that the insect is really scarce, and I admit that I am the more inclined to adopt this view when I call to mind the difficulty I had in rearing only one larva out of thirty which I possessed: this difficulty must also plead my excuse should a remark be made on the incompleteness of this life-history. In the beginning of May I found every year some green larvæ, resembling that represented on our tenth plate, feeding on the leaves of two pear-trees in my garden. At a very early stage of their existence they are found to have bitten round holes out of the leaves, free both of the midrib and of the margin of the leaf; they also rest in a somewhat curved position on the edge of the hole they have eaten out, so that they are only to be discovered by a sharp eye.

I have never found larvæ smaller than that shown at fig. 1, so that in this case also it appears very difficult to discover the first and very earliest stage of the animal's existence. On the petiole, however, of the leaves on which, or rather in which, such young larvæ lived, I almost always found a scar (see fig. 2), which appeared to me to indicate the place in which the egg had been concealed from which the little larva had proceeded. It appears that the larvæ move from place to place,—that is to say, they do not confine themselves to merely enlarging the hole in the leaf they at first bit out, for many holes are found, of the size of a silver penny, without inhabitant, and also leaves having two or three holes. When the larva has attained the size shown at fig. 3 it feeds indifferently from the margin or other part of the leaf, and, having hitherto always assumed a position with the back incurved, it now places itself as nearly as possible in a right line, so that even sometimes the last two or three segments project without any support. Larvæ which I had found on the 8th of May, of the size represented at fig. 1, had, three weeks later, attained their full size, as shown at fig. 4.

The green colour of the larva in its early stages is somewhat of a yellow tint, afterwards becoming a grayish green on the back, resembling the colour sometimes observed on willow leaves, the ventral surface and the legs being paler, and of a

tint approaching to yellow. The head is of a faint brown tint, or very pale *feuille-morte*. The body is somewhat slender, smooth, devoid of hair, and having two rather thick folds on each segment reaching to the row of stigmata; of these the first only is conspicuous, being comparatively large and bordered with black, the others being much smaller and having white borders. The mandibles are brown, and the eyes, which are small, are placed in round black spots. The thoracic legs are rather long and of a green colour; there are, in addition, only six pairs of abdominal legs, and the last segment is entirely destitute of the usual pair of anal legs. The tail-end is somewhat pointed. This species does not wave about the tail, and there is no trace whatever of extensible glands between the legs.

I left my larvæ out of doors until the end of May, as I had found by experience that the twigs of the pear, although kept in water, very soon wither; I then placed them in large confectioner's glasses, which were filled up to a certain height with damp mould. The larvæ, one after another, let themselves fall from the leaves and crept into the mould. I examined the glasses from time to time all through the summer, looking to see if I could perceive any signs of life, but in vain; so that by October I gave up watching, hoping to find the imago on the wing in the spring. However, the month of May arrived and I had not seen an imago. I now removed all the old pear leaves, and under them I found a female imago, dead; it had probably kept concealed among the leaves ever since its emergence, and so I had failed to discover it. I now turned all the mould out of the glass, a little at a time, hoping still that I might find some pupæ or nearly-developed imagos, but in vain. I found nothing, and was obliged to content myself with my solitary specimen: this was a female, and as the individuals of this species, taken by Mr. G. A. Six and myself in April and May, were also females, I am unable to give a description of the male. It seems that Hartig, who says of the present species "fliegt mitte April in Garten," had also observed none but females. It may be remembered that in the case of other species of sawflies, even including some of the commoner sorts, the males appear to be wanting, from which circumstance Professor Siebold supposes that in the case of these insects

parthenogenesis occurs the same as with some species of gallflies.

The imago is only from four to five millimetres long, and expands to one centimetre. The whole body is shining black. The head is broad and but slightly projecting, and, together with the thorax, is covered with very fine, silky pubescence. The eyes are widely separated; they are of an elliptical shape and moderately projecting, and are of a bronzy tint. The antennæ are black; they are as long as the abdomen, and are entirely similar in form to those of other species of *Nematus*,—for example, *Vallator*. The external angles of the prothorax towards the insertion of the wings, and the tegulæ, are of a reddish white. The anterior legs, from just above the knee, are of the same tint, which becomes somewhat darker towards the tarsi; the intermediate and posterior legs are also reddish at the knee, but the femora and tarsi are of a faded gray; all the apophyses and the tips of the coxæ are likewise of the same reddish tint. There is nothing remarkable about the transparent, more or less iridescent, wings; the nervures are of a faded earthy black, with the exception of the larger nervures at the insertion of the wing, where they are of a sordid white.

List of the Best Insects taken at Whittlesford during the past Season. By A. THURNALL, Esq.

Chærocampa porcellus.—Several flying on sweet-william flowers, and the larvæ on Galium. This species seems to be much more common here than *C. Elpenor*.

Sesia ichneumoniformis.—Three flying in sunshine; one depositing its eggs at the roots of birds'-foot trefoil.

Liparis chrysorrhæa.—I found a "nest" of the larvæ on whitethorn, from which I bred a large number of insects. I have never taken it here before.

Ennomos fuscantaria.—Two pupæ and two larvæ; all spun up on the leaves of ash. They hatched in due time, two males and two females.

Geometra papilionaria.—Three specimens flying in woods.

Corycia laminata.—Four specimens flying in woods.

Scotosia certata.—One flying over barberry flowers.

Anticlea berberata.—Six or eight flying over barberry flowers.

Pericallia syringaria.—A few flying in the evening.

Eupithecia subfulvata.—Larva very common on milfoil.

Anticlea sinuata.—One moth and six larvæ, which have all changed to healthy pupæ. This is an easy larva to find and rear.

A. rubidata.—Three at light in June.

Coremia quadrifasciaria.—One female at light; laid a few eggs.

Aventia flexula.—Two flying in the evening.

Platypteryx unguicula.—A few larvæ and imagos beaten from beech.

Notodonta dodonæa.—A larva on an oak trunk, which died before turning.

Acronycta Ligustri.—Several pupæ in moss on oak trunks, and larvæ beaten off privet hedges.

Nonagria geminipuncta.—Nineteen pupæ in reed stems, from which I obtained twelve or thirteen moths. This is a new locality, I believe.

Apamea unanimitis.—Several larvæ in March under bark.

Agrotis puta.—Very common at sugar in August.

Xylina semibrunnea.—About twenty-three at ivy bloom.

Eremobia oehroleuca.—A few on scabious bloom.

Toxocampa pastinum.—Common in the corner of one field.

Aglossa cuprealis.—Three specimens at rest.

Papilio Machaon.—Common at Wicken Fen in July.

A. THURNALL.

Whittlesford, Cambridgeshire,
January 25, 1875.

Entomological Notes, Captures, &c.

Chærocampa Celerio and *Cucullia Gnaphalii* at Hayward's Heath.—I am but a beginner in Entomology, but as you seem to value records of scarce insects you will perhaps like to know of the occurrence of two rare insects in this neighbourhood. In 1869 a specimen of *Chærocampa Celerio* was brought to me, picked up in a lane here, and fresh from the chrysalis. I grieve to say a mouse devoured it shortly

afterwards, though there is a melancholy revenge in the thought that my cat devoured the mouse that same day. I did not take the care of it I ought to have done, as I was then engaged with Coleoptera, and did not know the prize I had in my possession. Since then I have turned my attention to Macro-Lepidoptera. In the summer of 1872 I found, in a wood infested with *Cucullia Asteris*, a caterpillar, which I believed to be the larva of *Cucullia Gnaphalii*; unfortunately it came to an untimely end. A like fate befel another specimen of the same species, which I found in the same wood in 1873. However, in 1874 I found the perfect imago at rest on palings not very far distant, and a few evenings afterwards took a second specimen flying in the same wood where I had previously found the larvæ. These two specimens are now in my collection.—[Rev.] *Thomas E. Crallan; Hayward's Heath, Sussex, February 5, 1875.*

Deiopeia pulchella near Scarborough.—It may be interesting to some of the readers of the 'Entomologist' to hear that I took a fine specimen of *Deiopeia pulchella*, near Scarborough, in June, 1870.—*John M. Benson; 5, Beech Grove Terrace, Leeds, January 6, 1875.*

Cucullia Scrophulariæ (Entom. viii. 37).—In reply to Mr. Doubleday, I may say that I am by no means confident that the species I took at Whittlesea belongs to this; and it appears I forgot to insert a note of interrogation after it in my list. I found the larvæ feeding on figwort (*Verbascum**) in the latter part of June, and thought they must either be *Scrophulariæ* or *Verbasci*. I was not aware that the former was such a rare insect in this country. They are now in the pupa state, and their appearance will decide. Should I have made a mistake I will correct it then.—*S. L. Mosley; Edwinstowe, February 15, 1875.*

Leucophasia Sinapis (Entom. viii. 37).—I thank Mr. Doubleday for his information about this species, but it seems a matter of opinion, with very few facts to support it. I think those who live in localities for *Sinapis* would do well to investigate the matter. The white specimens that have come under my notice have generally been larger than the black-tipped ones, and especially broader in the fore wing.—*Id.*

* The figwort is *Scrophularia*; the mullein, *Verbascum*; hence, perhaps, the confusion of names.—*Edward Newman.*

Sarothripus Revayanus at Killarney.—Have I told you of the capture of a single specimen of *S. Revayanus* at Killarney, or rather close to Carra Lake, in Kerry, last August twelvemonths? It is unique as Irish.—*F. I. Battersby; Cromlyn, Rathowen, January 2, 1875.*

Roslerstammia pronubella at Salcombe.—On looking over the old 'Annuals' I was able to identify a very pretty little moth I took at Salcombe in June 1873,—*Roslerstammia pronubella*, figured in the frontispiece for 1855.—*G. C. Bignell; 6, Clarence Place, Stonehouse, Plymouth, January 23, 1875.*

A Coleophora New to Britain: Coleophora Tripoliella (Hodgkinson).—Some three years ago I took several specimens of a *Coleophora* on the salt marshes near Fleetwood. It came so near *C. Virgaurella* in appearance that it was not safe to pronounce decidedly upon it: still I could see it was a more robust insect than *Virgaurella*; when very fine it has a more smooth and silvery appearance as well. Last October I found a number of the larvæ and cases on *Aster Tripolium*: the cases are much larger and darker than the cases of *Virgaurella*. I have sent cases of both to Mr. Stainton, and he thinks my name a very suitable one.—*J. B. Hodgkinson.*

Description of the Larva of Noctua baja.—Eggs of this species were obtained from a specimen captured at Sherwood Forest in August, 1872. They hatched on the 3rd of the following month, and at once began feeding with avidity on wild rose. At the end of the month they were one-third of an inch in length, and by the middle of December had attained to five-eighths of an inch: they were still feeding, and indeed continued to do so throughout the winter, taking readily to bramble, dock, and, in fact, almost anything when rose was no longer to be obtained. They began to "go down" about the middle of April, though some at this date were only half-grown. When full-grown the larva may be described thus:—Length about an inch and three-eighths, and rather plump in proportion; head slightly retractile, globular and shining, rather narrower than the 2nd, and very much narrower than the 3rd segment; body cylindrical, rather obese, and slightly attenuated near and towards the head; the segmental divisions are distinct, and the skin smooth and soft. Ground colour dirty ochreous-brown,

tinged with red, in some specimens the red being much stronger than in others, especially on the dorsal surface; head pale brown, with a conspicuous dark brown mark on each lobe in front. A narrow yellowish line, edged with smoke-colour, forms the medio-dorsal line; subdorsal lines yellowish; these and the medio-dorsal line are very much interrupted, and very conspicuous only on the 2nd segment, where they are much broader and nearly white; there are no perceptible spiracular lines; the subdorsal lines are surmounted on each segment, from the 4th to the 12th, by a small yellow triangular mark, the apex of each pointing towards the head, and these marks are bordered above with rather broad smoky marks, which appear to meet on the medio-dorsal line, each pair forming a V-shaped mark, the apex pointing backwards; those on the 11th and 12th segments, however, are much larger and blacker than the others, and take the character of distinct marks, almost obliterating the yellow spots beneath them; a broad, dull, reddish band extends along the spiracular region, and the space between this and the subdorsal line is variegated with smoke-colour; spiracles and trapezoidal dots black. Ventral surface and claspers dirty grayish ochreous and semi-translucent; legs shining, pale pinkish brown.—*Geo. T. Porritt; Huddersfield.*

Description of the Larva of Notodonta cucullina.—On the 7th of August last I received from Mr. F. D. Wheeler, of Norwich, seven or eight larvæ of this species, and on the following day took down a description as follows:—Length about an inch and a quarter, and of average bulk in proportion; the front of the head flat, but the sides of the lobes rounded; it is broader than the 2nd segment, and slightly notched on the crown. Body irregularly cylindrical; of the segments, the 2nd is narrowest, and from it they gradually widen to the 6th, from which, to the 12th, they are of about equal width, but the 13th is rather sharply attenuated to the anal extremity. On the 12th segment is a prominent dorsal hump, and a smaller double hump on the 5th, 6th, 7th, 8th, and 9th, these humps being most conspicuous when the larva is at rest. Skin soft and puckered, and the segmental folds deeply marked. Ground colour grayish white, tinged with green; the head very pale yellowish brown, with chocolate-brown streak on each side and at some distance from the median suture; there are several similarly-coloured marks

about the mouth and on the sides of the lobes. Medio-dorsal stripe dull, dark green; it is narrow from the 6th to the anal segment, but takes the form of a gradually-widening broad stripe from the 2nd to the 8th, where it is widest; it is intersected in the centre of the 2nd and 3rd with a fine purplish line; subdorsal lines of the same colour as, but fainter than, the medio-dorsal, and bordered outside with a pale yellow stripe; there are no perceptible spiracular lines. The hump on the 12th segment is dark purplish brown, and a number of black horny spots form a sort of collar round the 2nd segment, just behind the head; segmental divisions yellow; trapezoidal dots on the anterior segments—on the broad part of the medio-dorsal stripe—very black and distinct, but not noticeable on the others; spiracles large and distinct, pinkish, surrounded with black; ventral surface yellowish green, without markings; legs and claspers pinkish brown. Rests with the front and anal segments raised and thrown backwards,—the usual *Notodonta* attitude.—*Geo. T. Porritt; Huddersfield.*

Explanation of the Phylloxera Plague.—In a paper read before the Paris Société d'Acclimatation, Dr. Turrel suggests that the rapid spread of the *Phylloxera Vastatrix* in France is due to the scarcity of small birds in that country. Forty years ago, he says, linnets, tits, &c., were numerous in Provence, and in the autumn they could be seen posted on the vine branches, carrying on a vigorous search after the insects, and larvæ and eggs of insects, concealed in the cracks of the stem and leaves of the plant. Since the commencement of the present century, however, it is easy to perceive that the destruction of small birds has been carried on more and more generally; and that, concurrently with this war of extermination against the feathered tribes, the numbers of destructive insects have increased at an alarming rate. Dr. Turrel thinks that, though it cannot be absolutely maintained, that the oidium and the *Phylloxera*,—the two latest forms of vine disease (the one a vegetable, the other an insect parasite),—owe their frightful extension to the scarcity of small birds; yet it is unquestionable that a plant like the vine, weakened by the attacks of insects, is less in a condition to withstand the ravages of parasites; and that, deprived of its feathered protectors, and left to the successive and unchecked onslaught

of the vine-grub and other normal enemies, it has been predisposed to succumb before the ravages of its new enemies.

[Dr. Turrel's paper is thus reported in 'Nature,' of Nov. 19. I could have desired nothing better than to know that the rapid increase of Phylloxera is due to the destruction of small birds; but Dr. Turrel only suggests this: he does not kill a linnet and find a hundred thousand specimens of Phylloxera in what is commonly called its "crop;" nor does he show how the linnet is to get at the roots of the vine where the Phylloxera is at work. A month previously I observed the fumes of carbolic acid were announced as an infallible cure of Phylloxera, but it was not said how they were to be applied. Before crude hypotheses are given to the public, with the sanction or through the instrumentality of Science, the subject should be thought over, and the feasibility of the cure considered. I cannot say that linnets *do not* feed on Phylloxera; but I consider it extremely improbable. Again, I am quite unable to show that carbolic acid is not efficacious; but I think it is obvious that the infected roots must be exposed to its fumes, and when exposed it would be much easier to burn them. Nothing would delight me more than to arrest the insane desire to exterminate small birds; but we must be careful not to ground our protection on hypotheses obviously untenable; and I think, moreover, it is injudicious (to say the least) to place an insect and a fungus in the same category, as possibly to be kept in check by birds.—*E. Newman.*]

Fossil Insects in Canada.—Where the excavations for laying the water-pipes are being made, near Rideau Hall, on the grounds of the Governor-General of Canada, the workmen have made a strange geological discovery. It is a stratum of fossil-rock several feet thick, containing the most accurate and beautiful petrified winged insects: there are some like butterflies, with the delicate fibre of the wings in a most perfect state of preservation.—'Times.'

Answer to Correspondent.

Charles Clifton.—*Sugaring for Moths.*—Can you tell me, in the 'Entomologist,' what is the time for going out to look at your sugar for moths? as I was in the country the other day and went out at eight, nine and ten o'clock, but was

not successful. Ought I to have tried later? I then thought it was a bad night, and gave up.

[I believe there is no stated time. It is usual to sugar a great number of trees, and then take the round of them in regular succession every half hour, beginning at dusk; but I cannot boast of much experience in this matter, not liking night-work.—*Edward Newman.*]

Extracts from the Proceedings of the Entomological Society of London.

DECEMBER 7, 1874, and JANUARY 4, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

British Oak-galls.—Mr. E. A. Fitch exhibited some oak-galls of *Dryocosmus cerriphilus*, *Gir.*, *Aphilothrix globuli*, *Hart.*, *A. albopunctata*, *Schl.*, and *A. callidoma*, *Hart.*; together with three curious bud-galls, unknown, from Rayleigh, Essex.

Hemiptera of the Mediterranean.—Mr. Champion exhibited an interesting collection of Hemiptera, brought from the Mediterranean by Mr. J. J. Walker. Amongst them were *Trigonosoma Desfontainei*, from Cagliari; *Phyllomorpha laciniata*, from Gibraltar; and *Prionolytus Helferli*, from Tangier.

Beetles in Tea.—Prof. Westwood forwarded a letter he had received from Mr. J. F. M. Harris Stone, accompanying a sample of tea imported from Shanghai, infested by a small beetle, which proved to be *Niptus hololeucus*, an insect belonging to a genus, the species of which feed indifferently on dried vegetable as well as animal matter.

[A full account of this beetle, so far as known, appeared in the February 'Entomologist' (Entom. viii. 43).—*E. Newman.*]

Phylloxera Vastatrix in Switzerland.—Prof. Westwood also communicated a letter from Prof. Forel, of Lausanne, stating that the *Phylloxera Vastatrix* had made its appearance among some vines at Pregny, in the canton of Geneva, which had been introduced from England into the graperies of Baron Rothschild, and that the *Phylloxera* had been

discovered in two of his greenhouses, among vines planted in 1869, sufficiently distant from each other to render it improbable that the insect had been communicated one from the other; and he therefore concluded that the disease had been introduced in 1869 from the graperies in England. The vines so attacked had, however, not succumbed to the disease, but were simply rather weaker than those which had not been attacked. He was, therefore, anxious to ascertain whether the vines in the English graperies were less influenced than those out of doors; but none of the members present were aware of the occurrence of the insect in England out of doors, but that it had hitherto appeared in greenhouses only.

Synonymical Notes on Longicorn Coleoptera.—Mr. C. O. Waterhouse communicated the following:—

“Fam. PRIONIDÆ.

Acanthophorus Palinii, Hope.—This species was placed by Mr. Adam White, with doubt, as *Acanthophorus Yolofus* of Dalman, and in Gemminger and Harold's 'Catalogue of Coleoptera' they are placed together without even a doubt. There being, however, in the British Museum a species of *Tithoës* (to which genus *A. Palinii* must now be referred), which I believed to be the true *A. Palinii*, I referred to Prof. Westwood, who kindly sent to me a sketch of Hope's type in the Oxford Museum, confirming my determination, and making it certain that *A. Yolofus* and *A. Palinii* are quite distinct species. *Tithoës Palinii* resembles *T. confinis*, but is shorter; the eyes are much approximated above; the thorax is broadest in front, with the anterior spine strong (much longer than the lateral spine), and very much recurved; the elytra are marked much in the same way, but the apex of each elytron is less rounded, and there is a small tooth at the sutural angle. Length 1 inch 10 lines; width 8 lines. Habitat, Sierra Leone.

Acanthophorus capensis, White.—This species is correctly placed in that genus, and does not belong to *Tithoës*, as placed in Gemminger's Catalogue.

Mallodon Gnatho, White.—This insect must be placed in Lacordaire's genus *Nothopleurus* (Gen. d. Col. viii. p. 125). As nothing is said by Lacordaire about the form of the mandibles in the description of *N. ebeninus*, it will probably

prove to be a species distinct from *M. Gnatho*, which has a remarkably large triangular tooth on the upper edge at the base of each mandible. The thorax of *M. Gnatho* has parallel sides.

Tragosoma subcoriaceum, Hope, female, 1831.—The male of this insect was described in 1867 by Mr. Pascoe, under the name *Sarmyds antennatus*.

Fam. CERAMBYCIDÆ.

Eburophora, White (*Eburigera*, Gemm. and Harold, Cat. p. 2899).—This genus should be placed next to *Sophron*, *Newm.*, and *Sophron eburatus*, *Pascoe*, should be transferred to it.

Trichoxys flexus, Chev., 1860 = *Clytus melanotelus*, *White*, 1855. (Types compared.)

Anthoboscus figuratus, *Pascoe*, 1869 = *Clytanthus marginalis*, *Chev.*, 1863. (Types compared.)

Anthoboscus leucothyreus, *Pascoe*, 1869 = *Clytanthus austerus*, *Chev.*, 1863. (Types compared.)

Clytanthus oppositus, *Chev.*, 1863 = *Clytus signaticollis*, *Lap. & Gory*, but with the pubescence rubbed off the abdomen; it is not a synonym of *C. japonicus*, as suggested by Mr. Bates, *Ann. & Mag. Nat. Hist.*, 1873.

Clytus Protogenes, *Newman*.—This is not a synonym of *Chlorophorus annularis*, as placed in *Gemminger's Catalogue*, but belongs to the genus *Acrocyrta*, with the third and fourth antennal joints (and fifth slightly) spined; it is very closely allied to *Acrocyrta strangaloides* of *Pascoe*.

Xylotrechus famelicus, *Pascoe*.—This species, for which Mr. *Pascoe* had no locality, is from Borneo.

Clytus dominula, *White*.—Is a *Xylotrechus*, closely allied to *C. Grayi*, *White*, and is not a *Rhaphuma*, as placed by *Chevolat*.

Clytus subcruciatus, *White*.—Is a *Calanthemis*.

Clytus Phidias, *Newman*.—Is not *Xylotrechus australis*, *Lap. & Gory*, as placed in *Gemminger's Catalogue*, but it is closely allied.

Clytus Mouhotii, *Pascoe*, 1869 = *Clytus semiluctuosus*, *White*, 1855.

Eriphus leucogrammus, *White* = *Pæciloderma lineolatum*, *White*, and belongs rather to this latter genus."

Varieties of Diloba cæruleocephala and Hibernia defoliaria.—Mr. Stevens exhibited varieties of *Diloba cæruleocephala* and *Hibernia defoliaria*, bred from larvæ taken near Brighton.

Indian Hymenoptera.—Mr. Smith exhibited a fine collection of Hymenopterous insects, forwarded from Calcutta by Mr. Rothuey. Amongst the Formicidæ were *Polyrachis bicolor* and *Dorylus longicornis*. Amongst the Fossores were *Mutilla sexmaculata*, *Pompilus dorsalis*, *Sphex sericeus*, *Chlorion lobatum*, *Ampulex compressa*, *Ammophila nigripes*, *Trirogma cærulea*, *Larrada aurulenta*, and *Bembex lunata*. Amongst the Vespidæ were *Eumenes petiolata*, *E. conica*, *E. flavopicta*, *Rhynchium transversum*, *R. argentatum*, and *Vespa cincta*. The specimen of *Rhynchium transversum* had been attacked by *Stylops*. There were also (of Apidæ) two new species of *Nomia*—one of them with capitata antennæ—and a new species of *Nomada*. Also several small, undescribed species of bees of the genera *Prosopis*, *Halictus*, and *Ceratina*; and a fine series of *Stelis carbonaria*. The whole were in beautiful condition.

The Winter Moth attracted by Gas-lamps.—Mr. M'Lachlan stated that one evening, about thirty-six hours after the breaking up of the recent intense frost, he had noticed the December moth (*Cheimatobia brumata*) attracted in great numbers to the gas-lamps in the neighbourhood of Lewisham, and that in some instances there were as many as a dozen on one lamp. Mr. Boyd mentioned a case that had come under his observation of that insect having been picked up, apparently dead, on the snow, and that it had revived on being placed in a warm room. Mr. Butler also noticed a similar fact in regard to a specimen of *Pieris Rapæ*. Mr. Jenner Weir made some remarks on the importance of ascertaining whether the insects noticed by Mr. M'Lachlan were hibernated specimens, or whether they had been newly hatched when he observed them.

Larvæ of a Mantis.—The Secretary exhibited a bottle containing a number of specimens of a Mantis, about half an inch long, which had been forwarded to him from Sarawak by M. de Crespigny, who was under the impression that they were perfect insects; but on examination they appeared to be only young larvæ. He observed them crossing the table

at which he was sitting, and at first sight they had the appearance of a column of ants.

JANUARY 25, 1875 (ANNIVERSARY MEETING).

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

[After the usual review of the state of the Society, and obituary notices of Prof. Zetterstedt, Dr. Herrich-Schæffer, George Robert Crotch, Francis Walker, Dr. Antoine Dours, and John Traherne Moggridge, the President gave the following lucid and instructive summary of the progress of Economic Entomology on the Continent of Europe, in the United States, and in England, alluding to the several subjects of "Phylloxera of the Vine," "Colorado Potato-beetle," "Bee-Keeping," "Economy of White Ants," "Economy of Stingless Bees," "Habits of Social Hymenoptera," and "Fertilization of Flowers by Insects," as follows:—]

The Phylloxera of the Vine.—The ravages of the Phylloxera Vastatrix, and the remarkable incidents connected with the life-history of this minute but formidable enemy of the viticulturists, have been the subject of many interesting communications to the Académie des Sciences of Paris, and to the French Entomological Society, during the past year. Among the innumerable remedies which have been advocated and tested as a means of checking the progress of this scourge, the only treatment hitherto recognised as absolutely effective is the submersion of the vineyards, where practicable, during one month in winter, which has been attended with perfect success. The principal facts ascertained in connexion with the biology of these destructive Homoptera may not be undeserving of some notice, considering the vast proportions which their propagation and extension have now assumed. The young larvæ, which hybernate on the roots of the vine, whether derived from the autumnal sexual races adverted to in the sequel, or (as it would seem) from antecedent broods, commence laying eggs in the early spring, their progeny producing and reproducing in continuous succession by agamogenesis, as usual among the Aphides, though, unlike these, always oviparous. Among these successive broods some individuals never acquire wings;

while others, becoming more elongate, quit the earth as pupa-nymphs, furnished with rudimentary alary appendages, emerging in the winged state from July to September. But the development of the race does not terminate here, on attaining the winged condition. In an interesting memoir, 'Sur le Phylloxera ailé et sa progéniture,' M. Balbiani has shown that these winged females (to which no males are ascribed) deposit their eggs, two to five in number, amid the down of the young vine-leaves, when in captivity; from which eggs an apterous sexual race is derived, as previously described by him (in 1873) in the case of the Phylloxera of the oak (*P. Quercus* of Fonscolombe), these eggs being of two different dimensions, the larger producing females, and the smaller males, both sexes destitute of organs of nutrition, the promusculi being reduced to a short flattened tubercle, and the female having the third joint of the antennæ pedunculated. The same diligent observer has more recently ascertained that the subterranean brood of the Phylloxera of the vine is also continued from year to year by a similar sexual race, which appears later than that derived from the winged type (about the middle of October), but perfectly identical therewith, the females of both producing only a single egg (*l'œuf d'hiver* of Balbiani); whereby, in the one case, the continuity of the race is maintained for several years upon the same root until this is entirely exhausted; while, in the other, by the intervention of the winged type, new colonies are dispersed far and wide. M. Balbiani also states that certain abnormal forms, occasionally found mingled with the winged type, noticed by him in several other species and formerly considered as males, are rather to be regarded as females with atrophied characters, somewhat analogous to the neuters of social Hymenoptera. Some strange theories, however, have been propounded by M. Lichtenstein, as to certain phases in the genetic cycle of the race, whereby it is alleged that the winged Phylloxera of the vines resort to the Kermes oak (*Quercus coccifera*) to deposit—not eggs, but —*pupæ*, from which such sexual race is developed as aforesaid; this winged type being characterized as "Androphores" and "Gynéphores," according to the sex of the *pupæ* deposited by these so-called "flying cocoons." M. Balbiani, however (on examining other specimens taken

by himself), maintains that the author of this startling hypothesis has confounded two distinct species; that alluded to as aforesaid being, as he conceives, a new species (to which he gives the name of *P. Lichtensteinii*), differing from *P. Vastatrix* in all stages of development, including that of the sexual race; while the manner in which it had been sought to explain the return of the progeny of the latter from the oaks to the vines, by means of a second supposititious winged-type, would be contrary to all the analogies of the genus. M. Lichtenstein demurs to these conclusions, and repudiates the name given by M. Balbiani, alleging:—(1) That the species adverted to by the latter is not new, being his *P. Rileyi*, described also by Kaltenbach in 1873, under the name of *P. corticalis*; (2) that this is not the species which he had found on the Kermes oak; (3) that although the former subsists on the *Quercus Robur*, he expects to prove next year that both this species and the *P. Vastatrix* resort to the *Q. coccifera* to deposit their *pupæ*; and (4) that he has found another species sparsely associated with these on the same oak, and nurtured thereon, being met with not only in the winged form, but also in the larval and pupal stages (distinguished by having two cylindrical and retractile tubercles between the antennæ), on which he confers the name of *P. Balbianii*. With respect to the galls on the under side of certain vine-leaves, less frequently met with in France than in America, and having a fimbriated aperture from above, Mr. Riley, the State Entomologist of Missouri, has long since shown (Third Report, 1871) that the autumnal individuals emanating from these galls descend to the roots, as subsequently verified by M. Signoret and others; and more recently Mr. Riley has obtained a leaf-gall (which, however, subsequently proved abortive) from one of the root-infesting type, which he defines as *Radicicola*, in contradistinction to the other, which he designates as *Gallæcola*. These galls, tenanted by an agamic apterous race, which never acquires wings (formerly attributed to the ovipositing winged females), Mr. Riley is now disposed to ascribe to the young hatched on the roots, more extensive experience having satisfied him that the presence of the *Gallæcola* type is not the invariable precursor of the *Radicicola* in an uninfected vineyard, nor in anywise essential to the continuance

of the species. The same author, in a paper recently read before the Académie des Sciences (December 14th), enumerates sixteen well-defined species of Phylloxera indigenous to North America; whereof only one is found on the vines, and one (*P. Rileyi*) on the oaks; the others being chiefly met with on different species of *Carya*. It is, moreover, worthy of remark that M. Signoret, on the 23rd of September, informed the Entomological Society of France that he still possesses a potted vine, whereon his first experiments were made in 1869; that every year he places on this vine the Phylloxeræ which are sent him, whether of the root or leaf-gall type; and that this vine is *still alive*, in spite of the Phylloxeræ upon its roots; retaining its verdure, though not in very thriving condition, from having been five years in the same earth and the same pot. A species of *Acarus* (the *Tyroglyphus Phylloxeræ* of Riley), which preys upon the root-inhabiting type, has been discovered by Mr. Riley in America, whereof colonies are being introduced into France; but Mr. Riley considers that any expectations founded thereon are doomed to disappointment. The *T. echinopus*, described by Dr. Fumoze and Prof. Ch. Robin in 1868, has also been found on the French vines. Another species of *Tyroglyphus*, met with abundantly on Fungi, more especially on the *Agaricus campestris*, has been the subject of an interesting communication by M. Méguin, published in the Paris 'Journal d'Anatomie et de Physiologie,' intitled "Mémoire Anatomique et Zoologique sur un nouveau Acarien de la Famille des Sarcoptides, le *Tyroglyphus rostro-serratus*, et sur son *Hypopus*," showing that the latter is but an adventitious nymph-form of the former, which the octopod-nymphs assume by moulting, when the Fungi become desiccated, resuming their previous nymph-condition by another moult on the moisture being renewed. This incidental heteromorphosis not extending to other stages, the hexapod-larvæ and adults are doomed to perish under such circumstances, while the occult-nymphs, in their *Hypopus* coat-of-mail, attach themselves to any insects that come in their way, for conveyance to another suitable abode, whereby the continuance of the race is provided for. A similar transmutation has been observed by MM. Riley and Planchon in the *Tyroglyphus Phylloxeræ*.

The Striped Beetle of the Potato.—The Colorado potato-beetle (*Doryphora decem-lineata*) is an enemy whose rapid advances towards the shores of the Atlantic threaten an invasion into Europe at no distant day. Mr. Riley points out how these destructive insects, when once established on the sea-board, may wing their way to vessels in port, being accustomed to fly in swarms, and may thus be borne over to found a colony in this country, irrespective of conveyance with the tubers themselves, which they are stated to devour greedily when dug up, several having been found ensconced in a single potato. Mr. Riley suggests that Agricultural and Horticultural Societies should make provision for the dissemination of correct information respecting these insects; and that specimens of the beetles themselves should be obtained for distribution, with the view of familiarizing persons with their aspect, and of preventing their diffusion. The importance of some efficient measures being adopted for this purpose can hardly be overrated, in default of which this scourge must assuredly be expected to follow in the wake of the Phylloxera, the Oidium, and other noxious importations from the same quarter. Mr. Riley's reiterated remarks on this head have a somewhat prophetic significance, when calling to mind that "in giving, through Sir Walter Raleigh, the precious tuber to Europe, America conferred upon the Old World an everlasting boon. She may yet unwittingly be the means of bequeathing as great a bane, by sending across the ocean the deadliest enemy of that tuber. At all events it behoves our European neighbours to be on the look-out, and to prevent, if possible, any such catastrophe." The attention of the Académie des Sciences has just been drawn to this subject by the French Minister for Commerce and Agriculture.

[On Monday, 8th February, Mr. Herbert introduced this pet panic into the House of Commons, by asking the Chief Secretary for Ireland whether Her Majesty's Government had taken any steps to prevent the introduction of the Colorado beetle into Ireland by the importation of American seed-potatoes or otherwise; and, should no precautions have already been instituted, what were the intentions of Her Majesty's Government on this subject. Sir M. H. Beach replied:—"The subject of the honourable member's question

was brought under my notice some time back, and I thought it right first to ascertain what steps had been taken by foreign Governments in the matter. I find that the only Governments which have taken any real action are those of Austria and Belgium. The former has assured the Government of Switzerland, which had warned the European maritime countries of the possible danger, that the importation of American potatoes would be prohibited; and the Belgian Government has introduced a Bill for a similar purpose, which has been agreed to by a special committee. I have also made enquiries as to the nature and extent of the evil to be apprehended. I think there is reason to suppose that the harm recently done to the American potato crop has been much exaggerated, and I am informed that the insect in question has been known in America for more than a century. It attacks the stalks and leaves of the potato-plant, not the root, though that naturally becomes diseased in consequence. No potato-stalks or leaves are imported from America, and, as only healthy roots would be imported, it would seem hardly possible that the insect could be thus conveyed into this country. I am now in communication with the English Privy Council on the subject, because it is obvious that if any preventive measures are adopted they ought to apply to the whole of Great Britain, as well as to Ireland. But I must add that the importation of potatoes into the United Kingdom, especially in the event of a failure of the home crop, is very large, and therefore any interference with this trade would require the most careful consideration on the part of Her Majesty's Government."—*Edward Newman.*]

Bee Keeping.—The British Bee-keeper's Association, instituted in May last, "for the encouragement, improvement, and advancement of Bee-culture in the United Kingdom," under the Presidency of Sir John Lubbock, held its first exhibition at the Crystal Palace in September last. This institution is calculated to confer important benefits upon the rural population by diffusing information as to the most approved principles of Apiculture, in the management of the hives, the collection of the produce, the preservation of the combs, and other matters, whereby the most profitable results may be obtained, thus holding out encouragement to many who have been deterred from embarking in such a lucrative

enterprise by apprehensions of incompetency; or who, having done so, have not known how to turn the resources of this vicarious industry to the best account. 'The British Bee Journal and Bee-keeper's Adviser,' published monthly, and now far advanced in its second volume, affords a useful medium of intercommunication upon this subject.

Economy of White Ants.—Two interesting communications from Herr Fritz Müller to Mr. Darwin have appeared in 'Nature' (Nos. 225 and 237), in the former of which the writer, treating of the natural history of the Brazilian Termites, states that he has come to the same conclusion as Mr. Bates with respect to the neuters,—namely, that these are not sterile females, but modified larvæ, which undergo no further metamorphosis; that, in some species of *Calotermes* the male soldiers may even externally be distinguished from the female soldiers; and that in the company of the queen there always lives a king, as observed by Smeathman a century ago, but doubted by most subsequent writers. He has also recognised the existence of two forms of sexual individuals; the one, consisting of *winged* males and females, produced in vast numbers, and leaving the termitary in large swarms; the other, of *wingless* males and females, which never quit the spot where they are born. A similar result would appear to be attained thereby, as in the case of the winged and wingless sexual races of the Phylloxera, already referred to, the former serving to disperse the race; the latter to continue the labours of the original colony by successive broods.

Economy of Stingless Honey Bees.—Herr Fritz Müller subsequently adverts to another "interesting group of social insects, the stingless honey-bees, *Melipona* and *Trigona*." He mentions that in *Melipona* wax is secreted "on the dorsal surface of the abdomen," instead of on the *ventral*, as in hive-bees; that the *Meliponæ* and *Trigonæ* "fill their cells with semi-digested food before the eggs are laid;" and that they close the cells "immediately after the queen has dropped an egg on the food;" whereas, in the hive-bee, the eggs are laid in nearly empty cells, which the workers close with wax when the adult larvæ, which they have been feeding, are about to undergo their pupa-metamorphosis. At a recent meeting of the French Entomological Society

(December 9th) a paper on the habits of the Brazilian Meliponæ and Trigona, by M. Maurice Girard, was read (although not yet published), from which it would appear that one of the former group establishes its nest in the interior of termitaries, living in amicable relations with a species of *Termes*. A new species of Brazilian Trigona, whereof the queen, males, and workers have been described by Herr Hermann Müller under the vernacular name of *T. cagafoga* ('Nature,' Nos. 193 and 237), is "supposed" to imitate some of the Formicidæ, in milking the larvæ of certain Membracidæ belonging to the Homopterous genus *Potnia* of Stål, to which, in the absence of Aphides, the ants of Brazil have recourse for the purpose of imbibing the saccharine fluid, which the former also emit.

Habits of Social Hymenoptera.—Sir John Lubbock has communicated to the Linnean Society, on two occasions during the past year, the results of some highly interesting observations made by him "On the Habits of Bees, Wasps, and Ants," his experiments having for their object to test the extent to which the social Hymenoptera may be enabled to communicate with each other. The deductions to be drawn from these experiments would seem to be of a character to dissipate much of the fantasy with which this subject has been invested by those writers who have attributed to such communities the employment of "*some kind of language*" as a medium of intercommunication. But in ascribing such faculties to these co-operating colonies, it may be conceived that (speaking figuratively) more was never intended to be implied than the habitual employment of certain symbols for intelligible purposes; and that none of these writers ever intended to assume that any of these interesting races could exercise the power of describing localities or of communicating facts, without acting as pioneers to their companions, and (as Hüber says) *bringing* others to such localities. As an instance of this nature, I may mention a circumstance in which similar evidences were elicited. A *Polistes* nest having been brought to me full of feeding larvæ, with a single specimen of the imago brood, I placed this nest, together with its solitary occupant, outside a window, but within the exterior Venetian blinds corresponding with those of three floors of several consecutive houses, covering the nest at first with a

tumbler, which was removed during the night; and in the morning the *Polistes* proceeded in search of her companions, bringing back with her two others to assist in feeding the larvæ. Some means of intimating to her associates the object of her apparition, and of urging them to trust to her lead, must doubtless have been made available on this occasion; but that she should have been enabled to define the particular window, among so many, where the nest remained concealed from view, and prevail upon the others to accompany her on such a strange and unaccountable expedition to a remote and unnatural locality for the discovery of the lost nest, could only have been accomplished by the exercise of a considerable amount of intelligence and communicative instinct. That these *Polistes* belonged to the original brood could scarcely be doubtful, as all others would return to their respective domiciles; but, as supererogatory evidence thereof, I added some strangers to the party from other nests taken elsewhere, and these intruders were at once attacked and driven away. This nest (now exhibited with some of its occupants *in situ*) is remarkable from having been constructed, to some extent, of the macerated paper of play-bills of different colours posted in the vicinity, as shown in the tinted layers of the respective cells. On a former occasion Sir John Lubbock pointed out that the sounds produced by the wing-vibrations in Hymenoptera vary according to circumstances; that "a tired insect produces a somewhat different note from one that is fresh, on account of the vibrations being slower;" that this "change of tone is evidently under the command of the will, and thus offers another point of similarity to a *true voice*;" that "a bee in the pursuit of honey hums contentedly on A', but if it is excited or angry it produces a very different note;" and that thus the sounds of insects "serve, *like any true language*, to express the feelings." He also remarks that "as even we, far removed as we are in organization, habits, and sentiments, from a fly or a bee, can yet feel the difference between a contented hum and an angry buzz, it is highly improbable that their power of expressing their feelings should stop here;" and that "one can scarcely doubt that they have thus the power of conveying other sentiments and ideas to one another." In the case of these *Polistes* (without diving too deeply into their mysterious endowments in this

respect) we may readily conceive the rapturous excitement manifested by the new comer from the lost domicile, as compared with the lassitude and despondency exhibited by the lorn home-seekers; nor can we err in assuming that, after the customary greetings of recognition on the deserted side, some conscious allurements must have been imparted to the latter to induce them to confide in such cogent invocation to follow the former; her object being attained as though her motives had been enunciated by *voice* or *language*, and her summons conveyed through such a medium.

Fertilization of Flowers by Insects.—The fertilization of flowers by insects (treated in several additional papers in 'Nature' by Messrs. Hermann Müller and T. H. Farrer) has also been the subject of a very remarkable Address by Sir John Lubbock, before the British Association, at Belfast, showing their mutual dependence upon each other, and pointing out how the sustenance afforded to the latter is requited by the transfer of pollen essential to the existence of the former, while calling attention to many structural peculiarities exhibited on either side admirably adapted for this purpose. But in discussing the mouth-parts and legs among the bees and wasps, upon which considerable stress is laid, as exemplifying modifications of these parts from an ancestral type, it should not be lost sight of that such suitable adaptation of organs to the requirements of the several races alluded to, is associated with many characteristic distinctions in the veining of the wings, coinciding with other relations of lineage and affinity, and furnishing, together with the aforesaid organs, premonitory indications of differences in habits and economy. "That the mouth of *Prosopis*" (one of the solitary bees) "probably represents the condition of that of the ancestors of the hive-bees before their mouth-parts underwent special modifications;" and that this "may be inferred from the fact that the same type occurs in other allied groups, as shown in the mouth of a wasp" (our "*Polistes*," to wit), is a deduction scarcely reconcilable with those divergences in alary structure between the respective groups, which are altogether independent of functional development, and of those influences for adaptational purposes which have been held to determine the survival of the fittest.

THE ENTOMOLOGIST.

No. 141.]

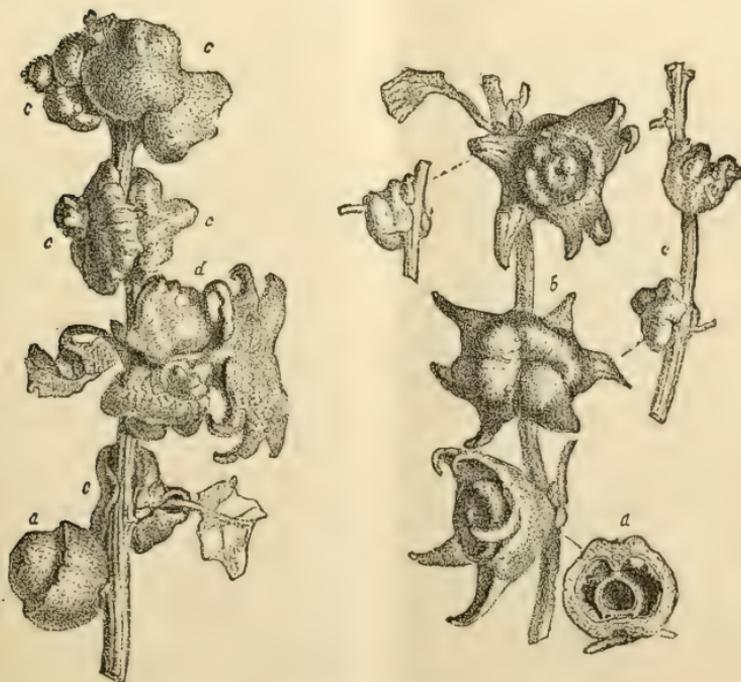
APRIL, MDCCCLXXV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER née WEISE.

(Continued from vol. vii. p. 267.)

Fig. 21.



CYNIPS GLUTINOSA.

21. *Cynips glutinosa*, Gir.—This species produces galls of three or four different shapes, which are seldom connected

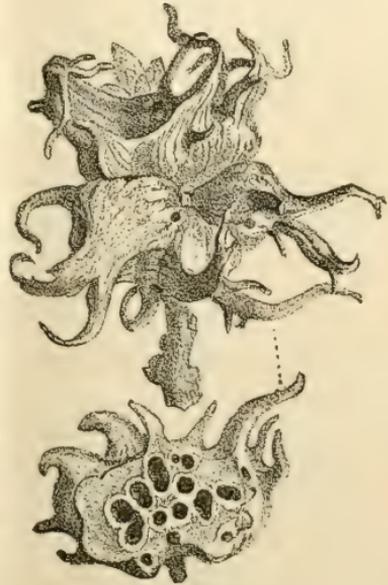
by intermediate forms. Dr. Giraud has described three of these varieties. The first variety, most frequently met with (the true *C. glutinosa*), is subglobular, and is about a centimetre in diameter. Its base generally adheres so closely to the twig or petiole that these produce impressions on the gall. At the point opposite the base there is an umbilicated cavity. On the whole, the basal half of the gall is more swollen than the upper half. When fresh the gall is yellow or partly red, and more or less glutinous; when dry it is generally brownish yellow, and loses its stickiness. In section it exhibits a large cavity. The thin egg-shaped inner gall is here either attached to the base or to the point exactly opposite, but subsequently it sometimes appears quite detached. The second variety (*C. coronata*) has, on the whole, the fundamental form of the preceding. Its lower half is, however, surmounted with a crown of recurved, shorter or longer, projections. That part of the gall which lies above the crown of thorns and bears the umbilic in its centre is generally more swollen than in the galls of the first form, so that the umbilic is far less conspicuous. This gall is generally of a lighter tinge, and far more glutinous and glossy. A section exhibits a thicker layer of moderately hard gall-substance and a smaller cavity, which sometimes occurs as a circular passage round the inner gall, that adheres to the base by means of a very short, or somewhat longer, pedicle. It sometimes happens, however, that the inner gall has only a basal attachment, and still the cavity is present, although smaller than in the first form. The third variety (*C. mitrata*), in spite of its different outward appearance, is the same species, but without a cavity in the interior. The base has a flat extension, but it generally adheres so tightly to the twig that the base becomes strongly recurved. From this roundly swollen base, which in mature galls is about a centimetre in diameter, projects a cone or a thick style-shaped part, rounded at the end and strongly umbilicated. The surface is smooth, of a brownish red colour, and moderately glutinous. It shows no cavity in the section, the inner gall everywhere closely adhering to the gall parenchyma. A fourth form, which I have twice met with, may be placed under the last variety, *C. mitrata*. It differs, however, in having several excrescences at its base, in its upper part forming a plain with

several projections, and in its being larger in size (fig. 21 *d*). The first form is found on *Quercus sessiliflora* and *Q. pedunculata*; the second on *Q. pubescens*; the third on *Q. sessiliflora*. The imago, generally matured by the beginning of winter, emerges in the following March or beginning of April.—*G. L. Mayr.*

Five species of *Synergus* have been bred from the variable galls of this species, four of which, *viz.* *Melanopus*, *Reinhardi*, *Pallicornis*, and *Vulgaris*, emerge in the spring and summer of the second year; whilst *Facialis* is produced in the autumn of the first year. *Ceroptres arator* finds a home in this species, as in many others. As parasites we have *Callimome abdominalis*, *C. regius*, and two species of *Megastigmus*, *viz.* *M. stigmaticans*, *Fab.* (= *giganteus*, *Kollar*), and *M. dorsalis*, *Fab.* (= *Bohemanni*, *Ratz.*). The gall has not been found in Britain.—*E. A. Fitch.*

22. *Cynips coriaria*, Hart.—This species produces a gall which, in its shape, reminds one somewhat of the variety *Coronata* of the preceding species. The simplest and most regular specimens are hemispherical, with the convex part attached to the stem, and the broad disk recurved in the middle. From the junction between the disk and the convex surface, or from the disk itself, emanate many long projections, which taper off and point either towards the gall or from it. Occasionally several of these projections unite, and then they form a lamina terminating in several points. Other specimens are more or less spherical, and their projections irregular. A trans-

Fig. 22.



CYNIPS CORIARIA.

verse section of the gall usually measures between one and two centimetres, exclusive of the projections, but specimens occur both larger and smaller; the average of the

projections varies from half to one centimetre. The gall is hard, brown, and not glutinous. It is chiefly remarkable in the section which exhibits many egg-shaped cells, in which the larvæ of the gall-flies live; these cells or inner galls are surrounded by the moderately hard, brown, gall-substance. It is found on *Quercus pubescens*, rarely on *Q. sessiliflora*, and is full grown in the autumn, but does not fall; therefore two-year old galls perforated with holes are often met with on the oaks. Herr von Haimhoffen, who has both described and figured this species in the 'Verhandlungen der Zoologisch-botanischen Gesellschaft,' 1867, page 527, states that when kept in a warm room the imagos emerged from December to the end of February, but those kept out of doors did not appear till the end of spring. From a gall which I collected on the 8th November, 1869, the first imago emerged on the 18th of the same month, and was followed by others during the next few days.—*G. L. Mayr.*

Three species of *Synergus*, viz. *Melanopus*, *Pallidipennis*, and *Pallicornis*, occur in the galls of this species; and *Megastigmus dorsalis* is parasitic on the *Cynips* larva.—*E. A. Fitch.*

Life-histories of Sawflies. Translated from the Dutch of Dr. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from p. 52.)

NEMATUS APPENDICULATUS, *Hart.*

Imago: *Hartig, Blatt-und-Holzwespen*, p. 202, No. 34.

Larva undescribed.

Nematus niger, *subnitidus*, *clypeo et pedibus pallide ochraceis*, *antennis subtus et alarum stigmatibus fuscis*.

I had from time to time seen on red-currant bushes a small green tenthredinous larva, which evidently belonged to a species of *Nematus*, but I had not taken any particular interest in the matter. The smallness of the larva, its green colour, the probability that it would only produce a yellow and black *Nematus*, whose number seems to be legion, the absence of anything remarkable in its habit and mode of

living,—all these circumstances seemed to make the subject anything but attractive. At last, however, on a peculiarly favourable opportunity presenting itself for rearing the larva in question, I made up my mind to the task, and, as I had found a considerable number in my garden, I took some of them indoors for the purpose of examination and observation. This was on the 20th of June, 1867. Unfortunately, the larvæ were nearly, if not quite, full grown. I think, however, that I remember observing that the younger larvæ, which I had before seen, differed from the more advanced examples merely in size.

The head (fig. 3) was of the usual form, somewhat depressed anteriorly; its colour was grayish green, the eyes being placed in rather large, round, black spots; from each of these spots proceeded a brown line, narrowing gradually and going to the top of the head, where the lines joined. There were some small brown spots about the trophi, and the teeth of the mandibles were of the same colour. The body was rather long and slender (see figs. 1, 2), and had altogether twenty legs. Above the line of the tracheæ the body was strongly wrinkled; I counted five folds on each segment. The 1st segment, the borders of the stigmata, the middle and posterior legs, the 11th segment, and the anal valve, were of a green-yellow tint; the remainder was green. On either side of the neck behind the head on a level with the eye was a fine black curved line, like a chevron reversed; a similar mark occurred above each thoracic leg (fig. 4); the claws of these were brown.

The little animals were nearly two centimetres long; their usual position was at full length along the edge of the leaf, the posterior segments being slightly curved, as shown at fig. 1; less frequently they were observed in the curved position of fig. 2, this being otherwise the usual posture of many species of *Nematus*. When they were full grown they descended from the leaves to the ground, where they spun up, under cover of some of the fallen leaves, in little shining, brown cocoons, some being of a paler tint than the others. Their original colour and appearance is shown at fig. 5. The cocoons in question were single, and between six and seven millimetres long. On the 16th of the following July I found two females had made their appearance in the jar in which I

kept the larvæ and cocoons; fig. 6 is taken from one of these. Out of the whole number eight imagos were reared; these were all females. I should not have known the male, which Hartig, *loc. cit.*, has also not described, had it not been that Mr. C. Ritsema had taken one (on the 8th of May, 1868) at the Bolwerk at Haarlem, and had presented it to the collection of our Society. The following is a description of the female:—Length about four millemetres, expansion eleven millemetres. Body short and compressed, the abdomen rather broad, and the penultimate segments somewhat high; thereby differing in form from many other Nematæ. Head and body shining, and of a black tint, more or less tending to brown. The head and the back of the thorax are thickly clothed with very short dark gray hairs. The antennæ are slender and filiform, more than half as long as the body; in some individuals entirely black; but in most cases ferruginous on the under side. The clypeus, above the labrum, truncate; labrum, base of mandibles and palpi reddish white. On the thorax the tegulæ are brown, and the cenchri gray. The wings are somewhat smoky, yet iridescent; the costal nervure and the stigma are of a pale brown tint, which might be described as tea-colour (see fig. 6). The legs are pale yellowish red, the tint of unripe yellow melon; they are darker in some individuals than in others. The bases of the coxæ and the middle of the femora are usually more or less brownish; in the posterior pair (fig. 7) the extremities of the tibial and of the tarsal joints are pale ferruginous.

The male differs in being much more slender, and, when looked at from above, having a longer head; also the abdomen is cylindrical, the anus being provided with two horizontal valves; added to this the antennæ are longer, being four-fifths of the length of the body; they are entirely ferruginous, with the exception of the upper surface of the first three joints. Further, the course of the nervures at the under side of the submarginal cells is somewhat different. And, lastly, the legs are a little longer, the femora without any brown colour, and the posterior tarsi nearly black.

I am not acquainted with the egg; I suppose it is concealed in wounds made in the veins of the leaf. The emergence of the imago in July and the capture of another in May point to two or more generations in the year.

NEMATUS SOLEA, *Voll.*

Larva and imago undescribed.

I place the description of this insect immediately after that of *Nematus appendiculatus*, on account of its agreement, in its different stages, with the latter species. It is new; at least I have not been able to find a description of it anywhere. Nevertheless, it may probably be Hartig's undescribed *Nematus xanthophorus* of his table in the first year of the "Stettiner Zeitung," with respect to which paper it is much to be regretted that it has never been further worked out. It may even be nothing more than the male of *Nematus Laricis* of Hartig, with which he was unacquainted.

I have called this species *Solea*, because, like the sole, it is very dark on the upper surface and white on the under. The larva, which lives on the larch (*Larix*), is full grown in the middle of July (I received full-grown examples on the 26th of July, 1861, from the late D. J. Wttewaall), and has twenty legs; it is entirely sap-green on the back and sides. The head is very shining, somewhat broader than in the former species, *feuille-morte* in colour, with two rather large, round, black spots, in which the eyes are placed. The six anterior legs are glassy green, with brown claws. The skin of the back is very strongly wrinkled; the four or five anterior segments have on each two transverse rows of extremely fine spines. The last two segments are of a paler and yellower tint; the ventral surface, together with the abdominal and anal legs, are of the same sordid yellow colour.

On the 27th of July these larvæ began to spin up among the needles lying at the bottom of the glass in which they were kept. The cocoon was shining, pale brown, and of the same size as that of the former species. It was not more than ten days before the imago appeared (see figs. *d*, *e*). My cocoons only produced one imago, a male, which was about four millimetres long. The head was rather broad, somewhat projecting between the eyes and the clypeus and labrum. Eyes pretty large, oval, brown-gray; ocelli very widely separated. The head was pale ochre-gray, with a broad quadrangular spot on the vertex, of a sordid black tint. Antennæ, considering the genus, thick and short, pale

ferruginous, with a brown glow on the upper side, the first two joints having black lines on the upper surface. Abdomen pale ochreous below, sordid black on the dorsum, excepting the margins of the prothorax, the tubercles, and the margins of the abdomen. The scutellum has a reddish glow. The legs are of the same colour as the sternum and ventral surface, only the base of the four posterior coxæ have a black spot, and the posterior tarsi are blackish on the upper surface. The wings are transparent, the costa and stigma being pale yellow.

I am not acquainted with the female, or with the eggs or the young larvæ.

Micro-Lepidoptera Taken or Reared in 1874.

By Mr. W. MACHIN.

I HAVE written out the following list of insects, which I have either reared from the larva or caught on the wing, and trust you may deem some of them of sufficient interest to find a place in the 'Entomologist.'

Depressaria depressella.—Bred in October from seed-heads of *Daucus Carota*, collected at Southend in September.

Lemnatophila phryganella.—Both sexes were reared in October, from larvæ found at Loughton, in July, on oak and hawthorn.

Exapate gelatella.—Both sexes were reared in November, from larvæ found at Loughton, in August, on hawthorn.

Tortricodes hyemana.—In February a number of strongly-marked specimens were reared from larvæ found on hawthorn, at Loughton, in autumn.

Epigraphia Steinkellneriella.—Reared in March, from larvæ found at Loughton on blackthorn, in autumn.

Elachista subobscura.—Was flying rather commonly on warm evenings, at the end of April, on Wanstead Flats.

Corycia tenerata and *Swammerdamia comptella*.—Were reared in April, from larvæ found on blackthorn, at Loughton, in the autumn.

Depressaria assimilella.—Was abundant in the larva-state between united stems of broom, in April, at Wanstead.

Chesias obliquaria.—Appeared occasionally in my breeding-cage, from the beginning of May till the 6th of August, from larvæ taken in the autumn.

H. Senecionis.—Bred sparingly in May, from seed-heads of ragwort.

Eupæcilia udana.—Bred sparingly in May, from the flower-stems of *Alisma Plantago*, collected during the winter.

Pseudopteryx cytisaria, *Depressaria costosella*, and *Coleophora genistæcolella*.—The larvæ were very plentiful on *Genista Anglica*, at Loughton, in the middle of May; and *Depressaria atomella*, sparingly.

Apamea unanimitis.—Five specimens were reared at the end of May, from larvæ found among grass at the roots of willows, in April.

Dicrorampha plumbagana.—Flew in some numbers along the banks of the main road at Low Leyton, on warm evenings, at the end of May.

Hadena Genistæ.—Reared three beautiful specimens from larvæ beaten from broom, at Wanstead, in August.

Grapholita obtusana and *Laverna lacteella*.—The former was common, and the latter rare, at Fair Mead Bottom, in the middle of June.

Harpipteryx scabrella.—Bred from larvæ beaten from hawthorn, at Loughton, in June.

Ypsolopha sylvella.—Bred from larvæ beaten from oak, at Loughton, beginning of July.

Harpipteryx nemorella.—Bred from larvæ beaten from honeysuckle, at Loughton, in June.

Enicostoma lobella.—Bred from larvæ beaten from blackthorn, at Loughton, in June.

Gelechia atriplicella.—Was reared in plenty from the seed-heads of both *Atriplex* and *Chenopodium*, collected in September; the first brood in June, the second in August, and the third in October.

Cucullia Gnaphalii.—A beautiful specimen was reared on the 26th June, from a larva found on golden-rod, near Seven-oaks, Kent, end of August.

Sesia chrysidiformis and *S. ingrattella*.—Seven of the former and one of the latter were reared in July, from the roots of sorrel, collected at Folkestone, in April.

Ephippiphora fœneana (in some numbers) and *Dicro-rampa simpliciana* (sparingly).—Were reared from roots of *Artemisia vulgaris*, collected at Darenth, in April.

Xanthosetia Zægana.—A fine series were bred in July, from roots of *Centaurea nigra*, collected at Darenth, in April.

Nephopteryx angustella.—Was not uncommon, but very local, on horse-chestnut trees, at Hampstead, in June.

Peronea cristana.—I have again reared this species from larvæ found between united leaves of hawthorn, collected in July, at Loughton.

Ephippiphora nigricostana.—Two specimens emerged in July, from the roots of *Stachys sylvatica*, collected in March, at Loughton.

Semasia rufillana.—A fine series were bred in July, from seed-heads of wild carrot, collected at Southend, in September.

Scythropia cratægella.—Larvæ in June and imagos in July, amongst blackthorn at Loughton, but rare.

Butalis chenopodiella.—Larvæ in plenty amongst *Chenopodium*, on a piece of waste ground at Wanstead, in August.

W. MACHIN.

22, Argyle Road, Carlton Square, N.E.

January 19, 1875.

Over the Fells in Summer, and Capture of Argyannis Niobe in North Lancashire. By C. S. GREGSON, Esq.

AT the end of July, 1871, I met my old friend J. B. Hodgkinson at Preston, and proceeded to Witherslack, in Westmoreland, on a collecting expedition, with head-quarters at the "Stanley Arms" there. On August 1st (insects generally being *passé* in the immediate neighbourhood) we went to Witherslack Hall woods: here also we found *Emmelesia tæniata* was over, and I determined to put a long-intended expedition into force, namely, to prospect the *terra incognita* between the shores of Morecambe Bay and Hawkshead, beyond Windermere Lake. Taking a hearty farewell of my good friend I pressed upwards through the woods (there very thick), until I found open ground at the top of the wood, and saw *Argyannis Adippe* in plenty around me. Here I amused myself until half-past 9 A. M. taking *Adippe*, examining them

for varieties, and watching them fly, as I set the normal forms at liberty. Afterwards I pushed on, keeping away to the left of the glorious ground behind Whitbarrow Scarr, another unknown entomological wooded district, which has never yet been asked to give up its insect-treasures, though some of my botanical friends have borrowed specimens of its little primrose. Looking across towards the opposite wooded ridge, beyond the valley, I observed a slight depression in the trees, six or seven miles away, apparently, and made for it, following the cart-roads when they seemed to lead that way, and leaving them when they did not (nobody interferes with anyone crossing the fells or fields in that district): they seem rather glad to see you, especially if you have any news or tobacco to impart to them. Whilst on my way to the ridge I hardly saw an insect, but once over its crown, and into a recently-cut hoopwood copse, *Adippe* greeted me all round, now here, now there, in the wood, and on the road-sides: such a sight I had never seen before. The fiercely hot day and want of water forced me to leave, after I had caught and looked at nearly a hundred specimens; and the sight of Windermere Lake, some miles below me, made me crave for water more than ever. Pushing on I crossed the lake, drinking as I went, and refreshed at the Ferry Hotel; thence up the zigzag road, leading to the village of Sawrey, I turned down the lane leading to the foot of Eastwaite Lake, crossed the bridge and through the plantation, and was in the Devil's Gallop: here *Adippe* again appeared. Whilst I was looking at the umbelliferous flowers for *Trycheris mediana* (here very abundant and fine) one alighted under my nose on my net, and I again took a great many for examination. Whilst so engaged a lady on horseback stopped to ask if I had found anything valuable; she seemed to know butterflies pretty well, and I showed her an extraordinary well silver-marked *Adippe*, illustrative of my seeming nonsensical—hard run after a butterfly, catching it, and then letting it fly—undertaking. Whilst so doing a specimen alighted on a flower of *Angelica sylvestris* close to us, which I secured, and showed her it as being entirely without silver markings; and this specimen, which I thought only a variety of *Adippe*, on being submitted to our good friend Henry Doubleday, for his opinion, is pronounced by him to be a veritable *Argynnis Niobe*.

I have been particular about describing the way to the Gallop from Windermere Ferry Hotel, because some people doubt there being such a place: let anybody ask at the ferry, not for the Devil's Gallop (the ferry people are not natives), but for Eastwaite Lake, and anybody near there will point out the Gallop; and when once our friends are in it they will be sorry for those who ever had to gallop over such rough land.

When at supper at Hawkshead I learned that the lady on the gray horse was Miss Aglionby, a daughter of Judge Aglionby, a lady who lives near, and is highly beloved in the district.

I need hardly say that I took a good many ordinary Lepidopterous insects that evening; but the best were *Eucosmia undularia*, anywhere in and near the Gallop where willows grew, and seventeen *Sericoris signatana* around one tall sloe bush. I shall long remember my twelve hours' ramble over the Fells in August, 1871.

C. S. GREGSON.

Captures in the New Forest in May and July, 1874.

By BERNARD COOPER, Esq.

IN company with my friend W. J. Argent, I spent a short portion of each of these months entomologising in the New Forest. Our object being as much the enjoyment of desultory rambles as the capture of rarities, many species will be found absent from the appended list, which ought otherwise to have been obtained; nevertheless, a few notes at this dull season of the year may not be unacceptable to some of our readers.

Leucophasia Sinapis.—Of this species we took both the spring and summer broods. It is generally distributed throughout the grassy rides of the plantations, but is not common. The second brood (the *var.* *Diniensis* of Boisduval) is easily distinguishable from the first by the isolation of the dusky apical blotch. Some three or four females of the second brood which we took are pure white, without any markings whatever (mentioned in Kirby as the *var.* *Erysimi*, *Bkh.*). This, I presume, is the variety referred to by your

correspondent (Entom. viii. 21) and by Mr. Doubleday (Entom. viii. 37).

Gonepteryx Rhamni.—Flying lazily among the flower-heads in July, in swarms.

Colias Edusa.—Saw one on the 18th July in the new enclosure.

Argynnis Paphia.—Common everywhere in the neighbourhood of brambles. As an instance of its abundance I may mention that a single sweep of the net on one occasion enclosed four, and on another three, specimens. Took more than a dozen fine specimens of the *var.* *Valezina*, besides several more or less torn.

Argynnis Aglaia and Adippe.—More local, and much less common than the preceding; frequenting the blossoms of *Centaurea nigra* in the flowery rides. Took a lovely series of each.

Argynnis Euphrosyne and Selene.—Common.

Vanessa Polychloros.—A few.

Limnitis Sibylla.—More common than in some previous years, being generally distributed throughout most of the oak woods. The best time to watch the evolutions of this graceful insect is in the early morning, when the flight is much lower than in the after part of the day.

Thecla Rubi.—A few specimens; end of May.

T. Quercus.—Very common.

Lycæna Ægon.—Abundant on the heaths.

L. Argiolus.—One specimen only; July.

Nemeobius Lucina.—A few; end of May.

Thanaos Tages, Hesperia Sylvanus and Linea.—All very common.

Moths, either on the wing or at sugar, were conspicuous by their absence. Whether owing to unfavourable weather, or to a scarcity of insects, or to a combination of both, it is certain that very little was seen on the wing after dusk. *Diphthera Orion* had been taken plentifully in June; and *Thyatira Batis* and *Dersa* were common; but more than once had we to leave the sugar without having seen a single specimen. The following is a list of the principal moths obtained:—

Lithosia quadra.—Two at rest; two at sugar.

L. aureola and *L. helveola*.—Several.

Calligenia miniata.—Very common.

Euthemonia russula.—A few on the heaths in May.

Liparis monacha.—Common in July.

Nemoria viridata.—About half a dozen stirred out in the daytime; end of May.

Boarmia consortaria and *Tephrosia consonaria*.—Several; end of May.

Ephyra trilinearia.—Several.

Epione advenaria.—Several; end of May.

Cleora lichenaria.—Several.

C. glabraria.—One.

Minoa euphorbiata.—Common.

Pseudopterpna cytisaria.—Common.

Selidosema plumaria.—About forty on the heaths.

Tephrosia biundularia.—Several.

Scotosia undulata.—One.

Melanthia albicillata.—Several.

Thyatira batis and *T. derusa*.—Common; the former in good condition from end of May to end of July.

Acronycta Ligustri, *A. tridens*, *Cymatophora fluctuosa*, *Triphæna fimbria*, and *Acosmetia caliginosa*.—Several.

Anarta Myrtilli, *Hadena Genistæ*, *Euclidia glyphica*, *E. Mi.*, and *Catocala promissa*.—About a dozen of each.

Catocala sponsa.—A few.

Larva-beating was more productive; and, among others, I obtained two *Stauropus Fagi* (both of which have changed to pupæ); besides several of *Notodonta dodonæa*, *Chaonia*, *Dromedarius*, *Dictæoides* and *Camelina*, *Diphthera Orion*, *Acronycta leporina*, *Amphydasis prodromaria*, *Orgyia pudibunda*, *Tephrosia extersaria*, *Boarmia consortaria*, *Tæniocampa miniosa*, &c.

BERNARD COOPER.

Higham Hill, Walthamstow.

Entomological Notes, Captures, &c.

Variety of Lycæna Phlæas.—In August, 1873, I obtained a very good specimen of the pale variety of *Lycæna Phlæas*. All those portions of the wings which are usually red were a light cream-colour on the upper side; the under side is a

dull stone-colour, instead of reddish brown as in the type, which it resembles, however, in all other respects, as far as I have observed. Is this variety of common occurrence? It is mentioned in Newman's 'British Butterflies,' but is the first specimen I have ever seen myself, nor have I seen a report of its capture lately. I may add the insect was taken by my brother in a lane near Chatteris.—*A. Harold Ruston; Aylesby House, Chatteris, February 17, 1875.*

Eupithecia Knautiata.—Perhaps you will allow me to make a few remarks on the *Eupithecia* which Mr. Gregson proposes to call *Knautiata*. In the first place I would point out that Mr. Gregson seems to have entirely overlooked Mr. Johnson's letter published in the 'Entomologist' for January (*Entom.* viii. 22); and to me the information this gentleman gives seems most important. He says, "that in former years heath grew abundantly at Bull's Hill." Now Mr. Gregson says that he has only found *Knautiata* at Bull's Hill, where at the present time there is no heath whatever; but at the other localities (Hawkshead, Witherslack, and Formby Moss), which he has visited, both the heath and *Knautia arvensis* were growing together; and on the heath only he found the *Eupithecia minutata*. From the above facts I gather that in former years both the heath and *K. arvensis* grew together at Bull's Hill (as well as at the other localities); but from causes, which Mr. Johnson explains, the heath was gradually exterminated, whereas, apparently, the *Eupithecia* was not, and, as its usual food failed, it took to *K. arvensis*; and hence the slight difference in appearance of both larva and imago. In the second place, as regards the difference in colour, I imagine this would be nothing more than natural from the change in food. In fact, in the colour of the larvæ of many *Eupitheciæ* there is scarcely any characteristic difference at all; and from my experience (although I have not bred them in hundreds or thousands) the chief agency in affecting their colour is their food. With regard to such characters as "stout," "thick," "stumpy," "short," &c., they can have but little value, unless the respective larvæ are compared at the same age. As far as I can judge, at present, I think *Knautiata* nothing more than a variety of *Minutata*; but if anyone will take the trouble to procure some eggs of *Knautiata* and feed the

larvæ up entirely on heath, and also some eggs of the usual form of *Minutata* and feed them entirely on *K. arvensis*, we should, no doubt, arrive at a satisfactory result.—*George W. Bird; The Dartons, Dartford, Kent, February 23, 1875.*

Sugaring for Moths.—I have often searched and enquired as to *time* with regard to sugaring. In Greene's 'Insect-Hunter's Companion,' and in Knaggs' 'Lepidopterist's Guide,' are ample and excellent directions as to modes of mixing and exposing sugar. As to time of day, I find only the following notice in the latter, at p. 93:—"Many leave their sugared trees for home at too early an hour; it should be remembered that some species fly at one hour, others at another, and that a succession of visitors arrive from dusk to dawn." As I have a service at 8.15 A.M., nearly a mile from home, I seldom visit my trees after 11 P.M. My plan is to sugar just before dusk, and to visit the trees, which are about five minutes' walk from my house, every hour up to 9 P.M. I seldom find anything later than this; but I was once rewarded at 10 P.M. by two fine specimens of *Cirrhædia xerampelina*. I have never met with any information as to time of year. During the last four years I have tried all periods, from January 1st to December 31st, and have come to the conclusion that, in this locality at least, it does not pay to sugar before August 15th or after November 30th. Last year sugar was unproductive; but a collector near here took many sugar-insects, if I may call them so, on ripe blackberries at night. I have not tried this plan myself, but if as effective as sugar it is certainly cheaper. I find few specimens after the moon has risen; very few, moon or no moon, if the wind is from the east, north-east, or north. My trees are on the south side of a wood of some extent. The greatest abundance occurs on dark, damp, warm, and showery nights, when there is a stiffish breeze from the south or south-west; only few if the night is calm, unless the weather is thundery. The trees should be visited every night, if possible, but need not be sugared oftener than every other night. Most likely there will be but few specimens until after the first week.—[*Rev.*] *Thomas E. Crallan; Hayward's Heath, March 4, 1875.*

[I shall be extremely obliged to my kind friend Mr. Doubleday if he will give entomologists the benefit of his

long experience in this branch of insect-collecting, which he not merely originated, but brought to perfection.—*Edward Newman.*]

Emmelesia unifasciata at West Wickham.—I took a single specimen of *Emmelesia unifasciata* at light, at West Wickham, on the 14th August last (1874). This is, I believe, a new locality for this scarce species, though it has been before recorded from Forest Hill, and lately by Mr. Marshall (*Entom.* vii. 209) from Cheltenham.—*W. A. Forbes*; 35, *S. Castle Street, Edinburgh.*

Rare Lepidoptera near Limerick.—Amongst my captures last season have been *Lobophora hexapterata*, *Eurymene dolobraria*, *Nonagria Typhæ*, *Sarrothripa Revayana*, *P. potentillana*, and *Gelechia cinerella*; and also the insects which you determined to be *Camptogamma fluviala* and *Oporabia filigrammaria*. Mrs. Battersby may be interested to know that I took six specimens of *Sarrothripa Revayana*, and could have taken more, but was not aware of its rarity as an Irish insect.—*William Talbot*; *Tarbert, Limerick, March 10, 1875.*

Name of Insect.—In a letter received from my friend Mr. Francis Smith, R.N., of H.M.S. "Repulse," he tells me that at Payta, in Peru, he captured a very queer-looking, wingless bee, and asks me if I can tell him what it is. As I am quite unable to do so I shall be very glad if any entomologist will kindly reply in the pages of this periodical. Here is Mr. Smith's description of it:—"A most curious insect, resembling a bee in all respects, but entirely devoid of wings or any traces of them. It is extremely rapid in its movements on the ground, running, when chased, under loose stones, &c. At first I had the idea I had captured some sort of spider. It has a *long sting*. Colour bright metallic-red, and in size about as large as a small bluebottle." The italics are mine, for does not the "long sting" seem to suggest this creature may belong to the Ichneumonidæ, and the so-called sting be its ovipositor?—*Gervase F. Mathew*; *H.M.S. "Britannia," Dartmouth, March 17, 1875.*

[Will Mr. F. Smith, of the British Museum, kindly reply? No one else is so capable.—*Edward Newman.*]

The Bignell Beating-tray.—As my entomological friends have designated this little apparatus by the above name, and

as my friend G. F. Mathew, R.N., has named it in the 'Entomologist' (Entom. viii. 14), and having had numerous enquiries about it and its construction, I will give the entomological world drawings and description of it. Fig. 1—

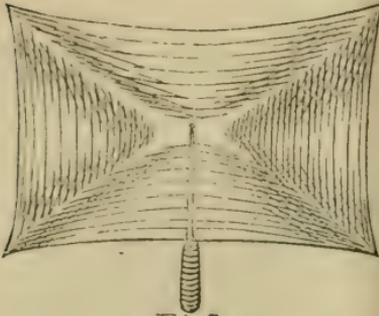


Fig 1.

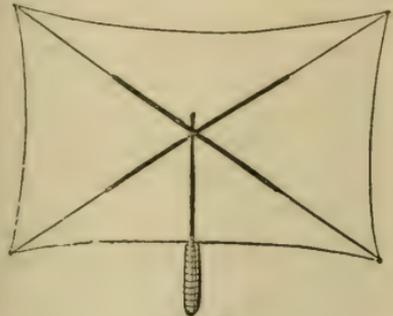


Fig 2.

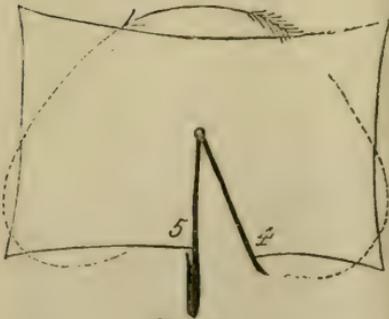


Fig 3.

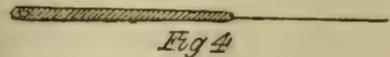


Fig 4

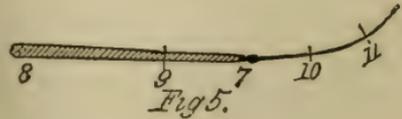


Fig 5.

showing it opened and ready for use. Fig. 2—the reverse side. Fig. 3—partly opened; 4 is to be brought over to 5, and fixed under the notch in handle; to close it, 4 is to be brought to 5 in the direction of the arrow. Figs. 4, 5—ribs. The size of the tray I use is four feet six inches long and three feet wide, and covered with black calico; experience has taught me that black is the best, having tried all colours. The rib, thirty-five and a half inches long, is made in two parts,—ash, twenty-two inches, and cane, thirteen and a half inches; the object in having part wood is to keep that portion stiff, and the cane is to make the necessary curve to form the tray; the cane is fastened to the wood by a brass hinge, over

which is passed a taper ferrule; the other end of the wood is covered with a small ferrule, about one inch in length, with a hole through it, 8, figs. 4, 5: a hole in the handle the same way. A stout piece of wire is passed through the whole and rivetted up tight; the calico is fastened to the frame-work at 8, 9, 10, 11 (fig. 5); 11 is a piece of tape sown on, about five inches long, to receive the point of the cane, and a false hem is made to receive the handle at 4, 5 (fig. 3). The handle, twenty-five inches for the longest and twenty inches for the shortest, 4 (fig. 3). From the above description I think anyone can make it.—*G. C. Bignell*; 6, *Clarence Place, Stonehouse, Plymouth, January 18, 1875.*

Lepismodes inquilinus.—In connection with the new *Lepisma*, reported to have been exhibited by Mr. F. H. Ward at a recent meeting of the Entomological Society of London, I would take the liberty of asking whether the insect may not be that kitchen pest which I described in the 'Zoologist' for 1863 under the above name? The genus *Lepismodes* differs from *Lepisma* in having a delicate lateral fringe all round the body, and in wanting the silvery scales, which are so familiar to microscopists as test-objects.—*Edward Newman.*

Answers to Correspondents.

Arthur Rydon.—*Forcing the Emergence of Lepidoptera from the Chrysalis, and difficulty of procuring Food for the Young Larvæ when Hatched.*—I have lately been rearing moths by putting the pupæ in a hothouse. The day before yesterday two pale tussocks emerged, and to-day I killed them, thinking both were males; but, on examination, I found one was a female, and had laid several eggs. What I wish to know is when would these eggs emerge (not-being kept in a hothouse), and what ought I to feed them on? I have also some lime-hawks and puss, duke of Burgundy fritillaries, privets, poplars, buff-tips, and spotted elephants. Can I get eggs from these, and could I rear them if I was very careful?

[If moths are compelled by any artificial process to emerge at any other than a natural and proper season, it follows as a

matter of course that should eggs be procured from them, these also must hatch at an unnatural and unseasonable period of the year: there will be no possibility of obtaining proper food for them, and they will inevitably perish from starvation.—*Edward Newman.*]

R. J. S.—I enclose an insect, which I shall be glad if you will name for me. I am undecided whether it is *Phibalapteryx lignata* or *Eubolia lineolata*. The lines on the hind wings are very different to those of either of the above, as figured in Newman's 'British Moths.' This moth was taken on the top of a hill, in the neighbourhood of Portsea, about the middle of February.

[The insect is *Eubolia lineolata*.—*Edward Newman.*]

H. C. Hodges.—I regret that I am unable to give the title of a book on British Pyralides and Tortrices, excepting Stainton, with which you are already acquainted. I am not likely to write any more books on Natural History,—certainly none on Pyralides and Tortrices. I quite understand the difficulty of getting correct names, but it is scarcely reasonable to give our Lepidopterists the trouble of naming common insects, although many would kindly give an opinion on a few rare or critical insects.—*Edward Newman.*

Charles Mann.—*English Entomological Correspondent desired for Wisconsin, U. S.*—I am corresponding secretary of the Natural History Society of Wisconsin, and as such am trying to open a correspondence with entomologists in different parts of the world, who would be willing to exchange for specimens collected here, those they may be able to collect for us. Beetles and many other insects might be sent moist, as they come from the alcohol, in a tin box, or perhaps a wooden one. Butterflies could be folded in stiff paper, with folded wings. I should be glad of the addresses of collectors in some of the English colonies or other distant places, and one or two collectors in England. I should also like a correspondent in England who would give me coins for insects or valuable minerals, or perhaps even prepared skins of our native birds. It is in the interests of science that I venture to address you, and it is on that plea that I hope it will receive your attention.

[As the 'Entomologist' circulates in every part of the world, it will be the better plan for naturalists, who seek such

correspondence and exchange, to correspond directly with Mr. Mann, without the intervention or assistance of any third person.—*Edward Newman.*]

Death of Dr. Gray.—John Edward Gray, for fifty years an active officer of the Zoological Department of the British Museum, from which Institution he retired only in last December, succumbed to the inclemency of an English spring on Sunday the 7th of the present month (March) having just completed his seventy-fifth year. He was the son of Samuel Frederick Gray, who acquired considerable notoriety as a botanist from his having been the first to introduce Jussieu's classification of plants into this country, in a work intituled "The Natural Arrangement of British Plants," Dr. Gray himself strongly advocating the new system. The reception of the work was not altogether favourable, for at that time there was a very prevalent feeling, especially in the Linnean Society, against the introduction into the Science of Botany of any other than the sexual and numerical classification promulgated by Linneus. It was probably under these circumstances that Dr. Gray turned his attention more exclusively to Zoology, and in 1824, through the influence of the late John George Children, he was appointed an assistant in the Zoological Department of the British Museum; and in 1840, on the retirement of Mr. Children, he succeeded to the post of Keeper of the Zoological collection to that establishment.

Few naturalists now living will recollect the meagre state of this collection when Dr. Gray's services were first acquired; but those who, like myself, can look thus far back into the past, will bear willing testimony to the vast improvements which took place under his auspices: his labours were energetic and unremitting, and he eventually succeeded in obtaining for our national collection a reputation second to none in Europe. And here it must be observed that this eminent success is not to be attributed *solely* to Dr. Gray's incessant zeal in advocating the purchase by the trustees of collections made by our fellow-countrymen and others in all parts of the world: seeing that whenever he experienced a difficulty in obtaining the necessary supplies from Parliamentary grants,

he did not hesitate to apply his own income to the acquisition of a specimen or a collection which he considered it important that the nation should possess. Indeed the growth of the collection under so liberal a *régime* outran the means of accommodation, and the crowded state of the shelves soon tended in some degree to preclude the careful examination of the multitudinous objects assembled.

The task of describing and cataloguing these vast collections followed as a matter of course. This was a most Herculean labour, and one that could not be accomplished single-handed. Dr. Gray therefore engaged the assistance and co-operation of the most advanced zoologists in every department of the Science. Thus, through his instrumentality, we have *eight* catalogues of sucklers, *three* of sucklers and birds together, *nine* of birds, *six* of reptiles, and *twelve* of fishes. It is, however, in entomology that he has rendered the greatest service to Science, having issued *nine* catalogues of Coleoptera, *five* of Orthoptera, *five* of Neuroptera, *ten* of Hemiptera, *forty-one* of Lepidoptera, *seven* of Diptera, and *three* of Crustacea. In addition to these we have *sixteen* catalogues or lists of Molluscous, and four of Radiate animals. Again, we have a series of *twenty* catalogues of exclusively British animals; thus by separating the British from the general collections, the English student has the opportunity of acquiring with less labour a knowledge of the natural productions of his own country. This simple enumeration of catalogues exhibits more clearly than can be done by any words of mine, what Dr. Gray accomplished on behalf of Natural History in our country, but these catalogues by no means comprise the whole of his most useful labours in this direction. In the "*Spicelegia Zoologica*" he published original figures and short systematic descriptions of new and previously unfigured animals, and these were continued in the "*Zoological Miscellany*," a serial having the same style and objects. He also contributed the natural history portion of the voyages of the "*Erebus and Terror*," only lately completed. Of his various minor papers the list alone, published in 1852, occupies twenty pages in the "*Bibliographia Zoologiæ*;" and the Catalogue of the Royal Society enumerates no less than four hundred and ninety-seven papers from his ever-active pen.

Dr. Gray's descriptions are almost entirely confined to the exterior; it seemed his especial aim to seize on those differences which are the most obvious, and would be the first to be noticed by the student when he begins to turn his attention to the examination of species; and in that department he was successful and lucid. It was perhaps my misfortune to differ from him in his view of the paramount value of superficial character, believing, as I do, that we should first associate those animals which agree in intimate, internal, and physiological characters, and only utilize differences of the exterior or extremities in the smaller groups as of genera or species. As an instance of the tendency I have mentioned, I believe that Dr. Gray to the last persisted in treating the marsupial animals as a section of the *Feræ*, or beasts of prey, whilst others have considered these wonderful creatures as forming a series equally important with the placental series, and in many instances parallel therewith. In this view of the primary importance of the marsupial character I always concurred, and hence it was my misfortune to differ from one whose knowledge and industry had placed him at the very head of the Science. It seems desirable to add that in the expression of this view as to the comparatively minor importance of the marsupial character, Dr. Gray is supported by the published works of six eminent zoologists enumerated by Mr. Waterhouse in his *Natural History of "Marsupialia, or Pouched Animals:"* these are Storr, Illiger, Frederic Cuvier, Bennett, Swainson, and Ogilby. In the work to which I have alluded Mr. Waterhouse has expressed an opinion opposed to that of the eminent zoologists I have mentioned, but in exact accordance with my own. As a noteworthy exception to the propensity to avail himself of external characters in his descriptions, I am delighted to invite attention to the use which Dr. Gray made of the skull in some of his most valuable contributions to Zoology. I would particularly mention three very recent instances. The first appears in the '*Zoologist*' for December, 1872, and is intitled "The Seals that permanently reside in or occasionally visit the British Islands" (S. S. 3333). The second is in the same journal for January and continued in March, 1873, and intitled "A Catalogue of the Whales and Dolphins inhabiting or incidentally visiting the seas surrounding the British

Islands" (S. S. 3357 and S. S. 3421): and the *third*, which exceeds both the others in permanent value and in richness of illustration (being accompanied by excellent figures of no less than forty-two skulls) is published as a separate volume intitled "Hand-list of the Edentate, Thickskinned, and Ruminant Mammals in the British Museum": it is dated 1873. These, the latest of Dr. Gray's labours—and it may truly be said of them *Finis coronat opus*—are wonderful examples of vigour of mind and energy of purpose, enduring to the very close of life.

In his domestic relations Dr. Gray was peculiarly happy: in 1826 he married Emma Maria Gray, the widow of a cousin, and a lady equally remarkable for her amiable disposition, her numerous accomplishments, and for the cordial and indefatigable assistance she rendered to her husband in his scientific pursuits. As an artist her faithful delineation of molluscous animals for the use of students, is above all praise. Few naturalists had previously ventured beyond the shell, and I am old enough to recollect the time when to prefer the anatomical details of the somewhat uninviting *animal* to its elegantly formed and often brilliantly coloured *dwelling*, would have been considered an indication of the worst possible taste. Mrs. Gray thought otherwise, and her judgment has been accepted by all who have followed her in the study of these little-known objects. Her admirable drawings were of infinite assistance to her husband.

The mortal remains of the naturalist were interred at Lewis-ham old church on Saturday the 13th of March. The funeral rites were performed in the simplest and most unostentatious manner. A plain hearse conveyed the coffin, and was followed by two private carriages containing the mourners, who were few in number, and confined to the immediate relatives of the deceased and one or two of his most intimate friends. By Dr. Gray's emphatic and repeated request no mourning coaches were employed. Dr. Günther, Mr. Frederick Smith, Mr. Busk, together with Dr. Gray's two old Museum attendants, Mr. Gerrard and Mr. J. Saunders, stood round the grave, and thus paid the last tribute of respect to one of the greatest zoologists that this country has ever produced.—*Edward Newman.*

THE ENTOMOLOGIST.

No. 142.]

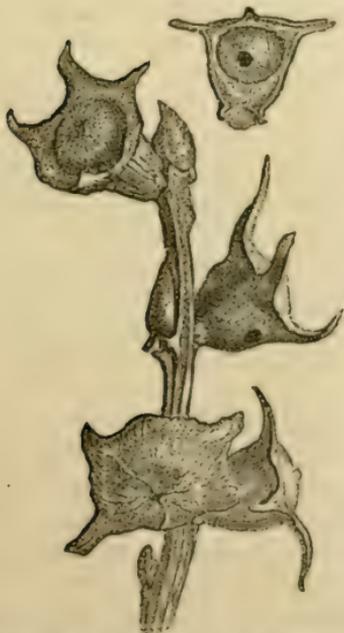
MAY, MDCCCLXXV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER née WEISE.

(Continued from p. 76.)

Fig. 23.



CYNIPS POLYCERA (and in section).

Fig. 23 a.



Id. var. SUBTERRANEA.

23. *Cynips polycera*, Gir.—This gall is found in the axils of the leaves of shrubby specimens of *Quercus pubescens*, rarely on *Q. sessiliflora* and *Q. pedunculata*. In the centre it measures one centimetre in length, and is of an inverted conical shape.

The blunt point of the cone by which it is attached to the twig is somewhat flattened; the base of the cone, *viz.* the upper end of the gall, forms an almost circular, flat disk, in the centre of which there is often found a small excrescence. This disk is one centimetre in diameter, and has a well-defined border, often quite sharp; on this border there are generally several projections pointing outwards, and terminating in a sharpish point. At first the gall is green, but later turns to a yellowish brown. In the section beneath the disk there is a large, spherical inner gall, coarsely striated, thick-walled, and hard, which touches the moderately hard gall-substance on all sides, but is not joined to it. If that part of the gall near the twig (just below the inner gall) contains parasitic larvæ, then the gall assumes a cylindrical shape, as the parasites occasion a swelling in the lower part of the gall. In most cases the development of the *Cynips* larva is not disturbed by the *Synergus* larva, so that the gall-maker and the parasite may be bred from the same gall. I found the *Cynips* quite mature in the first half of October, while the gall was still green; but, according to my observations, it does not emerge till the end of October or the beginning of November. *Cynips subterranea*, *Gir.*, certainly belongs to this species, as Dr. Giraud tells me that this gall is only a modified form of *C. polycera*. The specimens which I have received from him differ from *C. polycera* in their smaller size, and by their being attached to under-ground twigs, or those which are more or less covered with moss or leaves.—*G. L. Mayr.*

This remarkable gall was first figured by Malpighi ('Opera Omnia,' i. 123, fig. 50), but was not noticed from his time till Giraud described the insect and gall anew in 1859 (*Verh. d. zool.-botan. Ges. ix. 340*). Neither this species nor the preceding have occurred in Britain. *Synergus melanopus*, *S. pallicornis*, and *Ceroptres arator*, are its inquilines, all appearing in April and May of the second year. *Callimome regius* and *Megastigmus dorsalis* are probably both parasitic on the gall-maker. Dr. Mayr notices the interesting fact that the position of the *Synergus* does not interfere with the gall-maker: this is contrary to the history of the greater number of galls, as in most cases the inquilines (*Synergi*) cause the death of the *Cynips*, either by its

imprisonment or by abstracting the vegetal substance which serves for its support. In our common marble, or Devonshire, gall, produced by *Cynips Kollari*, both cases occur, (1) the inquilines living gregariously round the inner gall and so destroying the *Cynips*, or (2) the inquiline living singly in a small cell in the parenchyma, generally near the petiole or base of the gall: when this is the case the *Synergus* and *Cynips* may be bred from the same gall. Which particular species of *Synergus* this refers to I believe has not been satisfactorily determined, but our knowledge of the economy of the different insects inhabiting galls is very unsatisfactory at present.—*E. A. Fitch.*

24. *Cynips caliciformis*, Gir.—The spherical, pea-sized gall of this species is found in the axils of the leaves of *Quercus pubescens*, rarely in those of *Q. sessiliflora* or *Q. pedunculata*. Its brown (at first green) surface is beautifully faceted and closely covered with very short hairs, somewhat in the form of scales. Each facet is either convex or nearly flat, and has in its centre a small shining, generally hairless, papilla. The section shows this layer of bark to be thin and united with the large, moderately thick-walled inner gall. The gall is not deciduous. I have not yet been able to obtain the gall-maker.—*G. L. Mayr.*

This species is very rare on the Continent, and has not been found in Britain. *Synergus melanopus*, *S. Reinhardi*, and *Ceroptres arator*, occur in its gall.—*E. A. Fitch.*

Fig. 24.



CYNIPS CALICIFORMIS
(and in section).

Doings at Sallows. By G. F. MATHEW, Esq., R.N., F.L.S.

WRITING to several of my entomological correspondents lately, I have complained bitterly of the absence of sallows within easy reach of Dartmouth, for the few bushes I then knew of were either so tall or surrounded by such a mass of brushwood as to be entirely inaccessible. I have since,

however, had reason to change my opinion, for on the 25th of last month, while travelling from Dartmouth to Torquay, I observed a small bush in profuse bloom growing by the edge of a wood on the banks of the Dart, and no great way from Dartmouth. The following afternoon I landed on the railway just abreast the ship, and walked up the line to have a look at the bush by daylight, and clear away any undergrowth that might be in the way. On the road I discovered another rather stunted bush growing in a small clearing in a dense wood of young oaks, and quite easy to get at. It looked perfection, as the flowers were very thick, just open, and of the brightest yellow, while the surrounding air was loaded with their rich perfume, and bees innumerable were feasting to their hearts' content. I felt certain that if the *Taniocampæ* were well out, this bush would prove very attractive, and I should reap a rich harvest in the evening.

I then walked on to the other bush, which was on a steep, rough slope, just outside a wood, and I found thick brambles beneath it; but these I managed to clear away with a large pocket-knife. This bush was not so thickly covered with flowers as the other, but still there were plenty on it, and its situation was good.

The afternoon was soft and bright, with a gentle breeze from the west, and *Tortricodes hyemana* was flying merrily among the oak scrub, while *Cicindela campestris* disported itself on the dry banks. On palings *Xylocampa lithoriza* was unusually common, and I captured no less than fourteen fine specimens, and might have taken more had I wished to do so. They generally repose somewhere where the surrounding hue harmonizes so completely with their own markings that they are exceedingly difficult to see, and it requires a good eye and some practice to detect them, although occasionally I have taken them at rest on black-painted palings, where of course they were very conspicuous; but I have always fancied these must have been individuals whose faculties had been overcome by the previous evening's dissipation.

After dinner, at half-past seven, I left the ship again for the shallows. By this time the weather had changed, a thick fog having rolled in from the sea; but as it was still very mild, with scarcely a breath of wind blowing, I considered it

a favourable night, for these damp, warm evenings are invariably the best. On reaching the first sallow (the one growing in the small clearing in the oak wood), lighting my lantern, and throwing its gleams on the bush, a sight met my gaze which I have never before experienced during the whole course of my entomological career. The blossoms were actually swarming with moths, and hundreds of others fluttered round struggling for a meal! On nearly every flower there were at least three moths; and the fresh arrivals, crowding on to those who had already partaken too freely, dislodged them, and they fell helplessly to the ground below, but appeared soon to recover, for I noticed them in numbers crawling up the branches in quest of another meal. This host of moths was composed chiefly of *Taniocampa cruda*, although *T. miniosa*, *T. munda*, *T. rubricosa*, *T. gothica*, and *T. stabilis*, were present; besides *Hopporina croceago*, *Xylocampa lithoriza*, *Cerastis Vaccinii*, *Eupithecia abbreviata*, *E. exigua*, *E. pumilata*, and *Hybernia progemma*. I took one of Mr. Bignell's beating-trays with me (not the patent improved pattern, described in the last number of the 'Entomologist,' p. 89); but having forgotten the tin-holder for the outriggers and handle it was, comparatively speaking, useless, although I used it, after a fashion, as a small sheet. Upon beating the bush the effect was perfectly marvellous, the sheet and ground around it being literally covered with moths; and in addition to this a plentiful supply of them were deposited on my head, shoulders, &c. As soon as they began to recover they flew in such crowds round my lantern as almost to obscure it, and once or twice they actually succeeded in getting inside, through the ventilating aperture at the top, and extinguished the light.

Bats were in great force, and so bold that they often took moths from the flowers right under my nose; and once or twice I fancy, from the vibrations of their wings close to my ears, that they must have selected a victim from my hat or shoulders.

Coleoptera were represented by numerous specimens of *Dryops femorata*, a species which, I believe, was formerly considered rare. Hymenoptera were not absent, for *Bombus terrestris*, too lazy or too tipsy to return home, had taken up its quarters for the night, deeply and snugly buried amidst the downy anthers of the flowers.

Several *Tæniocampa cruda* fell on to my sheet in the clutches of a pallid-hued spider; and on a log of wood lying on the ground I saw a centipede busily occupied sucking the juices of another, which it had doubtless captured while it was in a state of unconsciousness.

I reached the ship again at eleven o'clock, well pleased with my evening's captures; and by that time the fog had cleared away and the stars shone out brightly.

The next evening (the 27th) it was bright and mild, but with a strong breeze from the north-west; but as I intended to leave Dartmouth the following day, and should be away for a week or ten days, I thought I had better pay another visit to the shallows, as they would probably be *passé* by the time I returned. I found *Tæniocampa cruda* just as abundant as on the previous evening, and *T. miniosa* had considerably increased in numbers; but they were nearly all males, for out of twenty-eight I boxed, only two belonged to the opposite sex. I have noticed this is generally the case with *Tæniocampæ*. *Hoporina croceago* and *Tæniocampa munda* put in an appearance again; but my grandest capture for the evening was a fine *Dasycampa rubiginea*.

The result of the two evenings was as follows:—

Dasycampa rubiginea.—One female.

Hoporina croceago.—Eight females and one male.

Tæniocampa miniosa.—Twenty-eight males and two females. Could have taken many more of this species had I wished.

T. munda.—Three males; evidently only just coming out.

Xylina rhizolitha.—Two females.

Tæniocampa rubricosa, *T. gothica*, *T. stabilis*, and *Cerastis Vaccinii*.—Common.

Xylocampa lithoriza.—Several very dark varieties.

Eupithecia abbreviata, *E. exiguata*, *E. pumilata*, *Hybernia progemmaria*, *Tortricodes hyemana*, and *Diurnea jagella*.—Several.

Tæniocampa cruda.—In prodigious numbers, and I selected several varieties.

Of the above *Hoporina croceago*, *Xylina rhizolitha*, *Tæniocampa rubricosa*, *T. gothica*, and *Xylocampa lithoriza*, have been good enough to supply me with eggs; and I hope on my return to H.M.S. "Britannia," at Dartmouth, I shall find

that *Dasycompa rubiginea* has done so also. But I may as well observe here, to prevent disappointment or the trouble of correspondence, that any duplicate eggs I may have of the above are all promised. It is strange that *Tæniocampa instabilis*, which is supposed to be "generally common and distributed," did not appear. Perhaps I shall see it later on in the season.

GERVASE F. MATHEW.

Instow, North Devon,
April 8, 1875.

Collecting as it was, and as it now is. By H. R. Cox, Esq.

COLLECTING is at present carried on very differently from how it was fifteen or twenty years ago. It is now much harder work than it was then, owing to the great number there are in the field. So far so good; but (which is much to be lamented) the good old free spirit of collecting is rarely to be found. Years ago, when a few entomologists started on a day's ruralizing, what unbiassed delight was experienced and evinced by us all! We started at early morn, intent on one object,—a day's thorough and innocent enjoyment. If one of our number captured a rarity we *all* were pleased; how we congratulated him, and loved to admire his specimen! If the rest of us were unfortunate there was no grumbling, no unpleasant exhibition of the "green-eyed monster;" there were no insinuations of Mr. Dealer So-and-so having that season imported a few gross of continental pupæ, and of having placed them in the woods for development, with a view to "making" them "British."

The object was, then, principally a day's innocent pleasure, and not so much with a view to amassing a large number of specimens in the shortest possible time. We want some of that collecting spirit now, for the *pleasure* of entomological rambles is comparatively little sought after; it is, "Who has the largest collection?" And much to the disgrace to many of our time, if collectors cannot get their coveted specimens by honest exertions, they will cheat in exchanging (or "bartering," as one of our best Lepidopterists facetiously termed it); or else procure foreign specimens, and insert them as British. Shame on these collectors; their originally

pure pursuit is getting more dishonest than English horse-dealing.

A proof of the deterioration of the manners of most of our collectors is that they are now generally considered, by the non-entomological public, as persons of questionable character. A gentleman, maybe perhaps one of large independent property, or perhaps a "reverend divine," is staying with his family at a village; ere he exhibits his deadly weapons he is considered quite *comme il faut*, but let him once show his amusement he is immediately dubbed as "only a fly-catcher;" he is snubbed by the world in general, and looked at by all as some one to be carefully avoided. This is no mere conjecture, as I have repeatedly of late noticed it in various parts of England.

While collecting last year, in the Hampshire woods, I came across a dealer that I well knew. On showing him my night's total captures at sugar, Mr. Z. remarked, with an indescribably sly chuckle: "Oh, yes! Ah! He, he! but the *other* box;" insinuating that I had another private fuller box in my pocket. This is not said against the *dealers*; by no means; but merely to show what little faith they now have in the word of amateurs, so much dissembling and deceit are there among them.

I knew a gentleman, of considerable standing in the entomological world, who succeeded in obtaining from a boy a somewhat mutilated specimen of a very rare butterfly; it was caught at the end of the gentleman's garden. On exhibiting it at one of our entomological meetings, a whisper was immediately started insinuating that it was very much like an imported German specimen; this remark soon developed itself in quiet corners into "decidedly German!" All this shows there is in the present day much deception among collectors.

Those who may chance to read these few hasty remarks will perhaps say: "What is the *use* of thus complaining?" To which I reply: "Can we not start a new clique of collectors, who, throwing aside all contamination they may have imbibed from the modern school, will follow the Science in its original and pure manner, arrange their gatherings for a day's sport, and collect or exchange in the style of the 'good old times?'"

H. RAMSAY COX.

Entomological Notes, Captures, &c.

Notes from Witherslack, near Grange.—In January last, tired of the monotony of winter, I took my bag and a few implements of the craft and started for Witherslack. At the worst period of the year, and in miserable weather, little could be done in Entomology; yet a fair quantity of the larvæ of *Psychoides verhuellella*, feeding in *A. Ruta-muraria* on the face of the rock opposite the inn, some *Lithocolletes* spun-up in oak leaves, a few chrysalides from under moss on trees, and a sackful of dead leaves of various species, will no doubt reward the expedition later on in the year. This plan of collecting large quantities of leaves, and keeping them until at least midsummer, will be found to repay a trial, especially by a Micro-Lepidopterist,—*Nepticulæ*, *Lithocolletes*, *Incurvariæ*, and plenty of hibernating larvæ, being secured, which could not otherwise be easily obtained. The months of January and July, in Witherslack, present indeed a marked contrast; in the latter, everything that could be desired by artist, botanist, or entomologist. Rich in insects, plants, and scenery, the lover of Nature, having once rambled through the woods of Ulpha, basked in the afternoon sun in the "Plantation," or climbed the steep of Whitbarrow, must indeed be fastidious if dissatisfied. But especially is this the Paradise of the Micro-Lepidopterist, the various nature of the soil and rocks favouring the growth of the most diverse species of plants, and the broken character of the district affording sheltered places for research in the most unfavourable weather. Small plantations of oak, birch, mountain-ash, sallow, buckthorn, and various kinds of fir, break the monotony of a large expanse of peat, covered with heather and *Myrica Gale*, over which rise at intervals little hills of limestone, with plants peculiar to themselves, and affording a distant prospect of Morecambe Bay. Recollections of the happy hours passed here with a friend, and hopes for the coming future on the ground so well known, yet so exhaustless, made my trip as pleasant as according to general opinion it would be disagreeable. Later on in the season I hope to be able to send a few remarks on the Lepidoptera of this district, not confining myself to the captures of any particular year, but including the total results of many an

expedition. In this Mr. Hodgkinson, who has taken so many species in this locality, and has made it his head-quarters, has promised to assist; and by far the greater share of information will be due to the patience and perseverance he for so many years has shown in the pursuit of Entomology. *J. H. Threlfall*; 17, Ribblesdale Place, Preston.

New Forest Insects (Entom. viii. 84).—I was surprised in reading Mr. B. Cooper's interesting list of New Forest captures in 1874 to notice that he speaks of the scarcity in that year of certain species. I will not trouble your readers with a list of my captures, as it would nearly be a repetition of Mr. Cooper's, but will merely say I found *Leucophasia Sinapis* decidedly common, and not so local as in most seasons. I easily captured two dozen specimens in an hour. I find the nearly white variety equally common in both broods. *Limenitis Sibylla*, though pretty common, was not nearly so plentiful as in the year 1869, when it swarmed in every wood here. *Lycæna Argiolus* was pretty common; I took twenty-six specimens; and of *Nemeobius Lucina* about twenty. The "new enclosure" is a somewhat vague term, as there are so many new ones. I have observed that in whatever direction one is collecting, the "natives," in giving instructions, invariably mention a "new enclosure." The "natives" are getting so entomological here that they can nearly always tell what species one is searching for, *i.e.* when they know the particular locality the "fly-ketcher" is going to: they always encourage the collector by telling him, "You'll ketch *he* there." I noticed *Colias Edusa* and *C. Hyale* within half a mile of Lyndhurst in 1869, but have not seen either species since.—*H. Ramsay Cox*; Lyndhurst.

Sugaring for Moths (Entom. viii. 88).—I do not know that I can give Mr. Crallan much information, that will be new to him, about sugaring trees for moths, but, in the first place, I may say that there is always some uncertainty attending it, moths being frequently very abundant one night, while on another, apparently equally favourable, scarcely any will be seen. The sugar should always be applied to the trees before sunset, and, when practicable, it should be put on warm, as the scent is much more powerful than when it is applied cold. The greatest number of moths will generally be found about three quarters of an hour after

sunset, and in spring and autumn but few will be found after ten o'clock. Many species visit the sugar about an hour before sunrise in the morning. Sugar is almost useless in the neighbourhood of lime-trees when they are in bloom, and also when there is much honeydew. There is a row of seventeen lime-trees in the field adjoining my garden, and I have sugared the trunks for more than thirty years in every month, except the four winter ones,—November, December, January, and February. Upon these trees I have captured nearly every *Noctua* which occurs in this neighbourhood.—*Henry Doubleday; Epping, April 21, 1875.*

[I am sure entomologists will be much obliged to Mr. Doubleday for these notes. I believe his experience is greater than that of any other entomologist living. I may add, as it is usual for every entomologist to keep a diary of his captures, that the publication of these diaries, or excerpts from them, would be of extreme interest; but they should be prepared in a systematic, and I need not say a careful, manner. I will give an imaginary day:—"May 1st. Wind light, S.S.W. Temperature, 65° Fahr.; inclining to rain. Sugared at Loughton. Captures" The advantages of such diaries can scarcely be estimated too highly: coming from eight or nine hundred localities, not only would they show us the exact range of a species, but would also teach us when to expect it, and under what atmospheric conditions.—*Edward Newman.*]

Description of the Larva of Eubolia peribolata.—The eggs were laid in a chip-box on the 18th September, 1874, and the larvæ left the egg-shells during the first week in October: they fed in *Ulex Europæus* (the common furze), almost exclusively on the blossoms, and after hybernation continued to feed until the end of April, when they had attained their full size; two or three have already spun up between the folds of some muslin in the breeding cage; two of the larvæ are now before me, full fed, yet exhibiting no change of colour or any disposition to spin. The larva rests in a perfectly straight position, but on being touched raises the anterior extremity, arching its back a little; its legs are then directed forwards, and closely appressed together, forming an almost continuous mass with the head. In crawling it makes a very decided arch, bending the body nearly

double. Head prone, slightly narrower than the 2nd segment, into which it is partially received; it is sparingly beset with short, straight hairs. Body robust, more resembling that of a *Leucania* than that of a *Geometer*, a resemblance which is rather increased by its pale colour and longitudinal striping; every part of the body, but especially the anal extremity, bears short, straight, scattered hairs; a raised lateral skin-fold extends the whole length of the body, and the segmental and sectional divisions are clearly defined. Head and body putty-coloured; head with a few darker markings on each cheek, and five black ocelli on each side near the mouth; the space in which these ocelli are placed is paler than the rest of the head; the dorsal surface of the body has three compound stripes extending its entire length; the medio-dorsal is divided longitudinally into three divisions, the middle one of which is composed of a series of wood-brown markings, and these again are resolvable into mere dots; the lateral divisions are pale brown, bordered with a series of darker dots; the side stripes partake of the same triple character, and include the spiracles, which are circular and as black as jet; the ventral surface has a triple median stripe, the middle division of which is single, the external divisions double. I am indebted to Mr. W. A. Luff, of Mansell Street, Guernsey, for a supply of these previously-unknown larvæ. They were forwarded purposely that I might describe them in the 'Entomologist;' and I am much gratified to make this public acknowledgment of Mr. Luff's kindness.—*Edward Newman.*

Eupithecia extensaria taken in Yorkshire.—I received a *Geometra* from Mr. Prest, of York, this morning, which he wished me to name for him if I knew it. It is *Eupithecia extensaria* of Freyer, a very striking and rare species, which, I believe, has never before been captured out of Russia; this specimen is beautifully perfect. I have a male and female in poor condition, which were given to me by the late Julius Lederer, who said it was very rare. Dr. Staudinger has never had it for sale. It is figured by Herrich-Schæffer in his 'Geometræ,' figs. 124, 125: it is a very large species, and quite distinct from any other *Eupithecia*.—*Henry Doubleday; Epping, April 16, 1875.*

[Mr. Prest adds the following information:—"The speci-

men was taken by Mr. Sawyer, late of Hull, but now residing in York. He found it on some waste ground near Hull." Referring to Herrich-Schæffer, p. 122, I find he considers *Extensaria* as synonymous with *Prolongaria* of Zeller, published in the 'Isis' for 1846, p. 198. Guenée is of the same opinion, but adopts the name *Prolongata*. He gives Livonia, Southern Russia, Altai, as the localities where the species occurs. (Uran. et Phal. ii. 336.) I add below Herrich-Schæffer's specific description and Guenée's observations, both of which are interesting. "*Extensaria*, m., Suppl. 124, 125. Large, cinereous, with three simple, narrow, sharp-pointed, whitish fasciæ; the first and second sharply angled before the anterior margin, the third united at the tip of the wing with an undulated line." (H.-S. Geom. p. 122.) "A fine species, which cannot be confounded with any other, whether we regard its size and the very lanceolate form of its fore wings, or their nearly straight white bands on a yellow-gray ground; the first and second elbowed on the subcostal ray; the third forming a letter Y at the costa, whence it unites with the subterminal line, a gray band, acutely pointed at the extremity, intervening between them. The female is smaller than the male, and has still narrower wings. The specimens from Livonia are larger, and have a yellower tint, than those from the Altai." (Guenée, Uran. et Phal. ii. 336.) This is indeed a fine addition to our list of British *Eupitheciæ*, and I most heartily congratulate both Mr. Sawyer and Mr. Prest on the discovery. The latter gentleman has kindly given me more particulars of the locality where it was taken, but wishes me not to publish them at present.—*Edward Newman.*]

Eupithecia minutata Larvæ feeding on *Achillea millefolium*.—Fearing some collectors think that *E. minutata* is entirely a heath-feeder, a few years ago I took three or four larvæ feeding on the flowers of the yarrow, and as they had every appearance of a pug-larva I took very great care of them, in the hope that they might turn out to be a new pug, but to my disappointment they proved to be *E. minutata*. The larva was quite a dirty white colour; not pink, as when feeding on heath. These larvæ were collected nearly a mile from any heath.—*George Baker; 47, Kedleston Street, Derby.*

Description of the Larva of Coremia Quadrifasciata.—The caterpillar is clearly divided into two colours by a line

running from the head to the extremity of the last pair of claspers; the spiracles lie in this line of division. The dorsal space is brown, variegated in shade from a light smoky brown to almost black, by interrupted lines running throughout its length, interspersed with numerous light-coloured blotches; four rows of minute warts run down this space, from each of which a short bristle is emitted. The head is slightly smaller than the 2nd segment, and of two shades of brown. The spiracles are black. The ventral space is of a very light brown, having a tinge of pink, and variegated, like the back, with blotches of a much lighter shade. The caterpillar thickens towards the middle, tapering gradually to each extremity. It assumes the form of an Ionic volute when annoyed. These larvæ were hatched on the 28th July from eggs deposited by a female captured a day or two previously. They have fed at various intervals throughout the winter on *Galium Mollugo*; and moulted for the last time about the middle of March.—[Rev.] *P. H. Jennings; Longfield Rectory, Gravesend, April 13, 1875.*

Leucania unipuncta or *extranea* at *Lyndhurst*.—I have received this morning from a son of Dr. Parker, of Lyndhurst, a fine specimen of *Leucania extranea*, which he says he took there last month. There is something very singular in the occurrence of a few specimens of this species here. Are they imported in any stage? It swarms in America, from Canada to Brazil; and a *Leucania* is also very common in Brazil, which appears but a slight variety of it.—*Henry Doubleday.* (In a letter to E. Newman.)

[The larva of this moth is the formidable "army-worm" of the United States. A great deal of information respecting it will be found in the 'American State Entomologist,' p. 47; reprinted in the 'Entomologist,' v. 91, with an editorial note by myself, stating that it was first described by Haworth, p. 174, under the name of *Noctua unipuncta*, or "white speck." Prior to this there appeared an extract from the 'Liverpool Mercury,' together with an enquiry by my friend Mr. Birchall (*Entom.* iii. 167), and a reply by Mr. Muller (*Id.* iii. 215), who gives several references to its occurrence in Europe, but refers it to the genus *Heliothis* and the species *Armiger*, a mistake both as to genus and species, which had previously appeared in the first volume of the 'Zoological

Record' (1864). The larva of *Heliothis armiger* is only too well known, in the Western States of the Union, under the name of the "fall army-worm," and is thus never confounded with the true army-worm. My readers are further referred to the 'American Entomologist and Botanist,' article "Army-worm," pp. 52, 53, and *Leucania unipuncta*, pp. 106, 111, 328, and 340: some of the information contained in these papers is extremely interesting. I will give extracts:—"In the corner where we saw them thickest, being oppressed with famine behind and our entrenchment in front, they turned on and devoured each other, the larger eating the smaller, and sometimes two making a meal of the same unfortunate. I did not see them kill each other. It may be that the living attacked only those already dead. I saw live ones carrying about dead ones in their jaws, like a pig with an ear of corn, as though to avoid the others, and to enjoy their meal alone. There were a gallon or two of heads left in that corner."—(P. 52.) Again:—"The army-worms are destroying about all the pastures in this vicinity, but confine themselves chiefly to the red-top grass. They have also destroyed considerable corn. I have myself twenty acres of red-top; and unless they stop working upon it inside of two weeks it will be entirely ruined for hay."—(P. 52.) The name of *Leucania unipuncta*, given by Haworth in 1803, is associated with the army-worm, p. 106, and again at p. 111, and still again at p. 340. The name of *Leucania extranea* was given by Guenée in 1852; he makes no reference to Haworth, but observes that it somewhat resembles *Heliothis armiger* and *H. peltiger*; whence probably the error in confounding the two army-worms. I have described it, in error, in 'British Moths,' p. 261, under the later name of *Extranea*, being quite unaware at the time of its identity with *Noctua unipuncta* of Haworth.—*Edward Newman.*]

Agrotis crassa in *Guernsey*.—I have another species to add to our *Guernsey* list, the *Agrotis crassa* of Hübner, two specimens of which I have taken in this island. I sent one of them to Mr. Doubleday, who has kindly returned it with this name.—*W. A. Luff; Mansell Street, Guernsey, April 19, 1875.*

[According to Guenée this species is found in France, Austria, and Germany, in July and August. This profound

Lepidopterist appends to his description the remark that few species have given rise to more confusion than this, which has from different authors received the names of Tritici, Segetum, Testacea, Ravida, and Crassa. He gives the following synonymy and characters of three varieties, forms, or races, which he calls respectively A, B, and C.

“Hb. 152 female, 560 male; Tr. i. 166; God. ii. 236, pl. 67; Gn. Ind. 241; Boisd. 857 = Tritici, W. V. N. 10 (non Lin.) = Segetum, Esp. pl. 60, f. 5 = Testacea (la Testacée), Engr. 448 *b, c* (non *a*) = Ravida (la Rousse), Engr. 446 *b*.

A.

Hb. 151 = Ravida (la Rousse), Engr. 446 *a*.

Male smaller, and notably paler; the sagittiform markings wholly, or almost entirely, wanting. Abdomen lighter. Hind wings pure white.

B.

The female has the fore wings altogether of an intense uniform brown-black, which conceals nearly all the markings, except the median lines; hind wings uniform grayish black. Abdomen entirely without bands.

C.

The female has the fore wings very much powdered with grayish white, especially in the median area; the orbicular and reniform are united at the base; the claviform is very short and indistinct; the disk of the hind wings is pure white.” (Guenée, ‘Noctuelites,’ i. 260.)—*Edward Newman.*]

Blue Butterfly in April.—Thinking it an unusual occurrence, I beg to say that yesterday (April 20th) I saw a blue butterfly, but of what species I cannot say for certain, as I was unable to capture it; but I believe it was Icarus.—*C. Lemesle Adams; Walford Manor, Shrewsbury, April 21, 1875.*

[It is the usual time for *Lycæna Argiolus*, and was probably that species.—*Edward Newman.*]

Scarce Hymenoptera at Norwich in 1874.—It is with great pleasure I record the capture of a fine specimen of a male *Macropis labiata*. This makes the fourth recorded British specimen. It was taken in the beginning of July last. This scarce bee has not been taken since 1842. Also *Didineis lunicornis*, July 2nd; and *Crabro signatus*, June 17th; one male only of each.—*J. B. Bridgman.*

Improved Cyanide Bottle.—Wrap a piece of cyanide, about half an inch square, in blotting-paper, folded two or three times; tie it round with cotton, and fasten it at the bottom of a wide-mouthed bottle with sealing-wax; then warm the bottle gradually over a lamp till the wax melts, and then cork it up. This has answered with me much better than the usual way of covering up with plaster; it also has the advantage of taking only a few minutes to make.—*John B. Bridgman; St. Giles North, Norwich, March 29, 1875.*

Correction of an Error.—I regret to observe than an error has crept into my communication, published in the last number of the 'Entomologist.' At page 82, line 6, "Nephopteryx angustella" is printed for "Æcophora angustella." Your kindly noticing this will, I trust, prevent entomologists searching the trunks of horsechestnut-trees, at Hampstead, for Nephopteryx angustella, which only occurs among spindle.—*Wm. Machin; 22, Argyle Road, Carlton Square, E., April 20, 1875.*

Erratum.—In Mr. Talbot's note (Entom. viii. 89), for "Gelechia cinerella" read "Grapholitha cinerana."

Answers to Correspondents.

N. R. M.—Larvæ Feeding on Turnip-seed.—I should be glad to learn something of the enclosed larvæ, which I found in February feeding on turnip-seed. I have occasionally found them before, but not in such great numbers. In about one pint of seed there must have been more than two hundred larvæ. I should also like to know if they are destructive to wood.

[The larvæ are evidently those of a Micro-Lepidopteron,—white, soft, and enclosed in loose cocoons, in which they are feeding. The seeds are mostly attached to the outside of these cocoons, but some are also in the inside, which is somewhat more finished, and is very evidently a dwelling-place into which the larva can retreat at pleasure after its foraging excursions. The cocoons vary greatly in size, some being scarcely half an inch in length, others measuring two inches in length: they are very flimsy structures, and collapse directly the larva is removed. Owing to the outside being

covered with seed these cocoons are not very obvious in the sample, but if submitted to a fine sieve the loose seed will readily pass through, and the cocoons with their destructive tenants will remain in the sieve. They can then be thrown into a basin of boiling water, and thus quickly destroyed. I hope my correspondent will endeavour to rear some of the perfect moths, and address them to a competent entomologist to obtain the scientific name. I shall have much pleasure in doing this if he knows no one more competent. If a sample of the seed be kept in a gallipot and covered with a piece of glass the moth will be sure soon to emerge, and will be seen resting on the under surface of the glass. The larvæ are not likely to prove destructive to wood; but confine themselves to the seed-diet which they have spontaneously selected.—*Edward Newman.*]

W. N. Nicholson & Son.—*Julus sabulosus.*—The enclosed worms have been sent to us by a client in the west of Ireland to ask if we can identify them, and suggest any remedy for the ravages they are committing on sandy soils. Mr. Hadfield, of this town, has recommended us to send them to you, as being the most skilled naturalist that he knows in England; and we should esteem it a great favour if you could furnish us with the desired information.

[The creatures you enclose are *Julus sabulosus*, of various sizes and ages. They are very abundant in sandy soils, feeding on any vegetable substance they can meet with. It would be particularly interesting if you had described the nature of the ravages they are committing; what plants are attacked; and how they are attacked. The species of *Julus* seem to be generally vegetable-feeders; they frequent fruit-trees on walls, entering the fruit by little holes that wasps have bitten in the skin, and excavating the interior, in which they coil up, always lying on one side. There is a good paper on them in the eleventh volume of the Transactions of the Linnean Society, in which all the species inhabiting this country are described. As to a remedy for this, or any similar insect-plague, there is none; on the contrary, great injury is done to our gardens by placing confidence in chemists' nostrums.—*Edward Newman.*]

Mr. Prince to Mr. Nicholson, on Julus sabulosus.—The insects I sent you attack all kinds of the cabbage tribe and

all kinds of turnips; also carrots, onions, and parsneps. Mangold and potato seem the only things that escape them. They attack the tap-root of all other plants when very young. I quite think the insect in the worm state, as I sent it you, punctures the roots of the different plants, and deposits its egg or larva, as the first sign we see of them is a small round lump on the root: this by degrees gets larger and larger; and when the plant is about six or eight weeks old, on cutting open this lump you will see small white maggots; these lumps and maggots go on increasing in size and number until they kill the plant; and in the case of Swedish turnips they form large angle-berries, like those seen on some cattle; and the turnip dies away. In the case of onions you will see them the very same as you see maggots in meat. Any further information I can give, if you let me know, I shall be only too glad to give it, or send you specimens in the different stages if you require it. I also beg to acknowledge the receipt of your letters of the 22nd and 25th inst., for both of which I return you many thanks, and I enclose you further particulars respecting the insect. If you can find out anything or any treatment that will banish this insect you will bestow a very great favour on us and many others. I have been fighting with it for years: tried all sorts of manures, salts, &c.; lime, also; but all to no purpose. Last February twelvemonth I dug into the sand hot roach lime from the kiln, at the rate of over six tons to the statute acre; still this insect carried off everything last summer; and out of that very piece of sand I got the insects I sent you.—*Stephen F. Prince; Ballycroy, Ballina, March 27, 1875.*

[I think Mr. Prince, in his explanatory letter, may possibly have confounded several insects together. The different species of *Julus* do not come from a white maggot, which is rather the economy of a weevil than a centipede; but I have often found a *Julus* in the excrescences caused by other enemies.—*Edward Newman.*]

E. Erskine Greville.—*A Luminous Centipede.*—On Wednesday, the 16th of September last, I was spending the evening with some friends at Isleworth, and was walking out in the garden about nine o'clock. It was a dark night, and I had come to a part of the grounds shaded by large trees, when I suddenly observed what appeared to be a luminous

worm gliding swiftly along the gravel path. It shed a light about a quarter of an inch in breadth, much more brilliant than that of the ordinary glow-worm, and left a track of light about a foot behind it; as an un-entomological companion said, it appeared as if it was "breaking bits off its tail;" the fact being that it left its phosphoric light on the stones and inequalities of the ground as it passed, the spots of light nearer to the creature being as bright as itself, and gradually fading. About two feet in front of this there appeared to be another insect half flying half hopping, and also brilliantly phosphoric. At once I threw a pocket-handkerchief over each, and took both into the house to examine them. The first was a species of centipede of a reddish brown colour, and about two inches long, while the second was nothing but an ordinary daddy-longlegs (*Tipula oleracea*), which appeared to have been caught by the centipede and to have escaped, as one wing was very much damaged and it had lost two or three legs, and was of nearly equal brightness with its aggressor, which appeared to have the power of leaving its light on everything it touched. I never before met with a luminous British centipede, and should be glad if you could inform me if it is a common occurrence, and also if you think that it was attacking such a comparatively large insect as a daddy-longlegs for the purpose of preying upon it.

[I have delayed the publication of this letter for many months because I thought the fact recorded was familiar to every entomologist; but having received other communications to the same purport, accompanied by enquiries as to name, &c., I cannot hesitate longer to give what information I possess on the subject. The centipede described by my correspondent, Mr. Greville, is *Geophilus electricus* of authors; and although often so abundant that it is impossible to walk on a gravel path any October evening without crushing some of them, still so few entomologists have really studied its habits with care, that many strange stories have got abroad respecting it. It is the "glow-worm in winter" of newspaper paragraphs, and reappears every year in print just as autumn is merging into winter, and when the sun of the "enormous gooseberry" has set for the season. Linneus has described, under the name of *Scolopendra phosphorea*, a species which appears very closely allied to our English

“luminous centipede,” or “winter glow-worm,” but is a native of Asia. He relates, on the authority of E. G. Ekeberg, the captain of a Swedish East Indiaman, that it dropped from the air, shining like a glow-worm, upon the deck of his ship, while she was sailing on the Indian Ocean a *hundred* miles from the continent. In Turton’s translation the statement is given rather differently, thus: “*Scolopendra phosphorea* inhabits Asia, and shines like a glow-worm in the dark; has been known to fall from the air into a vessel a *thousand* miles from land, in the Indian sea.” Kirby and Spence, in repeating this narrative, make the following observation: “However singular this statement, it is not incredible. The insect may either, as Linné suspects, have been elevated into the atmosphere by wings, with which, according to him, one species of the genus is provided; or, more probably, perhaps by a strong wind, such as that which raised into the air the shower of insects mentioned by De Geer, as occurring in Sweden in the winter of 1749, after a violent storm that had torn up trees by the roots, and carried away to a great distance the surrounding earth, the insects that had taken up their winter-quarters amongst it.” (‘Introduction to Entomology,’ vol. ii. p. 415.) What either of these learned authors may mean by assigning wings to a myriapod I am quite at a loss to understand. I hope Mr. Erskine will excuse the long delay in publishing this communication.—*E. Newman.*]

F. J. Phillips.—*Tenthredo Cratægi.*—The larva of the enclosed I discovered feeding on quick hedge on the 12th of July, 1874, in the dusk of the evening. The perfect insect emerged from the pupa state on the 18th April, 1875. I enclose with the insect the pupa-case. The larvæ left off feeding soon after I captured them, and assumed the pupa state on the 24th of July. Will you kindly oblige me by naming it?

[I have little hesitation in naming this insect *Tenthredo Cratægi*, notwithstanding certain discrepancies of character, one of which is very decided. The cocoon, instead of being hard, glutinous, and firmly attached to a twig of hawthorn, as generally observed in *T. Cratægi*, is woolly, loose, and has been spun amongst the rubbish and earth at the bottom of the breeding cage: this may be the result of the larva not being provided with suitable twigs to which to attach itself.

The imago is *particularly* downy, and the tarsi are *particularly* pale. *Tenthredo Cratægi* is a very abundant insect: on a mild evening, in July and August, a hundred of its mealy, glaucous larvæ may be picked off any hawthorn hedge in the course of half an hour. It is a great pet with the name-changers, scarcely any two entomologists using the same name:—*Cimbex Lucorum*, *Trichiosoma Lucorum*, *Cimbex sylvatica*, *Trichiosoma sylvaticum*. *Cimbex Betuleti* is the name adopted by Klug, Hartig, and Vollenhoven; but it has never been found feeding on birch, as this name would seem to imply.—*Edward Newman.*]

W. Macmillan.—*Name of a Wasp.*—Will you kindly inform me with what species of wasp the facial and abdominal markings, shown in the enclosed sketch, agree? The wasp, from which the sketch was made, I caught in a window on the 2nd of October last. A friend of mine has compared it with two queens of *V. germanica*, and thinks it is probably a queen of the small common wasp, *V. vulgaris*; but is by no means certain.

[I have no doubt of its being the common wasp, *Vespa vulgaris*, but the markings on the abdomen are subject to some variation; those on the face are more constant, and consequently more reliable.—*Edward Newman.*]

Extracts from the Proceedings of the Entomological Society of London.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

FEBRUARY 1, 1875.

Variety of Noctua glareosa; and Amara continua at Caterham and Mickleham.—Mr. S. Stevens exhibited a dark variety of *Noctua glareosa*, *Gn.*; and Mr. Champion exhibited specimens of *Amara continua*, *Thoms.*, taken at Caterham and Mickleham.

Polistes gallicus utilizing Play-bills in the construction of its Cells.—The President exhibited a nest of *Polistes gallicus*, taken on the Esplanade at Corfu, of which the cells were partly constructed with coloured paper taken from some play-bills posted in the vicinity, as alluded to in his Anniversary Address, delivered at the last meeting.

A Colony of Colletes founded at Shirley Common.—Mr. F. Smith remarked that specimens of *Colletes cunicularia*, *Linn.* (*C. hirta*, *St. Fargeau*), had been captured hitherto only in the Isle of Wight and near Liverpool, and that a number of specimens having been forwarded to him from the latter place he had transported them to a suitable locality at Shirley Common in 1843, and that he had reason to believe that he had succeeded in establishing a colony there, as the insect had been taken near the same spot in 1874 by Mr. d'Arcy Power.

FEBRUARY 15, 1875.

Variety of Strenia clathrata.—Mr. Phipson exhibited a singular variety of *Strenia clathrata* from Basingstoke, the wings being nearly unicolorous (fuscous), with a few pale spots.

Indian Hymenoptera.—Mr. F. Smith exhibited an additional collection of Hymenoptera sent from Calcutta by Mr. Rothney. It consisted of one thousand five hundred and seventy-three specimens of Fossorial Hymenoptera and Apidæ, all in beautiful condition. There were probably not more than twenty-five undescribed species; but from twenty to thirty species, which were hitherto represented in the British Museum by a single sex, were here most fully represented.

Fleas in a Rabbit's Ears.—Mr. Verrall exhibited a number of fleas, taken two days previously, from inside the ears of a rabbit, at Lewes. They were gregarious in this situation, and in such a position that the animal was unable to dislodge them by scratching.

Colouring Matter from the Cockchaffer.—Mr. Dunning called attention to the following extract from a recent French paper:—"The 'Bulletin des Sciences et Arts' of Poligny (Jura) gives particulars of a curious discovery by Dr. Auguste Chevreuse. He had found that in decapitating living cockchaffers, an hour after they have been feeding, they yield four or five drops of a colouring substance, which varies with the nature of the leaves on which they have been feeding, and he has already obtained fourteen different shades. M. Nichlès, Professor of Chemistry, M. Préclaire, Professor of Drawing, and M. Chatelain, architect, have found that this substance

may be employed either in mono-tinted drawings—like Indian ink, sepia, &c.—or mixed with water-colours, and that it does not change on exposure to the light. The colouring substance may be collected on glass or in shells, in which it may be left to dry, and when required for use it is sufficient to dissolve it in water. When applied in a thick coat it presents the effect of varnish. Two or three cockchaffers suffice for a small water-colour drawing.”

Pupæ of Pieris Napi required.—The Rev. R. P. Murray stated that Mr. Edwards, of Virginia, was desirous of obtaining specimens of the pupæ of *Pieris Napi*, and that he would be happy to receive them for him from any entomologist who might be able to obtain them.

MARCH 1, 1875.

Lepismodes inquilinus?—Mr. F. H. Ward exhibited some living specimens of a *Lepisma* allied to *L. saccharina*, which he believed to be a new species in this country, and which was found in a bakehouse near London, in the brickwork of the oven, and other warm places about the buildings. Mr. M'Lachlan suggested that it might have been introduced in some American flour, as Mr. Packard had recently published an account of a species which was found in America, closely allied to *L. saccharina*, and which he suspected might prove identical with the present species.

[I have no doubt that this supposed *Lepisma* is that city pest *Lepismodes inquilinus*. I shall be happy to send living specimens to Mr. Ward if he will accept them.—*E. Newman.*]

Fleas in Rabbits' Ears.—A note was received from Mr. W. C. Boyd, with reference to some fleas exhibited at the last meeting. He stated that fleas were frequently found on the *inside* of the ears of wild rabbits, especially about this time of the year, and that his brother had seen a rabbit which must have had three hundred fleas in the two ears, and that they looked as if smeared inside with black paint. He believed the rabbits were not much troubled by the presence of the parasites, as he had never noticed any inflammation, however many fleas there might have been. He also found that hedgehogs usually swarmed with fleas. Mr. Gorham said he had received fleas from a friend who had found them on mice.

THE ENTOMOLOGIST.

No. 143.]

JUNE, MDCCCLXXV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER née WEISE.

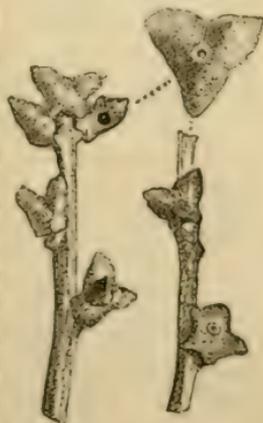
(Continued from p. 99.)

25. *Cynips amblycera*, Gir. (*C. corruptrix*, Schlechtendal).—This small gall, four to five millimetres long, consists of a short, cylindrical part, which contains the larva-cell: this part bears two or three oblique, stout, short, conical projections, which are either turned upward and outward, or only outward. At the point opposite the basal attachment we generally find a small wart, which is surrounded by a dense, woolly, short crown of hairs (in those specimens which have three cones the wart is in the centre of these three). The surface of the gall is red-brown and smooth. In section it shows a large, thin inner-gall, which is grown together with the thin wall of the cylindrical part of the gall, and does not extend into the cones, these being filled with a moderately dense parenchyma. The fly appears in May of the next year.—*G. L. Mayr.*

This species has not been found in Britain; *Synergus melanopus* occurs in its gall as an inquiline.—*E. A. Fitch.*

26. *Cynips galeata*, Gir.—The beautiful little gall consists of two parts, one placed upon the other, and tightly drawn

Fig. 25.



CYNIPS AMBLYCERA
(C. CORRUPTRIX).

together in the middle. The basal half is in shape like a round cushion, is five millimetres in diameter, and from two to three millimetres in height. Its regular development is prevented by the petiole producing an impression, into which the stalk is pressed. The surface of the lower half is red-brown, and generally distinctly reticulated with the darker-coloured epidermis, which, in the development of the gall,

becomes cracked in that manner. The epidermis itself is covered with scattered, moderately long, fine, woolly, white hairs. On the cushion-shaped basal part rests the almost bud-like upper part: the base of this part is quite as thick, and of the same shape, as the basal part of the gall itself; towards the top, however, it is prolonged into a short conical point, and into one or several fibrous projections, which are generally again divided before attaining the top; this upper part of the gall is covered with short woolly hair, and shows at its lower, swollen part a coarse longitudinal striation. In section, the inner gall is found contained in the cushion-shaped basal part, and is united with the substance of the gall all round. The bud-shaped



upper part is filled with a brown cellular tissue. This gall is found on the weak twigs of shrubby *Quercus pubescens* and *Q. pedunculata*. Neither Dr. Giraud nor myself was successful in obtaining the gall-fly.—*G. L. Mayr*.

In a note appended to his description of the gall, Dr. Mayr gives a description of the gall-fly from a dead, but mature, specimen, cut out of a gall. All the galls obtained by Dr. Giraud were empty but two, and they contained the larvæ of a *Callimome*. Dr. Mayr bred *Ceroptres arator*, but probably from the twig, and not from the gall. The species does not occur in Britain.—*E. A. Fitch*.

Life-histories of Sawflies. Translated from the Dutch of Dr. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from p. 76.)

EMPHYTUS SEROTINUS, Kl.

Imago: *Klug, Blattw. in Magazin Berlin*, viii. p. 288, No. 215; *Hartig, Blatt-und Holzwespen*, p. 253, No. 22.

Larva undescribed.

Emphytus niger, abdomine et femoribus fulvis, tibiis flavis, tarsis posterioribus fuscis.

Although this life-history is incomplete, as I am not acquainted either with the egg or the pupa of the species referred to, I have thought it advisable to publish my observations as far as they go, as it seems to me that the species is very rare, and I might probably wait for a long time in vain before I had an opportunity of completing them. I first observed a larva of this species many years ago at Beele, near Voorst; since then I have only found two others; and I have not received a single specimen from any of my entomological friends.

The larvæ I found were very nearly full grown, having only the last moult to undergo: one, as above mentioned, was taken at Voorst, and the others between Wassenaar and the Hague, at the side of the road. They were found on oaks in the beginning of the month of June, and seemed to feed by preference on the young leaves. When at rest they assumed the same position as do the larvæ of *Emphytus cinctus*, L.,—rolled round spirally, as shown at fig. 1. In feeding they began at the edge of the leaf, eating on toward the midrib. The body was quite round, much wrinkled on the back, and without either hairs or tubercles. They had twenty-two legs. The skin was sea-green in colour, but entirely covered with a sort of white bloom or powder, so that the true colour of the skin could only be distinctly seen between the folds. The spiracles, which were eighteen in number, had very narrow, obscure white borders, and were thus so inconspicuous that it was only by the aid of a magnifying-glass they could be distinguished. The outline of the head was round, excepting the parts of the mouth, and flattened anteriorly; it was of a purplish gray colour to just above the eyes, and from there

pale yellow, and was thickly covered with white powder along the posterior margin; as usual, the eyes were inserted in round black spots (see fig. 2). The claws of the anterior legs were brown.

After the larvæ had moulted for the last time the white powder had entirely disappeared. The head now assumed a shining, ochre-brown tint, with black spots, in which were the eyes (figs. 3, 4); the body was of a pale, feuille-morte colour, and wrinkled, the skin being in folds as before. They descended into the ground for the purpose of passing into the pupa state; but as on the occasion of making these observations I only had one or two examples at a time, and I am convinced that any disturbance of the mould prevents the completion of the metamorphosis, I let them remain quietly. Thanks to which, it may be, the imagos appeared; but in consequence of which I missed the opportunity of observing the pupa.

The perfect insects were produced at the beginning of October: I find two dates mentioned in my notes, namely the 3rd and the 14th of that month. Having regard to the length of the body, and more especially to the neuration of the wings, they certainly belong to the genus *Emphytus*; the structure of the antennæ, however, approaches more nearly to that of *Nematus*, while the habit of the larva closely agrees with that of many species of *Selandria*. The head is quadrate, with rounded angles (looked at from above), black, and thickly clothed with very short hairs; the sides of the head, behind the eyes, are very projecting, and the vertex has a number of elevated points. The labrum is very hairy; the mandibles are short and broad; the palpi are rather long, the middle joints being of a whitish tint. The thorax is clothed with a short pubescence; the tegulæ are brown, and the cenchri clear white. The first abdominal segment is black, and deeply notched on the posterior margin, so that, as is the case with the males of *Cimbex*, a considerable triangular space remains open, within which a white membrane is seen. The rest of the abdomen is shining and orange-yellow, both on the dorsal and ventral surfaces. The valves of the ovipositor are dark brown, nearly black. The antennæ are black, and are longer than is generally the case in the genus *Emphytus*. Wings transparent, iridescent, a little darker at

tips; the costal nervure and the stigma are sordid brown; the radial and cubital nervures, with their branches, are dark brown; and the remaining nervures orange; the coxæ are black; femora orange; tibiæ yellow, the ends of the posterior pair being brown; tarsi brown, having the base of the first joint yellow. Length of the imago eight millimetres, expanding to seventeen millimetres.

Notes on Ephyra punctaria and E. pendularia.

By B. G. COLE, Esq.

It is a well-known fact that the spring and summer broods of many insects are very different in appearance and size. In some cases, as in *Selenia*, the variation is so great that the two forms might readily be considered distinct, were no other data available for arriving at a decision than those afforded by the superficial characters of the specimens themselves.

The genus *Ephyra* is, I believe, generally considered double-brooded, the spring specimens being held to be the progeny of the preceding summer one; but in rearing larvæ from the egg I have noticed some facts that seem to show that at least a portion of the spring specimens are from the same batch of larvæ as the summer brood, although the two forms are so distinct in appearance.

On the 2nd of June, 1874, I captured a female *E. punctaria* at Hall End, Chingford, Essex, which laid a batch of eggs, the larvæ hatching out on the 9th. Most of the larvæ changed to pupæ between the 4th and 13th of July; but on the 16th of July, when the first moth appeared, I had several larvæ still feeding, and they did not change until the end of the month. The last specimen out that season appeared on the 26th of July; and on the 24th I had found specimens at large in Woodford Forest. These were all the autumnal form, distinguished from the spring specimens by being smaller, with the two dotted lines more distinct, and having between the outer of these and the hind margin of the wings two or more blotches of a beautiful purplish brown.

During the present month (on the 1st and 3rd of May) a few specimens have appeared from the same brood. They are

all of the large spring form, and exactly similar in appearance to the present moth, captured in June, 1874.

A brood of *E. pendularia* that I reared in 1869 behaved in like manner, moths appearing from July 12th to November 26th, being all the small form; and those pupæ which remained over the winter, and came out in the spring of 1870, were of the usual type.

It will be noticed that some of the larvæ of *E. punctaria* were longer feeding up than their brethren, and possibly these were the individuals that remained over the winter; still it is difficult to conceive the determining cause of the behaviour of the different specimens, and still more of their distinctness of form: the favourite hypothesis that heat hastens the development of the summer broods, and so prevents their feeding sufficiently to grow to their normal size, is here hardly applicable. In the instances I give the larvæ were exposed to exactly the same influences, climatic and otherwise, and yet the two phases of the same brood were as well marked as in the forms of *Selenia*, which the heat hypothesis is supposed to explain.

I merely take the above facts from my note-books, in the hope of calling forth correspondence anent the matter, encouraged by your remarks in the last number of the 'Entomologist' (*Entom.* viii. 107) that you will be disposed to pardon their crudity. Everyone must agree with the spirit of your request, that collectors would give such extracts more frequently: however imperfect the observations, they may lead to enquiry; and they would at least be more interesting and suggestive reading than the usual Latin "roll-call" of the slain, or those mythical accounts of the capture of re-set alien rarities in England, the exposure of the frauds and follies in connection with which have brought the British entomologist into such disrepute with true naturalists, and made him the subject of ridicule amongst the more sober and less gullible members of the craft.

B. G. COLE.

The Common, Stoke Newington, N.
May 11, 1875.

Some Remarks on Collecting and Collectors. By
W. ARNOLD LEWIS, F.L.S.

(Entom. viii. 103.)

LIKE others of your readers I take an interest in the subject which Mr. H. R. Cox has descanted upon in the last number of the 'Entomologist,' and with your permission I will write down some reflections which have suggested themselves to me in a collector's experience of several years.

I can confirm Mr. Cox's reference to "the good old free spirit of collecting." Free enough, in all conscience, that collecting was. I have myself spoken with a gentleman who in one year captured on the south coast *eight hundred* specimens of *Colias Hyale*, and I recollect that he boasted roundly of the exploit! The same once informed me, when I was in search of the second brood of *Leucophasia Sinapis*, that I need not expect again to see that insect in the neighbourhood, because he had that season *taken the whole spring brood*. It is possible that your correspondent has himself heard of these incidents, or others like them; and on these facts I should wish to make one or two remarks.

Anyone who captures eight hundred butterflies of one kind, when his own collection receives perhaps four-and-twenty, must have a very distinct *motive*. Mr. Cox speaks most truly when he hints that "the pleasure of entomological rambles" could have little to do with such a feat. What pleasure, in truth, could come from taking the lives of eight hundred defenceless *Hyale*? After the capture of, let us say, the first one hundred and fifty, sensations of "pleasure" must have begun to give way to physical fatigue. In Mr. Cox's expressive words, the object was once "principally a day's innocent pleasure, and not so much with a view to amassing a large number of specimens in the shortest possible time." But certainly in the case of the eight hundred, "amassing the large number" must have remained the motive long after pleasure, innocent or not, had left the scene. Setting out eight hundred butterflies must be a very tiresome business, and probably no other collector has experience of the labour it entails; seven hundred and seventy-six

Hyale, we may suppose, would be of no use to the captor, and they would remain over for distribution to Lepidopterists in want of the species. One almost envies this hard-working collector the spectacle of their "unbiassed delight." I am not perfectly informed whether this was the course taken by the captor of the eight hundred; but, if it was, he has doubtless made himself the most popular collector in the country. Far be it from me to say that this gentleman was anticipating "the modern school." I merely suggest that such a feat of the old, free spirit of collecting scarcely answers to "a day's enjoyment," but savours rather of "amassing specimens."

In the case of *Leucophasia Sinapis* the same reflections are suggested rather more strongly; while *Colias Hyale* comes at one time in large numbers, and (whether captured or left alone) then disappears to return again after several years, the gentle creature *Sinapis* may no doubt be easily exterminated. I can picture to myself the dismay of a collector whose "honest" (but too thoughtless) "exertions" have unduly thinned the numbers of a local insect, and the care he will always in future take that a like result shall not again occur. But I can *not* picture (even to myself) the attitude of mind of a collector who knowingly and with determination extirpates *Leucophasia Sinapis*, and talks confidently afterwards of the deed being effectually done!

So much for these instances (the two strongest, I admit, that I have ever heard of); and I am happy to gather that in one way of regarding such feats I am in agreement with your correspondent. With him I cry, "Shame on these collectors!" But I must decline to collect "in the style of the good old times," for these very instances I have mentioned belong (it will be understood) to the period which your correspondent regards approvingly. I desire to add something upon the status and public estimation of collectors. I am neither a reverend divine nor a person of large independent property, but I am accustomed to show, and to exact, civil treatment; and out of London I have never found the contrary. I do not receive the snubbing which Mr. Cox has "noticed" in various parts of England, and I hope he is under a misapprehension in regard to it. If, when I visit the New Forest (as I do in fact every summer), I carried off say a thousand *Zygena*

Meliloti, I could well understand my being supposed to catch burnets for my living. But I see no harm in that. If a collector takes insects by the hundred of a kind, there is little blame to the unsophisticated in supposing that he does it because he is paid. Dealers pure and simple I have nothing to say about. By their trade they are bound to find, catch, and carry away every insect with the most trifling value. They work for money, not for love; and they are outside the discussion altogether. For the rest, those who treat others well are well treated in return. As I neither cut down people's trees, nor flog them till I leave beneath each one a heap of leaves and broken branches, and as, speaking generally, I do not commit barbarisms when entomologizing, which I should shun at other times, I never find myself unwelcome, though everyone may know well enough that I go out catching moths and butterflies. I do not understand why others should have different experience.

As to collectors' demeanour towards each other, that is a subject which has caused me reflections times and oft. The mysteries made about a locality; petty dissimulations about time of appearance (to throw another off the scent); concealments of the facts of captures being made;—these and other paltry and more detestable things are, I fear, common. It must be really shocking to encounter a collector with a stock-in-trade of all these arts. Mr. Walton, so long ago as 1835, wrote on this very subject in the 'Entomological Magazine' (vol. ii. p. 279) in very feeling and earnest language, which all who have the opportunity should peruse. Mr. Shield ('Practical Hints,' pp. 19, 44, 191) and others have, from time to time, done what they could to bring about a better state of things. But remonstrances, notwithstanding, the complaint is, I believe, too well founded; and I regret very much to avow my own conviction that there is only one complete and certain cure for it. The evil has grown entirely out of the fictitious value ascribed to native specimens, and must vanish, like a breath, directly foreign specimens are admitted to have an equal worth. I have all the prejudices of one who for sixteen years has collected none but British Lepidoptera; and the intention which I have at length definitely formed of opening my collection to foreign specimens (or rather taking up the European fauna) first had its rise in the condition of

things to which your correspondent has alluded. I shall not take the line of urging the duty of all to accept European insects. That has been rather offensively done in the past, by some with whose ways and language towards collectors I confess nothing in common. But, as one individual speaking for himself, I must give up collecting only native insects, because (for one reason) I see to what arts, manners, and customs, I am against my will contributing.

W. ARNOLD LEWIS.

Temple, May 20, 1875.

Notes on Oviposition. By the Rev. P. H. JENNINGS.

Selenia illunaria.—Laid forty-five eggs on April 27th and 28th, all detached from one another and at random on the muslin cover, none on the food-plant; oval, polished, slightly flattened on the upper and under surfaces; pale yellow, with a slight greenish tinge, changing gradually to dark red. The young larvæ began to emerge on the seventeenth day, May 14th.

Anticlea badiata.—A female, taken on the 19th of April, laid nine eggs on the 20th, six on the 21st, three on the 22nd, one on the 24th, five on the 25th, one on the 26th, five on the 27th, two on the 28th, and three on the 29th; oval, polished, yellow, gradually deepening to orange: all fixed either on the points of the thorns of the food-plant, dog-rose (*Rosa canina*), or on the edges of the leaves,—with two exceptions, which were attached to a leaf-stalk. The young larvæ, which began to emerge on the sixteenth day, May 6th, were yellow, with orange-coloured heads.

Scotosia dubitata.—A female, taken May 5th, laid thirty eggs on the 6th and eight on the 7th, all detached; fifteen of these were on the upper edge of the leaves of the food-plant, common buckthorn (*Rhamnus catharticus*), and twenty-three on the edge of the under surface; oval, polished, slightly flattened on the upper and under surfaces; pale yellow, with a slight greenish tinge, assuming a reddish hue on the second day. The young larvæ emerged on the tenth day, May 16th.

Asthena candidata.—A female, taken May 8th, laid fifty-four eggs on the 9th and 10th; almost all singly, very seldom

in batches of three or four; all on the edges of the leaves of the food-plant, hornbeam (*Carpinus Betulus*), forty-six on the upper edge, and eight on the edges of the under surface; oval, opalescent, flattened on the upper and under surfaces, so that the edges are quite sharp. The young larvæ began to emerge on the ninth day, May 18th; they are white, thickly sprinkled with hairs; heads black.

Cidaria miata.—A female, taken May 5th, laid seventy-five eggs on the same day, eighteen on the 6th, and four on the 7th; all deposited singly near the middle of the leaves of the common birch (*Betula alba*), either on the upper or under surface, varying in number from one to ten on each surface; white, considerably flattened on both surfaces; both ends similarly rounded in shape, a little longer than broad; not polished. The young larvæ began to emerge on the ninth day, May 14th, attaching themselves by their claspers to the jagged points of the leaves, and standing at right angles, never moving, except bending down to feed.

Xylina rhizolitha.—A female, captured April 20th, laid fifty-five eggs; on the 26th, two; on the 28th, three, all scattered on the leaves; on May 1st, twenty-five, all on the muslin; on the 2nd, twelve scattered on the leaves, and ten on the earth, glass, and muslin; three on the leaves, white, Echinus-shaped, slightly rubbed longitudinally: streaks of reddish brown, appeared on the third day. The young larvæ began to emerge on the fourteenth day, May 10th.

P. H. JENNINGS.

Longfield Rectory, Gravesend,
May 19, 1875.

Entomological Notes, Captures, &c.

Vanessa Atalanta.—I have to record a singular occurrence, which may perhaps interest the readers of the 'Entomologist.' On March 6th Mrs. Boley, whilst walking through the lane leading to Fermain Bay, noticed one of the leaves in a bed of nettles curled up, and on opening it was surprised to find a small larva of *Vanessa Atalanta*; on searching further she succeeded in finding three more. The first larva spun up on April 18th, and on May 11th the first imago put in an appearance.—*W. A. Luff*.

[“Almost immediately on emerging from the egg the little caterpillar draws together the leaves of the nettle, and feeds in confinement. As it increases in size it requires more space, and continues to increase the size of its domicile up to the period of pupation: when removed from its retreat it feigns death, bending its extremities together; all its movements are slow and lethargic, and its only object when exposed seems to be again to conceal itself. The insect appears on the wing in August, September, and October.” (Newman’s ‘Illustrated Natural History of British Butterflies,’ p. 62.) There seems to be nothing new in Mrs. Boley’s discovery except the time of appearance; but it is interesting to learn that a butterfly, which in England never leaves the pupa-state before August, should in Guernsey emerge so early as the 11th of May.—*Edward Newman.*]

Lycæna Alsus.—In looking over Newman’s ‘British Butterflies’ lately I find that Surrey is altogether omitted from the list of localities for *L. Alsus*. I found it not uncommonly last season in a chalk-pit near Guildford, the only locality I yet know for it. I did not find *L. Adonis* in that neighbourhood, though it is included in Newman’s list. I hope to collect at Coombe Wood this season, and shall be glad to furnish you with a list of insects from that locality.—*W. Thomas; Surbiton Villa, Surbiton, May 4, 1875.*

Eupithecia consignata at Cambridge.—Last year I took a female of this species at a lamp-post in Cambridge, which, when confined in a muslin-bag with apple and whitethorn, laid a dozen eggs on the under sides of the leaves. The eggs were laid on May 16th. The larvæ, which hatched on the 29th of the same month, fed both on apple and whitethorn, but seemed to prefer the latter. The larvæ were full grown in the last week in June, and I found then that I had eight pupæ. Four imagos emerged this year, the first on April 22nd. The remaining four appear quite healthy, and will probably lie over till next year. I have also succeeded in taking three specimens at lamps here this season, unfortunately all males; the dates of capture were May 3rd, 4th, and 7th.—*Gilbert Raynor; St. John’s College, Cambridge, May 22, 1875.*

Eupithecia extensaria (Entom. viii. 108).—Referring to your notice of my capture of *E. extensaria*, I have had

several letters from correspondents suggesting to me the probability of its being an odd specimen accidentally imported. The species may have been imported by some of the numerous Black Sea and Baltic steamers trading to Hull. I think it highly probable it has been so introduced. But when? The fine condition of the specimen I took leads me to believe it has been bred in this country. The *Eupitheciæ*, generally, are not addicted to roaming; but even if this specimen was an exception it could scarcely have travelled a considerable distance from the nearest steamer without damage to its plumage. The coming season will no doubt show whether the species is established on the ground, or the specimen I have to be a solitary wanderer.—*James Sawyer*; 16, *Lendal, York, May 8, 1875.*

Eupithecia extensaria (Entom. viii. 108).—It is sufficient to know Mr. Sawyer to be assured that this recorded capture is in every sense a genuine one, so far as he is concerned; but steam is slowly working a revolution—even in Entomology: Livonia is practically now as near to us—especially to Hull—as the Continent is to the South Coast of England, for steamers trade weekly direct to Revel, Pernau, and Riga, bringing large cargoes of hemp, flax, linseed, and grain. The Russian peasant sends his produce to market in a dirty state, especially grain and linseed, largely admixed with weeds and rubbish. What more likely than that *E. extensaria*, in the egg or pupa state, has been brought over in this way? and the probability is strengthened by the locality of the capture being within a mile or two of the dock warehouses where these steamers chiefly discharge. This capture is, I believe, a solitary one, and unfortunately the spot has now been broken up for the extension of the dock, but there would be nothing startling in its having found a domicile here, for the climate is congenial.—*N. F. Dobrée; Beverley, May 18, 1875.*

Eupithecia Knautiata (Entom. viii. 38).—Is Mr. Gregson sure that the plant he found this species on was not *Scabiosa succisa* (*L.*)? I have never seen *Knautia arvensis* out of cornfields, whereas *Scabiosa succisa* is always found growing in company with the common ling in heathery, sandy ground. Should this be the case, would it not be better for him to alter the name of the species, unless the inflexible law of priority must hold its own in every case; else it might fall under the

same category of misnomers as *Cloantha Solidaginis*, which it is known does not feed upon golden-rod (*Solidago*), but bilberry (*Vaccinium*).—*J. Cosmo Melvill; May 7, 1875.*

[The same idea occurred to myself. *Scabiosa succisa* grows almost everywhere on heaths and wastes near London; *Knautia arvensis* only in cornfields, and the hedge-banks near cornfields.—*Edward Newman.*]

Leucania extranea or *unipuncta* (Entom. viii. 108).—As the capture here, by Mr. Parker, of this very rare *Noctua* has created such a sensation in the entomological world, it may interest some readers to know that, in addition to the countries mentioned by Mr. Doubleday, it is an abundant Australian species, as mentioned by me at p. 353 of the 'Entomologist' for 1873. While sugaring in the Bush, about thirty miles from Adelaide, it became at times a perfect pest. I have carefully compared the specimen captured in the New Forest by Mr. Parker with my Australian series, and find his specimen differs from mine in many respects; the colour of the fore wings being paler, and of a much more reddish ochreous colour than the Australian type; the apical streak is more decidedly marked, and the gloss in the hind wings is much stronger, resembling very much, in certain lights, the purple tinge in the hind wings of our *Agrotis saucia*. In Australia *L. extranea* emerges from the pupa in March.—*H. Ramsay Cox; Lyndhurst.*

The Season at Lyndhurst.—The season here is remarkable, on account of the great abundance of many common species: *Io*, *Urticæ*, *Rhamni*, and *Egeria*, have swarmed; *Polychloros* has also been very common, but the specimens are all remarkably small, doubtless caused by the great dryness of last year. Although vegetation is in various parts rather late, many insects have come out proportionately early; for instance,—*Acosmetia caliginosa* was out on the 13th of May, *Leucophasia Sinapis* was quite *passé* by the same time, and *Lycæna Argiolus* was also in the same condition in the last week in April.—*Id.*

Variety of Clostera curtula.—I have just had the good fortune to breed a fine variety of *C. curtula*: the fore wings are of a rich sepia-brown, which shows up the four wavy white lines to great advantage; where the dark blotch comes near the tip in the usual type, this variety has a rather paler

one, and the body and hind wings are much darker than usual. I have also bred a specimen of the usual type, which has one tip much paler than the other.—*H. Wittich*; 55, *Lansdown Road, Dalston, E., May 19, 1875.*

Xylomiges conspicillaris at *Dartford*.—Mr. Packman, of Dartford, took a fine female of *X. conspicillaris*, on the 10th of May. He brought it to me, and I am pleased to say I have a few eggs from it, which apparently are fertile.—*A. B. Farn*; *New Government Offices, Whitehall, S.W., May 14, 1875.*

Agrotis Helvetina.—Mr. Taylor kindly brought me his specimen of the *Noctua*, which my friend Dr. Knaggs named *Agrotis Helvetina*, to compare it with authentic specimens of this species given to me by Dr. Staudinger. I think the continental specimen which Dr. Knaggs examined must have been wrongly named, as such a keen observer could not possibly confound two such very different species. Mr. Taylor's *Noctua* scarcely differs from the red variety of *Neglecta*, except in size, being larger, and it may only be a variety of this species; but I cannot speak positively about it till I have seen a male. *Agrotis Helvetina* closely resembles the dark variety of *A. lucerneæ*, but is considerably larger, and has very long legs and antennæ.—*Henry Doubleday*; *Epping, May, 1875.*

Larvæ of Cirrhœdia xerampelina.—On the 3rd of May I took about twenty larvæ of *C. xerampelina*, under moss on ash-trees, near this village. I never took it here before, although I think I saw one of the moths at sugar in August last. I may add that a great many of the larvæ are ichneumonid.—*A. Thurnall*; *Whittlesford, Cambridgeshire, May 7, 1875.*

Beetle Destructive to Mangold Wurzel.—I have received almost simultaneous complaints of the destruction of young mangold wurzel in distant localities. In some instances the writers complain that the insects "began to eat the young plants before appearing above ground, and never left off; in many rows taking every plant." In the 'Field' newspaper I have given all the information I possess respecting this diminutive enemy of the farmer: this is chiefly extracted from the 'Annales de la Société Entomologique de France' for 1847, was originally written by M. Bazin, and has been

copied by Mr. Curtis in his 'Farm Insects,' p. 395. According to these authorities the beetle in question is the *Atomaria pygmæa* of Heer, the *Atomaria linearis* of our countryman the late J. F. Stephens: the specimens, of which I have received a copious supply in a living and excessively restless state, seemed closely to resemble certain examples of an *Atomaria*, which very many years ago I had named "*A. gutta*." I am, however, perfectly willing to accept Heer's name of "*Pygmæa*," or any other that will be tolerably permanent. M. Bazin, as translated by Mr. Curtis, tells us that this little beetle is "generated in great numbers, destroying the buds as they appear, and that on removing the clods of earth innumerable quantities may be seen." It seems at first to attack the root only, but afterwards, when the weather is fine, it comes out of the ground, ascends the stem, and devours the leaves. "These little creatures often appear in families on a small plant, of which in a few hours nothing will remain but a leafless stalk, which soon withers and dies." M. Bazin first observed this beetle in 1839 at Mesnil-St.-Firmin; and some years later M. Macquard stated that "it devoured the fields of red beet in the environs of Lille to such an extent that the cultivators were obliged to re-plough and re-sow the fields." M. Bazin considers the following remedies to be infallible:—1st, fallowing; 2nd, heavy rolling; 3rd, good tillage; 4th, powerful manure; 5th, thick sowing. I must in this instance totally disclaim all experimental knowledge of these remedies. I give them solely on the authority of the learned Frenchman, to whom we are indebted for the earliest life-history I have seen of this insect. Mr. W. H. Wayne, an intelligent correspondent of the 'Field,' informs us that the injury "still continues in spite of salt, lime, and soot," leading us to believe that he has given these supposed remedies a fair trial. Mangold wurzel is also obnoxious to the attack of several species of the saltant genus *Altica*, the larvæ of which mine the leaves in the same manner as those of the turnip are mined by *Altica Nemorum*; and it has been said that the larvæ of a necrophagous beetle (*Silpha opaca*) feed greedily on the leaves, beginning at their edges, just in the same manner as a woodlouse or the caterpillar of a moth. The curious fact of these insects eating green leaves, a diet so opposed to the taste we should

assign to it, has been observed by Mr. Maxwell in England, and Guerin-Méneville in France.—*Edward Newman.*

Sugaring: Toads at Sugar.—Few who collect insects are ignorant of the system of sugaring and its surroundings, or of the numerous enemies we meet with in the prosecution of the work. I do not allude to game-keepers, and the like, but those minor annoyances, which come uninvited to interrupt our composure and mar our chance of success. It is somewhat annoying if we have a good moth on the sugar to see a bat rush in and take it from us whilst we hold the light for its accommodation; neither is it pleasant to cast the light upon the sweetened mixture and find it completely covered with earwigs, woodlice, and a host of other equally unwished for creatures, whose presence seems in most cases to scare away those for which the sweet feast had been spread. Again, how ugly two or three great black slugs look helping themselves to the rum and treacle, although we might have seen something not altogether repulsive in their appearance amongst the dewy grass at our feet. All these, and many other drawbacks are perfectly well known to the entomologist, but I was not aware till last summer that the toad came in the same category, provided circumstances were favourable; such, however, is the case, as the following facts will prove. A friend of mine was accustomed to sugar the posts of an open fence near his house, and was sometimes rewarded with success. One of these posts becoming infirm a support was placed in an oblique direction from near the top of the post to the ground, and my friend, on going to his sugar, observed that a large toad had crawled up the support and stationed itself close to his patch of sweetened intoxicant, and that as the insects arrived at the attractive bait the toad appropriated them to its own personal use; and my friend further informed me that every night he sugared, the toad was sure to be there, and that he put on a portion of the mixture for the toad's especial benefit. Is not this a proof that toads have a memory? At least it is evident that the toad, having found a more abundant or more palatable fare by crawling up the rail, did not fail to be at its post night after night.—*G. B. Corbin.*

[A precisely similar occurrence is recorded in the 'Zoologist' for 1860, at p.7201. It is as follows:—"There is a tree

standing by the side of a ditch in the fens, which leans in, three feet and a half from the ground, two inches out of the perpendicular. There is a small, hollow place in the stem, one inch deep and two inches wide, and growing wider all the way from the ground until it is lost. On this tree, three feet and a half from the ground, I sugar for moths, and on several nights a large toad has ascended the tree to the sugar: it always sits quietly on the trunk, but I never find it on any other tree, although there are several in the neighbourhood, all of them ash. I believe the object is to take the moths as they come to the sugar. I have called the men at the railway bridge, which crosses the river near the spot, and one of these men the other night took it down, but it was there again in half an hour. I never find any moths on the tree if the toad is there.—*William Winter.*" I have long been familiar with the habit of moths to fall off the sugar in a fit of intoxication: my friend Mr. Doubleday has often spoken to me of having observed toads waiting for moths under his own sugarings at Epping. I am surprised Mr. Corbin has not two other sweet-toothed visitors to the sugar,—the longtailed field-mouse and a common ground-beetle, an insect, as I said before, much addicted to a "diet of worms:" one can scarcely imagine any similarity between the taste of worms and centipedes and that of rum and treacle. Entomologists always speak of the field-mouse as the "dor-mouse"—I think an evident error. Perhaps I may mention, in connection with this subject, two other kinds of insect-food for which the toad has a decided leaning: in the first instance this weakness may be called beneficial to man; in the second, prejudicial. The first is the gooseberry-grub (*Nematus ventricosus*); the second the honey-bee (*Apis mellifica*). The *penchant* of the toad for the gooseberry-grub was first noticed by Mr. Leadbitter, of Gray's Inn, who often observed the abundance of the grub on some currant-trees nailed against a garden-wall at Dorking. Mr. Leadbitter proceeds thus:—"Perceiving at the same time a toad, sitting quietly in a corner at no great distance, it occurred to me to try if he would eat them. Accordingly, having collected a large quantity of grubs, I presented him with one at the end of a short stick, and was much pleased to see him put out his long tongue, draw the caterpillar in, and devour it greedily.

I continued to feed him for about a quarter of an hour. Taking a turn in the garden the next day, about the same hour, I saw the old fellow sitting in the same corner as before. The two following days he returned to the same place, but the supply of gooseberry-grubs was exhausted; and, as the supply failed, the toad absented himself, and was seen no more." The only birds known to eat the gooseberry-grub are the cuckoo and the redstart: the former is ruthlessly persecuted as a "vermin;" the latter as a consumer of summer fruit. But to return to the toad. It has a propensity rarely observed, but very decidedly developed, for a kind of insect-food that one would have thought rather too pungent for his palate; but a fact was related to me, and published as long ago as 1853 in the "Proceedings of the Entomological Society," which places the matter beyond the possibility of doubt. It was stated thus:—"A stock of bees was observed to grow weaker day by day, until at last it became so pauperised that the hive was removed, and the bees turned adrift to shift for themselves; nothing was amiss with the interior of the hive. A second stock shortly afterwards exhibited similar symptoms of depopulation, and a suspicion was then entertained that some nocturnal depredator entered the hive at night and devoured the bees. About two hours after dark the hive was visited, with a view to an inspection of the interior, but on arriving at the spot with a lantern the owner found a large toad squatted on the alighting-board, and looking about him with bright and animated eyes. Presently a night-roving bee returned home: there was a sudden movement on the part of the toad, and the bee vanished. A long interval of patient watching ensued, when a second bee came home: a second movement of the toad followed, and the bee again vanished; but the light of the lantern was this time thrown full on him, and he was distinctly seen to swallow. The toad was caught and killed, and eight still-living bees were taken from the stomach."—*Edward Newman.*]

Localities and Collectors.—That unworked localities, when brought under the vigilant inspection of the entomologist, often produce the greatest number of rarities, is an undeniable fact; consequently, when we have a few hours to spare, we would fain rush off to some locality which we well know has been the scene of some grand "take," whilst we leave our

own immediate neighbourhood comparatively untouched. Again, we well know that some localities are much more productive than others, even provided each has had the same amount of labour expended on it; for instance,—I want no prophetic knowledge to assure me that a day spent in the New Forest will undoubtedly be more remunerative than the same time spent in the fields in this locality; yet, in the face of these facts, I do not hesitate to say that we often neglect places close at home, and the certainty of a moderate success, to run the risk of a total failure at a distance. Supposing we have collected in the same spot season after season, are we sure that we have detected *every* species to be found there? On the contrary, are we not often surprised at what we take? I have a case in point:—Last season I was walking through a fir-wood, where I have collected for some years past, and was greatly surprised at capturing a specimen of *Macaria alternata*, a species I had never dreamt of taking there amongst fir-trees, with no sallow in the neighbourhood; and, later in the season, as if in contrast, I beat out a specimen of the handsome and pine-loving *Crambus pinetellus* from a bush of spindle, where not a fir-tree stood. The only specimen of *Lobophora hexapterata* I ever took was upon an extensive heath in this neighbourhood; but perhaps the most remarkable captures are two specimens of *Agrotis valligera*, which I took at heather-blooms in the same locality. The occurrence of the latter species upon heaths in this neighbourhood has been doubted by some to whom I have mentioned it; but I have only to say that the specimens are in my cabinet, and can be seen by any person. It is strange that such a coast-loving species should occur here; but it seems equally strange that the heath-loving *Selidosema plumaria* should be found upon the cliffs at Lulworth, where I took two specimens a few seasons ago, when there for *Hesperia Actæon*. Thus it seems that no locality has been so thoroughly worked that the number of species actually to be found there are known positively, and the occurrence of a hitherto unsuspected species is no uncommon thing in any locality. The experience of many readers of this journal will undoubtedly bear me out in these remarks.—*G. B. Corbin.*

Answers to Correspondents.

A. R. Wilson.—*Melanippe tristata*?—I would take it as a great favour if you would name the accompanying moth. The only moth that it resembles is *Melanippe tristata*, but it differs from it materially, being much lighter, and the black bands being narrower and more interrupted. I took about eighteen of them in June among junipers; they were abundant, but the wind was high, and I had great difficulty in catching them. They are all light; in fact I have sent you about the darkest of the lot.

[Mr. Wilson's *Geometra* appears to be a light-coloured specimen of *Tristata*, *Linn.* (not of Hübner). I believe Baron von Nolcken first pointed out that two species were confounded under the name of *Tristata* by European entomologists. Dr. Staudinger has adopted his views, and the two species stand thus in the second edition of his 'Catalogue of European Lepidoptera:'—

No. 2689. *Tristata*, *Linn.* S.N.X. 526, F. S. 335; Clerck. *Icon.* 1, 13; Wood's Index, 566. *Limbo-punctata*, *Nolck.* Fn. 1, p. 270.

No. 2690. *Luctuata*, *Hb.* Btr. 1, 1, 4, Y. p. 34 (1786; *Non.* Btr. 1, 4, 3, T.). *Hastulata*, *Hb.* Btr. Nachtr. p. 110 (1792); *Molck.* l.c. p. 61. *Tristata*, *Hb.* 254. ? *Pupillata*, *Thnb.* Diss. Ent. 4, p. 62, fig. 13.

Both species probably occur in Scotland.—*Henry Doubleday; Epping, May, 1875.*]

Edward Thomson.—*Food-plant of Gonepteryx Rhamni.*—Can you, or any of your readers, tell me any other food-plant for *Gonepteryx Rhamni* besides the two buckthorns,—*Rhamnus catharticus* and *R. frangula*?

[I have said in 'British Butterflies,' p. 147, that the two buckthorns are the only shrubs on which *Rhamni* is known to feed. I have no later information on the subject; and it will be interesting if another food-plant should be discovered. I have seen the females hovering over an exotic evergreen in my garden, but could not find that she deposited eggs.—*Edward Newman.*]

E. C. Parker.—The capture of *Leucania unipuncta* or

extranea has been already recorded (Entom. viii. 110).—*Edward Newman.*

J. Jones.—*Phigalia pilosaria*: *Does it Feed on anything but Oak?*—Will you kindly tell me through the 'Entomologist' if ever the larva of *P. pilosaria* feeds on anything but oak? as I have taken two males this season—one on a gas-lamp in January, the other in March—and there is no oak growing anywhere near.

[I know of no other food-plant, or should have mentioned it.—*Edward Newman.*]

F. H. Ward.—*Lepismodes inquilinus*.—In reply to your enquiry touching my note on this insect (Entom. viii. 120), the information will be most readily communicated by copying the *original* note, published in the 'Zoologist' for 1863, at p. 8496. It is as follows:—"New Insect at the Friends' Institute.—In our London houses two species of insects may be said to swarm; these are the cockroach and the cricket. Everyone knows an infallible cure for these pests, just as everyone knows an infallible cure for whooping-cough and lumbago; everyone recommends the cure to his afflicted neighbour; but every human body continues subject to the two complaints, and every human habitation shelters the two obnoxious fellow-lodgers. The third fellow-lodger, which I propose to call *Lepismodes inquilinus*, and to which I can give no English name, is confined, so far as my knowledge extends, to the building known as the Friends' Institute, 12, Bishopsgate Street Without. Its body is half an inch long, and it has antennæ and tails each half an inch long, or rather more, so that the entire length is rather more than an inch and a half. Like a judicious epicure it prefers the dining-room to every other apartment in the house, and, like an experienced pilferer, its rambles are entirely nocturnal, concealing itself behind the wainscot by day, and wandering about by night in search of such provisions as sugar, crumbs, and other comestibles. It seems to find no very secure footing on the varnished surface of the wainscoting, and this physical infirmity led to its detection, for, whilst perambulating the treacherous varnish, it frequently lost its hold, and was precipitated, headlong, into cups, saucers, sugar-basins, and slop-basins, and, once in, its infirmity of "poor" or non-prehensile feet effectually preclude its escape. The various household utensils which I have mentioned are now used as

snares, and the numbers of our fellow-lodgers are thus thinned night after night."—*Edward Newman.*

Percy B. Gregson.—Name of Moth.—The moth represented in the drawing is *Halias prasinana*, the "common silver-lines." It is neither represented nor described in my 'British Moths,' because entomologists have placed it among the Micro-Lepidoptera, whereas that work only includes the Macros. This lovely moth is of very frequent occurrence near London, especially on oaks. I much wish entomologists making enquiries of this kind would always send sketches as Mr. Gregson has done; there is no difficulty in recognizing, and therefore none in naming, an insect thus accurately represented, whereas I find descriptions are generally useless.—*Edward Newman.*

J. C. Wesley.—Larvæ of Winter Moth.—I have no doubt the young larvæ are those of *Cheimatobia brumata*.—*Edward Newman.*

T. Benson.—Cocoon of Tenthredo Cratægi.—In 1872 I found the caterpillar of this cocoon feeding on the hawthorn. I cannot find the description of it in Newman's 'British Moths.' Will you kindly tell me what it is?

[It is the cocoon of a sawfly; not a moth. The name is *Tenthredo Cratægi*.—*Edward Newman.*]

W. Thomas.—Name of a Beetle.—I captured a beetle to-day (May 12th) on the wing, of a species quite unknown to me; and knowing that your columns of the 'Entomologist' are open for any information of the kind I require, I beg you will give me some help with the name of the species, which I am totally unable to ascertain, and of which I also enclose a coloured drawing. The colour all over is more of a dull coppery tint; but I found it rather difficult to arrive at the right hue.

[I have little doubt from the drawing that the beetle is *Trichius nobilis*; the colour of that insect is usually rather golden-green than coppery; but I have seen specimens in which the coppery tint prevails.—*Edward Newman.*]

Charles Wright.—Tiger, or Colorado Beetle.—I beg to send you for examination some examples of the Colorado potato-beetle, taken on paths in a wood near here, where they swarm. No one here has ever seen anything like them before; and our clergyman quite confirms my opinion that this dreaded enemy has at last arrived amongst us. If you

are unable to decide yourself, perhaps you will permit some other naturalist to see them, and give their opinion. I shall look anxiously for your next issue, as I am not alone in wishing to take immediate and active measures.

[The beetles are *Cicindela campestris*, a carnivorous ground-beetle, commonly known as the tiger-beetle: they prey exclusively on living insects. The beetles are left at the printing-office, in accordance with the wish my correspondent has expressed that some other naturalists should give their opinion.—*Edward Newman*.]

R. J. S.—*Name of Gall.*—The beautiful gall is made by *Cynips Ramuli*. I have never met with it, although I have no reason to believe it uncommon.—*Edward Newman*.

Francis Owen.—*Bramble Gall.*—The gall is made by one of the *Cynipidæ*,—*Diastrophus Rubi* of Hartig and Schenck (not *Rubi* of Schrank),—and is common throughout England, generally, I believe, being found on the dewberry (*Rubus cæsius*); but according to Mr. Müller its galls have also been found on the common brake (*Pteris aquilina*). I have never met with any galls on the bracken myself, so should be very glad of specimens from anyone who comes across them. It, like most of the galls and gall-makers, is preyed on by parasites, the most common being a *Eurytoma* and a *Callimome*. The *Eurytomæ* I have bred in great numbers from galls obtained in different parts of the country: they were named, by Mr. Walker, *E. rufipes* and *E. Rubi*, which I believe are synonyms. The *Callimome* is *C. macropterus*, *Walker*. This gall is figured by Réaumur in his third volume, plate 36.—*E. A. Fitch*.

A Young Collector.—(1) The size of the pin should be regulated by the size of the butterfly: thus a swallow-tail requires a pin much larger than a blue. (2) The 'Label List of British Butterflies and Moths,' published by E. Newman, 9, Devonshire Street, Bishopsgate, at fourpence.—*Edward Newman*.]

Death of Mr. Davis.—William England Davis, the collector who discovered, and after whom I had the pleasure to name, *Phycis Davisellus*, died of consumption on Tuesday, the 18th of May. I knew Mr. Davis well as an ardent and most obliging entomologist.—*Edward Newman*.

THE ENTOMOLOGIST.

No. 144.]

JULY, MDCCCLXXV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER *née* WEISE.

(Continued from p. 122.)

Fig. 27.



APHILOTHRIX LUCIDA.

27. *Aphilothrix lucida*, Hart.—The spherical, pale yellow gall which is found on shrubby *Quercus pedunculata*, *Q. sessiliflora*, and *Q. pubescens*, is generally about as large as a cherry, but sometimes is found as big as a walnut. Its whole surface is covered with stiff, stalky or fibrous projections, which stand out radiately, and terminate in a rusty red papilla. In section it exhibits a hard texture, with numerous egg-shaped cavities: in these live the larvæ of the gall-fly, without being separately enclosed in an inner gall.

The gall is not deciduous, and the flies appear in March or April.—*G. L. Mayr.*

Herr Kollar and Dr. Mayr both give *Synergus melanopus* as an inquiline of this gall. One specimen each of *S. apicalis* and *Ceroptres arator* have also been bred by Dr. Mayr from this gall, which has not occurred in Britain.—*E. A. Fitch.*

Fig. 28.



APHILOTHRIX GEMMÆ.

28. *Aphilothrix gemmæ*, L. (*C. fecundatrix*, Hart.).—This gall, in shape not unlike the strobile of the hop or larch, grows in the axils of *Quercus pedunculata*, *Q. sessiliflora*, and *Q. pubescens*. It is about the size of a cherry, seldom as large as a small walnut. It consists of a much compressed axis, to which the more or less hairy elongate scales are attached, and appear more densely crowded. The outside and lower scales are oval or oval-triangular; those lying on the top or inside are lance-shaped or thread-like. The egg-shaped inner-gall is situate at the end of the short axis; generally the scales surround it so completely that it is not visible at all, or at any rate only the top of it is to be seen. The inner gall is hard; has, when fully developed, a length of eight to nine millimetres, is flattened at its base, and shows at the opposite (upper) extremity a small circular impression, on which rests a very small cone with a shining vertex. If hindrances occur in its regular development it sometimes happens that this imprint, though near the top of the inner

gall, is placed sideways. The surface of the inner gall as well as the surrounding scales are red-brown, and frequently exhibits a very conspicuous longitudinal striation. The large, egg-shaped larva-cell lies in the interior. The inner gall falls to the ground in the autumn, and remains there through the winter. Finally, I must observe that in some instances the gall remains small, and the inner-gall is of a pale yellow colour, and only as large as a millet or hemp-seed; in such cases parasites are to be expected.—*G. L. Mayr.*

This species, which is common in Britain, is better known by Hartig's name, *C. fecundatrix*; the insect described by Linné being supposed to be a *Synergus*,—but this is doubtful. The inquilines inhabiting this gall are *Synergus melanopus*, *S. evanescens*, *S. apicalis*, and *S. vulgaris*; Dr. Giraud also gives *Aulax fecundatrix* (Bull. Soc. Ent. Fr. 1868); and according to Hartig, *Andricus trilineatus* is also an inquiline (Germ. Zeits. ii. 191): this last is probably an error. *Eurytoma signata*, *Callimome inconstans*, *Megastigmus dorsalis* (= *Bohemanni*), *Mesopolobus fasciiventris*, and *Entedon leptoneurus*, have been recorded as parasitic in the gall of this species. A Tortrix—*Carpocapsa juliana*—may be bred freely from these galls, the larva living in the imbricated mass of scales in the autumn. In order to breed the Cynips, inquilines, or parasites, great care must be taken to collect the galls before the inner gall falls; this generally happens in England towards the middle or end of August. The better way is only to collect the inner galls themselves; but if the Tortrices are wanted of course the leaf-bracts must be kept. It has been stated that the egg of this species is only laid in the fruit-buds; this is contrary to my experience, as I believe it is quite as frequently laid in the leaf-buds, if not exclusively so.—*E. A. Fitch.*

Notes on Oviposition. By the Rev. P. H. JENNINGS.

(Continued from p. 131.)

I HAVE much pleasure in forwarding you a few more notes on oviposition:—

Rumia Cratægata.—A female, taken May 26th, laid one hundred and thirty-four eggs: seventy-seven were deposited

on the 27th,—thirty-four of these on the food-plant, common whitethorn (*C. oxyacantha*); the rest, forty-three, on the muslin cover; those on the food-plant were generally arranged side by side in rows on either surface of the leaves, the largest number in a row being eleven; many, however, were deposited singly; those on the muslin cover were more scattered than those on the leaves, and the arrangement less carefully adhered to. Thirty-seven were laid on the 27th, fifteen on the 28th, five on the 29th, and one on the 30th. Of the whole, fifty-eight were deposited on the food-plant, and seventy-seven on the muslin cover: oblong, equally rounded at both ends, greenish white, glossy, very slightly flattened on the upper and under surfaces. The young larvæ began to appear on the thirteenth day, June 9th.

Venilia maculata.—A female, taken June 2nd, laid nineteen eggs: twelve on the 3rd, and seven on the 4th; they were deposited on both surfaces of the leaves singly, and in clusters without any arrangement: oblong, equally rounded at both ends, grass-green, glossy. The young larvæ began to appear on the eleventh day, June 14th.

Ephyra omicronaria.—A female, taken May 22nd, laid fifty-one eggs: thirty-two on the 22nd, four on the 23rd, and fifteen on the 25th; of these four only were deposited on the food-plant, common maple (*Acer campestre*), on the edges of the leaves; one on the glass; and the rest, forty-six, on the muslin cover: oval, white with a slight greenish tinge, not glossy; assumed a reddish hue on the third day after deposition.

Asthena luteata.—A female, taken June 4th, laid thirty-three eggs: twenty-two were deposited on the 4th, and eleven on the 5th and 6th,—the former on glass, the latter on the earth: oblong, equally rounded at both ends, slightly flattened on the upper and lower surfaces, light green, glossy; a large egg for the size of the perfect insect. The young larvæ began to appear on the twelfth day, June 16th.

Acidalia remutata.—A female, taken May 24th, laid forty-seven eggs: twenty-five were deposited on the 25th, thirteen on the 26th,—all on the earth, some singly, some in small clusters,—nine on the 27th, seven on the glass, and two on the edge of a leaf of the food-plant, common hornbeam (*Carpinus Betulus*): oblong, slightly depressed on the crown,

rounded at the other end, ribbed longitudinally, not glossy; assumed a beautiful rose-colour on the 4th. The young larvæ, which were very long and slender, began to appear on the fifteenth day, June 8th.

Cabera pusaria.—A female, taken May 22nd, laid thirty eggs: twenty-six were deposited on the 23rd, and four on the 24th; all on the glass or on the muslin cover: oblong, considerably depressed on the crown, rounded at the other end, light green, glossy. The young larvæ began to appear on the 12th day, June 4th.

Strenia clathrata.—A female, taken May 26th, laid fifty-four eggs on the leaves, stem, and flowers, of the common trefoil,—some on the upper, some on the under surface of the leaves, near the middle,—singly, and only one or two on each leaf: oval, considerably flattened on both surfaces, a beautiful bluish green, partaking very much of the colour of the food-plant. The young larvæ began to appear on the eleventh day, June 6th.

Aspilates citraria.—A wasted female, taken June 3rd, laid ten eggs: eight on the 3rd, and two on the 4th: oblong, pale yellow, considerably depressed on the crown, rounded at the other end; attached to the stems of the common trefoil; three singly, the rest in a row up the stem; all with the depressed end upwards; assumed a dusky brown colour on the third day. The young larvæ began to appear on the fourteenth day, June 17th.

Melanippe rivata.—A female, taken May 16th, laid sixty eggs: fifteen on the 16th, thirty on the 17th, seven on the 18th, and eight on the 19th; deposited on the tips of the leaves of the food-plant (*Galium mollugo*): oval, yellowish white, glossy. The young larvæ began to appear on the tenth day, May 26th.

M. montanata.—A female, taken June 4th, laid one hundred and fifty eggs: thirty-nine were deposited in the box on the 4th, forty-two on the 5th, twenty-six on the 6th, seventeen on the 7th, eighteen on the 8th, two on the 9th, and six on the 16th; of these, deposited from the 5th to the 10th, fifty were laid on the under side of the leaves of the common primrose (*Primula vulgaris*), and sixty-one on the muslin cover; attached very delicately to the points of the down on the under surface of the leaves, or to the finest fibres

of the muslin: oblong, equally rounded at both ends, white, glossy. The young larvæ began to appear on the twelfth day, June 16th, and attached themselves to the lower edge of the leaves, generally with the anterior part of the body curled in after the manner of the Ionic volute, and apparently moving only to bend down to feed.

P. H. JENNINGS.

Longfield Rectory, Gravesend,
June 19, 1875.

The Plague of Locusts in America. By EDWARD NEWMAN.

THE Colorado potato-bug, although causing serious and perhaps not altogether groundless anxiety to our transatlantic cousins, has been a source of unalloyed pleasure and profit to ourselves. *Doryphora 10-lineata*, for so it is called, has brought more substantial sustenance to the penny-a-liners of St. Giles's and the Strand than *Solanum tuberosum* itself; more lasting fame to our natural-history scribes and wonder-mongers than the last new novel on Evolution. The half-starved literary hack; the fashionable novelist; the mystical purveyors of the grand results of scientific research; the slipshod conversationist of society;—have equal cause to fall on their knees and thank Providence for this inestimable boon. But while we are thus paying this just tribute to the fertility of American soil and imagination, we are forgetting that America herself is suffering under the direst insect-scourge that ever afflicted the human race,—a scourge that has brought disease, desolation, dearth, and death, into thousands of once happy homesteads.

Until very lately we have rarely heard of locusts as one of the plagues of America. Egypt has long been celebrated as the mother and nurse of locusts, the seat and centre of locust devastation, whence the plague has spread east and west and south; the north only owes its immunity to the fact that the country is there bounded by the sea, which presents no harvest adapted to its requirements; and even northwards the locust has penetrated Turkey, Greece, Italy, France, and Spain, neither of which countries has enjoyed perfect immunity from the death-fraught visits.

By what route the locusts of Africa have reached the continent of Europe seems involved in some mystery; whether by the direct passage across the Mediterranean Sea, or the more circuitous course by the Holy Land, seems doubtful; but it is certain that locusts have visited Europe in force. In the year 591 a swarm visited Italy, pursuing their destructive career, and laying waste all before them until they reached the sea, in which they perished. The pestilence, arising from the stench, carried off men and beasts to the number of more than a million.

It were obviously foreign to my purpose to attempt the differentiation of the locusts of the Old Continent and the New; doubtless it would be easy to exhibit scientific characters, but Dr. Cyrus Thomas has lately performed the task in an exhaustive and masterly manner that leaves nothing to be desired. His work on the 'Acrididæ of North America' is one of the most complete monographs ever published.

There is a question of nomenclature about which I would raise my feeble voice,—the restriction of the words locust and grasshopper. In England we use the words interchangeably, and attach no *particular* meaning to either. But in America the line seems drawn with great strictness:—"Everyone in this country," says Mr. Bethune, "is perfectly familiar with what is commonly called a 'grasshopper;' but how very few are aware that what they term a grasshopper, and see too often to think much about, is the same kind of insect as the much-dreaded, famine-producing locust, that constituted one of the plagues of Egypt, and that is an object of so much terror wherever it prevails. A true locust it nevertheless is; but it were well, for many reasons, that our people became accustomed to call it by its right name. Our common species in this province, while it does not possess the power of suddenly appearing in vast numbers and emigrating from place to place, occasionally becomes greatly multiplied, and proves very destructive. The western locust or grasshopper, however, differing but very slightly from our species, is, as we shall presently show, quite as formidable a destroyer as its oriental congener. While the true American locusts are commonly called grasshoppers, and the true grasshoppers are termed crickets, katydids, &c., another element of confusion is mingled with our insect nomenclature, by the common

practice of giving the name of locust to a totally different insect, belonging to an entirely different order."

The care which Mr. Bethune has taken to establish the correct nomenclature, like the rules of the British Association for the Advancement of Science, instituted with a similar object, tends to increase rather than remove the difficulty in question. The terms grasshopper and locust have reference simply to magnitude; the smaller species being called grasshoppers, and the larger ones locusts. Until this is admitted there will be no solution of this difficult subject. However, there is no doubt that the locust of North America is the *Calopterus spretus*, a species of the class Orthoptera, and the family Acrididæ. In giving this creature the credit, or rather discredit, of all the mischief done in the United States, it is necessary to point out the existence of other and larger locusts in the United States, some of which attain an expanse of wing of nine or ten inches. The account given by Bethune of the ravages of *Calopterus spretus* is as follows, omitting the account prior to 1874:—

"*The Plague of Locusts in 1874.*—Let us now turn to the terrible visitation of the present year, from the effects of which so many thousands are now suffering the privations of famine throughout immense tracts of country. Last year (1873) the locusts or grasshoppers were stated to have inflicted considerable damage upon crops of various kinds in some of the Western States, principally Nebraska and Kansas; here and there also in Minnesota, Iowa, and Dakota, there were comparatively trifling visitations. But in the month of July of this year there began one of the most serious invasions that has ever occurred in the West. In point of numbers, and in extent of area affected, the plague was probably no greater than on some previous occasions, notably that of 1855 that we have referred to; the great difference, however, is caused by the fact that twenty years ago the country west of the Mississippi River was an almost uninhabited wilderness of prairie, while now it is traversed by a net-work of railways, covered with populous towns and villages, and occupied to a very large extent by multitudes of industrious people. Twenty years ago the locusts affected the food-supply, perhaps, of the buffalo, the Indian, and the scattered frontier settlers, but now their ravages cause desti-

tution and misery in tens of thousands of homes. Up to the beginning of July this year all looked bright and fair for the western farmer. His crops of all kinds were, as a rule, growing luxuriantly; the prospect of a bountiful harvest was quite as good as usual. After that date, however, sooner or later in different localities, all these bright prospects were overclouded, in many instances utterly destroyed. The following extracts from various newspapers will abundantly tell the tale. As early as the 19th of July a correspondent of the 'Prairie Farmer' writes from Howard County, Nebraska:—'Corn and potatoes were doing well until recently, when the grasshoppers [locusts] put in an appearance, and the result undoubtedly is, at the present moment, that there is not ten per cent. of these crops and of late oats left in this and the two neighbouring counties; and it is very doubtful if the countless millions of Vandals will leave a vestige of any green thing. The result must be almost certain starvation for new-comers, and must retard the development of this beautiful country for many years.' A lady correspondent of the same paper writes a few days later from Butler County, also in Nebraska:—"The low-hung clouds have dropped their garnered fulness down." But alas! and alack! they were not the long-looked-for rain-clouds, but grasshoppers. They passed over on the 23rd, only a few alighting; but a strong south-west wind on the 24th brought back countless millions; and on the 25th their numbers were fearful to contemplate. They would rise in the air when the sun shone hot, but as it grew cooler they came down like the wolf on the fold. They settled like huge swarms of bees on every living thing. Fields of corn that had been untouched before were now stripped of tassel and blade. A field of early corn was being eaten so fast that the girls went to save a few ears, instead of going to visit a sick schoolmate according to promise. Trees were so loaded with the pests, that those four and five feet high bent down till the tops touched the ground, and in some instances broke off; for three dreadful hours they dashed against the house like hail. So many came in at doors and windows that every aperture was closed; but not till they were so thick on the windows that we were forced to make a business of slaying. The 25th of July will be remembered by the citizens of this and some other counties as the dark day,

when desolation and devastation stared us in the face. The wheat, which was at first thought to be out of harm's way, was cut off about one-fourth by the destroying angels; a statement in our country paper says the average will be about eight or nine bushels per acre. After the grasshoppers stopped their depredations there were several damp, cloudy days that brought out new tassels and silks on the corn, but more than a week of hot, dry weather, with scorching winds, checked its growth; so there will be none, excepting a very few fields that partially escaped. Turnips have been grown since the rain; and it is to be hoped there will yet be some potatoes; sweet potatoes were not hurt so badly as the common potato. Broom corn, cane, and Hungarian grass, were unscathed.' A writer from St. Paul, Minnesota, to the paper above mentioned, says that the locusts 'have undoubtedly destroyed five hundred thousand bushels of wheat, and are likely to destroy another half million of bushels.' Later on in the season the St. Paul 'Press' publishes the following statement in reference to the plague of locusts in Minnesota:— 'It is safe to estimate the tilled area in the ravaged district at two hundred and seventy-five thousand acres, and of the area in wheat in that district at two hundred thousand acres: of this area probably not less than one hundred and fifty thousand acres have been destroyed. This represents not less than two millions five hundred thousand bushels of wheat devoured in the germ by the grasshoppers, or about one-twelfth of the wheat crop of the state. Add to this area fifty thousand acres of oats, at thirty-three bushels per acre, or one million three hundred and twenty thousand bushels in all, or one-twelfth of the oat crop of the state; twenty thousand acres of corn, at thirty-two bushels per acre, three hundred and forty thousand bushels, or one-twelfth of the corn crop of the state; and perhaps twenty thousand acres more in rye, buckwheat, barley, potatoes, and other crops; and the full extent of the grasshopper havoc cannot be easily estimated.' Our readers may further judge of the extent of the calamity and sufferings consequent upon it from the following pastoral letter, issued by the Bishop of Minnesota, and appointed to be read in all the churches in his diocese:— 'To the clergy and congregations of the diocese of Minnesota. You are aware that several counties of the State have

been desolated by locusts. In May I visited Martin county, and saw the beginning of their ravages. I laid the facts before the governor. The plague has increased. Many homes are desolated. They have the right to look to us for relief. They are our own flesh and blood. They are our brothers. They are God's children. The scourge is an awful one. It may be for *our* sins. It may be to try our faith in God. It may be to test our humanity. I ask your prayers and your alms. I recommend that an offering shall be taken up on the last Sunday in July, and that a further special contribution of money and provisions shall also be taken at our annual harvest-home festival. Please send your offerings to Hon. Isaac Atwater, Minneapolis, who will send them to the committee in St. Paul. Praying God to bless you, your friend and bishop,—H. B. WHIPPLE.' Extract from a widow's letter in Brown county:—'I mortgaged my farm to get seed last spring. All is lost. What to do I do not know. It would take a tear out of a stone to hear the people talk. I had a nice piece of barley almost ready to cut. There is nothing left but the straw, the heads lying thick on the ground. Dear bishop, I am almost heart-broken, and nearly crazy, to think of the long, cold winter, and nothing to depend on. May God help us. May the Lord look to every orphan and widow, and put it in the hearts of his children to help. The widow must not plead in vain.' The bishop also issued a form of prayer for relief from the plague of locusts, to be used in the churches throughout his diocese. From the September Report of the Department of Agriculture, at Washington, we cull the following note from Kansas:—'The late summer and fall crops have been almost entirely destroyed by grasshoppers. The common jumping grasshopper did much damage through the early part of the season, but about the middle of August clouds of the flying ones made their appearance over the county, devouring and destroying vast quantities of vegetation. Gardens were quickly eaten up, corn-fields were stripped of leaves, and in many cases the corn was entirely eaten off; fruit trees are left with naked branches, and in many cases the half-ripened fruit is left hanging on the trees, presenting a sickening sight of death and destruction. In addition to the actual loss by devastation, the loss caused by discouragement will be greater.

Years of patient waiting, hard work, and self-sacrifice, have been destroyed in a few days, with no known remedy for protection; just as the fruits of labour were beginning to be realized, destruction came; and the question with many is: "Is it of any use to try again?" Here is a field for the Department of Agriculture. Some method of protection or relief must be had against the destruction of this insect, or an immense tract of magnificent country will never be what it would without this curse. I am one of those who believe all such things may be controlled by some practical method; it only requires study, enterprise, and means to learn how. This county (Doniphan) could well afford to pay 100,000 dollars for a guarantee that no grasshoppers should ever trouble it again. I have learned that vegetation highly cultivated and growing vigorously is less liable to be destroyed than when on the decline or growing feebly. Thus it is we often see a single tree in an orchard eaten even to the bark, while others of the same variety are not damaged so much; and upon examination it will be invariably found that those mostly eaten were diseased, or had their vitality in some way impaired. This thing was noticeable when the same kind of insects were here six or seven years ago. Of all fruit trees, apple and pear trees suffer the most, while peaches, plums and cherries suffer the least. They eat the leaves off the apples, and leave most of the apples on, but of the peaches they will eat the fruit and leave the foliage; but in many instances, when vegetation is not plenty, I understand they clean all as they go; and I have seen instances of this kind. The damage to vineyards in this county is not so great. They do not seem to relish grapes, and are satisfied by eating off the stems and letting the bunches fall to the ground. There will not be enough corn in this county to feed what stock there is in the county as it should be fed.' The same report states that 'the plague'—as it justly terms it—is reported in two counties in Wisconsin, seven in Minnesota, five in Iowa, four in Missouri, thirty in Kansas, and seven in Nebraska. It adds that 'the wide-spread destruction which they (the locusts) have caused in the north-west has not been adequately described. In many places large masses of people will probably suffer during the coming winter for the necessities of life, their crops having been swept by this remorseless

enemy.' The next monthly report (that for October) records the prevalence of the plague in two more counties in Minnesota, two more in Iowa, four more in Missouri, four more in Kansas, four more in Nebraska, three in Texas, two in Colorado, and one in California. The following letter from Kansas is recorded 'to give some idea of its ravages:—'The farmers in my county had their land for wheat prepared in good time, and in a better condition than I ever saw. On the 6th of September the grasshoppers made their appearance all over the county. Farmers became alarmed, and did not sow any wheat. About the 18th to the 20th they appeared to go away. Farmers commenced sowing, and got in about two-thirds of their crop. On the 28th and 29th they came the second time, filling the air, reminding one of a snow-storm in December. Some who had sown early had wheat up nice, but you cannot find a spear in any place. Wheat which was sown before the grasshoppers came the first time has been eaten down, until the grain has finally ceased to grow. I am candidly of the opinion that every acre which is sown to-day in this county will have to be sown again. There is no other chance for it; and the great trouble will be that so many of our farmers have sown all their seed, and are not able to buy again. And what will they do? Some who have not been two years on their claims are leaving them, and going over into Missouri and Arkansas to winter, to find something to live upon.' We might go on to an almost unlimited extent with similar descriptions of the wide-spread devastation caused by these insects, and the consternation they have produced throughout the west. Every agricultural newspaper and a large number of city papers have published throughout the past season similar records of ruin and suffering. To assist their brethren in the afflicted regions, large sums of money have been contributed both by State Governments and by individuals; but it is greatly to be feared that the utmost liberality will hardly save from ruin, though it may relieve temporarily, many farmers who had recently settled on those hitherto attractive plains. Not only, it should be remembered, have they suffered from a dire plague of locusts, but they have also been the victims of a long-continued drought, accompanied in some localities by a terrible hot wind, resembling the *sirocco* that blasts Southern Europe

with the dry heat of the African desert. To add also to their series of calamities, the chinch-bug destroyed in many places those crops that the locusts spared."

EDWARD NEWMAN.

(To be continued.)

Entomological Notes, Captures, &c.

Captures in Somersetshire.—Lately I have become the possessor of Newman's 'British Butterflies,' and am somewhat surprised to find this county mentioned so seldom. I attribute it to the fact—as Mr. Corbin states in his paper in the 'Entomologist' (Entom. viii. 139)—"that unworked localities, when brought under the inspection of the entomologist, often produce the greatest number of rarities." In our (this) neighbourhood I am continually finding species I had no idea were to be found: *e.g.*, in the autumn of last season I had the good fortune to turn up a pair of *Lycæna Corydon*, in good condition, in Orchard Wood, near this town, where no chalk was nearer (to my knowledge) than Dorset; true there is a lime-quarry about a mile or two from the wood. Last week in the same wood I was gladly surprised to take a pair of *Melitæa Artemis* in splendid condition; a few specimens were taken by Mr. A. J. Spiller in 1865, but I have visited the locality regularly, and have no knowledge of its having turned up since until last week. A few days afterwards I happened to be hunting in the Neroche Forest, or, I should say, on the marshy grounds around the forest, and took fourteen specimens of *M. Artemis*, and could have taken dozens more, but all my boxes were filled with *Nemeobius Lucina*, *Thecla Rubi*, *Leucophasia Sinapis*, and *Fidonia Atomaria*. Now, *M. Artemis* might annually be found in Neroche, but last week was my first visit to the place; probably as the season advances I might turn up some other insect unknown as a Somersetshire species. Unfortunately, I am unable to visit the forest after dark: it is some distance from the town, but I have heard of *Eurymene dolobraria*, *Angerona prunaria*, and *Geometra papilionaria*, having been taken there. Last season I took *G. papilionaria*, *A. prunaria*, *Thyatira Batis*, and *Gonophora derasa*, at Orchard Wood.

The season promises good captures. I took a fine specimen of *Xylomiges conspicillaris* in Gower (South Wales) last month. *Amphydasis prodromaria* has been very plentiful around this town. *Macaria alternata* occurred a year or two ago in two localities around here; and in 1865 *Colias Edusa* literally swarmed at Orchard Wood; and *Colias Hyale* appeared singly. *Vanessa Polychloros* occurs annually; and a fine specimen of *Vanessa Antiopa* was taken near Bridgwater some two years since. I took *Sphinx Convolvuli* last season; and a friend of mine took *Cymatophora ocellaris*. I have written this chiefly on account of Mr. Corbin's paper; and should this meet the eye of any entomologists coming in the neighbourhood I should be most happy to give them further information; or if you require a list of the insects of Somersetshire, I should be most happy to furnish it.—*Frederic Stansell*; 45, *Alma Street, Taunton, Somerset, June 13, 1875.*

[I shall feel obliged for such a list, but cannot promise its insertion at present. In no case can I admit mere names. They must be accompanied by dates, localities, and other interesting circumstances.—*Edward Newman.*]

Bait for Apatura Iris.—In very good seasons this beautiful butterfly frequents a wood in the neighbourhood; but to catch it on the wing is, as all know, a very difficult task, owing to the strength and swiftness of its flight. Several plans have been suggested for luring it into the net: amongst others that of throwing a stone or piece of tin into the air, which the pugnacious insect is said to chase on its descent, thus being brought within reach; then there is that of nailing a dead animal to a tree or paling near its haunts,—and this latter is reported to have been eminently successful, but my own experience has been the reverse; and my reason for now writing is to ask you, and other entomologists whose labours may have been attended with more fortunate results, kindly to give me a hint or two. My brother has taken from time to time several specimens flying, principally females. One male he caught feeding on some excrementitious matter with great avidity; but never have the dead animals possessed any attraction.—*Joseph Anderson, jun.; Alresford, Hants.*

[I shall be delighted to record the experience of others. Although I have said so much about the capture of this

magnificent insect, I never had the pleasure of taking it myself.—*Edward Newman.*]

Larva of Apatura Iris.—On the 8th of June I received from Lyndhurst a fine larva of *Apatura Iris*, taken on the 7th by Mr. J. Ives. It is said to be the first example of the species in any stage that has been taken there for many years. It appears now to be preparing for pupation, and is attached by its first pair of claspers and by the anal pair to a thickish pad of silk, spun at the junction of two twigs of its food-plant. It has been in this position for two days. Perhaps next spring I may again fall across the species; and should I do so I will not fail to send you examples.—*Bernard Lockyer*; 204, *Euston Road, N.W.*, June 13, 1875.

Colias Hyale in May.—On May 31st I took a specimen of *Colias Hyale* (pale clouded-yellow) on the Arundel Road, near Clapham Common, about four miles from Worthing. I mentioned it to Mr. Pratt, the naturalist at Brighton, and showed him the specimen, which is a very good one, evidently of this year's brood.—*A. E. Hunter*; *Christchurch Vicarage, Worthing*, June 15, 1875.

Early Appearance of Colias Hyale.—On June 16th my friend Mr. A. T. Cobbold took a fine specimen of *Colias Hyale*, apparently but just out. It was flying by the side of a river within a mile of this town.—*E. F. Bishopp*; *Ipswich*.

[Several other records of the capture of *Hyale* in May, and one of *Helice*, have reached me.—*Edward Newman.*]

Food-plants of Gonepteryx Rhamni.—Boisduval, in his 'Species General,' gives *Rhamnus catharticus*, *Frangula*, and *Alaternus*: this last is an evergreen shrub, not found growing wild in the United Kingdom, but which has been extensively introduced into garden planting. Mr. Jenner Weir has recorded finding larvæ of *G. Rhamni* on the variegated variety, and I also have observed them on an ordinary specimen. I had often seen females hovering about a scrubby *Alaternus* in a warm corner of my garden; and on the 22nd of May last year observed one deposit several eggs. These duly hatched, and on the 22nd of June nine larvæ were feeding on the young leaves, some half grown, some smaller; showing that the eggs had not all been laid at the same time. The larvæ are very sluggish and inconspicuous

when young, but when about three-parts grown they are easily distinguished, and move about,—probably for fresh food, as they never seem to entirely consume a leaf or to touch an old one. No doubt they are picked off by birds, as they gradually diminished in number; and only two, which I protected with muslin, reached the pupa state. This year also there were several eggs on the same plant; and on the 30th of May three larvæ about half an inch long were feeding. The variety *Cleopatra* is said usually to feed on *R. Alaternus*; possibly that plant may be more abundant in Southern Europe than *R. catharticus* and *Frangula*. This variety and the typical *Rhamnii* have been stated to have been reared by Dr. Boisduval from “one brood;” whether this means from eggs laid by one female or from larvæ found feeding on one plant, I do not know; if the latter, it would be no proof that they are the same species, as the eggs are laid singly, widely apart, and there is not the slightest reason to conclude that the eggs on one plant are all laid by one female; the probability is, in fact, the other way, for the butterfly is plentiful, and flies from shrub to shrub, depositing only a few eggs on each, even when the shrubs are comparatively large.—*N. C. Tuely; Mortimer Lodge, Wimbledon Park, June 5, 1875.*

Lycæna Acis near *Cardiff*.—On Saturday last, the 4th of June, I had the pleasure of taking one male specimen of *Lycæna Acis*, at Penarth, near Cardiff, South Wales. Last year I captured ten specimens (eight males and two females). *Alfred F. Langley; Cardiff, June 10, 1875.*

Pale male of Bombyx Quercus.—I had the good fortune to capture in July, 1874, a male *Bombyx Quercus*, exactly the colour of the female. I think this variety is very scarce.—*John Sumner; Halsall Moor, Ormskirk, Lancashire.*

Chærocampa lineata in *Glamorgan*.—On May 27th I had a specimen of *C. lineata* brought me alive. It was taken in a cottage in this town.—*Evan John; Llantrisant, Glamorgan.*

Food-plant of Phigalia pilosaria (Entom. viii. 142).—I see in the ‘Entomologist’ for June you say of *Phigalia pilosaria* that you “know of no other food-plant” than oak. I bred a good many from the egg in 1873—4: they eat not only oak, but plum, pear, hawthorn, and wych-elm; preferring

plum to all the rest.—*John T. Boswell* (formerly *Syme*); *Balmuto, Kirkcaldy, N.B., June 1, 1875.*

[Mr. Doubleday, also, in a private letter dated 3rd June, says that it feeds in Park Hall Woods on hornbeam, birch, sawallow, aspen, &c.; and in his own garden, at Epping, on plum, apple, whitethorn, rose, &c. In this matter I have made a palpable and inexcusable blunder, but it arose from infirmity of memory and haste rather than ignorance. In an *old* number of the *old* series of the 'Zoologist,' I have told the marvellous life-history of this moth, and I think for the first time in this country; but as my observations have not hitherto appeared in the 'Entomologist,' I hope I shall be excused for the decided egotism implied in reprinting my own lucubrations: it will be seen that so far from giving oak as the only food-plant of *Pilosaria*, I have omitted the forest monarch altogether.—*Edward Newman.*]

Description of the Larva of Phigalia pilosaria.—The eggs are laid in crevices of the bark of *Carpinus betulus* (hornbeam), and some other forest trees, very early in the spring, and are hatched before the leaves begin to expand. The young larvæ find their way to the buds, and continue to feed on these until the leaves expand, previously to which they grow very slowly, but no sooner are young leaves available than the larvæ feed on them voraciously, and are full fed by the end of May or beginning of June, when they rest in a nearly straight position, but with the back slightly arched; they neither fall off the food-plant nor feign death when disturbed. The head is prone, of less circumference than the body, and notched on the crown. Body of uniform circumference, beset with numerous conspicuous warts, scarcely amounting to humps; each of these warts emits a strong, but short bristle, which terminates in an extremely fine point: the situation of the warts I will describe:—On the 2nd, 3rd and 4th segments they are small and insignificant; on the 5th segment are two placed transversely on the back, and one on each side, but these are still inconspicuous, although manifestly larger than those on the preceding segments; on the 6th and 7th segments, in the same position, are two dorsal and two lateral warts, all much larger; the same number and arrangement of warts obtains on the 8th, 9th, 10th and 11th segments, but all these are small, as on the 5th segment; on all these segments, that is,

from the 5th to the 11th inclusive, there is a minute wart in advance of each principal wart; on the 12th segment are two transversely placed and rather prominent dorsal warts, and two minute warts behind them: every wart terminates in a bristle. Head slightly hairy, opaque brown, with two paler, transverse, wavy markings across the face. Body sometimes yellow-green, but generally brown, with the warts black, and a few yellow markings, *viz.*, on the 2nd segment a transverse mark immediately behind the head; on the back of the 3rd and 4th segments two approximate stripe-like markings, and an amorphous mark in the region of each lateral wart. It descends to the ground, and changes to a smooth pupa just below the surface of the earth, during the first week in June; and the perfect insect appears in January or February following.—(Zool. 8782.)

Larvæ of Xylophasia scolopacina.—I have to record the capture by myself and two friends of over three hundred larvæ of *Xylophasia scolopacina*, in woods, at Hampstead and Highgate, between the 1st and 3rd of June. I believe this is the first recorded capture of the insect, so far south, in any stage, though the fact of its occurring near London must have been known to many entomologists for some years. My friend Mr. V. B. Lewes took a number of the imagines in July, 1870, at Bishop's Wood, Hampstead; and in the same year I took a few at Highgate; and I expect others must also have captured the species in these localities. The larvæ are rather local, and are most abundant in little sheltered nooks amongst the bushes just off the main rides, near the outskirts of the woods. They are most easily found at night, but can also be taken in the afternoon. They are very fond of biting through a stem of grass about half-way down, and then eating downwards from the point where they cut the stem. Does the species also occur in the woods on the south side of London? I have never seen the imago at sugar; but it is abundant at the flowers of the bramble during July. The larvæ are now full fed, and most of mine have buried.—*Bernard Lockyer*; 204, *Euston Road, N.W.*

Knautia or *Scabiosa* (Entom. viii. 133)?—It is not often that I have occasion to differ from my friend Mr. Melvill on botanical matters, but in the case of the habitat of *Knautia arvensis* I think it very likely that Mr. Gregson may be right, and I do not think anyone could confound *Knautia* and

Scabiosa. I have often seen the former on heathy hill-sides, far away from corn-fields, in the greatest profusion, growing amongst bracken and furze-bushes. If Mr. Melvill will go with me some afternoon in August to Cobden Edge, above the Strines Valley, Derbyshire, I shall be very glad to show him *Knautia* in perfection, in the sort of place I have described; and perchance we may find not only the larva of *E. Knautiata*, but many other things worth the ramble.—*Joseph Sidebotham; Southford, June 5, 1875.*

Ophiodes lunaris in Sussex.—When I was in Sussex last month, a friend, with whom I was out sugaring, fortunately captured *Lunaris*, as it rose up from the underwood, and he most kindly presented it to me alive on the spot. It is a fine male specimen in good condition, except a slight chipping of the wing.—*W. H. Tugwell; 3, Lewisham Road, Greenwich, June 16, 1875.*

Valeria oleagina in Hertfordshire.—Seeing that in Newman's 'British Moths' it is stated that "the green-brindled dot (*Valeria oleagina*) is extremely rare, and that no recent captures had taken place," I beg to say I have one that came from its chrysalis about a week ago. I cannot say where I obtained the chrysalis, as it was taken with numbers of other kinds from the tree-roots during the winter. Should you think it worth sending for I will forward it to you, if you will let me have it again.—*Benjamin Brown; Deards End Farm, Knebworth, Herts, June 17, 1875.*

[Pray send the specimen by private hand, and let the bearer take it back. I should be sorry to take the responsibility of having so rare an insect in my possession.—*E. Newman.*]

Catephia alchemista in Sussex.—On June 4th I took a specimen of *C. alchemista* at sugar, in a large oak wood in this county; it was about half-past ten o'clock. As there were no circumstances of the least peculiarity or interest connected with it, and the specimen closely resembles the figure in Newman's 'British Moths,' I have nothing further to add about it. I shall be glad of information from entomologists as to its foreign habitats, if any are known.—*W. Borrer, jun.; Cowfold, Horsham, Sussex, June 18, 1875.*

Moths at Cotoneasters.—It may not be generally known to your readers how wonderfully attractive the flowers of *Cotoneaster microphylla* are at this time of the year to moths, particularly *Noctuæ*. The shrub is now in full bud,

and is already crowded with *Agrotis Segetum*, *A. exclamatoris*, &c. When in full blossom, later on, I have found *Aplecta advena*, *Leucania conigera*, and *Mamestra anceps*, frequenting it in great numbers, as well as stray specimens of better species. I first discovered the intoxicating power of these flowers last year by noticing the countless numbers of bees they attracted during the day. I am not aware whether the shrub is at all common in gardens; but the three or four I work were planted two years ago in a very heavy soil, and thrive wonderfully.—*Gilbert H. Raynor; Hazleleigh Rectory, Maldon, June 19, 1875.*

Visitors to the Trees sugared for Moths.—To the well-known visitors to sugar I can add the great green grasshopper (*Acerida viridissima*): I suspect it came to feed on the moths, not on the sugar. At Deal I once saw one eating the body of a moth; the moth meanwhile sucking up the sugar as if nothing were amiss. At Bishop's Wood, Hampstead, I used to see a smaller representative of the great green grasshopper (*Meconema varia*, I believe), which certainly took the sugar. I am almost sure I saw the dormouse often at Bishop's Wood at sugar. I never tried to catch them, but remember admiring their fuzzy tails, so that I do not think I mistook longtailed field-mice for them. The longtailed field-mouse I never saw at sugar. Here they abound, to the detriment of my excursions; but though I have sugared every summer for six years, I have not seen one at sugar.—*John T. Boswell (formerly Syme); Balmuto, Kirkcaldy, N.B.*

On Polydrosus sericeus.—With the exception of one specimen, captured near Winchester last year by Mr. W. A. Forbes, I believe this beetle has not been taken in England for upwards of forty years; and even previous to then it would seem not to have turned up very abundantly. The National Collection in the British Museum only contains three specimens,—two perfect, and one mutilated. My friend Mr. F. Smith possessed one pair in his private collection, which were given him by the late Rev. Mr. Rudd, rector of Kimpton, who took them in this neighbourhood. The insect was quite unknown to me until Mr. Smith kindly pointed out its distinctive characters when examining the specimens in the British Museum. Beyond the fact of its being captured in a wood near here, I could glean no information respecting its economy; therefore did not know

on what particular plants, if any, it should be searched for. On the afternoon of Sunday, May 30th, accompanied by my nephew, I took a walk to the wood in question, and, after searching diligently for a couple of hours, I took one female. On the following evening, provided with a net each, I and my nephew took eleven specimens, nearly all males. The next evening I went alone, and took fifteen *Polydrosi*, but chiefly males. On June 3rd, between seven and eight o'clock, P. M., my nephew and I took sixteen (the majority of which were also males), making a total of forty-three. Since then other business has prevented my searching for more specimens; in fact, I have no ambition to take any more in one season, now that I know where to get them at the proper time when wanted. Of its economy all that I could ascertain from so short an acquaintance was that they were beaten almost exclusively from birch in one particular part of the wood. Whether they feed on the leaves, either in the larval or imago state, I cannot say; all I know is that it was useless beating any branches except those on which the leaves were much eaten by some insects. On flourishing branches, where the leaves were entire, no *Polydrosi* turned up. Time of appearance: from my experience of one season it would appear that the last week in May and the first in June should be taken advantage of to hunt for the insect. In habits it seems very lethargic, crawling slowly up the side of the net, and not running with the celerity of most of its congeners. It is also difficult to put in the cyanide bottle, as it clings to one's fingers, or anything its hooked claws come in contact with. These claws seem admirably adapted for holding on to the smooth surface of the birch leaves, especially during high winds.—*Henry Reeks; Thrupton, June 11, 1875.*

Answers to Correspondents.

John Sumner.—*Amphydasis Betularia.*—I have a very curious moth, exactly like the figure I enclose,—all black, except a white dot at the anal angle of the fore wings.

[The figure represents *Amphydasis Betularia var. Mauraria.*
—*Edward Newman.*]

J. W. Mills.—*Chelonia villica.*—I do not know whether the cream-spotted tiger (*A. villica*) is generally abundant or not this year, but we have managed to find ten of these

insects within the last few days. They seem to frequent elm-edges with plenty of grass and undergrowth.

[I have not collected for many years, but formerly I used to meet with *Villica* commonly, but never abundantly; and the larva much more frequently than the imago.—*Edward Newman.*]

F. G. Phillips.—*Singular Gall.*—I discovered to-day some oak-galls, the outer crust of which appears to have been eaten off by some insect. Never having myself noticed a similar appearance, and thinking it might interest you, who would doubtless be able to explain the cause of the irregularity, I beg leave to enclose you a specimen.

[I have opened the specimen sent, and find it composed of silky fibres; the interior was occupied by a large cell, in which a large, smooth, green caterpillar was reposing, and appeared about changing to a chrysalis, its markings being very obscure, as is frequently the case before changing. The gall, popularly known as "King Charles'" or the "oak-apple," has much the same appearance; the substance has a similar woolly character to that of the object now received; but the question arises whether the caterpillar so comfortably installed in the interior had any part in producing the gall. I feel unwilling to pronounce; the multiplicity of inquilines found in the oak-apple is truly marvellous. I think shortly to publish some account of them, from a list prepared by the late Mr. Walker; and doubtless it may be considerably extended, as the observations of one entomologist are scarcely likely to exhaust so prolific a subject.—*Edward Newman.*]

S. L. Mosley.—*To rear Galls.*—Would you tell me of some good plan to rear gall-insects? When I pluck soft galls and keep them in tin-cans they generally come to nothing, but mould and rot away.

[Will Mr. Fitch kindly reply.—*Edward Newman.*]

S. L. Mosley.—*Diptera.*—Would any person volunteer to name Dipterous insects? Also, is there such a thing as a complete list of Diptera published?

[Volunteers are requested to reply. There is a list of British Diptera published by the British Museum.—*Edward Newman.*]

Henry Reeks.—*Fallen Pears.*—I am sorry to have had this matter so long in hand without giving a definite reply.

It is very humiliating to find oneself baffled in all attempts to obtain the solution of a problem that never ought to have been a problem at all. Pears of every kind fall by myriads just after they are supposed to be knit; and this is a phenomenon that calls for a remedy, but hitherto has called in vain. It is obvious that when the fruit has fallen it is too late to suggest a remedy for that year; but it is also obvious that the fallen fruit must in themselves contain the enemies, and therefore present the opportunity of destroying them by wholesale, and thus prevent the perpetuation of the race. If we cut open a pear,—an infant pear, we will call it, for they all when thus attacked perish in infancy,—we find the interior occupied by small maggots of a pale hue, but yet not quite white: these come out in a few days, and congregate together on the surface of the glass, with which the vessel containing them may be covered; this exodus is probably preparatory to a retreat under ground for the purpose of undergoing metamorphosis. Nothing can be well easier than collecting the fallen pears at this season, and burning them; this summary process must destroy the parent-fly for the next year at least, always assuming that no flies will visit your orchard from other orchards, which I see no possible method of preventing. But I have not yet said to what class and order these flies belong, and here we must have recourse, as usual, to Kirby and Spence. From these high authorities we find that Mr. Knight—I presume the late Andrew Knight, of Downton Castle—attributed the mischief to a small four-winged fly. Kirby and Spence suggest that this was a sawfly,—a suggestion that is strongly corroborated by an observation of my own, for on cutting open a number of these fallen pears, sent me by Mr. Reeks, I find them inhabited by the larva of a sawfly of minute, but unmistakable, proportions. In opposition to this view I have received from Mr. Fitch a communication stating that two species of *Sciara* and one of *Cecydomia* destroy the embryo fruit of the year. The *Sciara* is most destructive; and the species are *S. Pyri* and *S. Schmedbergii*. *Cecidomyia* might also infest pears when fruiting, but I hesitate to say much respecting it; indeed, I feel that my knowledge of the subject is very meagre and unsatisfactory, and I only allude to it under the impression that I may possibly elicit information from others.—*Edward Newman*.

THE ENTOMOLOGIST.

No. 145.]

AUGUST, MDCCCLXXV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by Mrs. HUBERT
HERKOMER née WEISE.

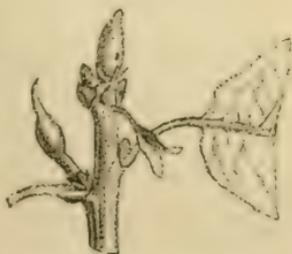
(Continued from p. 147.)

29. *Aphilothrix solitaria*, Fonsc.

(*C. ferruginea*, Hart.).—This woody, spindle-shaped gall is developed either without a pedicle, or with a short and thick one, on the axillary buds of *Quercus pubescens* and *Q. sessiliflora*. It is surrounded at the base by small bud-scales, and terminates in a style, which varies in length, and is often curved at the top; the blunt point of this style generally bears a small papilla or short cone. The gall is brown, and when fresh more or less covered with a yellowish brown wool. In the interior of this moderately thin, but hard gall, we find a large oval cavity, which is the larva-cell. Its longest diameter is one centimetre. The fly emerges in September, for on the 28th of that month I found on the oaks fresh galls of this species, showing the hole through which the fly had emerged.—*G. L. Mayr.*

Three different species of *Synergus* are dwellers in the galls of this species, namely,—*S. facialis* and *S. radiatus*, which emerge in July; and *S. vulgaris*, which lives in the gall through the winter, not emerging till April of the next year. From one hundred galls of this species, collected by Von Schlechtendal, only four produced the gall-maker; the others

Fig. 29.



APHILOTHRIX SOLITARIA.

containing either its inquilines or parasites. The only Chalcid I can find recorded as parasitic on this species is *Eupelmus azureus*, by Ratzeburg, in his 'Die Ichneumonien.' Like many of the bud-galls this species has been confounded with many others by different authors, more especially with *A. albopunctata*; in fact these species were only satisfactorily separated in 1865 by Schlechtendal, and then he afterwards mistook them the one for the other. This gall was first described as British by Mr. Cameron (*E. M. M.* x. 85), under Hartig's name, *Ferruginea*, who found them in Cadder Wood, near Glasgow. I have also received the true *Solitaria* from Mr. G. B. Rothera, who, with his friend Dr. Ransom, has found it in Nottinghamshire.—*E. A. Fitch.*

The Breeding of Gall-flies. By E. A. FITCH, Esq.

THE flies may be bred from some galls very readily by merely placing them into a chip or any other box, and letting them bide their time, but others require more attention and care, *e.g.*, the succulent galls of *Baccarum* (the currant oak-gall), *Curvator* (the kidney oak-gall), *Terminalis* (the common oak-apple), *Megaptera* (the oak-trunk gall), and many others, which if collected in damp weather, or are slightly immature and full of sap, are almost sure to mould; in such cases the better way is to leave them in the room for a day before putting them away, and then to remove their covering every day for a short time. I have found the thistle-gall of *Urophora Cardui* very troublesome.

The plan which recommends itself I think before all others is one used I believe extensively by the breeders of *Micro-Lepidoptera*, and which answers for galls admirably; that is to procure some common gallipots and rub them down, so as to have a smooth edge, on which a piece of good glass will fit closely, and in this receptacle, which will be almost airtight, the galls may be kept; it is very convenient also for examination, as the presence of mould or the exit of insects may be seen at once, and the escape of the flies, if the pot be ground smooth, will be impossible, which is not always the case with various boxes; of course anything may be substituted for the gallipot, if it has a smooth edge and flat top.

Care should be taken to have the receptacle very dry, and not to cause the condensation of vapour inside by leaving it in the sun.

When we are breeding from galls produced by sawflies (Tenthredinidæ), which occur almost exclusively on various species of willows, or some gall-gnats (Cecidomyidæ), we must have a small quantity of baked earth in the bottom of the jar, as their transformations are subterranean. Great care is necessary in breeding the various insects from galls, because the habits of some of the Cynipidæ, Chalcididæ, Ichneumonidæ, &c.,—all of which are freely bred from galls,—are such that they may very easily be introduced into the gallipot, and on their emergence of course are labelled as inhabitants of the galls themselves: for instance, how easy to introduce some half-dozen Aphides (plant-lice), which probably each contain an Allotria (Cynipidæ) or Aphidius (Ichneumonidæ); then, again, there are the numerous Chalcids and Ichneumons, which are parasitic on leaf-mining Diptera, Hymenoptera, and Lepidoptera; the leaf-miners themselves are also very liable to cause confusion; and when we remember that Mr. Walker bred examples of seventy-five different species (hundreds of specimens of some) from one species of gall in one year,—and these belonging to *seven* orders of insects, besides Arachnida and Acari,—it is evident the breeder of gall-flies (by this I mean, here, the different insects inhabiting galls) will find quite enough to occupy his attention without the interlopers.

After we breed the insects, and when we perhaps see the glasses of some twenty gallipots swarming with flies, we want to know how to preserve them well and quickly: this will best be accomplished by procuring a small basin of boiling water, and by holding the glass some little distance above, and giving it a tap, the greater part of the insects will fall or jump into the water with their wings and legs extended; then collect them on small pieces of paper—thick blotting, I use—and pull their antennæ, wings, legs, &c., out, as best suited for examination, and so leave them for a day, when the dried insects will fly off the paper at the least touch from a small knife or even pin; they may then be arranged on cut pieces of card-board (not too thick) with gum tragacanth, and so pinned,—separate species on separate slips; this is not

much trouble, as the insects may be killed and set quickly, and gummed of an evening or at any leisure time: when nicely set they are fit to be called specimens, and are useful for examination, which probably would not be the case were they left to die a natural death, or attempted to be pinned and set out.

One word of advice and caution: label everything very carefully; for breeding purposes only use the galls themselves,—no leaves, no twigs, no anything; in killing and setting be very careful not to mix specimens and species from different galls. This must all be attended to, in order to solve some of the interesting problems connected with parasitism and galls.

I have only spoken of the breeding of insects from mature galls, as that is only what should be attempted; but in special cases I dare say the gall might be kept by preserving the twig or plant in water, as we should a flower, till it comes to maturity and the larvæ have a chance of becoming full fed; then detach the gall. I have never attempted to breed insects from immature galls but once, and then in ignorance: it was with the common oak-spangles (*Neuroterus lenticularis*), which I collected in the autumn and winter from the trees, but could never breed the *Neuroterus*, till last year I collected galls from the ground at the foot of oaks in January and February, and so bred the gall-maker freely; and that is what must be done with this species and *Fumipennis*; it does not so much matter with the pretty little *Numismatis* (silky button-gall).

Galls should not be thrown away when the emergence of one series of insects is complete, as some will have tenants for a twelvemonth; the gall-makers, and various inquiline (dwellers in galls) and parasites, having various and separate times of appearance.

E. A. FITCH.

Maldon, Essex, July 1, 1875.

Notes on Oviposition. By the Rev. P. II. JENNINGS.

(Continued from p. 150.)

Selenia lunaria.—A female, taken June 8th, laid one hundred and ten eggs: twenty-eight on the 9th, forty-two on

the 10th, thirty on the 11th, one on the 12th, seven on the 13th, and two on the 14th; of these one only was deposited on the food-plant on the under surface of a leaf, sixty-two on the glass cylinder, and forty-seven on the muslin cover. Oval; yellow; smooth, but not glossy; all detached from one another.

Iodes vernaria.—A bred female laid one hundred and forty-eight eggs: on June 29th seventy-three, and thirty-three on the 30th, fourteen on July 1st, fourteen on the 2nd, seven on the 3rd, and seven on the 4th; these were laid in thirty-five different piles, the piles varying in number of eggs from one to seven, almost always attached to the stem of the food-plant, traveller's joy (*Clematis vitalba*). In shape the egg is nearly circular, a little longer than broad, perfectly flat on both surfaces, with very sharply defined rims; the piles are made with the greatest regularity, so that the rims exactly coincide. Colour bright green; sides glossy, and surfaces of the finest polish. The young larvæ, which began to appear on the fifteenth day, July 14th, were almost white, with nearly black heads.

Acidalia aversata.—A female, taken July 2nd, laid forty-three eggs on the 3rd, in clusters very like bunches of grapes, on a string of an old larva-web, which happened to stretch across the glass cylinder: they were deposited with great neatness, the smaller end touching the web, the larger standing out at an angle of 45° , or thereabouts; the several clusters containing from six to thirteen eggs. Oval, flesh-coloured, not glossy. On the fourth day the signs of fertility appeared in a few red specks on one side, about midway between the two ends. The young larvæ appeared on the twelfth day, July 15th: heads black, and five alternate rings of gray and black.

Corycia lemerata.—A female, taken June 30th, laid twenty-three eggs: twenty-one on July 1st and two on the 2nd; all close to the midrib of the leaves of wild cherry, and pressed as much as possible under it. Oval, yellow, glossy. On the fourth day the signs of fertility appeared in a few red specks on the crown, and were followed by others over the whole surface of the egg, which at last assumed an orange-colour, of which colour the young larvæ appeared on the thirteenth day, July 14th.

C. taminata.—A female, taken June 21st, laid one hundred and ninety-one eggs: forty-six on the 23rd, twenty-three on the 24th, twenty-two on the 25th, twenty-six on the 26th, fourteen on the 27th, six on the 28th, seven on the 29th, four on the 30th, fifteen on July 1st, sixteen on the 2nd, eight on the 3rd, and four on the 4th; scattered singly on both surfaces of the leaves of wild cherry. Very nearly circular; flattened on both surfaces; yellowish white, glossy. The young larvæ, which were almost white, began to appear on the ninth day, July 2nd, two days before the last eggs were deposited.

Ligdia adustata.—A female, taken June 17th, laid twenty-nine eggs: twenty-one on the same night, and eight on the 18th; nineteen were attached to a web on the food-plant (*Euonymus europæus*), two on the muslin cover, four on the edge of the under surface of a leaf, two near the middle of the under surface, one on the edge of the upper surface, and one on the stem of food-plant. Oblong; equally rounded at both ends; dull green, very much resembling the colour of the stem of food-plant; the surface covered with very minute, circular, convex markings; assumed a reddish brown hue on the fourth day. The young larvæ began to appear on the twelfth day, June 30th.

Cidaria corylata.—A female, taken June 21st, laid seventeen eggs: eight on the 22nd, six on the 23rd, and three on the 24th, attached to the edge of the under surface of the leaf. Of a faint greenish tinge; oblong; equally rounded at both ends; not flattened. The young larvæ began to appear on the twelfth day, June 4th.

Halias prasinana.—A female, taken June 18th, laid three hundred and ninety-three eggs: thirty-three on the 18th, one hundred and twenty-one on the 19th, eighty-seven on the 20th, fifty-four on the 21st, forty-five on the 22nd, thirty-two on the 23rd, and twenty-one on the 24th; of these thirty-three were deposited in the collecting-box, two hundred and thirty-six on the glass cylinder, and one hundred and twenty-one on the leaves of oak, mostly on the upper surface. In shape much resembling a limpet-shell, but less convex and circular; ribbed from the circumference towards the centre, which is occupied by a small, smooth convexity, around which the ribs rise; deposited both singly and in clusters of

as many as five, when the circumference of one often overlaps that of others; almost always singly when on the leaves. Yellowish white. The signs of fertility appeared on the third day, the centre assuming a brown hue, which gradually darkened, the circumference beyond it becoming colourless and transparent. The young larvæ began to appear on the thirteenth day, July 1st: almost white, head large, the body decreasing from the 2nd segment, and almost ending in a point.

P. H. JENNINGS.

Longfield Rectory, Gravesend,
July 17, 1875.

The Plague of Locusts in America. By EDWARD NEWMAN.

“*The Plague of Locusts in 1874* (Extract continued).— To illustrate the reality and intensity of the sufferings that we have alluded to, we shall give one extract only out of a large number that might be quoted. The writer of a letter to the ‘Prairie Farmer,’ dated ‘Kearney, Nebraska, November 16th,’ thus describes the condition of things in his neighbourhood:—‘Your readers have been pretty fully posted as to the ravages of locusts over this entire region, the devastation extending from Central Minnesota to the southern limit of Kansas, the whole country being almost as utterly destroyed, so far as provisions are concerned, as if it had been swept by the scathing flames. I speak more understandingly of my own neighbourhood, and shall endeavour to state facts that may be firmly relied upon, and which can be verified, if necessary, by the testimony of others in my own vicinity. The wheat crop, what there was of it, considering the dry weather, was good; but fully one-half of the settlers had no wheat at all; their sole dependence was corn and potatoes; in many instances the very uncertain product of prairie sod. Thus nearly half of our people were dependent solely upon the two above articles, both of which were almost entirely swept away by drought, bugs and locusts combined. *Every* family nearly, that was able to do so, having friends in Iowa and Missouri have gone there to winter: some may return; others never will. Many proved upon their claims, and have

left the country for ever. The number of actual homestead settlers is thus reduced fully one-half in my own neighbourhood, and of that one-half not one family in ten have provisions, fuel, or clothing, to last them through the winter; fully two-thirds have not food enough to last until the 1st of December. I find, from conversation in Kearney with settlers both north and south for a distance of thirty to fifty miles, that the same statement holds true over almost the entire region. Thus, notwithstanding the *cry* of some of our papers that "we are not beggars," more than two-thirds of those now on their homesteads must either beg or starve. In less than thirty days there will be starvation and death, unless these needs are promptly met. There is no corn, no oats, no feed of any kind for stock, except what is shipped in from a distance; there is no fuel except coal, at from 8 to 11 dollars per ton; there is no work, no money; there is no seed-corn, and, in very many instances, no seeds of any kind for another year's planting. On the 13th inst. I met two of my neighbours. One has a family of six to provide for, three of them young children: says he,—“I have just flour enough to last until Saturday night.” The other has a family of ten, four of whom are sick, and have been since September; one child, a bright boy of some four years, has lost the entire use of his limbs, and now has to have the care of a helpless babe: this man has flour for ten days, and potatoes that will enable him to get along for a week or two longer. Last winter this family of children were entirely without shoes or stockings, with clothing just sufficient to cover nakedness, and ragged at that. The writer of this article has flour for a week,—fifty pounds,—and pays for it in breaking one acre of prairie, thus giving 3 dollars in work for 1.20 dollar-worth of flour. He does not state this complainingly, being glad to get work to feed his five babies at any price. I merely give these three cases as a sample. While I give but three, there are many others all around me in fully as deplorable a situation. This want extends over the whole area of country,—west, north, and south; and the farther the settlement is from the supplies, the greater the wants and privations of the settlers.’

“*The Plague of Locusts in Manitoba, &c.; specially with reference to Devastations previously to 1874.*—Thus far we have

been describing the extent and terrible results of this year's plague of locusts in the Western States of the Union. We have now, unhappily, to record its occurrence in our own new province of Manitoba, which adjoins the state of Minnesota, so frequently referred to above. From the following record of visitations previous to this year, it will be observed that they were, in almost all cases, simultaneous with those in the neighbouring States, that we have described in the earlier part of this paper. For this record we are indebted to the letter of the Winnipeg correspondent of the Toronto 'Globe,' which appeared in that paper on the 5th of August last:—

'Grasshoppers first appeared in Red River towards the end of July, 1818, six years after the commencement of the settlement. They covered the settlement belt, but did not utterly destroy the wheat crop, it being nearly ripe at the time. Barley and other crops were swept away. They deposited their eggs and disappeared; and the following spring the crop of young grasshoppers was immense. These departed before depositing their eggs, but devoured all vegetation on their route, thus destroying all the crops of 1819. Great numbers came in during the season of 1819, and deposited their eggs; so that in 1820 the crops were again all destroyed. Thus for three successive years were the crops in this country destroyed by these pests. They then disappeared for thirty-six successive years, the next visitation being in 1857, when they visited the Assiniboine settlement, doing but little injury beyond depositing their eggs. The following season their progeny destroyed all the crops within their reach. In 1864 they again appeared in considerable numbers, but did little injury to the wheat crop. The following year the young grasshoppers partially destroyed the crops, leaving many districts entirely untouched. The largest swarm ever known came in August, 1867, but the crops were so far advanced that season that they did but little injury. Their eggs produced such immense swarms the following spring that they destroyed everything that had been sown throughout the settlement, and famine ensued. In 1869 they again visited the country, but too late to do much harm. The season following, however, they destroyed most of the growing crops. In 1872 immense hordes of these winged pests again visited a part of the country about the beginning of August. The

country west of Headingly escaped, and generally the wheat was not much injured, but they played sad havoc with the gardens. Nothing was sown the following spring throughout the infested district, but throughout the western settlements a large crop was grown and saved.' From the same source we have obtained the following particulars respecting the ravages of the locust in different parts of the province:—

'*The South*.—From West Lynn (Pembina) northward, as far as Scratching River, the oats and barley have been entirely destroyed, and the wheat partially.

'*Palestine*.—The latest reports from this settlement confirm the accounts that the settlement is laid waste.

'*Manitoba Lake*.—The shores of this lake are strewn three feet in many places with dead grasshoppers, the wind having driven them into the lake, where they were drowned and cast ashore.

'*The Boyne Settlement*.—They are very thick here, and have completely destroyed the oats and barley, and about half ruined the wheat.

'*Portage la Prairie*.—From Polar Point to the Portage the fields are swarming with grasshoppers, which have devoured the crops. Scarcely anything has escaped.

'*Rat Creek*.—In this neighbourhood it is reported that the crops of Kenneth McKenzie, Hugh Grant, and others, are being destroyed, and that the former had commenced cutting his oats and barley for fodder rather than let the pests take all.

'*Rockwood*.—The crops in this settlement have suffered severely: oats and barley completely destroyed, and wheat badly injured.

'*Woodland*.—Most of the settlers in this neighbourhood are entirely cleaned out.

'*County of Provencher*.—All the crops along the Red River, from Pembina to Stinking River, have been eaten up, excepting, in some instances, a portion of the wheat and potatoes have escaped.

'*Winnipeg*.—The gardens in this city and the oats and barley in the neighbourhood are being destroyed. During the evenings, at the going down of the sun, they seek the board-fences and sides of houses in such numbers that in many cases it is impossible to distinguish the colour of the houses, or the material of which they are built.'

“As yet we do not know whether the locust ravages are wont to extend over the great fertile region to the north-west of Manitoba,—that magnificent agricultural region drained by the Saskatchewan River; we hope, and we are strongly inclined to think, that the plague, if noticeable at all, is there trifling in character and moderate in extent. Should it be otherwise, should that ‘fertile belt’ be as subject to these visitations as the states to the south of it unhappily are, it must prove a great hindrance to its rapid settlement. If, on the other hand, it possesses an immunity not shared in by the western states, it will certainly draw from them, before many years are over, and as soon as railway facilities are afforded for transportation of goods and produce, a very large portion of those settlers who are now eaten out of house and home. We fully expect to see the tide of immigration, which for a few years past has been setting so strongly towards the plains of Kansas and Nebraska, turned towards our own more highly-favoured, even though more northern regions of Assiniboine and Saskatchewan.”*

EDWARD NEWMAN.

(To be continued.)

Entomological Notes, Captures, &c.

A few Remarks on some Collectors.—When I began reading Mr. Lewis’s remarks on this subject (Entom. viii. 127) I thought his rhetoric and clever insinuation respecting the eight hundred *Colias Hyale* referred to myself (by the bye, I fail to see why “defenceless” should be especially applied to that species), as I, in company with three other collectors, did capture about that number a few years ago, and, not having heard of a similar number being taken by others, I presumed he referred to me. Glad was I to find, on continuing, that it was not so; and lest some readers, who have either forgotten or did not read the circumstances under which these *Hyale* were caught, should be misled by Mr. Lewis’s paper, and so connect me with the attempted extermination of the “gentle creature, *Sinapis*,” I crave a few lines space. At p. 179, vol. iv., of the ‘Entomologist,’ it will be seen that *four* of us were collecting; and as we were more than *three*

* Rev. C. J. S. Bethune, M.A., in “Report of the Entomological Society of the Province of Ontario, 1874.”

weeks getting the number, the "physical fatigue" was therefore not so very great: an average of two hundred and fifty specimens a week is surely not *very* hard work for four enthusiastic collectors! Great pleasure most certainly did come through my success, which enabled me to give some of my friends some very fine series of this insect. I also attempted a little exchanging, but soon found the greatest pleasure was to be obtained in giving them away. As to the man who "took the whole spring-brood" of *Sinapis*, it is the first I have heard of it. Anyone who could attempt such a mean and selfish action (unless he were a dealer,—it would be pardonable then), should be treated with silent disdain and contempt.—*H. Ramsay Cox; Lyndhurst, June 14, 1875.*

[This little passage-of-arms must end here.—*E. Newman.*]

Sugaring for Moths.—I should like to say a word respecting sugaring. I have practised that pleasing pastime more than a quarter of a century. I have found that a good deal depends on the atmosphere: the weather gloomy, thick, foggy, damp nights, are the times that I have been successful, beginning about sunset in the month of June; and instead of putting the mixture on about the height of my breast I run the brush right down to the ground.—*John Potts.*

Life-history of Acidalia emarginata.—A female, taken during the first week in August, last year, deposited a few eggs, from which the young larvæ appeared on the 13th of that month. They grew very slowly until the time for hibernation came; and although they fed at intervals throughout the winter they increased very little in size. In March of the present year they began to feed more vigorously; and have now, July 13th, become about three-quarters of an inch long, after having lived in the larval state exactly eleven months, and spending most of that long period almost stationary on the dead twigs of the food-plant (*Galium mollugo*), resting sometimes in a straight position, and sometimes—especially in their very young days—with the back arched. Body tapering anteriorly, ribbed transversely and rough to the touch; the transverse ribs less distinct on the anterior portion of the middle segments. Colour of head and face dark brown. Head notched, and thickly sprinkled with hairs; as are also the 2nd and 3rd segments, on which the hairs point forward. Colour of body various shades of olive-brown. The medio-dorsal line is composed of two slender, darker lines, edging

another of a much lighter shade; the darker edging lines are only present from the 5th segment onwards to the 12th; on the 4th, 5th, 6th, 7th, 8th, 9th, 10th, and 11th segments, are two transversely-placed black dots; and on the 5th, 6th, 7th, 8th, and 9th, there is dark V, with its point towards the head; the divisions of these last-named segments are very perceptible in the lateral skinfold. The spiracles are of the darker shade. The ventral space of an almost uniform olive-brown.—[*Rev.*] *P. H. Jennings; Longfield Rectory, Gravesend, July 13, 1875.*

Spilodes palealis.—Yesterday (Friday) I had a fine specimen of *S. palealis* emerge from pupa. I found several larvæ last September, on the road from Dartford to Darenth Wood, feeding in the umbels of wild carrot, which they draw together with a web. They leave this when they are full fed, descend to the ground, and there form a compact, oval cocoon, somewhat resembling an eggar's cocoon in miniature, but I think rather large for the size of the insect. Some years ago I believe two or three specimens were taken in this locality,—one I know by my friend Mr. Dow; but it is only within the last year or two that the larvæ have been taken there, and then only sparingly, until last year, when they were taken in abundance. This is the first specimen, so far as I know, that has been bred from the larvæ which were taken at Dartford last year; and this fact will remove any doubt which existed as to whether the larvæ which were taken there really were *S. palealis* or not. It is, as far as I have heard, rather a difficult insect to breed, as it does not change to a pupa until about the middle or end of June, although it makes its cocoon in the autumn; and, like many larvæ which do the same thing, they die off. It is necessary to keep them moist, or they dry up; but, unfortunately, in keeping them moist lies the difficulty, as they are then very liable to go mouldy,—a state of things which has happened to most of mine. I may say that I have kept mine out of doors all the time. I find, on examining the remaining cocoons, that I have another one which contains a pupa, which I hope to find out in the course of a few days.—*C. W. Simmons; 39, Market Street, Caledonian Road, N., July 17, 1875.*

Lepidoptera at Rannoch.—I was at Rannoch in the first fortnight of July with (thanks to the kindness of Dr. Buchanan White, whose kind assistance was of the greatest value to

me), a fair amount of success. Sugar was very unproductive, and a few *Hadena rectilinea*, *Noctua conflua*, and dark *Cymatophora duplaris*, were all that I got for my trouble in that line. On the hills, however, I got *Psodos trepidaria*, *Larentia cæsiata*, *Coremia munitata*, *Larentia salicata*, *Melanthia ocellata*, *Cidaria immanata*, *Scopula alpinalis*, and many others. In the Black Wood, *Fidonia pine-taria* was not out, but *Acidalia fumata*, *Boarmia repandata*, and *Larentia cæsiata*, were common, and there were many Tortrices out as well, which Dr. White worked very successfully; but, as I had a fearful headache on the day we visited the wood, I must plead guilty to having been lazy on that occasion. Near Kinloch, *Emmelesia blandiata* and *Lycæna Artaxerxes* were out, and *Lycæna Alexis* was very conspicuous on the banks. I also saw, near the end of my stay, July 12th, a hibernated specimen of *Vanessa Urticæ*.—*J. C. Wassermann; Cullercoats.*

Apatura Iris (Entom. viii. 159).—This butterfly we occasionally see in a wood in this neighbourhood. I was away from home last year while the insect was out; but it was observed several times by my father, the late Mr. Thomas Bentall, feeding on dead moles, and he succeeded in capturing one specimen (a male) at this high-flavoured food. I have to-day bred a specimen (a female) from a larva beaten from sallow on the 5th of June, and which became a pupa on the 15th.—*S. R. Bentall; Nightingale Hall, Halstead, Essex.*

Apatura Iris (Entom. viii. 159).—I may say that on July 15, 1857, in the Farnham district, I took nine males from oaks with a hoop-net tied to a long pole, one other male on the ground, and two females flying near the ground. I have reason therefore to say that on that occasion the pole was of much service.—*Frederic Walker.*

Apatura Iris (Entom. viii. 159).—I was interested in reading the note by Mr. Anderson concerning this species. My experience would go to prove that there are times when the insect adopts the same mode of flight as other butterflies. Last July (1874) was dry in the early part, at least here, and the wind rose generally at sunset, so that there was but little dew deposited; and, sure enough, while this dry time lasted *A. Iris* flew low down, as if searching for the moisture it might otherwise expect to find on the leaves of oak, &c. I

captured six, and a friend one, without any difficulty; they all seemed too much engrossed in the search for something to take much notice of our approach.—*W. Jagger; St. Ives, Hunts.*

Argynnis Niobe near Canterbury.—On the 29th of June I had the good fortune to take a fine male of this beautiful insect, and to-day have succeeded in taking a second specimen, which I believe must be a variety, it being without silver spots, but of a dull yellow colour. I believe I saw a third, but cannot speak with certainty, as *Aglaia* are so like them when on the wing. I have shown this last one alive to a collector here.—*G. Parry; Church Street, St. Paul's, Canterbury, July 6, 1875.*

[It is the variety *Eris* of *Argynnis Niobe*.—*E. Newman.*]

Chærocampa Elpenor, &c., at Sugar.—Last evening, June 22nd, I obtained four specimens of *Chærocampa Elpenor* at sugar; three were hovering at one tree, and taken by one sweep of the net. On one tree I counted seventy-three insects, all common species. I do not think I shall over-state it in saying that *Agrotis corticea* and *A. exclamatoris* came by thousands, and *Triphæna pronuba* by hundreds. I captured two fresh *Xylocampa lithorbiza*, which seems to give this insect a wide range, as I took it here in February. Can there be a second brood? The only good thing taken here this season was one specimen of *Notodonta Chaonia*. I should mention that I laid the sugar on early, and that the *Chærocampa Elpenor* were taken before I lighted up; the evening was close, and without a breath of wind.—[*Rev.*] *A. C. Hervey; Butleigh Vicarage, Glastonbury Somerset.*

Anticlea sinuata.—On the 19th of June I had the pleasure of finding in one of my breeding-cages a beautiful female *Anticlea sinuata*. When I was away from home in East Kent, last August, I found a caterpillar on *Galium verum*, with which I was not acquainted; but on the appearance of the perfect insect a reference to 'British Moths' connected the one with the other, and told me the caterpillar I had found was that of *A. sinuata*.—[*Rev.*] *P. H. Jennings.*

Larva of Pterophorus rhododactylus.—On the 26th of May last the *Rev. T. W. Daltry*, of Madeley, and myself, took the larvæ of *Pterophorus rhododactylus* very freely in a wood in North Kent. We went in the hope of finding the larvæ of

this species, and of *Nola albulalis*, on the spot we had taken the imagos last July, but were quite baffled, so far as that latter species is concerned. Mr. Daltry soon detected that of *P. rhododactylus*, feeding just beneath the leaf overlapping the rose-bud, and eating into the bud from the side. Almost as many, too, were found in similar positions at the ends of the young rose-shoots.—*Geo. T. Porritt; Huddersfield, July 3, 1875.*

Capture of Ehiphiphora ravulana.—I am pleased in being able to report the capture of *E. ravulana*, a species that I believe has not been taken since 1868, although diligently searched for. Two years ago Mr. E. G. Meek pointed out to me the spot where he had taken his specimens, and, like a modern entomological sceptic, I had begun to doubt the species, when this year the insect again appeared. I captured my specimen within ten yards of the old locality. Strangely enough I took it on the wing.—*Sydney Webb; Redstone Manor House, Redhill, July 8, 1875.*

[Please say when and where. Date and locality seem to me the very pith and essence of these records.—*E. Newman.*]

Catoptria Aspidiscana and Dicrorampha Tanacetana at Grange.—On Whit-Saturday I went to Grange to look for *Catoptria Aspidiscana*. The day was a bitter cold one with a very strong wind, with occasional gleams of sunshine, and then it was very hot in sheltered corners. I spent about six hours, although a little rheumatic, hobbling over the rough limestone, and managed to make a great catch, *viz.*, thirty specimens, quite as many as for the previous seven years; the high wind had blown them all together; but I have had to pay the penalty ever since, being unfit to go away. Through the sudden changes and excessive walking I had to give all up and come home; could not move a limb with rheumatism. As soon as I was able to walk out a little I made my way to some gardens last week, and found a small bed of tansy, and most unexpectedly turned up *Dicrorampha Tanacetana*, a species that I never could get, only some half dozen from my late friend D'Orville. During my forty years' collecting I have had specimens sent to me of *D. Herbosana* as this species by well-up entomologists, but they are totally distinct. Now I have taken a splendid series of both sexes: the females are very bad to find; they will hardly fly under

any influences, not even touch-paper; they will creep up sometimes, only oftener walk about on the ground. Barrett's description of its distinctions is an admirable one, the rich yellow irroration and the stigmal differences being well set out. I may add that I have taken a few out of a clump of Michaelmas daisy. I am inclined to think the larva feeds on this as well as on the tansy. They seem excessively partial and local.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston, July 1, 1875.*

Catephia alchymista near *Colchester* (Entom. viii. 164).—In the 'Entomologist' for July I see there is a notice of the capture of *Catephia alchymista* in Sussex, on June 4th. I have great pleasure in informing you that this fine species has also occurred near Colchester this year, a single specimen having been found at rest on an oak-trunk on June 9th. It was taken by Mr. Tillaney of this town, and is now in my possession. Since the capture of the first British specimen by Dr. Wallace in 1858, in the Isle of Wight, I believe no other capture has been recorded till this year; so that, unless others have been taken recently, there are as yet only three British examples.—*W. H. Harwood*; 8, *West Stockwell Street, Colchester, July 22, 1875.*

Abundance of Callidium violaceum.—In a summer-house, lately built of pine-slabs, in a garden at Croydon, there have appeared by hundreds specimens of that beautiful beetle *Callidium violaceum*. They were running over the surface of the pine in all directions, beginning to make their appearance about the second week in June, and continuing about a fortnight. They have now entirely disappeared.—*E. Newman.*

Answers to Correspondents.

S. Bradbury.—*Thecla Quercus*, or purple hairstreak.—*Edward Newman.*

C. E. Johns.—*Name of a Moth.*—I think the moth described must be *Metrocampa margaritata*.—*E. Newman.*

J. S.—*Chelifer cancrroides.*—Can you tell me the name of the small insect, which I found this morning hanging on to the leg of a fly, and looking like a parachute attached to a balloon? And what is the object of the aerial journey?

[The first question is easily answered; the second is a problem more difficult of solution. The insect is *Chelifer cancroides*. I once found it in vast numbers under the bark of a willow tree on the banks of the New River. They are said to feed on minute Acari, but I am unable to confirm this. The usual situation is suspended to the leg of a fly by means of its extraordinary legs, which remind one of the claws to a scorpion or of a lobster, on a very diminutive scale. When allowed to crawl on a sheet of white paper their claws, or chelæ, are held in a remarkable and rather threatening attitude, forcibly reminding one of the attitude of a scorpion, a resemblance which the general structure of the creature serves to increase, and indeed which induced Dr. Leach to arrange it with the scorpions, and in close proximity with the spiders. Still we have to deal with its strange propensity to settle itself on the legs of flies. It is of course very natural to suppose that these flies, having a decided weakness for settling on the trunks of willows, and that these scorpion-like creatures having a similar weakness for the toes of a fly should fix themselves thereupon; still there is something that requires explanation.—*Edward Newman.*]

Henry Reeks.—*Hylesinus Fraxini.*—I found the enclosed larvæ and perfect beetles feeding just beneath the bark of young ash-trees. Can you kindly give me any information respecting them? Their great abundance must do the trees some harm.

[The beetles are *Hylesinus Fraxini*. They have long been known as injurious to ash-trees, but more particularly to young ones: as the trees grow older the effect is less marked, and on old trees the injury is scarcely perceptible. Painting the trees with turpentine has been effacious on a small scale; but it is the more general practice to let the trees outgrow the disorder. I have particularly noticed the partiality shown by the *Hylesinus* for those young trees which have been previously weakened by the attacks of *Zeuzera Æsculi*, presenting a parallel case to that of *Scolytus destructor* and *Xyleutes Cossus*, the attacks of the moths being almost invariably followed or accompanied by that of the beetles.—*Edward Newman.*]

A. I. S.—*Mangold Wurzel Beetle.*—I adopt the term "beetle" because the little creature is so named by the

sender. It is really not a beetle at all, but one of those apparently insignificant creatures which form the subject of Sir John Lubbock's admirable monograph on the 'Collembola and Thysanoura.' In this work it is represented on plate 2 under the name of *Smynturus fuscus*, and appears from the synonymy, in which of course I have perfect reliance, to be the "*Podura globosa-fusca*" of Linnaeus. It is not more than a tenth of an inch in length: it has a fat subglobose, body, no neck, a transverse head, and many-jointed antennæ; the basal joint is short, not projecting beyond the head; the second and third are longer, and are followed by a series of fifteen or sixteen *very* short joints, so short as to appear like mere marks on the exterior, and not to be real joints at all; the legs are short, shorter than the antennæ; indeed they appear ridiculously short in proportion to the obese body. Although these funny little creatures are accused by my correspondent of injuring our crops of mangold, yet I am far from being convinced that this is really the case; for it seems difficult to state in what the food of the *Smynturi* really consists. They certainly swarm on the young plants of mangold, and on, as well as under, such small stones as may happen to be in the immediate neighbourhood; but their object in thus congregating is by no means obvious. Sir John Lubbock observes that "the majority of the *Collembola* live on decaying vegetable matter, and they are to be found in great numbers in almost all damp places, skipping occasionally like fleas when disturbed." The object of the skipping propensity, possessed by some of the species, seems to be very doubtful; and it has been well observed by their eminent historian, that "the possession of a powerful saltatory apparatus appears to be a fantastic provision for a species that lives in the chinks and crannies of bark, in the interstices of fungi, or buried among decaying leaves." Concerning the habits of these *Smynturi* very little is known. But few life-studies of them have been sketched; but here is one, touched tenderly and with a master's hand:—"It is very amusing to see these little creatures coquetting together. The male, which is much smaller than the female, runs round her, and they butt one another, standing face to face, and moving backwards and forwards like two playful lambs. Then the female pretends to run away, and the male runs

after her, with a queer appearance of anger; gets in front, and stands facing her again; then she turns coyly round; but he, quicker and more active, scuttles round too, and seems to whip her with his antennæ; then for a bit they stand face to face, play with their antennæ, and seem to be all in all to one another." ("Monograph," p. 109.) It may seem to some readers that this has but little to do with mangold wurzel and mangold wurzel beetles, but I trust the departure from the strict order of science may be forgiven.—*Edward Newman.*

E. De Brath.—*Name of a Beetle.*—The beetle is *Cryptocephalus sericeus*. Very common in yellow composite flowers throughout the summer.—*Edward Newman.*]

S. L. Mosley.—*Diptera.*—I shall be very glad to name any British specimens of *Sarcophaga*; of any belonging to the restricted family, *Muscidæ*; and of *Anthomyidæ*. There is no complete published list of British *Diptera*; but Mr. G. H. Verrall is at present engaged in drawing one up.—*R. H. Meade; Bradford, Yorkshire.*

John Sterry, J. D. S., George Mennell, William Ashby, and a number of other Correspondents.—*Fireflies.*—From various parts of the country I have received accounts of specimens of fireflies captured on the wing, and actually in the act of emitting light. The localities are chiefly—Keston Common, in Kent; Tunbridge Wells; Sandown and Bonchurch, in the Isle of Wight; Fordingbridge, near Salisbury; and Penzance, in Cornwall. A very careful examination and comparison do not reveal any difference in character between these and the males of the ordinary English glow-worm. The prothorax has an indistinct, ochreous mark just within the margin, and without any decided limits beneath; the legs have also pale longitudinal markings, and the terminal joint of the abdomen is yellow, more especially two circular spots, from which the light is said to emanate; the elytra have three longitudinal keels, which are very feebly pronounced; and the wings are smoke-coloured. The specimens examined are from Keston Common and Penzance.—*Edward Newman.*

John Thorpe.—*Hair-worm.*—I enclose you an animal which we generally take on some rocks where fresh water runs over. We have taken them ten inches long. We should

be very glad to know its name and character. If you could give us any information about its habits, &c., we should take it as a great favour.

[The creature is a *Filaria*, or thread-worm; one of the section of Entozoa, or intestinal worms. I regret to say that their history is very imperfectly known to me; but during the greater portion of their lives they are certainly parasitic: man, quadrupeds, birds, fishes, and insects, are subject to their attacks. I have repeatedly found them protruding from the anus of a common ground-beetle, known to entomologists as *Feronia madida*: they not unfrequently exceed the beetle three or four times in length; indeed, one of them inhabiting man, and called the guinea-worm (*Filaria madimensis*), is sometimes three feet in length. This species is found in Africa, and inhabits the legs and feet of men, causing tumours and great suffering: it is extracted by a curious process: one end of the worm is seized with forceps and wound round a stick, which process of winding is continued day after day, until the whole is extracted; of course the patient has to keep quiet during the whole time. If during the operation the worm breaks, a portion remaining in the flesh, the patient dies. It is believed that the *Filarias* have two modes of propagation: *first*, by division, as when a portion is broken off from the body and becomes an independent animal; and *secondly*, by eggs, which are laid in water, and the young, becoming attached to aquatic animals, are swallowed by birds, and thus find their way to a suitable receptacle for development. It will be observed that I do not state this of my own knowledge, but simply from having read it.—*Edward Newman*.

Henry Reeks.—*Fallen Pears*.—Mr. Fitch informs me that the pear-maggot, which was the subject of a query by Mr. Reeks in the July number (*Entom.* viii. 167), is the work of *Cecidomyia nigra*. Mr. Murray, who has prepared a case for the Bethnal Green Museum, has illustrated with models the mischief-maker at work. He derives his information from Taschenberg, who, in his 'Entomologie für Gärtner,' gives its life-history at p. 364.—*Edward Newman*.

J. Purdue.—Will you please to inform me what part of an English inch is the line, spoken of in measuring beetles, &c.

[In Kirby and Spence's 'Introduction to Entomology' the line is stated to be one-twelfth of an inch; but there is a diversity of practice in this respect, which is extremely puzzling.—*Edward Newman.*]

Extracts from the Proceedings of the Entomological Society of London.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

MARCH 15, 1875.

Lepismodes inquilinus?—Mr. M'Lachlan remarked that the species of *Lepisma* exhibited at the last meeting, by Mr. F. H. Ward, did not, on examination, correspond, as he expected, with the description of *L. domestica*, a common species in the United States, nor did it coincide exactly with the descriptions of any of the other described species, so far as he had been able to compare them.

Lipura corticina.—Prof. Westwood said he had seen British examples of *Lipura corticina*, *Bourlet*, on apple trees, though the insect was not included as British in Sir John Lubbock's Monograph.

Boisduval's Sphingæ.—Mr. Butler read the following review of Boisduval's recently-published volumes of the *Suites à Buffon* (Lepidoptères), containing the Sphingidæ (including *Zygæna*, &c.):—"Dr. Boisduval's long-expected work on the Sphingidæ has at length appeared: it is illustrated by eleven excellent coloured plates; and if these had been published without the letterpress, Lepidopterists would have had cause to be grateful to the author; as it is, the work of this veteran entomologist contains so many errors and omissions, that it only obscures the subject which it should have assisted in illuminating. Not only has Dr. Boisduval, in the three hundred and eighty pages devoted to this magnificent group, apparently taken no pains to ascertain what has been done by other workers during the last nineteen years (entirely overlooking even the Supplement to Mr. Walker's Catalogue), but he has returned to the errors of Fabricius and his contemporaries, in his disregard of the law of priority: he calmly renames well-characterized genera and

species, quoting the universally-accepted names as synonyms, and gives no reason whatever for so doing; he constantly gives his own MS. names preference to the descriptions of others; he quotes Catalogue lists of undescribed species, thus conveying to the mind of the unwary student the impression that his species have long been characterized; and, in addition to all this, he hopelessly confounds together subfamilies and genera whose larvæ are utterly distinct. In proof of the recent publication of this work (dated 1874) I feel compelled to subjoin an extract from a letter which I recently received from the author, dated 18 Fevrier, 1875:—
'Le species des Sphingides, Sesiides et Castniides sera mis au vente Lundi prochain chez M. Roret editeur, Rue Hautefeuille à Paris.'

Remarks on the genus Terias.—The Rev. R. P. Murray communicated the following remarks:—"The species of *Terias* forming the *Hecabe* group have long been a source of perplexity to me, and for some time I have entertained a suspicion that most of them were referable to but one species, *T. Hecabe*, *Linn.* I think I am now able to bring forward proof that *T. Æsiope*, *Mén.*, at least, is only a form of *Hecabe*, and some evidence that the same is probably the case with *T. Brende*, *Doubl., Hew.*, and *T. Sari*, *Horsf.* I have frequently received from Mr. Miskin, of Brisbane, specimens of typical *T. Hecabe* from Rockhampton, and also others of *T. Æsiope* from Brisbane, these forms being common in their respective localities, while it is by no means common to find them intermixed. So far the only evidence in favour of their forming but one species was afforded by the large number of specimens intermediate in character which came from Rockhampton. But I now learn, by letters received from Mr. Miskin, that he has succeeded in breeding both forms from larvæ found on the same plant (*Indigofera*, sp.), and that he is now convinced that both forms belong to the same species. The curious distribution of the forms would tend to prove that the difference in markings is not sexual, but dependent on certain conditions as yet unknown to us. Both forms appear to be equally common in N.W. India, from whence I have received them in considerable numbers. I have never received the form *T. Æsiope*, *Mén.*, from Japan, where typical *Hecabe* is common, but curiously enough I have

seen large numbers of a *Terias* from Japan, which are, for the most part, indistinguishable from *T. Brende*, *Doubl., Hew.*, originally described from West Africa, but which graduate insensibly in typical *Hecabe*, so that I am strongly inclined to believe that this form (*Brende*) replaces in Japan the *Æsiope* of Queensland. The evidence is not so strong with regard to *T. Sari*, *Horsf.*, typical specimens of which seem exceedingly different from *T. Hecabe*, *L.* I possess, however, three specimens from Malacca, two of which are well-marked *T. Sari*, while the third, which is much smaller, presents certain peculiarities in the interior outline of the black hind margin of the anterior wings. Below, however, the quadrangular blotch, distinctive of *T. Sari*, is well-marked. A fourth specimen from the same locality, which must be referred to *T. Hecabe*, while presenting no trace of the blotch on the under side, exactly agrees in size, and in the markings of the upper side, with the third specimen just described. So that I think it is at least possible that *T. Sari* will ultimately be found to be but a form of the inconstant *T. Hecabe*." Prof. Westwood suggested that the case might be analogous to that of certain English species of *Pieris*, where certain forms, —*e.g.*, *P. Napææ*, *Esp.*, and *P. Sabellicæ*, *Steph.*,—now universally recognised as varieties of *P. Napi*, *L.*, had long been considered as specifically distinct. Prof. Westwood also suggested that attention should be paid to the times of appearance of the various forms, and the period noted during which they remained in the pupa stage. Mr. A. G. Butler remarked that the latter circumstance had an important bearing on the case of *Papilio Ajax*, *Linn.* He expressed a doubt as to the correctness of the supposition that *T. Sari* was only a form of *T. Hecabe*, though he thought that the breeding of the latter and *T. Æsiope* from the same food-plant was a strong point in favour of their identity.

Death of Mr. Doubleday.—My inestimable friend Henry Doubleday, of Epping, died at his residence on Tuesday, the 29th of June, 1875, sincerely regretted by all who knew him. I intend publishing a short memoir in the September number of the 'Entomologist,' when some account may possibly be given of his vast collections and their future destination.—*Edward Newman.*

THE ENTOMOLOGIST.

No. 146.]

SEPTEMBER, MDCCCLXXV.

[PRICE 6d.



SMERINTHUS TILLE (VARIETY).

Variety of Smerinthus Tille.—This beautiful variety chiefly differs from the typical colouring in the entire absence of the median transverse fascia of the fore wings. This fascia is of various shapes; sometimes entire, but as frequently interrupted, and forming two conspicuous blotches, the upper situated about the middle of the costal margin; the lower about the middle of the inner margin. The specimen is in the rich collection of Mr. J. A. Clark, to whose courtesy I am indebted for the loan of the specimen.—*E. Newman.*

Description of the Larva of Cleora glabraria.—On the 29th of June last I found two larvæ on lichens on oak-trunks in the New Forest, which I suspected were *Cleora glabraria*; and a fine imago of that species, which emerged last Sunday, proved that I was correct. As there is no description of this larva in 'British Moths,' perhaps the following attempt at one may interest some of the readers of the 'Entomologist:—

With the exception of a lateral fold below the spiracles the skin appears to be smooth and without warts. The ground colour of both the head and the body is whitish green; the former is margined with black; the latter is marked with black spots, consisting of, first, a medio-dorsal series, containing one in the middle of each segment, and a smaller one at each division; secondly, a sub-dorsal series of linear spots on each segment; and lastly, a rather oblique one on the skinfold at the anterior end of each segment: all these black spots are larger on the middle segments. Spiracles inconspicuous.—*H. J. Channon; Woodlands, Lewisham, July 27, 1875.*

Description of the Larva of Emmelesia decolorata.—As the larva of *Emmelesia decolorata* is not described either in 'British Moths' or in the 'Manual,' you may, perhaps, think it worth while to give your readers the following notes on this insect:—It is a fat, sluggish larva, resembling in outline some of the *Eupitheciæ* (*Pulchellata* and *Linariata*, *e.g.*), and when resting, exposed on the plant, is stretched out with the head rather thrown back. In colour it reminds one of the larva of *Ephestia elutella*. The head is small, of a shining brown colour, and evidently two lobed. On the 2nd segment there is a horny brown plate, and the anal segment, the claspers of which are wide and spreading, is similarly protected. The medio-dorsal line or band is broad and distinct, but tapering to each extremity, and is of a pale colour. The dorsal area is dull, faint reddish, and has a few shining hairs. On the sides the skin seems to be gathered up into a ridge, the summit of which is the palest part of the larva, and forms a nearly white, irregular, lateral stripe. Below this the reddish colour appears again as an irregular line, abruptly marking off the central area, which is pale, and has several small, but distinct, spots of a pale brown colour on each segment. I have generally found the larva on the stameniferous plant of the white campion, although it sometimes feeds within the seed-capsule. Its presence is generally first noticed by the half-eaten petals, although its food is not confined to these. It will eat either petals, or calyx, or seeds; but it is generally found within the calyx of the unopened flower-bud, devouring the contents. Later on, however, it enters the seed-capsule,

and may be found there occasionally; but this insect evidently prefers the stameniferous plant. The larva is full-fed in August, and spins a cocoon underground.—[Rev.] G. A. Smallwood; Barrow-on-Trent, Derby, July 28, 1875.

Description of the Larva of Hydræcia Petasitis.—Of nearly uniform thickness throughout, but slightly tapering towards both extremities. The segmental divisions are not clearly marked, but the sectional divisions are very distinct. The head is glabrous, and of a light brown colour. The body creamy white, and with dark brown oval spiracles. The dorsal surface of the 2nd segment is glabrous, and of a pale brown colour; the 5th and following segments have each a transverse dorsal series of four raised wart-like brown dots; the interior pair are generally more prominent and distinct than the outer ones; in younger specimens these warts are scarcely perceptible. There are a number of strong brown bristles scattered over the larva, and particularly about the dorsal warts, sometimes actually emanating from them, but generally in the interstices between them. The under side is creamy white. These larvæ, for which I am indebted to the courtesy of Mr. Robert Kay, of Spring Bank, Bury, bear a very striking resemblance to those of Phragmatæcia Arundinis, probably owing to a similarity of economy, both being internal feeders. Hydræcia Petasitis feeds in the substantial subterranean stem of the coltsfoot, Petasites vulgaris, in which it makes large excavations. It is usual to speak of this part as *the root*, but it seems to me rather an underground stem, from which leaves and flowers emanate every spring. I presume it is generally known that this species is the Vindelicia of Frey. Mr. Kay accompanies the larvæ with the following interesting particulars.—Edward Newman.

Hydræcia Petasitis.—With us Hydræcia Petasitis is not near so common as formerly, partially owing to “improvements;” and again, the larva is a desideratum with the anglers for bait. Not having obtained eggs at any time I cannot say how or when they are deposited; but imagine they are placed as low down the stem of the food-plant as possible, so that they may not be destroyed when the plant dies off. With the exception of a few Hydræcia micacea, and now and then a H. Humuli (feeding in the stems), H. Petasitis appears to be the only Lepidopterous larva which feeds internally on the

butter-bur (*Tussilago Petasites*). Sometimes the presence of the larva may be detected near the bottom of the stems of the food-plant, but in most cases there are no visible signs to show the presence of the insect so busy at work within; and perhaps the best way to find the insect is to pluck up a leaf and examine the base: if sound, it is generally useless examining further. The large plants, in a dry situation, are the most likely. When full grown the larva eats its way through the roots, enters the soil, and changes to a reddish brown chrysalis, without constructing a cocoon of earth,—as stated in Newman's 'British Moths,'—so far as my experience goes, and remains in the pupal state about three or four weeks. I found my first pupa when searching for larvæ, July 21st; and at the present time, August 16th, there are several larvæ still feeding, so that it is possible to find larva, pupa and imago at the same time. Generally it is not advisable to begin digging for the pupæ till the third week in August, as the pupæ are then in a sufficiently advanced state, and may be taken with the least risk of injury. This season, for the first time, I have noticed a few larvæ have been infested with a species of *Filaria*, or thread-worm, apparently the same I have seen bred in larvæ of *Xanthia citrigo*. The imago may be found by beating and examining the under side of the leaves (withered leaves preferred) in September. Like most internal feeders, *H. Petasitis* is apt to grease badly.—*R. Kay*.

Entomological Notes, Captures, &c.

Lepidoptera taken at South Shields.—On the 22nd July last I collected here on the coast one specimen of *Lithosia quadra*; and on the 27th, two of *Liparis chrysorrhœa*, one of *L. auriflua*, and one of *L. Salicis*; the two latter insects being new to this locality. *L. chrysorrhœa* was taken here two years ago; it has also been taken by my esteemed friend Mr. Wassermann, in his garden, at Cullercoats. *Nonagria Elymi* has been plentiful on the sand-reed since the end of June, and many of them are in fine condition still on August 10th. On July 25th a worn female of *Heliothis peltiger* came out of rest-harrow, where I was kneeling to box

N. Elymi: I took it in the hope of obtaining eggs, but in this was disappointed, as she died without depositing eggs. *Halonota grandævana*, *Zell.*, came out towards the end of June, and is becoming more plentiful than when I first met with it three years ago. *Gelechia gracilella*: ever since I took the first specimens of this insect, in 1870, I have done my best to make it common; but up to the present season I have not obtained more than a dozen specimens; the locality where I took most of them has been taken for building ground, and the hedge-rows replaced with brick walls. There yet remain two other places where it has occurred singly, and where I hope to obtain specimens for my friends.—*Christopher Eales; Laygate Street, August 10, 1875.*

Captures near Buxton.—On the 9th of August I had an hour on the moors, near the ‘Cat and Fiddle,’ a country inn about five miles from Buxton. I was not over well prepared for collecting, and had only about forty boxes with me, which I filled with about twenty-four *Penthina sauciana*, and the rest with *Peronea Caledoniana* and *Pe. Geminana*. I never saw more insects. The patch of *Vaccinium* was literally alive with those and other species. I should not have gone but for meeting with Mr. W. C. Boyd, of Ches-hunt; and he called my attention to *P. sauciana*. I never before met with this insect.—*J. B. Hodgkinson; 15, Spring Bank, Preston, August 6, 1875.*

Vanessa Antiopa near Ashford.—It may interest your entomological readers to hear that I caught a good specimen of *Vanessa Antiopa* in the village-street at Wye, near Ashford, Kent, last Saturday, August 14th.—*S. R. Majendie; Chartham, Canterbury.—From the ‘Field.’*

Vanessa Antiopa near Wells, Norfolk.—While driving yesterday in the neighbourhood of Wells, in Norfolk, I saw a fine specimen of *Vanessa Antiopa*, which my father secured with his hat. It is a fresh and perfect specimen. I believe that several were killed on this coast three years ago.—*Cyril Digby; Buxton.—From the ‘Field.’*

Vanessa Antiopa at Chertsey.—If it can interest British entomologists, I beg to inform you that I caught on St. Ann’s Hill, Chertsey, Surrey, on the 10th of August, on a windy and cloudy afternoon, a splendid specimen of *Vanessa Antiopa*.—*Alexander Wailly; 110, Clapham Road, S.W., August 21, 1875.*

Erebia Ligea at Margate.—During last summer (in August) a specimen of *Erebia Ligea* was taken by me in the garden belonging to a house in Margate. I have been assured by competent authority that I am correct in the name of my specimen; so this will add another locality in which to find this rare insect.—*W. J. Mercer; 12, Marine Terrace, Margate, August 7, 1875.*

[I should like to see the specimen, if Mr. Mercer will kindly send or bring it.—*Edward Newman.*]

Colias Edusa on the Wing.—*Colias Edusa* has been taken at Walton-on-the-Naze this summer, and I saw a specimen at Lyndhurst on June 19th.—*W. H. Harwood.*

Colias Edusa near Long Stratton and Nocton.—*Colias Edusa* has occurred several times at Long Stratton; and also at Nocton, near Lincoln, in the fen country.—*Henry F. Wilson; Forncett St. Peter's Rectory, Long Stratton, Norfolk.*

Colias Hyale near Long Stratton.—On the 18th of August my brother was so fortunate as to capture a fine specimen of *Colias Hyale*, a female, on the railway-bank, near Forncett Station. On the 19th I went myself and saw two more, but only succeeded in catching one, a fine female. Would you inform me whether or not Norfolk is further north than *Hyale* is usually captured?—*Id.*

Colias Hyale and C. Edusa in Norfolk.—On Friday the 20th, and Saturday the 21st of August, my brother and I took seven specimens of *Colias Hyale* and one of *C. Edusa* on the railway-bank, near Forncett Station, in Norfolk.—*Id.*

Deilephila Galii near Norwich.—On the evening of the 7th of August I had the satisfaction to take, at Norwood, a beautiful specimen of the bedstraw hawkmoth (*Deilephila Galii*).—*R. Laddiman; Cossey Terrace, Upper Hellesdon, Norwich.*

Depraved Taste of Lithosia complana Larvæ.—Having a quantity of larvæ of *Nudaria mundana* and a few of *Lithosia complana*, both of which were found feeding on lichens growing on stones, for convenience I kept all together in a large breeding-cage. I was surprised to find the pupæ of *N. mundana* gradually diminishing in number, and at last caught one of the *L. complana* larvæ in the act of devouring the remains of a pupa; after which it very coolly went to the

next to repeat the performance. I send this notice thinking it may perhaps be of interest to others breeding *L. complana*.—*R. Kay*.

Lithosia quadra at Redcar.—While at Redcar last month (July) I took *Lithosia quadra* on the 19th, on the sandhills. It seems to me to be out of place there, more especially as there are no trees within two miles.—*George Brook; Fernbrook, Huddersfield, August 3, 1875*.

Variety of Notodonta palpina.—I have recently bred a very dark variety of *Notodonta palpina*. It is nearly black, and very much unlike ordinary specimens.—*W. H. Harwood*.

Eupithecia Knautiata.—I have now before me three series of this species, bred from baby larvæ, fed separately on the following plants:—No. 1 series fed exclusively upon *Scabiosa succisa* flowers; No. 2 series fed exclusively upon *Scabiosa arvensis*; and No. 3 series fed exclusively upon the flowers of *Calluna vulgaris*. All the food they have had has been gathered from plants growing in my own garden; and the results before me are, first, Nos. 1 and 2 are fine, large, rich, almost purple-brown specimens; and No. 3 only differs in size, not in colour: they are relatively small specimens, but retain all the other characteristics of this species. Seeing it is now the rule of English botanists to ignore the classical generic name, “*Knautia*,” and call two plants (which some people think were well separated) both *Scabiosa*, so I have used that term above.—*C. S. Gregson; Fletcher Grove, Edge Lane, Liverpool, July 21, 1875*.

Larvæ of Xylophasia scolopacina.—I think it is due to myself to say that I first took the larvæ of *Xylophasia scolopacina* in June, 1873, at Highgate Wood. I took it there again last year; and this year I showed Mr. Lockyer how and where to take it, both at Hampstead and Highgate.—*C. W. Simmons; 39, Market Street, Caledonian Road, N*.

Lithosia quadra and *Xylophasia scolopacina* in Yorkshire.—I have taken a female specimen of *Lithosia quadra* at sugar, besides a fair quantity of *Xylophasia scolopacina*.—*J. Jackson; 4, Kendray Yard, Barnsley*.

Tryphæna interjecta and *Plusia interrogationis*.—On the 22nd of July I took *Tryphæna interjecta* and *Plusia interrogationis* at sugared ragwort.—*W. H. Harwood*.

Tryphæna subsequa at Redcar.—On the 27th of July I took

at sugar *Tryphæna subsequa*. I am informed that this is the first recorded capture in Yorkshire.—*W. H. Harwood*.

Dianthæcia capsincola at Sugar.—On visiting my sugared trees on Friday last (August 20th) I was very much surprised to find a fine female of *Dianthæcia capsincola*. Is it not very unusual to find any of this genus at sugar?—*A. Thurnall; Whittlesford, Cambridgeshire, August 21, 1875.*

Catocala promissa near Ipswich.—I took a solitary *Catocala promissa* last night, at sugar, in good order. The insect has not been seen in these parts for years. I have also taken *Lithosia quadra* in two places.—*C. F. Long; Borough Asylum, Ipswich, August 22, 1875.*

Sarrothripa Revayana.—I am now breeding *Sarrothripa Revayana*, from larvæ beaten from oak in the New Forest last month. This is a very singular insect, and it seems difficult to decide to what family it really belongs. Its little boat-shaped cocoon seems to indicate a close relationship to the genera *Nola* and *Halias*; but the Tortrix-like form of the perfect insect, combined with the method of folding its wings, like a *Crambus* when at rest, makes it quite a puzzle. The larva was new to me, and I did not know whether to think it a *Bombyx* or a *Noctua*, as it seemed to have some of the characters of both.—*W. H. Harwood.*

The Plague of Locusts in America. By EDWARD NEWMAN.

(Concluded from p. 179.)

I WILL now turn back, and, still availing myself of Mr. Bethune's admirable summary, endeavour to show that the locust, although so rarely heard of in England as an insect scourge in America, is no novelty in transatlantic regions. The earliest record of the visitation of locusts in America is to be found in Gage's 'West Indies,' a work of which I am unhappily ignorant, except through the extract made by Mr. Bethune. The following refers to the year 1632:—

"The first year of my abiding there it pleased God to send one of the plagues of Egypt to that country, which was of locusts, which I had never seen till then. They were after the manner of our grasshoppers, but somewhat bigger, which did fly about in numbers so thick and infinite that they did truly cover the face of the sun, and hinder the shining forth

of the beams of that bright planet. Where they lighted, either upon trees or standing corn, there was nothing expected but ruin, destruction, and barrenness; for the corn they devoured, the fruits of trees they ate and consumed, and hung so thick upon the branches that with their weight they tore them from the body. The highways were so covered with them that they startled the travelling mules with their fluttering about their heads and feet. My eyes were often struck with their wings as I rode along; and much ado I had to see my way,—what with a montero wherewith I was fain to cover my face, what with the flight of them which were still before my eyes. The farmers towards the south sea-coast cried out, for that their indigo, which was then in grass, was like to be eaten up; from the *Ingenios* of sugar the like moan was made, that the young and tender sugar-canes would be destroyed; but, above all, grievous was the cry of the husbandmen of the valley where I lived, who feared that their corn would in one night be swallowed up by that devouring legion. The care of the magistrates was that the towns of Indians should all go out into the fields with trumpets, and what other instruments they had, to make a noise and to affright them from those places which are most considerable and profitable to the commonwealth; and strange it was to see how the loud noise of the Indians and sounding of the trumpets defended some fields from the fear and danger of them. Where they lighted in the mountains and highways, there they left behind them their young ones, which were found creeping upon the ground, ready to threaten such a second year's plague if not prevented; wherefore all the towns were called—with spades, mattocks, and shovels—to dig long trenches, and therein to bury all the young ones. Thus, with much trouble to the poor Indians and their great pains (yet after much hurt and loss in many places), was that flying pestilence chased away out of the country to the South Sea, where it was thought to be consumed by the ocean, and to have found a grave in the waters, whilst the young ones found it in the land. Yet they were not all so buried, but that shortly some appeared, which, being not so many in number as before, were, with the former diligence, soon overcome."

A century later locusts are recorded as laying waste all the

vegetation of Mexico and Yucatan, and as having produced famine and suffering among the people, especially in California. The Jesuit, Father Michael del Barco, who lived as a missionary in that country for thirty years, relates that from the arrival of the Jesuits, in 1697 to the year 1722, the inhabitants were free from the plague; but in the latter year the sufferings of the people were awful. In 1746 and the three years following locusts swarmed without intermission, and after this were absent until 1753 and 1754; and finally, before the expulsion of the Jesuits in 1765; and the plague continued during the two following years. Clavigero, in his 'History of California,' gives a very interesting account of these several invasions, and describes the appearance and natural history of the insect with great minuteness:—

“The birth of these new grasshoppers has no particular time, but is dependent upon the early or late appearance of the rains, but they generally hatch during the latter part of September or early in October. Their life, from birth to death, lasts ten months, during which they cast their coats twice, and change their colours five times. When the wings have become of sufficient strength and the body at its maturity, they then begin to ascend into the air and fly like birds, and commence their ravages in every direction, desolating the fields of every green thing. Their numbers become so extraordinary that they soon form clouds in the atmosphere, of which the rays of the sun cast a shadow as they fly. They unite in masses of ten to twelve thousand, always following their conductors, and flying in a direct line without falling behind, for they consume every growing thing before them. To whatever height their guides conduct them to obtain a sight of their food, they follow; and as soon as growing crops or any verdure is sighted, instantly the swarm will alight, and speedily devour and devastate the fields around to that extent, and with that promptitude, that when they are seen by a new swarm of their fellows there is not anything more left to injure or consume. This lamentable insect-plague is bad enough in old and cultivated countries, but in the miserable peninsula of California, where they eat up the crops, green trees, fruits, and pastures, they cause great mortality in the domestic animals of the missions, and, with the effect of their ravages on the cereals and other

garden productions, cause great famines and sickness among the inhabitants and neophytes of the establishments. At one time immense multitudes of these voracious insects died, infecting the air dreadfully with the stench of their corruption and decay."

Subsequent invasions bear date 1838, 1846, and 1855. In the latter year they extended themselves over a larger surface than had ever before been noticed. They covered the territories of Washington and Oregon, and "every valley of the state of California, ranging from the Pacific Ocean to the eastern base of the Sierra Nevada; covering the entire territories of Utah and New Mexico; the immense grassy prairies lying on the eastern slopes of the Rocky Mountains; the dry mountain-valleys of the republic of Mexico, and the countries of Lower California and Central America; and also those portions of Texas which resemble, in physical characteristics, Utah and California." The records prove that the locusts extended themselves in one year "over a surface comprised within thirty-eight degrees of latitude, and, in the broadest part, eighteen degrees of longitude." The details of this insect-invasion was frightful in the extreme: before them was a productive paradise,—“orchards, gardens, vineyards, fields of young grain, crops of vegetables,—converted in a single day into a withered, blackened desert.” That summer was the hottest that had been known for ten years. During the two following years the invasion was confined to the east of the Rocky Mountains: in Minnesota, Nebraska, and Kansas, the locusts were especially destructive. The following passage is cited by Mr. Bethune from the 'Practical Entomologist,' vol. ii. p. 3:—

“The last day of August, near the middle of the afternoon, quite a number of grasshoppers were seen alighting, and that number rapidly increased till a little before sunset. The next morning they appeared much thicker, but were only so from having crawled more into the open air to sun themselves. About nine o'clock they began to come thicker and faster from a northerly direction, swarming in the air by myriads, and making a roar like suppressed distant thunder. By looking up to the sun they could be seen as high as the eye could discover an object so small, in appearance like a heavy snow-storm; each grasshopper very much like a very large

flake, save that it passed by instead of falling. The number was beyond imagination: the air was literally full of them, and continued so till late in the afternoon; countless millions passed on, leaving other countless millions covering the earth and devouring the vegetation.' Another writer from Kansas states that—'Yesterday, September 10th, the locusts made their appearance here, and are devouring everything green. They almost darken the sun in their flight. I put in sixty-five acres of wheat in the last week of August, which looked fine, but it has nearly all disappeared; by to-morrow night there will not be a spear left. Early-sown wheat will be totally destroyed.' From the description given by another writer in Kansas, we may quote the following graphic account:—'There is something weird and unearthly in their appearance, as in vast hosts they scale walls, housetops, and fences, clambering over each other with a creaking, clashing noise. Sometimes they march in even, regular lines, like hosts of pigmy cavalry, but generally they rush over the ground in confused swarms. At times they rise high in the air, and circle round like gnats in the sunshine. At such times I think they are caught by currents of our prevailing westerly winds, and are thus distributed over vast tracts of country.' The foregoing extracts will give our readers some little idea of the mode of appearance and the destructive powers of the locusts in the west. We might fill pages,—a volume, indeed, with similar accounts."

The following year, and again in 1868, they appeared to be much less destructive in Central Iowa and North Western Missouri, Nebraska, Kansas, Texas, and Utah, but did not cross the Mother of Waters, as the great Mississippi has been called. Whether this great river formed a natural barrier to their advance, or whether the eastern limit has been attained, it is impossible to say; but it is certain that hitherto the eastern states have escaped this mighty scourge.

In Mr. Riley's "Seventh Annual Report on Noxious and other Insects Inhabiting the State of Missouri," published during the present year, still further details are given, accompanied by maps, showing the exact limits of the devastation. I cannot afford more space to that part of the subject, but will conclude with a summary of the food-plants, which shows that it is almost omnivorous:—

“Scarcely anything comes amiss to the ravenous hosts when famished. They will feed upon the dry bark of trees or the dry lint of seasoned fence-planks, and upon dry leaves, paper, cotton and woollen fabrics. They have been seen literally covering the backs of sheep, eating the wool; and whenever one of their own kind is weak or disabled, from cause whatsoever, they go for him or her with cannibalistic ferocity, and soon finish the struggling and kicking unfortunate. They do not refuse even dead animals, but have been seen feasting on dead bats and birds. Few things, therefore, come amiss to them; yet where food is abundant they are fastidious, and much prefer acid, bitter or peppery, food, to that which is sweet. The following *resumé* of my notes and observations may prove interesting:—‘Vegetables and cereals are their main-stay; turnips, rutabagas, carrots, cabbage, kohlrabi, and radishes, are all devoured with avidity; beets and potatoes with less relish, though frequently nothing but a few stalk-stubs of the latter are left, and sometimes the tubers in the ground do not escape; onions they are very partial to, seldom leaving anything but the outer rind; of leguminous plants the pods are preferred to the leaves, which are often passed by; cucurbitaceous plants also suffer most in the fruit; in the matter of tobacco their tastes are cultivated, and they seem to relish an old quid or an old cigar more than the green leaf; tomatoes and sweet potatoes are not touched, so long as other food is to mouth. Of cereals, corn is their favourite; if young and tender, everything is devoured to the ground; if older and dryer, the stalks are mostly left; the silk is, however, the first part to go. All other cereals are to their taste, except sorghum and broom-corn, which are often left untouched. They are fond of buckwheat and flax, but seldom touch castor-beans. Next to vegetables and cereals they relish the leaves of fruit-trees: they strip apple and sweet cherry-trees, leaving nothing but the fruit hanging on the bare twigs. The leaves of the peach are generally left untouched, but the flesh of the unripe fruit is eaten to the stone. Pear-trees, as Mr. Gale informs me, suffered less than any other kind of orchard-tree at the Experimental Farm at Manhattan, Kansas. The tender bark of twig and branch and trunk of all these trees is gnawed and girdled; and these girdled trees present a sad picture as one

passes through the ravaged country during the subsequent winter. Sour cherry, apricot, and plum-trees, are less affected by them, while ripe fruit is seldom touched. Of berries, strawberries and blackberries are devoured, where raspberries are frequently unmolested. Flowering shrubs very generally suffer; and they are particularly fond of rose and lilac. Of herbaceous plants, Helianthus, Amaranthus, and Xanthium, are eaten with especial avidity. Grape-vines suffer more from the girdling of the fruit-stems than from defoliation. Forest and shade-trees suffer in different degrees, and some, when young, are not unfrequently killed outright. Last year, honey locust, red cedar, box elder, Osage orange, elm and oak, were either untouched or but little injured, while the following trees were preferred in the order of their naming: ash, willow, cottonwood, balm of Gilead, silver-leaved and Lombardy poplars, black ash, black locust, black walnut, hickory, Ailanthus, maple, Sumach, and evergreens. In every case they show a marked preference for plants that are unhealthy or withered.”

English philanthropists, who have taken such laudable pains to discover outlets for their charity in Africa, would do well to direct their attention to the naturally fruitful, but now desolate, regions westward of the Mississippi: the plethora of English wealth might here find a safety-valve among a people who are really and positively our own kith and kindred. Attracted by reports, to what was represented a western paradise, thousands of families have migrated from their homes in England to find a desolate, inhospitable waste, rendered so by the ravages of these insatiable destroyers. It may be asked whether the Americans themselves are doing their best to meet the emergency. And the answer is certainly in the affirmative. Men of science have exerted themselves to the utmost in diffusing a knowledge of the natural history of the insect, and in endeavouring to find means of exterminating or, at any rate, checking the increase of the enemy; while the benevolent have sought, by every means in their power, to repair the losses, and thus mitigate the sufferings.

A crumb of comfort remains to the afflicted; although some differences of opinion prevail on the subject, a general opinion prevails that the locust has reached its eastern limit

in the American continent:—"It seems to breed only on the higher mountain-elevations, where the atmosphere is very dry and attenuated, and where the soil seldom or ever gets soaked with moisture." Professor Thomas "found it most numerous in all stages of growth along the higher valleys and canyons of Colorado, tracing it up above the perennial snows, where the insect must have been hatched, and where it was found in the adolescent state. In crossing the mountains in Colorado it often gets chilled in passing the snows, and thus perishes in immense numbers, when bears delight to feed on it."

"My own belief," continues Mr. Riley, "is that the insect is at home in the higher altitudes of Utah, Idaho, Colorado, Wyoming, Montana, North West Dakota, and British America. It breeds in all this region, but more particularly on the vast and hot dry plains and plateaus of the last-named territories, and the plains west of the mountains, its range being bounded probably on the east by that of the Buffalo grass."

EDWARD NEWMAN.

Extracts from the Proceedings of the Entomological Society of London.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

APRIL 5, 1875.

New Species of Ornithoptera.—Mr. Sealy read the following notes on the species of Ornithoptera exhibited at the last meeting:—"The insect occurs in tolerable abundance along the coast of South Malabar, Cochin, and Travancore. At the town of Cochin, where I live, it is frequently seen. I have also observed it many miles inland, flying over the trees in the low jungles at the foot of the Western Ghats; but I have not noticed it at any great height above the sea. In Cochin I have seen it from March to August flying over the tops of the tallest cocoa palms, occasionally descending to hover over the flowers, especially those of the large scarlet Hibiscus, near which I have caught it in my own garden. The males seem less common than the females, and seldom are perfect on the wing. For several years I could get no

information regarding the larva; none of the natives knew it, but last monsoon I obtained it, and during June and July many were collected: they fed upon *Aristolochia indica*, and apparently upon it only. The larvæ were very splendid, of a rich velvety black, with a lateral band, and a saddle of white and red, very roughly tubercled, and the tubercles tipped with red. I cannot from memory attempt a closer description. A plate in 'Wood's Natural History' of the imago and larva of a species there given as *Ornithoptera Amphrisius* corresponds very closely with this Cochin species. But there seems some doubt about its identity. On July 19th, 1874, I obtained a large quantity both of larvæ and pupæ: the larvæ I fed upon *Aristolochia*, and many changed to pupæ. From these many emerged before I left India (August 13th), and others on board ship, from the pupæ I took with me. They appear to remain about three weeks in pupa. The pupa possesses the power of making a curious noise, like 'pha, pha,' and makes it very loudly when touched; the noise is accompanied (perhaps produced) by a sharp contraction of the abdominal segments. I thought at first it was merely produced by the rubbing of one ring of the pupa-case against the next, but the sound did not resemble a mere frictional sound; it was more like the sound of the rush of air through small holes,— 'pha, pha!' I tried to produce it with a dead chrysalis, but failed; and the pupa sometimes contracted on being touched without making the noise, and appeared unable to make the noise until some time was given to allow them to recover their vigour. A curious incident connected with this insect came under my notice some years ago. In cleaning out the body of a female I turned out a mass of apparently mature eggs, but they all proved unfertile; soon after, in operating upon another female, a slight pressure upon the body drove an egg out from the oviduct, and a repeated pressure extruded a second; the rest, twenty or thirty, would not come, and were taken out in emptying the body. The two which had been pressed through the oviduct hatched, and all the others shrivelled. I mention this as it seems a sort of confirmation of Von Siebold's observation respecting bees, that the fertilization of the egg takes place on its passage through the oviduct. The two larvæ lived two or three days, refusing every leaf I offered them. I did not then know *Aristolochia*

was the food-plant." Mr. Sealy also called attention to a peculiarity in the formation of the hind wings of the male, specimens of which he exhibited, there being a large pouch on the anal margin, filled with fluffy hair.

Colorado Potato-beetle.—Mr. M'Lachlan read a letter he had received from an Englishman residing in Pueblo, Colorado, U.S., stating that he had grown potatoes in various parts of the Union, and that he was satisfied it was not necessary for the potato-beetle to have pieces of haulm to support it whilst crossing the Atlantic, as he had found the insect in his potato-pits eating the tubers greedily; and that unless the English authorities took some steps to prevent the importation of potato-bulbs, he believed the beetle would soon be in this country. Mr. M'Lachlan drew attention to the following remark by Lieut. W. L. Carpenter, in his Report of the Zoological Collections made in Colorado during the summer of 1873 (extracted from the Annual Report of the U.S. Geological and Geographical Survey) with reference to the Colorado potato-beetle:—"This insect is still marching eastward, not a single specimen having been seen west of the dividing-ridge. It is probable that, should the potato be cultivated on the western water-shed, it would be free from the ravages of this destructive insect for a number of years; but that it would ultimately make its appearance in that region through the agency of the seed. This I believe to be the manner of their introduction to distant localities, as they are sluggish travellers, and quite incapable of spreading so rapidly by their own instinct. This belief is further sustained by their continued absence from the Salt Lake basin, occasioned by the cheapness of vegetables in the Mormon settlements excluding the importation of potatoes from Colorado. Not found at a greater altitude than eight thousand feet." Mr. Bates believed the distribution of the beetle depended more upon climatic conditions. The native home of the insect was the eastern plateaus of the Rocky Mountains, as far south as Mexico; and the climate of the West Coast of America being much more like the West Coast of Europe, their Faunas also bore a great resemblance. He believed the absence of the insect from the west of the Rocky Mountains to depend upon the difference of climate; and the same cause might be expected

to prevent the establishment of the insect in countries where the moisture of the atmosphere would probably be fatal to it. Mr. Stevens remarked that on different occasions he had received the insect in great numbers in bottles from Orizaba.

MAY 3, 1875.

Stylops taken in Andrena atriceps.—The President exhibited specimens of *Stylops* taken by himself, in the pupa state, in *Andrena atriceps*, at Hampstead Heath, on the 6th, 9th and 17th of April last. Mr. F. Enoch, who had been there on the 6th, at an earlier hour (between nine and ten o'clock), had been still more successful, having captured as many as seventeen males, one of which, however, was taken after 2 P.M. The President drew attention to the remarkable difference observable in the cephalothorax of the females in these specimens, as compared with those met with in *Andrena convexiuscula*, and remarked on the importance of not confounding the species obtained from different *Andrenæ*; *Stylops Spencii* having been derived by Mr. Pickering from *A. atriceps*, and figured by Professor Westwood in the first volume of the 'Transactions' of this Society, while those obtained by Mr. Thwaites from *A. convexiuscula* had been associated with his name in a monograph of the family by the President in the volume for 1874, under the name of *Stylops Thwaitesei*.

Insects of Kerguelen's Island.—Mr. M'Lachlan read an extract from a Report made to the Royal Society on the Natural History of Kerguelen's Island, by the Rev. A. E. Eaton, who was attached, as naturalist, to the Transit of Venus Expedition to the island. Nearly all the insects were remarkable for being either apterous or with greatly abbreviated wings. There were two Lepidoptera, one (only a larva) probably belonging to the Noctuidæ, the other to the Tineidæ. Of the Diptera, one species had neither wings nor halteres; another lived habitually on rocks covered by the tide at high-water, and its larva fed upon a species of seaweed. All the larger Coleoptera seemed to have their elytra soldered together. Mr. M'Lachlan said that the theory as to the apterous condition of the insects was, that the general high winds prevailing in those regions rendered the development of wings useless; and Mr. Jenner Weir remarked that

the apterous condition was correlated with the fact that plants under similar circumstances were apetalous and self-fertilising; and hence it was supposed that the existence of winged insects was unnecessary.

Chekanops under the Elytra of a Passalus.—Mr. C. O. Waterhouse exhibited a *Chekanops*, of which he had discovered two specimens under the elytra of *Passalus punctiger*, from Rio Janeiro, thus confirming the statement that these insects attach themselves to the bodies of other insects after the manner of *Acari*.

A New Neuropteran from Swan River.—Mr. C. O. Waterhouse also exhibited a drawing of a Neuropterous insect of the family *Ascalaphidæ*, from Swan River, presenting the peculiarity of having a large bifid hump on the basal segment of the abdomen dorsally, each division of the hump bearing a crest of hairs. He believed it to be the male of *Suphalasca magna*, *M' Lachlan*.

Collection of Neuroptera from Yokohama.—Mr. Wormald exhibited a collection of Neuroptera, &c., from the neighbourhood of Yokohama, received from Mr. H. Pryer. It included several interesting species of *Panorpidæ*, including a new genus of that family, according to Mr. M' Lachlan; fine species of *Osmylidæ*, &c. Amongst the *Trichoptera* was a remarkable species of the genus *Perissoneura*, black, with a large white spot in each wing, deceptively resembling a butterfly, especially an *Ithomia*.

JUNE 7, 1875.

Zygæna Meliloti and Z. Trifolii.—Mr. Briggs exhibited bred specimens of *Zygæna Meliloti*, accompanying them with the following remarks:—"In 1872 and 1873 I reared young larvæ of *Z. Meliloti* from the New Forest, up to and through hibernation, but they died in the following springs; and these larvæ, from the minuteness of the markings on the ground colour, showed a great distinction from the young larvæ of *Z. Trifolii* of the same age. Last year (1874) I found small specimens of *Z. Trifolii* in company with *Z. Meliloti*. I therefore took especial care that the eggs I reared were from four typical pairs of (the New Forest) *Z. Meliloti*, found *in copulâ*; the eggs were (in all four cases) larger than the eggs of *Z. Trifolii*—a peculiarity I had remarked in previous years.

Several of the moths I found difficult to refer with any degree of certainty to either(?) species. In the autumn many of the young larvæ had developed markings like those of *Z. Trifolii*. This spring (having failed in my two previous attempts) I put the *Z. Meliloti*, of which about thirty out of three hundred survived the winter, into a greenhouse, and in the result got nine pupæ; the major portion of the twenty-one others fed and grew with their companions for a while, and then hibernated again. Of the nine pupæ six have now hatched, and produced full-coloured specimens of the small *Z. Trifolii* that I found in company with *Z. Meliloti* last year. The following questions suggest themselves:—(1) Is the *Z. Meliloti* of the New Forest a separate species or a dwarfed form of *Z. Trifolii*? (2) If a dwarfed form, did the additional greenhouse heat aid in developing it? (3) If a separate species, can the specimens I bred from have paired with *Z. Trifolii* previously? I may add that I have compared M. Boisduval's description of the continental *Z. Meliloti* with the New Forest insect, and they do not agree in several particulars; and I have inspected the British Museum specimens of continental *Z. Meliloti*, and they also differ from the New Forest insect, especially in the form of the wings. The fact of the hibernation of the larva for a second year seems common. I have found it with *Z. Trifolii* and *Z. Meliloti* during the last three years, and it has been recorded of *Z. Lonicæræ*. Out of one hundred larvæ of *Z. Trifolii* that survived last winter I obtained twenty-five pupæ (most of which are out); about twenty died, and the rest resumed hibernation, in the first week in June, in a greenhouse, the average daily temperature of which is 75°, and are now hibernating and apparently healthy." Mr. M'Lachlan remarked that the insects of the genus hybridized very freely, and alluded to the possibility of their pairing more than once. Mr. W. A. Lewis had noticed that *Z. Meliloti* was by far the commonest insect in the part of the New Forest which forms its head-quarters, and that, as it appeared to have been only discovered there of late years, it might be a stunted form which had been developed recently. Mr. Weir said that he had taken the insect twenty years ago in Tilgate Forest.

Insects of Kerguelen's Island.—The Rev. A. E. Eaton

exhibited the insects recently taken by him in Kerguelen's Island. There were about a dozen belonging to the Coleoptera, Lepidoptera, and Diptera, besides some specimens of bird-lice and fleas.

Sound produced by Halias prasinana.—Mr. Briggs exhibited a specimen of *Halias prasinana*, which, when taken, was heard to squeak very distinctly, and at the same time a slender filament issuing from beneath the abdomen was observed to be in rapid motion, and two small spiracles close to the filament were distinctly dilated.

Living Larva in Andrena Trimmerana.—The President called attention to a living larva which he had that morning extracted from the body of a stylopized female of *Andrena Trimmerana*, taken at Reigate on the 4th of June,—this larva having a long attenuated telescopic process at the anterior extremity, and two piceous reniform appendages behind, like that of *Conops*, which he had frequently reared from *Pompilus*, *Sphex*, and *Odynerus*, as described by him in the 'Transactions' (vol. iv., ser. 2, 1858, pl. 28). These larvæ had also been met with in *Bombus* by Latreille, Dufour, and others, as well as in *Osmia*, but not in *Andrena*, which moreover had been doubly victimized in the present instance, having the greater portion of the abdomen preoccupied by another invader, and thriving in spite of this and of the *Conops* larva subsequently lodged at the base.

Podura found on Snow.—The Secretary exhibited some specimens of a minute *Podura*, forwarded to him by the Secretary of the Royal Microscopical Society, having been found on the snow of the Sierra Nevada, in California.

Flea attached to the Neck of a Fowl.—Mr. F. H. Ward exhibited some microscopic slides showing specimens of a flea attached to the skin of the neck of a fowl, and which remained there after the death of the fowl.

JULY 5, 1875.

Death of Mr. Doubleday.—The President announced the decease of Mr. Henry Doubleday, one of the Original Members of the Society; and Mr. Stainton made some remarks on his entomological labours, and on the great service he had done for Entomology in correcting the nomenclature of the British Lepidoptera.

Ornithoptera from Cochin.—Mr. Dunning remarked that the Ornithoptera bred by Mr. Sealy from larvæ taken at Cochin, South India, and exhibited by him at a recent meeting, had been identified as *O. Minos*.

Curculio attacked by a Fungus.—Mr. Bond exhibited two specimens of a *Curculio*, sent by Mr. Griffin from Nova Fribourgo, Brazil, which were attached to the same twig, and were both attacked by a fungus. Mr. Janson said that they belonged to the genus *Hylopus*, and were well known to be subject to such attacks.

Osmia nesting in a Lock.—The President exhibited a lock, taken from a gate at Twickenham, entirely filled with the cells of a species of *Osmia*, which Mr. Smith said was most probably *O. bicornis*, of which he had known several instances in locks. The larvæ were still alive and healthy.

Parasitic Coleoptera, &c.—The President also exhibited an example of the minute *Hylechthrus Rubi*, one of the *Stylopidæ*, parasitic upon *Prosopis rubicola*, recently obtained from briars imported from Epirus, and remarked upon a method of expanding the wings of *Stylopidæ*. In repose these wings were rolled up in an elongate form; but he found that by pressing them gently forward from below they suddenly became erect, and then easily retained an expanded position. He further exhibited males and females of *Spilomena troglodytes* (one of the *Crabronidæ*) reared from bramble-stems found at Shere, in Surrey; also a series of *Halictus nitidiusculus*, stylopized, and recommended entomologists going to the south coast in August to search for stylopized *Halicti*, especially on thistles. Finally, he remarked on the parasites of *Osmia* and *Anthidium*; and exhibited two specimens of the Coleopterous genus *Zonitis* (*Z. mutica* and *Z. bifasciata*) reared from the cells of *Osmia tridentata*, and a third (*Z. præusta*) from those of *Anthidium contractum*, which latter had also produced two species of *Chalcididæ* (*Leucospis dorsigera* and *Eurytoma rubicola*). He enumerated eleven species of Insect as attacking the same *Osmia* in various stages, of which he had himself reared six, including the two *Zonites* aforesaid, the other four being *Cryptus bimaculatus*, *Melitobia Audouini*, *Halticella Osmicida*, and *Chrysis indigotea*; some of which had been recorded by Dufour and Perris, together with *Stelis minuta* and two

species of Diptera (*Senometopia spinipennis* and *Conops flavipes*); two other Crypti (*C. confutor* and *C. signatorius*) being cited by Dr. Giraud. The *Zonitis* devoured the egg and pollen-paste whereon the *Stelis* also subsisted; the *Chrysis*, Crypti and *Senometopia* fed upon the soft larvæ externally; *Halticella* was reared within the more solid adult larvæ, whose tegument, desiccated and black (as in specimens exhibited), served for the hybernation of the parasite; the *Melitobia* destroyed the nymph in its soft state by external attack, and the *Conops* deposited its egg in the body of the bee itself after maturity. Specimens of this *Osmia* alive, and of the briars from which they were produced, were also exhibited.

Chrysomela cerealis.—Mr. Champion exhibited a series of recently-captured individuals of *Chrysomela cerealis* from Snowdon, its only known British locality. Mr. M'Lachlan stated that he had recently seen this species in the Department of the Saône et Loire, in France, in great numbers, each ear of wheat having several of the beetles upon it, and remarked on the singular nature of its sole habitat in Britain.

Trap-door Spiders in the Bark of a Tree.—The Secretary exhibited nests of a trap-door spider containing living inmates, sent from Uitenhage, near Port Elizabeth, by Mr. Henry W. Bidwell, a member of the Legislative Assembly of the Cape of Good Hope. The nests were not (as is usual) in the earth, but in cavities in the bark of trees, and the "trap-door" appeared to be formed of a portion of the bark, thus rendering it most difficult to detect the nests when in a closed condition. The Secretary was also informed that similar nests were constructed in door-posts and other places.

American Locusts and Army Worm.—Mr. Riley, State Entomologist of Missouri, exhibited sundry of the insect-pests that do so much damage in the United States, including the army worm (*Leucania unipuncta*) and the Rocky Mountain locust (*Caloptenus spretus*), and entered at some length into the habits of the latter insect, and the vast amount of destitution caused by it, stating that in a short period it devoured almost every living plant, leaving nothing but the leaves of the forest trees, and converting a fruitful country into an absolute desert. From a knowledge of the habits of the

insect, and believing in its inability to exist in a moist climate, he had predicted that its ravages would not extend beyond a certain line, and he had seen these predictions fulfilled almost to the letter. Having noticed that hogs and poultry grew excessively fat from devouring the locusts, and considering that the use of them as food for man would tend to relieve some of the distress occasioned in the devastated districts, he had, shortly before leaving St. Louis, organized a banquet, at which locusts, prepared in several ways (especially in the form of soup), were served up, and they were pronounced to be excellent. He distributed a number of baked locusts among the members present, but did not recommend them for food in that state, as the chitinous external tegument and the spines required to be removed before they were fit for digestion. Mr. Riley also stated that he was very desirous of taking a supply of the cocoons of *Microgaster glomeratus* to America, to lessen the ravages of the larvæ of the genus *Pieris* on that continent; and he would be greatly obliged to any entomologist who could assist him in obtaining them.

[Most heartily do I second Mr. Riley's request. No one has done so much for Economic Entomology in the United States as Mr. Riley; and I hope entomologists in this country will promote his patriotic views as far as is in their power, since we are certain whatever suggestion is thrown out by so thoroughly practical a naturalist is deserving of the most earnest consideration of his fellow-labourers in every country. With regard to the beneficial effect of importation of *Microgaster* into the United States, I must decline expressing an opinion. I can only say, try it.—*Edward Newman.*]

Removal of the Society.—The President stated that this was the last meeting that would be held at Burlington House; and that due notice would be given to the members when the arrangements at the new rooms of the Society, at 11, Chandos Street, Cavendish Square, were completed; the library having been already removed to that place. Mr. Dunning proposed, and Mr. M'Lachlan seconded, a cordial vote of thanks to the Linnean Society for the permission to hold the meetings at their rooms, so long enjoyed by the Entomological Society. This was carried by acclamation.

THE ENTOMOLOGIST.

No. 147.]

OCTOBER, MDCCCLXXV.

[PRICE 6d.]

Notes on Oviposition. By the Rev. P. H. JENNINGS.

(Continued from p. 175.)

Urapteryx sambucata.—A female, taken July 13th, laid one hundred and twenty-three eggs: eleven on the 13th, thirty-eight on the 14th, sixteen on the 15th, thirteen on the 16th, forty-one on the 17th, and four on the 18th. Of these sixty-six were deposited on the muslin cover, forty on the glass cylinder, and forty-seven on the under side of the leaves of the food-plant; some were laid singly, some contiguous and in order; those on the leaves were near the middle of each leaf, spherical, rather longer longitudinally, the end by which they were attached to the surface rather smaller than the other; longitudinally divided into eight flattened sides, which cease towards the top, leaving a circular space slightly depressed, and around which the divisions of the sides rise in small points; straw-coloured, smooth, but only partially glossy; became orange-coloured on the fourth day; lead-coloured just before the young larvæ were hatched, which took place on the eighteenth day, July 31st.

Cabera exanthemaria.—A female, taken July 3rd, laid eighty-five eggs: sixty were deposited on the 5th, eleven on the 6th, and four on the 18th. Of these twenty-five were laid on the upper surface of the leaves of the food-plant, goat-sallow (*Salix capræa*), singly and much scattered; twenty-four on the under side and thirty-six on the muslin cover: oblong, depressed on the crown, rounded at the other end, yellow, of the finest gloss, slightly flattened on both surfaces. The young larvæ began to appear on the thirteenth day, July 18th.

Emmelesia decolorata.—A female, taken June 18th, laid twenty-four eggs on the stem and calyx of the food-plant,

Lychnis dioica, deposited singly: yellow, gradually assuming a darker shade till they became of an orange-colour; oblong, glossy, very slightly flattened on both surfaces. The young larvæ, which were yellow, with a black head and a black corneous plate on the 2nd segment, began to appear on the seventh day, June 26th.

Melanippe procellata.—A female, taken July 3rd, laid thirty-eight eggs: twenty-three on the 4th, eight on the 5th, and seven on the 6th. The larger number were deposited on the upper edge of the leaves of the food-plant, traveller's joy (*Clematis vitalba*), some on the under edge, and one on the stem: almost white, opaque, oblong, slightly depressed on the crown, not glossy.

Anticlea rubidata.—A female, taken July 3rd, laid twenty-eight eggs: twenty-two were deposited on the tips of the leaves of the food-plant (*Galium mollugo*), for the most part singly, sometimes two on one tip, and in one instance six, and six on the muslin cover: oblong, equally rounded at each end; nearly white, glossy, having very much the appearance of pearls attached to the tips of the leaves. The young larvæ began to appear on the tenth day, July 13th.

Scotosia undulata.—A female, taken July 9th, laid one hundred and seventy-one eggs: thirty-one were deposited on the 11th, eleven on the 12th, thirteen on the 13th, twenty-four on the 14th, five on the 15th, five on the 16th, two on the 17th, ten on the 18th, fifty on the 19th, one on the 20th, eight on the 21st, eleven on the 26th: one hundred and eighteen were on the upper side of the leaves, the goat-sallow (*Salix capræa*), and fifty-three on the under side, all deposited singly: oblong, slightly depressed on the crown; white, slightly glossy. The young larvæ began to appear on the twelfth day, July 23rd.

P. H. JENNINGS.

Longfield Rectory, Gravesend,
August 18, 1875.

Entomological Notes, Captures, &c.

Captures in Kent.—I had again the pleasure of taking *Nola albulalis* in the north of Kent during the middle of July last, although I secured very few in comparison with the

number I captured the previous year. I do not think the species has been much less common than then, but scattered over a longer period, the weather being so variable. Last year, the week I was on the ground was exceedingly fine and hot; this year, on the contrary, it rained incessantly nearly the whole time. I also took *Apatura Iris* about the oaks; and *Pterophorus rhododactylus*, in both pupa and imago stages, about the wild roses. Amongst the less noteworthy species observed at the same time may be mentioned *Melitæa Athalia*, *Vanessa polychloros* (pupæ common), *Sesia myopæformis* (empty pupæ-cases common in old apple-trees), *Calligenia miniata*, *Acidalia rusticata* (in profusion on two elm-hedges), *Cidaria picata*, *Thyatira derasa*, *T. Batis*, *Acronycta Ligustri*, *Caradrina Morpheus*, *Epunda viminalis* (very common at sugar), *Rivula sericealis*, *Erastria fuscula*, *Ebulea crocealis*, *Pempelia roborella*, *Pterophorus lithodactylus*, and many others.—*Geo. T. Porritt; Huddersfield, Sept. 2, 1875.*

Captures of Lepidoptera.—I observe by Newman's 'British Moths' that he is doubtful about the occurrence of the dark variety of *Xylophasia polyodon* in the south of England: I venture to add that I found one at rest on palings, in Surrey, about July, 1872. I have lately been taking *Crambus uliginosellus* plentifully here: Stainton, I see, gives only three localities, but in one or two of these it appears to be abundant. I have likewise taken *Lycæna Egon* on a heath, about a mile and a half from Esher, in the direction of Claremont, where it appears to be pretty plentiful. *Anarta Myrtilli* also occurs there. I have been taking also *Phibalapteryx lignata* in some plenty. I captured one fine *Coremia quadrifasciaria* on the 6th, in the same locality. Also a fine specimen of *Ptilodontis palpina* at rest on a fence, on the 10th, which seems to me very late for the species. *Endotricha flammealis* has been common in Coombe Wood this year, where, also, *Acidalia promutata* has not been uncommon. A fine specimen of *Larentia olivata* turned up at light here on the 12th: this appears to be a northern species. I have likewise taken two fine *Leptogramma literana*; one on the 21st.—*W. Thomas; Surbiton Villa, Surbiton, August 24, 1875.*

Vanessa Antiopa at Edlington, near Doncaster.—Happening to be at Edlington on the 5th of September last,

entomologizing, I met with two men who had just taken a good specimen of *Vanessa Antiopa*. It was pinned sideways in a pasteboard-box, along with a lot of *Atalanta*, *Io*, and *Gonepteryx Rhamni*, which swarm there just now. I secured it for my cabinet.—*John Harrison; Barnsley.*

Vanessa Antiopa in Norfolk.—A specimen of *Vanessa Antiopa* was taken here on Friday, August 20th, and is added to a private collection in the neighbouring county of Suffolk. It measures three and one-thirteenth inches across the wings.—*John Tudor Frere; Roydon Hall, Diss, August 22, 1875. [From the 'Field.']*

Vanessa Antiopa in Ireland.—I am happy to tell you that you may add *Vanessa Antiopa* to the list of Irish Lepidoptera, a specimen in very fine condition having come into my possession, taken by a nursery-maid on a road in the neighbourhood of Belfast.—*John Bristow; Chichester Park, Belfast, September 11, 1875.*

Vanessa Antiopa and Colias Edusa.—My friend Mr. Hill saw a fine specimen of *Vanessa Antiopa* near Berkeley Road Station, on August 5th, but did not succeed in capturing it. I have been taking *Colias Edusa* freely on a railway-bank near here, and also in a clover-field near Chepstow, but found the females very scarce; the proportion being twenty males to one female. *Colias Hyale* I have not seen.—*J. Preston; Fishponds, near Bristol, September 20, 1875.*

Papilio Machaon, Gonepteryx Rhamni, Vanessa Io, and V. Atalanta.—In the Norfolk fens the larvæ and pupæ of *Papilio Machaon* have been scarce this season. May not this be attributed to the heavy rains at the season when the larvæ were feeding? I find *Gonepteryx Rhamni* and *Vanessa Io* entirely absent from localities where I have never failed to get quantities in former years. *Vanessa Atalanta*, on the other hand, has been unusually abundant.—*R. Laddiman; Norwich.*

Colias Edusa near Hendon and Hampstead.—I and my brother have within the last fortnight captured three very good specimens of *Colias Edusa*; two near Hendon, and one near Hampstead Heath.—*J. E. Sharp; September 6, 1875.*

Colias Edusa near Norwich.—On the 29th of August I saw, at South Walsham, a solitary specimen of *Colias Edusa* on the wing; on the 30th I also observed another near the

same place.—*R. Laddiman; Cossey Terrace, Upper Hellesdon, Norwich.*

Colias Edusa at Darlington.—I have the pleasure of recording the capture of two fine examples of *Colias Edusa* near Darlington. As they are not of usual occurrence I thought it well to let you know.—*Thomas Worthington; Jane Street, Darlington, September 13, 1875.*

Colias Edusa at Nottingham.—On Friday last, the 18th September, I observed two fine specimens of *Colias Edusa* here, at Nottingham. Is not this very far north for it?—*Stanley Birkin; Ruddington Grange, near Nottingham, September 23, 1875.*

Colias Hyale and C. Edusa in Suffolk.—My son (Hugh Peters), a lad of thirteen years, returned from Aldeburgh yesterday. He informs me that both *Colias Hyale* and *C. Edusa* were common in and around that town towards the latter end of August. He captured twenty-one in a few hours, and saw a great many more; but, being a windy day, they were soon out of reach. His captures were thirteen *Colias Hyale* and eight *C. Edusa*.—*John Peters; 8, Belgrave Road, St. John's Wood, N.W., September 4, 1875.*

Colias Hyale and C. Edusa at Maldon.—This appears to be quite a *Colias* season again, as this last week, when out shooting, I have noticed both *Colias Hyale* and *C. Edusa* many times, at localities in Essex, more than twenty miles distant from one another. This morning I took my net, and in less than twenty minutes caught eight fine specimens of *Colias Hyale*, one almost white. I saw others; it is quite common here.—*E. A. Fitch; Maldon, Essex.*

Colias Hyale.—I have taken several fine specimens of *Colias Hyale* close to this town during the past week.—*W. D. Causdale; White House, Witham, August 30, 1875.*

Colias Edusa and C. Hyale near Alresford.—*Colias Edusa* and *C. Hyale* have both occurred not uncommonly in this neighbourhood, during the last week in August and the beginning of September.—*Joseph Anderson, jun.; Alresford, Hants.*

Colias Helice at Alresford.—On the 15th of September my brother, Mr. Fred. Anderson, had the pleasure of capturing a fine specimen of this beautiful variety of *Colias Edusa* flying by the side of a railway-bank in the neighbourhood of this

town. I wonder whether the experience of other collectors is the same as his, as to the scarcity of the female of *C. Edusa*; but out of quite a large number of males he only succeeded in taking one female.—*Joseph Anderson, jun.; Alresford, Hants.*

Lycæna Arion near Kingsbridge.—The locality in this neighbourhood for this handsome insect was first discovered on the 30th of June, 1856, by Mr. H. Young and myself, at which time, and for many years subsequently, it was to be found in very large numbers; as many as three or four hundred specimens of a morning might be seen sporting about, alighting on the flowers of the wild thyme, and apparently sucking the nectar therefrom. If you give chase for the purpose of catching, it is necessary to be very quick, as they have a peculiar habit of darting into the thick furze, and creeping to its very centre; and all your beating the bush fails to again get them on the wing. Although their locality spreads over many miles of slopes thickly covered with furze, interspersed with wild thyme, facing the sea, I fear there is a great probability of their becoming almost exterminated, for at the present time their numbers are greatly diminished, chiefly attributable to the practice of the occupiers of the land annually burning patches of the furze for the purpose of destroying rabbits, and also converting it into feeding-ground for sheep and cattle. It seems a pity that so handsome an insect before long should be lost to the British fauna, at least in this district.—*H. Nicholls; Roseland, Kingsbridge, South Devon, September 6, 1875.*

Sphinx Convolvuli at Darlington.—We have taken nineteen *Sphinx Convolvuli*, flying over honeysuckle in our garden, since the 12th of August. We also missed five others.—*John Law; Elton Parade, Darlington, September 7, 1875.*

Sphinx Convolvuli in the North of Ireland.—I caught a fair specimen of *Sphinx Convolvuli* in the village of Glenarm on Thursday, September 9th, the first specimen I have seen in this locality.—*T. Brunton; Glenarm Castle, Larne, N. Ireland.*

Sphinx Convolvuli at Bristol.—A damaged specimen of *Sphinx Convolvuli* was brought to me this evening. It was captured last Saturday. It flew into an open window in Clifton Park; and, as is usual in such cases, was placed

under a tumbler, and allowed to beat itself almost to pieces. It is a remarkably large specimen.—*W. K. Mann; Granby House, Clifton, Bristol, September 14, 1876.*

Sphinx Convolvuli at Witham.—Two specimens of *Sphinx Convolvuli* have been captured in this town during the past week, and brought to me alive; but having passed through several inexperienced hands they are sadly rubbed.—*W. D. Cansdale; White House, Witham, Essex, Sept. 16, 1875.*

Sphinx Convolvuli at Hawley.—I had a specimen of *Sphinx Convolvuli* given me yesterday (September 20th). It was captured on a straw-rick in this village by a labouring-man.—*H. Jones; Hawley, Farnboro' Station, September 21, 1875.*

Sphinx Convolvuli at Gravesend.—I do not know whether *Sphinx Convolvuli* has been universally abundant this year, but I have succeeded in capturing twelve, and three others were brought to me. They were nearly all caught at petunias, between half-past six and eight.—*H. N. Ridley; Cobham Vicarage, Gravesend.*

Sphinx Convolvuli at Gravesend.—On Friday last, September 17th, a specimen of *Sphinx Convolvuli* flew into my gardener's cottage, attracted by the light. After careering once or twice round the room, and unfortunately dashing itself against the ceiling, it alighted on the table, where it was secured. It proved to be in fine condition, with the exception of a slight injury to the thorax.—[*Rev.*] *P. H. Jennings; Gravesend, September 20, 1875.*

Sphinx Convolvuli at Huddersfield.—On Monday, September 20th, at Armitage Bridge, Huddersfield, a specimen of *Sphinx Convolvuli* was knocked down by some boys, and fearfully damaged.—[*Rev.*] *G. C. B. Madden; Armitage Bridge, Huddersfield, September 21, 1875.*

Sphinx Convolvuli at Hammersmith.—Last evening, September 20th, while at a friend's house, I captured a fine specimen of *Sphinx Convolvuli*, which had been attracted into the room by some lilies (*Lilium auratum*), over which it hovered, extending into them a proboscis of unusual length.—*D. G. Cowan; Hammersmith.*

Sphinx Convolvuli near South Hackney.—This insect appears to be somewhat common this season. A specimen was brought to me on the 16th inst., taken in a garden near

here. I visited the locality the same evening, and captured a splendid female, and have since taken two females in beautiful condition. To-day a friend brought me the remains of a specimen he had rescued from his cat in his garden at Kennington.—*C. J. Biggs; South Hackney, Sept. 20, 1875.*

Sphinx Convolvuli at Barrow-on-Trent.—I took a good specimen of *Sphinx Convolvuli* here, on the 6th September, flying over petunias.—[*Rev.*] *G. A. Smallwood; Barrow-on-Trent, Derby, September 8, 1875.*

Sphinx Convolvuli at Eastbourne.—On the 10th of September I took *Sphinx Convolvuli* at rest on an old post in the marshes here. It appears to be plentiful here, as several have been taken.—*W. E. Parsons; 35, Langney Road, Eastbourne, September 20, 1875.*

Sphinx Convolvuli in Dublin.—I received a specimen of this moth on the 17th of September, sent from Dublin, where it had been found dead in the streets.—*T. H. Ormston Pease; Cote Bank, Westbury-on-Trym, Sept. 22, 1875.*

Sphinx Convolvuli at Cullercoats.—*Sphinx Convolvuli* was taken at rest on a scaffolding-pole at South Shields, in the last week of July, and is now in my collection. I saw another flying over some carnations in my garden at Cullercoats on the 24th ult. It seemed stupefied for a moment by the glare of the lantern, so I got a good look at it, but not having my net in my hand I lost it. I have also taken *Hadena Chenopodii* at sugar. It is mentioned as a southern species in 'British Moths.'—*J. C. Wassermann; Beverley Terrace, Cullercoats, near Newcastle-on-Tyne.*

Sphinx Convolvuli at Tottenham.—On the 31st of August I had a fine specimen of this species given me, which was taken at Tottenham the previous evening, attracted by light. This morning I received another from Bexley, taken hovering over flowers in a garden. Unfortunately the latter is much damaged.—*B. Cooper; Higham Hill, Walthamstow, September 18, 1875.*

Sphinx Convolvuli near Stoke Newington.—I had given to me last Saturday, by its captor, a specimen of *Sphinx Convolvuli*, taken from off a gate in the neighbourhood of Stoke Newington.—*C. Harris; 32, Pritchard's Road, E., September 15, 1875.*

Sphinx Convolvuli near Newton Abbot.—A fine female specimen of *Sphinx Convolvuli* was brought me yesterday, which had

been caught in a greenhouse close by. It had evidently been laying its eggs; and I kept it for some time in the hope that it would lay more, but I was disappointed. About eight years ago a male specimen of the same species was brought me, which had been caught in the same greenhouse. It is curious that we never noticed them in the garden. Should you think they would be likely to be attracted to the greenhouse by the flowers?—*Charles G. Vicary; Knowles, Newton Abbot, September 20, 1875.*

PS.—Last evening (since writing you yesterday) we captured two fine *Sphinx Convolvuli* in our garden. In the years 1846 and 1859 they seem to have been taken in great abundance. I wonder if 1875 will be recorded as an equally abundant year. Do you think it is anything to do with the climate? Would a damp summer be likely to be better for their larvæ than a dry one?—*Id.*

[I shall probably append a note to these captures when completed.—*E. Newman.*]

Colias Hyale and Sphinx Convolvuli at Maidstone.—In this locality, no doubt well known for its entomological riches, my sons and I have, last August, caught some twenty-five specimens of *Colias Hyale*. I have, between the 17th and 21st of September, been fortunate enough to secure five specimens of *Sphinx Convolvuli*; one male and four females. [*Rev.*] *J. Cave-Browne; Delling Vicarage, Maidstone, September 23, 1875.*

Acherontia Atropos in Parliament Street.—It may interest your readers to hear that a fine specimen of *Acherontia Atropos* was taken in Parliament Street yesterday evening. It flew into the dining-room at the 'Red Lion Tavern,' and was captured by one of the waiters, who was alarmed at its size and the peculiar noise it made. Apart from its being rather rubbed, it is a very good specimen of the largest of our Lepidoptera, and is now in my possession.—*Frank W. Duprey; 55, Parliament Street, September 7, 1875.* [From the 'Field.']

Larva of Hepialus sylvinus.—I see by the book of 'British Moths' that the larvæ of *Hepialus sylvinus* is not known. It may be interesting to know that I find the larva several inches in the ground, forming a passage leading to the root of *Echium vulgare*, upon which it feeds, then retires

to its domicile, and changes to a chrysalis. The larva is lightish yellow, slightly hairy, with light brown head. The chrysalis is very rough, and wriggles very much. *Hepialus Velleda* is common in the woods here. You describe it as being a northern species.—*William Purday*; 132, *Dover Street, Folkestone, August 31, 1875.*

Deiopeia pulchella at *Budleigh-Salterton*.—I caught a fine specimen of *Deiopeia pulchella* at Budleigh-Salterton, South Devon, on the 18th of August last, on a cloudy but hot day, about twelve o'clock. The locality was on the edge of a high cliff, where it flew out of some herbage.—*A. E. Wileman*; 10, *Westbury Park, Redland, Bristol, September 16, 1875.*

Deiopeia pulchella at *Biggleswade*.—I have just taken a very good specimen of *Deiopeia pulchella* (the crimson speckled). It was in a grass-close, or meadow. Its manner of flight reminded me of the veneers as it flew around me, and soon settled again. Its white appearance on the wing was very conspicuous, and would be sure to attract attention.—*J. King*; *Langford Road, Biggleswade, Beds, September 20, 1875.*

Deiopeia pulchella near *Kingsdown*.—I have the pleasure to inform you that I captured, on the 19th of September, a fine specimen of *Deiopeia pulchella*, in the undercliff near Kingsdown.—*Charles Boden*; 127, *Tooley Street, September 22, 1875.*

Deiopeia pulchella near *Paignton*.—I took another specimen of *Deiopeia pulchella* on the 18th of September, at Saltern Cove, near Paignton, where I had the pleasure of recording the capture of one last year. The specimen I have just taken is a very worn male. I roused it accidentally while walking through an uncultivated field near the coast.—*J. A. Lilly*; *Collaton Parsonage, Paignton, South Devon, September 23, 1875.*

Deiopeia pulchella at *Eastbourne*.—On Saturday, the 18th of September, while capturing *Colias Hyale* and *C. Edusa*, I was fortunate enough to take two specimens of *Deiopeia pulchella*. They were flying leisurely in a clover-field, taking short flights from one flower to the other. One of them appears to be a variety, the fore wings being nearly destitute of the crimson spots, and is a much larger specimen than the

other.—*W. E. Parsons*; 35, Langney Road, Eastbourne, September 20, 1875.

Female Pupæ of Bombyx Quercus attractive to Males.—The latter end of last month I had two pupæ of *Bombyx Quercus*, which I placed near an open window. I was very surprised a day or two afterwards to see a male oak eggar hovering over the pupa-case. I have often caught them with the perfect insect, but never knew they were attracted by the pupa. The two pupæ have since emerged, and are two very fine female specimens. Can you give me any enlightenment on the case?—*Charles G. Vicary*; Knowles, Newton Abbot, Devon, September 13, 1875.

Euthemonia russula reared from the Egg.—At the latter end of June and beginning of July I captured four female *Euthemonia russula*. They produced me about sixty eggs, which were hatched in the third week in July. I fed the larvæ on dandelion and narrow-leaved plantain; the favourite being dandelion. About the beginning of August, observing that sixteen or eighteen were progressing much faster than the rest, I removed them to a larger cage, in which they remained until the beginning of September, and retired from sight. On the 15th of that month, seeing no sign of them, I thought to clear the cage of any refuse they had left, and was surprised to see six perfect insects, all females. Since then they have been appearing daily; and I have now sixteen, twelve being females and four males; one female I am sorry to say is a cripple. I have not forced them in any way. The larvæ, when small, were kept in a tumbler covered with muslin: as they increased they were removed to a glass cylinder; and the eighteen were removed to a larger cage, and kept in the coolest place I could think of to be handy,—that was the grate in the bed-room,—never exposed to the sun, but subject to the draught of the chimney, and the windows of the room being open day and night. The rest of the larvæ, about forty, are lively and apparently healthy, and varying in length from about half an inch to an inch: indeed, so active and peculiar is their movement that I am highly amused and fully employed (when changing their food) to prevent their escaping from a sheet of newspaper. Their invariable practice is to roll in a ring; when after a time they will uncurl, and “run-a-muck” with an incredible wriggle across the

paper. Now, may not these be the progeny of the females that have partaken too freely of the bottle (cyanide), and their constitution been impaired, or are they going to hibernate? as I am told is their habit.—*G. Haggart; Folkestone.*

Leucania albipuncta at West Wickham.—While sugaring at West Wickham Wood, on the 24th of August last, I had the good fortune to take a specimen of *Leucania albipuncta*; and, as I believe it has never been taken in that locality before, my capture may be worth recording.—*C. Channon; Woodlands, Lewisham, September 22, 1875.*

Leucania albipuncta at St. Leonard's-on-Sea.—I had the good fortune to take a specimen of *Leucania albipuncta*, at sugar here, on the 20th of August. It is in fair condition.—*John T. Sarll; Beauvoir House, Hollington Park, St. Leonard's-on-Sea, August 31, 1875.*

Whereabouts of the Specimen of Leucania unipuncta.—As it is desirable that the whereabouts of a British specimen of *Leucania unipuncta* should be known to entomologists, I beg to inform them that the specimen taken by me in the New Forest, last March, is now in the cabinet of my friend Mr. J. Ross, of Bathampton, near Bath.—*E. C. Parker; Hampstead, August 19, 1875.*

Acronycta Alni near Nottingham.—I had the good fortune to obtain, on August 18th, two larvæ of *Acronycta Alni*, feeding on a plum-tree in our garden here at Ruddington (four miles from Nottingham). Another collector also took one near here about three years ago, and was successful in producing the imago. I am afraid I shall not have the same luck, as mine are not eating at all yet, and seem very uneasy in the cage.—*S. Birkin; Ruddington Grange, Nottingham, August 19, 1875.*

Acronycta Alni at Chatteris.—I have great pleasure in recording the capture of a single larva of *Acronycta Alni* here on the 18th of August. It was taken on a wooden bench under a walnut-tree, which was three or four yards from a row of lime-trees, in the middle of the day. The larva had only three or four bristles on it, and refused to eat any food I gave it, but entered a hollow bean-stalk provided for it on the 20th. This is, I believe, the first occurrence of *A. Alni* in this neighbourhood.—*A. Harold Ruston; Aylesby House, Chatteris, Cambridgeshire, August 21, 1875.*

Cirrhœdia xerampelina at Grantham.—During the night

of the 30th August, 1875, a friend of mine captured two very fine *Cirrhœdia xerampelina* in a telegraph-box, at Grantham, which he kindly presented to me. Four specimens have now been taken during the last fifteen years at Grantham.—*Isaac Robinson; Grantham.*

Cirrhœdia xerampelina near Manchester.—It may perhaps interest Lancashire entomologists to learn that on the 7th of September I took a good specimen of *Cirrhœdia xerampelina* on a lamp in this vicinity. I have also seen several wasted specimens of this beautiful insect.—*J. H. Aspinwall; Oak Bank, Withington, Manchester, September 21, 1875.*

Hadena peregrina at Kingston, Surrey.—I have just been so fortunate as to capture a fine fresh specimen of *Hadena peregrina*, sitting on palings in this neighbourhood, but unfortunately one hind wing is not perfect. I took it on the 17th of September, about 3 P.M.—*W. Thomas; Surbiton Villa, Surbiton, September 17, 1875.*

[Is Mr. Thomas sure of the identity of this insect?—*Edward Newman.*]

Hadena satura in Kent.—During the last week of July I took a very fine specimen of *Hadena satura* at sugar, on Braborne Downs. Since then Mr. Edney, a collector here, has taken two more, which I now possess, at the same place. The first that I ever saw was taken by Mr. Edney, in August, 1873, and sent alive to Mr. Doubleday, who named it, and told him he had a large female taken by the late Mr. Harry Osborne.—*G. Parry; Church Street, St. Paul's, Canterbury, August 23, 1875.*

Cucullia Gnaphalii near Seal, in Kent.—I had the good fortune to take five larvæ of *Cucullia Gnaphalii* on plants of golden-rod: two on August 1st, and three on the 2nd, near Seal, Kent. I found them feeding on the leaves, and not on the flowers of the plant, as *C. Asteris* does.—*C. W. Simmons; 39, Market Street, Caledonian Road, London, N., August 4, 1875.*

Spilodes palealis in Norfolk.—On the 20th of August I took two specimens of this insect; one in my garden at Thetford, and the other in Croxton parish, three miles distant. Mr. Barrett, in his able paper on Norfolk, says, "No recent captures have been recorded." *Colias Edusa* and *C. Hyale* seem to have changed seasons, as I took in the same locality *C. Edusa* on the 24th of June, and *C. Hyale* at

the end of August. For *P. lætus* I was chiefly indebted to the keen sight of a kind friend, more accustomed to their rapid flight.—*Battershell Gill*; 9, *Cambridge Terrace, Regent's Park, September 13, 1875.*

Spilodes palealis at *Brockley*.—It may be interesting to some of the readers of the 'Entomologist' to know that I took a specimen on the wing of *Spilodes palealis* on the railway-banks, near Brockley, New Cross, on the 4th of August. I believe this is the second capture of this insect there.—*Arthur Bliss*; 4, *The Terrace, Ladywell, near Lewisham, August 20, 1875.*

Cosmia pyralina.—This species seems to be but poorly represented in most cabinets, the localities where it occurs being few and far between. It has, however, been known to occur pretty continuously in Monk's Wood, near Huntingdon; and being in this part of the country at the time of the insect's appearance I determined to try for it. I was somewhat unfortunate in not being able to get over before the 6th of August, and then only for a single night. Mr. Richardson, of Clare College, met me at the 'White Hart,' Alconbury, Weston, where we took up our quarters, though not so comfortably as we could have wished. One wood we selected, from the group standing in Alconbury, Upton and Sawtry parishes, was that in Sawtry, St. Judith, which, though somewhat smaller than Monk's Wood, has not been worked so much by entomologists. We sugared some sixty or seventy trees, almost without exception oaks. During the first round we took a couple of *Cosmia pyralina* on the fifteenth tree, from which we augured much future success. This longing, however, was not to be fulfilled; and the only other *C. pyralina* we got were two on one tree towards the end of our first round. We commenced a second round about half-past ten, but found insects so scarce that it took but little over half an hour. The other insects attracted by the sugar are scarcely worth mentioning: *Noctua baja* and *Cosmia trapezina* swarming everywhere, with a few *Tryphaena janthina*, and single specimens of *Tryphaena fimbria*, *Caradrina alsines*, and *Epunda viminalis*. Three of the *Cosmia pyralina* taken were females, from which I infer that had we been a week or two earlier we should not have found the species so scarce.—*Gilbert Raynor*; *St. John's College, Cambridge, August 23, 1875.*

Phoxopteryx paludana, &c.—It is with much pleasure I record the capture of this lovely species. During the past month (August) I paid a visit to the fens of Cambridgeshire, and succeeded in taking a fine series. It is extremely local, and I could only get to the locality by the help of a leaping-pole, and even then I was knee-deep in slush and sedge, owing probably to the excessive rains. I also met with *Nonagria Hellmanni*, *Tortrix dumetana*, *Euchromia purpurana*, *Catoptria expallidana*, *Hyria auroraria*, and several other species, including *Papilio Machaon*, in the larval and imago state. I am sorry to say my companion was not used to leaping, and managed to slide down the pole into about four feet of water and mud, which compelled us to return to headquarters, “five miles from anywhere, and no hurry.”—*E. G. Meek*; 56, *Brompton Road, S.W.*

Ephippiphora ravulana.—In reply to your enquiry concerning this species, I beg to say I first met with it at Darenth Wood in 1866. Since then I have met with it in East Sussex. The habits of this species greatly resemble those of the *Stigmonota*, to which genus I believe it belongs.—*E. G. Meek.*

Coleophora deauratella near *Witham*.—On the 19th of June last I took a very good specimen of *Coleophora deauratella*, whilst sweeping for *Tinea*, on a railway embankment near this town.—*W. D. Cansdale*; *Witham, August 30, 1875.*

Gryllus viridissimus.—I have had six specimens of this grasshopper this season, which I kept alive together for several weeks. On going to their cage one morning I found one dead and half eaten. I was not before aware that *Gryllus viridissimus* was such a cannibal.—*R. Luddiman*; *Norwich.*

Answers to Correspondents.

N. C. Tuely.—*Food-plants of Gonepteryx Rhamni* (Entom. viii. 160).—In the year 1874 a supply of eggs of *Gonepteryx Rhamni* were sent me by Mr. W. Holland, and as they were about to hatch I made every endeavour to find one or other of their food-plants—*Rhamnus catharticus* or *R. Frangula*—in this neighbourhood. I had never observed either

of the plants amongst those which grew in this part of the country, neither could I now find anyone who had done so. I enquired of all those who were likely to be able to afford me the desired information, without success. A resident, well versed in Botany, informed me that he had not seen either plant, here, or in North Wales. The first larvæ that were hatched died on whatever I gave them; and with a forlorn hope I gave them the leaves of many trees and shrubs, which I knew they were not likely to eat or to live on. Those which hatched later I was able to rear upon buckthorn, kindly sent me every week in tin boxes by Mr. Holland, from Reading. But still the food-plant of *G. Rhamni* must be here, either in the form of buckthorn or some other plant, as the butterfly, though scarce, is not unfrequently captured. I have seen three specimens only on the wing, two of which were taken. These occurrences were severally in the years 1868, 1871, 1875. At the time I was in need of the plants I searched well the locality in which the first insect had been taken, which was half-way down a rocky hill-side,—a favourite resort that same year for *Colias Edusa*,—in a densely-wooded lane; but here I could only find oak, ash, elm, whitethorn, blackthorn, hazel, rose, honeysuckle, and innumerable low plants, and not a sign of buckthorn. I visited the gardens, plantations and woods around, with no better success; and a letter in the local paper has not had the desired effect of discovering either of the buckthorns in this county. To show the advanced state of botanical knowledge in these parts, I may mention that during my search for the *Rhamnæ* I had blackthorn, barberry, and rose, brought to me as one of those plants.—*Owen Wilson; Carmarthen, August 12, 1875.*

Alfred Wood.—Name of a Moth.—Will you oblige me by naming the enclosed effigy of a moth? taken at sugar in these (the Wick) woods on the 12th August. The upper wings are dark brown, mottled with a still darker shade of the same colour; the hind wings, with the exception of a broad border of intense black, are yellow, with a light fringe, and a pale oblong mark on the inner margin. I have also taken, more or less freely, in the same locality, during the present season, *Cymatophora duplaris*, *Diphthera Orion*, *Acronycta Ligustri*, *A. Menyanthidis*, *Synia muscivola*, *Apamea fibrosa*, *Rusina tenebrosa*, and *Cosmia diffinis*.

[I guess, and it is little better than a guess, that the figure is intended to represent *Tryphæna fimbria*. The broad black border induces this opinion.—*Edward Newman*.]

T. R. Archer Briggs.—*Gall on Hypochæris radicata*.—As a great deal has been said lately in the 'Entomologist' respecting different sorts of galls, I think it worth while to enclose some specimens of one which I found on Thursday last (5th August) at Knighton, Wembury, South Devon, on the flower-stems of *Hypochæris radicata*. It may be common as a British species, but cannot, I think, be so in the neighbourhood of Plymouth. I have seen what may have been the same on an allied plant, *Hieracium umbellatum*.

[The galls on the flower-stems of this plant, sent by Mr. Briggs, are, I think, *not* to be attributable to animal influence, but to vegetal, as on examination I could find no traces of insect-life within the galls. The stem is no doubt attacked by a fungus of which I know nothing, except that I have never met with it myself. Only last year I mistook one of these fungoid excrescences for an insect-gall, *viz.*, the elongate orange gall, to be met with on various grasses during the summer, which is produced by *Hypocrea* (*Epichloe*) *typhina*. I opened several which contained a white maggot, probably a species of *Chlorops*, which I afterwards ascertained had nothing whatever to do with the formation of the gall. There are three or four gall-making insects connected with the hawkweed (*Hieracium*) and its allies, but only one—*Aulax Sabaudi*—has occurred in Britain to my knowledge: this *Cynips* makes hairy, reddish, many-chambered galls on the stems. There are two others, which ought to occur in Britain, both *Diptera*,—*Trypeta reticulata* makes galls on the flower-heads, and *Cecidomyia sanguinea* makes small red galls on the leaves of *Hieracium sylvaticum*.—*E. A. Fitch*.]

H. J. Channon.—*Vitality in the Leg of a Butterfly*.—I should like to ask if you could explain a curious phenomenon I witnessed last May. My brother in setting out an *Argynnis Euphrosyne* pulled off one of its legs, which shortly afterwards began to move, curling the tarsi round, doubling up close at the next joint, and after a time stretching straight out again. This took place about every minute, and continued from four o'clock till eleven, having been placed on damp cork to prevent its stiffening; and next morning the tarsi

were still moving, although the motion at the other joint had ceased. The butterfly was quite dead at the time it was set, and I am quite unable to account for the facts stated above.

[I am unable to give any explanation of this fact, but it is by no means an unusual occurrence.—*Edward Newman.*]

G. Haggard.—*Food-plant of Setina irrorella.*—I have a good batch of eggs of *Setina irrorella*. Can you kindly inform me what the larvæ feed on? for on reference to the 'British Moths' I find the particulars very scant; indeed, it is there stated that it is taken in situations where the tree-lichens grow. My female was taken in the railway cuttings between Dover and Folkestone, and not a vestige of tree or shrub near; also two males were taken in a similar situation. Perhaps since the account was written something more may be known of its history, and I should like to rear them if possible; though if lichen-feeders I may find it difficult.

[I shall be obliged to any entomologist who will give any additional information on this subject.—*Edward Newman.*]

Joseph S. Baly.—*Honey Bees* (Entom. vii. 293).—The phenomenon which your correspondent describes is not uncommon amongst bees, and is thus spoken of by Langstroth in his work on the 'Honey Bee,' p. 116:—"Bees sometimes abandon their hives very early in spring, or late in summer or fall. Although exhibiting the appearance of natural swarming, they leave, not because the population is so crowded that they wish to form new colonies, but because it is either so small or the hive so destitute of supplies that they are driven to desperation. Seeming to have a presentiment that they must perish if they stay, instead of awaiting the sure approach of famine, they sally out to see if they cannot better their condition." Bees, when sallying out under these circumstances, are termed a vagabond swarm: sometimes they try to gain entrance to another better-supplied hive, or more often fall to the ground from exhaustion, and perish. I fear the occurrence is likely to be frequent this year, as, owing to the unusual amount of wet, very few stocks have laid up any stores for the winter, and most are weaker than they were in early spring.—*H. Jenner Fust, jun.; Hill Cottage, Falfield, Gloucestershire, August 6, 1875.*

J. S. Woodhouse.—*Flies sticking to Glass.*—*What is the cause of flies adhering by the legs to window-panes, and*

dying in this position?—Mr. Woodhouse describes very minutely the appearance of flies found in this condition. I offer the following explanation, which is in part problematical, and is almost entirely derived from the publications of others. The disease is attributed to a cryptogamic plant, but whether a fungus or a member of the comprehensive and somewhat heterogeneous order of Algæ, we have no positive decision; botanists seem divided in opinion on the point. Amongst those who have written on this plant are Pringsheim, Archer, De Bary, Unger, Thuret, Tute, Griffith and Henfrey, Braun, Robin, Cienkowski and Nageli. The prevailing opinion seems to be that it is an imperfect terrestrial form of *Saprolegnia ferax*, a fungus of which I know nothing except the name. This particular form is called *Sporendonema Muscæ*, and has its habitat in the bodies of flies. *Empusa aulica* is another fungoid growth of a like nature. These fungi—I call them so, not for the purpose of expressing an opinion on their true character, but simply for convenience—these fungi, or rather their spores, are found to exist in multitudes in the bodies both of diseased and of apparently healthy flies: the spores are found floating in the blood of the flies; but in a short time they seem to exhaust all the fluid matter, and then expanding, or rather lengthening into filaments, called mycelia, they at last completely fill the body of the fly with a substance resembling cotton-wool, and the fly at last succumbs to starvation, although to all appearance replete with food, when the fungus makes its appearance at the interstices of the segments and at the spiracle, and throws out spores all round, forming a kind of circle round the fly, entirely composed of these spores and the filaments which emanate therefrom. There seems to be something glutinous, or to say the least, adhesive, in this fungus, for through its instrumentality the fly becomes so firmly attached to the pane that it is frequently impossible to remove it without the loss of a leg. With regard to the fly being fixed to the window-pane, I can only suggest that this circumstance exhibits no selection on the part of the fly, but simply arises from the circumstance that in this selection they are peculiarly exposed to observation.—*Edward Newman.*

James Deane.—*Musca pluvialis.*—I enclose a small sample of a species of fly, by which I was much troubled for

about ten days, but I am glad to say that now only a few stragglers remain. I do not think I exaggerate when I say that there must have been thousands of them in my room where I was performing some operations with cantharides. If you can tell me anything of their history, and where they are likely to have come from, I shall be greatly obliged by your doing so.

[The fly is unquestionably *Musca pluvialis*; but with regard to their economy I have to confess my entire ignorance, and shall be obliged for information. I have not only heard of, but known, instances of flies assembling indoors in such large numbers, but I cannot find out the attraction, or what it is that induces a line of conduct apparently so much at variance with their general habits.—*Edward Newman.*]

T. R. Archer Briggs.—*Gall on Potentilla reptans.*—I enclose specimens of another gall from the neighbourhood of Plymouth, and shall be very glad to know the name of it, although it may prove to be but a common one. I found it on the 30th of August, in a pasture in the Tavy Valley, near Plymouth, Devon, occurring, as you will see, on the stems and petioles of the creeping cinquefoil (*Potentilla reptans*). I do not remember to have noticed it previously.

[Mr. Fitch kindly hands me a reply, as under:—"I believe this gall is included, both by Marshall and Müller, under Curtis's name of *Brevicornis*, which is probably a synonym of *Aulax Potentillæ* of Hartig; or, as Foester has it, *Xestophanes Potentillæ* de Villers = *Aulax splendens* of Hartig."—*E. A. Fitch.*]

Joseph Anderson, jun.—*Effect of Acids on Green Insects.*—I have in my cabinet a foreign beetle resembling a gigantic specimen of *Aromia Moschata*. The name of it is, I believe, *Golofa Porteri*, and it should be a brilliant green colour; but one day, thinking to "kyanise" it, I saturated it with phenic acid, and was mortified by seeing it change to a coppery red. Could you, or any of your correspondents, tell me of an alkali that would be likely to restore the original colour?

[The effect of acid on the colours of insects is so great that it is better to avoid the use of them altogether. In the case of metallic colours it is less observable than in the delicate wings of *Lepidoptera*. I cannot mention any drug from

actual experience as likely to restore the original colour; but I should try spirits of ammonia.—*E. Newman.*]

Joseph Anderson, jun.—Thera variata.—It is stated in Newman's 'Illustrated History of British Moths,' that "the true Variata has never occurred in England." Will you kindly tell me whether since the work was written it has been discovered in this country? Also what are the distinguishing characteristics between Variata and Obeliscata?

[This is rather a case of nomenclature; and I will endeavour to explain, as well as I am able. *Thera variata*, according to Guenée, includes five named varieties, or forms, as they are sometimes called:—A, Obeliscata of Hübner; B, Fulvata of Fabricius; C, Variata of Wood; D, Simularia of Boisduval; and E, Vitiosata of Frey. The type, according to Guenée, is well figured by Hübner; and, on the authority of my late friend Henry Doubleday, I said that this form had never been taken in Britain; at the same time adding that "the two were probably distinct species." I am still in doubt on this subject; and not possessing an *authentic* specimen of Variata, can only copy Guenée's description, with which Mr. Anderson is probably already familiar. I give the original:—"Le type, bien figurée par Hübner, est d'un gris un peu olivâtre, saupoudré, avec l'espace median noirâtre, rétréci par en bas, où il forme de petites taches ovales contiguës. La subterminale est distincte, fortement dentées. Les ailes inférieures sont grises, avec une lunule cellulaire distincte et une ligne médiane un peu coudée, noirâtre. La femelle est plus grande et souvent plus pale." (Uran. et Phalæn. ii. 372.) Although I have great pleasure in copying this description, I am perfectly satisfied with Mr. Doubleday's decision that our British species is Obeliscata, and that Variata yet remains to be discovered in Britain. It will, however, be seen that Dr. Standinger again unites the two, No. 2593 of his Catalogue, giving Variata as the name of the species, and Obeliscata as that of the variety; and Fulvata of Fabricius, Pinetata of Borkhausen, Simulata of Guenée, and, doubtfully, also Ulicata of Duponchel, as synonyms. A second variety, or aberration, is Strangulata of Hübner.

T. Matthews.—Hemigynous Specimen of Lycæna Icarus; Heliophobus popularis at Horley; to Keep the Colour of Dragonflies.—I am pleased to inform you that I captured a

hermaphrodite specimen of the common blue (*Polyommatus Alexis*), the left wings being female, while the right ones are male; this is equally apparent on both sides. Can you tell me if this is a rare occurrence? The specimen was taken in a grassy lane in Horley, on the 1st of September, and is now in the cabinet of Mr. Murray Aston, of Hatchgate, Horley. This gentleman has taken nearly thirty specimens of the feathered gothic moth (*Heliophobus popularis*) at a lamp in his hall. Can you inform me of the food-plant of this species in its larval state? If I am not asking too much, will you tell me how to make dragonflies keep their colour after death, and where I can procure a work on this order of insects? I may add that Mr. Aston took all his *Popularis* during the last week in August.

[(1) Hemigynous, or half-female, specimens of *Lycæna Icarus* (*Alexis*), are by no means uncommon. (2) The larva of *Heliophobus popularis* feeds on grasses. I have said all I know about this insect at p. 291 of 'British Moths,' where the larva is described. (3) In order to preserve the colour in the bodies of dragonflies, do not kill them until three or four days after they are taken, when the body will be empty. Having killed them with cyanide of potassium, slit the abdomen open with a pair of small scissors, take out the contents, and fill up the cavity with a piece of writing-paper, rolled up in the same form as the body.—*E. Newman.*]

Henry N. Ridley.—*Edemera cærulea.*—*E. Newman.*

H. Sturmer.—I am unable to give an opinion as to the name of the larva described.—*E. Newman.*

G. A. Smallwood.—*Variety of Cirrædia xerampelina.*—I have this year bred a dark variety of this moth. The colour of the dark central bar is spread over the whole wing, the usual yellow being entirely absent, except on the edges of the central bar, where it forms two conspicuous yellow lines, reaching from the inner margin quite up to the costa. This variety is very distinct and striking; the more so as this insect is so little liable to variation.

[I was formerly inclined to consider this a distinct species; but seeing that Guenée ('Noctuelites,' i. 402) considers it a variety only,—a judgment in which my late friend Doubleday entirely concurred,—I cannot presume to differ from such authorities.—*Edward Newman.*]

W. Oxenden Hammond.—*Name of a Beetle.*—Would you kindly name the insect of which I send sketch? I know nothing of Coleoptera, but it looks as if it came near the Longicorns. I found it (or a pair, rather) on an umbelliferous flower. They were there two days consecutively; and the second day I took them. Very probably it is a common insect. Will you kindly say whether it is so or not?

[*Stragallia elongata.* Of frequent occurrence on umbelliferous flowers.—*Edward Newman.*]

C. Harris.—*Entozoa in Ox-beef.*—The enclosed I found in some boiled round of beef, and which I take to be part, or the whole, of the embryo of some parasite. Is it one of the cestoid worms; and is not its occurrence in the flesh of the ox very rare? I should esteem it a great favour if you could furnish some information respecting the matter.

[I cannot answer the question without consulting more competent authority.—*E. Newman.*]

Sphinx Convolvuli at Bowdon.—Yesterday, September 23rd, a specimen of *Sphinx Convolvuli* was taken here.—*S. Stürmer; Bowdon, Manchester.*

Haggerston Entomological Society.—The annual exhibition of this Society will take place on Thursday and Friday evenings, the 11th and 12th of November; and the Committee will be pleased to receive exhibitions from any entomologist. Application to be made to the Secretary, Mr. F. Bartlett; 'Brownlow Arms,' Brownlow Street, Haggerston, E.

South London Entomological Society; 104, Westminster Bridge Road.—At the meeting of this Society, held on Thursday, August 12th, 1875, Mr. J. R. Wellman proposed that a resolution expressive of the deep regret felt by the members at the death of the late Mr. Henry Doubleday, should be placed on the minutes, and also forwarded to Mr. Newman. Mr. Ficklin warmly seconded, and Mr. Power supported, the resolution; and, after several members had spoken of the great loss that the entomological world has sustained, it was unanimously carried. The minute passed is as follows:—"This meeting desires to record the deep regret

felt by the members present at the death of the late Mr. Henry Doubleday, whose services to Entomology have been of immense value for many years past, and whose invariable kindness has endeared him to all who have known him."

Death of Mr. Doubleday.—Henry Doubleday, who was without exception the first Lepidopterist this country has produced, died at his residence, at Epping, on the 29th of June, 1875, sincerely lamented by all who enjoyed the pleasure and advantage of his acquaintance. Had he lived two days longer he would have completed his sixty-seventh year. Mr. Doubleday was remarkable alike for his extensive knowledge of British Lepidoptera, and for the unequalled liberality with which he imparted that knowledge to others. He inaugurated a new era in Entomology by introducing uniformity in the nomenclature of species; thus making the names of British insects correspond with those in use on the continent. At present there is no decision as to the destination of Mr. Doubleday's collection of Lepidoptera. Various propositions have been made, but the trustees have not fallen in with either of them. The house, out-buildings, furniture, and books, have been sold; and nothing now remains at Epping of the great entomologist but a plain tablet in the Friends' Burial Ground, showing the spot where his remains rest in peace.—*Edward Newman.*

Errata.

In my description of the larva of *Emmelesia decolorata* (Entom. viii. 194), for "*Ephestia elutella*" read "*Ypsipetes elutata*"; for "*central*" read "*ventral*".—[Rev.] *G. A. Smallwood; Barrow-on-Trent, Derby.*

I see from the September number of the 'Entomologist,' that you have confused my communications with those of Mr. Harwood. The records of "*Tryphæna subsequa*," "*T. interjecta*," and "*Plusia interrogationis*" (Entom. viii. 199), are mine, not Mr. Harwood's.—*Geo. Brook; Fernbrook, Huddersfield.*

Hydræcia Petasitis feeds on the "butterbur" (*Petasitis vulgaris*), not on the "coltsfoot," as stated (Entom. viii. 195).

THE ENTOMOLOGIST.

Nos. 118 & 119.] NOVEMBER, MDCCCLXXV.

[PRICE 1s.

Trap-door Spiders in the Bark of Trees. By E. NEWMAN.

“IT is now one hundred and sixteen years since Patrick Browne gave an illustration, in his ‘Civil and Natural History of Jamaica,’ p. 420, tab. 44, fig. 3, of the nest of a trap-door spider, the first record of the kind with which I am acquainted [published in London in 1756]. Seven years later the careful observations of the Abbé Sauvages appeared [in the ‘Histoire de l’Acad. Royales des Sciences,’ pp. 26—30, published in Paris, 1763], in which he gave a very good description of the nests of the ‘Araignée maçonne’ (*Nemesia cæmentaria*), which he discovered near Montpellier, likening them to little rabbit-burrows lined with silk, and closed by a tightly-fitting, movable door. Rossi [in an article intituled, “Observatione Insettologische,” published in the ‘Memorie di Matematica et Fisica della Società Italiana,’ vol. iv. 1778; and ‘Fauna Etrusca,’ vol. ii. 1794] published an interesting account of the nest and habits of a trap-door spider, which he had observed in Corsica, and near Pisa; and from that time up to the present day the curious dwellings of these creatures, many of which have been discovered in warm climates, have continued to attract the attention of naturalists.”

The foregoing extract is from a work intituled, ‘Harvesting Ants and Trap-door Spiders,’ by J. Traherne Moggeridge, part ii. p. 73. The mode in which these *residences* are constructed is admirably explained by Mr. Gosse, at page 115 of his ‘Naturalist’s Sojourn in Jamaica.’ Both these authors—Mr. Moggeridge, alas! is no more—are inimitable in their graphic descriptions of the habits and manners of the living; a science totally apart from the anatomical details of the

dead, with which the attention of naturalists has been too exclusively occupied. Mr. Gosse writes as follows:—

“In digging their mountain-gardens the negroes often expose the curious subterranean nests of the trap-door spider (*Cteniza nidulans*), many of which are brought to me. This spider makes its tubular dwelling in soft earth, frequently choosing cultivated ground, on account doubtless of this quality. Each nest is cylindrical, or nearly so, from four to ten inches deep, and about one inch in diameter; the bottom is rounded; and the top, which is at the surface of the soil, is closed very accurately with a circular lid. They are not all equally finished, some being much more compact, and having the lid more closely fitted than others. Some have irregular bulgings and ragged laminated off-sets on the outer surface; but all are smooth and silky on the inside. This smoothness, however, does not preclude any little irregularities or unevenness of surface; nor is it glossy: its appearance rather resembles that of paper, which has been wetted and dried again; it is always of a reddish buff hue, but the outside is stained of the colour of the surrounding earth. The mouth of the tube and the parts near it are very strong; the walls here often having a thickness of from an eighth to a quarter of an inch, but the lower parts are much thinner. The lid is continuous with the tube for about a third of its circumference, and this part may be called the hinge, though it presents no structure peculiar to itself; it is simply bent at a right angle, as is manifest if a nest be cut longitudinally through with scissors, the incision passing through the midst of the lid.

“The mode of construction I judge, from examination of many nests, to be this. The spider digs a cylindrical hole in the moist earth with her jointed fangs or mandibles, carrying out the fragments as they are dislodged. When the excavation has proceeded a little way she begins to spin the lining, which forms the dwelling. I conclude thus because nests are occasionally found a few inches in length with the lid and upper part perfect, but without any bottom, these being evidently in course of formation. I suppose that she weaves her silk at first in unconnected patches against the earthy sides, perhaps where the mould is likely to fall in; and thus I account for the loose, rough laminae of silk that are always found projecting from the outer surface. These are

overlaid with other patches more and more extensive, until the whole interior walls are covered; after which the silk is spun evenly and continuously all round the interior, in successive layers of very dense texture, though thin. Under the microscope, with a power of 220 diameters, these layers are resolved into threads laid across each other, and intertwined in a very irregular manner; some are simple, varying from a seven-thousandth to a two-thousandth of an inch in diameter, and others are compound, several threads in one part separate, being united into one of greater thickness, which cannot then be resolved. No pellets of earth are ever interwoven with the silk to form the outer layers of the walls, though the adhesive nature of the silk when freshly spun causes fragments of earth to remain attached to the surface. The mouth of the tube is commonly dilated a little, so as to form a slightly recurved brim or lip; and the lid is sometimes a little convex internally, so as to fall more accurately into the mouth and close it. The thickening of the hinge by additional layers is, I think, accidental only, as out of the many specimens I have examined only one or two had such a structure. In the neatest examples the lid is of equal thickness throughout its extent, agreeing also with the walls for the first few inches of their depth.

“One of peculiar compactness, now before me, I have slit open longitudinally with a pair of scissors in the manner spoken of above: the thickness of the substance is in no place greater than one-sixteenth of an inch, which is very regularly maintained throughout the lid and upper parts. The appearance at the cut edge closely resembles mill-board so divided; the layers of which it is composed being very numerous and compact, especially towards the interior side, where they can scarcely be distinguished even with a lens. In this specimen there is what I cannot find in any of the others I have examined. A row of minute holes, such as might be made by a very fine needle, are pierced around the free edge of the lid, and a double row of similar holes just within the margin of the tube. There are about fifteen or sixteen punctures in each series, and they penetrate through the whole substance, the light being clearly seen through each hole. Now what is the object of these orifices? I do not think, as I have somewhere seen suggested, that they are intended to afford a hold for the spider's claws when she

would keep her door shut against the efforts of an enemy ; for what would have been the use of having them in the tube, *close to the lid*, so that not the eighth of an inch intervenes between the series of the lid and that of the tube, when the former is tightly closed. I would suggest whether they may not be air-holes, for so tight is the fitting of the lid, and so compact the texture of the material, that I should suppose the interior would be impermeable to air but for this contrivance ; and as those in the horizontal lid might possibly be closed by minute particles of earth rolling on it, the second row around the edge of the perpendicular tube, just at the surface of the ground, would still be available in such a contingency. They may admit also an appreciable amount of light."

I am not disposed to pursue the subject of these minute holes further than to say that these holes suggest to my mind the idea of a needle and thread having been passed through and through, and the needle and thread subsequently withdrawn. But I will here mention the occurrence in Britain of a spider closely allied to the trap-door makers, the particulars respecting which were communicated to the Linnean Society by myself in February, 1856, and were subsequently published in the 'Zoologist' for that year (Zool. 5021). This spider is *Atypus Sulzeri* of Latreille, the *Oletera atypa* of Walckener ; and a full account of its doings is given from the observations of Mr. Joshua Brown, of Cirencester, who suggests that it was feeding on an earth-worm at the time of capture. A female only was obtained, the males eluding the most diligent search ; and Mr. Brown expresses his wonder where they could possibly secrete themselves. There is no trap-door to the domicile of this spider, which consists simply of a single tube constructed in the earth. Walckener, in the first volume of 'Histoire Naturelle des Insectes Aptères,' thus records its economy at page 244:—

"The female constructs, in rather moist places, a subterranean gallery, first in a horizontal direction, and then turning downwards. In the interior of this gallery she constructs a very close, white, silken tube, which she strengthens with bits of grass and moss ; and at the bottom of this she deposits her eggs in an oval mass, enveloped in a web of white silk, and fixed by threads at each end. She leaves part of the tube hanging out of the hole to protect the entrance : this external

part is two or three inches long, and half an inch in diameter. The tissue of the tube is very close, fine and white, and resembles the cocoon in which some lepidopterous pupæ are enclosed. It is of uniform diameter, and terminates below in a slightly pointed extremity, which is attached to a bundle of silky hairs interlaced with fibres of plants. Thus the bottom of the tube is protected from the humidity of the earth."

I will now continue the quotation from the 'Zoologist,' in Mr. Brown's own words:—

"When on a visit to Hastings during the past autumn, having to pass through a lane with a high and steep sand-bank on each side partially covered with grass and bushes, I noticed on one of the banks, which had a south aspect, something hanging down, which looked like the cocoon of some moth; but found, on compressing it slightly, that it was quite empty. It then occurred to me that it might be the nest of a spider; and on examining more closely I found, to my surprise, that it descended into the bank, and appeared firmly attached at the distal extremity; so firmly, indeed, that I could not extract the first I found without breaking it. My curiosity, however, was now thoroughly awakened; and, on finding a second example, I went more cautiously to work, removed the sand carefully with a long knife, and at a depth of nine inches I found the extremity of the structure, and drew it out quite perfect. It was a long silken sack, and at the bottom was a hardish lump, which proved to be a spider. The next I tried went very much deeper; indeed so deep that I failed, after much trouble, in getting it out at all. I tried many others, sometimes succeeding and sometimes failing in my attempts to get them out entire. I found them vary greatly in length, and think they may be lengthened at various periods of the spider's growth. In some of the nests there seemed very obvious indications of this lengthening. The usual length was about nine inches, but some were very much longer. Their form is tubular, commonly of an uniform diameter of three-quarters of an inch, and rounded at one end in the form of a purse. They are composed of very fine silk, closely woven throughout; white or whitish within, and covered exteriorly with yellowish or brownish particles of sand, which give the tube a dirty appearance exteriorly; but inside they are always neat and clean. The exterior portion

of this tube visible on the bank is about two inches in length, pendant, and always inflated; it is of a darker colour than the subterranean portion of the tube, and agrees in this respect with the general surface of the bank. I took home one of these tubes in a collapsed state, or with the sides pressed together, and having the spider at the extremity. On opening the box I perceived a movement throughout the tube, as if it were undergoing the process of inflation; this soon subsided. The next morning, however, I was surprised to see the tube inflated throughout its entire length, more especially at that end which had been exposed on the bank. How can the spider effect this? In some of the tubes it is very difficult to discover any external aperture; but, in that portion which is exposed and is distended more than the rest, I sometimes discovered one or more minute openings, protected or covered by a little valve or door. In some nests these openings are not to be detected; when present they open towards the bank. Although very loosely constructed at the lower extremity, I do not think there is an opening there, except when the spider is deepening her burrow; or, I think, in some instances, the spiders would have escaped through it when I extracted the sack. This was never the case."

This process of inflation is one of the greatest possible interest. Although, through the courtesy and kindness of Mr. Brown, I am possessed of ample materials for doing so, I never could discover the mode of inflation. The object was more easy to account for, since the adhesive nature of the silken lining of the sack rendered the walls very liable to cohere, and thus the tubular character of the structure would be destroyed.

Mr. Brown most kindly sent me living specimens, in order that I might examine them for myself; which I did with great deliberation and care, but without obtaining any further information. I particularly directed my attention to the subject of food, Mr. Brown having conceived the idea that the spider fed on earth-worms. This idea seems to arise from his having found a mangled earth-worm, in connection with the tube, during the course of his diggings and investigations; and more especially from his having been unable to find the wings, legs, or other parts of insects, attached to

the silky tube; which one would have reasonably expected, had the spider subsisted on an insect-diet. The most rigid search revealed nothing of the kind. Still I am reluctant to believe in the vermivorous appetite of the spider, without more conclusive evidence than we at present possess.

A male *Atypus Sulzeri* was taken from a rabbit-earth while ferretting in the neighbourhood of Bloxworth, in January, 1857, and was transmitted by the Rev. O. Pickard-Cambridge to Mr. Mead, of Bradford, and recorded in the 'Zoologist' for that year (Zool. 5624).

The late Mr. Sells, in the Transactions of the Entomological Society of London has, in a paper intituled, "Notes respecting the Nest of *Cteniza nidulans*," entered into many details concerning these interesting spiders; and Sir Sidney Smith Saunders, the present President of the Entomological Society, has given, in the Transactions of that Society, admirable figures and descriptions of a trap-door spider inhabiting the Ionian Islands, which he has called *Cteniza Ionica*. (See vol. iii. p. 160, pl. ix.) Sir Sidney Saunders has also greatly distinguished himself as a most painstaking observer, by his researches into the economy of those minute parasitic Coleoptera which prey on bees.

Mr. Moggeridge's admirable work, intituled, 'Harvesting Ants and Trap-door Spiders,' published in 1873, throws considerable light on these interesting spiders. I must content myself with two short quotations:—

"The nests are exceedingly difficult to find, and in some cases it is only by chance that I have been able to light on them. All these trap-door spiders seem usually to prefer rather moist and shady places and sloping banks, or loose terrace-walls, where the interstices between the stones are filled up with earth, and concealment is afforded by the creeping *Lycopodium* (*Selaginella denticulata*), *Ceterach spleen-wort*, or maidenhair ferns, with short moss and splashes of white lichen to distract the eye." (*Moggeridge*, p. 91.)

Mr. Moggeridge goes on to describe different forms of nest; and afterwards refers to the well-known habit of the trap-door spider of keeping the door closed by holding on from within. He relates his own experience in these words:—

“I will now relate what I saw on one of these occasions, for there has been much speculation as to the manner in which the spider clings to the door, and offers the determined resistance which is experienced. No sooner had I gently touched the door with the point of a penknife than it was drawn slowly, with a movement which reminded me of the tightening of a limpet on a sea-rock, so that the crown, which at first projected a little way above, finally lay a little below the surface of the soil. I then contrived to raise the door very gradually, despite the strenuous efforts of the occupant, till at length I was just able to see into the nest, and to distinguish the spider holding on to the door with all her might, with her fangs and all her claws driven into the silk-lining of the under surface of the door. The body of the spider was placed across and filled up the tube, the head being away from the hinge; and she obtained an additional purchase in this way by blocking up the entrance.”

Mr. Moggeridge believes that whenever a spider resists in this way she makes the needle-holes, to which former allusion has been made; but, without wishing to controvert the opinion of so excellent an observer, I may perhaps be excused for remarking that the regularity of these minute holes rather militates against the supposition that they are caused by this process of holding on with fangs and claws to prevent the lid being opened by an enemy.

I have here to mention a fact and a surmise in connection with these trap-doors that seems to partake rather of the character of romance than of sober reality. The door is covered with *Lycopodium* and moss, presenting exactly the same appearance as the surrounding surface. Mr. Moggeridge thus describes one particular instance:—

“The moss on the door grew as vigorously, and had in every way the same appearance, as that which was rooted in the surrounding earth; and so perfect was the deception that I found it impossible to detect the position of the closed trap-door, even when holding it in my hand. There can be no doubt that many nests escape observation in this way; and the artifice is the more surprising because there is strong reason to believe that this beautiful door-garden is deliberately planted with moss by the spider, and not the effect of mere chance growth.” (P. 97.)

Up to this date all recorded observations—including those of Mr. Moggeridge, the last and most complete—point to spiders burrowing and constructing habitations *in the earth*. On the 7th of October last (1874) a communication was received by the Editor of the 'Field' from Mr. Bain, of 71, Cornhill, containing a cutting from the 'Uitenhage Times,' a South African newspaper, of which the following copy appeared in the 'Field' of October 10th:—

“Remarkable Spider.—Unless we are mistaken, there is a species of this insect in Uitenhage which is at present unknown to entomologists beyond. It was discovered a few years ago by Dr. Dyer in the bark of his oak trees. On very close examination of the bark a beautifully-formed oval lid may be discovered, of about a third of an inch longer diameter. On raising this lid with the point of a penknife it will be found to open into a conical cavity, which is occupied by a small jet-black spider. The insect resists the raising of the lid with the tenacity of an oyster refusing to be opened, and holds on with all its might by two feet. As soon as the penknife is withdrawn, the door is closed with a sudden snap. We have consulted naturalists and books, but have not succeeded in gaining any description that answers to this insect. Should this paragraph meet the eye of anyone possessing information on the subject we should be thankful.”

This did meet the eye of one possessed of some information on trap-door spiders, he having read Mr. Moggeridge's work on the subject. I therefore wrote the following note, which appeared as an Editorial comment on the extract:—

“This is one of the great family of trap-door spiders, which have attracted the admiring notice of all naturalists. Of these, the species known as *Cteniza nidulans* is perhaps the most familiar. It is a native of the West Indies, and constructs in the earth a tube, which it lines with silk. The lid so exactly resembles the surrounding earth, that it is impossible to detect it when closed by the spider from within. Another very interesting species inhabits the Ionian Islands, and forms its tube among the roots of trees; and others inhabiting the south of Europe, more particularly Mentone, have been observed and described by Mr. Moggeridge, in a work of surpassing interest. It is difficult to say when the very earliest account of these wonderful creatures

was published; but those cited by Mr. Moggeridge are among the earliest and best. The most complete and elaborate are by Patrick Browne, in 1756; by the Abbé Sauvages, 1763; by Rossi, in 1778 and 1794; by Mr. Gosse, 1847; and finally by Mr. Moggeridge, in 1873. The description quoted by our correspondent is very exact: but these spiders generally construct their habitations in the earth, and not in the bark of trees. This may, therefore, prove a species of trap-door spider new to science."—*Edward Newman.*

It appears that it attracted the attention also of another reader, who designates himself "Anglo-African," who wrote the following paragraph, which appeared in the 'Field' of October 17th:—

"It may interest your readers to learn that the trap-door spider, described in the 'Field' of October 10th, is also found in the neighbourhood of the Vaal River, South Africa, in the regions of the Diamond Fields. I have myself discovered two trap-doors. The first time, when lying in my tent one hot Sunday afternoon, with the curtains of the tent up, I observed the trap open just outside the tent, and the spider come out, leaving the trap open. On being slightly alarmed, by pushing a stick in his direction, he retired at once, and closed the trap. So very like the surface was this, that, looking away to call a 'chum' to watch him, I could not again see the place. However, our attention was rewarded in a short time by the spider again appearing,—I suppose on a foraging expedition. It was suggested to try if he was afraid of rain, and, on sprinkling the ground on which he had taken his afternoon's walk, he beat a retreat again. This was repeated several times on his finding nothing was the matter. The door, or trap, was of an oval form, about three-quarters of an inch by half an inch in size, and appeared to have a capital hinge, and was countersunk, so as to be level with the ground, and fitted in a marvellous way. We took bearings of the spot, and intended to have another interview with our little friend; but a 'new rush' set in, and he was completely forgotten. I should mention that this was in gravelly soil. On the other occasion I and my chum were 'prospecting,' but not for trap-door spiders. However, we came on the tube of one in digging away the surface sand, and, carefully working

round it, got it out intact. It was quite two feet six inches in depth, and at the bottom was three times the size of the tube: this large part was, I presume, the sleeping apartment, as it is evident he must have 'dined out.' The tube was straight as possible, and strengthened at intervals of about an inch by extra rings, something like a Malacca cane. The interior, as far as we could see down it, was perfectly smooth, and about the size of the one described above. The trap-door was most cleverly fitted, and, as in the other case, corresponded exactly with the surface soil. The tube was quite strong, and bore its own weight easily. Whether or no its maker was inside or not I cannot say, as having, unfortunately, given it to one of our Zulu servants to carry to camp, whilst we proceeded with our work, I never saw it again; and the 'boy's' reason for not bringing it was that, being asked to take a 'soupjie' at the canteen, he put it down outside to be safe, and could not find it again. This specimen was found opposite Jautzjie's Kraal, at Likatlong, and some mile and a half from the Vaal River.—*Anglo-African.*"

It certainly does not appear to me that this spider is of the same species as that recorded on the 10th of October, no mention being made of the tree-trunk habitat. However, I have reprinted it with the view of making the subject as complete as possible.

On the 25th of May of the present year Mr. Kemsley, formerly editor of the 'Uitenhage Times,' brought over with him from South Africa some of the spiders alluded to in that paper. They were consigned to his care by his friend Mr. Bidwell, of the same paper, who requested to have them reported on. Having suggested, as previously quoted, that "they might be new to science," Mr. Bidwell wished it to be ascertained whether such was the case. The spiders arrived in good condition, each in little square pieces of oak-bark, or what was so called, containing the spider and its domicile. They had maintained a rigorous fast during their transit from South Africa to the Strand; in fact, Mr. Kemsley knew not whereon to feed them. However, this abstemiousness did not appear to have interfered with their welfare; and the subject was fully discussed at the meeting of the Entomological Club, held here on the 23rd of June; and those present seemed to agree with me that the facts were new to science.

I have distributed them among entomological friends, especially sending some to the Rev. O. Pickard-Cambridge, begging him to investigate the matter, and report to the 'Field' newspaper,—a journal which has distinguished itself for years by the amount and accuracy of the Natural History information it has circulated. Mr. Cambridge, with his usual courtesy and energy, at once entered on the task, and reported as follows:—

"A New Genus and Species of Trap-door Spider from South Africa.—An account (extracted from a South-African newspaper) of the discovery by Mr. Dyer of a trap-door spider, whose nest is made in the bark of trees, was published in the 'Field' of October 10th, 1874. Examples of the nest, with the portion of bark in which each is constructed, together with the spider inhabiting one of the nests, have lately been handed to me by the Editor, with a request that I would write a few words upon the subject. It will, therefore, I think, interest the correspondent who sent them to learn that the spider belongs, as it appears to me, to a genus not hitherto characterised; its nest also being of a different type from that of all other trap-door spiders with which I am acquainted. The genus, for which I propose the name *Moggridgea* (in memory of my kind friend, the late lamented student of trap-door spiders, Mr. J. T. Moggeridge), is allied to *Nemesia*, *Latr.*, but differs from it, among other characters, notably in the absence of the usual short, strong spines at the fore extremity on the upper side of the falces, as well as in the wide separation of the eyes of each of the two lateral pairs. The spider which accompanied one of the nests is an adult female, and measures five and a half lines in length. The cephalo-thorax and falces are of a deep shining black-brown colour; the legs, which are short and strong, are of a lighter brown, the metatarsi of those of the second pair being of a clear yellowish white; the abdomen is of a dark purplish brown; and the tibiæ, metatarsi, and tarsi of the first and second pairs are furnished underneath, on either side, with a row of strong spines. The nest consists of a silken tube, scarcely more than an inch in length, rugged on the outside in such parts as may be exposed, and formed in the folds and interstices of the rough bark. This tube is closed with a hinged lid of an oval or circular shape (according to the

exigencies of the position), and the entrance appears to be always at the earthward end; *i.e.*, the tube seems always to run upwards. One of the tubes submitted to me was constructed in the channelled groove of a piece of wood which had apparently formed part of some building or other. The shortness of the tubes, compared with those made in the ground by some species of *Nemesia* and *Cteniza*, is remarkable, as is also the position in which they are found; the lid, too, differs from all yet known to me, in being a compound of the two great types into which Mr. Moggeridge has divided those already known,—the ‘cork’ and ‘wafer’ types. Lids of the former are of solid construction, and fit into the mouth of the tube like a short cork, without any projecting margin; those of the second (or wafer) type are flatter, of much slighter or thinner make, and simply shut down upon the mouth of the tube. That, however, of the nest under consideration is of the ‘cork’ type, with a projecting ‘wafer’ margin; the cork portion is less thick than that of the typical ‘cork’ lid, but distinctly thicker than the margin, and fits into the tube, while the margin covers its edges so closely and completely that the nest is entirely concealed,—the outer side of the lid, like that of the exposed parts of the tube, exactly resembling the surrounding surface of the bark. The use of the spines on the falces of *Nemesia* (and *Cteniza*) is to excavate the hole in which the tube is made; but, as the present spider forms its nest in channels already made, these spines would be useless, and hence their absence; or perhaps it would be truer to say that the spider, not being furnished with the necessary implements, but gifted with the trap-door nest-making instinct, has thus fixed upon a position in which excavation is needless. Further details of form, colour, and structure, would be probably out of place here; but I hope shortly to prepare a more minute scientific description, with drawings of the spider and its nest, for publication in the Proceedings of the Zoological Society. With regard to its specific name, I propose to call this very valuable and interesting addition to our trap-door spiders, *Moggridgea Dyeri*, after its discoverer, Dr. Dyer, of Uitenhage, South Africa; and I would ask that gentleman to use his evidently keen powers of observation for the discovery of the male sex, which would no doubt present far stronger and more

important specific characters than the female. A subsequent correspondent, 'Anglo-African,' in the 'Field' of October 17th, 1874, speaks of this spider being also found in another locality; but his description of the nest, its great length,—two feet six inches,—and its situation, show that it belongs to a much larger spider, and one of quite a different genus, probably to an undescribed species of *Nemesia* or *Cteniza*.—*O. P. Cambridge; Bloxworth Rectory, August 20, 1875.*"

I trust that the interesting subject of trap-door spiders burrowing in the bark of trees, or at any rate utilizing the fissures of bark for the purpose of constructing their silken domiciles, will claim the attention of our correspondents in South Africa, and especially of the Messrs. Woodward, who have already done so much to illustrate the Natural History of these little-known regions.

EDWARD NEWMAN.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 172.)

Fig. 30.



APHILOTHRIX GLOBULI.

In situ: *a*, detached; *b*, magnified.

30. *Aphilothrix globuli*, Hart.—This green spherical gall is found in the terminal or axillary buds of *Quercus pubescens* (and probably also of other oaks); one-half or more of the gall is covered with the bud-scales, and has a diameter from 3 to 4·3 millimetres. At the point opposite the base there is a wart (or a blunt cone) of a yellow or rusty red colour. The naked green surface of the gall is soft when fresh, and shows a sappy substratum, which, however, dries up in the autumn, and produces on the still green surface reticular plications or wrinkles. Inside the soft layer is the woody inner gall, which contains a

larva-cell. The surface of this inner gall exhibits reticular rings. According to Hartig the fly emerges in the month of February.—*G. L. Mayr.*

In a subsequent note (second half, p. 68) Dr. Mayr says:—"The gall falls in October, while it is yet fresh and soft, and passes the winter on the ground." I have found the galls of this species in Essex (see Entom. vii. 24, and Ent. Mo. Mag. xi. 110) in the autumn, and even as late as the middle of December, still in the bud, where it is easily seen on account of its green colour. I, however, failed to breed any of their inmates, probably from the inner galls withering, as no doubt this species, like the Neuroteri (leaf-spangles), requires to be collected from the ground in the spring to be successful. Dr. Mayr gives *Synergus ruficornis*, *S. vulgaris*, and *Callimome regius*, *Nees*, as inhabiting its galls; Prof. Kaltenbach gives *Siphonura chalybea*, *Rtzb.*; Ratzburg himself gives *Eupelmus azureus*, which, as he says, is probably hyperparasitic; and Hartig gives *Neuroterus* (*Ameristus*) *parasiticus* as parasitic in the gall of this species. Another year I hope to see which of these we have in Britain.—*E. A. Fitch.*

31. *Aphilothrix autumnalis*, Hart.—There is much similarity between the gall of this and the last-described species. Like that, more than half is covered with bud-scales: it is, when fresh, of a green colour, and has beneath the scarf-skin a thin fleshy reticulation, and at the summit a small round wart. It differs from the gall of *A. globuli* in its more oval or prolate form; in its being from three and a half to five millimetres long, and having a diagonal diameter of two and a half to three and a half millimetres; in the surface of the inner gall having no reticular rings, but blunt, longitudinal striations, which also show on the surface of the brown gall, for in the process of drying the thin fleshy layer adheres closely to the inner gall. According to Hartig this gall does not burst forth from the bud till the beginning of October, and falls to the ground in the middle of the same month. I have only found it once, but have had several fresh specimens sent to me by Herr Tschek, of Piesting.—*G. L. Mayr.*

This gall, I believe, occurs in Britain; but owing to the great confusion existing about the various bud-galls, I think the less said about this rather obscure species the better, at present.—*E. A. Fitch.*

Fig. 31.



A. AUTUMNALIS.

In situ: a, detached.

On Capturing, Killing and Setting Hymenoptera.—[The following recommendations and suggestions are by Mr. Frederick Smith, of the British Museum, and are published in the 'Entomologist's Monthly Magazine' for August. I have, perhaps, captured, killed and set more British bees than any man living, and therefore am qualified to express an opinion on Mr. Smith's method. Mr. Smith's observations are elicited by a previous paper of Dr. Kriechbaumer's, the advice given in which Mr. Smith by no means inclines to follow. After criticising somewhat severely the Doctor's method, Mr. Smith proceeds as follows, and I bear most willing testimony to the value of his advice. It comes here very appropriately as a sequel to Mr. Fitch's recommendations in the case of gall-flies, which appeared in the July number of the 'Entomologist.'—*Edward Newman.*]

"I will, as briefly as I can, describe my own method of capturing and setting Hymenoptera, and leave it for Hymenopterists to try both methods, and make known their opinions which is the better. I capture my insects with a bag-net (when I consider a net necessary, because I really capture three-fourths with my fingers) made of the very finest white net that is manufactured, twenty-two meshes to the inch: this is only to be procured at a few of the best shops in London. When collecting, I carry a good supply of the best block pill-boxes of different sizes, packed in a flat tin case that fits a satchel; this prevents the boxes being crushed in travelling to my hunting-ground. On arriving there I transfer the boxes to the right-hand pocket of my coat. When I capture an insect in my net I select a proper-sized box, take off the lid, and secure the insect in it against the side of the net; then, with a little manipulation, I put on the lid. The insect is now quite uninjured, with not a hair on its body ruffled. Each capture I thus secure in a separate box. These boxes I put into the left-hand pocket of my coat; and when I have filled a number, or have taken some great rarity, I put them back into the tin case; if a rarity, I frequently put the box in which I first secured it into one a size larger. Before starting on an excursion I examine all my boxes, to be sure that the lids fit closely; if they do not, a strip of paper pasted round the rims makes them secure. On arriving home I proceed to kill the insects: I take first

the largest boxes used and raise the lids on one side, so as to leave a very narrow opening to admit the fumes of sulphur; I then pile the boxes one upon another in a pyramidal heap, and over the pile I place a bell-shaped glass, usually six inches in diameter, but the size will vary according to the number of boxes; I then take a little powdered sulphur on the end of a thin piece of flat wood (a match in fact), light the sulphur, and place it beneath the bell-glass,—this process will sometimes require repeating once or twice, until the sulphur will no longer burn beneath the glass; it is then sufficiently charged. In this condition I leave it for about half an hour. I then empty the contents of the pile of boxes into two or three larger ones, recharge the bell-glass, under which I place the boxes of insects, and leave them until the following morning: the insects will then be in a proper condition for setting. Every insect will be found in the most perfect condition: pubescent ones, such as humble-bees, have not a hair disturbed, and they can be pinned without a chance of any liquid *oozing out of the thorax* and matting the pubescence. My method of setting and drying specimens is as follows:—For the latter process I use a drying-cage, with door and back covered with net (perforated zinc would answer as well, if not better): the cage has several setting-boards resting upon slips of wood, and corked on one side, the cork being half an inch thick, thus allowing the insects to be pinned at a proper height. The setting process is very easy and simple: having run a pin through the thorax, slightly before the middle of its disk, I mount it on to the setting-board, running the pin into the cork, until the under side of the thorax very nearly touches the cork; the next thing to be done is to arrange the legs in a natural position by the aid of fine plyers and setting-needles, securing the limbs in position, when necessary, with pins; on each side of the specimen I place a table for expanding the wings upon; this is simply a strip of good, stout Bristol-board, that is, stout card. These tables must be of various sizes, and used according to the size of the wings of the insect. Having fixed the tables firmly, I place the wings upon them with a setting-needle, and having, by a little manipulation, if necessary, hooked the wings together, push them forwards into the required position, holding them there with a needle,

until, with a brace made of a strip of card shorter than the table, and pierced through at one end with a pin, the wings are secured in their proper position. The last process is to arrange the antennæ. This can sometimes be done by placing them on the end of the table on which the wings are spread; but, in the majority of cases, it must be done with pins. The time necessary for insects to remain on the setting-boards depends upon a variety of circumstances. I am here alluding only to insects recently caught. In the height of summer, if dry and hot, a fortnight may do for small or slender insects, but I seldom remove any so soon. *Bombi* should, even in hot, dry weather, remain at least a month, and at other times must be left five or six weeks, or the wings will be apt, in damp weather, to fall out of position."—*Frederick Smith*.

Life-history of the Pear-tree Slug. By EDWARD NEWMAN.

THE "potato-bug" seems reluctant to cross the Atlantic, and the panic it engendered is dying out, in spite of the energy which some practised scribe or expert conversationist will occasionally strive to maintain or renew the excitement. As if purposely to avail itself of the procrastination of this coy and somewhat problematical mischief-maker, a real insect grievance has taken up its abode in our midst, and seems to demand serious attention. The pear-tree slug is a reality, tangible, palpable, visible, smellable,—for it appeals most forcibly to the olfactory organs.

Mr. Fitch, to whom allusion will be made again hereafter, in defence of the slug against this charge, thinks that the smell is only emitted under circumstances of provocation, and may possibly be protective only,—a sort of warning to the aggressor not to taste a creature whose scent is so offensive, lest he should find the flavour as repugnant to his palate as the odour to his olfactory organs. This kind of protection is possessed by the larvæ of many other sawflies.

Complaints as to the burnt-up appearance of our pear-trees, —and, by the way, of our cherry-trees as well—inquiries as to the cause; and a plethora of infallible remedies, with polysyllabic and for the most part unpronounceable names,

have found their way into all our advertising columns and wrappers; yet year after year the plague seems to increase and spread.

My object in penning these notes is to bring the creature face to face with his victims,—those who, in the west and south-west of England, annually lose their pears and their perry through the instrumentality of these insects; for unless we know our enemy—his appearance, his ways, and his whereabouts—all our attempts to compass his destruction must be futile. We have all heard of the nocturnal slaughter of sheep in Algeria, and of the cunning devices to eradicate the enemy, to stamp out the aggressor, and thus allow the persecuted sheep a respite. Large sums were raised, fertile brains were worked, and engines of all forms and on all principles were constructed, with a view to compass his destruction; nothing was omitted that ingenuity could suggest, valour inspire, or wealth procure. One thing, however, was forgotten; and that was to identify the ovicide. No one had deigned to inquire what particular beast, bird, or reptile, evinced this kleptomania for mutton; so that lion and leopard, hyæna and jackal, vulture and eagle, shared the opprobrium about equally among them; until the hunters, on going the round of the traps at early dawn, found a party of Bedouins squatting on their heels, with mutton on their knees, mutton between their fingers, and abundant evidence of mutton slaughter and mutton cookery unmistakably around them. Then came a revulsion of feeling; then the tide of subtle strategy and impetuous bravery was diverted into another channel. Even before accident supplied me with this apt illustration of my theme, I had arrived at the conviction that it is desirable to ascertain your enemy before “trying conclusions” with him; and it is in this spirit that I invite attention to the life-history of the pear-tree slug.

And here let me state *in limine* that the earliest, best, most complete, and most accurate account of this objectionable insect was written by Professor Peck, and was printed at Boston, U. S., at the very end of last century, by order of the Massachusetts Agricultural Society. This body awarded fifty guineas and a gold medal for the memoir, which it is now difficult or impossible to procure. Dr. Harris, however, one of the most eminent of American entomologists, has given us

the substance of this essay at p. 418 of his 'Treatise on Insects Injurious to Vegetation.' This second account, with some abbreviations and modifications, has been adopted by all subsequent writers; and its chief points are incorporated in the present memoir, not, however, unadvisedly, or without a careful study of the insect in a state of nature. I have also to acknowledge the great assistance I have received from Mr. Edward A. Fitch, one of the best observers of insect life-history that ever lived, and one who has laboured, and is still labouring, most efficiently in the elucidation of our British oak-galls.

In June the mother-fly emerges from the earth in which she had voluntarily buried herself. Her first thought, like that of our own female relatives, is matrimony; and doubtless her powers of attraction, as with us, are taxed to the uttermost; but in what manner they are exercised philosophers have failed to discover. Her second thought, or instinct, or duty, is preparing for a family. A word as to her personal appearance: she is always in mourning; even before matrimony she wears the sable garment of widowhood; her head, antennæ, body and legs are almost entirely clothed in black; her wings, otherwise colourless, wear a blackish shade across their middle. Her native tree in this country is the sloe. By beating a sloe-bush, at the beginning of June, into a net or umbrella, after the manner practised by entomologists when thrashing for caterpillars, you may obtain some of these little black, and seemingly lifeless, creatures, which are about the size of a grain of wheat. If they fall into the umbrella—held of course upside down—they will roll over and over to the bottom of the concavity, and there lie perfectly motionless; of course their object is to assume the semblance of death, so as to deceive the uninitiated. A great number of insects have this habit of feigning death, evidently with the object of rendering their appearance unattractive, and themselves unrecognisable to those other insects, or animals of any kind, which make living insects their customary food. As though purposely to aid in this life-preserving, and therefore very excusable, deception, their bodies are so fashioned that by bending their heads downwards beneath their breasts, pressing their antennæ, legs and wings closely against the body, and resolutely abstaining from all movement, the whole

appearance becomes so inorganic that even the sharp, prying eye of a bird would be deceived, and the delicate, discriminating touch of a spider would fail to detect life under this mask of death. Some insects have a special provision for this manœuvre; as in those many-bladed knives which are the delight of schoolboys and the terror of timid mothers, each of the limbs fits with the greatest nicety into a groove purposely fashioned to receive it. If you examine a pill-beetle (*Byrrhus*), while it is shamming death in this way, you will find it so compact and pill-like that you are quite unable to distinguish the legs from the body until the creature condescends to crawl, and thus reveal the secrets of its structure. Notwithstanding this love of concealment, one or other of the roving males, similarly coloured to the female, but of a far more volatile disposition, is sure to find her, and impregnation and maternity follow as matters of course. Then she may be seen in the act of oviposition,—on a sloe-leaf in the hedges, or a cherry-leaf in the garden, or a pear-leaf in the orchard,—and a serious matter she makes of it. So serious and so intent is she in the performance of this maternal duty, that you may sometimes take her off the sloe-leaf between your finger and thumb. She will evince no disposition to fly, make no effort to run, but only resort to the expedient of feigning death,—an expedient that facilitates her capture rather than otherwise, especially if you hold one hand beneath the leaf on which she is operating, in order to arrest her fall. I need scarcely say that this insect is a member of the great family of sawflies,—a family that has long attracted the attention and admiration of the entomologist; nor need I again describe the saw with which all of them seem to abrade the cuticle of the leaf, leaf-stalk, or twig, on which they deposit their eggs.

Suffice it to say that the abrasion made by the insect whose history I am relating is of a slightly-curved or crescentic form, and that the egg is laid in this abraded portion. The denuded parenchyma of the leaf thus comes into immediate contact with the under side of the egg, which is of an oblong shape, and is covered with a leathery shell, capable of considerable expansion as the enclosed larva increases in size. Thus the egg is seen very obviously to grow,—a fact familiar to entomologists, but one which

ornithologists may be excused for hesitating to accept, seeing how very brittle are the eggs to which they have devoted their best attention. This faculty of growth in the egg-state was known to Linnæus, and has been recorded by all subsequent writers on this tribe of insects. To criticise or contradict observers so careful as Professor Peck and Dr. Harris is out of the question; but there is one point in which I differ from these most observant and accurate entomologists. Both Peck and Harris either state, or lead us to infer, that the egg is laid and that the larva feeds on the *under* side of the leaf. My own experience is exactly the reverse of this, and agrees with that of the Rev. Charles Bethune, as given at p. 51 of his 'Annual Report of the Entomological Society of Ontario,' which I have lately received through the courtesy of my kind friend Mr. Reeks, of Thruxton. My experience agrees with Mr. Bethune's; I find the larvæ on the *upper* side of the leaf. This want of accord may probably arise from there being several species confounded under one name, and three of them I had named provisionally after the trees on which I found the slug feeding:—*Blennocampa Cerasi* on the cherry, *B. Pruni* on the plum or sloe, and *B. Pyri* on the pear. I find, however, that I am unable to differentiate these in a manner likely to find acceptance with entomologists. I therefore prefer adopting "*Æthiops*" as a specific name for all our slug-worms, at the same time expressing a feeling of some regret that the word "nigger," the literal translation of *Æthiops*, should have been applied to the sawfly of the turnip,—a very different insect, and one of which a complete life-history has already been given in the 'Entomologist.' Another question of some interest, as regards the geographical distribution of insects, arises as to the identity of the slug-worms of Europe and America. There is, however, no necessity to introduce this difficulty to the reader, unless it be to say that the three are so similar that I am unable to separate them.

To proceed with our life-history of the one which feeds on the pear-tree. The eggs continue to grow during thirteen days; at first slowly, towards the end of that period more rapidly. On the fourteenth day, according to Professor Peck, the young grub emerges from the egg. I have no doubt this statement is correct as regards the United States, but I

cannot say that I have verified it in England. On first emergence they are white or colourless, but in a very short time they are covered with a black, brown, or olive-coloured jelly, of offensive scent and disgusting appearance. Although Peck, Say, Harris, Bethune and others in America, De Geer, Réaumur, Bouché, Hartig and many others on the continent of Europe, and Mr. Westwood in England, have written on this loathsome grub, and although I have read their observations with the attention they merit, I cannot say that I thoroughly understand the mode in which this jelly or mucilage is produced: it accumulates on the surface of the skin, until the creature becomes a dark mass without apparent life, or even organisation. The slugs are first observable at the beginning of July,—then of course very small; and a succession continues to make its appearance, and to infest the leaves of sloe, pear, cherry or service, throughout August and September, and often far into October. They glide with extreme slowness over the surface of the leaf, and partly by means of claspers, a pair of which are attached to the under side of every segment, except the 1st, 4th, and 13th. These claspers seem to possess little of that prehensile property which is so striking a character of the claspers of the caterpillars of moths and butterflies. In addition to the claspers, fourteen in number, which are situated on the under side of the abdomen, there are six articulated or thoracic legs. These, as well as the head, are invisible, except when the creature is crawling or feeding; indeed, these so-called organs of locomotion are concealed by the body and its concomitant slime or jelly, and their office seems to devolve on the annular segments of the body, which, by alternate dilation and contraction, effect the desired object. This phenomenon is observable in the larvæ of many other insects, particularly in those which are apparently apod, such as the maggots of flies and some Curculionidæ. The body is somewhat swollen at the anterior extremity, and gradually attenuated towards the posterior, which is slightly raised,—a character frequently observable in this family of insects, as well as in the cuspidate Lepidoptera. During the greater part of their larval existence, these slug-worms seem quite destitute of that rambling propensity which is commonly observable in the larvæ of Lepidoptera; indeed, in them,

rambling would be useless, since the upper cuticle and the parenchyma of the leaf, which constitute their principal food, are always within reach without the trouble of moving. These they consume in a very methodical manner, leaving the lower cuticle entire; this very soon dies, withers, and turns brown, making the whole tree look as though covered with dead leaves.

The process of exuviation, or casting of the skin, obtains in this, as in all other larvæ. Before it is performed the little slug wanders about the leaf with more freedom of movement than usual; it is no longer glued, as it were, to the cuticle. After the skin is cast the slug may be seen licking its old coat, an occupation which seems particularly enjoyable. The mandibles are also incessantly and actively at work; yet the cast clothing does not entirely disappear, although it is certainly diminished: the anterior part seems to be eaten, the hinder part neglected. This observation is made in consequence of the well-known propensity of certain lepidopterous larvæ to make a meal not only of the egg-shell from which they have just emerged, but also of the garments, which are from time to time thrown aside in favour of a new suit. What a saving might be effected if we humans could thus utilise our old clothes instead of feeding on beef and mutton, the price of which seems gradually advancing towards a point which will render the use of such viands impossible. The changing of the skin takes place in America five times. I cannot say that five is the number of ecdyses in England, as I have not counted the new suits worn by English slug-worms. At the last change the slug loses its jelly-like surface, and appears in a neat yellow skin without any viscidness. This occurs nearly a month after their first escape from the egg-shell; the head and segmental divisions are now quite as perceptible as in any other species of sawfly. Henceforward it eats no more, but crawls down the trunk of the tree and buries itself in the earth: at the depth of three or four inches, each forms a neat little oval cell, in which to undergo its final changes to a chrysalis and perfect fly. This cell is formed of earth, but is lined and intermixed with liquid glue secreted in the stomach, and ejected by the mouth. This liquid glue is obviously nothing more than silk in a liquid state, —a preparation with which the larva of nearly every moth,

butterfly, hymenopteron, or coleopteron, is provided more or less abundantly, and one which is always applied to the fabrication of a cocoon, cell, or covering of some kind in which to undergo its transformation. When this gum has once hardened, and assumed its final state of leather-like toughness, it is insoluble in water, and forms a perfect protection from wet. In this cocoon the grub resides during the remaining portion of the autumn, also during the entire winter, and until the following summer: it is contracted in size, but otherwise unchanged in character. Its change to a necromorphous chrysalis does not take place until spring has far advanced, and then that state is but of short duration: fourteen or twenty days suffice to mature the perfect insect, and at the expiration of this it emerges from the tomb, and the same cycle of existence is recommenced and recompleted as before.

I believe every leaf-eating insect has its parasite,—its appointed enemy, whose office in creation is to keep the leaf-eater in check, and thus maintain the balance of nature. Were it not thus, so vast would be the destruction of vegetation that man himself must perish in the fruitless struggle to maintain life. These insidious parasites, and faithful allies of man, are Hymenoptera, insects of the same class as the flies produced from the slug.

A word remains to be said about the supposed remedies; and here I must confess that I am at fault. In England we trust too much to the inventive genius of chemists and druggists. Whenever these gentlemen offer for sale a preparation which they have previously called by some cacophonous name, the little republic of cultivators is delighted to buy, delighted to be taken in, and delighted to grumble at the inefficacy of the nostrum; and so ends the amusing comedy. In America it is somewhat different; our Transatlantic cousins, having made themselves thoroughly acquainted with the enemy, have had recourse to practical measures with a view to compass his destruction. Sand, ashes, lime, and powdered hellebore, have been tried with great energy; but the last only has been found reliable. The results of these experiments were recorded in the September number of the 'Canadian Entomologist' for 1870.

As soon as the slugs were observed at work in spring they

were treated to a plentiful supply of dry sand, thrown up into the higher branches with a shovel, and over the lower ones through a sieve. The sand stuck thickly to the slimy skins of the grubs, completely covering them. Supposing the enemy conquered, no notice was taken of him for some days, when he was found to have recovered from the assault, and to be as vigorous as ever. It was then determined to test the sand experiment on a smaller scale. Several small branches of pear-trees were selected and marked, on each of which were six slugs, and these were well powdered over, and completely covered with sand. On examining them it was found that they had shed their sand-covered skin, and had crawled out as slimy as before. The sand was applied a second and a third time, with similar results. Ashes were next tried in the same manner as the sand had been, and were found equally ineffectual. Seeing then that sand was useless, the slugs were treated to a strong dose of hellebore and water, which soon finished them. Another experiment was tried with a solution of hellebore, and is thus reported:—

“On the 13th of August, at 8 A.M., a branch of a cherry-tree was plucked, on which there were sixty-four slugs. This branch had only nine leaves, so it may be supposed it was thickly inhabited. A dose of hellebore and water was showered on them, about the usual strength,—an ounce to the pailful,—when they soon manifested symptoms of uneasiness, twisting and jerking about in a curious manner. Many died during the day, and only six poor sickly-looking specimens remained alive the following morning, and these soon after died. During the past season (1870) these slugs have been unusually abundant on our pear-trees, in many cases destroying the foliage so thoroughly that they looked as if they had been scorched by a fire, every leaf in some instances dropping from the trees, so that for a time they were as bare as in mid-winter. Nearly a thousand trees in the young pear orchard of the writer suffered severely. During the latter part of June and the early days of July we had no opportunity of inspecting these trees; and when we visited them on the 7th of July they were so much injured that we thought they could not be much worse; and, as the slugs were then full grown and fast disappearing, and as the

application of a remedy to so many trees was a matter of so much labour, nothing was attempted to remedy the evil."

Then follows a list of the pear-trees injured; and from this it appears that some varieties suffered much more severely than others. In the course of a fortnight after these observations were made, new leaves began to push out vigorously on the defoliated trees, and within a month or six weeks all was green again.

"In the meantime," says Mr. Bethune, "the mischief-makers were preparing for a second descent, and we in our turn were preparing to receive them. On the 29th of July, when going through the orchard in the afternoon, the new brood of flies were found in the greatest abundance, resting on the young leaves and on those portions of green which still remained on the leaves partially eaten by the last brood. They were congregated, however, most thickly on those trees where green leaves were most abundant. On disturbing them they would fall to the ground, with the antennæ bent under the body, and the head bent downwards. . . . We caught sixty specimens, and might have taken hundreds: they were so thickly spread that in many instances there were two or three on a single leaf. By the last week in August the second brood of slugs were hatched. Now those trees which had previously escaped were all more or less infested. . . . A raised platform was rigged up in a one-horse cart, in which was placed a barrel of water in which a pound of powdered hellebore had been mixed; and from this elevated stand this mixture was showered lightly on the trees from the rose of a watering-pot. It was astonishing how quickly the trees were cleared by this method: scarcely a slug could be found on a tree the morning after the application had been made; and ten pounds of hellebore, with five or six days' work of a man and horse, served to go over the whole ground."

Powdered hellebore has been successfully tried in England on a small scale; but there is an apparent difficulty in raising the water to a sufficient height to be of much service among the giant pear-trees of Worcestershire and Herefordshire. Still I would by no means discourage the attempt.

In a scientific point of view it would be interesting to ascertain the identity or otherwise of the "slugs" of Europe and America, and to ascertain also whether the slugs had

migrated, either naturally or through the instrumentality of man, from the old to the new continent, or *vice versá*. It is stated, and I doubt not on good authority, that there are two broods of this mischievous insect in America. At present we know of but one in Britain. Let us hope that a second may not hereafter reveal itself.

EDWARD NEWMAN.

Peckham, October 10, 1875.

Entomological Notes, Captures, &c.

Obtaining Eggs from Captive Lepidoptera.—In the ‘Canadian Entomologist’ for September Mr. T. L. Mead, of New York, gives a description of a simple and easily-constructed cage for keeping the females of Lepidoptera in health and vigour until the eggs are deposited on the food-plant. As the method in some of its details is new to me, I thought it might also prove so to some of your numerous readers, and therefore copy that portion of his note *verbatim*. Mr. Mead says:—“A notch is cut in the side of an empty wooden-box, through which a branch of willow or other appropriate food-plant is passed, care being taken to select a leafy spray, so as to partially fill the box with foliage. It is then covered with gauze, tacked fast on one side and part way on the adjoining sides, that on the fourth side being held down by a piece of wood fastened to the remaining flap of gauze. This renders easy the examination of the contents at any time. Now, a saucer of dried apples, sugared and partly filled with water, is put in, and the cage is complete. Butterflies, like *Limenitis Arthemis*, will live in such a vivarium for two weeks and more after their capture, and appear to enjoy the food provided immensely, laying many more eggs than if enclosed in a bag and allowed to perish of hunger and thirst. I have often captured specimens and dropped them in upon the pile of dried apples: instead of fluttering about and endeavouring to escape they instantly unrolled their tongues, and feasted for several minutes upon the repast prepared for them without a motion of the wings.”—*Henry Reeks; Thruxton, October 19, 1875.*

Varieties and Deformities.—From time to time the pages

of the 'Entomologist' are illustrated either by pen or pencil,—sometimes both,—with so-called "varieties" of our native Lepidoptera, and in almost every instance the specimens described differ from the normal type of the species, either in the distribution of *colours*, or in intensity of shade or markings. Occasionally we read of dwarf specimens, or, on the other hand, specimens of gigantic proportions, but we seldom see any account of a deformed individual; and by deformities I do not mean the poor, crippled creatures we sometimes get in our rearing-cages,—although perhaps they should claim the appellation, "par excellence,"—but those in which one particular limb, although fully developed, differs from the corresponding one. That such deformities do occur we are all well aware; I think they are sometimes not totally uninteresting to those who really love insects for their own sake. Last summer I and a friend were searching for *Acidalia straminata*, and whilst near a fir-wood a moth attracted my attention by its peculiar flight. I caught and boxed it, to find it was a specimen of *Ellopiia fasciaria*, with one of its hind wings about *half* as large as the opposite one, although this dwarfed limb is apparently fully developed, and has the red bar across it similar to the other, but the wing being shorter than usual the bar is naturally nearer the body; consequently the moth looks very one-sided now it is set. I have yet a still more remarkable "deformity" in my cabinet in a male of *Colias Edusa*. The specimen in question has both fore wings narrow and rounded, almost reminding one in form of the fore wings of *Lithosia quadra*. Its colours are not so bright as other specimens in my series, but the markings are similar; and on account of the wings being so much narrower the black spot appears to be almost equidistant from the costal and inner margins. Doubtless many readers of this journal possess specimens equally interesting and curious; but, in nineteen-twentieths of the varieties described, the variation is in colour, and not in form. This I almost wonder at, since the acquisition of varieties is, and has been, such a mania with collectors, and almost anything out of the common course of nature is deemed a prize.—*G. B. Corbin.*

[I am rather pleased that any correspondent of the 'Entomologist' should have observed, what is a fact, the general absence from its pages of notices of deformity. I entirely

agree with the spirit that suppresses all notice of deformity among mankind, and am well pleased to see the same forbearance exercised towards the world of animals.—*Edward Newman.*]

Abundance of Colias Hyale in Suffolk.—I have been surprised not to see your natural-history columns crowded by your entomological correspondents with notices of the occurrence of that, to me, rare butterfly, *Colias Hyale*. Both it and its near relative *C. Edusa* have occurred abundantly—the former exceedingly so—in East Suffolk during the last three weeks. A brother of mine, who is collecting, took several specimens of each. I am curious to know if East Suffolk is the only district that has been visited.—*H. J. Rope; Blaxhall, Wickham Market.* [From the 'Field.']

Colias Edusa, C. Hyale, Sphinx Convolvuli, and Catocala sponsa, near Petersfield.—I took here, on September 30th, a rather worn specimen of *Sphinx Convolvuli*: it was at rest in some long grass when I found it. I also took at sugar here, on August 9th, a fair specimen of *Catocala sponsa*; and on September 18th, about five miles from here, a good female *Colias Hyale*. I have also taken this autumn ten specimens of *Colias Edusa*, of which only two were females.—*Waldegrave; Blackmoor, Petersfield, Oct. 18, 1875.*

Colias Hyale and Sphinx Convolvuli near Birmingham. On the 13th September I captured a good specimen of *Colias Hyale* near the Ran Dan Woods, about thirteen miles from Birmingham, while out shooting; and on the 23rd I saw one on the wing at Shirley, about six miles from Birmingham. On the 24th I had brought to me a very large specimen of *Sphinx Convolvuli*, having been captured in a greenhouse in some neighbouring nursery-gardens; and two others at the same time were captured on the outskirts of the town. Both species are exceedingly rare in this neighbourhood, and I never remember having seen either before.—*Walter Ludlow; Solihull, near Birmingham.* [From the 'Field.']

Colias Hyale, C. Edusa, and Sphinx Convolvuli, at Hitchin.—Seven specimens of *Colias Hyale* and four of *C. Edusa* have been taken by the boys in this school within the last month. They were all taken on the Midland and Great Northern Railway embankment, a little to the north of Hitchin Station. Two gentlemen have taken specimens of

Sphinx Convolvuli here lately, one of which has come into my possession; and another has been found in the garden here.—*John Grubb; The Woodlands, Hitchin, September 25, 1875.*

Colias Edusa and Sphinx Convolvuli at Hendon.—On September 13th a male *Colias Edusa* was taken in the garden here by my friend Mr. Brown; and on the 26th, a fine female *Sphinx Convolvuli* was brought me: it was found at rest on a post. In the evening of the same date I took a male, as it was hovering over a bed of scarlet geraniums.—*R. South; Goldbeater's Farm, Mill Hill, Hendon.*

Sphinx Convolvuli, Colias Hyale and C. Edusa abundant at Ipswich.—*Sphinx Convolvuli* has been very plentiful here throughout September; and *Colias Hyale* and *C. Edusa* have swarmed everywhere.—*C. F. Long; Borough Asylum, Ipswich.*

Lycæna Acis near Cardiff.—Four specimens of *Lycæna Acis* were taken near Cardiff last year, and one more this year by Mr. Williams, of Marlborough College, one of which is in my possession.—*N. Manders; Marlborough College, Wilts.*

Deilephila Galii at Weybridge.—My brother and I caught two specimens of *Deilephila Galii* here, in August, several years ago. They were flying over such flowers as verbenas, geraniums, &c. I have recorded this because I believe the moth is rare.—*Oswald Milne; Weybridge, Surrey, October 9, 1875.*

Sphinx Convolvuli in Guernsey.—This fine hawk-moth has been unusually abundant in Guernsey this autumn. The first specimen was brought me on August 26th by a little girl; she had found it at rest on the arcade steps. On August 28th another specimen was brought in a chip-box; but, as may be supposed, it was too much battered to be of any use as a specimen. September 6th, a boy brought a fine specimen, taken on the window of a house in Pedvin Street. September 16th, a lady collector brought me a fine specimen to kill for her; and on the same day a friend sent me a fine specimen, which had been taken in King's Road. September 17th, a specimen brought, taken on the door of a house in Mount Durand. September 18th, my friend Mr. Derrick called to tell me he had been informed by a lady that *Sphinx Convolvuli* were very abundant in her garden in King's Road,

hovering over honeysuckle at dusk, and that we were kindly invited to see them. We determined to capture some if possible, so repaired there that same evening. On one of the garden-walls was a large quantity of honeysuckle in full bloom, which was evidently the attraction. We stationed ourselves in front of it, net in hand; we had not long to wait before they began to put in an appearance; and after several unsuccessful attempts we succeeded in capturing five. We were told that two cats belonging to the house stationed themselves on the wall regularly every evening watching for these moths, and often succeeded in capturing them. September 23rd, a specimen was brought me, very much worn and wasted. September 24th, we again visited the honeysuckle in King's Road; and, although it was almost blowing a gale of wind, succeeded in taking one moth. Besides the above captures, which have come under my more immediate notice, I have heard of the following:—Two were taken at rest on a white sheet hanging in a garden in Mount Durand; the captors, thinking them very beautiful, pinned them alive on some wax-flowers under a glass-shade, thinking, no doubt, that the insects would die in a very short time; both insects and flowers must have been greatly improved. Another specimen was exhibited in the window of a boot-maker's shop in Smith Street; and a gentleman living in Candie Road found one crushed on his garden-walk. My friend Mr. Cumber has also given me the following list of captures, most of which have been added to his collection:—Two taken in the sick-ward and one in the yard of Town Hospital; two in a garden in Brock Road; one at rest on a greenhouse, near Victor Hugo's house in Hauteville; one at rest on a railing near Salarie Battery; and one on a street-door knocker. A full-grown larva was brought me from Alderney on October 14th, and has been forwarded to Mr. Newman to describe in the 'Entomologist;' and I am informed that a great number of specimens of the perfect insect have been captured there this season.—*W. A. Luff; Guernsey.*

Description of the Larva of Sphinx Convolvuli.—Opportunities of examining the larva of *Sphinx Convolvuli* are of such rare occurrence in this country that I was delighted to avail myself of Mr. Luff's kindness in sending me a specimen. It was by no means what the various figures and descriptions

had led me to anticipate; indeed no description I had read had given me any idea of the reality. The entire absence of oblique lateral stripes at first induced the conclusion that some mistake had been made in determining the species: this idea, however, was soon dissipated, and was speedily followed by the conviction that I had the larva of *Sphinx Convolvuli* before me. The face when the creature is at rest is held nearly in a vertical position; the mouth, however, is inclined slightly backwards towards the feet, which are inclined forwards. It is very slightly convex, and notably narrower than the 2nd segment, which partially receives it: this segment is narrower than those which follow, and which are of nearly equal substance to the 13th, and this is evidently less than the rest, as usual in larvæ; on the 12th is an arcuate, decurved, caudal horn, which is moderately stout at the base, and tapers to an acute point; the body is transversely wrinkled, and has manifest incisions separating the segments. The colour of the head is green, with a slender black line between the cheeks; this forks at the lower extremity and includes the mouth; each cheek has two longitudinal black stripes, whereof the exterior on each cheek slightly exceeds the interior both in length and breadth. The body is bright apple-green, with six longitudinal series of black spots, and a narrow black medio-ventral stripe commencing on the 5th segment and terminating on the 12th; this narrow stripe is interrupted between the 5th and 6th segments, and also between the 6th and 7th: the medio-dorsal area is without black markings, and the sub-dorsal area has a distinct series, one on every segment, excepting the 2nd, 5th, and 6th; each spot is seated in the incision between the segments, and is therefore double, part on the preceding, part on the following segment; the anterior portion pointed and slightly oblique, the posterior portion rounded: the last of this series on each side is linear, oblique, and continuous with the caudal horn, which is chestnut-brown with a black tip: the second series of black spots on each side is lateral, and situated exactly half-way between the series already described and the spiracles; in position these spots alternate with those in the sub-dorsal series: the third series of black spots on each side is spiracular; each spiracle is oblong and black, and is surrounded with a very delicate pale circumscription; each

spiracle forms the centre of a nearly circular black spot; the nine spiracles thus surrounded form the third spiracular series: the medio-ventral line, already described, is dilated into a black blotch between each pair of abdominal claspers; the legs are black and shining: the claspers are pale green, with black, curved and prehensile ciliæ; each has a black spot on its outer side. This larva was found in Alderney, feeding on the leaves of the large bindweed, *Convolvulus sepium*. The specimen buried itself on the 14th of October, and so remains. I will now say a few words about a pupa of the same species, dug up in a potato-field at Deptford, and now before me. This is two inches and an eighth in length, and of proportionate thickness: the case containing the maxillæ is transversely marked, as if with rings; it is perfectly detached from the body, except at its insertion; it is parallel with the body for two-thirds of its length, and then, after nearly touching the leg-cases, is bent inwards and upwards, and terminates in a blunt extremity; the anal extremity of the pupa is obtuse and scabrous.

The extraordinary abundance in which this species has appeared this year, as recorded in the pages of the 'Entomologist,' is only equalled by the records in the 'Zoologist' for 1846, when it appeared throughout the length and breadth of the kingdom. Taking the records alphabetically, we find it occurred at Aylsham, Blackheath, Bridlington, Camberwell, Carlisle, Chipping Norton, Chelmsford, Clonmel, Dunmow, Faversham, Hackney, Hessle-on-Humber, Hull, Huddersfield, Hythe, Kingsbury, and a variety of other places in the vicinity of London, Leyton, Leicester, Norwich, Nottingham, Preston, Reading, Sudbury, Tooting, Tunbridge, Uppingham, Winchester, York, and Yarmouth: in the last-named locality it is reported to have occurred "in immense quantities," one person having taken fifty-seven, and enormous numbers having been seen on Caistor Marrams, a sandy district by the sea-shore. The interval of twenty-nine years, between 1846 and 1875, did not pass without the occurrence of *Convolvuli* being occasionally noticed; and I find captures of the insect recorded in almost every volume of the 'Zoologist' or 'Entomologist' until this year. In 1868 it appeared in abundance on the Norfolk and Suffolk coast, more particularly at Aldeburgh, as recorded in the 'Field' newspaper. Its

profuse occurrence on the eastern coast in 1868, coupled with its abundance in Guernsey during the present year, seems to favour my theory that our rarer Lepidoptera are frequently "blown over" from the Continent. The speed at which a *Sphinx* can travel, even when unaided by the wind, is truly marvellous, and when assisted by a favourable breeze it may perhaps be greater still. I see my friend Mr. Biggs combats this idea.—*Edward Newman.*

Sphinx Convolvuli.—This insect must have occurred very abundantly this season, as since my last communication I have obtained seventeen more, nearly all in good condition; and, including those taken by others, upwards of sixty have been taken in the same locality, all flying over the blossoms of marvel of Peru, which seems specially attractive to them. How to account for their occurrence in such numbers is a puzzle; but I think the greatest evidence against the migratory theory is that some of the specimens caught last were in the finest condition, which would seem to indicate a succession of freshly-developed insects. As far as I have observed the insect is rather shy in its habits and easily startled, as I noticed that when struck at and missed they went right away, and seldom or never returned to the same spot to feed. They did not seem to have much partiality for light, as when the glare of a lantern was turned on them they invariably receded from it; but I have seen them flying in the most brilliant moonshine, when you required no lamp to distinguish them. The majority of the specimens taken were females, and several of those I examined contained no eggs. The last specimens I know of were captured on the 1st of October. I visited the spot several favourable evenings after this, but saw no more of them.—*C. J. Biggs; South Hackney, Oct. 19, 1875.*

[The absence of eggs in the ovaries of many of the females of the larger Sphingidæ has been fully noticed by Mr. Doubleday in the 'Zoologist' (Zool. p. 1862), by myself in the 'Entomologist' (Entom. ii. 263), and by Mr. Biggs in the above communication. In such cases the abdomen is perfectly empty, a mere hollow cylinder; and the same phenomenon has been observed in some of the Noctuidæ. This absolute sterility among the females of *Sphinx Convolvuli* amounts to a very large percentage: seven out of eight having been found in this condition. The proportion of sterile

females of *Acherontia Atropos* is smaller, but still very considerable; it has not been ascertained with any degree of accuracy. Well, then, how is the race continued? Do the few fertile females deposit their eggs in the autumn during the great festival of honey-sucking? or after honeysuckle, marvel of Peru, petunias, verbenas and geraniums have been laid under contribution, and the pregnant female nourished with an abundant supply of sweets? According to the concurrent testimony of continental entomologists the eggs are laid and the larvæ are hatched in the autumn, the latter feeding up quickly, and retiring beneath the ground before the winter has deprived them of the means of sustenance: it will be found that there is abundant time for this state of maturity to be attained. A few moths may remain undeveloped until spring; but I take it a vast majority emerge at the end of August or during September of the following year.—*Edward Newman.*]

Sphinx Convolvuli at Maldon.—*Sphinx Convolvuli* has been found about here tolerably plentiful, my pupils having secured about a dozen specimens. Also *Colias Hyale* has been about here in the lucerne-fields.—[*Rev.*] *J. W. Mills; St. Lawrence Rectory, Maldon, Essex, October 11, 1875.*

Sphinx Convolvuli at Winchmore Hill.—On the 18th of September one of the national school-boys here brought me a perfect specimen of *Sphinx Convolvuli*.—*D. G. Lathom Browne; Uplands, Winchmore Hill, October 1, 1875.*

Sphinx Convolvuli in the West of Scotland.—The West of Scotland must be included among the numerous lists of localities which have this year been visited by *Sphinx Convolvuli*. I have just received one, which was caught in a greenhouse at Row, near Helensburgh.—*J. H. Pearson; 208, St. Vincent Street, Glasgow, October 2, 1875.*

Sphinx Convolvuli at Hazeleigh, Essex.—I picked up a mutilated specimen of *Sphinx Convolvuli* on a public road near Hazeleigh Rectory, on September 18th. I hear that the species has also been captured at Maldon this autumn.—*Gilbert H. Raynor; St. John's College, Cambridge, October 14, 1875.*

Sphinx Convolvuli at Hastings.—While playing croquet about the end of September last I was surprised by seeing a fine specimen of *Sphinx Convolvuli* hovering over a bed of

geraniums. I tried to secure it, but was unsuccessful. The next evening it returned to the same spot just at the same time, and is now a specimen in my collection. A few days after I heard of another being taken in the neighbourhood.—*Rosa M. Sotheby; Sunny Side, Ore Valley, near Hastings.*

Sphinx Convolvuli at Sheffield.—I have in my possession three specimens of *Sphinx Convolvuli*; one taken at Dore, Sheffield, by Mr. Wolstenholme; and the others at Edwinstowe, by Mr. Fells. All found flying over honeysuckle; taken September 25th and 26th.—*John Clark; 45, Church Street, Sheffield, October 18, 1875.*

Sphinx Convolvuli at Leeds.—On September 24th a male *Sphinx Convolvuli*, with the end of the wings split, very well marked, was taken off a gate-post at Wortley, Leeds. On September 25th another was brought me, a fine female; it was taken in a garden on a rhubarb-leaf, at Beeston Hill, Leeds.—*C. Smethurst; 25, Chatham Street, West Street, Leeds, October 20, 1875.*

Sphinx Convolvuli at Darlington.—Since the last captures I communicated to you of *Sphinx Convolvuli* we have taken fourteen more, making thirty-three in all, but some of them are rather worn.—*John Law; Elton Parade, Darlington, October 20, 1875.*

Sphinx Convolvuli at Birkenhead.—On September 1st I had a very fine male of *Sphinx Convolvuli* brought to me, which was taken sitting on the railway-bank between Birkenhead and Hoylake; it looked as though it had just emerged from the pupa.—*James Porall; Heath Bank, Wallasey, Birkenhead, October 19, 1875.*

Sphinx Convolvuli at Lincoln.—On the 20th of September I had given me a specimen of *Sphinx Convolvuli*, which was taken on some wood by the river's side at Lincoln.—*F. A. Trafford; High Street, Lincoln.*

Sphinx Convolvuli at Croydon.—On the 24th of September I took a fine specimen of *Sphinx Convolvuli* at rest on palings here.—*W. Frohawk; Wellesley Road, Croydon, October 5, 1875.*

Sphinx Convolvuli at Norwich.—On the 20th of September a friend of mine took a specimen of *Sphinx Convolvuli* at rest outside this city.—*Robt. Laddiman; Cossey Terrace, Upper Hellesdon, Norwich.*

Sphinx Convolvuli at Peckham.—I captured this morning on my way to school, in the Clayton Road, High Street, Peckham, a specimen of *Sphinx Convolvuli*. Having no box I was obliged to make a paper-bag to put it in, and it remained quiet for several hours.—*Arthur A. Barrett*; 34, Radnor Street, Peckham, London, October 4, 1875.

Sphinx Convolvuli and *Macaria alternata* at Christchurch.—Would it interest any of your readers to know that *Sphinx Convolvuli* occurs in this locality regularly every season during September? I have now on my setting-board two fine specimens, caught on the 14th and 15th September. Three years ago I captured in July several fine specimens of *Macaria alternata*; last year, two; this season, only one.—*W. McRae*; Christchurch School, Hants, Sept. 22, 1875.

Sphinx Convolvuli at Christchurch.—Between the 17th and 25th of September I had the good fortune to secure three fine specimens of *Sphinx Convolvuli*. Do the females of this species hibernate? If so, do they deposit their eggs before or after hibernation? Having several times attempted to procure eggs from captive females, I have in each instance failed. I should be glad of any information relative to this species which you or any of your correspondents can communicate.—*W. McRae*; Christchurch School, Hants.

Sphinx Convolvuli, *Epunda nigra* and *Xylina petrificata* at Newton Abbot.—On the 25th September last I captured two fine female specimens of *Epunda nigra* at sugar, and on the following night two more,—one at sugar and the other at light; they have never been caught here before; indeed, I had no idea that they came so far inland, they being generally caught by the sea-side in Devonshire, as, for instance, Teignmouth, Torquay, &c. I also had the good fortune to catch another fine *Convolvuli*, this making the fourth capture here this year. Last night (October 7th) I captured, for the first time, four specimens of *Xylina petrificata* at sugar; I believe they are considered a very local species.—*Charles G. Vicary*; Knowles, Newton Abbot, October 8, 1875.

Sphinx Convolvuli, *Glæa erythrocephala*, &c., at Wells or in Wales.—On showing my collection of Noctuæ the other day to the Rev. A. C. Hervey, he noticed a moth which I had placed near *Cerastis spadicea*, thinking it to be a variety of that species, as it was unknown

to me. Mr. Hervey at once said that he thought it was *Glæa erythrocephala*; and on referring to Newman's 'British Moths' I think there is no doubt he was right. On looking at my notes I found it was taken at sugar in my garden on the 4th of October. I have had a great number of *Noctuæ* at sugar in my garden this year. I place it only on two apple-espaliers, and a board. Early in the year *Agrotis exclamationis*, *Noctua xanthographa*, *Triphæna pronuba*, and *Xylophasia polyodon*, came literally by hundreds; and later in the season *Polia flavocincta* was nearly as common. At this time *Anchocelis pistacina* is the common frequenter of the trees. I have taken during the past three months—*Amphipyra Tragopogonis* (common), *Catocala nupta*, *Agrotis puta* (a very dark series), *Xylophasia lithoxylea*, *Xylina rhizolitha*, *Acronycta Psi*, *Miselia Oxyacanthæ*, *Xylina semibrunnea* (three specimens), *Agrotis saucia*, and some beautiful varieties of the very variable *Anchocelis pistacina*. A fat larva of *Triphæna pronuba* visited one tree regularly every night for a week, and enjoyed its luscious drop as much as the perfect insect. I may add to the notes respecting *Sphinx Convolvuli* that I have added one fine specimen to my collection this year, caught in Wales; and that Mr. Dove, of the County Asylum near, has caught two or three. I saw one more, which was not taken.—*H. W. Livett; Wells, Somerset, October 11, 1875.*

Deiopeia pulchella near Paignton.—Yesterday, September 24th, I had the pleasure of taking another specimen of *Deiopeia pulchella*, a rather worn female, at Salterne Cove, near Paignton. As I felt certain of capturing it, when I once saw it, I watched its habits for ten minutes or so. The afternoon was bright, and the insect was flying about, and settling continually on the flowers of *Eupatorium cannabinum*, which grows in profusion at Salterne Cove. I kept the insect alive to see if it would lay any eggs, but it has died in the course of last night. Including the specimen I took on the 25th September, 1874, this is the third *Deiopeia pulchella* I have taken within a circle of a hundred yards, and within seven days of each other,—September 18th, 24th, 25th.—*J. A. Lilly; Collaton Parsonage, Paignton, South Devon, September 25, 1875.*

Deiopeia pulchella at the Land's End.—On the 17th of

September a gentleman who was with me caught a specimen of *Deiopeia pulchella* flying at dusk on the cliffs near the Land's End, Cornwall; and, by searching near the same spot, I myself subsequently caught three more,—two on the 20th, and one on the 22nd September. All four specimens are in fine condition, and appear as though lately emerged from the chrysalis.—*Annie Michael*; 3 & 4, *Great Winchester Street, London, E.C., September 28, 1875.*

Deiopeia pulchella at Bournemouth.—I have to record the capture of *Deiopeia pulchella* on the coast of South Hampshire. Two were taken, and another seen, by the daughters of Lady Hester Leeke, who kindly presented me with one of them. Lady Hester has also sent me the following note on the subject:—"The first was taken on the grass-plot before the house at West Cliff, in the afternoon of September 16th; and the second on the East Cliff, near Boscombe Chine, among the tufts of stunted vegetation near the edge of the cliff, also in the afternoon, about three days after the capture of the first. They fly very slowly near the ground." The spots upon the fore wings of both specimens are much smaller than in the few foreign specimens I have seen; but such a variation is, I believe, not uncommon amongst continental examples of this beautiful, and until of late years very rare, British species. A friend informed me some time since that the species is very common in some parts of India.—*G. B. Corbin.*

Deiopeia pulchella and *Epione vespertaria* at Waltham Cross.—On the 19th of September last, when on the look-out for *Colias Edusa* and *C. Hyale* in a clover-field here, I took a specimen of *Deiopeia pulchella*. It is quite perfect and very fresh, apparently only just emerged from the chrysalis. It was flying heavily, settling occasionally on the heads of clover. On the previous afternoon I caught a male *Epione vespertaria* in the same field, at rest on a piece of wood; unfortunately its wings are somewhat crumpled. I believe this is a new locality for both species.—*Arthur W. Paul*; *Waltham Cross, October 4, 1875.*

Deiopeia pulchella in Devonshire.—A female specimen of *Deiopeia pulchella* was taken on the wing, on the afternoon of October 2nd, in Challice's nursery here.—*J. Purdue*; *Ridgeway, Plympton, Devon, October 19, 1875.*

Captures at Sugar.—During August and September I captured the following insects at sugar in this locality:—*Thyatira derasa*, several; *Cymatophora diluta*, commonly; *Leucania conigera* and *Nonagria fulva*, a few; *Hydræcia nictitans*, commonly; *H. micacea*, a few; *Cerigo cytherea*, commonly; *Apamea fibrosa*, two; *Agrotis puta*, very abundantly; *A. aquilina*, commonly; *A. ravida*, commonly; *A. pyrophila*, several; *Triphana fimbria* and *T. interjecta*, common (the latter particularly so); *Xanthia citrigo*, *X. cerago*, and *X. silago*, commonly; *Xanthia gilvago* and *Cirrædia xerampelina*, several; *Tethea subtusa*, four; *Cosmia diffinis* and *C. affinis*, extremely common; *Polia flavocincta*, two; *Heliothis armiger*, one; *Catoeala nupta*, several. They were all taken in the same locality, the sugar being laid upon sixteen trees in a road facing a wood.—*A. J. Spiller; Stanstead, Bishops Stortford.*

Captures at Sugar: Xanthia aurago, Epunda lutulenta, &c.—I commenced sugaring early in June; but until September with little or no success, the result being nearly always the same,—“a beggarly account of empty boxes.” In September, however (which was here a month of most glorious weather), things changed for the better; and as the species I took are somewhat local I think them worth recording:—September 13th, one *Epunda lutulenta* (female); 17th, two *Xanthia aurago*; 18th, four *E. lutulenta* (two males and two females) and three *X. aurago* (including a very beautiful variety, the median portion of the fore wings being so thickly sprinkled with crimson-purple scales as almost to obliterate the usual orange; this colour is quite distinct from the ferruginous purple bands at the base and hind margins); 22nd, one *X. aurago*; 24th, three *X. aurago*, one *E. lutulenta*, one *Agriopsis aprilina*, and one *Calocampa exoleta*. It is rather strange, but in this particular locality *X. aurago* is more abundant than either *Xanthia cerago* or *X. silago*. I omit all reference to the “ignobile vulgus,” such as *Anchocelis litura*, *A. lunosa*, *A. pistacina*, &c., which were only of too common appearance.—*Joseph Anderson, jun.; Alresford, Hants.*

Captures at Newton Abbot.—I have received a very fine specimen of *Xylina semibrunnea*, and also a specimen of *Sphinx Convolvuli* (taken in a stable, dead), from Bagtor, a

little village on the borders of Dartmoor. I have also had the pleasure of capturing three more *Xylinea petrificata* at Newton Abbot.—*Charles G. Vicary; Knowles, Newton Abbot, Devon, October 22, 1875.*

Xanthia aurago near Willesden.—On the 18th September, in company with Mr. A. Priest, I sugared an open fence near Willesden Junction, and was rewarded with a fine specimen of *Xanthia aurago*, an insect I did not expect to meet with so near London.—*C. Seabrook; Marlborough Square, Chelsea, September 22, 1875.*

Cirrædia xerampelina in Scotland.—I took a good specimen of *Cirrædia xerampelina* here, on the night of the 30th August last, at sugar.—*Robert Service; Maxwelltown, Dumfries, N.B., October 1, 1875.*

Cirrædia xerampelina at Hendon.—In the autumn I am in the habit of sugaring the foliage of pyramid yews, *Arbor vitæ* and other shrubs, as I find that insects come more freely at this period of the year to sugar when laid so, than when spread on the trunks of trees. It was on a yew so baited I had the pleasure of taking a fine pair of *Cirrædia xerampelina*; one, a female, on the 7th of September, and on the 8th a male on exactly the same spot. *Xanthia gilvago* has been rather common here this season.—*R. South; Goldbeater's Farm, Hendon.*

Eremobia ochroleuca in Cambridgeshire.—I see that in Newman's 'British Moths,' Brighton and Lewes in Sussex, Bristol, Suffolk, and Yorkshire, are the only localities given for *Eremobia ochroleuca*. I took two or three specimens about the middle of August, some five or six years ago, at Gamlingay, in Cambridgeshire; they were flying about thistles and other wild flowers by day. I saw several others, but did not take them.—*John T. Sarll; 8, High Street, Camden Town, October 7, 1875.*

Ennomos fuscantaria.—On the evening of September 22nd I took from the street-lamps two specimens of *Ennomos fuscantaria*; one in good order; the other was unfortunately spoiled in boxing.—*Joseph Anderson, jun.; Alresford, Hants.*

Catocala electa at Brighton.—On the 24th of September I had the good fortune to take at sugar, about eight miles from Brighton, a specimen of *Catocala electa*, which I think

is the first recorded British capture. It was taken in a strong south-west wind, off an elm-tree, about eight o'clock. It is now in the possession of Mr. Meek, of Brompton Road.—*A. Vine; Temple Street, Brighton, October 15, 1875.*

[Mr. Meek writes as follows:—"When at Brighton last Saturday I bought what I supposed to be a *var.* of *Catocala nupta*; but, upon comparison with a European collection, I find it is *Catocala electa*. What a grand addition to our list! I may add that Mr. Vine is a gentleman in whose statement I have the fullest confidence. The moth was also seen, when scarcely dead, by Mr. Trangmar, Mr. McArthur, and others, who all thought it an extraordinary *var.* of *Catocala nupta*.—*E. G. Meek; 56, Brompton Road, S.W., October 14, 1875.*"]

Acentropus niveus at Sheerness.—In the middle of August last I found this insect in great abundance at a locality where it was scarce in 1874. There were hundreds of dead specimens floating on the water, accompanied by many apparently half-dead. Living examples clung to the reeds, or to any weeds which raised them so much as a head out of the water; and at dusk they were to be seen flying in all directions close to the water. The easiest mode of capture was to turn over some stones which lay at the water's edge, when as many as a dozen or twenty might be seen on a single stone. With one exception, the specimens that I set are of uniform size. The ordinary size is less than half an inch, but one female specimen measures nearly an inch. I searched carefully for more large examples, without success.—*J. Platt Barrett; 34, Radnor Street, Peckham, October 12, 1875.*

Vanessa Antiopa near Norwich.—On the 9th of August a fine specimen of *Vanessa Antiopa* was taken by a gardener in a greenhouse at Thorpe, Norwich.—*J. Parker; 6, Surrey Terrace, Norwich, October 25, 1875.*

Astynomus ædilis at Cardiff.—On the 29th of November last I had the good fortune to take a fine male specimen of *Astynomus ædilis* upon a lady's dress in a tram-car. The antennæ are very fine. Is this a common beetle?—*T. L. Howe; Cardiff, October, 1875.*

[It is common in Scotland, not in Wales.—*E. Newman.*]

Correction of an Error.—I wish to correct an error made by me in advertising my capture of *Hadena peregrina* (*Entom.*

viii. 229). My specimen proves to be only a pale variety of *Proteus*. It was quite an oversight of mine recording the capture, as I had not previously compared it with examples in my cabinet; and the plates of *Proteus* in Newman's 'British Moths' are quite different to any I have ever seen of the latter species. Indeed, I should have believed the plates to represent a different insect.—*W. Thomas; Surbiton Villa, Surbiton, October 6, 1875.*

[I fear that others of Mr. Thomas's captures have been incorrectly named. I need hardly point out the necessity for greater care.—*Edward Newman.*]

Answers to Correspondents.

John Bristow and Arthur W. Paull.—Pear-tree Slug.—This is a matter which may prove interesting to your readers, and concerning which I should be glad to have information. A friend of mine, living near Belfast, informed me that his pear-trees were being destroyed by an insect which neither he nor his gardener had ever seen before. In two large gardens almost every pear-tree was attacked, while plums, peaches, &c., even though their leaves withered, were untouched. On examination I found the leaves covered with what at first sight appeared small leeches, about half an inch long, of a shining, dark olive-green colour, almost black; the head was swollen; and the tail, at its extreme point, generally slightly raised from the leaf. The whole insect was covered with a dark slime, that gave it the appearance of a leech, neither legs nor distinct head or mouth being visible. On rubbing one of the insects, however, I found the slime rubbed off, and revealed a larva, with distinct characteristics of that of a sawfly. The leaves are denuded of their soft cuticle, both on upper and under side, and the brown skeleton of fibre alone left. When feeding, the larva is at full stretch, apparently adhering as close to the leaf as a leech or slug, and no appearance of head, the shining slime covering all. Can you inform me of what species this is; or if it has been observed in such destructive numbers elsewhere?—*J. B.*

[The creature is the very objectionable pear-tree slug, of which an account will be found in the current number. I am indebted to the courtesy of Mr. Arthur W. Paull, of Waltham

Cross, so celebrated for his roses, for a supply of these slugs, feeding on the leaves of pear, cherry, and service.—*Edward Newman.*]

J. E. Sharp.—*English Names.*—If you could kindly tell me the English appellations of the following you would greatly oblige:—*Spilodes palealis*, *Argymnis Niobe*, *Catephia alchymista*, *Penthina sauciana*, *Notodonta palpina*, and *Lithosia quadra*. Also if you can inform me where I could obtain a list of English and Latin names of butterflies and moths.—*J. E. S.*

[*Notodonta palpina* is called the “pale prominent;” *Lithosia quadra*, the “four-spotted footman;” and *Catephia alchymista*, the “alchymist.” These names seem to border on the nonsensical, and had better be discontinued. The others do not appear to have received English names.—*E. Newman.*]

Geo. T. Porritt.—*Duplicate Descriptions of Larvæ.*—A few months ago you told me you never published descriptions of larvæ of species which had previously been described in the ‘*Entomologist*’ by yourself. Your September number (*Entom.* viii. 194) contains a description of that of “*Emmelesia decolorata*,” by the Rev. G. A. Smallwood, and you will find full description of it by yourself, from specimens I sent you, in the August or September number, 1867. The same thing has occurred several times before; with *Lobophora hexapterata*, for instance.—*G. T. P.*

[I am greatly obliged to Mr. Porritt for the courteous manner in which he has pointed out this oversight. I had completely forgotten the two prior descriptions to which he refers. There is, however, some difference between the two gentlemen. Mr. Smallwood had evidently overlooked the fact that I had supplied the omission in ‘*British Moths*’ by publishing a full description of the larva of *Decolorata* at page 325 of vol. v. of the ‘*Entomologist*,’ whilst some, at least, of Mr. Porritt’s descriptions appeared to be *advisedly* duplicate. Be this as it may, I must express my decided objection to duplicate descriptions of the same object in the same journal; and I hope Mr. Porritt will accept this view, seeing what a multitude of objects and of facts still await a chronicler.—*Edward Newman.*]

C. A. Harris.—*Larva of Acronycta Alni. Dog-tick.*—The

larva is certainly that of *Acronycta Alni*, much shrunk owing to the exhausting operations of the parasites preying on its vitals. The parasites are a species of *Anthomyia*, probably that called *Musca Larvarum* by Linneus. The other insect is *Ricinus Canis*, the common dog-tick; of course it has no connection with the *Acronycta*.—*E. Newman.*

Henry J. Slack.—*Moth with Perforating Maxillæ.*—Last year Mr. McIntire presented to the Microscopical Society a slide containing the antlia of an unknown moth, with the extremity adapted for perforation. The 'Comptes Rendus' for August 30th, 1875, gives a paper by M. Künckel on "Perforating Lepidoptera," with figures of the auger-like proboscis of Australian *Ophideres*. The paper refers to an account given in the 'Capricornion,' published at Rockhampton. I can learn nothing of this magazine, which I suppose from its name is issued in tropical Australia. I shall be much obliged if you can tell me whether any English moths have perforating proboscis, or any others you may be acquainted with. I fancy that, as many entomologists are not microscopists, such a piece of apparatus may have been overlooked. The mounters of objects usually select insects easily obtained, and we may have some like the *Ophideres* in the respect mentioned. The *Ophideres* are reported to attack oranges.—*H. J. S.*

[I have not seen the paper in the 'Comptes Rendus' to which my correspondent refers, nor do I know any instance of an English moth possessing perforating maxillæ; still I am by no means disposed to deny or doubt the existence of such a structure. Turning to Westwood's 'Modern Classification,' I cannot find any notice of this peculiarity; and I think that most industrious and praiseworthy compiler would scarcely have overlooked, or failed to repeat, such a record, had one existed prior to 1840,—the date of his great work. Notwithstanding this apparent absence of record, there is nothing improbable in the statement. I must here call attention to the universal belief, repeated by Westwood (Classification, ii. 498), that "the mouth of Diptera is formed only for imbibing fluid matter;" and contrast this with what I have stated to be the truth, as shown by Müller, Bowerbank, Deane, Bennett, and a host of others, and corroborated by my own observations, that all those Diptera, supposed to frequent

flowers for the sake of honey, as Syrphidæ, Eristalidæ, &c., are purely pollen-eaters, and subsist on the hard, dry, pollen granules, produced so abundantly by our autumnal flowers. I cannot avoid concluding that our microscopists have never examined the contents of the abdomen of a Syrphus, stuffed, as it often is, like a pincushion, with perfectly dry pollen. I fully unite with my correspondent in regretting that many entomologists are not microscopists,—doubtless entomologists should utilise the microscope more extensively; but I must couple my lamentation with a wail equally heartrending, that many microscopists are not entomologists, or we should never have waited until 1873 to learn a fact so very patent as that the flower-loving Diptera feed on pollen. Let us help one another, and both will receive the benefit.—*E. Newman.*]

S. von Stürmer.—*What to look for.*—Two or three of us, young as collectors, take in the 'Entomologist,' and it is most interesting, but its records are all of the past. I would suggest that some hints as to what to do, or what one may expect for the time of year, be made for the coming month, or rather the month of publication. I do not mean a perfect list, for that would be impossible, but some of the more common and larger insects. This would be I know a great boon to many.—*S. v. S.*

[I would suggest the purchase of 'Merrin's Calendar,' which shows what may be expected every month.—*Edward Newman.*]

Mrs. Newhouse.—*Name of a Moth.*—Mrs. Newhouse will be obliged if Mr. Newman will kindly name the moth, half of which is enclosed.

[*Euplexia lucipara.*—*E. Newman.*]

Millière's Work.—I bought, at the late Mr. Henry Doubleday's sale, Millière's 'Iconographie et Description de Lépidoptères et Chenilles Inédits.' Nos. 24, 27, 28, 30, 31, 32, 33, and 34, are missing. If any of Mr. Doubleday's friends have these numbers, and do not want them, will they communicate with me?—[*Rev.*] *H. Harpur Crewe; Drayton-Beauchamp Rectory, Tring, October 7, 1875.*

West London Entomological Society.—The Third Annual Exhibition of the above Society will take place in the

Church Room of St. Mark's Institute, George Street, Oxford Street, on the evenings of the 2nd and 3rd December, from 6 to 11 o'clock P.M.—*E. W. Timms; Secretary.*

Haggerston Entomological Society.—The Annual Exhibition of this Society will be held in their rooms at the 'Brownlow Arms,' Brownlow Street, Haggerston, on the evenings of Thursday and Friday, November 11th and 12th, from 7 to 11 P.M. All entomological friends are invited to attend; the first evening being specially reserved for them. Anyone wishing to exhibit will kindly send their exhibitions on or before Thursday evening, November 11th, to the Secretary, Mr. Bartlett, at the above address.

Leeds Naturalists' Field Club, and Scientific Association.—At the one hundred and eighty-ninth meeting of the above Association, September 15th, 1875, Henry Pocklington, F.R.M.S., President, in the chair, Mr. James Abbott reported the capture of *Colias Edusa* on the 5th September, on the Otley Road, near Adel Dam, five miles north of Leeds. The insect was identified by Mr. W. E. Clarke. Other members reported that a specimen of *Vanessa Antiopa* had been taken about a fortnight ago in the neighbourhood of Kirkstall Road, Leeds, and was now in the possession of Mr. C. W. Liversedge.

Death of Mr. Charles Tester.—It is with sincere regret I record the death of Charles Tester, of Balcombe. He died at his residence, Sherlock's Farm, on the 17th of September, at the age of forty-eight, after a very few hours illness. Mr. Tester never went far from home in search of insects,—Brighton and Lewes being the longest journeys he ever made,—but he worked his own locality well. In his youth he met with a sad accident by the bursting of a gun, which caused the amputation of his left hand; shortly after which his brother shot his right hand off, thus leaving him in an almost helpless state; but by various ingenious inventions he could manage to use a net and cyanide-bottle; and we have to thank him for most of the British examples of *Dicranura bicuspis*, *Sesia sphaeciformis*, *Notodonta carmelita*, *Noctua ditrapezium*, and *Cucullia Gnaphalii*.—*E. G. Meek; 56, Brompton Road.*

THE ENTOMOLOGIST.

No. 150.]

DECEMBER, MDCCCLXXV.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 255.)

32. *Aphilothrix collaris*, Hart.—This inconspicuous brown gall grows in the axils of the leaves of *Quercus sessiliflora*. It is hard, smooth, spherical or oval, and is, when mature, two to three millimetres long, and at the end generally more or less conically pointed. In well-developed specimens there lies directly underneath the cone a shallow, zonal impression, which is frequently conspicuous from its lighter or darker tinge. One half, or rather more, of the gall is surrounded by the bud-scales. Some specimens are pale yellow, and entirely, or almost entirely, surrounded by the bud-scales, only showing their blunt point: very likely these are such as are inhabited by parasites. I do not know whether the fly has been bred by anyone except Hartig. Schenck states that the gall remains in the bud after the fly escapes. It is, however, doubtful whether this is always the case, for Schenck only found the galls in small numbers, and never bred the fly.—*G. L. Mayr.*

What I believe to be the gall of this species I have found in Kensington Gardens, London, and bred the gall-flies, but unfortunately lost them. Since being in Essex I am not satisfied about this and the preceding species. *Synergus nervosus* and *S. palliceps* are its inquilines; and Kaltenbach gives *Eurytoma verticillata* as its parasite.—*E. A. Fitch.*

Fig. 32.



a. *A. COLLARIS*
in situ.

b. Detached
and magni-
fied.

c. A section
cut through
the bud-
scales.

33. *Aphilothrix callidoma*, Hart.—This beautiful spindle-shaped and long-stalked gall breaks forth from the axils of *Quercus pubescens* in such a manner that the small bud,

Fig. 33.



a. *APHILOTHRIX CALLIDOMA* in situ. b. Detached. c. A section of the same.

from the point of which the thin pedicle proceeds, is not altered externally. The gall is about the size of a barley-corn, either short or long spindle-shaped. Its surface is green or red when recent; later on it becomes reddish brown, and exhibits a few or many either sharp or indistinct longitudinal striations. However, in some specimens there is not a trace of these striations to be detected. The top of the gall is marked, and terminates in a wart or short cone: it has a yellow-brown colour, and is bald; the remaining part of the gall and the foot-stalk are scantily covered with moderately short, white, deflected hairs. Sometimes one meets with specimens in which the thin stalk is rather short, and the basal half of the spindle very long, with the upper half, however, very short. In the section the cell appears as a large, longitudinally oval cavity, bordered by a thin, white, inner gall, which is on all sides conterminous with the substance of the gall; above and beneath this inner gall is found a brown reticulation. According to Dr. Giraud's observations the galls are found from the month of July to October, and the earliest fall off, whilst others are only beginning to develop themselves. I have myself only found them once late in the autumn.—*G. L. Mayr.*

This gall was first described by Malpighi; and Hartig did

not breed the Aphilothrix, although he once met with the larva; Giraud being the first to describe the perfect insect, and he only had two galls, out of some thirty or forty, which produced the proper gall-maker, the others being infested with Synergi, of which Dr. Mayr gives two species as inhabiting these galls, *viz.* *S. nervosus* and *S. vulgaris*; Ratzeburg says *Siphonura brevicauda*, *Nees*, was bred from them by Hartig. I found one specimen of this very remarkable gall last July (1874) at Rayleigh, but failed to meet with others. See *Ent. Mo. Mag.* xi. 110.—*E. A. Fitch.*

A Month's Entomologising in North Kent.

By W. H. TUGWELL, Esq.

A MONTH in the country! This may seem a small matter to many of my favoured "brothers of the green-gauze net;" but to a pent-up Londoner it is a weighty and anxious question to settle, where he will fix his tent for his annual campaign; and, having in successive years tried the New Forest, Isle of Wight, Devonshire, Dorset, and Sussex, this July, 1875, I determined to try my own county, *viz.* North Kent, and endeavour to get a new series of *Apatura Iris*, which lordly species I had not taken since 1858; so having secured some comfortable rooms at a farm-house, in a very wooded district between the Thames and Medway, on July 6th I arrived at my intended hunting-grounds. A few miles walk across country, on a hot July morning, had prepared an appetite for an inside-lining of sandwich and the juice of the grape. I sat down on a gate at the entrance of a wood to discuss these animal necessities, and complete for the nonce my mundane happiness by a pipe—when, lo! sailing grandly overhead came his imperial majesty, displaying proudly, it would seem, his newly-acquired purple robes, and settled a few feet above my head on the outer branches of a young ash. I could only sit and contemplate his imperial majesty, and enjoy the sight of his rare beauty as he sat on his leafy throne, as at the moment I was quite unprepared to invade his sylvan retreat, having only a very short-handled net at hand. During my stay, however, I had the pleasure of taking fourteen,—seven males and seven females. The

weather during most of the month was most unpropitious for collecting, we having such continued rain and wind, which not only prevented work, but soon spoiled the condition of most insects. All the male *Apatura Iris* I took were more or less damaged, but the females were in fine order. This species continued on the wing the month through, that is to say, when the weather would permit. I captured a male on the 31st. I got eggs from two females, but unfortunately they proved infertile. Catching *Apatura Iris* is most exciting work, but it involves a great waste of time, as one has to wait the coming of their majesties, and this year they were scarce,—some days not one would be seen,—and a long ash-pole is not a convenient thing to collect with generally.

The exquisite little *Nola albulalis*, too, was one of my objects of search, and I succeeded in taking it in splendid order; and when really fine it is extremely pretty. I failed, as did everyone else, to find it in the numbers Mr. Porritt reported last year; this season Mr. Porritt only secured nine or ten specimens in his week's stay. I found this species particularly influenced by weather,—the slightest fog or north-east wind and you may as well go home, for not a specimen will rise, although I could take them when the underwood was saturated with heavy rain.

A striking feature to me was the absence of any of the fritillaries: the only species I saw during my stay was *Melitæa Athalia*, and of that very few indeed; possibly that species was over. *Thecla W-album* was common, but soon out of condition, owing to the wet and wind. The autumn brood of *Lycæna Argiolus* was just out as I left. The common *Vanessidæ* and *Satyrs* comprised the *Diurni*; in fact this group was but poorly represented.

The wet, cold weather seemed propitious for sugar, as I never experienced such a numerous attendance at my ambrosial banquets before; many species absolutely swarmed. I have counted over fifty *Rodophæa tumidella* on one tree, beside hosts of others. Although I got nothing especially rare, I secured a fine series of many good things: *Lithosia quadra* was a rare visitor; *Mamestra abjecta*, I got but one; *Agrotis ravidæ*, a fine series; *Triphæna fimbria* was most abundant, and in every shade of brown from palest to

darkest; *Agrotis nigricans*, too, was in splendid variety; *Thyatira batis*, *T. derasa*, *Acronycta Ligustri*, *A. Rumicis*, *Cosmia affinis*, *Amphipyra Tragopogonis*, *Noctua triangulum*, *Gonoptera libatrix*, and *Epunda viminalis*, were common; whilst *Xylophasia polyodon*, *Triphæna pronuba*, *T. orbona*, *Agrotis Tritici*, *Apamea oculea*, *Miana strigilis*, and *Cosmia trapezina*, jostled each other for standing-room,—it was a sight to see them. The following better things, too, were less abundant:—*Hypenodes albistrigalis*, *H. costæstrigalis*, *Pyralis glaucinalis*, *P. fimbrialis*, *Phycis roborella*, and a few extremely fine *Toxocampa pastinum*. I certainly never saw sugar so attractive before.

The underwood being so much soaked by rain made it bad for beating and for getting *Geometræ*. However, I obtained *Limacodes Testudo*, *Nola strigula*, *Cidaria picata*, *Pericallia syringaria*, *Melanthia rubiginata*, *Eupithecia plumbeolata*, and *E. tenuiata*; the local *Acidalia rusticata* was not rare in its peculiar spots; *Acidalia inornata* deposited me sixteen eggs, from which I obtained sixteen imagos this October,—this appears contrary to rule; and from a batch of eggs of *Acidalia emutaria*, from the Gravesend marshes, I reared a fine series, only five weeks in larva, and imagos produced early in September, although a few of the same batch are hibernating as larvæ.

Of the *Tortricina* I only met with the following:—*Tortrix transitana*, *T. corylana*, *Dichelia Grotiana*, *Leptogramma Boscana*, *Peronea Schalleriana*, *P. variegana*, *P. tristana*, *Lællingiana*, *Penthina ochroleucana*, *Antithesia salicana*, *Phtheocroa rugosana*, *Pædisca profundana*, *Argyrolepia æneana*, *Eupœcilia angustana*, and *Cochylis inopiana*: the beautiful *Pterophorus rhododactylus* was difficult to get in any number; so many larvæ had been collected that the species was and probably will be, year by year, a more scarce insect. It is well to know the life-history of all species, but at times it may not be an unmixed good, as it entails, in many instances, an almost entire destruction of a species, by too closely working it in its larval state.

Had the weather been more propitious I should doubtless have had better sport; but I returned from my trip well pleased with North Kent as a collecting-ground.

W. H. TUGWELL.

3, Lewisham Road, Greenwich.

Recreations of a Country Doctor concerning Sugaring.

By H. W. LIVETT, M.D.

It was about the year 1830 that I met with and was enchanted by Rennie's books in the Library of Entertaining Knowledge,—‘Insect Transformations,’ &c. From that time to the present (with, I am sorry to say, an *hiatus* of some twenty years) I have been a collector, though still but a “discipulus,” as quaint old Izaak Walton says. One reason why I have not attained the rank of “magister” may be because I have not known anyone near of kindred taste with whom I could work and learn; but the principal hindrance has been my limited opportunities, owing to the engrossing nature of my profession,—one which of necessity occupies nearly all one's time, often Sundays as well as working-days.

With what envy have I read from time to time of expeditions to the New Forest or other favoured localities, with the long lists of consequent captures; of the “happy hunting-grounds,” where larvæ of the most desirable species would tumble into your umbrella at each tap of the beating-stick; or where the graceful Camilla might be seen “skimming lightly o'er the plain;” where *C. Edusa* and *Hyale* might congregate; or even the great emperor himself might royally disport, delighting the eye and quickening the pulse of the would-be captor! But to me—occupied most of the day, and of necessity at home when not so occupied, with holidays very few and far between—such delights were only to be read of and dreamt about, not to be enjoyed. Doubtless there must be many an aspirant to entomological knowledge with like limited opportunities;—for the encouragement of such I write this paper.

I live in a small city,—a *rus in urbe*, certainly,—and in which most of the private houses have gardens attached: my own is a fairly good one, and in it I have taken many species, some rare. In 1868 we took eight specimens of *S. Convolvuli*, hovering over a small bed of petunias less than three feet in diameter; and all of which specimens, I may note by the way, were seen at exactly the same time on the five or six evenings they appeared, *viz.* just at twilight. I took in 1872 a specimen—the only one I ever saw—of *D. rubiginea*, on the berries of a yew on the lawn. *C. sponsa* and *G. erythrocephala*—the last an especial great take—fell victims to their

liking for sugar; and of this year's captures I will now proceed to speak.

I may premise that I brush my sugar—made into syrup with beer, and flavoured with rum—at about sunset on two espalier apple-trees, standing some few yards apart. I brush it in one continuous streak, from about five feet high to within a foot or two of the ground: from this some thin lines of the syrup will run, on which many moths will settle in preference. I have read much of favourable nights,—calm, dark, warm, moist; I cannot say that I have found any kind of night peculiarly favourable or otherwise. My most successful night of the later part of this season was on the 16th of October, when the moon, nearly full, was shining brightly; the wind north-east, and a good deal of it; the thermometer lower than usual (it fell to 35° that night): and yet I took eight or nine species, including three *X. semi-brunnea*, and *C. exoleta* and *A. aprilina*.

I began to sugar early in August, and took my last moth November 3rd. At the commencement I did not possess one of those useful oval zinc boxes which I subsequently procured, but only a cyanide bottle, yet with this I missed very few. I took in it three *C. nupta*, though how so large a moth got in without injury is a mystery. The last month I have used the oval box, with bruised laurel-leaves, adding to them a little chloroform just before using, as I find the moth drops in more readily on account of the vapour, and is almost instantly rendered quiet, if not insensible, so that the box is ready for another capture. I have taken eight or ten insects at one visit quite rapidly; and if a small piece of leno be put into the box, the moths catch their feet in its meshes, and do not injure each other. To prevent the stiffness consequent upon death by chloroform, I put the captures I wish to retain, after examination, into a relaxing box, *i.e.* a mustard-tin, containing bruised laurel-leaves covered with leno, and give the rejected ones a chance for their lives by placing them on the grass, and I find that they nearly all recover. Whether their narrow escape renders them tectotallers for ever after, I have not ascertained. I fear not, unless they are much more virtuous than the genus *homo*.

The species I have taken in the three months on the two trees are as follows:—

T. batis, one; *B. glandifera* and *B. perla*, common;

A. tridens; *A. Rumicis*; *L. lithargyria*, plentiful; *L. straminea*; *A. putris*; *X. lithoxylea*; *X. polyodon*, dozens; *A. oculea*; *M. strigilis*; *C. cubicularis*; *A. puta*, a dark series; *A. suffusa*; *A. saucia*; *A. segetum*; *A. exclamationis*, dozens; *A. nigricans*; *T. janthina*; *T. orbona* and *T. pronuba*, dozens; *N. augur*; *N. plecta*; *N. C-nigrum*, common; *C. Rubi*; *C. xanthographa*, dozens; *T. cruda*; *O. macilenta*; *A. pistacina*, dozens; *A. lunosa*, plentiful; *C. spadicea*, a few; *S. satellitia*, common; *X. ferruginea*, common; *P. flavocincta*, dozens; *M. Oxyacanthæ*, many; *A. aprilina*; *P. meticulosa*, common; *X. lithoriza*; *C. exoleta*; *X. rhizolitha*, many; *X. semibrunnea*, eight; *A. Tragopogonis*, common; *C. nupta*, three; besides a few Geometers and Pyrales.

The interest attached to sugar capturing is certainly great,—something similar I should imagine, “*parva componere magnis*,” to that of the sportsman in the East, who cannot tell what noble game may leap out of the tangled jungle at any step; so on a dark night, when the moth-hunter proceeds with “stealthy steps and slow” to the sweetened tree, and turns on the light, he cannot tell what almost unknown rarity may possibly delight his eyes and reward his pursuit; and even some of the more common insects—*M. Oxyacanthæ* or *C. diffinis*, for example—appear, I think, more beautiful under the lamp than at any other time. I know that when I saw *C. exoleta* the other night, under such circumstances, I could not imagine what grand prominent I was beholding,—with his full crest and closely shut-up wings he was exactly like some important member of that family.

But it is quite time that I should conclude this gossipy paper. Scientific entomologists and practical collectors may think it, I fear me, not worth the space it occupies. I trust there are some, like myself—collectors under difficulties—to whom this paper may afford some measure of encouragement when they see how much may be done with but limited means and space at command.

Should there be a locality where *A. pistacina* and *P. flavocincta* are not plentiful, it will give me much pleasure to send any applicant a few, as long as I have any, if he will first send me a post-card. If he receives no reply he must consider that my stock is exhausted.

H. W. LIVETT.

Wells, Somerset.

PS.—It was a stormy night last night, November 7th, much wind and rain. I did not sugar, but went up to look at the trees, expecting nothing,—when lo! a fine and perfect *Dasy-campa rubiginea* was my reward. I felt confident that I ought to find the species, but feared the season was too far advanced.—*H. W. Livett.*

Entomological Notes, Captures, &c.

Description of the Larva of Eupithecia togata.—On the 6th of September Sir Thomas Moncrieffe, Mr. W. Herd and I started for a locality where *Eupithecia togata* has occurred tolerably freely, with a resolute determination not to return home till we had found the larva and made ourselves thoroughly acquainted with its food-plant and habits. The perfect insect always occurs in the neighbourhood of spruce fir-trees; to the spruces we therefore directed our attention. Long did we carefully scan the twigs; diligently did we beat the boughs, but all in vain. "Bother the larvæ!" we all exclaimed. We stood together racking our brains, and staring up into a tall spruce. "I've got it!" we almost simultaneously cried out; "they are in the cones." "I'll go up," said Mr. Herd; and up he went, and soon began to pelt us with cones. Amongst them were several from which a copious quantity of fresh frass was protruding. These were quickly laid open with a sharp knife, and very soon a lively, fat, pinkish-looking larva, very like a miniature *Cossus ligniperda*, was disclosed to view, which I at once recognised to be *Eupithecia togata*, from a beautiful drawing which Mr. Buckler executed for me several years ago, from a larva reared on young shoots of spruce, from eggs laid by a captured female. A further search revealed sundry other larvæ: in one fresh fallen cone we found no less than seven of various sizes. They feed between the scales of the cone, upon the ripe seed at the base. The larva is a uniform dull pink, more or less clouded and spotted with black on the dorsal segments. Some of the smaller and younger specimens were very dingy. The head is black, with two small white dots at the base; on the neck are two conspicuous black dots. When full fed it quits the cone, and spins a

slight cocoon on the surface of the earth. The pupa is bright red, and resembles that of *Eupithecia subfulvata*. Another somewhat similarly-coloured larva, apparently that of a Tortrix, feeds inside the cones in company with that of *Eupithecia togata*. Sir Thomas Moncreiffe believes it to be *A. strobilella*.—[Rev.] *H. Harpur Crewe; Drayton-Beauchamp Rectory, Tring, November 1, 1875.*

Paucity of Wasps; Destruction of Fruit by Bees.—I have observed that the bees have been to the full as destructive to the fruit as wasps are in ordinary years: figs, peaches, plums, and pears, have been entirely eaten away by them. Can there have been any failure in the honey from the flowers this year? or is it only the presence of the wasps that keeps away the bees from the fruit in ordinary years? Last year our honey was all eaten, and our bees nearly destroyed by the wasps. Queen wasps were, as you observe, very abundant in the spring; still this paucity of wasps is partial. A fortnight ago I was staying with a friend about five miles to the north of Launceston, and I never saw wasps more abundant than they were there.—[Rev.] *G. C. Green; Modbury, South Devon, October 4, 1875. [From the 'Field.']*

[There is no doubt that the past autumn has been remarkable for both these phenomena. I have received fifty-one letters on the first subject, and the daily papers have teemed with communications on the second. In the spring of this year queen wasps were observed in unusual numbers; and it was generally supposed that the workers would be proportionately abundant in the autumn. This has not been the case; but, on the contrary, wasps have been either fewer than usual or entirely absent. Cornwall, Dorsetshire, Devonshire, Norfolk, Nottinghamshire, Somersetshire, Suffolk, Surrey, and Sussex, have generally enjoyed immunity from the visits and depredations of wasps; while from one locality in Essex, and two in Kent, the number appears to have been as large as usual; and from several localities in Lancashire, Yorkshire, Durham, and Northumberland, greater abundance than common has been reported. In the garden of Her Grace the Duchess Eleanor of Northumberland bottles baited with sugar and water were found to be almost filled with wasps; and the contents of two of these bottles were counted, and found to be respectively nine hundred and one thousand two

hundred wasps. Mr. Higgins, Her Grace's gardener, also states that one hundred and three nests have been taken within a circle of one mile from the Hall. With regard to honey-bees, on the contrary, the number has been so large, and the depredations so excessive and so general, that complaints have been published in the daily papers, and propositions have even been made to obtain the interference of the legislation in restricting the number of hives in the localities in which they are situate! A word remains to be said as to the relation between wasps and bees. Pettigrew informs us that wasps, hornets, and humble-bees, seldom do harm or gain admission to the hives; but this requires modification or explanation as regards wasps; and it will be well to attend more carefully and attentively to the subject. Wasps quarrel and fight with bees, and of course in their altercations they frequently drive the bees from the ripe fruit on which both of them delight to feed. "Set a thief to catch a thief" is an approved and time-honoured maxim; and there is little doubt that one set of robbers is ever a check on another; so that the paucity of wasps may in some measure account for the bees exercising so freely their marauding propensities. I may state that the large number of letters I have received on this subject is doubtless attributable to an enquiry of my own in the 'Field' newspaper.—*Edward Newman.*]

Gall on Hieracium umbellatum.—In a former communication to the 'Entomologist' (Entom. viii. 233) I spoke of having seen a gall on *Hieracium umbellatum*, in the neighbourhood of Plymouth. I have since found some dried specimens of this that were laid aside in a cupboard, and now forward them to you. I gathered them several years ago—I believe in the neighbourhood of Horrbridge, Devon, about ten miles from Plymouth, and on the southern border of Dartmoor. They prove to be very different from what I sent on *Hypochaeris radicata*, and may perhaps be the work of *Trypeta reticulata*—one of the insects mentioned by Mr. Fitch in his interesting communication concerning the other.—*T. R. Archer Briggs; 4, Portland Villas, Plymouth, October 26, 1875.*

[I believe the galls are old specimens of *Aulax sabaudi* of Hartig.—*Edward A. Fitch.*]

Lepidoptera near Folkestone.—C. Hyale, tolerably plentiful. C. Edusa, rather scarce. E. russula, eleven females and seven males, bred from the eggs laid in July, and many captured. A. gilvaria, plentiful. L. albipuncta, four. A. saucia, seven. N. glareosa, three in the Warren. N. Dablii, six. X. cerago and X. silago, plentiful on flowers of Scabious. X. flavescens, var., one. X. gilvago, var., two, the bar being broken into dots. Is it not strange that the original type has not been taken? T. retusa, one, worn. P. flavocincta, two. E. lichenea, two. C. vetusta, seven. C. exoleta, five. X. semibrunnea, three. H. armiger, one, very fine. S. anomala, one. *Pyralides.*—S. palealis, six. M. polygonalis, one.—G. Haggart; 71, Granville Terrace, Folkestone, Nov. 13, 1875.

Colias Hyale abundant, and C. Edusa, near Maldon.—During September I succeeded in taking as many as seventy specimens of *Colias Hyale*, the greater part in a large clover-field, in Woodham Mortimer parish, but something like a score in a lucerne-field, on the glebe-land belonging to Hazleigh Rectory. One of the females deposited eight eggs—seven in the bottom of a pocket-box, and one on a clover-head: these unfortunately proved to be infertile, shrivelling up in a few days. *Colias Edusa* was not abundant: I only secured twelve good specimens, three of which were females.—Gilbert H. Raynor; St. John's College, Cambridge, November 10, 1875.

Colias Edusa at York.—On Thursday, September 9th, I captured a fine specimen of *Colias Edusa*; on the 11th two more; and on the 25th a *Sphinx Convolvuli*.—J. Hawkins; Holgate, York, October 23, 1875.

Sphinx Convolvuli at Newport, Isle of Wight.—It may interest entomologists to hear that I have taken two specimens of the *Convolvuli* hawk-moth. I caught them both soon after sunset, hovering over a bed of geraniums, on the 22nd and 26th of September.—Frank Morey; Newport, Isle of Wight. [From 'Science Gossip.']

Deiopeia pulchella at Hastings.—I am pleased to be able to record the occurrence at Hastings of a specimen of *Deiopeia pulchella* on the 17th of October, in a field near here.—E. A. Butler.

Deiopeia pulchella in India.—One of your correspondents in the November number (*Entom.* viii. 280) alludes to having

heard that *Deiopeia pulchella* was met with in India. Each year, from 1852 to 1856, it was abundant in my garden at Wuzeerabad (a military station since abandoned), on the banks of the Chenab river, in the Punjab; where I also caught a goodly number of *Sphinx Convolvuli*, *Chærocampa Nerii*, *C. Celerio*, and a remarkably large *C. Elpenor*.—[Rev.] *J. Cave-Browne; Detling Vicarage, Maidstone.*

Correction of an Error.—In my communication in last month's number (*Entom.* viii. 278), "Wales" should be "Wells."—*H. W. Livett.*

Answers to Correspondents.

John Parker.—*Are there Two Broods of Papilio Machaon in a Season?*—It appears there are, from my experience this year. On July 1st I took, at Ranworth, several nearly full-fed larvæ of that beautiful butterfly, *Papilio Machaon*: they went into the pupa state in four days; and on the 19th, fifteen days afterwards, the perfect insect appeared.—*J. P.*

[From personal experience I can give little additional information to that published at p. 152 of my 'British Butterflies.' The butterfly continues to appear throughout the summer; and the larvæ, pupæ and imago were not unfrequently found on the same day by those who hunt the fens assiduously. No trustworthy record has yet been made, showing that the late imagos are the children of the earlier specimens. This, however, appears to have been decidedly the opinion of Harris and Lewin. Lewin's work was published just eighty years ago; and his statement is so explicit that it seems reliable. Later authors appear to have been mere copyists, and not to record the result of personal observation. I quote Lewin:—"The first brood of this butterfly appears on the wing in the middle of May. The female lays her eggs in ten or twelve days, and in a week's time the young caterpillars come forth. In six or seven days they shift their first skin; about the end of June they change their skin for the fifth and last time; and in six or seven days they arrive at full growth. They then prepare for their approaching metamorphosis, by fixing themselves with a strong tie round the middle and by the tail. In a day's time the chrysalis is complete; and this superb butterfly comes

forth the July following. The caterpillars from the eggs of this stock are bred about the first week in August. After the usual shifting of their skins they become full fed the end of September, and change to a chrysalis in a short time. In this state they continue through the winter and until the following May."—*Edward Newman.*]

N. C. Tuely.—*Food-plants of Gonepteryx Rhamni* (Entom. viii. 231).—I see by the October number of the 'Entomologist' that Mr. Wilson was at a loss to find the food-plants of *Gonepteryx Rhamni*. In addition to the buckthorns the larva will eat the leaves of the apple, pear, and medlar, which no doubt could be supplied in any locality without much trouble.—*Edward A. Fitch; Maldon, Essex.*

G. Haggard.—*Setina irrorella.*—I once took a number of larvæ of *Setina irrorella* at Hayling Island, feeding on a ground-lichen which grows plentifully amongst the grass just outside the tide-mark. They afterwards fed fairly well on the gray lichens, which are not uncommon on apple and other trees, and I reared a set of moths. I believe this larva is exclusively a lichen-feeder.—[*Rev.*] *H. Harpur Crewe; Drayton-Beauchamp Rectory, Tring, October 4, 1875.*

——— *Food-plant of Setina irrorella* (Entom. viii. 234).—In reply to Mr. Haggard, I may say that judging from the quantity of imagos I have found stretching, and the situation where the insect occurs on the rocks—which are well clothed with lichens—at Douglas Head, Isle of Man, and where, as stated in the 'British Moths,' "there seems no suitable place for tree-lichens to grow" (Mr. Haggard appears to have misread the paragraph), I believe we may safely infer that the larva does feed on lichens which grow on the rocks; at any rate, so far as the above locality is concerned. During the past season I bred a quantity of *Nudaria mundana*, the larvæ of which I found feeding on lichens growing on stones: by bringing a few pieces of the stone home I had no difficulty in rearing the insect. Perhaps Mr. Haggard might succeed in a similar way with *Setina irrorella.*—*R. Kay; 2, Spring Street, Bury, October 11, 1875.*

——— As Mr. Haggard asks for information on the food-plant of *Setina irrorella*, in the October number of the 'Entomologist,' I copy the following from the Ent. Mo. Mag. viii. 171 (January, 1872), being an extract from a paper by Mr.

Buckler and the Rev. J. Hellins ("Notes on the Earlier Stages of some Species of Lithosidæ") :—"On July 30th, 1865, some eggs were received from Dr. Knaggs, and noted as globular, pearly in texture, and clear purplish brown in colour. The larvæ hatched August 13th, but no note of them was taken, and they must soon have perished from want of proper food and treatment. However, there is no doubt that in their habitat they must hibernate when small, and feed up in early summer. On May 21th, 1867, after considerable search, a number were found, then approaching full growth, on the Sussex coast. The food is a blackish brown lichen, growing on stones above high-water mark, and in some cases mixed with a yellow lichen,—a fact of much interest when the colouring of the larva is considered. The larva seems fond of sunshine, moving about in it slowly over the stones. When about to moult it protects itself by spinning overhead a number of silken threads, under cover of which it remains until the moult is completed. The moths were bred early in July." Then follows a description of the full-fed larva.—*Edward A. Fitch; Maldon, Essex.*

Henry R. Jackson.—*Distinction of the Lepidopterous and Coleopterous Larvæ.*—Will you kindly inform me of any characteristics by which I can always distinguish between the larvæ of Coleoptera and Lepidoptera?—*H. R. J.*

[The best distinction that I know of is that the larvæ of Lepidoptera always possess claspers on the under side of the abdomen, with strongly prehensile hooks. With these they clasp the twigs, and hold them steadily while they devour the leaves; and these organs serve also for progression, enabling them to ascend the trunk of trees with ease and rapidity. Some entomologists have called them feet or legs, often adding an explanatory prefix, as *prolegs* or *fore legs*, *prehensile legs* or *abdominal legs*. The larvæ of Coleoptera have no such organs. Then the larvæ of Lepidoptera have ten ocelli or simple eyes, five on each cheek: these are situated close to the mouth, five on each side, and give to the caterpillar the wondrous power of examining the structure of a leaf, and of thus acquiring information as to whether it is a suitable species on which to feed; these are truly microscopes of high power, and are brought systematically almost in contact with the leaf, as we use a pocket-lens of high

power. These two characters are always present in Lepidoptera; and I believe Coleoptera never possess them.—*Edward Newman.*]

John B. Bridgman.—Export of Bees to New Zealand.—I enclose a notice from 'Nature' which I cannot understand. Can you help me? *What* did Buckland send?—a nest of humble-bees seems to me simply nonsense; and until now I was under the impression that by far the greater part of fertilisation of clover was done by what I suppose is meant by the "common" bee—the hive-bee. About here, during the time the clover-fields are in full flower, the fields are literally alive with hive-bees, and the noise they make may be heard some distance; of course Bombi are to be found there also. The only other bee I have seen at clover is *Cilissa tricincta*, and that is only one spot of white clover. "Two nests of English humble-bees were last week sent to New Zealand by Mr. Frank Buckland for the Canterbury Acclimatisation Society. These insects are specially desired in New Zealand for the purpose of fertilising the common clover. The proboscis of the common bee is not sufficiently long to reach down to the pollen of the clover-flower, while the humble-bee is enabled to do so. In this way the insect is expected to do great service to the agriculturist by largely extending the growth of clover. The bees were packed in their own nests in two boxes, and will be under the charge of a member of the New Zealand Council, who is provided with every necessary for their welfare during the voyage. They are expected to arrive about the middle of January—midsummer at the Antipodes." ('Nature,' p. 527, October 14th.)—*J. B. B.*

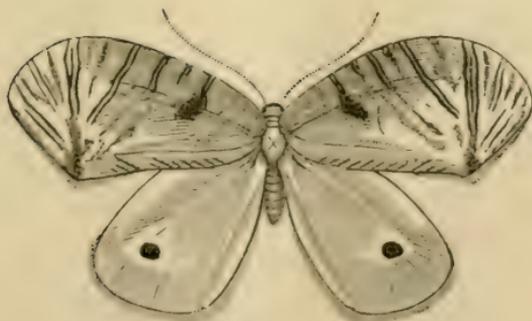
[I have a good deal to say on this subject hereafter; but may just state that I have worked hard at these bees with the valued assistance of the late Mr. Walker and the late Mr. Doubleday, in addition to that of many naturalists still living. Mr. Smith from time to time kindly named our captures, and I shall adopt without hesitation his nomenclature of the species. The published observations of Mr. Buckland and of the Editor of 'Nature' convey no idea to my mind, nor do I think they will to the minds of entomological readers generally.—*Edward Newman.*]



Yours most truly
Edward Newman

THE
ENTOMOLOGIST

VOLUME IX.



PSYCHOPSIS MIMICA.

LONDON:
SIMPKIN, MARSHALL, & CO., STATIONER'S HALL COURT.

1876.

"How many are so regardless,—take so little note of what passes around them, that they would go to their graves without discovering half the beauties of Nature, if no one unfolded its leaves for them; thus losing some of the purest pleasures the embodied soul is capable of enjoying, for want of an interpreter. Such interpreters, while they open to many a new and inexhaustible source of pleasure, are of great utility; and we must love and venerate the man who employs his talents in thus increasing the amount of human happiness."

EDWARD DOUBLEDAY.

"Reader, our companionship ends here. Should the author have persuaded thee to follow in his footsteps, to tread the paths which he has trodden, to gaze with an inquiring and delighted eye on those things which he has gazed on,—it is enough. He bids thee affectionately—farewell!"

EDWARD NEWMAN, in '*Grammar of Entomology*.'

"Read his true nature in his works."

PREFACE.

It has been the custom in Prefaces to the 'Zoologist' for the Editor briefly to summarise the principal work in Natural History recorded in the pages of the volume; but the author of those pleasant words, after long and faithful service, has at length been called away to his eternal rest. There can be no more appropriate Preface to this, the Thirty-fourth volume, and the last with which he was connected, than some record of a long life heartily devoted to the cause of Nature.

EDWARD NEWMAN was born at Hampstead on the 13th of May, 1801. His ancestors became members of the Society of Friends at the rise of that sect in 1616, and several of them suffered imprisonment on account of their faith, yet they have always remained stedfast to their tenets. His parents, George and Ann Newman, had four children, all sons, of whom Edward was the eldest. Both father and mother had a taste for Natural History, and early inculcated it in their children. One of his brothers writes:—"Edward's love for Natural History was born with him, and this natural taste was fostered by both parents. Our father encouraged us by daily conversation to observe all natural objects: he knew the notes of all the birds of the district, and imparted the knowledge to his children. I well remember him telling us at the breakfast-table that that morning he had heard the chiffchaff for the first time that year, or seen the whitethroat; and we used to record such events in our little note-books. White's 'Natural History of Selborne' was the beloved book of the family; that and 'Bewick's Birds' were referred to almost daily. Our mother taught us the names of all the wild-plants as they came into blossom, and encouraged us to collect and study them." To these books may be added 'Bingley's Quadrupeds,' which was also a great favourite. He himself writes:—"I had a very, very early predilection for butterflies; I may say even from my nurse's arms." And

evidence of early work in Natural History appears in a minute memorandum-book, inscribed in large capitals on the first page:—"Botany. E. Newman," without date, but written in pencil; at so early an age that each letter is formed separately, and occasional pages are devoted to "pothooks and hangers." The following is an extract:—"Of the geranium. The class is Monadelphica. The colour is various, being sometimes white, in others scarlet; its leaf is round, but ragged; there are peppermint-scented and pencil-blossom. There are many other geraniums, but I do not know their names." Then follows a list of the Linnean divisions:—"Dodecandria, Icosandria, Polyandria (many), Didynamia (4), Tetradynamia (6)," &c.

In the year 1812 he was sent to a boarding-school at Painswick, in Gloucestershire, of which Oade Roberts, a member of the Society of Friends, was master, where, in addition to being initiated into classical studies, his love for Natural History was developed. On "10th mo. 29, 1813," he writes home to his mother:—"I take great pleasure in botanizing, but there are not so many flowers as there were when I first came here to school; but still I find some. I shall have great pleasure in showing thee my botanical copy-books when I am at home." This is written in a small neat hand, very different from that in the memorandum-book mentioned above. On "2nd month 3rd, 1815," he is still at Painswick, and writes to a relative:—"I could not give Helen much information with respect to lichens and mosses, as I have only yet studied the first classes; but I am now beginning to study the class Cryptogamia, though the snow has been on the ground ever since I returned." One of his schoolfellows, a cousin, writes:—"We were both initiated into a love for Natural History, which continued to interest us in after years; in his case eminently so. * * * What particularly impressed itself on my mind was the neatness and accuracy of Edward's drawing of a beetle,—so superior to what any of the rest of us could accomplish."

On leaving school, in the year 1817, he went to Godalming, in Surrey,—his mother's birthplace,—to which rural town his father, formerly in business in London as a manufacturer of morocco-leather, had removed on his retirement. The family house is just outside the town, at the corner of the lane

leading to Hatch. The father, however, seems to have been by no means tired of commercial life, for he again entered into business—this time at Godalming—as a wool stapler. This step was probably taken by the good man solely for the sake of his son, in order that on leaving school he might begin a commercial career under parental supervision. For ten years father and son continued in the wool trade; but the study of Nature—for which the neighbourhood of Godalming offered great opportunity—proved a strong counter-attraction to the younger man. He was not energetic in the routine of business, and it is to be feared that his absence from duty was frequent; nevertheless, he was far from idle. Indeed, idleness was foreign to his nature; not only at this period, but throughout life, idleness was in his opinion a positive crime. He held that no man need ever be without work. He knew scarcely any rest: if when he came home there were an interval of only a few minutes before a meal, out would come books, papers, and insect-boxes, and he would at once be deep in scientific work. He was generally in bed by ten o'clock at night, but up again in the very early morning; until his later years he was seldom in bed after six o'clock, and in summer-time he would often be up and at work by five, four, and even three o'clock. After 1840 the greater part of his writing was done before breakfast; he would also write from about seven to nine in the evening; but the greater part of the work was done in the uninterrupted quiet of the early morning.

It was in this spirit of industry that he wandered away from business at Godalming, and sought more congenial pursuits in the lanes and fields, the woods and commons, of the beautiful county of Surrey. Whether shooting blackcock on Hindhead, climbing old hollow trees for owlets, or wandering about the lanes with an insect-net, the mere present pleasure of the occupation was not the principal charm. "When the lengthening days give the first impulse to the feathered tribes to bend their course northward for the breeding season, it is here that I listen for the first notes of the chiffchaff; here I watch for the blackcap, the nightingale, the willow wrens, the garden warblers, the whitethroat; here, hour after hour, have I hunted for their nests,—my object not being plunder, but information. Often

have I covered my hand with scratches, from the prickles of briars and brambles, in my attempts to gain a satisfactory view of a nest and its contents, without causing any disarrangement, well knowing how great was the risk of desertion if the parent birds should discover anything amiss; and, when deserted, if I knew not the builders, a nest was valueless. How well was I repaid for bleeding hands, if I discovered but one point in the history of a species. Eggs strung on bents are rife in all country places; old nests are easy to be seen when the leaves are gone; birds are plentiful in every hedge-row, and their song is the burthen of the passing breeze: but to connect with certainty each bird with its mate; to assign it the proper nest and proper eggs; to learn the exact time of its arrival and its departure;—all this is a study, a labour, rarely undertaken, and affords a pleasure akin to that which must be felt by a traveller exploring countries where man has not before trodden.' Let the reader turn to the first chapter of the 'Letters of Rusticus,' from which the foregoing extract is taken, and observe with what microscopic, yet loving and living, detail the natural features of the neighbourhood of Godalming are pourtrayed. No words can give so true an account of these ten years spent at Godalming as the 'Letters of Rusticus.' Extract after extract might be quoted, all to the point, and of exceeding interest; but the short space which can be allowed to this brief memoir does not permit.

It will be noticed that 'Rusticus' is here spoken of as the actual work of Mr. Newman. This brings forward the once-vexed question of the authorship of those charming 'Letters.' To few besides the author's near relatives has the secret been divulged; even Edward Doubleday, his nearest friend and second self, was kept in ignorance of the actual fact, although he, in common with most naturalists, had a shrewd suspicion. When the 'Letters' appeared in the 'Magazine of Natural History' and the 'Entomological Magazine' they caused quite a sensation in Godalming. Written by one who knew Godalming so well, who was so able a writer, as well as so skilled a naturalist; yet no one was able to discover the author. After much discussion they were finally attributed to the late Mr. J. D. Salmon. The veil may now be withdrawn,

revealing Mr. Newman as the author of the whole. Much of the information on the birds and mammals of Godalming was, however, gleaned from his kind friend and frequent companion Waring Kidd, who, now in his eighty-eighth year, still lives at Godalming; and modesty prevented Mr. Newman from assuming the authorship when the facts were not all his own. The 'Letters' having been once begun under a *nom de plume* ('Magazine of Natural History,' 1832, vol. v. p. 601) it was convenient to continue the pleasant fiction. It has probably escaped the notice of many that the last of these 'Letters' were published in 'Chambers' Journal' in 1850, and were on the house sparrow; mice, rats, weasels and stoats; feathered mousers; and squirrels. In one branch of his "Observations," *vic.*, the life-histories of insects injurious to agriculture, Rusticus was a pioneer: no such work had previously been attempted; and, great as is its value, few besides Mr. Newman and the late John Curtis have ever ventured upon it. These chapters on Economic Entomology were continued at irregular intervals in the 'Entomologist,' the 'Zoologist,' and the 'Field,' until towards the close of his life.

In the year 1826 the wool business at Godalming was abandoned. It had never been a very profitable concern; and the parent, now past middle life, was desirous of freedom from commercial occupation. The son had never taken to it kindly.

In the same year Mr. Newman came up to London, and entered into a rope business at Deptford. To a nature such as his—delighting in all the charms of a life in the country—the change to Deptford would have been most distasteful, had it not opened out further opportunities for the cultivation of friendships and society among men of his own tastes. The rope business was to a great extent managed by the foreman, who had held the same post in the wool business at Godalming. It was not allowed to become a drudgery, although to him commerce was never congenial. Only one day in each week was entirely devoted to its affairs; a small part of each of the remaining days sufficed. At the rope-walk he had a large garden, which he subsequently described as a place where everything grew as it liked. A large plot of ground was sown with the common red valerian, because of its attractiveness to insects; and here he

would remain in one spot for an hour or more at a time, mute and motionless, intently studying the habits of some insect, until he had mastered the minutest detail.

At Deptford he had many friends; and of the friendships then formed many ceased only with life itself. Francis Walker, Edward and Henry Doubleday, John and William Christy, Samuel Hanson, and Dr. Bowerbank, were perhaps the most intimate. Not only amongst scientific men, but in the Society of Friends, and indeed in the whole parish, did he find congenial spirits. His keen wit, acute perception, his knowledge, and genial manner, rendered him a general favourite; yet he appeared all unconscious of the charm which he possessed. No one could entertain a greater contempt for shallowness and conceit, for a man possessing knowledge only surface-deep who assumed to be an authority; in fact, for "humbug" in any shape. He scorned to conceal his opinions for fear of giving offence, and did not spare chastisement wherever deserved. His pen was as powerful in caustic satire as in microscopic description; and it was brought to bear with effect in parish affairs, in which he took a keen interest. At one time a part of Deptford was without gas, and, curiously enough, as it seems to us in the present day, there was strong opposition to its introduction. He worked vigorously for the cause of light, and had the satisfaction of success.

During the period of his residence at Deptford he made many excursions with one or other of his chosen associates. Birchwood, in Kent—for many years the place at which the annual dinner of the Entomological Club was held, or, as he puts it, "duly solemnised"—was frequently visited. In Wales, in Scotland, and in Ireland, he also took long walking tours: in all these rambles he was humbly studying Nature, and carefully adding to his already vast store of information. In 1826 his parents had removed from Godalming to Leominster, in Herefordshire; and thus a fresh country was opened out. It was here that his first fernery was formed, a graphic description of which is given in the Introduction to the 'History of British Ferns.'

Notwithstanding his incessant and unwearying work in Natural History, and that a great part of his life had been

spent in constant scientific study, there was no haste to rush into print, for as he himself says, "What is done prematurely has most commonly to be done twice;" and it was not until the year 1831 that his first paper was published. This appeared in the 'Magazine of Natural History,' then edited by J. C. Loudon, and was entitled—"Polyommatus Argiolus, Melitea Euphrosyne and Selene." His attention at this time and for some few years later—until 1837—was principally devoted to Entomology; indeed, with the exception of the few short letters of Rusticus, in the 'Magazine of Natural History' (1832 and 1833), on birds, the whole of his published writings up to 1838 are upon entomological subjects. It was in 1832, however, that he was fairly broken to literary harness. In that year the 'Entomological Magazine' commenced its career of usefulness: it emanated from the Entomological Club,—a small body of gentlemen, who met socially at each other's houses on one evening in every month. This, the oldest entomological society in the country, was instituted in 1826 by Mr. Samouelle, author of the 'Entomologist's Compendium;' and he and Messrs. Davis, Hanson, and Newman, were the original members. At this time (1832) the Club consisted of the Rev. C. S. Bird, Messrs. W. Bennett, J. S. Bowerbank, William Christy, jun., John Curtis, A. H. Davis, E. Doubleday, S. Hanson, J. Hoyer, E. Newman, F. Walker, and J. J. Walton. Of these fathers in Entomology all but two have passed away. It was not surprising that such men should feel the need of a journal devoted to their science. The "Introductory Address" is of considerable interest, and sets forth that the projectors anticipate no profit, but have undertaken the work "with a disinterested desire to promote the progress of a science to which they confess themselves zealously attached." Mr. Newman was chosen Editor, and threw himself heartily into the work. In the first volume, out of sixty-three articles fifteen are from his pen,—many written under pseudonyms,—in addition to elaborate editorial notices of new books. Amongst his writings in this volume attention may be called to the beautiful lines "On the Death of Latreille" (p. 320), as well as to the "Entomological Supplies" (p. 432), professing to be translations from the Persian, Arabic and Greek, but in

reality emanating from his genius alone: entomologists have not often been also poets. Mr. Newman continued to contribute freely in succeeding volumes, writing under various pseudonyms—"Corderius Secundus," "E. N. D.," "Rusticus," and others,—as well as in his own name. The five volumes of the 'Entomological Magazine' give the reader a more intimate personal acquaintance with him than any of his books or subsequent writings. It was, perhaps, a feature in his journalism that he and his readers became at once acquaintances, and after a while actual friends; indeed, many who made his friendship through his writings never saw him, yet have felt his loss as keenly as though they had been constantly in his society. In addition to the members of the Club the following well-known scientific men were amongst the contributors to the magazine:—Messrs. Babington, Dale, Douglas, Haliday, Hewitson, Shuckard, J. F. Stephens, Swainson, Waterhouse, Westwood, and Yarrell, all of whom were more or less personal friends. Edward Doubleday was Editor of the second volume, Mr. Newman of the other four.

It was in 1832 that Mr. Newman's first important publication appeared,—a demy 8vo. pamphlet of 56 pp., entitled, 'Sphinx vespiformis: an Essay;' with the motto:—

"All are but parts of one stupendous whole,
Whose body Nature is, and God the soul."

This clever attempt at classification created a considerable stir, and met with strenuous opposition.

In the year 1833 he was elected a fellow of the Linnean Society; and in the same year he took an active part in establishing the Entomological Society of London, which Society may be said in great measure to have sprung from the Entomological Club, then of the respectable age of seven years. He was elected a member of the first council; Mr. Kirby, honorary President; and Mr. Children, President. During the succeeding years, in addition to editorial work, he wrote occasionally in the 'Magazine of Natural History,' and contributed various papers to the above Societies.

In the year 1835 the 'Grammar of Entomology' was published; a most useful little book. "The author supposes his reader utterly ignorant of Entomology, and endeavours to show

him that it is the History of Insects, and the Physiology of Insects, and the Classification of Insects, and the Art of Preserving Insects." This book soon went out of print.

In 1836 the laws and regulations of the Entomological Club were codified; Mr. Newman was re-elected Curator, and Mr. Walker, Secretary; and an appeal was made for contributions of insects and books. This appeal was most liberally responded to, many gentlemen, Mr. Newman amongst the number, giving their whole collection; and other valuable donations of insects were received. So liberal were the donations that the Club had to choose between building a museum and paying a curator, or disposing of all but the British insects. Eventually the bulk of the collection was presented to the British Museum. The second regulation is—"That the Cabinet and Library be open at the house of the Curator, 21, Union Street, Deptford, on the Friday in every week during the months of January, February, March, April, September, October, November, and December." This practice of throwing open his house to naturalists on one evening in the week was continued until 1841. From that year until 1849 the Club cabinets were under the care of Edward Doubleday and of Francis Walker. On Mr. Newman's removal to York Grove, Peckham, in 1849, he resumed the curatorship, and in 1856 the weekly assemblies. He always looked forward to the company of his friend Mr. Jenner Weir on these occasions; indeed, it was in great measure owing to his kind assistance in after years, when health was failing, that they could be continued. In a letter to him, dated 8th September, 1856, 5.45 A.M., he writes:—"I am re-arranging the Lepidoptera belonging to the Entomological Club, and am doing this solely for the purpose of assisting beginners, who are almost daily applying to me for names. I purpose being at home at six o'clock every Thursday evening for this especial purpose. You will see that the Collection ought to be in better condition than it now is, or I shall not be so useful as I could wish. This idea is not new: I did the same thirty years ago, and continued the practice for many years; but other cares intervened, and the cabinets went to poor Doubleday, whose generous disposition was not qualified for a curatorship, and under him the Collection

became reduced to a mere skeleton,—he gave and lent to everyone whatever they asked of him.” This one night in the week was sacred to its purpose: no engagement—not even illness—was allowed to interfere. It was always a pleasure to him to afford information, especially to young men, and they would avail themselves freely of the opportunity. Older naturalists, too, would often come, and their company was a great pleasure to him. In the earlier days this evening was no great undertaking; but in later years it was almost more than his powers permitted. He would come home weak and tired, and needing rest; or he may have been at home ill during the whole week: but Friday evening always found him at his post, ready to show the Collection, or patiently to name captures even if of no great interest or rarity. Of the many young men who were welcomed, few knew how a kind and courteous manner sometimes concealed bodily suffering. The Entomological Club is now in its fiftieth year; and, with the exception of the eight years mentioned above, its Collection has always been under his care, and much of his time was devoted to it.

In 1837 he abandoned the rope trade, and wrote to a relative as under:—“I am wholly without any definite prospect as regards business, having entirely given up my own, which was a very small affair. * * * I am very indifferent as to any business engagement, as it is always so great a tie, and cannot be abandoned for any length of time without something like a dereliction of duty: moreover, I think that the opportunity for enjoying life will with me shortly expire, and I am desirous, while blest with strength and health, of visiting the country, and breathing the air of mountain-wilds unchecked by the necessity of returning on a certain day.”

In the foregoing a record will be observed of that melancholy which, not only at this period but throughout life, at times beset him: it was not often of long duration, nor had it any real cause. Only a short time before, he had written:—

“To me long life-time, though to thee forbidden,
Perhaps may be granted.”

Thus showing that the erroneous idea that his life would be short had only recently been entertained.

It will be seen that he had already paid a visit to Wales:

this was just prior to the letter, in company with his friends John and William Christy; and of this visit he wrote in the Introduction to the 'History of British Ferns.'

He was now freed from the cares and restraints of business; but no great journey was the result. Having begun to work at ferns he became fairly engrossed with his subject, as was always the case with everything he undertook. But still he was only studying, not writing, or at least not publishing; for, as has been already observed, he never published until his subject had been thoroughly grappled with and mastered. His first paper on ferns appeared, it is true, in 1838; but it was not until 1840 that the 'History' appeared, although the first edition only reached to 104 pages.

In June, 1839, he went to Ireland, whither he had made an excursion with his friend William Bennett a year or two previously. Starting alone from Newry, knapsack on back, he went northward, and so round the entire coast, until the tour finished at Dublin, in August. Throughout the whole trip he had paid especial attention to ferns, and collected a mass of information concerning them. But every natural object, in whatever branch, was of interest to his cultivated mind; and in the "Notes on Irish Natural History" (1840), entomological, ornithological, and botanical observations, generally, are to be found.

December of the same year found him still without a business, but working hard at the 'Ferns;' not only writing the letter-press, but drawing the illustrations; for the whole of the beautiful drawings which illustrate it—figures, tailpieces, and landscapes—are the product of his careful pencil. Especial attention should be called to the fern scutcheon, with the motto, "Elegantia et Humilitate," on the title-page. The book was published early the following year, and was soon out of print. It was printed by George Luxford, the printer of the 'Magazine of Natural History,' which Mr. Newman was then temporarily editing, and thus they were associated. The 'Ferns' having gone off so well there was inducement to publish other books. Mr. Luxford was a botanist and of literary ability, and therefore somewhat of a congenial spirit. Mr. Newman was about to be married, and in want of a business. The idea, therefore, occurred to effect a

partnership, and print his own books. This was done; and he once more commenced business—this time as a member of the firm of Luxford & Co., Printers, Ratcliff Highway, at the sign of the “Bouncing B.” On the accession of an entomological partner the “B” received an insect shape, and was used as a trade-mark. Next year, however, Mr. Luxford was bought out of the business; and the printing-office was removed to Devonshire Street, Bishopsgate, where Mr. Newman conducted it until 1870, when he retired from business in favour of his son.

In June, 1841, the ‘Phytologist’—a monthly botanical magazine—was started, and was conducted with great spirit for some years: Mr. Luxford was editor; but Mr. Newman wrote frequently, and was responsible for the work. It was never commercially successful; and on the death of its editor, in 1854, it came suddenly to an end. Dr. Trimen, writing in the ‘Journal of Botany,’ remarks:—“The thanks of British botanists are due to Mr. Newman for the possession of that valuable repertory of the progress of their department for thirteen years.”

After his marriage, Mr. Newman resided for two years in Wellclose Square, being then a near neighbour of Mr. N. B. Ward, whose beautiful, “closely-glazed” fernery, in one of the worst parts of London, was a constant delight. The “stitching parties” at Mr. Ward’s brought together many botanists.

Mr. Newman having now settled down to a business more congenial than either of the former ones,—namely, printing books on science,—he gave up his former country wanderings, and went to work in earnest. But although thus closely occupied he was by no means debarred from his scientific studies. In 1840 the ‘Entomologist’ had been commenced, taking the place formerly occupied by the ‘Entomological Magazine,’ Mr. Newman being Editor, and contributing freely. In 1841 he published the ‘History of Insects,’ of which he says:—“This little book was observed as a caterpillar, in 1835; in 1837 it disappeared, and remained concealed as a quiescent and lethargic pupa, until, roused by the genial influence of the present spring, it has burst its cere-cloths, and assumed the ornamented wings of a gay and volatile butterfly.”

At the end of 1842 the ‘Entomologist’ was discontinued; but

with January, 1843, commenced the 'Zoologist,' of which the founder lived to conduct an uninterrupted series of thirty-three annual volumes,—a circumstance probably without parallel in the history of journalism throughout the world. He would often look at the row of red volumes on his bookshelves with a quiet pleasure, not unmixed with a certain pride. The following extract from the Preface to the first volume gives, in his own words, an idea of the character and scope of the journal:—"The attempt to combine scientific truths with readable English has been considered by my friends as one of surpassing rashness; and many have been the kind and pressing solicitations I have received to desist from a labour so hopeless; many the supplications to introduce a few Latin descriptions, just to give the work a scientific character. In reply to my friends, I would beg to instance White's 'Selborne.' That most delightful of histories is written in pure, plain, intelligible English, and has found ample favour in the eyes of the public. White is now no more; but his mantle has fallen upon others: a multitude of observers have arisen in the same field, and, what is more to my purpose, have become contributors to the pages of the 'Zoologist.' Nature herself is exhaustless; our field of observation is wider, a thousand-fold, than White ever enjoyed; our capacity for observation is certainly not less. These are the grounds I have for hoping that the 'Zoologist' will succeed." The practice of writing Natural History in simple English, thus rendering it interesting even to those not deeply versed in Science, was one on which Mr. Newman strongly insisted. In the lists of contributors to the pages of the 'Zoologist' appear the names of almost every British naturalist of note.

In 1844 the second edition of the 'Ferns' made its appearance, the first having gone rapidly out of print. In the second edition the work had increased from 104 to 424 pages. The Equisetaceæ and Lycopodiaceæ were added, as was also such a mass of additional information that the work was almost rewritten, and hardly to be called a second edition, deserving to rank as a new book. From this time—with the exception of the collected 'Letters of Rusticus' (1849)—until the publication of a third edition of the 'Ferns,' in 1854, he brought out no new book, his time and thought being sufficiently occupied with

business and with editorial duties. There is no volume of the 'Zoologist' that does not contain numerous articles from his pen: these are upon Entomology, Ornithology, and other branches of Natural History; and many are of considerable importance. With him it was not sufficient to work out only one branch of a science, or even all the various ramifications of that one science: with whatever he undertook he made himself thoroughly familiar. He had taken up the study of Natural History, and everything connected with it was of interest to him,—whether Quadrupeds, Birds, Reptiles, Fishes, Insects, or Plants; he was familiar with every branch of every subject.

In the year 1850 he read before the Zoological Society, an ingenious paper proposing a new Physiological Arrangement of Birds. The new system, however, met with slender support, and considerable opposition.

An essay "On the Employment of Physiological Characters in the Classification of Animals," the result of most careful thought, was published in 1856. These two papers are full of information, and the reasoning is very acute. Some naturalists are still of opinion that Mr. Newman's views have been too much disregarded by modern systematists, especially as to the proposed division of birds into two great groups, *vis.* Hesthogenæ and Gymnogenæ: the former containing those birds which produce their young clothed with down, eyes open, and capable at once of running and feeding themselves; the latter, those birds which produce their young naked, blind, and helpless.

The 'Insect Hunters,' or Entomology in verse, appeared anonymously in 1858: it was written for beginners, and gives an insight into the hidden mysteries of the science in simple language. The author discourses pleasantly to a young friend on "The Four Stages of Insect-life:" "Metamorphosis;" "The Scale Wings;" &c. There is a charming little poetical Preface. Although anonymous, the author was at once suspected. The book was quickly out of print; and a second edition, bearing the author's name, was published in 1860. In this appeared several other poems, written at an earlier date.

In 1858 Mr. Newman became Natural-History Editor of the 'Field,' and continued to hold that post until his death. The Natural-History department of that paper, however, largely

increased, and other editors were added. Amongst his papers in the 'Field,' those on economic entomology are of the greatest value; and there can be no doubt that it will be long before his "life-histories" are superseded. Amongst the master-pieces are those of the goat-moth; gooseberry grub; turnip grub; daddy-longlegs; and pear-tree slug: these valuable contributions were continued to within a month of his death, as a column and a half of the 'Field' for May 13th, 1876, is taken up with his "Life-history of the Sandfly, or Simulium." He wrote of these papers:—"My object in penning these notes is to bring the creature face to face to face with his victims; for unless we know our enemy—his appearance, his ways, and his whereabouts—all our attempts to compass his destruction must be futile." Before his time it was usual to consider all insects found on plants as "blight," and to purchase some proffered nostrum in order to destroy them. No one seemed to consider it possible that some insects might be useful, seeing that others were so obviously hurtful. The articles on the inmates of the Crystal Palace Aquarium—popularly written, yet full of information—are also worthy of considerable attention.

From 1858 to 1861 Mr. Newman was engaged on a series of articles in 'Young England' on Insects and Birds. At the same period he acted as Natural-History Editor of the 'Friend' for about two years, writing a column or two in each month's issue of that newspaper.

In March, 1861, Mr. Newman had the gratification of receiving a Testimonial—consisting of scientific books—from about seventy gentlemen, in "high appreciation of services rendered in the promotion and diffusion of scientific knowledge." Mr. Newman had very properly refused to allow his own journal to be used as a means for advertising the testimonial to himself, and by this action many were led to believe that the project was distasteful, and held aloof. The books, however, besides being of great use and pleasure to the recipient of the testimonial, were highly appreciated by his Friday-night visitors. A full history of the transaction will be found in the 'Zoologist' for 1861 (Zool. p. 7457), but modesty seems to have prevented it being indexed.

Mr. Newman's writings had of late years assumed a more ornithological complexion: and in 1861 his small work, entitled

—‘Birdsnesting, being a complete description of the birds which breed in Great Britain and Ireland,’ made its appearance. Three years later, however, he was once more engaged on the old favourite subject—the ‘Ferns.’ The price of his beautiful book was necessarily comparatively high; and many low-priced fern books, by other writers or compilers, had made their appearance. In order to compete with these, a fourth edition of ‘British Ferns’ was published in 1864: it was of smaller size and considerably lower price, and illustrated with steel-plates instead of by woodcuts, as in the former editions. The Introduction, as well as that to the former editions, may be noticed as among the most charming of Mr. Newman’s writings.

The ‘Zoologist’ had, since 1860, been growing more and more bulky: double numbers were frequently resorted to, and yet space could not be found for all the worthy communications that were received. In order to cope with this *embarras de richesses*, the ‘Entomologist,’ which had been merged in the ‘Zoologist’ in 1843, resumed its separate existence in 1864. A large part of the entomological communications at once went over to it, and the difficulty was at once satisfactorily met. From that time the ‘Entomologist’ has been steadily increasing in public estimation; and its circulation is, for a purely entomological periodical, unprecedentedly large.

Mr. Newman had long felt the want of a book of reference on British birds. Montagu’s ‘Ornithological Dictionary’ was a most valuable book, but it was half a century out of date; it had long been out of print, and was very scarce. The idea occurred that what was a desideratum to himself must certainly be so to others. The fourth edition of ‘British Ferns’ being now completed, and the ‘Entomologist’ fairly launched, he at once set to work. With the help of Selby’s ‘Illustrations of British Ornithology’ (1833), Yarrell’s ‘History of British Birds’ (1856), the ‘Zoologist,’ and the ‘Field,’ he laboriously brought the work up to date, giving a reference to Yarrell’s figure of the bird, and Hewitson’s figure of the egg. The editorial additions are naturally very great, and are separated from the original by editorial brackets. The ‘Dictionary of British Birds,’ a demy 8vo, extending to 400 pages of small type closely printed, was published in 1866.

On its completion, Mr. Newman made preparations for continuing the 'Illustrated Natural History of British Moths,' which was commenced in 'Young England.' Five numbers (80 pp.) had been brought out by Mr. Tweedie, in direct contravention of Mr. Newman's wish, and without his knowledge: for these five numbers, written at a much earlier date than the remainder and not printed under his supervision, he never would hold himself responsible. It will be seen at once that they are incomplete, and stand sorely in need of the care bestowed upon the rest of the work. Mr. Newman was eventually induced to continue the work, and having once consented he, as usual, laboured with all his heart. The descriptions of the perfect insect and of the larva are most careful and accurate, indeed almost microscopic. The figures, of which there are more than eight hundred, were drawn and engraved under his own superintendence. In all his former works the woodcuts had been drawn by himself, and engraved by Mr. Kirchner; but now the allotted span of life was nearly reached, and his artistic powers had failed. The engraver was the same, however; and the beauty and accuracy of the figures are in great measure owing to his care and skill. This book came out in monthly numbers, the last one appearing in June, 1869, when the complete volume was published.

Immediately upon the conclusion of 'British Moths' (486 pp. super-royal 8vo), the companion work was commenced,—'An Illustrated Natural History of British Butterflies' (1871), on which even greater care was evinced, as especial attention was given to geographical distribution. These two works form the text-book of British Macro-Lepidoptera.

'British Butterflies' was written in Mr. Newman's seventieth year, and was his last complete work. Two years previously he had retired from business, but by no means from labour. He was at first actively engaged on the above-mentioned work, and on its completion the 'Zoologist,' the 'Entomologist,' and the 'Field,' kept him fully occupied. He was often to be seen at the Crystal Palace Aquarium, and the result of the visits is to be found in various papers in those journals. In the year 1868 he had built an aviary in his garden, and this was a constant source not only of recreation, but of study. There he would sit, until the birds became so tame as to fly to him on his

entrance and feed from his hand. In "Notes of my Bird Cage" (Zool. S. S. 3157) will be found an account of his success in breeding the little Australian parrakeet (*Mclopsittacus undulatus*): he possessed upwards of thirty at one time, all bred in the aviary. A diary of the birds, after the manner of Gilbert White, was carefully kept, and short notes frequently appeared in the magazines. He had a great affection for all living animals, and could not bear to see anything suffer, even for its own good. He frequently visited the Zoological Gardens, always intent on gaining information; and in his later years was earnestly at work on a new classification of birds. One of his friends writes, with reference to these visits to the Zoological Gardens, and to the proposed classification of birds which he did not live to complete, and of which but few fragments remain:—"For forty years a visit to the Zoological Gardens has been one of my greatest enjoyments; but with Mr. Newman, who was my frequent companion, the pleasure was very much enhanced. He would stand to watch the movements of that remarkable bird, the Caviama (*Dicholophus cristatus*); its position amongst birds was to him a puzzle, but he at last, I am inclined to think, regarded it as a Raptorial bird, as classified by Mr. Sharpe, of the British Museum. He attached great importance to the mode by which a bird progressed on the ground, and he exhibited almost a childish delight when he first observed that eagles hopped. Natural History was to Mr. Newman not only an intellectual scientific study, but was also an absorbing passion." He was at this time devoting as much attention to Entomology as to other branches of Zoology, making an especial study of the Gallflies and their productions, of the Sawflies, and the Bees,—the latter chiefly with a view to observations on the fertilisation of plants by their agency. His "Collected Observations on British Sawflies" were laid aside for years, and their revision and publication in the 'Entomologist' was only commenced shortly before his death. It is hoped that further instalments may yet appear, containing his later views on a natural classification of Insects,—a subject which had continuously occupied his thoughts since 1834.

The end was now drawing near. In February, 1873, he had

had a severe illness, from which, although unknown to all but himself, he never entirely recovered: it preyed upon his spirits, and lessened that mental grasp which had hitherto characterized him. Towards the end of May, 1876, he again became seriously ill; and although at first it was thought that with his vigorous constitution he would overcome the disease, as he had done previously, he became worse. Further surgical assistance was called in, but to no purpose; and on the 12th of June, 1876, acutely conscious to the last, he passed peacefully away. In his last illness he was patient, and without care or any anxiety. He was interred at Nunhead Cemetery.

Mr. Newman was a Fellow of the Linnean and Zoological Societies, of the Royal Microscopical Society, and of the Zoologico-Botanical Society of Vienna; he was also an original member and, in 1854, President of the Entomological Society of London; an honorary member of the Entomological Societies of France and Pennsylvania, of the Botanical Society of Edinburgh, and of several minor societies: but the only title on which he set value was that of *Academiæ Cæsareæ Naturæ Curiosorum*,—the Imperial Academy of Leopold Charles of Austria, consisting of the forty most distinguished naturalists known to the council throughout the world; each takes the cognomen of one of the original members,—his was that of “Latreille.” Membership of this learned body conferred the title of Doctor, but he was too modest to use the title. Ostentation of every kind was distasteful to him, and he derided it in others; indeed, he prided himself on the opposite extreme, and his manner of life was especially simple and retiring.

The following extracts, from kindly letters written by Mr. Cordeaux, Captain Hadfield, Mr. Frederick Smith, and Dr. Bowerbank, may fittingly be appended to this memoir, and are but types of many. In writing this sketch of a useful life, difficulty has been felt in condensing the material that has offered: much that would have added to its interest has been reluctantly omitted for want of space.

“His loss is no common one, for all who have known him for so many years, through his writings and as a correspondent, can testify to the invariable and ready way in which he imparted information: he has done more in his long life of usefulness

than any of his contemporaries to foster and encourage a love of natural science. The 'Zoologist,' alone, will ever remain a monument of his indefatigable industry; and, as a storehouse of facts for the working naturalist, will be continually quoted in all future works bearing on its special branches of English Zoology."

"We, his friends and admirers, have lost one whose equal we may vainly seek, for he was a man of wonderful power of mind, of great judgment, a profound thinker, an able writer; and, from his great experience in editorship, better qualified than any of our naturalists for conducting a popular journal like the 'Zoologist.' Ever ready to instruct and encourage, too, the student of Nature; never censorious or dictatorial, though his patience at times must have been sorely tried."

"The name of Edward Newman is inseparably associated with the list of those who have themselves advanced natural science, and who have done all in their power to help and encourage others in the field in which they have so successfully laboured."

"He was esteemed and valued by all who knew him. His life was usefully and honourably spent in the pursuit and dissemination of knowledge; and the results of his labours, as published, are a more durable and honourable monument than either bronze or marble."



CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- Adams, C. Lemesle 72, 160
Anderson, Joseph, jun. 155, 260
Andrewes, F. 232
Armitage, G. D. 201
Ashpole, Henry 229
Aspinwall, Alfred 20
Aspinwall, J. W. 183
Auld, Henry A. 78, 139
- Barrett, J. Platt 71, 177
Bayley, Miss 211
Benson, L. 262
Bignell, G. C. 203, 255
Birchall, E. Howard 209
Bird, H. M. Golding 261, 269
Blest, W. W. 278
Boden, Charles 182
Bond, Frederick, F.Z.S. 217
Boswell, J. T., LL.D., F.L.S. 257
Bowerbank, J. S., LL.D., F.R.S. 91, 129
Brackenbury, Rev. E., M.A. 258
Bradbury, S. 160, 185
Bridgman, J. B. 159, 173
Briggs, T. R. Archer, F.L.S. 143
Brown, A. M. 140
Brown, Benjamin 279
Brown, J. 204
Browne, E. G. 72, 262
Butler, E. A. 275
- Cansdale, W. D. 257
Carrington, John T. 169, 184, 241, 272, 279
Cave-Browne, Rev. J. 155
Clark, Eustace F. 140, 184
Clark, J. Edmund 69
Clarke, W. B. 130
Cole, G. B. 153
Conquest, Harold 230
Corbett, H. H. 205, 256
- Corbin, G. B. 21, 276
Cox, H. Ramsay 58, 230
Crallan, Rev. Thomas E., M.A. 265
Crewe, Rev. H. Harpur 204, 205, 260
Crossfield, Talbot K. 256, 259
- Daltry, Rev. Thomas W., M.A. 19
Dobson, H. T., jun. 183
Doncaster, Arthur 276
- Eastham, George 157
Edmonds, Walter S. 19
Edwards, G. 142
Edwards, W. 126
Enock, Fred. 128
- Farquharson, J. R. Phelps 257
Fitch, E. A. 1, 26, 50, 74, 115, 121, 146, 171, 194, 202, 210, 245, 268
Forbes, W. A. 142, 144
Fust, H. Jenner, jun., M.A. 158
- Gatcombe, J. 182
Giles, J. J. 276
Greene, Rev. J., M.A. 150
Gregson, C. S. 8
Grimond, James 71
- Hambrough, Rev. Windsor 182, 205
Hamlin, C. 231
Harwood, W. H. 233, 259
Hedworth, Thos. H. 141
Hervey, Rev. A. C. 92
Hodge, T. 274
Hodges, H. C. 210
Hodgkinson, J. B. 207, 208, 260
Holton, E. 86
- Jennings, Rev. P. H., M.A. 12, 131, 197, 208, 209, 254

- Johns, E. F. 92, 258
 Jones, Alfred 91
 Jones, H. 161, 278
 Jones, J. Matthew 54

 Katter, Dr. 152
 Kay, R. 48, 158, 207
 Keyworth, William W. 10
 Kynaston, W. H. 137

 Laddiman, Robert 20, 81, 208
 Lewis, W. Arnold, F.L.S. 69
 Livett, H. W., M.D. 261
 Luff, W. A. 16, 256, 257

 Madden, Rev. G. C., M.A. 71
 Maling, W. 19
 Manders, N. 262
 Mann, W. K. 258
 Marée, Charles 20
 May, J. W. 3, 247
 McArthur, Neil 132, 259
 McRae, W. 207, 258
 Michael, Annie 276
 Milsom, W. D. 201
 Mosley, S. L. 156, 157
 Mudie, James 185

 Neale, Henry 183, 231
 Newman, Edward, F.L.S., &c. 26, 42,
 49, 59, 73, 89, 96, 97
 Norman, S. 232

 Oldfield, George W. 87

 Parker, John 258
 Pease, T. H. Ormston 132, 161
 Perkins, V. R. 231
 Peters, J. 262
 Porritt, George T., F.L.S. 13, 47, 88,
 139, 141, 178, 186, 197, 211
 Pratt, D. 277, 279
 Prest, W. 276, 278

 Raynor, Gilbert 158
 Reeks, Henry, F.L.S. 86
 Ridley, H. N. 48
 Riley, Chas. V., M.A., Ph.D. 62, 108

 Robinson, E. K. 201, 205, 206
 Rogers, H. 231
 Rolfe, R. A. 199
 Ross, J. G. 183
 Roxburgh, Thos. J. 278
 Ruston, A. Harold 204

 Sarll, John T. 232
 Service, Robert 140, 230
 Sharp, W. E. 104
 Sheppard, E. R. 134, 160
 Simmons, C. W. 70
 Smith, Frederick 15, 234
 Sorrell, Thomas 159
 Standish, F. O. 68
 Stent, R. J. 203
 Stenton, E. H. 232
 Stevens, Samuel, F.L.S. 183, 193
 Stewart, F. 206
 Stowell, Rev. Hugh A., M.A. 232, 233

 Tasker, Rev. C. J. W. 180
 Thomas, W. 92, 141
 Thornthwaite, W. H. 19
 Threlfall, J. H. 124
 Thurnall, A. 17, 48
 Tosswill, R. G. D. 142
 Tucker, G. 161
 Tugwell, W. H. 179

 Walker, Francis (the late) 52
 Wallace, Alfred Russel, F.L.S., &c.
 221
 Warner, Septimus 72
 Webb, Alfred 93
 Webb, Sydney 277
 Weir, J. Jenner, F.L.S., F.Z.S. 217,
 230, 251, 267
 White, F. Buchanan, M.D., F.L.S.
 278
 White, Rev. J. H., M.A. 93, 231, 234
 Whittle, F. G. 208
 Wigglesworth, H. 213
 Wileman, A. E. 256
 Williams, Edward 182
 Wilson, Owen 70, 201, 202, 204
 Wilson, T. 20
 Wratlaw, Rev. A. H., M.A. 232, 259

ALPHABETICAL LIST OF SUBJECTS.

- Abdomen of earwig, worm in 263
 Acherontia Atropos at Folkestone 276
 Acidalia emarginata 206
 Acronycta Alni at Stratford-on-Avon
 20; bred 204; in Carmarthenshire
id.; larva, near Derby 232; near
 Retford *id.*; at Edwinstowe 276
 " auricoma 208
 " strigosa 204
 Aculeate Hymenoptera 173
 Aeschna mixta at Norwood 162
 Agrotis nemoralis, life-history 179;
 near Herne 208
 Agrotis pyrophila at Stratford-on-
 Avon 20
 " saucia at York 20
 " tritici and Agrotis aquilina
 169, 210
 Anatomy, insect 185
 Andricus burgundus 74
 " circulans 51
 " crispator 268
 " Cydoniæ 251
 " curvator 195
 " " var. axillaris 51
 " inflator 50
 " multiplicatus 220
 " nitidus 246
 " petioli 219
 " terminalis 28, 34
 " testaceipes 219
 " urnæformis 194
 Anthomyia pluvialis 40
 Ants 94; swarms of 234
 " and Imbauba trees 67
 Apatura Iris in Huntingdonshire 230
 Aphilothrix Clementinæ 2
 " corticalis 143
 " Glandulæ 1
 Aphis sp. 42
 Arctia fuliginosa, larvæ 70
 " rubiginosa, injury to linen in
 bleach-fields by larvæ 42
 Argynnis Adippe, hermaphrodite 203
 " Dia 69
 " Lathonia at Hastings 275
 " Niobe 21
 Asthenia pygmæana 92, 141
 Attacus, remarkable species 162
 Atypus Sulzeri in the North of Lon-
 don 128
 Balaninus glandium 94
 Bees, instinct of 130; humble, des-
 patch of to New Zealand 142;
 uncertain in their appearance 159;
 and wasps 162; making comb in a
 hedge 260
 Biorhiza renum 115
 " sinaspis 117
 Blackmore, Trovey, death of 240
 Bombus muscorum, Mutilla europæa
 parasitic on 239
 Bombyx Rubi, to breed 72; rearing
 the larva 205
 Borer, Yucca, notes on 82, 108
 Botys verticalis 278
 Braconidæ 35
 Brown, Edwin, death of 240
 Bugs introduced into Africa by the
 Arabs 90
 Butterflies, small, immense flight in
 the Bermudas 54, 86; and moths,
 how to relax 137, 152, 180; Japanese
 192
 Cabinets, insect, black spots on 93
 Callimome abdominalis 37
 " auratus *id.*
 " nigricornis 36
 " regius 37
 Callinorpha Hera 210; near Dover
 263
 " variety 25
 Caryoborus, Corozo nuts destroyed
 by 214
 Catalogue of British Insects, new
 part 264
 Caterpillars, preserving 139
 Catocala Fraxini 278
 Cecidomyia sp. ? 40
 Chelonia villica, treatment of larvæ
 during hibernation 206
 Chærocampa Celerio at Brighton 231;
 in Berwickshire, 276; at Edwin-
 stowe *id.*
 " porcellus, larva 183
 Chortobius Davus, in search of 203
 Cidaria populata, larva 13
 " reticulata, larva at Winder-
 mere 207
 Cimex femorata 3
 Clostera anachoreta 232

- Cnephasia lepidana* bred 208
Cnethocampa pityocampa 21
Coccus, species of 216
Coleoptera 24; new 118; British 162
Coleopterous insects, singular forms 215
Colias Edusa 182; early appearance *id.*; near Dublin *id.*; and *var.* *Helice* in Carmarthenshire 201; and *Colias Hyale*, remarks on 217; at Hundforth 256; eggs and larvæ *id.*, 257; *var.* *Helice* in South Wales 256
 „ *Hyale*, is it double-brooded? 202; and *C. Edusa* 230
 Collection, the Doubleday 72, 96, 118, 144, 279
 Corozo nuts destroyed by a *Caryoborus* 214
Cossus ligniperda at sugar 183, 207, 208
Crocallis elinguaris, early hatching 88; does it hibernate? 141
Cræsus septentrionalis bred 239
Crymodes exulis near Loch Laggan 263
Cryptoceridæ, new species 264
Cryptus hortulanus 36
Cucullia scrophulariæ 233, 259
Cychnus cylindricollis, habits 189, 190
Cynips aries 77
 „ *exclusa* 78
 „ *gemmea id.*
 „ *Kollari*, the Devonshire gall 52
Danais Archippus 267; in Sussex 265
Dasycampa rubiginea in December 69; at Hawley 278
 Day, red-letter 131
Decatoma immaculata 36
Deilephila Euphorbiæ, locality for food-plant 263
 „ *Galii* near Norwich 258
Deiopeia pulchella at Bournemouth 258; near Christchurch *id.*; at Brighton 259; in the Isle of Wight *id.*; in Suffolk *id.*; at Hastings 275; at the Land's End 276
Dianthæcia irregularis 232
Diurnea fagella 141
 Doubleday Collection 72, 96, 118, 144, 279
 Dragonfly infested by red parasite 235
Dryophanta agama 130
 „ *cornifex* 172
Dryophanta disticha 171
 „ *divisa* 147
 „ *folii* 123
 „ *longiventris* 146
 „ *scutellaris* 121
 Earwig, worm in abdomen 263
 Easter at Witherslack 124
Ebulea crocealis, larva 88
 „ *stachydalis* 191
Elachistidæ 39
 Electricity? are the colours of *Lepidoptera* influenced by 251
 Enemies to horse-chestnut shoots 239
Ennomos alniaria 278
 „ *angularis*, variety 49
Enoicycla, female 24
 Entomological Society, proceedings 22, 117, 162, 186, 213, 263
 Entomological pins 160, 184, 209
 Entomology, journalist's 234; in Cornwall *id.*
Ephemeridæ 191
Ephydra, larvæ and pupæ 118
Ephyra orbicularia 208
 „ *pendularia var.* 217
Epunda nigra at Rugby 19; not double-brooded 185
Eremobia ochroleuca at Deal 232; south of York 262
Eulophus gallarum 39
Eupelmidæ 38
Eupithecia larvæ in Ireland 260
Eupithecia saturata var. callunaria 205
Eupithecidæ, British, an attempt to arrange by their larval characteristics 8
Eurymene dolabraria, larva 254
Eurytomidæ 36
 Flea, the mole's; a discovery for Leap-year 89
 Food, variation of *Lepidoptera* according to 263
 Food-plant of *Deilephila Euphorbiæ*, locality for 236
 Food-plants of *Gonepteryx Rhamni* 79, 202; of *Saturnia Carpini* 161; of *S. Cynthia id.*
 Fungus on insects 215
 Galls of *Aphilothrix Glandulæ* 1; of *A. Clementinæ* 2; of *Synophus politus* 27; of *Andricus terminalis*

- 28; of *A. inflator* 50; of *A. curvator rar. axillaris* 51; of *A. circulans* 52; of *Cynips Kollari id.*; of *A. burgundus* 75; of *Spathogaster Giraudi id.*; of *S. aprilinus* 76; of (?) *Cynips aries* 77; of (?) *C. excluda* 78; of (?) *C. gemma id.*; of *Biorhiza renum* 116; of *B. synaspis* 117; of *Dryophanta scutellaris* 121; of *D. folii* 123; of *D. longiventris* 146; of *D. divisa* 147; of *D. agama* 150; of *D. disticha* 171; of *D. cornifex* 172; of *Andricus urnæformis* 194; of *A. curvator* 195; of *A. testaceipes* 219; of *A. petioli id.*; of *A. multiplicatus* 220; of *A. Cydoniæ* 245; of *A. nitidus* 246; of *A. crispator* 269
- Galls, oak 143
- Geometra papilionaria*, variety 205
- Gnat, common 191
- Gonepteryx Rhamni*, food-plants 70, 202
- Hadena rectilinea*, larva at Windermere 207
- Haggerston Entomological Society 264
- Halias prasinana* 262
- Harvest-bug, remedies for attacks of 239
- Hedya* (*Spilonota*) *ocellana* 41
- Heliothis armiger* 261
- " *peltiger* at Blackpool 183
- Heliozela sericiella*, mines of 24
- Hemerobius* in winter 48
- Hemerophila abruptaria*, larva 197
- Hemiteles areator* 35
- Hermaphrodite *Argynnis Adippe* 203
- Horse-chestnut shoots, enemies to 239
- Humble-bees, exportation of to New Zealand 15
- Hybernia leucophearia* 277
- Hydræcia petasitis* 207
- Hymenoptera, aculeate, doings and observations among during 1875, 173; relation of various groups 186; work on 213
- Hyria auroraria*, larva 197
- Ichnæumonidæ* 35
- Insect fauna of St. Helena 90; cabinets, black spots on 93; anatomy 185
- Insects, list of the best captured at or near Whittlesford during the past season 17; inhabiting oak-apples 29; of Kent and Surrey 71; wind-pipes of 91; organs of the senses in *id.*; circulation of blood in *id.*; relaxing 137, 150, 152, 153, 155; fungus on 215; South African, mimicry in *id.*; Coleopterous, singular forms *id.*; and plants, peculiar relations 221; British, new part of Entomological Society's Catalogue 264
- Instinct of bees 130
- Journalist's Entomology 234
- Lampides bætica* 92, 132
- Larentia cæsiata* near Bury, Lancashire 158
- Larva of *Cidaria populata* 13; of *Lithosia aureola* 47; of an *Æstrus* (?) infesting man 71; of *Ebulea crocealis* 88; of *Nola albulalis* 177; of *Strenia clathrata* 178; of *Macroglossa stellatarum* 183; of *Chærocampa porcellus id.*; of *Hemerophila abruptaria* 197; of *Hyria auroraria id.*; of *Bombyx Rubi* 205; of *Cidaria reticulata* and *Hadena rectilinea* at Windermere 207; twigs of horse chestnut attacked by 216; of *Acronyeta Alni* near Derby 232; of *Eurymene dolabraria* 254; of *Danaïs Archippus* 265; of *Stauropus Fagi* 268
- Larvæ of *Arctia rubiginosa*, injury to linen in bleach-fields by 42; varieties of *Vanessa Io*, &c., probably caused by starving 49, 87; of *Arctia fuliginosa* 70; of *Lepidoptera*, preserving 72, 81; preserving 78, 104, 130, 157; in reeds 92; and pupæ of *Ephydra* 118; of *Chelonia villica* and *Pericallia syringaria*, treatment during hibernation 206; burrowing *id.*; *Eupithecia*, in Ireland 260
- Latridius lardarius* 34
- Lepidoptera*, captures 18; at Newcastle-on-Tyne 19; preserving larvæ 72, 81; collected at Great Malvern in 1875, 126; of the Higher Alps 162; foreign 184; spring and autumn broods 191; transmission by post 211; varieties and rare British 213; rare, in the Isle of

- Wight 231; are the colours of influenced by electricity? 251; variation of according to food 263; at sallow-bloom 272
- Lepidopterous insect parasitic on *Fulgora candelaria*, habits 258
- Leucania albipuncta* in the Isle of Wight 231; at Deal, 232; at St. Leonard's *id.*
- " *vitellina* in the New Forest 183
- Life-histories of sawflies 3, 247
- Life-history of *Agrotera nemoralis* 179
- Limacodes Asellus*, remarks on the oviposition 68
- Linnean Society of London, proceedings 94
- Lithosia aureola*, larva 47
- " *sericea* 207
- Lithosidæ, scarcity of 276
- Locust, the true, near Wells 261
- Locusts, ravages of, in Spain 214, 235
- Lycæna argiolus* 257
- " *Arion* 204
- Machaon* and *Podalirius* 157
- Macroglossa stellatarum*, larva 183
- Macro-Lepidoptera, additions to the list of, inhabiting Guernsey 16
- Manestra objecta* 48
- Megastigmus dorsalis* 38
- Megathymus Yuccæ*, notes on 82, 108
- Melanagria galathea*, varieties 193
- Metrocampa margaritata*, buff-coloured 161, 211
- Micro, name of 161
- Microdus rufipes* 36
- Microtypus Wesmaelii id.*
- Mines of *Heliozela sericiella* 24
- Mites, preservation against 71; and grease 155, 156
- Mosquitoes in Ireland 93
- Moths, names 20; and butterflies, how to relax 137, 180; preserving from mites and grease 140
- Mutilla europæa* parasitic on *Bombus muscorum* 239
- Nematus consobrinus* 247
- " *gallicola* 236
- Newman, Edward, obituary notice v., 145
- Noctua flammatrix* in the Isle of Wight 231
- Nola albulalis*, larva 177
- Notes upon sugaring 10; on oviposition 12; on oak-apples 32; on preserving larvae 78; on the *Yucca* borer 82, 108
- Oak-apples, notes on 32
- Oak-galls, descriptions of 1, 26, 50, 74, 115, 121, 146, 171, 194, 219, 245, 268
- Oporabia filigrammaria* near Bury, Lancashire 158
- Orgyia pudibunda* double-brooded 262
- Otiiorhynchus picipes* 135, 160
- Oviposition, notes on 12; of *Limacodes Asellus*, remarks on 68
- Pachnobia alpina* 209, 241
- " *hyperborea* 241, 279
- Pachytylus migratorius* near Wells 261
- Papilio Machaon*, are there two broods in a season? 20; in Sussex 230
- Parasite, red, dragonfly infested by 235
- Parasites of *Osmia* 118
- Pericallia syringaria*, treatment of larvae during hibernation 206
- Pieris Brassicæ*, ravages of 257
- " Rape in winter, 69
- " " *var. Aurea* 199
- Pimpla*, species of from galls of *Andricus terminalis* 35
- Pionea margaritalis* 277
- Pins, entomological 160, 184, 209
- Plants and insects, peculiar relations of, as exhibited in islands, 221
- Platymesopus Erichsonii* 39
- (?) " *Westwoodii id.*
- Podalirius* and *Machaon* 157
- Polysphænis sericina*, description from Guenée 73
- Pseudo Bombyces*, time of appearance 206
- Psyllidæ taken near Lee, Kent 216
- Pteromalidæ 38
- Pteromalus Cordairii* 39
- " *Dufourii id.*
- " *gallicus id.*
- " *leucopezus id.*
- " *meconotus id.*
- " *stenonotus id.*
- Pupæ of burrowing larvae 206
- Pyralis verticallis* in Westmoreland 260
- Pyrameis Atalanta* in Perthshire 71

- Pyrameis *Huntera* in S. Devon 255
 " *Virginicensis* 279
 Ravages of locusts in Spain 214, 235;
 of *Pieris Brassicæ* 257
 Reclusa, early emergence 132
 Red-letter day 131
 Relaxing and grease 182
 Rophidia *Ophiopsis* 161
 Sallow-bloom, captures at 272
 Saturnia *Carpini*, hatching 142; food
 161, 186
 " *cynthia*, food 161
 Sawflies, life-histories of 3, 247; Bri-
 tish, collected observations on 59
 Scopula *deceperialis*, is it double-
 brooded? 205
 Selidosema *plumaria*, &c., near Alver-
 stoke 233
 Semasia (*Ephippiphora*) *gallicolana* 41
 Sericoris *irriguana* near Loch Laggan
 263
 Spathegaster *aprilinus* 76
 " *Giraudi* 75
 Sphekodes, British species of 97
 Sphekodes *Ephippiata* 103
 " *fuscipennis* 104
 " *gibba* 102
 " *rufescens* *id.*
 " *subquadrata* 103
 Sphinx *Convolvuli* at Rugby 19; near
 Newcastle, Staffordshire *id.*; at
 Bury 48; in Gloucestershire 231;
 near St. Ives *id.*; at Salisbury *id.*;
 at Deal 232; in Orkney 257; at
 Clifton 258; at Winchester *id.*;
 near Christchurch *id.*
 Spiders in the bark of trees 167
 Spilodes *palealis* 278
 Staphylinidæ of the Amazon Valley
 189
 Stauropus *Fagi*, larva 269
 Strenia *clathrata*, larva 178
 Stylops *Kirbii* 191
 Sugaring, notes upon, during Sep-
 tember and October, 1875, 10
 Swarm of ants 234
 Synergus *socialis* 34
 Synophus *politus* 26
 Tæniocampa 262
 Terias *Lisa*, immense flight in the
 Bermudas 54, 86
 Tetrastichidæ 39
 Tetrastichus *Diaphantes* *id.*
 Thecla *Quercus* 41
 Thrips *sp.* 42
 Tillus *unifasciatus* 183
 Tinea, new British 159
 Tortrix *viridana* 40
 Torymidæ 36
 Trochilium *allantiformis* 204
 " *Valeria oleagina*, " correction of error
 299
 Vanessa *Antiopa* near Basingstoke
 201; at Cheltenham *id.*; in Filey
 Bay *id.*; at Lea Bridge marshes
 229; in Dumfriesshire 230; in the
 Isle of Wight 256
 " *Io*, &c., varieties, probably
 caused by starving the larvæ 58,
 87
 Variation of Lepidoptera according to
 food 263
 Varieties of Vanessa *Io*, &c. 58, 87;
 of *Melanargia galathea* 193; of
 British Lepidoptera 213
 Variety of *Callimorpha Hera* 25; of
Ennomos angularia 49; of *Geo-*
metra papilionaria 205; of *Ephyra*
pendularia 217
 Wasps and bees 162
 Weevil, hop 134, 160; new to Britain
 263
 Wilkinson, Thomas, death of 120
 Worm in abdomen of earwig 263
 Xanthia *gilvago* a cannibal 158
 Xylina *lambda* 191
 Xylotrogus *brunneus* 183
 Zeiraphera *communana* 40
 Zoological collections, use of yellow
 glass for 132
 Zygæna *Filipendulæ* with yellow spots
 117; at Dulwich, 211
 " *nubigena*, is it a Scottish
 insect? 142, 158

THE ENTOMOLOGIST.

No. 151.]

JANUARY, MDCCCLXXVI.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by E. A. FRICH, Esq.
(Continued from vol. viii. p. 291.)

Fig. 34.



APHILOTHRIX GLANDULE.

- a.* Natural size of gall in situ. *b.* The same magnified.
c. Section of the same.

34. *Aphilothrix Glandule*, Hart.—The gall is conical, swelling out at its base, and assuming a turban-like form; the lower part of this base is surrounded by the scales of the axillary bud, while the upper part projects from the bud. This gall attains a longitudinal diameter of six millimetres, and has the same length at the base. When fresh the gall is green, and covered with snow-white, silky, recurved, smooth hairs. The top of the gall carries a mastoid process, yellow and naked. The section generally exhibits two cavities:

the upper one—the larger of the two—is egg-shaped, and surrounded by a thin whitish layer (of the inner gall); the lower cavity—extending in a horizontal direction—is either empty or filled with a spongy reticulation.—*G. L. Mayr*.

Dr. Mayr gives no *Synergus* as inhabiting this gall, but undoubtedly there is one, as in a letter from Mr. Rothera relating to this gall, which he has found at Ollerton, near Nottingham, he says:—"On making a longitudinal section of a third gall, I found at the base the same irregular decaying space as before; but in the neck of the gall three chambers, separated by septa, and each containing a well-developed maggot." This clearly points to *Synergus*. As Dr. Mayr does not give the time of appearance of the gall, I may say Mr. Rothera found it first on the 27th of August, and later immature specimens on the 28th of September, but in a different year; so the immature gall is probably to be met with throughout the autumn.—*E. A. Fitch*.

35. *Aphlothrix Clementine*, Gir.—This spherical gall is about the size of a pea (five millimetres). Its base is insignificantly elongate, and has at its summit, exactly opposite, a short conical projection. It is of a brownish yellow colour, and several small, flattened, conical projections are irregularly scattered over its surface, which is slightly rugose and sprinkled with hairs, which are recurved in the direction of the base of the gall.



APHLOTHRIX CLEMENTINE.

a, b. Galls of *A. Clementine*.

c. Section of the same.

Near the top, however, and especially below the more or less distinctly-marked point, the growth of these hairs is more abundant. The section exhibits two layers of the consistency of leather: the exterior one is thin and yellow; the interior also thin and red-brown, enclosing a large spherical cavity, in which the yellow spherical inner gall lies loosely. Director Tschek informed me by letter that he had found this gall lying on the ground under high trees of *Quercus sessiliflora*, on the topmost branches of which tree it appears to grow. The gall seems to fall late in the autumn, generally after the first frost. Director Tschek noticed in those galls which had recently fallen that they still retained the bud-like scales at their base. Frauenfeld

and Tschek succeeded in breeding some flies as early as February and March, the greater number, however, not appearing before the following October and November.—*G. L. Mayr.*

In a subsequent note Dr. Mayr has the following (second half, p. 68):—"On the 2nd October, 1870, I found, near Gutenstein, in North Austria, the still green galls of this species, in great numbers, on the ground under high trees of *Quercus sessiliflora*, some of which were surrounded by the bud-scales. From hundreds of these galls a single gall-fly emerged on the 23rd March of this year (1871), so that I may expect a great number in the autumn." Again, in the 'Verhandlungen' for 1872 (vol. xxii.), he tells us that "from the Gutenstein galls of this species I bred at the end of February, and particularly in March (1872), a great number of the gall-maker. On the 8th October, 1871, I also found in an oak wood, near Vienna, some galls under large trees of *Quercus sessiliflora*." *Synergus melanopus* and *S. vulgaris* were bred from the galls by Dr. Mayr. Curiously, the gall from which the original description was taken by Giraud was found under a tree by a very young person at Wiener-Neustadt.—*E. A. Fitch.*

Life-histories of Sawflies. Translated from the Dutch of Dr. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from vol. viii. p. 125.)

CIMBEX FEMORATA, L.

Larva and imago:—*Brischke und Zaddach, Beobachtungen über die Arten der Blatt- und Holzwespen (in Schriften der K. physikalisch-ökonomischen Gesellschaft zu Königsberg, 3er Jahrgang, 1862), p. 252, and the authors quoted.*

Cimbex (mas) violacco-nigra, antennis tarsisque luteis; (fæm.) lutea, thorace fusco-piloso, abdominis basi cingulo nigro-violaceo.

The indigenous *Cimbices* form four groups:—*C. humeralis, Fourc.*, stands by itself, and *C. Amerinæ, L.*, is equally distinct; *Lucorum, Vitellinæ* and *Betuleti, Kl.*, form the

third group (if one may say of the two former that they each separately form a group); and there remain in addition *C. connata*, *Schr.*, *Sylvarum*, *F.*, *Femorata*, *L.*, and perhaps *Fagi*, *Zadd.*, respecting which it is not yet proved, not only whether it be indigenous, but also whether it be a species.

This last group was regarded by Klug and subsequently by Hartig, following the first-named author, as forming *one* species, *Cimbex variabilis*, which name I adopted in my first catalogue. It is, however, quite certain, and has been shown by repeated observations of its metamorphosis, that *C. connata*, the first species in my new catalogue, is a distinctly separate species; its metamorphosis is described and figured in the seventh volume of this publication* (p. 59 *et seq.*, pl. 1 and 2). With about equal certainty, chiefly relying on the different coloration of the female, it may be taken that *Sylvarum*, *F.* (*Betulae*, *Zadd.*), is a true species. Perhaps *Fagi* will have to be referred to this last species; this is, however, doubtful, if, as Brischke considers, the larva displays fixed distinguishing characteristics, and feeds exclusively on beech. There remains, lastly, one other species, feeding on willows, and which will form the subject of this paper. There is, however, another difficulty with regard to this species. Brischke, who found these insects in great numbers, divides them into two groups: the one, which remains of a sordid green colour during the whole of its larval existence, lives, according to this author, on smooth-leaved willows; the other, which at the latter period of its larval state becomes reddish, or even flesh-coloured, lives on the leaves of the goat-willow (*Salix caprea*). I have never seen these red larvæ, but, at the same time, I have never met with *Cimbex* larvæ on the goat-willow. This being so, we are not much concerned with the question whether this larva, which is only known to us by description, really represents a species or not. Nevertheless, should the pale variety *Pallens* be produced from it, and, as Brischke asserts, from it alone, it would occur in the neighbourhood of Arnhem.

Although willows are very numerous in our well-watered country, the larger insects inhabiting this species of tree are never met with in large quantities. Perhaps excursions,

* 'Tijdschrift voor Entomologie'; translated in 'Zoologist' for July, 1869.

undertaken at the right times, along our rivers, on the banks of which scarcely anything but various species of willow is to be seen, would amply repay the trouble. I have not as yet tried this method of search, and have but seldom met with *Cimbex* larvæ on willows growing along the roads or ditches. I am thus by no means able to say as regards our country, as Brischke says of the environs of Dantzic, that the present species is numerously represented in it; on the contrary, I am bound to state that it is of very infrequent occurrence. Besides having been taken by me, the larva has been found by C. B. Voet, the celebrated Lyonet, and Messieurs H. Gerlach and F. J. M. Heylaerts, jun.

The following are the observations of the first-named writer in his manuscript work, dedicated to the stadholder, William III.:—"I found this larva on willow trees. In crawling it principally makes use of its six sharp anterior claws; for the rest it has, besides these, sixteen very short, blunt feet or processes, with which it attaches itself very strongly to the leaves, according to my notion, in the same way as boys lay hold of the stones by means of pieces of leather; but, as far as I have observed, it only makes use of the eight feet immediately following the sharp claws, simply dragging along the rest of the body bent round underneath. It very seldom moves or crawls about, lying almost always curled up, with the tail against the anterior feet and the head. It fed on willow-leaves up to late in September, and then crept into the refuse of rotting leaves," &c.

Lyonet writes as follows, in his work, '*Recherches sur l'anatomie et les métamorphoses de différentes espèces d'Insectes*, pp. 168, 169:—"La mouche dont on va parler nait d'une fausse-chenille encore à vingt-deux jambes et dont le onzième anneau est le seul qui en est dépourvu. Elle vit de feuilles de saule et a un pouce et sept lignes de longueur. Je suis porté à croire que c'est la même dont parle Goedaert, tom. i., expér. 64, et qu'il prend pour une chenille véritable. Il dit pareillement que la sienne vivoit des feuilles du même arbre, mais il ajoute qu'elle ne faisoit qu'un repas par jour, et vécut chez lui deux ans et vingt-quatre jours sans manger ni agir: aussi ne marque-t-il pas qu'elle ait changé de forme, ce qui pourroit bien n'être provenu que de ce qu'elle ne se portoit pas bien, ou avoit été gardée dans un lieu trop froid;

car le froid, ainsi qu'il est connu, retarde les fonctions animales des insectes, et les suspend même entièrement quand il parvient à un certain point; de sorte qu'un animal peut rester ainsi des années dans un état d'entière léthargie et de parfaite inactivité, sans mourir, et peut reprendre ensuite toutes ses fonctions lorsqu'on le transporte dans un air tempéré. Quoi qu'il en soit, les miennes firent leurs deux ou trois repas par jour; et après s'être repues, elles se courbèrent en hélice ou limaçon, comme la sienne, ainsi qu'on la voit représentée fig. 22, en se tenant couchées sur la feuille dont elles vivoient et accrochées par les six patés antérieures, avec une force suffisante à pouvoir braver les vents assez violens. En juillet, mes fausses-chenilles de cette espèce, sans que j'aie remarqué qu'elles eussent premièrement quitté leur peau comme le font grand nombre de celles de leur classe, entrèrent en terre. Elles s'y firent des coques ovalaires, passablement unies, dont la forme, un peu rétrécie vers le milieu, se voit fig. 23, et qui, pour la couleur, ressembloient à du cuivre rouge mat, et par la dureté pouvoient résister à une pression de quelque force. L'insecte s'y changea en une nymphe blanchâtre, à yeux noirs, dont tous les membres se distinguoient aisément, et étoient arrangés ainsi qu'on le voit par devant fig. 24, et de côté fig. 25. Il n'y avoit que les ailes, qui ramassées en tas, et appliquées contre les côtés de la nymphe, se terminoient entre la seconde et la troisième paire de jambes, qui ne se reconnoissoient pas si bien. J'eus en juin de l'année suivante des mouches mâles et femelles de ces fausses-chenilles, et ainsi après moins d'une année de jeune."

After these two quotations I can considerably shorten my description. I never observed the egg: this is probably inserted by means of the robust ovipositor of the female in a cut made by her saw in a twig of the willow. The larvæ which I found had already moulted for the second or third time: they then resembled, except as to size, the full-grown larva represented at fig. 1. The head and body are of a gray greenish yellow; a bright blue stripe extends along the back, beginning just behind the head and terminating very near the anus; this stripe is of a darker tint between the folds. The whole body is transversely divided into folds, on which are fine white grains or points. There are twenty-two

legs. The spiracles are bordered with black, the margins being somewhat expanded on the under side, so that they present the outline of a hart's hoof; above them are the orifices of the glands.

This larva differs from that of *Connata* in the absence of the yellow lines on the back next to the blue stripe; also in the ground colour being less green, and in having no row of darker dots above the spiracles; the skin below these is also less verrucose. From the larva of *Sylvarum* it differs in being less yellow and more of a gray tint; the head also is darker, and the dorsal stripe begins higher up and extends further; it is also more verrucose below the spiracles.

As regards food, *Femorata* eats the leaves of the willow, while *Connata* feeds on alder, and *Sylvarum* on birch.

Femorata lives in the larva state from June to August or September. It does not pass the pupa state on the branches, but makes its cocoon in the mould or at the roots of the trees. The cocoon is of a dark colour. The insect only enters into the pupa state a fortnight or three weeks before its emergence as an imago, which, like the other species, gnaws off a piece of the cocoon. Some larvæ remain two winters or, more accurately, a year and a half in the cocoon.

The only difference between the male of this species and that of *Connata* is that the wings do not exhibit any blue tinge. I do not consider it necessary to give a detailed description of this insect; a comparison of figs. 4 and 5 with fig. 16 of plate 2, vol. vii., first series, will suffice. I should only say that the colour of the body appears to me to be darker, while the antennæ are more entirely red. I cannot, however, state confidently that these characters always prevail.

The female also differs very little from that of the species mentioned. The thorax, which is more of a bronze colour in *Connata*, is, together with the head, in this species more thickly covered with woolly, brownish yellow hairs. The purple of the abdomen is in this species much blacker, has less of a coppery tint, and generally does not extend so far backwards: for example, in *Connata*, segments 1 and 2 and a triangle on segment 3 are of that colour; in *Femorata* only the first segment, with triangles on the centre of two or more succeeding segments.

At fig. 6 I have represented the tarsus of one of the posterior legs enlarged, in order to show more clearly the singular little soles which are found on the under sides of the joints, and consist of a flat disk with a thick projecting muscular border. In the catalogue I named this species *Cimbex lutea*: this is the Linnean name of the female. I adopted this name on the authority of Zaddach. I see, however, that Linnæus first described the male, which he called *Femorata*; and I therefore think it is more reasonable to adopt this latter name, unless one were to drop both names as being collective names of certain species which he regarded as *one*; in which case precedence would have to be given to the name adopted by Brischke and Zaddach, namely *Cimbex Saliceti*.

The female variety *Pallens*, which, according to the above-mentioned authors was also reared from larvæ feeding on willows, differs in the following particulars:—The dorsum of the thorax is of the same loamy yellow as the margins of the prothorax, and has only a wedge-shaped brown spot on the mesothorax; the abdomen, in the two examples with which I am acquainted, is entirely yellow, without any dark purple band or spots; lastly, the legs are entirely yellow, and the outer margin of the anterior wings is clouded with brown. There is no record of the place where these two examples were taken, so that I cannot confidently assert that they are indigenous.

An Attempt to Arrange the British Eupithecidæ by their Larval Characteristics. By C. S. GREGSON, Esq.

At present, look where we will, we find this genus so muddled and mixed in our various books and lists that it seems evident our authors were, or are, little more than mere compilers, not one of them having shown any knowledge of the relationships of these most interesting groups of Lepidoptera. Thus we see in one list *Togata*, which is not an *Eupithecia* at all, placed between *Juniperata* and *Pumilata*, the larvæ of which differ much from each other; whilst in another work we have *Assimilata*, with its long, slender larva, placed between *Minutata* and *Tenuiata*, two larvæ which I think almost as far removed from each other as it is

from either of them; and again, in another list, we have the long, slender, cylindrical larva of *Subfulvata* of Haworth preceding the stout, swelled-out larva of *Succenturiata* of Linn., followed by the long, slender larva of *Centaureata*, which is followed again by the short, broad larva of *Linariata*. Here, I think, we see how utterly chaotic our *Eupithecidæ* are placed; and in order to clear up the British species, and place them somewhat more naturally, I have annexed a list, drawn up and arranged entirely from my own knowledge of the larvæ of this genus. Had I obtained any assistance from any of my friends the arrangement might have been more perfect; but they might have had to share the blame of any shortcomings. As it is, I alone am blameable; but as I am not acquainted with the larvæ of more than six or eight of the forty to fifty European *Eupithecidæ* which are not British, I make no pretence of placing the British species as I might do had I bred nearly the whole of them, as I have bred the British species. I may say, I treat one or two species, now in our list, as mere aberrant forms of good species, and I also reject *Venosata* and *Togata* as not being true *Eupithecias*: it may be that some of the continental *Eupithecidæ* might connect them with Curtis's genus in my mind if I knew these larvæ; but, in the absence of such knowledge, I prefer to reject them, or at best to place *Venosata* before the true pugs. Its larva being so different from any other European pug-larva I know, and utterly unlike any British pug-larva, I shall then for perspicuity group our British species from the form of the larva; and as I have found, during many years pug breeding, that this is a pretty general guide to markings also, though not absolutely so, I shall follow the annexed plan.

Larva shortish, broad from head to anus.—*Venosata*.

Larva short-attenuate.—*Plumbeolata*, *Isogrammata*, *Pygmeata*, *Helveticata* = *Arceuthata*, *Tenuiata*, *Rectangulata*, *Pumilata*, *Debiliata*, *Valerianata*.

Larva medium and stout.—*Trisignata*, *Pulchellata*, *Linariata*, *Succenturiata*, *Satyrate*, *Expallidata*, *Albipunctata*, *Companulata*, *Knautiata*, *Minutata*, *Absynthiata*, *Subnotata*.

Larva long, cylindrical, generally tapering to head.—*Consignata*, *Castigata*, *Vingaureata* = *Pernotata* (*var.*), *Irriguata*, *Vulgata*, *Abbreviata*, *Dodoneata*, *Exiguata*, *Pimpinellata*, *Centaureata*, *Subfulvata*, *Nanata*.

Larva slender.—Lariciata, Pusillata, Fraxinata, Innotata, Indigata, Constrictata, Assimilata, Coronata.

I have placed Coronata last in the arrangement, because I hardly know a better place for it. I may say of Togata I know nothing of its larva, though I spent a jolly day at Black Park, Bucks, with my old friend the late Edward Hopley, after the perfect insect, in July, 1862; and the description given in Ent. Mo. Mag. vol. ix. p. 114, being without size or shape, does not help me to place it. The author, it is true, gives some characters, but these only confound confusion; he says, "central," "dorsal," "subdorsal," &c.; and as I have always thought the dorsal line or marking was the central line or marking (on the back), I begin to think "things is getting mixed," when we have both central and dorsal, especially as further on he says: "An odd, internal-looking animal, strongly resembling a miniature *Cossus ligniperda*"! but as I fail to find any remarks about the red marks or blotches so conspicuous upon the larva of *C. ligniperda*, I cannot connect them, or see any resemblance from this vague description. I purpose placing this insect in a new genus; and with one more remark shall close this paper. Egenata is another form, which I treat as a variety of Innotata; hence have omitted it from the list of species.

I am aware that some of my friends will differ from me in this, but, nevertheless, I hold to my opinion at present. When I am shown I am in error, I shall gladly admit that I did not know as much to-day as I may to-morrow; and nothing will give me more pleasure than to be corrected, if, trusting to my memory of our pug larvæ (some of them not having been bred or even seen by me for nearly twenty years), I have misplaced or malplaced them, my object being simply to place them less incongruously than they at present stand in our books and in our cabinets.

C. S. GREGSON.

Rose Bank, Fletcher Grove, Edge Lane,
Liverpool, October 3, 1875.

Notes upon Sugaring, during September and October, 1875.

By WILLIAM W. KEYWORTH, Esq.

THE following notes upon sugaring I have taken during last September and October, with the object of finding out,

if possible, some data which can be relied upon with some sort of certainty as to what sort of night is likely to produce a good haul of Lepidoptera. The sugar I used was always about one half-pint of common black treacle, with about a tablespoonful of rum; and I always sugared the same trees.

1. Day fine, towards evening cloudy, with slight south-west wind and heavy dew. A very fair number.

2. Day dull and close, with very heavy thunder-storm in the middle of the afternoon, after which there was a brisk wind from the west. A great number before the moon rose, after which I found very few.

3. Day fine, with wind from the west, sky clear, and no dew. Only three very common species.

4. Day fine, with no wind, cool in the evening, and no dew. Nothing at all except a few earwigs.

5. Day fine, but dull towards evening, no dew, and a good deal of wind. Very few of any kind.

6. Very fine day, cloudy towards evening, with a slight dew and gentle south-west wind. A moderate number.

7. Very windy day, with alternating cloud and sunshine; the wind dropped towards evening, and there was a slight dew. About twenty specimens of common species.

8. Very fine day, cloudy and close in the afternoon and evening, with a slight west wind and dew. A great many of all sorts.

9. Very stormy and wet morning, which cleared up about noon, and the wind dropped to a light breeze from the west; the vegetation very wet with the rain in the morning. Numerous species.

10. Day rather cold and windy, but warmer towards evening, with a slight dew. A very large number of common species.

11. Very close day, with a light west wind, and a slight dew in the evening. A great number.

12. Magnificent day, without a cloud, but extremely windy, and a very slight dew. Nothing at all.

13. Very warm day (with a good many butterflies about), with hardly any wind and no dew. Very fair number.

14. Very fine day, but rather misty, which increased towards evening, and the grass very wet. Only four common ones.

15. Very fine day and close, with a moon in the evening, no dew. Nothing at all.

16. Day fine, with two or three slight showers, and very misty at night, with no wind. Ten or twelve common species.

17. Windy day, with a few showers in the morning: in the evening the wind subsided, and the grass remained wet from the rain in the morning. A great number before the moon rose.

18. Morning very wet, with strong west wind. It cleared up in the afternoon when the wind dropped. A very fair number.

19. Day cloudy and close, with wind from the west, which increased about eight o'clock. Very fair for about twenty minutes, after which there was hardly anything.

20. Dull day, with rather a strong wind from the south, which abated towards evening; very cloudy, and a slight dew. Very great number.

Judging from the above notes, I find that as a rule fine or showery days—with a west or south wind and some sort of moisture on the grass, either rain or dew, and no, or at least a very young, moon—are good, if the wind is not too strong; whereas a dry night, or when the wind is north or east, is usually bad.

WILLIAM W. KEYWORTH.

Alderley Edge, near Manchester.

Notes on Oviposition. By the Rev. P. H. JENNINGS.

(Continued from vol. viii. p. 218.)

I SEND you a few more notes on oviposition, which will bring what I have to say to a close till next season.

A. scutulata.—A female, taken August 12th, laid thirty-seven eggs: twenty-five on the 13th and twelve on the 14th. Of these thirty-one were deposited on the under surface of the leaves, four on the upper, and two on the stem of food-plant, *G. Mollugo*; some were laid singly and some in batches, varying in number, the largest seven: oval, slightly flattened on both surfaces; attached to the leaf or stem by the small end; cream-coloured, not glossy; surface covered

with minute, circular, convex markings. Signs of fertility began to appear in reddish specks on the sides, together with a deepening of colour throughout. The young larvæ appeared on the seventh day, August 25th.

S. retulata.—Three females, taken the first and second weeks in July, laid a number of eggs on the ground, without any adhesive property: oblong, equally rounded at both ends; whitish, with the faintest yellow tinge, partially glossy. The deposition of the eggs did not take place till some time after the females had been taken. They were fed, and survived till the month of August. The eggs are now, November 18th, of a light brown.

S. rhamnata.—Two females, having been fed about a fortnight, laid twenty eggs on August 3rd and thirty-two on August 4th: oblong, equally rounded at both ends; bright yellow; became orange-coloured on the fourth day, of which colour they still remained on November 18th.

C. picata.—A female, taken July 16th, laid thirty eggs: a few on the under surface of the leaves of the food-plant (*G. Mollugo*), the rest pressed closely amongst the stems of the blossoms and the leaflets springing up around them: oblong, equally rounded at both ends; white, with faintest greenish tinge, partially glossy.

P. H. JENNINGS.

Longfield Rectory, Gravesend,
November 18, 1875.

Entomological Notes, Captures, &c.

Description of the Larva of Cidaria populata.—As there is such a slight description of the larva of this species in 'British Moths,' I think a more complete one will not be considered out of place in the pages of the 'Entomologist.' I may say here, that although I have reared a large number of these larvæ, I have never seen any of the "green-tinted" forms mentioned by Mr. Newman. This year I fed up two broods from eggs obtained from moths captured last season, and from them the following notes were taken. The eggs were deposited about July, 1874, and began to hatch on the 3rd of April of the present year. The newly-emerged larvæ

were dark greenish brown, the sides yellowish green, and the head dark wainscot-brown. They fed up well on bilberry; and on the 3rd of June, being full grown, their description was taken as follows:—Length about an inch and a quarter, and of average bulk in proportion. The head has the lobes rounded, but is rather flat in front, and is slightly broader than the 2nd segment. Body tolerably, but rather unevenly, cylindrical, tapering a little towards the head; there is a slight lateral ridge, which on the 3rd segment takes the form of a distinct swelling. The skin has a tough appearance and is rather rough; there are a few exceedingly minute hairs upon it; the segments slightly overlap each other, rendering the divisions distinct. The ground colour varies in different specimens from a median shade of brown to almost black, the great majority, however, being of the paler type. In these the head is of the same colour, with two median pale lines, and a reddish brown mark on the side of each lobe. On the dorsal surface is a series of large, pale, almost diamond-shaped whitish marks, each of these marks being more or less mottled with brown spots and streaks; those on the posterior segments are the largest and most conspicuous; those on the others indeed vary very much both in size and distinctness, in some being confused and not so noticeable. The pale whitish subdorsal lines are distinct only on the 2nd, 3rd and 4th segments, being a continuation of the two pale lines on the head; the space between these pale lines is filled up by a short black stripe, and on the 3rd segment (the swollen one) is a transverse black collar. Along the spiracular region, on the lateral ridge, are a few dull reddish brown marks. The ventral surface and claspers are of the same shade as the ground of the dorsal surface, but there is a distinct, narrow, dark brown central line, rather broadly bordered with pale grayish white. Legs brown. The cocoon is very slight, and is formed by drawing together with silken threads a few old leaves. The pupa is about five-eighths of an inch in length; the eye-, leg- and wing-cases prominent; the anal tip pointed. Colour pinkish brown, the wing-cases streaked with dark brown; dorsal line broad, dark brown; behind the head it divides into a V-like mark; there is also a dark brown ventral stripe from the base of the wing-cases to the anal tip. The first imago emerged on the 21st of June.—*Geo. T. Porritt; Huddersfield, November 2, 1875.*

Exportation of Humble-bees to New Zealand.—Some months ago I was waited upon by a gentleman who gave me to understand that he called by desire of Mr. Frank Buckland to ask my advice as to the best method to be adopted in order to introduce some species of our humble-bees into New Zealand, the object being the fertilisation of the seeds of red clover, there being no bee in the colony whose tongue is long enough to effect that purpose. After some consideration of the matter I gave my opinion, and I still adhere to it. I have been greatly surprised by reading an extract from 'Nature' of the 14th of October last, by which I learn that Mr. Frank Buckland has sent two nests of humble-bees, packed in their own nests in two boxes, under the charge of a member of the New Zealand Council,—I suppose of the Canterbury Acclimatisation Society. I should be glad to hear of the success of this undertaking, but for several reasons I am of opinion that the result will prove an utter failure: be that as it may, I wish it to be distinctly understood that the method adopted is not one of my recommending. On reading that "the bees were packed in their own nests," I conclude the species was one of the surface-builders—"moss-builders" they are usually erroneously called, since the majority of the nests of these bees have little or no moss used in their construction. The species is not particularised, but I may, I think, safely conclude that it was *Bombus Muscorum* or *B. senilis*. These are not such hardy species as some of those that construct their nests under ground, and therefore not species I should recommend for exportation. The surface-building bees found in Great Britain are seven in number, and all these finish their labours and disappear several weeks before the hardier species. The nests sent would, I presume, contain male, female, and worker bees. My observations of humble-bees have extended over thirty-five years, and I believe that the impregnation of females never takes place in the nest; I also believe that it always takes place in the open air, and that no impregnated female ever returns to the nest. When this act has taken place, the female, in my opinion, at once seeks for a suitable hybernaculum in which to pass the winter. I therefore conclude that none of the females in the nests sent are impregnated, and I anticipate that the broods will perish on the voyage; or, if by great care any arrive at New Zealand, it will only

be a few unfertile females. Having expressed somewhat reluctantly my opinion,—so adverse to the desired success,—I will state what I believe to be the only plan that can be adopted with any hope of success. In the first place, I should not think of attempting to introduce any surface-building species. I should select two or three of the hardiest ones,—such as *Bombus terrestris*, *B. Lucorum*, *B. Hortorum*, and *B. subterranea*. In order to make the chance of success as great as possible, I should take care to send only impregnated females: these can now be obtained, all the humble-bees having retired to their winter-quarters. A number of such females were required some years ago for scientific purposes: a collector was employed, who searched under my own instructions. The result was that he obtained in a few days over fifty females, all in a torpid state. My plan would be to get a number of such torpid bees, and, by some of the best-known means of refrigeration, keep them in a state of torpidity during the voyage. This once accomplished, success would be certain. Humble-bees survive four or five months of torpidity, and they can now be exported in a much shorter time than five months. This is the plan I recommended when applied to, and I should certainly not have thought of trying an experiment which I fear will prove a total disappointment.—*Frederick Smith.*
 [From the 'Field.']

Additions to the List of Macro-Lepidoptera inhabiting Guernsey.—*Sesia Megillæformis*?—Having noticed that the *Sesia* mentioned in a previous list (Entom. viii. 30) as *Ichneumoniformis* seemed somewhat different from the usual type, as figured in Newman's 'British Moths,' I sent it to the late Mr. H. Doubleday, with an enquiry as to whether it had been correctly named. The following was Mr. Doubleday's reply:—"I do not possess a *Sesia* exactly like the one you sent. It is very closely allied to *Ichneumoniformis*, but the yellow bands on the abdomen are fewer, and the caudal tuft is not exactly the same. I never saw the *Megillæformis* of Hübner; but Dr. Staudinger gives it as a variety of *Ichneumoniformis*, and says there are only three yellow bands on the abdomen." *Nonagria geminipuncta*.—One specimen taken, flying to the light of my lantern at the Grande Mare, Vazon, on September 1st. *Xylina petrificata*.—One specimen taken at ivy-bloom, October 14th.—*W. A. Luff; Guernsey.*

List of the best Insects captured at or near Whittlesford during the past Season.—(Those marked * I had not previously taken here).—**Sesia formiceformis*.—Nine taken amongst osiers, July 27th. *S. apiformis*.—Thirty or more bred from pupæ dug. **Hepialus hectus*.—Very common in one wood. **Nulularia senex*.—Forty taken by myself and friend flying over rushes, July 10th, from 8 to 8.30 P.M. *Orygia fascelina*.—One male bred from larva.—*Lasiocampa quercifolia*.—One full-fed larva found. *Epione apiciaria*.—A few amongst shallows. **Selenia illustraria*.—One fine male netted. *Amphydasis prodromaria*.—One at rest and one at light. *Geometra papilionaria*.—One attracted by light. *Iodis vernaria*.—Five or six netted over clematis. *Corycia taminata*.—Two netted in June. *Eupithecia isogrammata*.—Very common over clematis. **Lobophora sevalisata*.—One at rest on a hawthorn-stem. **L. hexapterata*.—Two males netted in May near aspen. *Ypsipetes impluviata*.—One bred from pupa under alder-moss. *Melanthis albicillata*.—One only, taken by a friend. *Anticlea sinuata*.—Six bred from the six larvæ recorded last year; none this year. *A. rubidata*.—Two netted in June. *A. derivata*.—One netted in May. *A. berberata*.—Seven or eight over a barberry-bush. *Coremia quadrifasciata*.—Two worn ones netted. *Phibalapteryx tersata* and *P. vitalbata*.—Three or four netted over clematis. *Scotosia certata*.—Seven flying round a barberry-tree. *Platypteryx unguicula*.—Three females bred, and two males netted. **Cymatophora duplaris*.—One at sugar in garden. **C. ocellaris*.—Two bred, and two more pupæ dug. *Acronycta strigosa*.—Two at rest and one at sugar in garden. **Leucania pudorina*.—One at sugar in garden. *L. comma*.—Four at light. *L. straminea*.—Fifty-five bred from larvæ found in May. *Nonagria typhæ*.—Two bred from pupæ. *N. geminipuncta*.—Fifteen bred from a large number of pupæ. *Calamia phragmitidis*.—Saw traces of larvæ; also one larva. *Neuria saponariæ*.—Three at light in June. *Cerigo cytherea*.—Common at light, sugar, &c. **Miana literosa*.—Five at sugar in garden. *Agrotis saucia*.—One at sugar. *A. rorida*.—Common at sugar and light. *Tryphæna interjecta*.—Common, flying very swiftly. *Noctua rhomboidea*.—One at sugar in garden, August 17th. **Tæniocampa populeti*.—

Three at willow-bloom, March 31st. *T. munda*.—Seven at willow-bloom, March 30th. **Xanthia citrigo*.—Two at sugar in garden. **X. cerago* and **X. silago*.—Very common at sugar. **X. gilvago*.—Sixty or seventy at sugar in garden. **Cirrædia xerampelina*.—Twelve bred from larvæ found in May. **Tethea subtusa*.—One at sugar in garden, July 21st. *Eremobia ochroleuca*.—Two larvæ feeding on darnel, and one bred; they would not touch cock's-foot grass. *Hecatera dysodea*.—Three at light and one at rest. **Epunda lutulenta*.—Twelve fine ones at sugar in August. **Agriopsis aprilina*.—One bred from pupa dug. *Xylina semibrunnea*.—Forty at ivy-bloom and sugar. *Dysthymia luctuosa*.—Several seen and one taken. *Toxocampa pastinum*.—About a dozen taken, more common than usual, and very much earlier. *Aventia flexula*.—One fine female at sugar.—*A. Thurnall*; Whittlesford, Cambridgeshire, Nov. 17, 1875.

Captures of Lepidoptera.—I have the pleasure to inform you that I have been fortunate enough to add to my collection during the past season a fine specimen each of *Noctua flammatra* and *H. scutosa*. They were both taken near Norwich on July 10th and August 11th respectively. They were captured at light by a young friend who was collecting for me, and came into my possession while quite limp. Unfortunately, I had provided my friend with some rather long pins amongst others, and one of these he passed through the thorax of *N. flammatra*, not knowing the rarity of the insect. In order that the insect should go into my cabinet, which, being home-made, had very shallow drawers, I was foolish enough to remove about one-tenth of an inch from the head of the pin with a pair of pliers, and thereby cause a suspicion as to its being a genuine English specimen. This should prove a word of warning to fortunate captors of scarce insects. I have, however, not the slightest doubt as to its capture in Norfolk; though the fact of it having been taken within twenty miles of the North Sea goes towards establishing your theory that the majority of our greatest rarities have been blown over from the Continent. To *H. scutosa* the same remarks apply, though fortunately it is properly pinned. I may mention that these insects form a most valuable addition to the list of Norfolk Lepidoptera, and should be very pleased at any time to show them, by appointment, to

Mr. Barrett, or any other entomologists from that county. I have taken during the past and preceding seasons about a dozen specimens of *H. armiger* from the same locality, though they, with few exceptions, are by no means in good condition. This also is an addition to the Norfolk Fauna. In conclusion, I would advise collectors never to call a locality unprofitable until they have tried the attraction of light. The following are among the captures I have lately made by its employment:—*S. Convolvuli*, *L. quadra*, *E. dolobraria*, *A. prodromaria*. *N. dictæa*, *N. dictæoides*, *N. trepida*, *N. chaonia*, *N. dodonæa*, *C. ridens*, *L. cespitis*, *A. saucia*, *C. xerampelina*, *E. ochroleuca*, *C. chamomillæ*, &c.—*W. H. Thornthwaite*; 416, *Strand, W.C., November 19, 1875.*

Lepidoptera at Newcastle-on-Tyne.—I have few novelties in Lepidoptera, the capture of which to report during the past season. Those most worthy of note are one *Ennomos erosaria* in Thornley Woods, in September; a fine male, just escaped from the pupa. Three *Oporabia filigrammaria* came to light near the town; no heather grows within two or three miles of the place of their capture; without doubt the larvæ feed on willows or sallows. Also one specimen of the pretty little *Pyalis fimbrialis*. Notwithstanding the cold and wet summer we experienced in the North, insects were rather plentiful, more especially Noctuæ; the common species appeared in swarms. Also Tortrices seemed more abundant than usual; the best of my captures were three or four *Peronea umbrana*. Butterflies were very scarce, with the exception of *Pieris Brassicæ*; the second brood being more abundant than I have noticed for several years.—*W. Maling.*

Sphinx Convolvuli near Newcastle, Staffordshire.—A very fine *Sphinx Convolvuli* was brought to me this autumn (end of September), which had been knocked down in this parish, and captured by a working man. Having fallen into inexperienced hands it had unfortunately got a good deal rubbed. It was a very large specimen. I fancy North Staffordshire is an unusual locality for this fine moth.—[*Rev.*] *Thomas W. Daltry*; *Madeley Vicarage, Newcastle, Staffordshire, November 23, 1875.*

Sphinx Convolvuli and Epanda nigra at Rugby.—I have had three specimens of *Sphinx Convolvuli* brought to me this season, taken at rest here; others have been seen, but

unable to get them. I also took at sugar one stormy night, about the end of September, a specimen of *Epunda nigra*; it was on a post in some gardens; I have not found another. I believe this is a new locality.—*Walter S. Edmonds*; 28, *Lawford Street, Rugby, November 20, 1875.*

Acronycta Alni and *A. pyrophila* at *Stratford-on-Avon*.—I have taken a caterpillar of *Acronycta Alni*. Is it a very great rarity? I have also taken several specimens of *Agrotis pyrophila* at sugar; they were never taken here before.—*Charles Marée*; *Stratford-on-Avon, October 4, 1875.*

Agrotis saucia at *York*.—I have pleasure in recording the capture of a fine specimen of *Agrotis saucia* on the 6th of October. Also a rather worn one of *Xanthia gilvago*. *Calocampa vetusta* came to sugar on the 16th, one specimen, along with numbers of *C. exoleta*.—*T. Wilson*; *North View, Holgate, York, October 20, 1875.*

Answers to Correspondents.

J. Parker.—"Are there Two Broods of *Papilio Machaon* in a Season?" (Entom. viii. 301.)—This question does not yet appear to be satisfactorily decided. The time of emergence of this species from the chrysalis state seems to be very uncertain. If I may judge from experience those produced from eggs laid in May do not *always* emerge the same year, as one is given to understand by Lewin, but the majority producing imagos the following May or June. On the 3rd of August, 1874, I procured, at Ranworth, four dozen chrysalides of *Papilio Machaon*, one of which emerged on the 6th and two on the 7th of the same month; all the rest made their appearance as imagos in May and June, 1875. In previous years I have noticed the same circumstance. In July, 1875, I brought from the Norfolk fens a quantity of larvæ of this species, which in due time reached the chrysalis state, one of which emerged about three weeks afterwards, and a perfect specimen from the same stock came out on November 26th, the temperature of the room being 36° Fahr. It lived six days in an apparently dormant state. Is not this rather extraordinary?—*Robert Laddiman*; *Norwich.*

Alfred Aspinwall.—*Names of Moths*.—Would you kindly name the three moths enclosed? No. 3 seems to me greatly

to resemble *Barrettii*, the general colour and the white spot at the anal angle of the under wing leading me to this conclusion.—*A. A.*

[(1) *Amphipyra Tragopogonis*, (2) *Hydræcia nictitans*, (3) *Hadena dentina*.—*Edward Newman*.]

G. B. Corbin.—*Cnethocampa pityocampa* and *Argynnis Niobe*.—Where is *Cnethocampa pityocampa*? I am led to make this enquiry from the fact of having been somewhat surprised last season at the very common occurrence of this species in Kent, and the silence which has prevailed this year with regard to its occurrence. Is the species so thoroughly British that no question can be raised as to its authenticity, or has my isolated position as a collector prevented me from recognising the well-known fact? Surely if the species was so common as represented upon fir-trees, they have not been exterminated in one season's collecting, assiduously as that might have been carried out; or did the continued rains and floods of spring and early summer destroy the hopes of this season with this particular species? Again, has *Argynnis Niobe* been taken this season at the bottom of that particular "huge rent" amongst the rushes in Kent, or has that also disappeared with *Cnethocampa pityocampa*? If I mistake not, it was stated in the 'Entomologist,' at the time of the occurrence of *Argynnis Niobe*, that a pair were to be figured in its pages; but the non-appearance of these portraits seem to point to the fact that some doubt existed as to the thoroughly British origin of the specimens in question. Did such a doubt exist? To persons like myself, who live away from the great marts of entomological specimens and information, the news of a new species added to our native Fauna is regarded with perhaps greater interest than we should otherwise experience; and with regard to the two species, *Cnethocampa pityocampa* and *Argynnis Niobe*, I must say my interest and curiosity were awakened, but it certainly has not been satisfied; possibly, however, I have felt some bias from the doubts expressed about the thorough genuineness of all these specimens at the time of their capture. I understand that *Argynnis Niobe* has unquestionably been taken in England once or twice, which is perhaps sufficient to establish its identity as a British insect; but I had hoped that this season would have recorded its further occurrence in that particular locality in Kent,

which county seems to have become quite an emporium for entomological rarities.—*G. B. C.*

[I am much obliged to Mr. Corbin for these enquiries. I cannot believe in the Kentish captures of these two species, in this respect differing from my lamented friend Henry Doubleday, who was so honest and truthful in all his statements that he was ever willing to credit those of others. When I penned the paragraph to which Mr. Corbin alludes, I certainly intended to figure *Argynnis Niobe* as British; but the specimen in my possession on further information proved so questionable that I postponed the drawing and engraving *sine die*. I have received records of the capture of twenty-six specimens of *Daplidice* and a round dozen of *Podalirius*, which I suppress for the same reason.—*Edward Newman.*]

Extracts from the Proceedings of the Entomological Society of London.

NOVEMBER 3, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

This being the first meeting of the Session, the President read the following address:—

Gentlemen,—On the opening of our new Meeting Room and Library, at the commencement of the present Session, it may be fitting to inaugurate our reunion and installation here by a few introductory remarks. Your Council has long been conscious of the many inconveniences experienced from the former inaccessible position of our Library at Bedford Row and its disconnection with our Meeting Room, conceded to us by favour of the Linnean Society at Burlington House. The numerous additions, moreover, to our bibliographical collection having superadded want of space to other exigencies, it has been deemed expedient to provide for these requirements in combination with some other Society capable of affording us adequate accommodation. By the unremitting exertions of our Secretary, Mr. Grut, this has finally been accomplished; and although the advantages of bringing our Library and Meeting Room into juxtaposition in a more central site must necessarily involve a certain increase in our annual expenditure, it may not unreasonably be anticipated

that the beneficial influences resulting therefrom will not be confined to those only who now muster in our ranks, but will also constitute a source of attraction to others. Arrangements have likewise been made whereby, as already intimated in convening this meeting, our Library will be open to Members and Subscribers every Monday from two to seven o'clock, as heretofore, and on every Wednesday and Friday from two to five o'clock, instead of one day in the week. I must also bring under your notice that we are indebted to the liberality of one of our Members for a further proof of the interest which he has on several occasions exhibited on behalf of this Society, in providing for the entire expense of transferring our Library to this locality, as well as of the glazed book-cases and fittings requisite for its reception. In connection with these ameliorations it has been found necessary to alter the days hitherto appointed for our meetings from Monday to Wednesday, the former day in each week being already appropriated to the meetings of the Medical Society. Our Anniversary Meeting, however, will still be held on the third Monday in January, as prescribed by the Bye-Laws, but at an earlier hour,—namely, five o'clock in the afternoon. It has also been deemed opportune to revert to the former custom, as originally provided by the founders of this Society, of holding our meetings in the first week of each month throughout the year, instead of having certain bi-monthly meetings to obviate the difficulty arising from the closing of the rooms at Burlington House during the summer recess. Having thus adverted to the changes, made with a view to promote the interests of this Society and the convenience of its Members, I would further draw your attention to the expansion which it has been deemed advisable to give to the usual custom of introducing friends at our meetings, by throwing open our doors to all entomologists indiscriminately on this occasion as appertaining to one and the same system, actuated by corresponding impulses, and influenced by similar attractions in common with ourselves. Our policy is not one of exclusiveness, but rather that of fostering and developing new sources of emulation from within and from without, which can best be effected by cultivating a closer intimacy with those who are fellow-labourers in the same field. To all such we tender a hearty welcome. I would venture, in conclusion, to suggest to some few of our most

esteemed Members, who are habitual absentees, the benefits which they might be enabled to confer by returning to our horizon from their remoter orbits in the realms of ether, and shedding new lustre upon our discussions. We are each of us more or less liable to be called upon in various ways to satisfy the importunities of conventional obligations; and in looking forward to the future as fraught with propitious augury, we must rely upon the zealous co-operation of all to improve our vigour and efficiency. We will now proceed, Gentlemen, to the ordinary business of the evening.

On the proposal of Mr. Sheppard, seconded by Mr. Bates, it was agreed that the thanks of the meeting be given to the Members of Council and the Secretary for the trouble they had taken on behalf of the Society in making arrangements for the new Meeting Room and Library, and in removing and entirely re-arranging the collection of books. Also, that the thanks of the meeting be given to the Member who had so generously aided the Society by undertaking to provide the expenses of removal to Chandos Street.

Mines of Heliozela sericiella.—Mr. Boyd exhibited specimens of the mines of *Heliozela sericiella*. He had succeeded in rearing the insects, by confining them with a young oak-plant, and thus was enabled to discover their habits, of which nothing had hitherto been known. The mines were formed in the foot-stalks of the leaves.

Female of Enoicyla.—Mr. M'Lachlan exhibited a living apterous female of a Trichopterous insect, *Enoicyla* (probably *E. pusilla*, *Burm.*). He had recently bred it, with others, from cases forwarded to him by Mr. Fletcher, of Worcester, the discoverer of the insect in this country. Mr. M'Lachlan gave an account of its structure and singular habits. The perfect insects emerge in November, the males being furnished with ample wings.

Coleoptera.—Mr. Champion exhibited examples of the following Coleoptera recently captured by himself, *viz.*, *Cryptophagus Populi* (varying greatly in size and colour), taken from the burrows of *Colletes Daviesana*, near Farnham, Surrey; *Orchestes semirufus*, *Gyll.?* from Woking; *Epuræa neglecta*, beaten from faggot-stacks at Darenth Wood; and *Psammodytes porcicollis* from Whitsand Bay. The last-named had been taken by Mr. S. S. Walker.

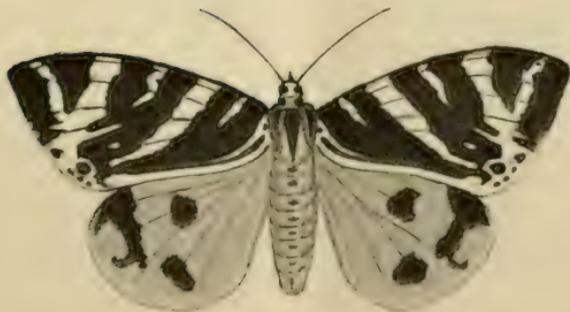
THE ENTOMOLOGIST.

No. 152.]

FEBRUARY, MDCCCLXXVI.

[PRICE 6d.

Variety of Callimorpha Hera. By EDWARD NEWMAN.



CALLIMORPHA HERA (the upper figure represents a variety).

I AM indebted to the kindness of Mr. Luff for the opportunity of figuring this beautiful variety of a species which is but little known to English collectors. An illustration of the normal form of Hera has already appeared in the pages of the 'Entomologist,' and is reprinted here in order to afford

readers an opportunity of comparing with the variety. It will be observed that the oblique cream-coloured stripes which adorn the normal insect are in this aberration partially or altogether wanting. In the normal insect six such stripes are present, five of these reaching the costa, and the sixth being situated at the base of the wing, immediately in contact with the body. I will try to make my meaning intelligible.

To begin with calling the basal stripe No. 1, it will be observed that it is slender and pointed, and intermediate between the costal and inner margins; in some examples it is continued almost as a thread-like line towards the anal angle. No. 2 is on the costa only, is parallel to No. 1, and much resembles it, but is rather less. No. 3 is variable: it generally extends obliquely from the costa to the anal angle; at the costa it is broad, but gradually diminishes to a point before reaching the angle; in the variety it generally ceases almost immediately below the costa, but reappears as a slender line near the anal angle. No. 4 is costal only, and smaller; a mere spot, almost square. No. 5, in the normal insect, extends from the costa obliquely downwards, until it meets No. 6, also oblique, but tending in another direction; they unite in forming a letter V; in the variety this ceases immediately below the costa: the hind wings present but small difference in the distribution of their markings; their colour is scarlet, with black spots.

After taking all this trouble in trying to describe the differences that exist between the normal insect and the aberration, I feel that I have not expressed those differences nearly so well as Mr. Willis has done in the drawing, which Mr. Kirchner has engraved with such consummate skill.

EDWARD NEWMAN.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from vol. viii. p. 291.)

36. *Synophus politus*, Hart.—This more or less spherical gall grows out of the axillar and terminal buds of the Turkey oak, and varies much in shape. I shall first of all describe the one that is commonest and most regularly developed.

It is generally about the size of, and has very much the appearance of, a large gall of *Cynips lignicola*. At first it is greenish, but when mature of a yellowish clay-colour, sometimes almost black. It is sprinkled all over with small



Fig. 36.—GALL OF *SYNOPIUS POLITUS*.

whitish warts, and covered with short hairs, which are only visible with the aid of a magnifying-glass (sometimes the base, which generally retains the bud-scales, is fixed to, and grown into, the branch). At the point opposite the base either a small umbilicate cavity or a small conical tubercle is often found. The section shows that the gall consists of two layers: the exterior one is green when fresh, and consists of bark substance; the interior one, however, which contains the larva-cell, is formed of true wood substance. As the second variation, I might mention that form which bears crippled leaves on its surface, but in all other respects perfectly agrees with the former variety. From this second variation a third form is very often developed: in this case the gall appears to have so long a continuity that it could easily be mistaken for a mere swelling of the stem (consequently it does not look like a bud-gall); this delusion is all the more easy if the fly is not developed the first year, and the following year the gall continues to grow as a twig. A fourth variety is interesting on account of the constancy of its size and shape; we often meet with an oak on which we only find this variety in great numbers: it is spherical, and is about five millimetres in diameter; the small white warts are wanting, or are far less conspicuous than in the first-described form; the umbilic or conical projection at the top is also wanting. In section it exhibits a much thinner layer of bark and wood substance, while respectively the larva-cell is very

large. From this form a *Synophus* is developed, which perhaps is generally smaller, but differs in no way from specimens bred from the normal form: as an important fact, I must mention that I have bred from these galls some specimens which do not in the least differ even in size. The normal flight-time of the gall-fly is March and April; I have, however, extracted living specimens from a gall I cut open the following autumn. With those galls which have been collected some time before the flight-time of the fly, it is certainly advisable to soak them for some hours in water, as the gall-fly is often unable to bite through the wood-layer, which gets very hard and dry from being kept in a room. On the 9th April of this year I found a leaf of the Turkey oak, of which only one half was developed: to the midrib adhered a mature gall of *Synophus politus*, from which a fortnight later a fly emerged.—*G. L. Mayr.*

Dr. Mayr records *Synergus variabilis*, *Syntomaspis Cerri*, *Callimome regius*, *Megastigmus Synophri*, and *M. dorsalis*, as having been bred from the galls of this species. Will they follow the introduction of *Quercus Cerris* into Britain?—*E. A. Fitch.*

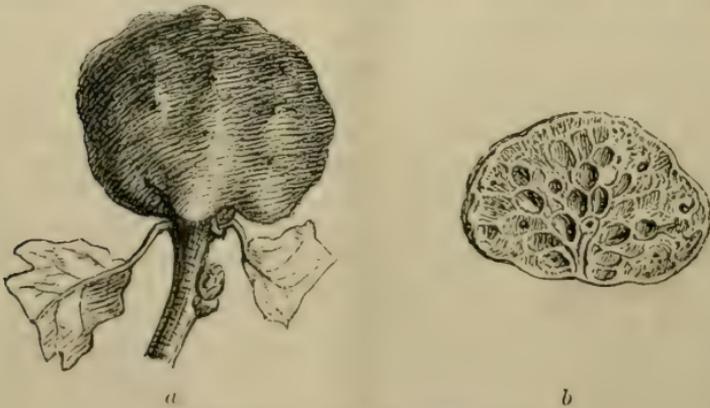


Fig. 37.—*ANDRICUS TERMINALIS.*

a. Gall of *Andricus terminalis*.

b. Section of the same, showing the numerous larva-cells.

37. *Andricus terminalis*, Fabr.—This well-known, quick-growing fungus-gall is developed from the terminal, rarely from the axillar, buds of *Quercus sessiliflora*, *Q. pedunculata*, and *Q. pubescens*. It is generally spherical, a little broader

than long (two to four centimetres in diameter). It is fully developed about the middle of May, when it is of a pale yellow or brownish yellow colour, but where exposed to the sun it assumes a rosy tinge. This fungoid gall exhibits in the interior a great number of egg-shaped, yellowish white larva-cells, which are closely surrounded by the spongy parenchyma. At the end of May or beginning of June the gall-makers, as well as the inquilines and some parasites, make their appearance. In June the rose-chafers (*Cetonia*) eat their way into these galls in such a manner that the spongy tissue is either partly or entirely consumed, and the galls become resinous. If we look for the galls of this species in the following winter or spring, on the twigs, we shall find the fungoid substance entirely destroyed by efflorescence, and only the inner galls remaining, adhering to one another. From these inner galls, however, parasites are often produced, even in the second year.—*G. L. Mayr.*

The gall of this species is the well-known oak-, or King Charles', apple, and is probably one of the best-known insect-productions of Britain, but not so generally is the production connected with the producer; it is very widely distributed. The galls, which vary greatly in size—more so than in the dimensions given by Dr. Mayr—are, or were formerly, in great request upon the anniversary of the Restoration, the 29th of May. Respecting life in these galls, I cannot do better than reprint two notes of the late Mr. Francis Walker on the subject, one published as long ago as 1846, in the 'Zoologist' (iv. 1454—7); the other recent (*Entom.* v. 432), but referring as it does in a great measure to the previous paper, it is as well they should appear consecutively.

“List of Insects inhabiting Oak-apples.

“The well-known oak-apples are inhabited by a great variety of insects, which constitute a little world, and derive their nourishment either immediately or indirectly from those galls. The insects in the following list have emerged from a considerable number of oak-apples collected in the neighbourhood of Southgate during the summer of 1845.

“*June, 1845.*—*Nitidula grisea*, 1. *Balaninus glandium?* 149 during this and the following months of summer. *Forficula auricularia*, a few in the summer; some of them were

larvæ. *Psocus subocellatus*? a few in the summer and autumn. *Atropos* —? abundant till the winter. *Teras Quercus-terminalis*, 495. *Synergus socialis*; a few specimens of two or three other species of *Cynipites* appeared in the summer. *Pteromalus Naubolus*, 7 females. *Pteromalus* —? 2 males; nearly allied to the preceding species. *Pteromalus semifascia*, 1 female. *Pteromalus ovatus*, 5 males. *Pteromalus domesticus*, 6 or 7 females during the summer. *Eupelmus urozonus*, 4 females. *Eulophus gallarum*, *Nees*, 1 (*E. Euedoreschus*, *Walker, Mon. Chal. i.*). *Cecidomyia* —? 1. *Cecidomyia* —? 2. *Tortrix viridana*, 2 or 3.*

“*July.*—*Physoevria* —? 2 or 3. *Nitidula grisea*, 1. *Latridius lardarius*, 1. *Corticaria transversalis*, 2. *Carpalinus fuliginosa*, 1. *Aleochara* —? 2. *Ochestes Quercus*, 4. *Pimpla* —? 1. *Pimpla* —? 1. *Hemiteles areator*, 1. *Teras Quercus-terminalis*, 29, 110. *Synergus socialis*, 516. *Decatoma immaculata*, 8 females. *Megastigmus dorsalis*, 109 males and 12 females. *Callimome cingulatus*, *viridissimus*, *parellinus*, *inconstans*, *confinis*, *minutus*, *exilis*, *chlorinus*, *mutabilis*, *latus*, *leucopterus*, *abdominalis*, *leptocerus*, *autumnalis*, 496 males and 443 females. *Pteromalus Naubolus*, 218 males and 164 females. *Pteromalus dilectus*, 4 males and 4 females. *Pteromalus fuscipennis*, 8 males and 2 females. *Pteromalus fasciiventris*, 1 female. *Pteromalus* —? 4 males; nearly allied to *P. Naubolus*. *Pteromalus ovatus*, 35 females. *Pteromalus hilaris*, 2 females. *Eupelmus urozonus*, 2 females. *Tetrastichus Diaphantes*, 1 male and 45 females. *Eulophus gallarum*, 174. *Eulophus Agathyllus*, n. s., 1 female. *Inostemma Boscii*, 1. *Ceraphron* —? 1. *Drosophila* —? about 20; it is nearly allied to *D. cellaris*. *Lozotænia Xylosteana*, 1. *Zeiraphera communana*, 3. *Chætochilus sylvellus*, 1. *Pentatoma lurida*, 1 larva. *Anthocoris Nemorum*, 20 and upwards in all stages of growth, during this month and August. A few *Arachnida* and *Acari*, of such species as dwell under the bark of trees, appeared in this month and in August.

“*August.*—*Dromius 4-maculatus*, 1. *Cryptophagus cellaris*, 1. *Corticaria transversalis*, 10. *Microgaster* —? 1. *Aphidius* —? 1. *Teras Quercus-terminalis*, 66. *Synergus*

* A large caterpillar, probably of a *Noctua*, sometimes consumes the whole interior of the oak-apples.

socialis, 15. *Decatoma immaculata*, 3 males and 2 females. *Megastigmus dorsalis*, 633 males and 578 females. *Callimome*, 264 males and 595 females; species the same as in July. *Eupelmus urozonus*, 3 males and 1 female. *Tetrastichus Diaphantes*, 11 males. *Chaetochilus sylvellus*, 1. *Aphis* —? *Thrips* undescribed, 25 and upwards. *Pteromalus Naubolus*, 403 males and 599 females. *Pteromalus dilectus*, 15 males and 29 females. *Pteromalus fuscipennis*, 12 females. *Pteromalus platynotus*, 5 females. *Pteromalus planus*, 1 female. *Pteromalus dubius*, 1 female. *Pteromalus fasciiventris*, 1 male. *Pteromalus decidens*, 1 female. *Pteromalus ovatus*, 5 females.

“*September*.—*Cryptophagus cellaris*, 1. *Latridius transversus*, 3. *Corticaria transversalis*, 14 and upwards. *Megastigmus dorsalis*, 12 males and 9 females. *Callimome*, 4 males and 17 females; species the same as in July. *Pteromalus Naubolus*, 24 males and 23 females. *Pteromalus dilectus*, 1 male and 2 females. *Pteromalus* —? 2 females; nearly allied to *P. Naubolus*. *Pteromalus* —? 4 males; nearly allied to *P. Naubolus*. *Pteromalus decidens*, 1 female. *Pteromalus ovatus*, 3 males and 15 females. *Eupelmus urozonus*, 2 males. *Ceraphron* —? 1. *Ceraphron* —? 1.

“*October*.—*Megastigmus dorsalis*, 4 males. *Pteromalus dilectus*, 1 female. *Pteromalus ovatus*, 1 female. *Tetrastichus Diaphantes*, 1 female.

“*December*.—*Megastigmus dorsalis*, 3 males and 3 females. *Callimome nigricornis*, 1 male.

“*January*, 1846.—*Megastigmus dorsalis*, 8 males and 4 females. *Callimome nigricornis*, 2 males.

“*February*.—*Megastigmus dorsalis*, 33 males and 6 females. *Callimome nigricornis*, 35 males. *Pteromalus domesticus*, 6 females. *Eulophus gallarum*, 600 and upwards.

“*March*.—*Bracon* —? 1. *Synergus socialis*, 4. *Callimome nigricornis*, 6079 males and 981 females. *Pteromalus domesticus*, 16 females. *Eulophus gallarum*, 4513.

“*April*.—*Synergus socialis*, 5. *Megastigmus dorsalis*, 100 or upwards. *Callimome nigricornis*, 10,600 and upwards. *Pteromalus Naubolus*, 2. *Eulophus gallarum*, 10.

“*May*.—*Bracon* —? 6. *Megastigmus dorsalis*, 40. *Callimome nigricornis*, 30. *Callimome* —? 2 or 3. *Pteromalus Naubolus*, 708. *Pteromalus ovatus*, 20.

"June.—*Megastigmus dorsalis*, 5 males and 1 female. *Pteromalus Naubolus* and *ovatus*, 179. *Eupelmus urozonus*, 3 males and 5 females. *Tetrastichus Diaphantes*, 128.

"*Summary of Species and Specimens*.—Coleoptera, 9 species; 191 specimens, and upwards. Orthoptera, 1 species; 5 specimens. Neuroptera, 2 species; some hundreds of specimens. Hymenoptera (Cynipites), 4 or 5 species; 30,246 specimens. Hymenoptera (Parasitic), 45 species; 24,417 specimens, and upwards. Diptera, 3 species; 23 specimens, and upwards. Lepidoptera, 5 species; 9 specimens, and upwards. Hemiptera, 5 species; 51 specimens, and upwards. Arachnida and Acari, 5 or 6 species; a few specimens. Total—species, 75; specimens, 55,000 and upwards.

"All the Coleoptera, Orthoptera, Neuroptera, Diptera, Lepidoptera, Hemiptera, and Aptera, with the exception of *Balaninus Glandium* and *Drosophila*, were probably accidental visitors.

"*Teras Quercus-terminalis* is the cause of the formation of the oak-apples, in each of which a great number of its larvæ reside; sometimes sixty flies or upwards emerge from an oak-apple. It varies exceedingly in size, but usually all the individuals produced from one oak-apple are of one sex, and of the same size. Sometimes the habits of the larva are solitary, and it then lives in two other kinds of galls that are formed on oak-leaves.

"*Synergus socialis* is one of the 'Inquilini,' or dwellers in hired houses, as some of the Cynipites have been termed.

"*Pteromalus Naubolus* is, perhaps, only a variety of *P. semifascia*.—*Francis Walker*." (Zool. 1846, p. 1454.)

"*Notes on Oak-apples*.—The plan of creation requires a continual appearance and disappearance of material existence. Each form of life is from dust; and having performed its part, or completed its circle, returns to dust, which is again gathered up into new creatures; and these numberless and ever-varying circles constitute the great round of existence, and the whole work is preserved in order by the control which the parts exercise upon each other. The oak-leaf falls and returns to dust, which serves for the growth of the oak, and, in process of time, is developed again into leaves. In other cases the circle of existence is less simple, and two

circles of life are combined; and some part of the substance of the oak-leaf is transformed into oak-spangles by means of a gall-fly. In the oak-currant the circle is more complicated, for not only gall-flies, but also parasitic flies take part in the work. In the oak-apple the arrangement is far more intricate, for very numerous kinds, perhaps one hundred in number, representing all the chief orders of insects, are occupied in it; and it is not only inhabited by insects, but is also frequented by Acari or mites, whose chief dwelling-place is wood-moss, where the species of Bryobia, Zetes, Tydeus, Iphis, Murcia, Nothrus, Oribates, Pelops, Penthaleus, Hoplophora, Eumæus, Erymæus, Caligonus, Carabodes, Celæno, Cepheus, and the more elegant Eupodes and Linopodes abound; and British Entomology is in need of a book on these wood-moss mites; and oak-apples afford abundant materials for another volume. *Andricus terminalis*, by means of its punctures and egg-laying, is the means of forming the oak-apple, which supplies its offspring with board and lodging; but numerous enemies appropriate to themselves the bodies, or the food and habitation, of this offspring; and other kinds avenge the Aborigines by consuming their invaders. Some kinds inhabit the oak-apple for two months; one species lives a year in it; and the successive generations of this fly pass from oak-apple to oak-apple. But the life-history of the other kinds requires to be traced for ten months elsewhere. Each oak-apple is tenanted by many individuals of the Teras, and there is much to be observed as to how the grubs are distributed through the oak-apple during its growth, and in noticing the successive arrival of other species, which find their way into the oak-apple, or insert their eggs therein. In conclusion I will mention two or three oak-apple insects, in addition to those which I have previously noticed. *Lampronota Segmentator*:—this is probably a parasite of *Pœcilochroma corticana* (Fam. Tortricidæ), a moth that frequently emerges from oak-apples. *Psylla* — : —I have not yet ascertained the name of this species; it has a very close resemblance to *P. Buxi*. *Anthomyia pluvialis*:—another species of this genus, *A. canicularis*, has been reared from the cottony oak-gall, the habitation of *Andricus Ramuli*. *Eulophus Gallarum* is frequent in these two galls.—*Francis Walker.*" (Entom. v. 431.)

COLEOPTERA.

Lathridius lardarius.—July. In the synopsis to Walker's first paper nine species of Coleoptera are said to be included; if we reckon the two species of Lathridius mentioned, *viz.* *L. lardarius* and *L. transversus*, we have ten. From this, and from the habits of the two species, I think we may infer the insect referred to is the same as that bred in September—the *L. transversus*, *Oliv.*, and not *L. lardarius*, *De Geer*.

Balaninus glandium?—Walker marks this species with a query, and it is very probable that the beetles bred by him were *Balaninus villosus*, *Herbst*, and not the acorn-feeding *B. glandium*, *Marsh*, as *B. villosus* (which is a British species) has been bred from oak-apples by Dr. Reinhard, Dr. Suffrain, and Prof. Kaltenbach. Besides *B. villosus*, another species of this genus is common in Britain as a gall-inquiline; the larvæ of *B. Brassicæ*, *Fab.*, feeding on the substance of the willow- and saw-wood-galls of *Nematus saliceti* (= *Vallishneri*) and *N. pedunculi*.

ORTHOPTERA.

In addition to the common earwig, another Orthopterous insect has been bred from the galls of this species, *viz.* *Meconema varia*, *Fab.* (the tree-grasshopper).

HYMENOPTERA (Cynipites).

Andricus terminalis, *Fab.* = *Teras Quercus-terminalis*.—This insect, the true gall-maker, was for some time rather unhappy in the choice of its generic name, as *Teras*, the name given to the genus erected by Hartig, had priority with the Lepidoptera, Treitschke having taken it for a genus of Tortricidæ. Marshall then endeavoured to resuscitate Geoffrey's name, *Diplolepis*, while Dr. Förster, in his synopsis of genera, proposes *Dryoteras*; but on Dr. Mayr's authority it is now included in *Andricus*.

Synergus socialis.—In Dr. Mayr's monograph of the Synergi this is given as a synonym of *S. melanopus*, *Hart.*, and *S. facialis*, *Hart.*, only, recorded as inhabiting *A. terminalis* galls. However, as *S. facialis* occurs in the summer of the first year, probably all Walker's species so bred belonged to this species, as I breed it very commonly from oak-apples

in the summer myself, and they are certainly all *S. facialis*, *H.*; those bred in March and April of the second year may be *S. melanopus*, *H.* (= *S. socialis*, *H.*), as this species passes the winter in many oak-galls. The identification of *Synergi* is always difficult, so it is quite likely that these two species—*S. melanopus* and *S. facialis*—were included by Walker under the Hartigian name, *S. socialis*: a *Synergius* in the spring from this gall has not occurred to me at present. These are the true Inquilini, or, as Walker terms them, "dwellers in hired houses;" they are, I believe, invariably vegetable-feeders, living on the substance of the gall, and so in many cases depriving the legitimate inhabitants of their means of sustenance; in their manner of parasitism thus somewhat resembling the cuckoo-bees (*Cuculinæ*). I find no record of any other species of *Cynipidæ*, as having been detected to be in any way connected with the galls of this species.

HYMENOPTERA (Parasitic).

Ichneumonidæ.

Hemiteles areator, Panz., Grv.—This species has been bred from many Lepidopterous pupæ, in which it is probably hyper-parasitic on other *Ichneumonidæ*; it was very probably connected with *Tortrix viridana* in this case. Ratzeburg records two other species of *Hemiteles* bred from this gall, viz., *H. coactus*, *Rtzb.*, and *H. punctatus*, *Rtzb.*

Lampronota segmentata = *Lissonota segmentator*, Fab. (*Entom.* v. 432).

Pimpla spp. ?—Ratzeburg also records (*Ichn. d. Forst.*) two species of *Pimpla* from *A. terminalis* galls, both bred by Herr Reissig in the spring of the second year, viz., *P. calobata*, *Grv.*, and *P. caudata*, *Rtzb.*; whether these were the two species bred by Walker it is difficult to determine. *P. alternans*, *Grv.* = *P. scanica*, *Vill.*, a species parasitic on *Orchestes Quercus*, has also occurred in these galls.

Braconidæ.

Bracon ?—March and May, second year. Ratzeburg received his *B. caudatus* from Herren Brischke, Tischbein, Reissig, and Nördlinger, all obtaining it from these galls in May of the second year, thus coinciding with the six specimens bred by Walker in time of appearance. *Bracon*

immutator, *Nees*, has been bred from these galls by Dr. Reinhard; it was probably parasitic on a *Curculio*.

Microgaster sp.?—Both sexes of *Microgaster* (*Apanteles*) *breviventris*, *Rtzb.*, have been bred from the gall of this species, in which they were probably parasitic on *Orchestes Quercus*.

Aphidius sp.?—This undetermined species of *Aphidius* was probably parasitic on an *Aphis*.

In addition to the above list of *Ichneumonidæ*, *Ratzeburg* received three other species from his numerous correspondents, as follows:—

Cryptus hortulanus, *Grv.* (*Ichneumonidæ*).—"Herr Reissig bred one female from *Cynips terminalis* galls at the end of May of the second year; with it the very common *Hemiteles punctatus*." (*Ichn. d. Forst. ii. 124.*)

Microtypus Wesmaelii, *Rtzb.* (*Braconidæ*). *Ratzeburg* himself bred a solitary individual from an *A. terminalis* gall, which he erected into a new genus, separated from *Microgaster*; it was bred, with hundreds of *Torymidæ*, at the end of June (1847).

Microdus rufipes, *Wesm.* = *Therophilus rufipes*, *Nees.* (*Braconidæ*).—Several specimens bred by Herr Bouché from these galls, in which it was parasitic on *Hedya ocellana*.

CHALCIDIDÆ.

Eurytomidæ.

Decatoma immaculata.—*Ratzeburg* records *Eurytoma signata*, *Nees*, as very commonly bred from this gall; he also gives it as parasitic in several other galls and on a *Lithocolletis*. It is undoubtedly a compound species, and from his description certainly a *Decatoma*; so the *A. terminalis*-bred specimens were probably the same species as Walker's *D. immaculata*.

Torymidæ.

Callimome nigricornis, *Fab.*—This is *Syntomaspis caudata*, *Nees*. *Ratzeburg* gives *Torymus admirabilis*, *Först.* (= *crinicaudis*, *Ratz.*) as bred commonly from *A. terminalis* galls; they are both synonyms of this species, which occurs very abundantly in the spring of the second year. It has also

been bred from the common oak-spangle gall of *N. lenticularis*; and Kaltenbach says it has been bred from *Orchestes Quercus*, by Herr Reissig. We meet with great confusion in trying to work out the records of parasitism in Chalcididæ; the species themselves are perplexing, and the synonymy more so; *e.g.* Ratzeburg, in 'Die Ichneumoniden,' under *Torymus caudatus*, Nees, arranges specimens he had received from correspondents bred from galls of *A. terminalis*, Rh. Eglanderiæ (a rose species), and from galls of *Nematus viminalis* (a willow species); whilst under *T. admirabilis* and *T. crinicaudis*, besides the oak-gall specimens, he includes specimens bred from *Tortrix strobilana*, thus having three specific names for one species, and in one species including four certainly distinct. But to return to Kaltenbach's assertion that this species is parasitic in Coleopterous larvæ, which is interesting, we have the following quotation occurring in Mayr's excellent and most lucid monograph:—

"In Von Heyden's collection there is a female with the statement,—'From beetle-larva under oak-bark, *Bostrichus*?'—which was named *C. admirabilis* by Dr. Förster. It is three millimetres long; oviduct, five millimetres long; blue, with a slight green shade; abdomen for the most part violet; legs green, with yellow tarsi; mesothorax very finely punctate, almost smooth and shining. Although undoubtedly this specimen does not differ from the species bred from *A. terminalis* galls, it may be found to belong to another species, when the above-quoted economy shall be proved to be correct."

Apart from dwelling in galls various species of *Torymidæ* are known to be parasitic on Hymenoptera and Lepidoptera; but these are the only two instances, as far as I know, of its connection with the Coleoptera; and here, as in many other cases of parasitism, further observation would be satisfactory.

Callinome abdominalis, Boh.—*Cingulatus*, Nees (Walker's list) and *Cyniphidum*, Ratz., are synonyms. This species, which occurs in many other oak-galls, may be bred in June and July of the same year.

Callinome regius, Nees, = *C. inconstans*, Wlk. (Walker's list) = *leucopterus*, Wlk. (Walker's list) = *longicaudis*, Rtz.

Callinome auratus, Fonsc. = *viridissimus*, Boh. (Walker's list) = ? *parellinus*, Wlk. non Boh. (Walker's list) = *con-*

finis, Wlk. (Walker's list) = *minutus*, Wlk. (Walker's list) = ? *exilis* (Walker's list) = *mutabilis*, Wlk. (Walker's list) = *latus* (Walker's list) = *chlorinus*, Wlk. (Walker's list) = *leptocerus*, Wlk. (Walker's list) = *autumnalis*, Wlk. (Walker's list) = *muscarum*, Nees = *propinquus*, Först. = *propinquus*, Ratz. = *appropinquans*, Ratz. = *gallarum*, Ratz. = *nanus*, Först. = *basalis*, Wlk. = *curtus*, Wlk. = *inconspectus*, Wlk. = *bicolor*, Wlk. = ? *terminalis*, Wlk. = *microstigma*, Wlk.—This and the preceding species—C. regius, Nees—are of general occurrence in oak-galls, as probably might be inferred from the list of synonyms.

Megastigmus dorsalis, Fabr. = *Bohemanni*, Ratz. = *xanthopygus*, Först.—This species has been bred from most oak-galls. Dr. Mayr describes six varieties, and says: "A. terminalis, a single specimen in July of the same year, var. (f)." Mr. Walker seems to have had a succession of emergences: it occurred with him from July of the first year to June of the second. I have only bred it in June, July, and August of the first year, and then commonly. It is curious this species should not affect this gall so much in Germany, as in Britain it is especially common in it; e. g. Walker's 1560 specimens compared to Mayr's 1, with his numerous correspondents: it is also unnoticed by Ratzeburg in connection with this gall.

Eupelmidae.

Eupelmus urozonus, Dalm.—This species is figured in the 'Entomologist,' vi. 226, from one of A. H. Haliday's drawings. It may be bred commonly from these galls in the summer. Ratzeburg says of *E. azureus*, a synonym of this species, that it is hyper-parasitic in this and other galls on *Eurytoma* and *Microgaster*.

Pteromalidae.

In addition to the fourteen species mentioned by Walker, Ratzeburg gives the following, besides several doubtful instances; but owing to the immense number of species, and to the very close resemblance between many, the question of synonymy must be difficult; but as with the *Torymidæ*, so with the *Pteromalidæ*, several varieties and species are recorded under different names; but in this genus we have no Mayr to follow at present.

(1) *Pteromalus Cordairii*, Ratz. = ? *Neesii*, Ratz.—Bred by Herren Erichson and Tischbein from the gall of this species, and of *A. curvator*.

(2) *Pteromalus Dufourii*, Ratz.—Bred by Herr Reissig from second-year galls of *A. terminalis* and *Cecidomyia* (*Hormomyia*), *Fagi*.

(3) ? *Pteromalus gallicus*, Ratz.—Bred by Herr Nördlinger from "Galläpfeln."

(4) *Pteromalus leucopezus*, Ratz.—Terminalis-bred specimens, received by Ratzeburg from Herren Nördlinger, Tischbein, and Reissig (commonly).

(5) *Pteromalus stenonotus*, Ratz.—Ratzeburg bred both sexes of this species from this gall himself, and received a female from Ziegler, bred from *Tinea cognatella*—*Hyponomeuta cognatella*, *Hüb.*

(6) *Pteromalus meconotus*, Ratz.—A single female bred by Ratzeburg; and fifteen males and five females bred by Herr Tischbein from these galls. Herr Nördlinger also bred it from them at the end of May (first or second year not stated).

(7) ? *Platymesopus Westwoodii*, Ratz.—Bred by Herr Saxesen in July, 1837, from an oak *Cynips*; the species was not specified, but it was probably *A. terminalis*.

(8) *Platymesopus Erichsonii*, Ratz.—Bred by Herr Erichson, from the gall of this species (*A. terminalis*).

Elachistidæ.

Eulophus gallarum, Lin.—This is one of the most frequent and abundant inhabitants of oak-apples, and it is also common in many other galls, occurring in both the first and second years. Ratzeburg gives five species of *Eulophus* and eight species of *Entedon* as parasitic on *Orchestes Quercus* alone. Ratzeburg's *Entedon scianeurus* is probably this species, which is not a true *Eulophus*, but an *Olynx*.

Tetrastichidæ.

Tetrastichus Diaphantes — *Cirrospilus Diaphantus*, Wlk.—This insect belongs to a very extensive family, Walker alone having described about one hundred and eighty species of *Tetrastichus*.

I believe the above includes all the *Chalcididæ* mentioned

by Walker. Ratzeburg mentions two or three others, in addition to those noticed above. Next to the Chalcididæ, but lower in the scale of creation than that family, come the Proctotrupidæ, the most slightly-developed of all the Hymenoptera; of this family two or three species are connected with oak-apples. Walker names two,—a Ceraphron and an Inostemma (Platygasteridæ); Ratzeburg ('Die Ichneumonien,' iii. 181) figures a Ceraphron bred from these galls, and which he erected into a new genus—Dendrocerus Lichtensteinii; this may be synonymous with the first species of Walker—Ceraphronidæ.

DIPTERA.

Cecidomyia sp.?—Of the two species of Cecidomyidæ, bred by Walker, it is very probable that one was the *C. inflexa*, *Bremi*. Specimens of Tipulidæ have occurred to me as also to Mr. Rothera, in the summer of the first year, from these galls; but they belong rather to *Sciara* than *Cecidomyia*, I think.

Anthomyia pluvialis.—This is the typical species of the restricted genus *Anthomyia*. *A. (Homalomyia) canicularis*, *L.*, is said to be associated with cabbages, but there are many very closely-allied species.

LEPIDOPTERA.

Tortrix viridana, *L.*—Ratzeburg, in his 'Die Ichneumonien,' gives sixteen Hymenopterous parasites of this species, *viz*, three Braconidæ, ten Ichneumonidæ, and three Chalcididæ; of these Hemiteles areator only is included amongst Walker's insects. It is probable that two or three pupæ of this pretty, but far too common, little moth were collected by Walker with the galls, and so came to be bred accidentally with one of its parasites.

Zeiraphera communana.—This is the *Pædisca (Pæcilo-chroma) corticana*, *Hüb.*, which species is a frequent feeder on these galls: but there is another Hübnerian *P. corticana* amongst the Tortrices, with which it must not be confounded—the *Antithesia (Penthina) corticana* (= *picana*, *Frol.*), which feeds on the leaf-buds of willow.

Chatochilus sylvellus.—This species is *Cerostoma sylvella*, *L.*

A large Lepidopterous larva has occasionally been found feeding in the interior of these galls, since Walker's notes; but, as far as I know, the species to which it belongs has not been determined at present. (See Entom. viii. 167, and other notes.) In addition to the five species mentioned by Walker, three others have been recorded from this gall.

Thecla Quercus.—A larva of this butterfly was found feeding on oak-apples by Mr. Barrett (Ent. Mo. Mag. iv. 153.)

Hedya (Spilonota) ocellana, Fab.—A common species, flying in June and July; the larva feeds on various trees and shrubs. Ratzeburg received seven species of Ichneumonidae as parasitic on it; one of these—*Microdus rufipes*—is mentioned in these notes.

Scymasia (Ephippiphora) gallicolana, Zell., = *obscurana*, Wilk. non Steph.—On the 23rd June, 1869, Mr. C. W. Dale bred a specimen of this rare species from an oak-apple, collected in the spring, near Sherborne, Dorsetshire, which he first recorded under the name *Stigmemonota internana*, Gu.,—quite a different species. However, his mistake was rectified by the Editors of Ent. Mo. Mag., who gave us the following piece of information at the end of their note:—

“Dr. Rössler states that the larvæ of *S. gallicolana* live through the winter in the old and dried galls of *Cynips quercus-terminalis*, which are firmly fixed on the twigs of young oaks, and that severe winters seem to be fatal to them; after a mild winter nearly every gall collected produced one or several of the moth.” (Ent. Mo. Mag. vi. 186.)

As pointed out by Mr. Barrett, in his “Notes on Tortrices,” in the same magazine, this species has been confounded with *Halonota (Phthoroblastis) costipunctana*, Haw. Kaltenbach (“Die Pflanzen-feinde, p. 659) says:—“*P. costipunctana*, Haw. = *gallicolana*, Z. The larva lives, according to Von Heyden, on oak, in the galls of *Cynips terminalis*, L., and is not uncommon at Frankfort: in these it lives in an out-stretched cavity, leaves the gall in October, and the imago appears in May of the following year (Stett. Entom. Zeit. xxi. p. 118). I received this species from Dr. Ott Hofman, who likewise had bred them in numbers from these oak-galls.”

From these observations it appears that this moth is undoubtedly an oak-apple inquiline; and from Mr. Barrett's

information, the synonymy of *P. costipunctana* with *gallicolana*, as in Doubleday's list and many German authors, is incorrect, Haworth's insect being a distinct species.

HEMIPTERA.

Thrips sp.—These little pests have now been ascertained to belong to the order Thysanoptera, separate from Hemiptera, Homoptera, and Orthoptera, each of which it resembles in some characteristics.

Aphis sp.—The species bred by Walker was no doubt *Thelaxes* (*Vacuna*) *dryophila*, *Schk.*, an oak-frequenting species, which feeds on the twigs, leaves, and fruit; it has also been found feeding on the substance of these and folii galls. No doubt other species of Aphides, now included in the genus Homoptera, may be found in and on oak-apples occasionally; but *T. dryophila* is the only species recorded as being dependent on them for sustenance, as far as I know.

Psylla —.—I am unable to find any true *Psylla* (Homoptera) connected with oak.

The object I have had in view throughout these notes has not been so much the embodying of new information as the collating of old, to serve as a starting-point for more extended and confirmatory observation. The interest of parasitism, which affects all orders of insects, is very apparent in the "life in an oak-apple."

E. A. FITCH.

Injury to Linen in Bleach Fields by the Larvæ of Arctia rubiginosa. By EDWARD NEWMAN.

[AN application for advice on this subject having been made to the Editor of the 'Field' newspaper, and having been handed me for my opinion, I wrote to Mr. Eccles, from whom the application originally came, soliciting further information, and asking permission to publish the same. In reply I received the following interesting and explicit letter, to which I have appended a few observations of my own, regretting, however, their insufficiency and incompleteness. Still, however, I think it will not be considered an unimportant step to have ascertained the name and nature of an insect that can cause so great an injury, more especially as it

was previously deemed innocuous. I do not attempt to suggest a remedy at present.]

“To Edward Newman, F.L.S., &c.

“Larne, November 26, 1875.

“Dear Sir,—The firm of which I am a member has suffered serious loss by holes in linens exposed on bleach-fields during this summer and autumn in particular, and at same seasons in former years, without being able to ascertain the cause.

“I presume you are aware that the system of bleaching linens in this country is a peculiarly tedious one, extending over six weeks. The linens, after having been boiled in soda-ley and thoroughly washed, are spread over bleach-fields, where they remain for days; and this process is repeated again and again, according to quality, for some linens require double the amount of work that others do; and I have invariably found that those which require the most frequent grassing have been most subject to holes. I have been obliged to give the matter very special attention; and in September last I detected a particular lot of linens very seriously damaged at grass by holes, and this lot covered with thousands of these caterpillars.

“I should mention that before being sent to grass I had this parcel of linens most carefully examined, by drawing each web over a pole, erected in front of a window, and found it free from holes. When brought in from grass four days afterwards, I had it examined in the same manner, in same place, and by the same person, when the holes were discovered with thousands of these caterpillars on the webs, and in many cases in the holes; generally at each hole there was a greenish matter, evidently ejected by these caterpillars. Some of the holes were not larger than the head of a pin, but many of them were sufficiently large to admit of the caterpillars creeping through, and I found them in the act of doing so. At every part of the web where I found holes I found caterpillars in their vicinity, and where there were no holes I did not find them.

“I am sorry I did not keep any samples of these holes as they were when discovered, but I had them all very carefully marked, and I now enclose you a few cuttings to show you

their appearance after having undergone the necessary slaverly of bleaching. I also enclose samples of same after finishing, and you will remark that these holes are very clean cut.

"I fortunately collected a number of these caterpillars in a piece of newspaper which I had in my pocket; they cut their way out of it, leaving on it the same greenish marks, and the holes in it are identically similar to those as made on the linens when examined. I enclose you also this scrap of newspaper.

"Since the early part of October, when the colder weather set in, these caterpillars have disappeared, and simultaneously the holes are not to be found. I am therefore convinced that the holes in the linens have been caused by these caterpillars, and to an extent which, without seeing, must be incredible. I do not for a moment contend that the caterpillars eat the linens for food; but is it impossible that they eat their way out of the cloth, just as a rat does, to make its exit, for of course the linens when exposed at grass become tossed by wind, &c., and are generally blown into rolls; and when caterpillars are upon the webs they are enclosed in the folds, and may they not eat their way out? I am convinced that they do; and, as the caterpillars will doubtless appear again next season, I am now mainly anxious to prevent next season the destruction I have had to submit to this year. Can you inform me how this is to be done?

"The bleach-fields are forty acres in extent, and, having been in grass for perhaps half a century, they are, of course, very much covered with moss. The moths'-eggs laid this year will doubtless become caterpillars about June next; by destroying their eggs I get rid of the plague. I have thought of giving the fields a heavy coat of lime, which is to be had of very best quality in great abundance in this neighbourhood. I have been recommended salt by one, and nitrate of soda by another; but, as the case is a very peculiar one, I am anxious to act under such professional advice as you are so competent to give. I therefore beg that, even if I have failed to convince you of the possibility of the holes having been caused by these caterpillars in the way I have described (not as food, but as a means of exit), you will nevertheless be good enough to inform me what, in your opinion, is the best means to adopt with a view to rid the field of any eggs laid

by this or any other moths during the past or in any previous year, and so prevent such eggs becoming caterpillars, for it is as such they have done the injury.

“Of course, whatever is used as a remedy must not permanently do injury to the grass, nor damage any linens which may hereafter be exposed thereon; and, as the extent of ground to be operated upon is so considerable, it is important that the stuff should be as inexpensive as possible to insure the complete destruction of moths’-eggs, &c.

“Hoping you will give the matter your careful consideration,—I am yours faithfully,
“WM. ECCLES.”

[In the first place, I may state that the caterpillars, of which I have still a number under my notice, are those of a familiar but not very common moth, well known to entomologists as the ruby tiger (*Aretia rubiginosa*). At present (December) they seem to be hibernating on the inner side of the flower-pot in which they are confined, covered only by a piece of gauze, and are perfectly stationary, neither requiring food nor exercise. At p. 140 of the ‘Entomologist’ I gave a complete life-history of the insect,—of course not mentioning the delinquency in respect of linen-cloth, of which I was totally ignorant, and believe to be entirely exceptional. I will, however, repeat some of the salient points, as they may possibly assist my correspondents in the North of Ireland in pointing out the insect to their neighbours, and warning them of the injury it has already done in the bleach-fields. The life-history will be found *in extenso* in No. 33 of the ‘Entomologist.’

The parent moth lays its eggs (from thirty to forty in number) on the leaves of the broad-leaved plantain (*Plantago major*), and also on several species of dock and sorrel: these hatch, and become caterpillars in about fourteen days. They are covered with small, stiff, reddish hairs; and as they crawl up the plantain or dock leaves, or climb the bents or blades of grass, they remind one of miniature bears; in fact, they ascend a blade of grass just as a bear mounts the pole in the Zoological Gardens. But when they are still younger, and not yet possessed by a rambling or climbing spirit,—indeed, while they are quite babies,—they keep on the under side of a dock-leaf or plantain-leaf, or, in captivity, of a

lettuce-leaf, if provided by their care-taker, and then make little circular holes in those leaves, at first not much bigger than shot-holes. Viewed from the upper side of the leaf these holes have a very strange appearance: the body of the caterpillar is completely concealed by the leaf, while the head, just visible through the shot-hole, seems to be making mouths at you from the other side, after the manner of a clown grinning through a horse-collar; the incessant movement of the caterpillar's jaws, as seen through a pocket-lens, tends to make the resemblance more complete.

In August these caterpillars generally leave off eating, and prepare for their winter's rest, retiring towards the roots of the herbage, and there remaining until April, when they feel the calls of hunger, again come abroad, and feed greedily. About the middle of May I have found them full fed, and building their cocoons, in which to undergo the transformation to a chrysalis. The cocoon is rather a curious structure: it is composed of loosely-felted silk, abundantly interspersed with the red hairs which covered the body of the caterpillar, and which seem to have been shed for this especial service; the shape of the cocoon is something like a boat turned upside down; the chrysalis is very dumpy, and quite black. Before assuming this state the caterpillar emits a quantity of greenish fluid, as stated by Mr. Eccles. This leaves a green stain on the cloth, very similar to that on the piece of newspaper in which Mr. Eccles had imprisoned them. I am unable to decide whether this green fluid is ejected from the mouth or the anus; I think probably the latter, as such a discharge seems usually to follow the last excrementitious matter prior to the change to a pupa. The samples of injured cloth are very curious: they exhibit little holes of no particular form, but apparently cut by the mandibles of a caterpillar; there is, however, no single aperture large enough for the larva to have passed through: but I do not think this a difficulty of any moment, for the injury remains, and is unquestionably to be attributed to the larvæ, whether they were detected occupying the holes, or utilising them as a means of escape. One thing seems perfectly clear, they could not have been made by the moths on their emergence from the pupæ; the solvent then used, of whatever nature, would not produce the appearance of having been gnawed,

since we all know that the moth is entirely destitute of mandibles, and of performing a task requiring such energy. Still I have observed that many moths prefer a substance like linen-cloth to which to affix their cocoons; and it seems probable that in this process of cocoon-building they may nibble little holes in the cloth. I know that this is the case with other caterpillars; they use their jaws very freely, often gnawing their way through wood or even harder substances. I entirely acquit the caterpillar of any penchant for the linen-cloth as an article of diet, but the injury remains, notwithstanding the acquittal, and every precaution must be taken against its recurrence. I confess my inability to suggest any remedy that is likely to prove effectual.

There is no doubt that to attack the insects in the egg-state, as Mr. Eccles suggests, is the right plan; but we must not entirely neglect the first instruction given by Mrs. Glass in her cookery-book, touching the jugging of a hare: "First catch your hare." In both instances—hare, and ruby tiger's eggs—this seems essential. The idea of looking for these eggs would evoke a smile on the gravest countenance: they are no larger than the head of the smallest pin. Then as to attacking them on the broad scale, either by treating the bleach-fields with lime, salt, or nitrate of soda, I fear it is impracticable. Moreover, every experiment of this kind is assuredly a leap in the dark. I trust the mischief may not occur again; as in the case of the yellow-tail moth, the Hessian fly, and various other insects which have seemed to threaten a continuous loss, and from time to time have elicited prophecies of famine, which happily still await fulfilment, this visit of the ruby tiger may possibly never recur. Sincerely hoping this may be the case, I must content myself with doing as Mr. Eccles suggests,—continuing to give this subject my best and most unremitting attention.

EDWARD NEWMAN.]

Entomological Notes, Captures, &c.

Description of the Larva of Lithosia aureola.—On the 22nd of September last I received from Mr. J. G. Ross, of Bathampton, near Bath, a dozen larvae of this species. They varied considerably in size, the largest, a full-grown one,

being about three-quarters of an inch in length, and tolerably stout in proportion. Head globular and shining, about the same width as the 2nd segment; body rounded above, but nearly flat ventrally; it is of tolerably uniform width, but a little attenuated posteriorly; segmental divisions tolerably well defined; the trapezoidal warts very large and well-developed, giving the surface of the body a rather rough appearance; from each wart springs a tuft of hair. The ground colour is rather a peculiar dark olive-green, thickly freckled with both darker and paler spots, making the creature altogether bear a striking resemblance to the lichens on which it feeds. The shortest, and indeed almost the best, description of it would be simply "lichen-coloured," the grayish green, or commonest type of lichen-colouring being understood. The dorsal stripe is formed by an interrupted series of narrow black marks; there is also a series of similar, but more conspicuous marks on the subdorsal region, these marks, on the middle segments, being bordered above with whitish; the tubercles are reddish brown; the hairs brown. The head is intensely black, with a very conspicuous, white, A-shaped mark. Ventral surface dull, pale olive-green, with interrupted, smoky central stripe.—*Geo. T. Porritt; Huddersfield, January 4, 1876.*

Sphinx Convolvuli at Bury.—Yesterday I had a worn specimen of *Sphinx Convolvuli* brought to me to identify. It was captured about the second week in August, whilst on the wing, in a dwelling-house, probably attracted by the light, in the centre of the town.—*R. Kay; 2, Spring Street, Bury, December 15, 1875.*

Hemerobius in Winter.—On Sunday morning (January 9th) I found a species of *Hemerobius* in my room. It was of a brown colour. There had been no fire in the room; and the thermometer in the garden registered 18° of frost on the previous night. Do these insects usually hibernate?—*H. N. Ridley; Cobham, Gravesend, January 12, 1876.*

[I was not previously aware of this habit in *Hemerobius*, having never observed it.—*Edward Newman.*]

Mamestra abjecta.—In my list of the insects sent to you I omitted to send you the capture of a worn *Mamestra abjecta*, taken in my garden in July or August last.—*A. Thurnall; Whittlesford, December 29, 1875.*

THE ENTOMOLOGIST.

No. 153.]

MARCH, MDCCCLXXVI.

[PRICE 6d.



ENNOMOS ANGULARIA (male and female).

Variety of Ennomos angularia.—The figures, male and female, of *Ennomos angularia*, are not only singular as a variety, but also singular as being so much alike as almost to induce the conclusion that they might be referred to some new and undescribed species. They were bred by Mr. Neave from the same batch of eggs, and were the only specimens of this particular coloration. The fore wings have the upper surface uniform dark brown, with a transverse oblique median band of a pale fulvous; the hind wings are paler, shaded to darker towards the margin. Mr. Neave has kindly lent them, purposely for figuring in the 'Entomologist,' and has accompanied them with the following information:—"In the early part of 1874 I had eleven eggs of *Ennomos angularia* given to me; they were all laid singly on the glass lid of a pill-box: of these only four hatched. The larvæ were fed the whole time upon whitethorn, and produced imagos on the

following days. The pair figured—male, 3rd July; female, 5th; the other two, a male and female, on the 2nd and 8th respectively. These latter were dark, but not so strongly marked as the former. I may add the parent female was darker than the ordinary type.—*B. W. Neare*; 5, *Highbury Grange, Highbury Park, N., February 3, 1876.*—*Edward Newman.*

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 42.)

Fig. 38.



GALL OF *ANDRICUS INFLATOR* (and section of the same).

38. *Andricus inflator*, Hart.—This gall appears like a terminal swelling of the young shoots of *Quercus pedunculata*, and is clothed with leaves like any other twig. Its development is undoubtedly caused by the gall-fly laying its egg in the axis of the terminal bud. When the bud is developed in the spring, the top of the axil part remains white, its periphery being but little prevented from development with the leaves; an elongate cavity is exhibited, in a longitudinal section, at the lower part of which lies the small egg-shaped inner gall, like an egg in a cup of corresponding dimensions; the cavity is covered with a thin skin at the top. In June the fly breaks through the upper end of the inner gall and the top membrane. The empty gall continues growing until the autumn, and from its axillary buds several twigs are developed in the course of this and the next year. Professor Schenck calls the *C. axillaris* described by Hartig a variety of this species. Schenck has bred the fly, and found it identical

with *A. inflator*. Dr. Giraud tells me in a letter that he takes it for a modified form of the gall of *Andricus curvator*. A specimen which Professor Schenck gave me consists of a swelling, almost egg-shaped, of about 8 millimetres, by 5.5, full of blisters, thin-walled, the surface of which is uneven, covered with leaf-like scales, on one side leaving folds, the margin of which exhibits indistinct traces of leaves; at the bottom of the large cavity lies an oviform inner gall. This swelling is situated in the upper angle between the twig and the lateral bud; the latter, however, does not grow on the twig itself, but on a very short stumpy lateral.

Note 1.—On May 19th of this year (1870?) I found two swollen galls on *Q. sessiliflora* which seemed to belong to the galls of *C. axillaris*, although when fresh they differed in appearance. At the beginning of June, I opened the larger of the two, the cavity in which resembled the gall of *A. curvator*, which species I extracted from it.—*G. L. Mayr.*

38a. Andricus curvator var. axillaris.—From Mayr's note, and a subsequent one under *curvator*, it will be seen that figure 38*a* is referable to *Andricus curvator var. axillaris*, and not to *A. inflator*.

This gall is, I believe, tolerably well distributed in Britain: it has occurred, but never commonly, almost everywhere I have collected, and has been recorded from Scotland (Ballater) by Mr. Traill. *Sapholytus connatus*, *H.*, is its inquiline, and *Megastigmus dorsalis* a parasite, both occurring, like the gall-maker, in the early summer. Batzberg says, in his 'Die Ichneumoniden' (ii. 151), "I obtained one female from Herr Hartig, which he had determined as *Siphonura variolosa*, *Nees*. He had bred his specimens from *Cynips disticha* and *Andricus noduli* and *inflator*." *S. variolosa*, *Nees*, is probably a synonym of *Ormyrus punctiger*, *Westw.*, a species which occurs in several galls. In addition to *M. dorsalis* I have bred *Syntomaspis caudata*, *Nees*, *Pteromalus* sp.? and *Psocus bipunctatus* from these galls.—*E. A. Fitch.*

39. Andricus circulans, *Mayr.*—In February and March of last year (1869) I found, in the neighbourhood of Vienna,

Fig. 38 a.



A. CURVATOR
var.
AXILLARIS.

small galls growing out of the axillary buds on stubs of the Turkey oak; the producers of these belong to a new species.

Fig. 39.



GALL OF
A. CIRCULANS.

These galls are of an elongate-oviform shape, similar to small ant-pupæ, about 2 to 5 millimetres long; from one to eight occur in a bud, and are so surrounded by the interior broad and short bud-scales, that only their upper part is visible. When the air is humid, the long linear outside scales stand out in such a manner that the gall is easily seen, but when the weather is dry they close over the galls in such a manner that it is difficult to see them. The galls are naked, of either a brownish yellow, a dirty reddish brown, or a beautiful light red colour, and show, when examined through a strong magnifying-glass, oval or elliptical cells. The walls of the gall are very thin, and enclose the cavity in which the gall-maker lives. If a large number of galls occur in one bud, it sometimes happens that one gall is in the centre, while the others are arranged round it in a circle; when there are only four they resemble the seeds of one of the Labiata: the galls are

frequently so compressed that they are flattened at the points of contact. Galls collected in February and kept in a hot room, produced some males at the beginning of March, while the females did not appear till eight or ten days later; from those collected on March 21st the flies emerged in April, and of those collected on April 15th many were already pierced; but from those that were entire the flies emerged in the course of a few days. No *Andricus* appeared in May—only a few *Ceroptres* and *Pteromalidæ*. I have only met with a few specimens this year.—*G. L. Mayr.*

In a note Dr. Mayr gives a description of the imago. The *Ceroptres* referred to is *C. Cerri*, *Mayr.*—*E. A. Fitch.*

The Devonshire Gall, Cynips Kollari. By the late
FRANCIS WALKER.

[At p. 251 of vol. vii. of the 'Entomologist,' we read:—"I was expecting Mr. Walker's notes on the parasites of *Cynips*

Lignicola (read Kollari), when the mournful intelligence reached me that his labours were ended, and his observations had ceased for ever." These notes were written, although not forwarded, and are here produced, by kind permission of the family, as an appendix to the other information there given concerning this gall and its inhabitants.—*E. Newman.*]

"Four inquilines are said by Dr. Mayr to inhabit this gall: *Ceroptres arator* and *C. pallicornis* appearing from April to June, *S. melanopus* and *S. Reinhardi* appearing in May and June of the second year. He mentions two parasites—*Callimome regius* and *Megastigmus stigmaticans*; and observes that *Diomorus calcaratus* is a parasite of *Stigmus pendulus*, which also inhabits this gall.

"From some of these galls, gathered in the autumn of 1872, *Cynips Kollari*, *Callimome regius*, and *Megastigmus stigmaticans*, emerged in July, 1873; also one male and one female of *Therophilus rufipes*. I am indebted to the Rev. T. A. Marshall for the name of this Braconid. In 1874 the above galls produced 1 *Callimome regius*, female, July 23rd; 1 *Megastigmus stigmaticans*, male, July 17th; 1 ditto ditto, August 3rd.

"The following list enumerates the products of some galls gathered in the autumn of 1873:—

"September, 1873: 410 *Cynips Kollari*; 6 *Callimome regius*, 4 males and 2 females.

"October: 110 *Cynips Kollari*; 2 *Callimome regius*, 1 male and 1 female; 25 *Megastigmus stigmaticans*, 24 males and 1 female.

"November: 110 *Megastigmus stigmaticans*, 96 males and 14 females.

"December: 64 *Megastigmus stigmaticans*, 47 males and 17 females.

"January, 1874: 41 *M. stigmaticans*, 18 males and 23 females.

"February: 19 *M. stigmaticans*, 6 males and 13 females.

"March: 12 *M. stigmaticans*, 2 males and 10 females.

"April: 5 *Syntomaspis caudatus*, 3 males and 2 females; 26 *Callimome regius*, 18 males and 8 females; 7 *C. abdominalis*; 7 *Eurytoma squamea*; 24 *Decatoma biguttata*; 2 *Pteromalus fasciventris*; 1 *P. tibialis*; many of *Synergus Reinhardi*; 2 *Hemitelus areator*; 1 *Hemerobius fuscus*; 2 *Psocus* sp—?

“May: 58 *Callimome regius*, 5 males and 53 females; 3 *Megastigmus stigmaticans*, 2 males and 1 female; 4 *Eurytoma squamea*; 4 *Decatoma biguttata*; 1 *D. flavicollis*; 1 *Dasycera sulphurella*; 1 *Grapholita Juliana*; 1 *Passalæcus gracilis*.

“June: 663 *Megastigmus stigmaticans*, 466 males and 197 females; about 40 *Synergus melanopus*; 1 *Psocus bipunctatus*; 2 *P. 4-punctatus*.

“July: 35 *Cynips Kollari*; 166 *M. stigmaticans*, 21 males and 145 females.

“FRANCIS WALKER.

“September, 1874.”

On an Immense Flight of Small Butterflies (Terias Lisa) in the Bermudas. By J. MATTHEW JONES, Esq.

[Reprinted from ‘*Psyche*’ for December, 1875, No. 20, p. 121; and communicated by the Author.]

MARVELLOUS indeed, as naturalists well know, are those periodic movements of the feathered race known as spring and autumn migrations. Moved by an instinctive impulse implanted in them by the Creator, thousands upon thousands of birds of all sizes, from the bulky swan to the tiny humming bird, travel by sea or land to distances so remote that, unless it was ascertained beyond doubt that the space was traversed, the fact would be considered almost incredible.

But if we are greatly astonished at the power of endurance exemplified in this long-sustained flight of some of the smallest birds, what will be said when we relate a circumstance connected with a similar power possessed by a species of butterfly, so small and apparently incapable of withstanding the violence of the elements, that we know not which is the more remarkable, the distance traversed, or the number of these frail little creatures which lived to reach those remote isles of the ocean, after an aerial journey of some six hundred miles or more?

Thus it was. Early in the morning of the first day of October, in the year 1874, several persons living on the north side of the main island perceived, as they thought, a cloud coming over from the north-west, which drew nearer and nearer to the shore, on reaching which it divided into two

parts, one of which went eastward and the other westward, gradually falling upon the land. They were not long in ascertaining that what they had taken for a cloud was an immense concourse of small yellow butterflies (*Terias Lisa*, *Boisd.*), which flitted about all the open grassy patches and cultivated grounds in a lazy manner, as if fatigued after their long voyage over the deep. Fishermen out near the reefs, some few miles to the north of the islands, very early that morning, stated that numbers of these insects fell upon their boats, literally covering them. They did not stay long upon the islands, however, only a few days, but during that time thousands must have fallen victims to the vigorous appetites of the blue bird (*Sialia sialis*, *Baird*) and black bird (*Minus carolinensis*, *Gray*), which were continually preying upon them. Only one other instance of a flight of these butterflies visiting the islands is recorded (in my 'Naturalist in Bermuda,' p. 120).

Mr. Darwin, in his 'Naturalist's Voyage of H.M.S. Beagle,' writes as follows:—Several times when the ship has been some miles off the mouth of the Rio Plata, and at other times when off from the shores of northern Patagonia, we have been surrounded by insects. One evening, when we were about ten miles from the Bay of San Blas, vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. Even by the aid of a telescope it was not possible to see a space free from butterflies. The seaman cried out "it was snowing butterflies," and such in fact was the appearance. More species than one were present, but the main part belonged to a kind very similar to, but not identical with, the common English *Colias Edusa*. Some moths and Hymenoptera accompanied the butterflies, and a fine beetle (*Calosoma*) flew on board. The day had been fine and calm, and the one previous to it equally so, with light and variable airs. Hence we cannot suppose that the insects were blown off the land, but we must conclude that they voluntarily took flight. The great bands of the *Colias* seem at first to afford an instance like those on record of the migrations of another butterfly, *Pyrameis Cardui* (Lyell's 'Principles of Geology,' vol. iii. p. 63), but the presence of other insects makes the case distinct, and even less intelligible. Before sunset a strong breeze

sprung up from the north, and this must have caused tens of thousands of the butterflies and other insects to have perished.

In the 'Entomologist' (vol. iii., p. 226) it is stated that during a cyclone, and a distance of 600 miles from the African coast and 200 miles from the Cape Verde Islands, a vessel was visited by numerous birds and butterflies, the latter being *Diadema Bolina* and *Pyrameis Cardui*.

Now the instance related by Darwin only proves the fact of flocks of butterflies being observed *ten* miles from the land, and that recorded in the 'Entomologist' leaves it an open question as to whether the insects were direct from the coast of Africa or Cape Verde Islands,* or indeed whether they occurred in remarkable numbers. We have, therefore, reason to believe that the vast host of *Terias Lisa* which arrived at the Bermudas on the 1st of October last, and that visitation recorded in the 'Naturalist in Bermuda' as occurring on the 10th of October, 1847, are the only instances known of such extraordinary flights of Lepidoptera, or indeed of any insects being met with at such an amazing distance from land.

The question, therefore, naturally arises—How did this immense concourse of butterflies get to the Bermudas? The nearest point of land is Cape Hatteras, in North Carolina, which is somewhere about 600 miles distant, and if they had started from this point and taken a straight line to the islands, without meeting with any contrary winds, it would, at the rate of twelve miles per hour (a fair average rate of travel for any of the *Pieridæ*), have taken them two days and two hours (of course including nights) to complete the distance; a space of time almost too great, we should imagine, for an insect in no degree remarkable for robust frame or strength of wing to keep up a continuous flight. We are, however, inclined to think that the presence of this vast concourse of insects at the Bermudas was not owing to ordinary causes, and that we must look to some extraordinary means to solve the mystery. From a very extended series of observations made at intervals during the last twenty years, with the view of throwing light upon the migration of North American birds to those

* I do not find any record of the occurrence of *P. Cardui* in the Cape de Verde Islands, although it is found on the islands to the north.—*S. H. Scudder.*

islands, we have become impressed with the fact that the largest flights of birds occur there during the period of great atmospheric disturbance. From the latter end of September to that of October, violent revolving gales are prevalent throughout the region which comprises the east coast of the Southern and Middle States and the North Atlantic in those latitudes, for some 600 or 800 miles from land. At this particular period vast flights of birds of all kinds are proceeding southward along the coast for their winter resorts in Florida, West Indies and South America, and must often meet with the violent gales we have alluded to. Now the observations of scientific aeronauts, like Glaisher and others, teach us that the upper atmosphere is composed of currents of air differing in their courses as elevation proceeds, and some cases are on record in which balloons at a great height have suddenly come in contact with violent direct gales, which carried them onward with such velocity as to render their course one of extreme peril, only escaping destruction by the superior manœuvring of those in charge. Let us suppose a violent revolving gale passing along the coast of the Southern States, about the latitude of the Bermudas, during the period of the autumnal migration of birds and butterflies, engulfing some of those great flights which are then proceeding along in a southerly direction. Drawing them up high in its vortex, a direct westerly gale is met with, blowing with great force out to sea. Hurlled with amazing rapidity along this cool aerial current, in the course of about three or four hours the heated vapour arising from the Gulf Stream would be met with; and would it be considered as too imaginative to grant that the ascending warmth of that stream has power sufficient to ameliorate the condition of the cool current, to stay its rapid course and allow the animal freight to descend, which, then within a comparatively short distance of the Bermudas, would seek the nearest land by that instinctive impulse so characteristic of these tribes, and aided perhaps by perfect calm or favouring breeze, arrive at those distant isles, without encountering the dangers which—in the form of contrary winds—would most certainly accompany an

* *Terias Lisa* occurs along the Atlantic Coast from New Hampshire to Cuba. It is excessively rare north of Cape Cod, common from New Jersey to Cape Hatteras, and extremely abundant farther south.—*S. II. S.*

intentional migration to the islands? If our theory, however, be an incorrect one, as it may be, we should indeed be glad if some one would lend a helping hand to solve this question of a migration of tiny butterflies from the American main to those small and remote isles, 600 miles away over the rolling waters of the trackless deep.

J. MATTHEW JONES.

Halifax, N.S., November 15, 1875.

Description of some Varieties of Vanessa Io, &c., probably caused by starving the Larvæ. By H. RAMSAY COX, Esq., F.L.S.

So much has been said on "varieties" being produced by starvation that some readers who have not had personal experience in the subject may be a little interested in a short description of the "varieties" (so-called) that I lately bred of some of the *Vanessæ*, caused, I believe, by starvation. I should say that the shortness of fare the poor larvæ were subjected to was quite unintentional.

We captured in the New Forest a number of half-grown larvæ of *Vanessa Io*, which were carefully fed for a few days; but owing to my boy's neglect, and to my being busy with the net, they were left several days without food; all dead leaves and stalks had been devoured. They were a very long time changing, and many fastened themselves to the *bottom* of the cage, as if too weak to spin up on the top or sides, in the ordinary manner. *Very few died either in the larval or pupal state.*

Nearly all the imagos were of course rather small; they varied much in the intensity of their colouring, and two specimens are very singularly marked. In one, the yellow costal spot is only represented by a very small white mark: there is scarcely any yellow in the ocellus, a large part of which is filled up with black, the usual chocolate patch in it is also black. The chocolate ground colour is also darker than usual. In the hind wing the ocellus contains only two small round violet spots. The other specimen is similarly marked, except in the hind wings, in which there is no ocellus at all of the ordinary character, but merely *an irregularly shaped*

dull whitish blotch, containing a very indistinct small brown mark.

Vanessa Urticæ and Polychloros were similarly treated: the latter produced no peculiar-looking specimens, excepting that the ground colour was darker than in ordinary bred specimens. The Urticæ in spite of their starving came out nearly the natural size. Many have a thick black nervure in the centre of the wing; also a brownish patch between the middle costal spot and that in the inner margin, and the dark margin round the wings *is wider than usual*.

The effects of starving these three species would therefore appear to be similar, as far as the causing of dark spots, patches, &c., goes. Being very interested in the subject, I should be glad to hear from other collectors if they have often noticed the same features when breeding the Vanessaæ.

H. RAMSAY COX.

Thornleigh, Forest Hill,
January 24, 1876.

Collected Observations on British Sawflies.

By EDWARD NEWMAN.

BEFORE attempting to catalogue the reputed British species of sawfly, I crave permission to give my own view of what a sawfly is, and also to indicate what I suppose its position in the system of Nature. In doing this I propose to incorporate, recapitulate, and amalgamate, certain opinions I expressed in the year 1832, and during the ten or twelve years immediately following.

I am led to this course by reading, after a lapse of thirty years, the following passage in a letter addressed to me by the late Dr. Harris, of Harvard University:—

“In a private course of lectures on Entomology, given to some of the students of the University four years ago, I endeavoured to explain your system, and made diagrams for the purpose, some of which still remained hanging in the room when our excellent friend Mr. Doubleday saw my collection of insects. I have often wished you would combine in one work all that you have published on the classification of insects, and the characteristics of the groups. . . . You have often very happily illustrated what

before was obscure, and have pointed out some striking resemblances, or affinities, as it is the fashion to call them. You have proved to my satisfaction the centrality of certain groups or types of form containing some of the characteristics of the surrounding groups, together with a character peculiarly their own. This, it appears to me, must be the key to affinities, if such exist. That there are really seven great and perfectly natural groups of insects, and that they approach each other as you have represented, appears undeniable. Divide any one of them, and the parts lose their relative value when compared with the other groups."

—*Extract from a letter from Dr. Harris to E. Newman, dated January 7th, 1844; and published in the Memoir of Dr. Harris, by Col. T. W. Higginson, prefixed to the Entomological Correspondence of T. W. Harris, edited by Samuel H. Scudder, 1869.*

At the risk of being considered prosy in the repetition of a thrice-told tale, I will repeat Cuvier's "distribution of animals according to their organisation," and define four groups, which, though virtually identical with those I am about to employ, have different names. The divisions are these:—

1. *Endosteate animals*, having an endo-skeleton, or internal framework of bone, to which the muscles are attached; the muscles clothe and cover the endo-skeleton, and both are enclosed in a sack, called the skin. We are told by anatomists that this endo-skeleton is continually undergoing disintegration, absorption, and renewal; but of this I am incapable of forming an opinion, still less can I describe any portion of the process. Nevertheless, seeing that the exo-skeleton of the next group is repeatedly discarded and reproduced, I am perfectly ready to admit an analogous phenomenon may exist in the endo-skeleton, although the process by which it is performed is so widely different that one fails to follow it in all its details. [These are the *Vertebrata* of Cuvier.]

2. *Exosteate animals*, which have no internal framework of bone, but, in its stead, an indurated skin, enveloping and enclosing the softer parts; and this I call the exo-skeleton, or external skeleton. This answers the same purpose of protection and support to the muscles as the endo-skeleton, but its position is exactly the reverse. The exo-skeleton, as

I have called it, varies infinitely in its character: in the larvæ of Lepidoptera it is thin, soft, and flexible in the extreme; while in crustaceans, particularly in the claw of an aged crab, it is so thick, solid, and calcareous, that it can only be broken by a smart blow with the hammer. Between these two opposites of extreme thinness and extreme thickness, every conceivable intermediate occurs; but whatever difference exists in this respect all exo-skeletons agree in being repeatedly shed and renewed during life-time. The process of moulting is common to most animals: the bird loses and reproduces its feathers; the suckler its hair; but in exosteates this exuviation extends to the whole covering: this is shed entire, and not only to the covering, for the exuviation extends to the interior, but those organs which are most intimately connected with life share the same fate as the exo-skeleton, of which they actually seem to form part, and are cast off like our old clothes and replaced by a new suit. I have been particularly interested in observing how complete is this internal, as well as external, exuviation in crabs, crayfish, and lobsters, the discarded garments of which form most beautiful objects to examine, showing that even the breathing apparatus to its most minute parts is cast off, and replaced by a new one secreted within the body of the animal. [These are the *Articulata* of Cuvier.]

3. *Anosteate animals*, which have no bones at all, but which have the power of building a house or shell for protection out of material secreted by their own body. I say have the power of doing so; but they do not always exercise the power, very many species having neither bone, shell, nor any substitute for these at any period of life. [These are the *Mollusca* of Cuvier.]

4. *Actiniate animals*, which have their several organs arranged in a radiating fashion round a centre, like the starfish. The other divisions have not this radiating arrangement of parts, but are what is called bilateral, that is, they have both sides alike. [These are the *Radiata* of Cuvier.]

The second of these divisions is that to which the sawflies belong; but these require further division.

In my Familiar Introduction, published in 1841, I adopted Latreille's name of *Condylopa* for this province, but I now prefer to propose an entirely new one—*Exosteata*; its contents

are also modified. The province, as altered, contains four sub-provinces, as under:—

1. *Hexapods*, which at no period of their existence have more than six legs, and which are variously known as butterflies and moths; gnats and flies; bees, wasps and sawflies; beetles; locusts and cockroaches; bugs, plant-bugs, plant-lice, animal-lice, springtails; dragonflies and stoneflies, &c.: these are associated by the single and simple, though constant, character of possessing six legs, and no more. These frequently possess also two or four wings; but in a primary definition this appears scarcely deserving of notice, since wings are so frequently wanting. [These are the *Insecta* of Latreille.]

Moreover, these insect-wings are in reality windpipes, or, perhaps, speaking with greater precision, portions or branches of windpipe everted and altered expressly to fit them for the function of flight, instead of confining their duties to the more ordinary and—as we believe—normal office of respiration. In order to achieve this additional duty, we find that certain main branches of windpipe, having forsaken their usual site in the interior of the trunk, issue, one or two from each side of the mesothorax, and one or two from each side of the metathorax, each branch encased in a bony cylinder, which is frequently sufficiently transparent to admit of the structure of the windpipe being seen through its walls; while the constant pulsatory movements of blood-disks everywhere, between each cylinder and its enclosed windpipe, proves, beyond the possibility of doubt, the existence of a circulation throughout the insect world. These external ramifications of the windpipe, and as a consequence its bony casings, are infinitely less numerous than those confined to the trunk, Lyonet having stated that he counted 1804 branches in a specimen of *Xyleutes Cossus*, and that he only discontinued counting because they eluded the powers of his glass from excessive tenuity. Still they are numerous and conspicuous, and subserve the useful purpose of supplying characters to the descriptive entomologist; but of this more hereafter. We find them always connected with each other throughout their length by a membrane, which, in fact, is double, or composed of two membranes, although it appears as only one: its double character is

proved by the presence of fluid, which, on the creature's emergence from the pupa state, is observed to occupy a space between them, sometimes even imparting to the part the appearance of an inflated bladder. Nevertheless, as the insect rapidly advances towards maturity, the blood retires into the trunk, and the bladder is seen to shrink and finally to collapse, while the two membranes approach, unite, and henceforward become one and indivisible. A word remains to be said about the encased windpipes. These are generally divided and branched, the branches taking many directions, frequently anastomosing, and thus forming a complete network or frame, which supports the membrane, distended over them like the canvas over the ribs in the sails of a windmill, and the two united constitute the so-called "wing." In aquatic larvæ a very similar arrangement of parts is observable; but while in the imago state the number of these "wings" never exceeds four, in aquatic larvæ of hexapods it often rises to twelve or fourteen; then they are employed as swimming organs, in addition to their use as respiratory organs; but the name of "windpipe," or of some equivalent in the language of science, is retained, while in the perfect insect the name of "wings" is universally applied.

2. *Octopods*, which at every period of their existence possess eight legs,—as mites and spiders, and all spider-like animals; in these there is never any indication of wing. [These are the *Arachnides* of Latreille.]

3. *Anisopods*, whose legs are mostly ten, but often more, and which are for the most part marine animals,—as crabs, lobsters, crayfishes, prawns, and shrimps. [These are the *Crustacea* of Latreille.]

4. *Myriapods*, which possess a multitude of legs, and which are familiarly known as centipedes, or hundred legs. [These are the *Myriapoda* of Latreille.]

The essential characteristic of Exosteate structure, necessitated, as I conceive, by the external situation of the principal organs of support, is the fusion, amalgamation, or inseparability, of several systems of organs. The organs of support, circulation, and respiration, instead of being detached, as in endosteates, are so inextricably involved as to defeat the attempts of the most skilful anatomist to separate them; indeed, it seems a necessity that the organs of respiration

should be attended by those of circulation, and that both should be enclosed by those of support throughout their circuitous and manifold ramifications. In Endosteates the bones form a connected system adapted to the especial function of support, and the organs of respiration consist of a single and simple windpipe opening at its upper extremity into the throat, and terminating at its lower extremity in the lungs, where the air which it has received at the throat comes in contact with the blood, and receives the necessary oxygenation to ensure its life-supporting properties. In hexapods we may suppose the same process of oxygenation necessary, but it does not take place at any fixed point, as the lungs: the process goes on in every part of the trunk, in the legs, wings, and antennæ, because the windpipe is infinitely divided, and accompanies the blood-vessel in all its windings, however intricate, however ramified; so that the blood is always lubricating and moistening the windpipe, and thus maintaining it in that condition so essential to the due performance of its functions.

In both Endosteates and Exosteates the windpipe is composed of a series of rings closely appressed together; they are sufficiently strong to maintain their form and position against any pressure that may come from without, but still sufficiently flexible to offer no impediment to the free motion of the equally flexible bones, which they invariably traverse from end to end. We have lately heard a good deal of flexible glass: these tubular bones, through which the blood and air constantly circulate, may be compared to flexible glass. They also resemble glass in being frequently transparent, so that the functions, in course of progress within, may be observed and watched from without. This transparency, however, is confined to a few families, and, in these families, exclusively to the wing-bones; the existence of transparent bone in the trunk has not been noticed, and probably does not exist. Moreover, the wing-bones of Coleoptera are almost invariably opaque, and of a dark brown colour, which effectually precludes all examination of the interior.

This differentiation of the two great provinces of animals—I say *two*, because I make no attempt to cope with the other two, Anosteate and Actiniate—is so totally, so diame-

trically opposed to the teaching of Kirby and Spence—teaching which for half a century we have been taught to believe infallible—that it would be uncandid, and certainly uncourteous, to omit all mention of these fathers in Entomology, supported as they are by other leaders in the domain of science. In pursuance of this object, in the justice of which every reader will concur, I cannot do better than cite their own words. After enumerating the observations of Swammerdam, Réaumur, Bonnet, De Geer, Baker, and Chabrier, all of whom speak more or less decidedly of blood-vessels, currents, moving fluids, pulsations, and circulation, they proceed in this emphatic manner, crushing, as it were, the observations of these worthies under the weight of authority,—the authority of Lyonet, Cuvier, and Marcel de Serres,—enforced as it is by their own views on this important and highly interesting question.

“But though these arguments, which I have stated in their full force, appear strong, and at first sight conclusive, those which may be urged for the more modern opinion—that no circulation exists in insects, properly so-called—appear to have still greater weight. Lyonet, whose piercing eyes and skilful hand traced the course of so many hundred nerves and *bronchiæ*, long after they became invisible to the unassisted eye, and which were a thousand times smaller than the principal blood-vessels opening into so large an organ as the supposed heart of insects might be expected to be, could never discover anything like them. His most painful researches, and repeated attempts to inject them with coloured liquids, were unable to detect the most minute opening in the dorsal vessel, or the slightest trace of any artery or vein proceeding from or communicating with it. And Cuvier, whose unrivalled skill in Comparative Anatomy peculiarly qualified him for the investigation, repeated these enquiries, and tried all the known modes of injection, with equal want of success; and is thus led to the conclusion that insects have no circulation; that their dorsal vessel is no heart, and therefore ought not to be called by that name; and that it is rather a secretory vessel, like many others of that kind in those animals.”—‘*Introduction to Entomology*,’ vol. iv. p. 91.

Notwithstanding this very explicit statement of facts and

opinions, the learned authors cite the wondrous discoveries of Carus, which seem opposed to them, and finally arrive at this solution :—

“The endeavours of M. Carus to discover any proofs of a circulation in their last state, except in the wings at their first development, were without success. He observes that the fact of the currents of fluids in larvæ, not being defined by vascular parietes, enable us to comprehend the rapidity and facility with which the traces of the circulation are lost in the perfect insect. On the other hand, the existence of a circulation at one period, and its cessation at another, elucidates many circumstances connected with the physiology of these animals; for instance, the contrast between the rapid growth and transformation of the larvæ, and the stationary existence of the imago, &c. Lastly, he remarks that the phenomena of this circulation do not throw any light on the obscure subject of the mode of nutrition in perfect insects; which, therefore, must still be supposed to be effected according to the idea of Cuvier,—without the intervention of vessels.”—*Introduction to Entomology*, vol. iv. p. 96.

To Dr. Bowerbank we are indebted for clearing up the doubts about circulation. He attributes the errors, for such they assuredly are, into which Lyonet and other great authorities have fallen, neither to haste, nor inattention, nor inability, but solely to the imperfection of the microscopes they employed. After the publication of his paper in the fourth volume of the ‘Entomological Magazine,’ troops of scientific men came to test, and of course ended in verifying, his observation: Professor Owen, Marshall Hall, Newport, Gulliver, Mantel, Geoffroi St. Hilaire. Of the last-named the following reminiscence will be read with pleasure :—

“One of the most remarkable of my visitors was the great French naturalist Geoffroi St. Hilaire, who paid a short visit to England in 1833. He had read my paper ‘On the Circulation of the Blood in the Larva of *Ephemera marginata*,’ and doubted the possibility of seeing the valvular action of the great dorsal vessel described therein. I had fortunately in my possession some very favourable subjects for exhibiting these beautiful phenomena; and when all was in order, and the great man applied his eye to the instrument, he at once saw the very facts he had doubted, and, without moving his

eye, he shouted 'Ah!' He sat as if glued to it, and did not seem capable of moving from it. His son-in-law, Dr. Martin St. Ange, fed him with the sweet cake that had been offered to him with some wine as refreshment, as he sat gazing at the beautiful sight; but nothing could induce him to remove his eye from the insect, until at last a plunge it made in the cell carried it out of sight; and Geoffroi St. Hilaire started to his feet, threw up both his arms as he strode down the room, and shouted '*Magnifique!*'"

(To be continued.)

Entomological Notes, Captures, &c.

Ants and Imbauba Trees.—Some time ago I sent to Germany for publication a note on the relation between our imbauba trees (*Cecropia*) and the ants which inhabit their hollow stem. As there may be some delay in publishing, I will give you a short abstract. Mr. Belt has already stated that the ants farm scale-insects in the cells of the imbauba stem, and he believes that their presence must be beneficial. This is no doubt the case; for they protect the young leaves against the leaf-cutting ants (*Ecodoma*). Now there is a wonderful contrivance by which, as in the case of the "bull's-horn acacia," the attendance of the ants at the right time and place is secured. At the base of each petiole there is a large flat cushion, consisting of most densely-crowded hairs, and within this cushion a large number of small, white, pear-like or club-shaped bodies (specimens enclosed) are successively developed, which, when ripe, emerge at the surface of the cushion, like asparagus on a bed, and are then greedily gathered by the ants and carried away to the nest. The object of the dense hair-cushion appears to be (1) to secure to the young club-shaped bodies the moisture necessary for their development; and (2) to prevent the ants from gathering the unripe bodies. In most cases it is by honey-secreting glands that the protecting ants are attracted. Now Mr. Belt observed ('*Nicaragua*,' p. 225) that the honey-glands on the calyx and young leaves of a passion-flower were less attractive to the ants than were the scale-insects living on the *stems*. This would most likely be the case with the imbauba; and

it is probable that the use of the little pear-shaped bodies is to form an attraction stronger than that of the scale-insects, and thus to secure the attendance of the protective ants on the young leaves. As far as I could make out, the club-shaped bodies consist mainly of an albuminous substance. The ant colonies are founded by fertilised females, which may be found frequently in the cells of young imbauba plants. Each internode has on the outside, near its upper end, a small pit, where the wall of the cell is much thinner than anywhere else, and where the female makes a hole by which she enters. Soon after this the hole is completely shut again by a luxuriant excrescence from its margins, and so it remains until about a dozen workers have developed from the eggs of the female, when the hole is opened anew from within by these workers. It would appear that the female ants, living in cells closed all around, must be protected against any enemy; but, notwithstanding, a rather large number of them are devoured by the grub of a parasitic wasp belonging to the Chalcididæ. Mr. Westwood has observed that the "pupæ of the Chalcididæ exhibit a much nearer approach to the obtected pupæ of the Lepidoptera than is made by any other Hymenoptera" ('Introduction to the Modern Classification of Insects,' part xi. p. 162). Now the pupa of the parasite of the imbauba ant is suspended on the wall of the cell by its poster or extremity, just like the chrysalis of a butterfly.—*Mr. Darwin; in 'Nature' of February 17, 1876.*

Remarks on the Oviposition of Limacodes Asellus.—In the early part of last year Mr. W. H. Harwood sent me thirteen pupæ of this species, from which I reared five female moths and seven males, and as I wanted to obtain the eggs I was determined to run the risk of allowing them to copulate which one pair obligingly did. A female having emerged first, a male followed the day afterwards; and in about an hour or so after it had emerged they copulated: this took place at mid-day. After separation I placed the female in a gallipot with a few beech leaves, and covered it over with a piece of white silk sarsenet and then with glass, and in two or three days I removed the sarsenet and found it bespattered with a whitish and glutinous-looking substance, resembling gum or varnish; and not believing it to be the egg, but some

kind of viscous matter which had got dry, I drew my finger over the largest patch and found that moisture came from it, so concluded that it was composed of eggs. Although I applied a strong lens I could not detect an egg of any shape; however, I put the gallipot aside, and looked every day until some eight or nine days had elapsed, when I found the sarsenet thickly sprinkled with whitish and very minute larvæ; but being much engaged at the time, I regret that I was unable to procure food until the second day after the larvæ had hatched: the weather was hot, and I was sorry to find them in a semi-alive state, and I could not get any to feed. By the species copulating at mid-day, and the eggs being decidedly those of a Tortrix, it would appear that it should not be classed in the genus *Limacodes* with *Testudo*, where the late Mr. Henry Doubleday puts it, as it certainly is more approximate to the genera *Halias* and *Sarrothripa*.—*F. O. Standish; High Street, Cheltenham, February 14, 1876.*

Argynnis Dia.—I have to announce an undoubtedly British specimen of this fritillary. It is a female, and was taken in 1872, at Worcester Park, Surrey, by a connexion of my own, Master Wallace A. Smith. He could not identify his capture, and placed it apart by itself. Very recently, on my looking over his insects, he drew my attention to the specimen as something peculiar. He perfectly recollects making the capture, and the exact spot where it was made. I found the specimen pinned and set in beginner's fashion. Mr. Wallace Smith has never had to do in his life with any dealer or collector; and, except things given to him by me, his cabinet contains nothing which he did not catch himself.—*W. Arnold Lewis; Temple, February 14, 1876.*

Pieris Rapæ in Winter.—This morning a gentleman brought to me a fresh living specimen of *Pieris Rapæ* he had captured in his garden yesterday. This is surprising, as we are now in the midst of the severest frost we have had this winter.—*G. T. Porritt; Huddersfield, February 14, 1876.*

Dasycampa rubiginea near Street, in December.—I had the good fortune to obtain a specimen of this moth while geologising and fern-collecting, in a gully about three miles from Street, during the last week of December. The specimen is unfortunately somewhat injured.—*J. Edmund Clark; 20, Bootham, York, February 8, 1876.*

Food-Plants of Gonepteryx Rhamni.—In reply to Mr. Edward A. Fitch (Entom. viii. 302), I may say that there is no more difficulty in obtaining the leaves of the apple and pear tree in Wales than there is in finding the Welsh language there; but the question is, are these the natural food-plants of *Gonepteryx Rhamni* in Great Britain? Mr. Fitch says the larvæ will eat apple, pear, and medlar: he may have bred the species upon these plants, or he may have obtained his information from Kaltenbach's 'Pflanzenfeinde,' where medlar and the "Pyrus-arten" are given, besides the buckthorns, on the authority of De Geer. Still I shall be glad to hear if any entomologist has ever found the eggs or taken the larvæ from either of these trees in this country. If so, it will satisfactorily account for the appearance of the butterfly in Carmarthenshire. In support of Mr. Fitch's theory, it is also interesting to know that Kaltenbach in the same work gives almost the same additions to the food-plants of *Lycæna Argiolus*. I have generally understood the food-plants of this butterfly to be confined to holly, ivy, and the two buckthorns. Kaltenbach does not mention either holly or ivy as food-plants of the "holly blue," but, quoting from De Geer, gives *R. Rhamni* and *R. Frangula* (De Geer, i. thl. 8 Abh. pp. 62—65), and continues to say, that "later observers have found the larvæ on medlar and apple." Can any of your readers substantiate this statement? If so I shall be very glad to hear from them, either through the medium of your columns or otherwise.—*Owen Wilson; Carmarthen.*

*The Larvæ of Arctia fuliginosa** (Entom. ix. 42).—I have perused with much interest Mr. Eccles' letter with regard to the injury done to his firm's linen, and would offer a few suggestions for the removal of the damaging agent. I notice Mr. Eccles desires to be informed how to get rid of the eggs. This, I think, is a mistake, as the real enemy is the caterpillar; and, besides, that is the most tangible object to proceed against. Now, the next thing to be considered is what measures should be adopted for their destruction. I would suggest that Mr. Eccles should employ some boys for a few days about the middle of April to collect these caterpillars, paying them so much per hundred for all they collect. This would not, I think, be a very difficult task, as

* Erroneously printed "rubiginosa" in the February number.—*E. Newman.*

it is a habit with these caterpillars to bask in the sun after hibernation (the state they are in at the present time), when they may be picked up quite easily where they occur. As they are collected it is needless to say that care must be taken to destroy them; and, should there be any difficulty with regard to this, I would suggest, as one means by which some of them might be disposed of, that Mr. Eccles should send me a few dozen, as I am not fortunate (or, as Mr. Eccles would probably say, unfortunate) enough to find them so plentifully near me.—*C. W. Simmons; 39, Market Street, Caledonian Road, London, N., February 3, 1876.*

Preservation against Mites, &c.—Van. *Physostigmatis* (Calabar bean) is an excellent preservative in cabinets against the attacks of mites and grease, to be used the same way as benzine or corrosive sublimate; and I tried benzine or benzole, as is directed in Newman's 'British Moths,' but I could not get the insects right after.—[*Rev.*] *G. C. Madden; Armitage Bridge Vicarage, Huddersfield, January 18, 1876.*

Larva of an Œstrus(?) Infesting Man.—I extracted twenty *Fuunyés*, an insect like a maggot, whose eggs had been inserted on my having been put into an old house infested by them. As they enlarge they stir about, and impart a stinging sensation; if disturbed the head is drawn in a little. When a poultice is put on they seem obliged to come out, possibly from want of air. They can be pressed out, but the pimple in which they live is painful. They were chiefly in my limbs.—'Livingstone's Last Journals,' vol. ii. p. 4.

Insects of Kent and Surrey.—The Council of the South London Entomological Society have decided to attempt the publication of a list of insects found in Kent and Surrey; and in order to make the Lepidopterous portion as complete as possible, I venture to ask for help from collectors who have worked in either county, and more especially in districts above twenty miles distant from London. Local lists will be gratefully acknowledged.—*J. Platt Barrett; 34, Radnor Street, Peckham, S.E.*

Answers to Correspondents.

Pyrameis Atalanta in Perthshire.—Several specimens of the above species were seen and captured in our garden at

Blairgourie; and my friend Mr. Guild, of Broughty Ferry, took several in his garden there in September. Can you tell me if it is usual to find this butterfly so far north?—*James Grimond*.

[The name of this butterfly occurred in every list I received from Scotland when writing my account of British butterflies, and in no instance is anything said of its rarity. Dr. Buchanan White informs me it occurs in Scotland from the sea level up to the base of Ben Lawers.—*E. Newman*].

To breed Bombyx Rubi.—I have the last three seasons had a number of larvæ of *Bombyx Rubi* which have always died during the winter. I now have some hibernating, and should be glad if you could tell me when I ought to begin to feed them again, and how they ought to be kept during the winter.—*C. Lemesle Adams; Walford Manor, Shrewsbury, December 23, 1875*.

[Procure a large wooden box of any kind,—a tea-chest will do; put a large tuft of heathy turf in it; instead of a lid, cover with a piece of wire gauze; leave it out in all weathers; take care that the bottom be perforated to allow the wet to drain off; treated thus, they will be sure to come out.—*Edward Newman*].

Preserving Larvæ of Lepidoptera.—I shall be extremely obliged if any one will tell me the mode of preserving larvæ. I have seen some preserved which look very natural, and I wish to know the method employed.—*E. G. Browne; Eton College, Windsor*.

[I have long been promised a paper fully explaining the process, and accompanied by figures of implements employed. I know not why it is deferred; and trust the author on reading this will kindly comply with the wishes of his friends.—*Edward Newman*].

The Doubleday Collection.—The valuable collection of Butterflies and Moths, belonging to and collected by the late Mr. Henry Doubleday, of Epping, has been now, by the wish of many collectors and with consent of the Trustees, placed in the Bethnal Green Museum; to be called "The Doubleday Collection."—*Septimus Warner; Hoddesdon, February 24, 1876*.

THE ENTOMOLOGIST.

No. 154.]

APRIL, MDCCCLXXVI.

[PRICE 6d.

Description of Polysphænis sericina from Guenée.

By EDWARD NEWMAN.



POLYSPHÆNIS SERICINA (female).

THIS beautiful moth being now added to the list of the Lepidoptera of the British Islands, on account of its occurrence in Guernsey, I think it will be well to copy the description from Guenée.

“Fore wings bright grass-green, clouded with olive-green, with the median area, or at least the upper part of it, of a still brighter green, powdered with whitish; the two median lines are very distinct, white, bordered with black; extra-basilar line deeply notched towards the lower extremity; the elbowed line, with the teeth, very distinct, and prolonged into black points. The ordinary markings are more or less hidden in the greenish white; the subterminal line is almost reduced to white dots on the black wing-rays. Hind wings reddish fulvous, with the wing-rays and a cellular mark darker, and a broad, marginal, black band surmounted with a very indistinct transverse line; these markings are perceptible on the under side. That of the fore wings with a

large, cellular, black spot. Antennæ of the male furnished with slender laminæ, which are pubescent on the sides and verticillate towards the tip. Abdomen with the five anterior segments crested, the crests more conspicuous on the third and fourth. Larvæ of a grayish flesh-colour, with brownish markings, and the dorsal area lighter and in form of a band; the medio-dorsal stripe very distinct, of a velvety black-brown, with an oblong white mark; in approaching the hinder incision the subdorsal stripe scarcely perceptible, surmounting a yellow spot about two-thirds of the length of each segment, and which becomes black on the 10th and 11th segments; the stigmoidal stripe is scarcely perceptible, and nearly concolorous with the ground colour. A black basement occurs on the 12th segment, and this extends into the anal claspers. The head is brown, with two black spots on the forehead. It feeds in April on the honeysuckle, and only in the night, and remains continually on the twigs, attacking the lower leaves."—'Noctuelites,' vol. ii. p. 72.

This fine insect occurs in Central and Western France, Italy, Dalmatia, and the Channel Islands, but is nowhere abundant. Owing to the peculiar habit of the caterpillar, feeding as it does on the lower leaves of the honeysuckle, and only in the night, it is very likely to escape observation; indeed, in the larva state it would be almost impossible to find. Our southern maritime counties offer it a congenial habitat, and the honeysuckle in all our hedgerows would afford it abundant food, while their excessive trimness and stiffness, so rarely found on the Continent, would offer it ample security against the umbrella and beating-stick of the larva-hunter. I am indebted to Mr. W. A. Luff, who is now studying the Entomology of the Channel Islands, for this beautiful species.

EDWARD NEWMAN.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 52.)

40. *Andricus burgundus*, Gir.—The resemblance between the gall of this species and the one last described is so strong that I am unable to give a constant mark of distinction. If,

in spite of this, I have described *A. circulans* as a new species, it is because the flies differ considerably from one another, and *A. burgundus* appears a month later. Dr. Giraud informed me that he also had met with the species last described, and thought it new. He thinks that each gall of *A. burgundus* is formed on an anther, and the union of several galls in an undeveloped flower-bud would produce such an impression. It is certain that the galls of *A. circulans* are generally developed on leaf-buds, and further investigations will show whether the galls of *A. circulans* are *only* to be found on leaf-buds, and those of *A. burgundus* *only* on flower-buds. The figure of the gall of *A. burgundus* is from typical specimens.—*G. L. Mayr.*

In the 'Entomologische Zeitung' (Stettin), xxxi. 396, Von Schlechtendal, in his paper on gall-flies, describes the gall of another and new species as the *Andricus burgundus*, *Gir.* This is another Turkey oak species, and has not occurred in Britain.—*E. A. Fitch.*

41. *Spathegaster Giraudi*, Tschek.—This small oviform gall, varying in length from 2·7 to 4·5 millimetres, is developed in the early spring from the small axillar buds (which are scarcely larger than a pin's head) of the weakest, one-year old, shoots of *Quercus pubescens*. When recent it is green, more or less reddish, and generally thickly covered with soft, red, porrected hairs. It only consists of a thin, moderately soft shell, which forms the larva-cell; the small bud-scales are situated at the base of the gall. The gall-fly appears in the first fortnight in May. This year, the spring being late, I did not obtain the fly till the middle of May, from fresh galls kindly sent me by Director Tschek.—*G. L. Mayr.*

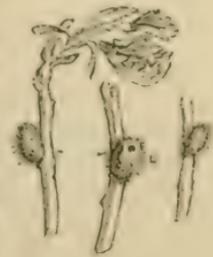
This species—named after Dr. Giraud, from galls found rather commonly near Piesting (Austria), by Tschek (1869,

Fig. 40.



GALL OF ANDRICUS BURGUNDUS (of the natural size and magnified).

Fig. 41.



GALL OF S. GIRAUDI.

Verh. der zool.-botan. Gesellschaft, Wien, xix. 559)—is but a synonym of one of Giraud's own species, *S. flosculi* (1868, Ann. Soc. Ent. Fr. p. 54), as pointed out by Dr. Mayr. *Ceroptres arator*, *H.*, occurs in the gall as an inquiline, in the summer of the same year.—*E. A. Fitch.*

42. *Spathogaster aprilius*, Gir.—This vesiculate gall, normally about as large as a pea, is generally developed on

Fig. 42.



GALL OF
SPATHOGASTER APRILINUS.

the terminal, rarely on the axillar, buds of *Q. pubescens*, but it sometimes occurs on those of *Q. sessiliflora*. It is remarkable on account of its rapid growth, as it becomes mature, and exhibits the circular hole made by the exit of the fly, within a few days after the bursting of the buds. It is spherical, oviform, or knobby, and either of a yellowish white or yellowish green colour, partly rosy, and covered with short scattered hairs; at its base it rests on the large exterior bud-scales; the interior scales, which easily fall off, are dispersed about its upper part. It consists of a juicy, thin-walled

marenchyma, and contains from one to five cells, which are conspicuous on the outside, appearing like bumps, and are often distinctly divided by furrows; in the interior a somewhat perpendicularly-placed marenchyma forms the division of the cells. The cells are large in comparison to the size of the insect, generally oviform, and for the most part placed upright on their longitudinal axis. The galls are often so small that the buds which contain them can only be recognised through the bud-scales which are less regularly placed and are more open. Each gall-fly, when escaping, makes a circular hole in the substance of the gall, but it is done in such a manner that the piece cut out is left adhering at one point. Soon after the escape of the fly the gall shrivels up to such a degree that we only meet with a dry crippled bud in its place. Dr. Giraud states, in his 'Signalements,' &c., that he found many galls on April 20th already pierced, and yet he obtained a number of flies up to April 23rd. On the 17th of April, last year, I found these galls on the

Laaerberg, near Vienna; some of them were pierced, but in spite of that I obtained many of the gall-flies within the next few days. This year, spring being so late, I did not find them till May 15th; then, however, in great profusion on the Leopoldsberg, near Vienna. They occur as much on shrubby oaks as on old trees. The large well-developed galls were more or less pierced; they only produced two males, but in the course of the same month a number of *Platymesopus tibialis*, *Westw.*—*G. L. Mayr.*

I have seen British specimens of this gall, found by Mr. Rothera, near Nottingham. It probably occurs elsewhere; but, as Giraud observes, it occurs early, and the period of its existence is very short. It is, consequently, very likely to escape observation. In addition to *P. tibialis*, Mayr obtained four species of *Ceroptres arator*, *H.*, in June of the first year.—*E. A. Fitch.*

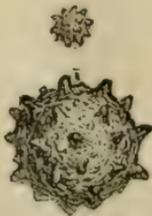
Fig. 43.

? GALL OF *CYNIPS ARIES*.

43. ? *Cynips aries*, Gir.—This beautiful gall has been sufficiently described by Dr. Giraud in his ‘Signalements,’ &c. (Verh. d. zool.-bot. Ges. 1859, p. 371), with this exception:—“Si je ne me trompe, elle siège dans le pétiole d’une feuille dont la nervure principale seule a continué à croître et a produit ce grand prolongement qui la surmonte;” for the gall is a genuine bud-gall, being developed from the axillar buds, and still retaining the small bud-scales at its base. The specimen figured I received from Dr. Giraud.—*G. L. Mayr.*

44. ? *Cynips gemmea*, Gir.—With regard to this questionable species I refer to the description given in Dr. Giraud's

Fig. 44.



? GALL OF *CYNIPS GEMMEA* (natural size, and magnified).

'Signalements,' &c., and only give a figure from a typical specimen in the imperial zoological cabinet.—*G. L. Mayr.*

45. ? *Cynips exclusa*, Ratz.—It is very doubtful whether this gall is produced by a distinct species of gall-fly, or only

Fig. 45.



? GALL OF *CYNIPS EXCLUSA* (in the bud).

belongs to one of those just described. I add the figure of a specimen, from Von Heyden's collection, which probably is referable to this species; but it is badly preserved, which makes it impossible to refer it to one of the previously described galls (Forstinsekten, iii. 56, pl. v., fig. 8).—*G. L. Mayr.*

Notes on Preserving Larvæ. By HENRY A. AULD, Esq.

ALTHOUGH the mode of preserving larvæ for the cabinet is familiar to many practical entomologists, there may be a few who read this journal to whom the method, simple as it is, may be unknown. Specimens are often seen pickled in bottles of spirits; but treated thus they seldom form very beautiful objects, and, enclosed in tubes and vials, cannot be arranged side by side with the imago forms. Therefore, to know how to preserve larvæ in such a way that they may be

placed with the perfect insects, and so enhance the interest of their collections, would doubtless be a boon to many a tyro-lepidopterist; and in the hope that, now the season has fairly set in, some may be induced to experiment upon the commoner species, these few notes are offered.

Fig. 1.

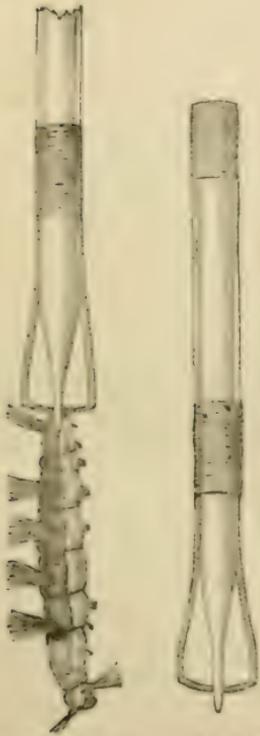


Fig. 2.



Fig. 1. Blowpipe; the left-hand figure having the larva attached. Fig. 2. Shows the mode of preserving. For the loan of these two cuts—which illustrated my notes on the same subject, in 'Science Gossip,' a few years back—I am indebted to the kindness of Messrs. Hardwicke and Bogue, the publishers of that journal.--H. A. A.

A blowpipe is required; but as the instrument, constructed as it generally is, would be unfit for the work, it is necessary to procure some specially made from glass-tubing, the end of which is to be melted and drawn out to a fine point. It is, perhaps, preferable to make them oneself from tubes of

various diameters, so that the largest or most minute larvæ may be operated upon. Two pieces of watch-spring, about three inches long, each having a portion at the tip heated, and then bent at right angles, a quarter of an inch from the end, should be bound round the blowpipe, as shown in fig. 1. A spirit-lamp, tripod stand, and an oven, are also requisite, the latter—represented in the sketch by the glass-bottle, as shown in fig. 2—being easily made from a tin-canister, such as chocolate is generally sold in, by punching out of the lid a hole the size of a florin.

It is almost superfluous to mention that the larvæ should be in good condition, and selected, if possible, shortly after their skins are cast, but not before they have regained their toughness. They should be killed in the cyanide bottle, or with anything not destructive to their colour, and then steeped for an hour or so in a solution of alum to harden the skin. The internal organs are then to be removed by forcing them through the anal aperture with the fore finger and thumb between blotting-paper. The inside being completely removed in this way, the larva should be fastened to the blowpipe in such a manner that the two pieces of watch-spring pressing against the point of the tube may grasp the smallest portion of its last segment. Thus fastened, it can be gently inflated and kept distended whilst drying in the oven, which, in the case of small specimens, will occupy from one and a half to two minutes, according to the heat, which should not be raised very high for those of a delicate colour. It sometimes happens that when inflated the larva does not assume the position required: it bends into a semicircular form, or the head-part curves downwards. To remedy this a simple arrangement of thin wire tied to the blowpipe, as shown in fig. 3, may be made to hold it whilst drying; in fact, by bending the wire it may be held in any position.



Fig. 3.—Fine wire attached to blowpipe to hold larvæ whilst drying.

When removed from the oven dry, the specimens are ready to be mounted on twigs, very fine ones being cut to fit in

between their claspers. If mounted in this way on the food-plant they will possess a very life-like appearance, and form beautiful objects for the collection.

Cossus ligniperda preserves admirably; and the *Bombyces* will be the favourites of all who take to preserving them. The larvæ of the *Sphingidæ*, if of a green colour, are almost sure to fade during the drying process, which for them should be conducted very slowly. Some persons restore the natural colour by the use of pigments; but this is to be deprecated. If there are many which do not retain their natural appearance, there are, on the other hand, many that do; and by practising on these a proficiency may be acquired which will enable the operator to manipulate the others with better chance of success.

HENRY A. AULD.

The Retreat, Blackheath.

Preserving Larvæ of Lepidoptera.—Perhaps the following, taken from the 'Taxidermist's Manual,' may help Mr. E. G. Browne:—"The easiest way of destroying the caterpillars is by immersion in spirits of wine. They may be retained for a long time in this spirit, without destroying their colours. After having killed the caterpillar, as above directed, make a small puncture at the tail, gently press out the contents of the abdomen, and fill the skin with fine dry sand, bringing the animal to its natural circumference. It is then exposed to the air to dry, and will have become quite hard in the course of a few hours; after which the sand may be shaken out at the aperture, and the caterpillar then gummed to a piece of card. Another method is, after the entrails are squeezed out, to insert into the aperture a glass tube, drawn to a very fine point. The operator must blow through this pipe while he keeps turning the skin slowly round over a charcoal fire; the skin soon becomes hardened, and, after being anointed with oil of spike and resin, it may be placed in the cabinet when dry. A small straw or pipe of grass may be substituted for the glass pipe. Some persons inject them with coloured wax after they are dried."—*R. Laddiman; Norwich, March 18, 1876.*

[I have often tried the plan of killing larvæ in spirits of

wine, recommended by Mr. Laddiman on the faith of the 'Taxidermist's Manual,' and actually procured a gross of small phials of very clear glass, intending to keep one larva in each; but long before the one hundred and forty-fourth phial was loaded, those at the beginning of the series had become as black as ink, which seemed so objectionable that I abandoned the attempt, and threw away the specimens. I have since received skins filled with fine dry sand, which continued to escape; I suppose through the aperture by which it was introduced. The drawers in which such preserved larvæ were deposited presented the appearance of being infested with mites, and constantly evoked the exclamation:—"I see you have mites here; you must look after them in time!" The coloured wax I have never tried.—*Edward Newman.*]

Notes on the Yucca Borer (Megathymus Yuccæ, Walk.).

By CHAS. V. RILEY, M.A., Ph.D.*

[THE Castnians have always been a favourite group with me, and I have felt a disposition to place them with those familiar Lepidoptera, of which Xyleutes Cossus is an expressive example, and which we all seem to recognise by the name of "internal feeders." It is a group marvellously heterogeneous in its adult state, and marvellously homogeneous in the larval state. I recollect well the cachinnation I provoked, when in 1832 I proposed they should be associated: it was thought a climax of absurdity to place Xyleutes Cossus and *Egenia Tipuliformis* in the same category. Mr. Riley's most interesting paper gives me some confidence that the idea is not so far-fetched; and I hope hereafter, if I should live, to include other and unlooked-for Xylophagans, even among the Micro-Lepidoptera. But I will quote Mr. Riley.—*Edward Newman.*]

The study of aberrant forms in Nature is always interesting. They are continually confronting the naturalist. They baffle the systematist, and constantly remind him of the necessarily arbitrary nature of his classificatory divisions. Few divisions seem more natural, at first glance, than that of

* From a Paper read before the Academy of Science of St. Louis, U.S.: communicated by the Author.

the Lepidoptera into Rhopalocera (butterflies, or day-flyers) and Heterocera (moths, or night-flyers). It was no sooner proposed by Boisduval than it was recognised as a most convenient arrangement, and adopted very generally. The antennæ in this order are always conspicuous, and their clubbed or non-clubbed tips are easy of observation, and associated with other important characteristics which separate the two groups. The Sphingidæ, however, by their crepuscular habit, and their antennæ thickening towards the end, though terminating abruptly in a point, bring the two groups in close relationship, and diminish their value; while the Castniidæ, on the one hand, and the Hesperidæ, on the other, so intimately connect them, that it becomes almost a matter of opinion as to whether the former should be considered butterflies, or the latter moths. *Urania* and other abnormal genera make the relationship of the two groups still more perplexing. On antennal structure alone—whether we consider the clubbed or non-clubbed tips according to Boisduval, or the rigidity, direction, and length, which Mr. Grote deems of greater importance—two primary divisions cannot be based. If we take the spring or spine on the hind wings, which is so characteristic of the Heterocera, we meet with the same difficulty, for a large number of moths do not possess it, while an accepted Hesperian (*Euschemon Rafflesiæ*, *Macl.*), from New South Wales, is furnished with it. Nor is there any one set of characters which will serve as an infallible guide to distinguish moths from butterflies; and the number of moths described as butterflies, and the fact that Kirby considers the position of *Barbicornis*, *Threnodes*, *Pseudopontia*, *Rhipheus*, *Egiale*, and *Euschemon*, included in his ‘Synonymic Catalogue of Diurnal Lepidoptera’ as doubtful butterflies, gives sufficient proof of the truth of the statement. Between all classificatory divisions, from variety to kingdom, the separating lines we draw get more and more broken in proportion as our knowledge of forms, past and present, increases. Every step in advance towards a true conception of the relations of animals brings the different groups closer together, until at last we perceive an almost continuous chain. Even the older naturalists had an appreciation of this fact. Linnæus’s noted dictum, “*Natura saltus non facit*,” implies it; and Kirby and Spence justly observe that “It appears to be the opinion of most modern physiologists

that the series of affinities in nature is a concatenation or continuous series; and that though an hiatus is here and there observable, this has been caused either by the annihilation of some original group or species or that the objects required to fill it up are still in existence, but have not yet been discovered." Modern naturalists find in this more or less gradual blending their strongest argument in favour of community of descent; and speculation as to the origin, or outcome rather, in the near present or remote past, of existing forms, is naturally and very generally indulged, even by those who a few years back were more inclined to ridicule than accept Darwinian doctrine. Shall we then say that the old divisions must be discarded because not absolute? As well might we argue for the abolition of the four seasons because they differ with the latitude, or because they gradually blend into each other. Entomologists will always speak of moths and butterflies, howsoever arbitrary the groups may come to be looked upon, or however numerous the intermediate gradations. These thoughts naturally present themselves in considering so osculant a species as the *Yucca* borer.

The entomological reader is aware that the queenly *Yuccas* cradle and nourish a very curious and anomalous Lepidopteron—the *Pronuba yuccasella*. The genus is further interesting, from the entomological side, as giving us the insect under consideration. In the home of the *Yuccas*, and more particularly in the home of the caulescent species, like *Y. aloifolia* and *Y. gloriosa*, persons who have occasion to dig up the roots, or subterranean trunks, often notice that these are bored and hollowed out along the axis, the burrow cylindrical, and lined at its upper end with silk, which is generally intermixed with a white, glistening, soapy powder. These tunnellings are made by our *Yucca* borer, which dwells therein; and their presence may generally be detected by masses of excrement observable amongst the leaves, and by certain chimney-like projections made by the twisting and webbing together of the more tender heart-leaves, or even of the flower-stalk, after they have been partly devoured, into a sort of funnel, from which the excrement is expelled. The tunnellings weaken the trunk and induce rot, so that the plant is not unfrequently prostrated thereby; and as the

insect is sufficiently common in the Gulf States to sometimes be found in every third plant over extended regions, its work renders the Yucca worthless as a hedge-plant, for which it has been tried.

In the months of April and May, in South Carolina, but earlier in more southern latitudes, the parent *Megathymus* may be observed, where the Yuccas abound, passing, with very rapid, darting flight, from plant to plant, remaining but a few seconds at one place, during which she fastens an egg to some portion of a leaf. She is generally seen at this work in the morning hours. The eggs, which are well developed when she issues from the pupa, are laid singly, though several are often attached to the same leaf, generally near its tip, and on the upper or under side indifferently. In the course of about ten days the young reddish brown larva gnaws its way out through the crown of the egg, and conceals itself in a web between some of the more tender terminal leaves. Generally it will be found at first near the tip of a leaf, where the sides naturally roll up and afford a safe retreat. It then gradually works to the base, feeding the while, and rolling and shrivelling the blade as it descends. Other blades are often joined; and, in fact, the insect lives among the blades till it is about one-fourth grown, and seldom enters the trunk before that time. How soon, in the larval development, the white, powdery secretion, already spoken of, appears, or how many larval moults occur, has not been ascertained; but the more mature larva is always more or less covered with this powdery matter, which doubtless serves as a protection from the mucilaginous liquid which the tissues of the Yuccas contain and freely exude upon interference or maceration. Pupation does not take place till the subsequent late winter or spring; there being, from all that I can ascertain, but one brood each year. The burrow often extends two or more feet below ground, and during the coldest weather the larva probably remains in a partially dormant state at the bottom. Occasionally two larvæ inhabit the same trunk; in which case their tunnellings are kept separate, side by side. The pupa state is generally assumed just below the chimney-like funnel at the top of the burrow, and no other preparation is made for it than partial closing, near head and tail, to insure suspension. This

funnel is, in reality, built and extended by the larva; and what little matter besides silk goes to make its exterior has been added and worked in from the outside. In the several larvæ that I have had feeding in breeding-cages, this habit of building up and making tubes, for which remnants of leaves and other extraneous substances are pressed into use, struck me as quite characteristic; and in one instance I have had such a tube extended over nine inches from the tunnelled trunk, the moss on which the section of *Yucca* rested being used in its construction.

In the issuing of the imago the pupa skin is rent on the middle of the notum and across the eyes, and the casings of the legs are never, and those of the antennæ seldom, severed from their solderings in the exuvium. The imago rests with its antennæ slightly diverging and generally directed forwards, with the wings elevated, closely appressed, and with the costa of primaries at an angle of about 45° from the body. Regarding the flight, which is diurnal, Dr. J. H. Mellichamp, of Bluffton, S.C., was impressed with the extremely rapid and darting motions of the insect as it passes from plant to plant; and Mr. E. A. Schwarz, of Detroit, who has had very excellent opportunity of observing the species in Volusia Co., Florida, informs me that, when startled, *Megathymus* flies directly upward twenty or thirty feet, then horizontally for a long stretch,—sometimes out of sight,—and descends as directly as it rose. It frequents open places, is very shy, and generally settles near the ground.

(To be continued.)

Entomological Notes, Captures, &c.

On the Immense Flight of Terias Lisa in the Bermudas (Entom. ix. p. 54).—The majority of the readers of the 'Entomologist' will, I am sure, have felt great interest in the valuable paper, by Mr. J. M. Jones, on the extraordinary flight of *Terias Lisa* to the Bermudas. As I take especial interest in the migration of butterflies, as well as birds, and being ignorant of the geographical range of that species, beyond that given by Mr. S. H. Scudder in a footnote at p. 57, I should feel greatly obliged to my friend Mr. Jones if he could kindly answer the following questions:—(1) In

what proportion of sexes did the butterflies arrive? (2) Was the species previously indigenous to the Bermudas; and, if not, does the food-plant of the larvæ occur on the islands? (3) Were the females observed to deposit any eggs? (4) Would the insect in the latitude of the Bermudas hibernate; and, if so, at what stage of its existence? Now, as a natural consequence, if *Terias Lisa* is not indigenous to the Bermudas, and its food-plant does not occur there, this vast flight of butterflies must have perished without providing for the continuance of the species. Darwinian as I am,—thoroughly believing in the evolution of species,—I cannot credit any of these interesting phenomena to “chance.” There must be a design in this occasional and often periodical migration of species, which, in regard of insects, must necessarily be, as a rule, only partial, after the manner described by Mr. Bates, as occurring in the Amazon region, and by Mr. Holdsworth, in Ceylon. There can be no doubt, I think, that many of our so-called species originate first by separations, as above alluded to, and then by the breeding *inter se* of these forced insular forms.—*Henry Reeks; Thruxton, March 8, 1876.*

Varieties caused by the Starving of Larvæ.—Mr. H. Ramsay Cox gives the following passage (*Entom.* ix. p. 58), as to the effect produced upon *Vanessa Urticæ* in the imago state by starving the larvæ:—“The *Urticæ*, in spite of their starving, came out nearly the natural size.” I beg to say that I once experienced a somewhat similar effect produced in the imagos of *Vanessa Urticæ*; and a query, as to which, appeared in the ‘*Entomologist*’ (vol. v. p. 371). My experience, however, was somewhat different from that of Mr. Cox, inasmuch as my specimens were very much smaller than the usual size, the largest measuring one inch and three-quarters, the smallest only one inch and five-sixteenths, respectively, from tip to tip of fore wings. At the time I had no idea of the probable cause; but from a paragraph in Newman’s ‘*British Butterflies*’ (p. 54), being an extract from the ‘*Entomologist*’ (vol. ii. p. 132), by Mr. J. R. S. Clifford, and remembering that my larvæ, like those of Mr. Cox, had been left with a short supply of food, I believe the cause of the small size of the imagos was attributable to the deficiency of food whilst in the larva state. My experience, as to the

wings of the perfect insects being in no way shrivelled, corresponds with that of Mr. Clifford.—*George W. Oldfield*; 25, *Margaret Street, Cavendish Square, March 1, 1876.*

Description of the Larva of Ebulea crocealis.—On the 14th of June last I received a few larvæ of this species from Mr. J. H. Threlfall, of Preston, who had collected them at Grange; and on the following day a further supply from Mr. W. H. Grigg, of Bristol. The full-grown larva is about half an inch in length, and stout in proportion; head globular, the same width as the 2nd segment; body cylindrical, slightly attenuated at the extremities; segmental divisions deeply cut; tubercles raised, each emitting a fine hair; a distinct polished plate behind the head. The ground colour is a very pale semi-translucent glaucous-green; the head, and plate on 2nd segment, intensely black and shining; a dark green pulsating vessel forms the medio-dorsal line, this line dividing even the plate on 2nd segment; the sub-dorsal lines are waved, of the same colour, but finer and less distinct; there are no perceptible spiracular lines; tubercles and spiracles black; hairs brownish. The ventral surface uniformly very pale, transparent glaucous-green. Feeds on *Inula dysenterica*, and when full-grown draws the edges of the leaves together, and in the cavity thus formed changes to pupa. The pupa is rather elongated, smooth, and shining; colour a deep rich brown; the abdominal divisions yellowish brown. The imagos began to appear on June 30th.—*Geo. T. Porritt*; *Huddersfield, March 3, 1876.*

Early Hatching of Crocallis elinguaris.—In the early part of last August I took a female of *Crocallis elinguaris* at Bishop's Wood, Highgate, which laid me a batch of eggs on the side of a chip-box. At the time I took the moth it was settled on a tuft of grass in the hedge, and had the appearance of being just out, so that I concluded the eggs would be useless; but upon looking at them this afternoon I found two small larvæ out, and the other eggs show signs of approaching fertility. On referring to Newman's 'British Moths,' I find that the larva lives throughout the winter. Is not this an uncommon occurrence?—*E. Holton*; 56, *Acton Street, Gray's Inn Road, March 4, 1876.*

[There are many instances of recorded deviation from the rule of hibernation in caterpillars.—*Edward Newman.*]

The Mole's Flea: a Discovery for Leap Year.—A rare prescience, analogous to that which led Adams and Leverrier to announce the existence of a ninth planet long before our best instruments had brought it within the range of human vision, induced some of our leading entomologists to name an insect as the Mole's Flea, just half a century before that saltant hexapod vouchsafed to present himself to the expectant eye of science. Mr. Fitch, whose researches on galls and gall-insects have rendered him the *facilis princeps* of the Cecidology of this country, has discovered that the mole is thickly infested with a minute flea peculiar to itself. He writes to me thus, in reply to my request that he will give me some details of the capture:—"I do not think any 'details of capture' can be needed for the mole's flea, as I believe the difficulty would be to find a mole on which these fleas were not abundant. Last spring I caught from thirty to forty moles, and I do not think there was one of them on which I did not notice these fleas. Several of these moles were dead, though perhaps not stiff, when taken out of the ground, yet their fur contained the fleas; so I do not think they leave the animal so soon as is the case with some others, which I have observed to take their departure immediately after the death of the animal on which they were living. In killing hedgehogs, not always an easy task, I have seen the ground completely covered with fleas immediately afterwards: in one case, which I recollect more especially, the operation took place on a white door-step. I remember, last year, on catching a field-mouse, directly I had put an end to its existence by squeezing its throat, the fleas made their exit over my hand. If you recollect, I told you these fleas were blind; and I believe this fact is well known to microscopists." I see by a list of microscopic objects, obligingly lent me by Mr. Fitch, that a "mole's flea without eyes" is advertised for sale; the price is one shilling and upwards for these and other parasites in the same catalogue. Mr. Fitch has supplied me most liberally with specimens of this flea, and I have forwarded a series of them to my friend Dr. Bowerbank, who has immortalised himself by revealing the secrets of the insect-world and of sponges. Dr. Bowerbank writes as follows:—"I have carefully examined the mole's fleas with a power of 200 linear, viewing them in every possible position,

but I cannot detect an eye in any of them. They have beautiful, short, clubbed antennæ, and are altogether very interesting little fellows." I see no alternative, therefore, but to conclude that the mole's flea is perfectly without eyes; and one sees at once that there is small need of the power of vision in an insect that is never destined to see the light of day except through the intervention of the mole-catcher. To a *non-entomologist* it must appear strange that the name of "mole's flea" and "*Pulex Talpæ*" should have been applied to a flea never found on the mole; but entomologists will know that this is in strict accordance with the time-honoured custom in the science, for an entomologist will frequently name an insect after any plant, rather than that on which it feeds. Therefore the name of "mole's flea," having been given by Samouelle, and endorsed by Curtis, Dugés, Westwood, and Walker, must be retained, however inappropriate for the usurper, and a new name must be invented for this real inhabitant of mole-skin. Having virtually declined the practice of insect-naming and description-writing for thirty-six years, I shall not now resume it; so leave the christening of this little stranger to those who covet, and claim, and not unfrequently do battle for, such barren honours.—*Edward Newman.*

Bugs Introduced into Africa by the Arabs.—Inside, the dwellings of the natives are clean and comfortable; and before the Arabs came bugs were unknown. As I have before observed, one may know where these people have come from, by the presence or absence of these nasty vermin.—'*Livingstone's Last Journals,*' vol. ii. p. 33.

Insect Fauna of St. Helena.—The following brief extract is part of a letter from Mr. Waller to Dr. Hooker, and is reprinted from '*Nature*' for February 3rd:—"The insect flora[?], although so extremely limited that I have not in nearly even three months collected more in Coleoptera than one hundred and fifty species, still continues to keep up its character for eccentricity—ringing the changes on some half a dozen types (chiefly Rhyncophorous) to a marvellous extent. We seem, indeed, never to exhaust them, turning up new species almost every time that we can secure a hard day's work on the *Compositæ* ridge. Having ultimately to work them out, I take scores of specimens, and must have mounted carefully some six or seven thousand already."

Answers to Correspondents.

Windpipes of Insects: Organs of the Senses in Insects.—I have read your article about the windpipes of insects (Entom. ix. 62) with much pleasure, and I think you are doing good service in thus enlightening our entomological friends, so few of them trouble themselves about such matters, although they are most interesting subjects for study. Species hunting is all very well; but to my mind the wonderful variations and adaptations of their organs to their especial purposes is by far the more interesting subject of study. Who knows anything about their organs of smell? I have long had some crude ideas on that subject, and I shall hope to discuss that subject with you some of these days.—*J. S. Bowerbank; 2, East Ascent, St. Leonard's-on-Sea.*

[Certainly not sent for publication; but I hope Dr. Bowerbank will pardon the breach of confidence I commit in publishing it. It is lamentable to reflect that we have absolutely no knowledge of the seat of hearing, taste, or smell, in any of the hexapods; indeed, if we have not stood *absolutely still* since the publication of the 'Bybel den Natuura' in 1783, we may be said to have retrograded. I make no apology to entomologists for my exultation in having found an approver of my views. This exultation is surely allowable, when we hear the pæans with which the naming of a new beetle is hailed.—*Edward Newman.*]

Circulation of Blood in Insects.—In the last number of the 'Entomologist' (Entom. ix. 90) it is stated that Dr. Bowerbank discovered circulation in insects. In a magazine, named 'Ward's Miscellany,' of 1838, it says that a German naturalist, Behn, discovered it. I should be obliged if you will kindly tell me on which side is the error.—*Alfred Jones; Torquay, March 14, 1876.*

[I may refer to this subject again hereafter. It will be sufficient for the present to state that I have ascertained the titles and dates of these papers on "Circulation of Blood in Insects." 1. Dr. Bowerbank's papers are as under:—"Observations on the Circulation of the Blood in Insects."—'*Entomological Magazine*,' vol. i. pp. 239—244, April, 1833. "Observations on the Circulation of Blood and the Distribution of the Tracheæ in the Wings of *Chrysops Perla*."—'*Entomological Magazine*,' vol. iv. pp. 179—185, October, 1836.

2. M. Behm's papers are as follows:—"Discovery of a Circulation in the Legs of Hemiptera, dependent on the motions of the Dorsal Vessel."—*Müller's Archiv.*, 1835, pp. 554—62. "On the Structure of the Blood Vessels."—*Deutsch. Nat. Bericht.*, 1844, p. 113. I think this will be considered as giving Dr. Bowerbank a decided priority.—*Edward Newman.*]

Lampides bætica.—How many times has *Lampides bætica* been captured in England?—*E. F. Johns; Winton House, Winchester, March 16, 1876.*

[Three: two specimens are said to have been taken by Mr. M'Arthur; the first on the 4th of August, 1859, and the second the day following; the third specimen was taken by Mr. Latimer, near Christchurch, in Hampshire, also on the 4th of August, 1859. (See 'British Butterflies,' p. 119.) No subsequent record has been published. There is something suggestive of my "blown-over" theory in this accordance of date.—*Edward Newman.*]

Inquiry respecting Asthenia pygmæana.—I have lately taken a specimen of a Tortrix unknown to me, and which agrees in every respect with *Asthenia pygmæana* in Stainton's 'Manual.' Have there been any late occurrences of this insect? as I find it nowhere mentioned in the 'Entomologist' or elsewhere. I was surprised to see it turn up, and I think I must have mistaken it for some other insect. Could you oblige me with any information on the subject? I have never observed a specimen like the above-mentioned before. As there are so few Tortrices occurring this month I think I could hardly have mistaken it.—*W. Thomas; Surbiton Villa, Surbiton, March 7, 1876.*

[I am unable to assist Mr. Thomas in this inquiry. I am unacquainted with the species *Pygmæana*, and I have not seen Mr. Thomas's specimen. This insect is the *Subsequana* of Haworth, of whose description Mr. Stainton's appears to be a translation. A description in German will be found at p. 281 of Herrich-Schæffer's splendid work, but no figure, it having been previously figured by Hübner, No. 69. In such a case I would recommend Mr. Thomas to take the insect to Mr. Weir, Mr. Machin, or Mr. Eedle, either of whom would probably be able to give the required information at a glance.—*Edward Newman.*]

Larvæ in Reeds.—Could you kindly tell me what the

enclosed larvæ are? They are abundant in the reeds here.—[*Rev.*] *A. C. Hervey*; *Beaulieu*, March 17, 1876.

[The specimens of reeds sent contain each the larva of a parasite, which still requires further examination.—*Edward Newman*]

Black Spots on Insect Cabinets.—Can you tell me the cause of black spots arising in the drawers of a mahogany insect cabinet, lined as usual with cork? Some of my drawers are covered with the most unsightly black spots and blotches of all sizes. I find the cork beneath the paper where these marks occur of a blackish colour; but why it should be so I am at a loss to know. At first I thought that washing the paper in places with bichloride of mercury, or the accidental dropping of the oil of aniseed, thyme, and spirits of wine, with which I occasionally soak my insects, might have caused this discoloration; but places in some of the drawers where I know neither of these liquids have fallen, accidentally or otherwise, are just as bad. I find neither painting them over with white paint, nor chalking them carefully, are of any use permanently, as the black substance, whatever it is, asserts its supremacy in the course of a short time, in most instances. Can you suggest a remedy? I have had the cabinet many years (probably ten); and it is only within the last year or two these disgusting disfigurements have appeared. They seem, too, to be increasing. The cabinet is mahogany throughout; there is no deal in it anywhere.—*J. H. White*; *Hemingford Grey*, *St. Ives*, *Hunts*, March 8, 1876.

[I have never observed anything of the kind, and can hardly give an opinion. Perhaps some of my correspondents have had similar experience, and will say what remedy was found effective.—*Edward Newman*.]

Mosquitoes in Ireland.—On the 26th of January I was bitten by an insect, exactly resembling a mosquito, in the evening by lamp-light, in the residence of a friend in the centre of the county Wexford. I was first attracted by the buzz, with which I have had unpleasant associations both in Australia and America. After allowing it to bite me on both hands, I killed it. The marks of the bites still remain. Have mosquitoes often been observed in Ireland?—*Alfred Webb*; 74, *Middle Abbey Street*, *Dublin*, February 8, 1876.

[*Culex pipiens*, the common gnat, is the only so-called

mosquito of England and Ireland. It is abundant in both countries.—*Edward Newman.*]

W. Thomas; Surbiton.—I am obliged for the notice, but prefer not recording escapes; moreover, the insect in question would scarcely be recognisable on a gas-lamp.—*E. Newman.*

Geo. R. Dawson; Driffield.—The hind wings of the female are darkest. This is almost invariably the case in the Noctuidæ, when the sexes differ.—*Id.*

E. F. C.—The food of larva of *Bombyx Pernyi* is unknown to me. In confinement it will eat oak; but the species ought not to be in the larva state at this time of year.—*Edward Newman.*

Augustus Priest.—Many thanks; but I have repeatedly declined mere lists of names. If accompanied by any particulars that could possibly interest other subscribers, or any information respecting the habits, food, &c., of the insects named, such lists would be acceptable.—*Edward Newman.*

Extract from the Proceedings of the Linnean Society of London.

FEBRUARY 17, 1876.

J. Gwyn Jeffreys, F.R.S., Vice-President, in the chair.

Ants.—"Additional Observations on Ants," by Sir John Lubbock, Bart. In this paper Sir John communicated some further experiments in continuation of those contained in his last memoir. As regards the cases in which when an ant has found a store of food, other ants make their way to it, he commenced by referring to some of his recent observations. To the edge of a board communicating with the nest he fastened three parallel strips of paper about a foot long (G, H, and I). One of these (G) led to a shallow glass tray containing a number of larvæ. The object of this was to ascertain how many ants would find the larvæ for themselves under such circumstances, and, as a matter of fact, none did so. On the middle strip (H), near the centre, and at right angles with it, he placed two strips of paper two inches long, one (K) leading to another shallow tray (F) containing larvæ, while the other (L) rested on the third strip of paper (I). He then took an ant (F. nigra), marked her, and put her on the tray (F). She immediately took a larva, and went away to the nest along the strip of paper (H). Now, it is obvious that

by always causing the marked ant to cross from the strip of paper (Π) to the larvæ over a particular bridge of paper (κ), and if, whenever a stranger came, the paper bridges (κ and L) were reversed, it would be shown whether the other ants who came to the larvæ had had the direction and position explained to them. In such a case they would go right, notwithstanding the interchange of the paper bridges; but if they found their way by tracking the footsteps of the first ant, they would pass over the paper bridge (κ), and thus be led away from the larvæ to the strip of paper (I). The result was that out of seventy-nine strange ants, which came up to the point at which the paper bridges diverged, twenty-four went straight along the strip of paper, eleven took the right bridge to the larvæ, while forty-four were misled, and went over the paper bridge (κ) away from the larvæ to the strip of paper (I). He then slightly altered the arrangement, transfixing one end of the two paper bridges by a pin, and so fastening them by one end to the strip of paper (Π), the other ends free, that each of them could be turned either to the larvæ or to an empty glass tray. When the marked ant came he turned one paper bridge (κ) to the larvæ, the other (L) to the empty tray; while whenever any other ant came he turned the bridges, so that κ led to the empty tray, and L to the larvæ. Under these circumstances, seventeen ants which came along the strip of paper (Π), without a single exception, went over the bridge (κ) to the empty tray. He then varied the experiment by leaving the paper bridge (κ) loose, as at first; but instead of having a separate bridge (L) he cut the strip of paper (Π) into two pieces (Π' and Π''); then, when a strange ant was coming, he rubbed his finger two or three times over the bridge (κ), so as to remove—or, at least, confuse—the scent. As soon as the ant had passed over the first part (Π') of the strip of paper (Π), and had arrived on the part (Π''), he took up the piece (Π') and placed it where the paper bridge (L) had been in the previous experiments, *i. e.*, so as to connect the end of Π with the empty glass tray. By this arrangement the bridge κ was left in its place, and, on the other hand, there was a bridge which the marked ant had crossed and re-crossed as often as κ , but which led away from the larvæ. Under these circumstances, out of forty-one ants which found their way to the end of the strip (Π), and within two inches of the larvæ, fourteen only passed over the bridge (κ) to the larvæ,

while twenty-seven went over (H') to the empty tray. Taking these observations altogether, out of one hundred and fifty ants which came to the end of the strip of paper (H), and thus within two inches of the larvæ, only twenty-one took then the right turn, and arrived at their destination. These experiments, therefore, certainly seem to show that when ants flock to a treasure of food, which one of them has discovered, they either accompany one another or else track it out by scent. The fact, therefore, is by no means an evidence of any high intelligence, or any complex system of communication, but is merely an instance of instinct, little higher than that which is found in other social animals. On the other hand, that some higher power of communication does exist, seems, however, to be obvious from some of the facts recorded in Sir John's previous paper. In the latter part of his present paper the author narrated a variety of experiments on the senses of ants, and on their power of recognising friends. A lively discussion followed the reading of the paper.—'Nature,' March 2, 1876.

The Doubleday Collection of British Lepidoptera.—The terms proposed by the Trustees of the Doubleday Collection, and agreed to by the Directors of the South Kensington Museum, are—(1) That the Collection shall be lent for a period of five years, after which the Trustees shall have the right of resuming possession of it. (2) That it shall be kept separate and undivided, and called the "Doubleday Collection." (3) That it shall be open to the public at all reasonable times, under the care of the attendant; and that due care shall be taken for the protection and preservation of the specimens. (4) That as soon as possible after it has been deposited in the Museum, a Catalogue, specifying the number of each species, &c., shall be made, a copy of which Catalogue shall be furnished to the Trustees. The Bethnal Green Museum is a branch of the South Kensington. The Collection has been safely deposited at the Bethnal Green Museum for about a month. It is at present in one of the lower rooms, near Lane Fox's collection; but, so soon as arrangements have been made for the proper exhibition of the insects, it will be brought up. It has been inspected by several entomologists during the month.—*Edward Newman; 7, York Grove, Peckham, March 18, 1876.*

THE ENTOMOLOGIST.

No. 155.]

MAY, MDCCCLXXVI.

[PRICE 6d.

On the British Species of Sphekodes. By EDWARD NEWMAN.



1. SPHEKODES GIBBA, male. 2. Ditto, female. 3. S. SPHEKOIDES, male.
4. Ditto, female (Mr. Smith now places these as synonymous with
S. gibba). 5. S. SUBQUADRATA, female (the head of the male is of the same
subquadrate form).

SPHEKODES is a genus of small bees, whose life-history is at present extremely obscure. Authors are by no means unanimous as to the leading question, whether the species are constructors or parasites, who labour not themselves, but avail themselves exclusively of the labours of others. St. Fargeau believed them parasitic on the genus *Halictus*, but Kirby says they burrow in the ground for purposes of nidification. To Mr. Smith we are indebted for an excellent monograph of the species, published in the 'Zoologist'

(Zool., vol. iii., p. 1012), so long ago as the year 1845. In this the following observations occur on the question of parasitism; they will bear repeating after the lapse of thirty years:—"Most authors who have described or alluded to this genus since the publication of Kirby's 'Monographia' have described these bees as parasitic insects; but I am not aware that anyone has proved them to be so. This supposition I believe to be founded on their wanting the polliniferous organs, combined with a habit they have of entering holes or burrows in banks, as if in search of the nest of some bee, wherein to deposit their eggs. This, however, is but slight evidence. There is, perhaps, no insect which has the habit of entering the burrows of other species more constantly than *Trypoxylon Figulus*,—an insect which I have ascertained to be no parasite, since it furnishes its nest with spiders; still I have observed it burrowing. Again, *Ceratina* is destitute of polliniferous organs; but this insect has been proved by Mr. Thwaites to construct its own nidus. Réaumur has described *Sphexodes* as excavating its burrows in the bare sections of banks to the depth of nine or ten inches, in which to deposit its eggs, together with a supply of pollen and honey. Mr. Kirby appears to have entertained the same view; and my own observation leads me to a similar conclusion. On several occasions I have seen these bees busily engaged in burrowing; and last summer I watched one thus employed for a considerable length of time. All that I have seen engaged in this way selected a spot either in the midst of a colony of *Haliecti* or *Andrenæ*. I think it, however, very probable that they frequently make use of a ready-formed burrow, and that they furnish a supply of liquid honey in the manner of *Colletes* or *Ceratina*. I am thus led to dissent from the generally-received opinion of their being parasitic, and shall endeavour, by future observation, to place their true habits beyond a doubt. Walckenaer, Serville, and St. Fargeau, agree in considering *Sphexodes* to be parasitic on *Haliecti*. My own observation has shown me that they are as frequently to be found in company with colonies of *Andrenæ*; and, if parasitic, it will eventually be found that they are by no means confined to the genus *Haliectus*."—'Zoologist,' p. 1011 (1845).

Ten years later Mr. Smith, in his 'Catalogue of British Bees,' seems to remain of this opinion, for he says—

“The bees which are included in this genus have hitherto been regarded as parasitic on those comprised in the genus *Halictus*; and, indeed, many circumstances tend to support such a supposition. They are usually found burrowing, not only in similar situations, but forming mixed colonies. The females of both genera appear some time before the males, and in fact their economy is alike. St. Fargeau places them amongst his division of parasites, immediately following his exotic genus *Rathymus*, with which they have not the slightest affinity, their only resemblance being in the distribution of colours—black and red. The result of my observation leads to the conclusion that no species of the *Andrenida* is parasitic. The only apparent support of the theory of their parasitism is the absence of the usual polliniferous organs. Such, however, is also the case in *Prosopis*, *Ceratina*, &c. In the year 1849 I discovered a mixed colony of *Halictus abdominalis*, *Andrena nigro-ænea*, *Halictus Morio*, *Sphekodes subquadratus*, and *S. Geoffroyellus*: this being at a short distance from my house I had an opportunity of frequently observing their economy. My visits to the colony were frequent, and I made close observation on the proceedings of the bees; yet, notwithstanding, I could not in a single instance detect the *Sphekodes* entering the burrows of *Halictus*. Those into which the former bee entered were of a smaller diameter than those of *Halictus*; in fact, intermediate in size between the burrows of *H. abdominalis* and *H. Morio*—too small to have admitted the female of *H. abdominalis*. These proceedings were observed on several occasions. No males of any of the bees were to be seen at this time, those of *Andrena* having disappeared some time, and those of the *Halicti* not being developed. On visiting the colony one cloudy morning I was much delighted to observe the head of one of the species of bees at the mouth of most of the burrows,—the female *Halicti* at their own burrows, and *Sphekodes* also at *their own*. The result of my observations of this colony led me to believe, still more firmly, that *Sphekodes* is not a parasite. Since the time when the above observations were made, I have on several occasions detected *Sphekodes* busily engaged in forming her burrow; a fact which I consider conclusive of the correctness of the opinions above stated.”—*Catalogue of Bees*, p. 15.

In 1866 the late Mr. Shuckard, author of 'Essay on the Indigenous Fossorial Hymenoptera,'—a volume of great research,—issued a philosophical, but somewhat incomplete, work, intitled 'British Bees: an Introduction to the Study of the Natural History and Economy of the Bees Indigenous to the British Isles.' I say "incomplete," inasmuch as the species are not systematically described, and the "natural history" of the bees we find under the "general observations" which are appended to the "general character" at the head of each genus. This plan has the advantage of admitting a discursiveness of style, which might be out of place in a more scientific and systematic work; but at the same time it allows a vagueness altogether at variance with the precision of true science. As an instance of this vagueness, the author says that "All the facts recorded, without reference to authorities, are the result either of personal observation or of diligent study, which, from the length of time that has intervened, have become so blended in my mind that I can no longer separate their sources." So that the author both assumes the liberty of *appropriating* the researches of others without acknowledgment, and of *repudiating* passages which may hereafter be pointed out as erroneous, on the plea that they are, in all probability, copied from others. This seems hardly fair to those who have laboured long and assiduously in the same field. Thus the principle of *suum cuique* is altogether ignored. Hence we scarcely know for what portion of the following remarks we are to give Mr. Shuckard the credit of originality:—

"They are not uncommon insects; and I have found them abundant in sandy spots sporting in the sunshine on the bare ground, where they run about with great activity; the females chiefly, the males the while disporting themselves on any flowers that may be adjacent; and they are especially fond of ragwort. Their prevalent colours are black and red, the latter occurring only on the abdomen in different degrees of intensity and extension, and sometimes limited to a band across it. Much difficulty attaches to the determination of the species, from the characters which separate them being exceedingly obscure, for it is not safe to depend on the differences in the arrangement of colour upon them, as it varies infinitely; nor can their relative sizes be depended

upon as a clew, for in individuals which must be admitted to be of the same species, size takes a wider extent of difference than in almost any of the genera of bees. St. Fargeau, who maintains the parasitism of the genus, accounts for it by saying that in depositing their eggs in the nests of the *Andrenæ*, *Halicti*, and *Dasypoda*, the *Sphekodes* resorts to the burrows of the species of these genera, indifferent to their adaptation to its own size; and thus, from the abundance or paucity of food so furnished to its larvæ, does it become a large or a small individual. Westwood says they are parasitic upon *Halictus*. Latreille says they are parasites. They are certainly just as destitute of the polliniferous apparatus as the preceding genus. Mr. Thwaites once thought he had detected a good specific character in the differing lengths of the joints of the antennæ, but I believe he never thoroughly satisfied himself of its being practically available. At all events, great difficulty still attaches to their rigid and satisfactory determination. There is an array of entomologists who deny their being parasites. Mr. Kirby says they form their burrows in bare sections of sand-banks, exposed to the sun, and nine or ten inches deep, and which they smooth with their tongues. But then, in impeachment of the accuracy of his observation, he further supposes there are three sexes, founding his statement upon what Réaumur remarks of having observed pupæ of three different sizes in the burrows. In the first place, it is not conclusive that these pupæ were those of *Sphekodes*; and secondly, we know that this condition of three sexes is found only in the social tribes, wherein the peculiarity of the economy exacts a division of offices. Therefore his adoption of this inaccuracy militates against the reception of his other statement. But Smith also states that they are not parasites, and apparently founds his assertion upon direct observation. It still, however, remains a debatable point, from the fact of the destitution of the polliniferous brushes, and thence the character of the food necessary to be stored for the larvæ. It would be very satisfactory if these apparent inconsistencies could be lucidly explained. If, however, it be ultimately proved that *Sphekodes* is a constructive bee, as well as *Prosopis*, we have still this fact exhibited by our native genera, that none of the sub-family of short-tonged bees or *Andrenidæ* are parasitical. This is a

remarkable peculiarity, as it is amongst them that we should almost exclusively expect to find that distinguishing economy, from the seemingly imperfect apparatus furnished in the short structure of their tongues. It is possible, however, that Nature has so moulded them as to fit them chiefly for fulfilling its objects within merely a certain range of the floral reign, and which restricts them to visiting flowers which do not require the protrusion of a long organ to rifle their sweet stores."—'British Bees,' p. 197.

It will be seen, therefore, that the economy of these bees was unknown, or rather very imperfectly known, to those who have been the most assiduous in their researches into bee life-history. The insects themselves—that is, their personal appearance—are familiar to all who have spent pleasant hours in the capture of wild bees. English species are very uniform in colour and general appearance; but those of the same species vary greatly in size. The species agree in having the head and thorax black, without any gloss, and clothed with a very short pilosity of a gray colour; the abdomen is generally of a brick-red colour, and very glabrous; it is always more or less varied with black, particularly at the tip. None of the British species appear to have those yellow or whitish markings on the face which are so conspicuous and ornamental in the genus *Prosopis*. There are five species described as British by Mr. Smith, as under:—

1. *S. gibba* is fond of hiding in flowers, burying itself among the florets of composite flowers, especially of thistles; and these flowers, being in great measure autumnal, it follows that autumn is the proper season for collecting this species, which is also frequently found on sand-banks, in company with the burrowing bees that commonly frequent such situations. Fig. 1 represents a male; fig. 2, a female (the unshaded parts of the figure are red in the bee; the line below represents the size); fig. 3 represents a male; and fig. 4, a female of *Sphekodes sphekoides*: this was the *Melitta sphecoides* of Kirby, 'Monographia Apum,' vol. ii., p. 41; it is not now maintained as a distinct species, but is incorporated with *S. gibba*, and included under the same name.

2. *S. rufescens*.—There is a great confusion about the specific name of this species. It is certainly the *Apis gibba*

of Fabricius, but not of Linneus, which name is correctly applied to the preceding species, which it closely resembles. It seems to have been first described by Fourray; and Mr. Smith now combines it with his own *S. pellucida*, described at p. 1014 of the 'Zoologist.' It is equally abundant with *Sphekodes gibba*, frequenting composite flowers in the autumn, particularly those of thistles and ragwort. The thorax of *S. gibba* is wavy; that of *S. rufescens* finely punctured.

3. *S. subquadrata*.—This species seems of somewhat doubtful distinction. I have a single specimen so-named by Mr. Smith. I took it off the blossoms of the ragwort (*Senecio Jacobæa*), in a gravel-pit on Blackheath, very near Vanburgh House. Mr. Smith says he had the good fortune to discover a colony of it; and, by watching it until the time when the males usually appear, at length succeeded, in the month of August, in capturing both sexes in the nest. The females were readily distinguished by their subquadrate heads from all the other species. The males are not so easily distinguished; they most closely resemble those of *S. gibba*, but their heads are not wider than the thorax, the antennæ are proportionately shorter, and the wings are not fuscous as in that species. Fig. 5 represents a female.

4. *S. Ehippiata*.*—This little bee is extremely common on composite flowers, particularly of ragwort, thistles, and scabious. I have occasionally found it abundantly on the field scabious (*Scabiosa arvensis*), or, in modern parlance, *Knautia arvensis*, and less commonly on *Scabiosa succisa*. It occurs also on *Jasione montana* on Blackheath, and on *Ageratum Mexicanum* in gardens. Mr. Smith has said nothing of its favourite flowers, localities, or economy; but, like several previous authors, he raised the varieties into species, and again united them, as in duty bound. Sex has also some bearing on the aspect of the insect, and probably also on its coloration. It is less and more slender than its congeners, and has a good deal the appearance of a small *Halictus*. Mr. Smith has a very excellent paragraph on this subject, which is admirably appropriate, and will be found particularly useful here, as I have no figure:—

* Misprinted "Ehippia": the word probably meaning "ehippiatus," or saddled, in allusion to the red on the abdomen having a fancied resemblance to a saddle.

“The size alone would serve to distinguish this little bee from its congeners; but it is subject to very considerable variety. The females have sometimes the extreme base, as well as the apex of the abdomen, black, and the head occasionally subquadrate; the legs are sometimes nearly black. The males vary much in the degree of colouring in the legs: specimens occur with their feet testaceous-red; the abdomen also varies much in its markings. I formerly considered it to constitute two species; but I have satisfied myself that it is only a variable insect. In the Linnean Cabinet is the authentic specimen of the *Sphex ephippia* of Linneus,—one of the varieties of this insect. The *M. divisa* of Kirby is a dark example of the male, having the antennæ black; but they are usually more or less fulvous beneath; but in truth it is almost impossible to decide whether the latter variety be not in reality a very minute male of *S. gibbus*.”—‘*Catalogue of Bees*,’ p. 20.

The fifth species is described by Mr. Smith, under the name of *S. fuscipennis*, which is said to have been found by Dr. Leach at Kingsbridge, in Devonshire.

EDWARD NEWMAN.

Larvæ Preserving. By W. E. SHARP, Esq.

To the systematic entomologist who makes a collection of any special group of insects, not so much from a mere love of acquisition of specimens, or ambition to surpass rival collectors, but who looks upon it as an illustration of the various groups, families and genera into which the insect world is divided, it must ever cause regret that this should only be attainable with complete satisfaction in the imago state. In all orders of insects those typical characteristics which unite or divide species into genera and families are displayed in many cases as much in those stages which we must consider as incomplete, as in the imago form. Bearing this in mind the methodical collector of insects should exhibit not only the imagos of a species, but also side by side with these the unattractive larva from which they sprang, the pupa form and home in which they underwent their metamorphosis, and even the egg from which they were first hatched; and these

not placed unmeaningly side by side on pins, but so arranged as will best illustrate the habits, food, and general economy of that species. We could then see at a glance the whole life-history of the insect, and the better appreciate those typical distinctions which are often more forcibly developed in the long larval life than in the indefinite characteristics of the imago. Yet how seldom do we see among collectors such a course adopted. One of the chief reasons for this deficiency is doubtless want of space in cabinets or store-boxes. To introduce into a collection, already sufficiently large, the whole antecedents and surroundings of every species from egg to perfect insect, would require immensely more room than most collectors have to spare. This difficulty, however, is not insurmountable. The real secret lies in the difficulty there is found in satisfactorily preserving these immature forms; and we owe our thanks to Mr. Auld for having given some valuable hints on so difficult a subject. As regards my own experience, I have several times tried this plan of inflation, but have not as yet been able to get very satisfactory results from it. Of course, the fault may lie as much with the want of skill in the operator as with the method itself. My difficulties are these, and perhaps Mr. Auld would say whether he has been able to overcome them, and, if so, how.

First, one of the results is a distension and rigidity of the skin perfectly unnatural to the living larvæ. It is obvious, that as the skin of the caterpillar is blown out to its fullest extent, and kept so till dry, there can be none of the folding in of the skin at the segment joints, neck, &c., and all these indentations are completely lost in the smooth rotundity of the inflated skin; for instance, in such a subject as *L. Quereus* the narrow purple bands which lie between the segments are extended till the larva is almost unrecognizable; indeed, it is quite curious to observe the loose flaccid skin, when inflated, suddenly start out to its very fullest extent, like a small balloon.

Again, the larva is generally blown out perfectly straight by this method (indeed Mr. Auld gives directions for the attainment of this end), and by the extension of the skin the body is elongated perhaps one-third more than its natural length when in a posture of repose. The head is also stretched out to its furthest extent, claspers and legs the same, and

altogether the inflated skin looks but a wretched caricature of its original self. By this operation, too, the skin becomes very brittle, and unless great care is taken the hair is very likely to be singed, or the skin scorched to a beautiful brown tint. These, however, are but minor objections, the chief one seeming to me to lie in the undue extension and rigidity of the body. Perhaps where I have failed in getting satisfactory results, more skilful operators might succeed; but even those museum specimens which I have seen preserved in this way seem open to the same faults.

The method I have found to produce the best results I was induced to adopt from a paragraph in 'Science Gossip,' page 234, 1872. The plan consists of injection with white wax. Paraffin wax is what I use injected into the skin after the contents have been removed, as Mr. Auld describes. The wax is melted by being placed in a vessel immersed in hot water, and then injected into the empty skin by a syringe, having a very fine orifice, which is inserted into the anal opening. A piece of cotton, slipped round the last pair of claspers, should be held by the fingers against the syringe to prevent the larva slipping off, which it is very liable to do, and thereby spoil the operation. The melted wax must be urged very gradually into the skin, until the exterior is plump and full, but not so full as to distend any part in an unnatural manner. The skin should be held to the syringe till the wax becomes hard enough not to run out, and at the same time pliable enough to yield to the fingers, so that any impressions, indentations, or other markings requisite can be made, and the juncture of the segments run round with a blunt knife, lightly or deeply, as the subject may require. The larva can be curled or bent round, the head drawn back as in *Vinula*, or the front segments pushed together as in some of the *Sphinges*. The *Geometer* larvæ can be bent into their natural form; warts, humps, &c., brought into full relief; claspers and legs arranged to satisfaction; and, in short, all the fantastic forms which adorn the exterior of this magazine, imitated to an almost exact copy of Nature,—all which results are quite unattainable with the inflation system.

In preserving larvæ in this way, the principal points to guard against are as follows:—Too rapidly or vigorously filling up the skin, in which case the wax may burst through

or overflow, and with pilose larvæ irretrievably spoil the specimen, as when the wax once gets on the outside of the skin it is impossible ever to get it off without pulling all the hair off with it. In the case of smooth larvæ the wax, if it overflows, can easily be pulled off when hard. If, on the contrary, the injection be carried on too slowly, the orifice of the syringe will be closed by the hardened wax, and must be taken out of the skin and warmed again; and to keep the larva steady at the same time, without the wax already injected into it running out, is no easy matter. With care, however, both these extremes may be avoided. The real difficulty is with very small or slender larvæ; indeed, I should suppose for these the inflated mode would answer better than the injection. I have not myself tried much below the size of *P. Rapæ*. With hairy subjects the chief difficulty is to prevent the hairs coming out during the process of disembowelling; and I should like to know whether any contributor has ever had the courage to attack *Chrysorrhœa* or *Auriflua*, and, if so, with what results, as, from bitter experience, I have learned it is better to have nothing to do with them. To ensure the colour of some of the green or transparent skinned larvæ, a little colouring matter of the correct tint, mixed with the melted wax before injection, will be found to give good results. As regards mounting, it is certainly very unnatural to see larvæ stuck on the ends of wire, or fastened flat down to cardboard, it being much more in harmony with Nature to mount them on the proper food-plant, which should be carefully dried,—leaves, stem, and flowers, if possible,—and then the larvæ of different ages skilfully fastened on by the hidden help of wire, gum, &c.

I should be glad to hear the experience of other entomologists on this mode of larvæ preserving, as I consider many are debarred from this branch of collecting by the numerous and acknowledged difficulties which are attendant.

W. E. SHARP.

Birkenhead.

[The reader will of course understand that I am not responsible for any of the plans recommended by my correspondents. I have not tried either of them.—*Edward Newman.*]

Notes on the Yucca Borer (Megathymus Yuccæ, Walk.).

By CHAS. V. RILEY, M.A., Ph.D.*

(Continued from p. 86.)

THE first notice of this insect that we have any record of is that by Boisduval and Le Conte, who figure it under the name of *Eudamus? Yuccæ* on plate 70 of their 'Iconographie.' Though there is no text accompanying the plate, it is evident from the generic reference that the insect is considered Hesperian, and no one could hesitate to so consider it if guided by the figures. In those of the imago the head is unnaturally broad, the body too slender, and the antennæ with the club too slender and too much hooked. The wings in repose are thrown forward as in *Thecla*; the antennæ erect, and the legs too slender. The larva has the large and nutant head, narrow thoracic joints, and green, yellow and white longitudinal stripes so characteristic of Hesperid larvæ. The pupa has much the form and colour of *Epargyreus Tityrus*, *Fabr.* In short, these figures, in many respects, and those of the larva and pupa more particularly, are so unlike the insect considered in the present paper, that the question might be justly raised as to whether I am dealing with the *Yuccæ* of Boisduval and Le Conte, if the figures in the work in question were known to be generally trustworthy. But I have already shown how inaccurate and unreliable some of the said figures are; while the food-plant, as indicated by the specific name, and the size, markings, and colour of the perfect insects in the plate, leave no doubt as to the identity of *Yuccæ, B. and L.*, and the species here considered. Too much imagination entered into the composition of that plate, and the probability is that after Le Conte's figures were received in Europe by Boisduval, the latter by mistake coupled with *Yuccæ* the larva and pupa of some other large Southern Hesperian.

The next reference to this insect is by Walker, in 1856, who is the first to briefly describe it as *Castnii Yuccæ*. In 1871, Kirby referred it doubtingly to *Ægiale, Feld.*, in Hesperidæ. In 1872, Scudder made it the type of a new genus (*Megathymus*) in Hesperidæ, without further diagnosis than the incorrect figures in the 'Iconographie' alluded to.

* From a Paper read before the Academy of Science of St. Louis, U.S.: communicated by the Author.

This reference is followed by Wm. H. Edwards in the Synopsis accompanying the first volume of his work on N. A. Butterflies (1872). Scudder subsequently states that "it is not a butterfly," and Mr. A. R. Grote, after an examination of specimens collected in Florida, regards it "as belonging to the Castnians, where it is placed by Walker."

It will thus be seen that this insect has sorely perplexed systematists, having been banded from the butterflies to the moths; and that the balance of opinion withdraws it from the butterflies and places it with the Castnians—a family which, in some respects, combines the characters of the two great Lepidopterous divisions, but is regarded, and justly, as having most affinities with the moths.

I shall endeavour to show that this opinion is not well-founded; that *Megathymus* is a genuine butterfly, and that its greatest affinities are with the Hesperians. Together with one or two other species it forms a small, aberrant tribe; but, in order to more fully discuss its affinities, it is necessary to give an exposition of its characters, as no detailed descriptions have yet been published.

Affinities.—Scudder, who has certainly given more attention than perhaps any other author to the Hesperians, divides them into two groups, which he considers of tribal value. The first to which he applies Latreille's name *Hesperides* is characterized chiefly by the primaries in the male having a costal fold (often inconspicuous, however); by the posterior extremity of the alimentary canal being protected beneath by a corneous sheath, which extends beyond the centrum or body of the upper pair of abdominal appendages, sometimes nearly to the extremity of the appendages; by the club of antennæ being elongate, roundly bent, or with a sinuous lateral curve; by the prevailing colour being dark brown, with white or translucent angular spots; by the stout body and swift flight; by the eggs being distinctly ribbed vertically; and by the larvæ generally feeding on leguminous plants and living in horizontal nests made with the leaves. The second tribe, to which he gives Hübner's name *Astyci*, the front wings of the male have no costal fold; the extremity of the alimentary canal is not protected by any extruded sheath; "the prevailing tints of the wings are tawny and black, marked also but often feebly with pale, sometimes vitreous, spots;"

the antennæ have a stout club, which either tapers rapidly or is devoid of a crook; the hind wings are usually horizontal in rest; the eggs are smooth, usually broader than high; and the larvæ "feed on Gramineæ, and generally construct vertical nests among the blades."

The eggs of the Castnians are, so far as I am aware, unknown and undescribed. In both butterflies and moths they present an infinite variety in form, in sculpture, and in the manner in which they are laid. As a rule, however, those of the larger moths are either ovoid, spherical, or flattened, and rarely subconical or sculptured; while those of butterflies are more often conical, and present greater variety in form and sculpture. The eggs of Hesperians are subconical, and those of the Astyci, as we have just seen, in being smooth and broader than high, agree exactly with those of *Yuccæ*.

The larvæ of the Castnians are, according to Boisduval, endophytous, boring the stems and roots of Orchids and other plants, like the Sesians and Hepialians, and like *Yuccæ*. But they are ornamented with the ordinary horny piliferous spots or warts which characterize Heterocerous larvæ, and have a horny anal plate. Butterfly larvæ, on the contrary, rarely possess these warts, but frequently have the body uniformly beset superiorly with close-shorn bristles as in *Yuccæ*, such bristles generally springing from minute papillæ. The newly-hatched larvæ of the two divisions approach each other more nearly in general appearance, as all animals do, the farther we go back to the commencement of individual life; but though the newly-hatched larva of *Yuccæ* bears a general resemblance to the same stage in many endophytous Heterocerous larvæ (*e.g.* *Xyleutes Cossus*), yet in the stiff hairs springing from the general surface, or from very minute points, instead of from distinct tubercles, it agrees with the Rhopalocera. The legs, both false and true, together with their armature and the trophi, are so extremely variable in both divisions that comparisons can hardly be instituted. The endophytous habit, though very exceptional, is found in butterflies (*e.g.* *Thecla Isocrates*, *Fabr.*: see Westwood's *Intr.*, ii., p. 369). None of the Heterocerous borers, so far as my experience goes, line their burrows continuously with a matting of silk; but use the silk very sparingly, or not at all, till about ready to pupate. The larva of *Yuccæ*, for the most

part, lives in a tube of silk, which it builds and extends often several inches beyond the trunk or stem in which it burrows, and from which it often, especially when young, issues to feed. In this, again, it approaches the Hesperians, which are partial concealers, and live, when not feeding, within silken cases or tubes constructed among the leaves of their food-plants.

The pupæ of the Castnians, like those of all Heterocerous borers known to me, are, according to authors, armed with rings of minute spines on the hind borders of the abdominal joints—the spines serving a very useful purpose in assisting the pupa out of its cocoon. Heterocerous borers also pupate in a more or less perfect cocoon, made either within or without the burrow; and, in the issuing of the imago, the mesothoracic covering generally collapses, the leg-cases become unsoldered, and those of the antennæ are always separated and often curled back over the head in the exuvium. The Hesperians pupate within the silken cavity occupied as larva, or else in a separate slight cocoon: the pupa is generally attached to a silken tuft by the hooks of the cremaster, and sometimes by a silken girth around the middle of the body besides: it is not unfrequently covered with a slight powdery bloom, and is characterized by the prominence of the prothoracic spiracle: the exuvium more nearly retains its form, the leg-cases remaining soldered, and even those of the antennæ being rarely separated. In not having a well-formed cocoon, in being covered with bloom, in the characters of the exuvium, in the conspicuity of the prothoracic spiracle, but more particularly in the want of minute spines on the borders of the abdominal joints, *Yuccæ* is again Hesperian and not Castnian. Indeed, except in the broader anal flap, densely surrounded with stiff bristles, in place of an apical bunch of hooks, in the smaller head and larger body, it resembles *Nisoniades* in general form, colour, and texture.

The typical Castnians, in the perfect state, have the wings large with loose and *very large* scales, and the hind-wings *invariably* armed, at costal base, with the *long stout spine*, or spring, which serves to lock the wings in flight by hooking in a sort of socket beneath the primaries, and which is so characteristic of the Heterocera. The venation resembles more nearly that of the *Heptalians*, and is totally unlike that

of the Hesperians. The veins are slender : in the primaries 1a and 5 are as stout as the rest : the discal cell is short, connected transversely with 3 and with an areolet above : in the secondaries the cell is nearly obsolete, and the independent or vein 5 of secondaries is as stout as the others. (Comp. Fig. 30 a, b, with Fig. 31.) The antennæ, though thickened at tip, are generally long and more or less supple, and there are two distinct ocelli between the eyes, behind the antennæ. The Castnians vary much in general appearance, but, whether we deal with the Brazilian *Castnia Linus* (*Cram.*) with its narrow, elongate, rounded, clear-spotted wings, and its remarkably elongate and swollen basal joint of the middle tarsi ; or with *C. Licus* (*Cram.*) which has broad, angular wings ; or with the genera *Ceretes*, *Orthia*, *Gazera*, and *Synemon*—we find the characters above-mentioned constant : they are typical of the family and are Heterocerous characters. *Yuccæ*, on the contrary, has none of these characters ; but in the smaller wings, in their venation, in the closeness of the small and narrow scales and hairyness at base, in having no ocelli, and in the unarmed secondaries, entirely agrees with the Hesperians. I attach much less importance to the antennæ, size of head and body, or even the spurs of tibiæ ; because they are all more variable. Thus, while most of the Castnians have the antennal club tipped with a spine or a bunch of bristles, others (*e.g.* *Castnia Orestes*, *Walker*, from Surinam) have it of the same shape as in *Yuccæ*, and unarmed, or even more short and blunt (*Synemon Theresa*, *Doubl.*). Again, in most Hesperians the club tapers, or is curved at tip ; but there are all degrees of variation, from the extremely curved club of *Epargyreus Tityrus* (*Fabr.*) to the straight and blunt club of *Oarisma Poweshiek* (*Parker*). The small head and subobsolete spurs in *Yuccæ* are abnormal compared with either family ; for most of the Castnians have the spurs much as in *Hesperia*, and the head almost as broad as the thorax. In the stiffer, relatively shorter antennæ, with large club ; in the spines which stud the tibiæ, as well as in the stoutness of the thorax and abdomen, *Yuccæ* is again Hesperian rather than Castnian. The Castnians, like the Uranians and many other exceptional moths, resemble the butterflies in being day-flyers ; but the position of the wings in repose, which is a more important

character, is said by all observers to be similar to that of *Catocala*, *Drasteria*, and other *Heterocera*, viz., deflexed or incumbent. *Yuccæ*, both in manner of repose, in colour, and in pattern, is a staunch *Hesperian*.

In short, a careful consideration of the characters of our *yucca* borer shows that in all the more important characters it is essentially *Hesperian*: and that in most of those characters by which it differs from the more typical species of that family—as in the small spurs, in having only the apical ones on the hind tibiæ, in the tibial spines, and difference in size of legs—it is more *Rhopaloceros* than *Heteroceros*. The same holds true when we consider the adolescent states. In the small head of both larva and imago, and in the very large abdomen, it is abnormal; but these characters are traceable to the abnormal larval habit, and are very unimportant compared to the pterogostic and other characters cited. I have long since concluded that general larval form and appearance is so dependent on habit and so variable according to habit, that it is less valuable than more minute structural characters, and that for purposes of classification it has even less value than egg-structure, and infinitely less than imaginal characters. All endophytous *Lepidopterous* larvæ, of whatever family, have certain general resemblances that are a consequence of similarity of habit; and I give it as my emphatic opinion that *Yuccæ* is a large-bodied *Hesperian*, which, though approaching the *Castnians* through *Synemon*, has no real relation with them. In certain marked characters it departs from the *Hesperians* as at present understood, and the only question which a careful study of the species gives rise to in my mind is—not whether it should be considered a *Castnian*, but whether it offers characters that necessarily separate it from the *Hesperians*. Families should, I think, be made as comprehensive as possible and not unduly multiplied; and in considering aberrant forms, the objects of classification are best subserved by retaining them in whatever division can claim the balance of characters. It is better to widen than to restrict in the higher groups. LeConte does better service in bringing *Platyp-sylla* among the *Coleoptera* than does Westwood in creating a new Order—*Achreioptera*—for it. *Phylloxera*, in *Homoptera*, is much more wisely retained in the *Aphididæ* than made the type of a new Family.

Let *Yuccæ*, therefore, be retained in *Hesperidæ*. By its aberrant characters it may constitute the type of a third tribe, for which I would propose the name *Castnioides*. This Tribe consists at present, in addition to *Megathymus Yuccæ*, of two other good species, the one from Mexico, the other from Costa Rica. It is very probable that this number will be greatly increased as we come more familiar with the Lepidopterous fauna of Mexico and Central America, where the yuccas and agaves abound; for I have little doubt that the last-named plants will also be found to nourish other species of the Tribe.

Enemies.—I have reared from the yucca borer eleven *Tachnia* flies, all belonging to the species which I have designated *anonyma*, and which infests the larvæ of a number of other Lepidoptera. The fact that *Yuccæ* is attacked by such a parasite is further proof that it is more or less an external feeder, since it is hardly probable that the parent *Tachina* would enter the burrow, and I know of no genuine endophytes that are similarly attacked.

Conclusion.—Whether we have in our yucca borer a remnant of more ancient and synthetic types from which the *Castnians* on the one hand and the *Hesperians* on the other are derived, or whether we have in it a more recent variation from the more typical *Hesperians*, are questions which, with present knowledge, permit only of a speculative answer. The former hypothesis is, however, the more plausible. The *Castnians*, while occurring in Mexico, find their greatest development in Central America and Brazil. The few *Castnioides* known, inhabit the southern part of N. America. During the tertiary period, when the ocean reached over the whole Mexican plateau northward, the fauna of North and South America was much more similar than at the present time. It is not difficult to conceive how a Lepidopterous family that was then common to both divisions of the continent, may since that time have deviated in the two directions indicated, and yet have left some less modified forms in the intermediate country. We are assisted in this conception if we view, with some botanists, the *Yuccas* as remnants of an ancient flora.

We may learn from the history of this butterfly, as from that of the Hackberry butterflies, how unsafe it is to describe,

and particularly to create genera, from mere drawings. *Megathymus*, as founded on Boisduval's figures, is very much of a myth. It is so with all genera erected by the mere coining of a name without recognizable definition; and while a Hübner, in making a number of divisions on superficial grounds, may accidentally hit upon relationships which subsequent research proves correct, he certainly does not greatly benefit science by his work. Again, we may learn the necessity for the adoption by entomologists of some rules for guidance in matters that do not come within the scope of present accepted rules. Can names connected solely with published figures be accepted? Shall we write *Yuccæ Boisduval* or *Yuccæ Walker*? Such questions become the more important when two different names are employed. A figure, however good, cannot be considered a definition; and, whilst most entomologists would consider that the species in question had not virtually been named until described by Walker, others take a different view, and perhaps with reason, since a good figure, so far as recognition of the thing intended is concerned, is infinitely more definite than the majority of the earlier descriptions of species in entomology.

In conclusion, I take pleasure in expressing my obligations to Mr. W. F. Kirby of Dublin, Mr. John A. Ryder of Philadelphia, and Mr. Herman Strecker of Reading, Pa., for kind assistance in my studies of this insect; and more particularly to my esteemed correspondent Dr. J. H. Mellichamp of Bluffton, S. C., for his efforts in furnishing material, and to my friend Mr. S. H. Scudder of Cambridge, Mass., for valuable aid, always freely given.

CHAS. V. RILEY.

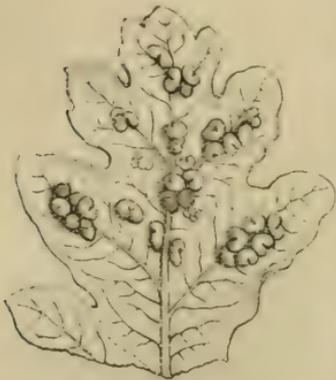
Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 78.)

46. *Biorhiza renum*, Hart.—This gall is, in the fresh state, very beautiful, though small. It appears towards the end of September on the under sides of the leaves of *Quercus sessiliflora*, *Q. pedunculata*, and *Q. pubescens*, generally in large numbers, and often densely crowded: it is attached to

the leaf by means of a very delicate, extremely short stalk, and is not visible from the upper side. In shape it is either

Fig. 46.



BIORHIZA RENUM.

spherical, oval, reniform, or tuberculate, and has a central diameter of two millimetres. In colour it is at first green; but later on it generally changes to a brilliant red. The gall exhibits in section a succulent parenchyma; and in the interior is a larva-cell, without an inner gall. In the month of October the galls begin to fall off the leaves: they pass the winter on the ground. Dr. Giraud states that he did not obtain the flies till the following summer.—*G. L. Mayr.*

Having described the root, bark, and bud-galls, we now come to

the large class of leaf-galls, thirty-three of which are described by Dr. Mayr. In his description of this gall he says, as above, that there is no inner gall; this he subsequently corrects by saying, "I find a thin, but indistinct inner gall." This species has been recorded from several localities in England and Scotland, and I have found it widely distributed in Essex, but it only occurs on the leaves for about the first fortnight in October, and, like the oak-spangles, it swells up in the winter; so, in order to be successful in breeding the gall-flies, it is necessary to keep it moderately moist. Dr. Giraud, who was the first to breed the *Cynips*, says:—"It is remarkable that the galls inhabited by the *Biorhiza* assume a blackish colour and a regularly oval form, whilst those which are occupied by other insects remain yellow or red, and preserve their irregular form." *Synergus varius*, *H.*, and *S. Thaumacera*, *Dalm.* (= *Klugii*, *H.*, and *luteus*, *H.*), are inquilines of this species, both occurring in April of the second year. Dr. Giraud mentions *S. vulgaris*, *H.*; but, as this is not confirmed by Mayr, it is probable the specimens were referable to *S. varius*. Schlechtendal bred a male *Callimome* from these galls, but the species was not specified. The only other parasite I can find recorded is *Mesopolobus fasciiventris*, *Westw.*, in addition to the *Anthomyia* (Diptera), which was bred by Haitig,

who was somewhat doubtful as to its being the producer of the gall. He named the species *A. Gallarum*.—*E. A. Fitch*.

47. *Biorhiza synaspis*, Hart.—This gall may be found in May on the under side of the leaves of young oaks. It is a green, sappy, smooth ball, of from five to seven millimetres in diameter, and attached to the leaf in one spot only. In section it exhibits a central larva-cell, surrounded by a thin inner gall bordering the sappy reticulation. In June the gall falls, and assumes a red colour; and towards the end of the month, or in July, it is pierced by the wingless gall-fly. The specimen figured I obtained many years ago from Dr. Giraud (never having found the gall myself). It is of a brownish yellow colour, covered with numerous red spots.—*G. L. Mayr*.

Fig. 47.



BIORHIZA SYNASPIIS
(and in section).

This insect belongs to the Hartigian genus *Apophyllus*, which is separated from *Biorhiza*, *Westw.*, through having one less joint in the antenna than that genus. Hartig himself included this species and *Biorhiza aptera* both in *Apophyllus*. Since the publication of his 'Mitteleurop. Eichengallen,' &c., Dr. Mayr has met with the galls of this species in some numbers on *Quercus sessiliflora*, and more rarely on *Q. pubescens* in September, thus differing from Hartig's time of appearance, who says "the gall falls in June." He also bred from them at the beginning of October several specimens of *Synergus albipes*, *H.*, and *S. physoceras*, *H.*; the latter occurs in no other gall but this, Hartig's specimens, received from Kollar, being bred from "small round galls on the leaves of *Quercus pubescens*." This gall has not been recorded as British, but it is doubtful whether it does not occur here.—*E. A. Fitch*.

*Extracts from the Proceedings of the Entomological Society
of London.*

DECEMBER 1, 1875.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Zygena Filipendule with Yellow Spots.—Mr. W. A. Forbes exhibited a variety of the burnet moth (*Zygena Filipendule*) with yellow (instead of red) spots, of which he

had bred several from larvæ taken near Winchester. They were bred with others of the ordinary colour; but he believed that the variety was natural, and not caused by extraneous circumstances.

New Coleoptera.—Mr. G. C. Champion exhibited specimens of *Anisotoma oblonga*, *Er.*, taken by him near Farnham, and *A. curta*, *Fairm.*, from Esher, Surrey. The latter was new to the British list. Also *A. Algirica*, a new species, taken by Mr. Rippon in Algiers.

Larvæ and Pupæ of Ephydra.—Mr. William Cole exhibited carefully-executed drawings of the pupæ of a species, apparently belonging to the Dipterous genus *Ephydra*, which he had taken clinging to the stems of grass below high-water mark, near Southend. The water whence it was taken was brackish. He also exhibited the larvæ and perfect insects in spirits.

Parasites of Osmia.—The President stated, with reference to the numerous parasites found on *Osmia tridentata*, that M. Jules Lichtenstein, of Montpellier, had recently obtained the *Zonitis præusta* from the cells of this bee; and likewise the *Euchælius vetusta*, *Duf.*, from its desiccated adult larvæ, in the same way that *Halticella Osmicida* effects its metamorphosis; thus making the thirteenth parasite recorded as affecting this *Osmia*.

The Doubleday Collection.

[The following correspondence will interest readers of the 'Entomologist.']

11, Duncan Place, London Fields, Hackney, E.

March 18, 1876.

To the Directors, South Kensington Museum, London, S.W.

GENTLEMEN,—The Doubleday Collection of Lepidoptera, recently placed in the Bethnal Green Museum, is a collection of very great value to all entomologists, containing as it does types of nearly all the British and European species; and it is very essential that it should be open for all students to be able to compare and name specimens therefrom. This Collection, being arranged according to the universally accepted catalogue of our species, it is, therefore, of the greatest value. During the lifetime of the late Mr. Doubleday, the Collection was always open to any entomologist who wished to inspect it; and we beg permission to have the

same privilege allowed to us at Bethnal Green Museum. It is almost impossible for a student to compare specimens if the Collection is kept in a public place; therefore we venture to hope that the Collection will be kept in a private room. The late Mr. Doubleday was one of our very best authorities on the Lepidoptera, he having diligently studied the species during the whole of a long lifetime, and his knowledge of them was probably greater than any other living British entomologist. Therefore, we beg on behalf of the four entomological societies (the Haggerston, the East London, the South London, and the West London) we represent, to suggest this memorial. If our ideas on the subject are not fully explained herein, we beg to suggest a deputation, consisting of two members of each of the above societies, wait upon you at any time or place you may suggest.

Signed on behalf of the Haggerston Entomological Society, consisting of one hundred members—

J. A. CLARK, M.P.S., &c. W. HARPER.

On behalf of the East London Entomological Society, consisting of forty members—D. PRATT. T. EEDLE.

On behalf of the South London Entomological Society, consisting of ninety members—G. C. CHAMPION. J. G. MARSH.

On behalf of the West London Entomological Society, consisting of ninety members—T. BODEN. W. GATES.

South Kensington Museum, London, S.W.

April 7, 1876.

Bethnal Green Branch Museum.

SIR,—I beg to acknowledge receipt of a memorial, bearing date 18th March, 1876, signed by you and seven other gentlemen representing the Haggerston Entomological Society, the East London Entomological Society, the South London Entomological Society, and the West London Entomological Society, in reference to the Doubleday Collection of Lepidoptera, which has been lent by the Trustees for exhibition in the Branch Museum at Bethnal Green. I have the pleasure to acquaint you that, upon careful consideration of the arrangements necessary for the proper care of the Collection, it has been decided to give full effect to the wishes which have been expressed on the part of the four entomological societies named. A room will be specially provided, and an attendant will be in readiness to show the

Collection to such persons as may apply to the officer in charge for permission to inspect it.—I am, Sir, your obedient servant,

RUNCLIFFE OWEN,

Director, S. Ken.

J. A. CLARK, Esq.

11, Duncan Place, London Fields, Hackney, E.

Death of Thomas Wilkinson.—We regret to have to chronicle the death of Thomas Wilkinson, the distinguished entomologist. Mr. Wilkinson died on Thursday morning, April 13th, at his residence in Cliff Bridge Place. The cause of death is supposed to have been internal rupture. By profession Mr. Wilkinson was a butler; but during the latter part of his life he was in a state of independence. At the time of his death he would be fifty-eight years of age. Mr. Wilkinson was known as an entomologist, not only in Britain, but on the continent of Europe. The greater part of his life he devoted to patient and persevering efforts in rearing our Micro-Lepidoptera, and watching them through the stages of their minute existence. By his indefatigable exertions he succeeded in unloosing many a Gordian knot that would have continued to puzzle the mere theorist for years to come. His knowledge was not confined to entomological science. He was also a great botanist, and was more or less acquainted with many other natural sciences. It was not a little owing to the fine combination of knowledge which he possessed that he succeeded so eminently and so practically in his own favourite branch. He leaves behind him a collection of entomological specimens, which is declared by competent judges to be the best in the country. Mr. Wilkinson united to his great abilities as a naturalist many personal virtues. He was a steady, upright man, mild and unobtrusive in his manner. There was no element of selfishness in his composition. A true lover of Nature, his mind was commonly absorbed in his delightful studies; and he was thus elevated above all meanness. Regardless of praise or reward, he humbly laboured in that field of science which he made his own. In the death of Mr. Wilkinson the town of Scarborough has sustained a great loss.—‘*Scarborough Gazette*,’ April 20, 1876.

Errata.—P. 103, line 3 (present number), “Fourray” should be “Foureroy;” lines 8 and 9, after “*S. gibba*” read “is coarsely, that of *S. rufescens* finely punctured.”—Edward Newman.

THE ENTOMOLOGIST.

No. 156.]

JUNE, MDCCCLXXVI.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 117.)

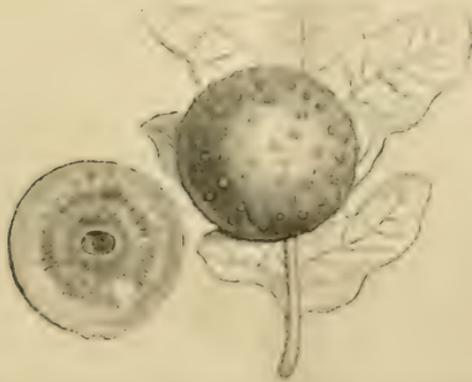


Fig. 48.—*DRYOPHANTA SCUTELLARIS* (and in section).

48. *Dryophanta scutellaris*, Oliv. (*Cynips folii*, Hartig, Schenck, Schlechtendal).—The gall of this species, which is universally known and to be met with throughout Europe, is large, juicy when recent and spherical. It appears on the under side of the leaves of *Quercus sessiliflora* and *Q. pedunculata*; it only adheres to the leaf in one spot, which is the reason it does not show on the upper side. It varies in size from one to two centimetres in diameter, and is of a green, yellow, or—if exposed to the sun—red colour; its surface is either smooth or more or less covered with small papillæ. Even when dry the gall somewhat resists the dividing knife; however, it exhibits in section no actual inner gall, only a spongy, loose, gingerbread-like parenchyma, which contains

the larva-cell in the centre. The gall-makers emerged from the end of September to the middle of December. It is impossible to mistake this species for the one next described, —*D. folii*, *L.*,—as it strictly keeps to the above-mentioned oaks.—*G. L. Mayr.*

The galls of this and the next species have been much confounded together; but as Mayr says that the true *D. folii* of Linné *only* occurs on the South European species of oak, —*Q. pubescens*,—it is hardly possible that it can be British. I have specimens of *D. folii* received from Dr. Mayr, and can certainly say I never saw galls like them in this country: they are spherical, as *D. scutellaris*, with the texture and smoothness of the common *D. divisa* galls. Our common cherry-galls must, therefore, be referable to *D. scutellaris*, and possibly, in a few cases, to *D. longiventris*. They occur commonly in Britain, ranging as far north as Perthshire. I found them exceedingly abundant last autumn twelvemonths, on the large sappy leaves of the stubs and pollards of the Undercliff, in the Isle of Wight, from which I bred *D. scutellaris* from 1st to 21st January, *Synergus pallicornis* in May and June, *Decatoma biguttata* in May, and *Callimome regius* from May to August. Mayr mentions three species of *Synergus* and two species of *Torymus*, as connected with this species, *viz.*—*Synergus pallicornis*, *H.*, appearing in May of the second year; *Synergus Tscheki*, *Mayr*, in April of the second year; and *Sapholytus connatus*, *H.*, as inquiline; and *Callimome abdominalis*, *Boh.*, on the authority of Hartig; and *Callimome regius*, *Nees*, which occurs from October of the first year throughout the summer of the second year, as parasites. In the galls of this species, as also in those of *Cynips glutinosa*, *C. Kollari*, and *C. lignicola*, *Callimome regius* is in some cases a parasite of the inquiline, when it is generally rather smaller. Mayr received one specimen of *S. connatus* from Tschek, labelled—"From *D. scutellaris* gall;" but possibly it might have emerged from a gall of *A. noduli*, occurring in the leaf. In Germar's 'Zeitschrift' (vol. ii. p. 192), Hartig describes *Neuroterus inquilinus*, and says:—"I once bred a single female from a gall of *Cynips folii*" = *scutellaris*, *Ol.* Whether this has been confirmed since, I cannot say. We often find single *Synergus* larvæ living in small chambers made in the

substance of these galls, and in no way connected with the inner gall or dwelling proper of the Cynips. This I have also observed in the galls of *C. Kollari*, and in the cup of the galls of *A. gemmæ*, in which case the tenant is one of the Cynipidæ—*Andricus trilineatus*, *H.* It is an interesting case of parasitism, showing most clearly, although now proved beyond doubt, the vegetal subsistence of *Synergus* larvæ. It also has a bearing on the mode of life of different species, and its presence in such a situation in no way interferes with the production of the gall-maker. Schlechtendal describes four varieties of this gall, tenanted by the *Dyrophanta*, *Synergi*, and *Pteromalidæ*. He also observes that—"In galls which pass the winter under the leaves I can never find a Cynips." The British inhabitants of these galls, bred by Mr. Rothera and named by Walker, were, besides the gall-maker, *Synergus* (sp. ?), *Eurytoma nodularis*, *Megastigmus dorsalis*, *Callimome elegans*, and *Callimome antennatus* (? female, ? *versicolor*). Mayr does not seem to have received *M. dorsalis* as an inhabitant of the cherry-galls. Walker observes that the specimens from these are rather larger than *Terminalis*-bred specimens. *C. elegans* is a willow-frequenting species. In addition to the above record of parasitism we have three species of *Ichneumonidæ* mentioned by Ratzeburg, as connected with this species, two of which were bred by Bouché and one by Brischke, *viz.*—*Porizon claviventris*, *Gr.*; *Bracon aterrimus*, *Ratz.*; and *Orthostigma gallarum*, *Ratz.* He also bred or received the two species of *Torymidæ*, mentioned above; his *T. nanus*, *Först.*, "from oak-leaf galls," were probably from the galls of some other species. Two species of *Pteromalus*—*P. fasciculatus* and *P. jucundus*—are mentioned by Förster; and, as noticed at p. 42 of this volume of the 'Entomologist,' an *Aphis*—*T. dryophila*—may sometimes be found feeding on the incipient galls of this species.—*E. A. Fitch.*

49. *Dryophanta folii*, Linné (non Hartig).—The gall of this species is moderately common. It only occurs on *Quercus pubescens*. It appears on the under side of the leaves about the beginning of June; it is of about the size of a pea, and is a dull, bare, brownish yellow, moderately hard ball; it is covered with scattered inconspicuous flat papillæ, adheres to the leaf only at one point, and is not visible on the

upper side. When mature it exhibits in section a dry, but not dense, radiating parenchyma, and contains in the centre a cavity for a larva-cell, but no inner gall. Late in the

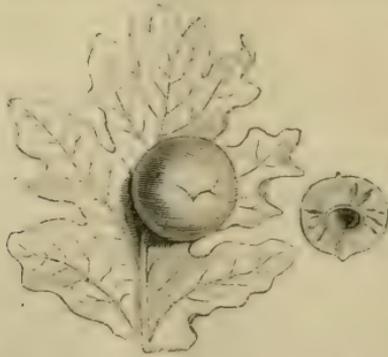


Fig. 49.—*DRYOPHANTA FOLII* (and in section).

autumn we find some galls fall off, while others still adhere to the leaves. From galls kept in a room the flies appeared from October to December.—*G. L. Mayr.*

The inquiline and parasites of this species, given by Mayr, are as follows:—*Synergus pallicornis*, *H.*, in the spring of the second year; *Syntomaspis lazulina*, *Först.*, Mayr and Haimhoffen bred over two hundred specimens of this species, mostly in May and June of the second year; *Callimome abdominalis*, *Boh.*, in March of the second year; and *C. regius*, *Nees*, from March to June of the second year. Mayr also notices an interesting case in which he collected a specimen of this gall on July 18th, then quite immature, which produced *Synergus pallicornis* in the following spring.—*E. A. Fitch.*

Easter at Witherslack. By J. H. THRELFALL, Esq.

ON Friday, the 14th of April, Mr. J. B. Hodgkinson and myself went to Witherslack on the old errand. The weather during the week had been anything but propitious; and during our stay, until Monday night, cold winds to some extent neutralised the heat of an April sun. As far as the perfect insect was concerned, Mr. Hodgkinson's usual perseverance was rewarded with several specimens of such

insects as *Dasystema salicella*, *Micropteryx purpurella* and *M. unimaculella*, *Depressaria pallorella* and *D. capreolella*, *Butalis incongruella*, *Gracillaria phasianipennella* and *G. elongella*, with others of less note.

My own attention was to a great extent confined to larvæ, and the following fell to our united efforts:—*Coccyx hyrciniana* was very plentiful in spruce-firs, in the same plantations as *Coleophora laricella* in the larches; the latter so abundant that almost every bursting shoot was whitened by its occupants. The oxeyes along every road were twisted by *Dicro-rampha acuminatana* and *D. consortana*; but they are yet too young to take, except for special observation. *Lampronia prælatella* was in some quantity under wild strawberry-leaves near the plantation; it appears very local, as, although its food-plant occurs plentifully all over the district, we only found it in a space of perhaps one hundred yards. *Laverna miscella*, mining the *Helianthemum*, was too young; but *Depressaria assimilella*, in united broom-twigs, was full grown, and no doubt would have left in a few days. *Rumex acetosella* yielded its usual variety of *Gelechiæ*; the larva of *G. tenebrella* is certainly a most curious one, in no respect like any other of its family that I have seen, perhaps on account of its habit of feeding internally in the stems (the larva is stout, rosy red, and inactive; perhaps it may turn out something else). On the bank *Anthyllis* shoots betrayed the presence of *Gelechia anthyllidella* by their bleached appearance, although the surrounding vegetation still retained its wintry appearance. Whilst collecting *Oenecrostoma pinariella* in the leaves of Scotch fir, we were surprised by finding a larva drawing the same together in a web, which is supposed to be *Cedestis farinatella* or *C. gysselinella*. Can anyone oblige by describing the difference between the habits of these larvæ? Selecting the warmest night, we obtained—by beating heather, *Myrica* gale, and cranberry, into an umbrella—various larvæ of *Noctuæ*, *Geometridæ*, and *Coleophoræ*, including *C. pyrrhulipennella* and *C. juncicolella*, the latter in abundance. Instead of wasting time by endeavouring to select these on the spot, we tumbled the beatings into a sack, and carefully sifted them at home, by which means most extraordinary spiders, bugs, &c., were exposed. *Elachista gleichenella* was abundant on a stiff,

narrow grass, which grew only under the shelter of some juniper bushes in a dry stony field; but *E. serricornella* was unobtainable: probably it is a late feeder, as it does not appear before July.

This was the result of our holiday; and in the coming months no doubt we shall be furnished with ample material for observation and reflection, and less usefully with perfect insects for the setting-board.

The collector should regard the net as useful only when it directs him to the locality of an insect, and gives a clew to the discovery of its larva; and if he should discard it for an entire season, possibly on looking over the year's work, during the inaction of winter, he would find his cabinet certainly no poorer, and his mind replenished with an amount of information no mere collecting can afford.

J. H. THRELFALL.

4, East Cliff, Preston.

Lepidoptera collected at Great Malvern in 1875.

By Mr. W. EDWARDS.

April 24th.—*Argiolus*, *T. Rubi*, *Napi*, *Rapæ*, *Brassicæ*, and *Cardamines*.

May 29th.—*Sinapis* (scarce), *Geryon*, *Ulmata*, *Euphorbiata*, *Omicronaria*, *Punctaria*, *Adustata*, *Marginata*, *Sylvanus*, *Alveolus*, and *Tages*.

May 30th.—Started for *Sinapis*; very scarce to former years; captured twenty-nine after walking twelve miles or more.

May 31st.—Tried sugar; insects abundant. Amongst my captures were *Ocularis*, *W. Latinum*, *Batis*, *Plecta*, *Rurea*, *Thalassina*, and *Prasinana*; while *Trilinea* and *Strigilis* were swarming. Wind north-east.

June 4th.—Insects at sugar; one fine male *Alni* taken by a friend. My fresh captures were *A. Ligustri*, *Bella*, *Rumicis*; snails, beetles, and centipedes, a pest. Wind north-west.

June 7th.—Fresh captures: one *Alni*; *Anceps*, *Megacephala*, *L. Comma*, *Furuncula*, and *Fasciuncula*. Wind south-west, and muggy.

June 8th.—Tried for *Alni* in same woods, without success.

June 16th.—Sugar; took *Derasa*. Glow-worms most brilliant.

June 24th.—After much rain beat for *Geometra*: captured *Marginata*, *Albulata*, *Bisetata*, *Blomeraria*, *Thymiaria*, *Rhomboidaria*, *Elutata*, *Albicillata*, and *Ocellata*.

June 28th.—Tried sugar; no success.

July 1st.—Tried sugar; saw *Dentina*.

July 10th.—*Perla* swarming on the walls in Malvern.

July 12th.—Captured at sugar, *A. Ligustri* (in fine condition); likewise *Brunnea*, *Festiva*, *Nebulosa*, *Conigera*, and *Lithargyria*. Wind south-west, muggy.

July 16th.—Took *Adippe*, *Aglaia*, *Paphia*, *G. C-Album*, *Argiolus* (second brood), *Semele*, *Urticae*, *Bisetata*, *Margaritata*, and *T. Quercus* (first time taken in this locality by myself). Insects very numerous. A hot, muggy day, with occasional glimpse of sun.

July 19th.—Went in search of *Iris*, where I had the pleasure of taking it last year; but no success.

July 26th.—Tried sugar again; nothing fresh but *Lucipara*.

July 28th.—Tried again the quarters for *Iris*; but in vain. *Fritillaries* and worn *Linea* in abundance.

August 3rd.—Tried sugar: took *Nictitans*, *Putris*, *Cytherea*, and *Puta*. Wind cold, north-west.

August 9th.—Took *Diluta*, *Fimbria*, *Janthina*, and *Plecta*, at sugar.

August 17th.—*Diluta* abundant; captured some fine dark varieties. *Trapezina*, snails, earwigs, centipedes, and woodlice, a pest.

August 23rd.—Tried sugar; nothing fresh; but was very much astonished to find *L. Egeria*, with wings extended, evidently sipping away with great gusto the repast which was laid for its nocturnal ally. My friend Mr. Onslow, who has spent many evenings with me this season, was as much surprised as myself to find such an unusual visitor to sugar. Among other lovers of sugar, I have once seen a toad, a dormouse, and common mouse; the two latter upon several occasions. Wind south-west.

September 9th.—Captured *Citrago*, *Silago*, *Cerago*, *Aurago*, and *Ferruginea*, at sugar. Wind south.

September 13th.—Nothing fresh; *Xanthias* plentiful.

September 24th.—*Cæruleocephala* at the lamps; likewise *Pennaria*.

September 30th.—Captured a fine specimen of *Convolvuli*; *Grapta C-Album* very abundant; while *Urticæ* and *Io*, with *Agestis*, I never saw more plentiful—almost every bramble blossom had a specimen.

Edusa has been taken on the railway-banks but sparingly. I think this locality may boast of the number of butterflies: I have taken forty-two out of the list within a radius of eight miles. I was very unfortunate at ivy bloom, owing to so much rain and cold nights.

W. EDWARDS.

Great Malvern.

Entomological Notes, Captures, &c.

Atypus Sulzeri in the North of London.—Some time ago I was studying ‘Blackwall’s Spiders,’ and have been very much interested in the various accounts, but none gave me so much pleasure as that of *Atypus Sulzeri*; and ever since I have “had it in my head,” and always look for its tubes whenever I have a chance; and last week, in my rambles in this lovely north of London, I saw what at first appeared like a piece of dirty tape, hanging from the sides of an overhanging bank. My “heart was in my mouth” directly I saw it, for I felt sure it was the nest of *Atypus*; so I very carefully dug it out, and at the bottom was the owner,—a female, a most ferocious animal, ready to show fight if touched. I generally like to feel how hard a spider can bite; and *Atypus* would take the prize, for I could not stand it. I examined the bank and found several others, the tubes varying from four to seven inches, each containing a female, and at the bottom of one I found the remains of a beetle of some kind. This interested me much, as I read in the ‘Entomologist’ that Mr. Moggridge thought they fed upon worms. I venture to think that the jaws are better formed for feeding upon Coleoptera than soft worms. I send the nest just as I found it, after taking the females out, upon which I am operating to show jaws, &c. I left several nests for future examination; and on paying a second visit I noticed one blown up, and just as I was taking a fly out of my net I noticed a small spider; and upon bringing my pocket-magnifier upon it found it a young *Atypus*, but could

not think how it got into my net: certainly I had been sweeping. About half an hour after I observed a web, which I thought was a gossamer; but, on closer examination, was surprised to find it covered with a number of young *Atypi*, the same size as the one found upon my net. I counted those on the web, and found about forty or more: they were passing and repassing each other upon the threads; the web was upon some wild sage. I boxed a dozen, and left the others for future examination, for I mean to "keep my eye" upon them, and learn all I can. I examined one under my microscope, and was much surprised to see the eyes move round, as though set upon a universal joint.—*Fred. Enock*; 30, *Russell Road, Seven Sisters Road, April 3, 1876.*

[Of course I was greatly interested in this communication, and I confess felt extremely sceptical as to the eyes moving round, "as though set on a universal joint;" but not feeling competent to express any opinion on a subject so new and so unexpected, I forwarded the communication to Dr. Bowerbank, whom I have ever found ready to assist me in the editorial comments which I find I am expected to append to very many of the communications received for publication. As a matter of course I solicited Dr. Bowerbank's sentiments on the subject, which, with his unvarying courtesy, he sent me as under:—

"I have two very fine cast skins of the garden spider, and in both these the eye appears to have been skinned along with the rest of the organs. If it had not been a fixed organ this could scarcely have happened. I have always felt convinced that spiders, like snakes, shed the skin of the eye along with the rest of the dermis. Of course I cannot contradict the assertion of Mr. Enock, as I have not the specimen he refers to; but I presume that the same structural law obtains through the whole tribe of spiders; and I do not think that it is in the power of a hand-lens to determine whether the eye does move or not, and I think it more probable that the reflection of the lens in the eye of the spider has deceived the observer, and a very slight movement of the creature's head would cause the appearance of a movement of the eye. In the compound eyes of the dragonfly, beneath the microscope, the reflection of a pin, placed between the object-glass and the eye, may be seen in every

one of the lens by a little management; and this fact is well known to old microscopists when the eye is viewed by direct light. I should have replied sooner to your note, but I had to find and examine my spider-skin objects.—*J. S. Bowerbank; 2, East Ascent, St. Leonard's-on-Sea, April 10, 1876.*”

Notwithstanding Mr. Enock's firm conviction of the value and validity of the discovery, and notwithstanding also the very rational doubts thrown out by Dr. Bowerbank, I have thought it desirable to bring the whole subject under the notice of entomologists, hoping that, in the brief intervals they may snatch from the worship of the potato-bug and the vine-pest, they will find a solution of the most interesting question that has for a long time claimed their attention. It is fortunate that the 'Entomologist' should have been the first to record both the burrowing of trap-door spiders into the bark of trees, and the possession of a revolving eye by any member of the octopod exosteatæ. With regard to Dr. Bowerbank's example it can scarcely be considered a parallel case, for the reptiles, and emphatically the chameleon, shed their skins entire, eyes and all; and yet they all possess a rotating motion in the eye, and the chameleon more than any other. Of course the discussion cannot end here, and it is, moreover, desirable that it should receive the most searching investigation.—*Edward Newman.*]

Instinct of Bees.—An interesting exhibition of the instinct of bees occurred to me during the summer. I had been professionally engaged in the town, about a mile from my residence, and upon returning in the middle of the day I found my bees had swarmed. I always kept empty hives ready, and forthwith hived the bees, placing a white cloth over the hive, because the day was very hot, the sun powerful. I set the hive at one end of a table close to the spot upon which the bees had fixed. At the time of hiving I had not a hive-board ready to place the hive upon, but had one carefully prepared in readiness for the evening, when I proceeded to place the hive upon the board, preparatory to setting it in its position in the bee-house. Upon lifting the hive to set it upon the board, I observed the table, where the hive had stood, covered with numbers of bees, which soon began to run about in all directions, from their having been thus suddenly disturbed. I did not feel inclined to interfere

with them, but simply placed the hive on the board with the entrance towards the bees, and waited to see the result. They continued to run about the table for about half a minute as if bewildered, not knowing where to find the hive, when I heard a peculiar vibrating and buzzing sound proceeding from the hive. In an instant all the bees faced about, with their heads towards the hive; and in half a minute not a bee was to be seen upon the table,—they had all marched into the hive in regular procession. The above sound appears to have been produced by the queen summoning her subjects to take possession of the hive in its new position, and they immediately responded to the call.—*W. B. Clarke; 9, Marine Terrace, North Shields, May 10, 1876.*

[This seems at variance with the observations of our best observers, who deny to bees the sense of hearing.—*Edward Newman.*]

A Red-Letter Day.—A red-letter day in this season of black frosts, white frosts, persistent north-easters and clouds of dust, is something to give us a little encouragement and raise our drooping spirits. Time present offers nothing to cheer the entomologist, for a long season to-morrow has not failed to be like to-day, so that it seems almost useless to look forward,—biting winds and chilling frosts still prevail. We must, therefore, solace ourselves with a thought of the past; and so a day which would not, in an ordinary spring, be considered worthy of a chronicle, starts forth into vivid remembrance, and seems to ask for a notice it would not otherwise obtain. While penning this I am recalling April 4th,—a lovely day of an extremely pleasant week,—a day reminding us of a line of Horace:—

“*Solvitur acris hyems, gratâ vice veris et Favoni.*”

The balminess of the atmosphere, after a succession of wind, snow and hail, induced me to pay a visit to some tallows in full blossom about four miles distant. Armed with lanterns, boxes, and a wide-spreading dusting-sheet, I set forth with three friends (two of whom are correspondents of yours—Messrs. S. O. and H. N. Ridley) hoping for success,—at least in the number of our captures, if not in their rarity. Nor were we disappointed; at every shake of the gold-coloured branches numberless catkins, and almost as many moths,

came tumbling down upon the sheet: *Gracilis* and *Rubricosa* came down plentifully; *Stabilis*, *Instabilis*, *Cruda* and *Gothica* in abundance; nor did *Exoleta*, *Satellitica*, *Vaccinii* and *Spadicea* fail to put in an appearance. "Here's *Gracilis*,"—"There's *Rubricosa*,"—"Here's *Exoleta*," followed in quick succession. The consequent excitement and the soft air of the evening have stamped the day upon our recollection as peculiarly enjoyable; and now that May is come—charged with March winds, March dust, and March frosts—we look back upon it with the greater pleasure. I only hope many of our friends took advantage of it, and, while deriving equal pleasure with ourselves, were still more successful; and they who allowed it to slip by will, I hope, be reminded by our experience, when shallows are again in blossom, to seize the opportunity, and seek occasion to chalk out a good "red-letter day."—[Rev.] *P. H. Jennings; Longfield Rectory, Gravesend, May 15, 1876.*

Early Emergence of Reclusa.—It may be of interest to you that a specimen of *Reclusa*, in my possession, emerged before the 25th of March, though kept in an atmosphere only two or three degrees above the external air. I see some authorities give May as the time of its emergence.—*T. H. Ormston Pease; Cote Bank, Westbury-on-Trym, May 1, 1876.*

Correction of Error.—Lampides Bœtica.—In the 'Entomologist' (Entom. ix. 92) it is stated that I took "two" specimens of *Lampides Bœtica*; it should have been "one," which I have always understood to be the only one ever recorded.—*Neil McArthur; 6, Ashton Street, Brighton, April 24, 1876.*

The Use of Yellow Glass for Zoological Collections.—At a recent meeting of the Entomological Society of Belgium, M. Capronnier read a paper giving an account of some experiments which he had made bearing on the question as to how public collections of insects may best be exhibited so as to satisfy all the purposes for which they are intended. M. Felix Plateau, at a former meeting, proposed to substitute yellow for colourless glass in lighting rooms containing entomological collections. In the discussion which followed it was suggested that experiments should be made by submitting insects to the influence of glasses of various colours.

M. Capronnier was entrusted with carrying out these experiments, and the paper referred to contains his report. Everyone knows that among the Lepidoptera it is the green and carmine colours which are most rapidly destroyed by daylight. M. Capronnier wished to obtain insects of the year's hatching, but could only obtain sufficient quantities of *Euchelia Jacobea*, L. The inferior wings of this insect are of a deep carmine, uniform in tone,—an important point in the experiments. The principal colours of the solar spectrum are the yellow, the red, and the blue. M. Capronnier rejected the red as giving a tint too dark, and added the mixed colours, violet and green. He had thus four tints chosen with the same degree of tone, and of a moderate shade—yellow, violet, green, and blue, besides a colourless glass. He made five small square boxes of .08 centimetres square and 1 centimetre in depth; the whole surface was covered with one of the above-mentioned glasses. Each wing was fixed in the middle of the box, and floated in a bath of very bright light, but protected from the rays of the sun. Each of the wings was partly covered by a band of black paper, and their position was so arranged as to leave exposed successively each of the parts during a period of fifteen, thirty, and ninety days. The following are the results:—*Colourless glass*.—After fifteen days of exposure the carmine tint was visibly attacked; after thirty days the alteration was more sensible; and after ninety days the work of destruction had rapidly advanced, and the carmine had passed into a yellowish tint. *Blue*.—With this tint the same alterations took place as in the case of colourless glass. *Green*.—This colour preserved the carmine during the first fifteen days; a change was indicated on the thirtieth day; and on the ninetieth the alteration was marked. *Yellow*.—During the ninety days the yellow alone left the carmine colour almost intact. M. Capronnier says *almost*, for a slight alteration in the tint could be noticed at the end of the ninety days. This last observation proves that there is no absolute preservative, and that collections must be kept in darkness, under penalty of seeing them seriously changed at the end of a given time. Nevertheless, it is evident from the above that the yellow is the best preservative against alterations in the colours of insects. M. Capronnier consequently concludes that a

yellowish colour should be preferred and combined in every arrangement of an entomological room. Moreover, the cloths that cover the show-cases ought to be yellow rather than green, and, what is important and indispensable, the window-blinds ought to be absolutely yellow.

[I have preferred to give the translation of this paper, which appeared in 'Nature' of April 20th, to the original French, which I regularly receive from Brussels, through the courtesy of the secretary, Mons. A. de Born.—*E. Newman.*]

Answers to Correspondents.

E. R. Sheppard.—*The Hop Weevil.*—A friend of mine, a farmer in North Kent, has asked me to get named for him the beetles, which I send you by this post. They have been doing terrible damage in his hop gardens. I send you a short account of what he told me concerning them:—"The beetle appears at dusk in the evening; it eats the hop-bine in small holes; sometimes eats the outside skin the whole length of the shoot. They first appeared two years ago; this being the third year of their appearance. They are more numerous this year; sometimes as many as fifteen of these beetles being found on one hop-shoot at a time. They bury themselves about two inches and a half in the mould, in the middle of the hop-stool, during the day lying dormant on their backs. They are round every hop-stool in a garden of four acres of hops, and they have commenced to advance to another adjoining hop-garden. They were never seen before in the neighbourhood. They have not been seen in any other hop-garden near, although there are many other large hop-gardens in close proximity. Three years ago black-currant bushes were planted in between the hops, but these were subsequently removed, and then the beetles appeared. The hop-garden is by the side of Darenth Wood." I send you with the beetles pieces of the hop-shoots, eaten into holes by these destructive insects. I am not a collector of beetles myself, hence my taking the liberty of sending them to you, thinking that you would kindly name them for me; and if you could inform me what remedy would be best to adopt for their destruction I shall be much obliged. I follow, and

have followed, Entomology most of my life, and have seen many destructive insects, but I never saw anything like this before. They injure fresh shoots every night; so you may judge of the wholesale destruction they are causing. My friend has put soot round each stool, but they seem to like that. Now is the time for tying the hop-bine, but of course that would be useless.—*E. R. Sheppard; 13, Limes Villas, High Road, Lewisham, Kent, S.E., May 3, 1876.*

[The beetle is *Otiorhynchus picipes*: it is entirely nocturnal in its perambulations, hiding in the earth by day, generally close to the stool of the hop-plant, where it is secure from observation. The hop-bine is hollow like a reed, and hexagonal; its outside wall or coating being very rough to the touch. The beetles emerge from their hiding-place at dusk, and climb up the bine, each commencing nibbling just where it suits his inclination, holding on during the operation by the tenacious claws or hooks, with which all his legs are furnished; and indeed so tight does he cling with them that it is difficult to remove him against his will; but, notwithstanding this, he will frequently feign death, and throw himself to the ground, there to remain perfectly motionless, and exactly like a little lump of earth, until he believes all danger past, when he will slowly and deliberately ascend the bine as before. He seems to possess but a small mouth: this is situated at the extremity of a snout or rostrum, and is furnished with a pair of corneous jaws, with which he digs a way into the wall of the bine in many different places, seldom passing entirely through, but being apparently quite content with having stopped the circulation of the sap, and thereby suspended vitality in that particular bine, and defeated all its endeavours to produce hops. The particular bine becomes flaccid, and to all appearance lifeless; yet this by no means interferes with the ability of the stool to produce more bines, although these, being later, are very rarely so productive, neither are they so likely to bring their hops to maturity. I always find the strongest, largest, and most succulent bines selected for the attack; and I have also remarked that when the attack has proved fatal to one particular bine, and it has become flabby and flaccid, it loses all the attraction it possessed for the weevil, and is neglected, in order that another more healthy victim, one fuller

of sap and vigour, may be found to attack. Thus, one after another, a third or more of the stools may be destroyed through the repeated weakening of the bines. But the stools suffer from another mode of attack by the same insect; and this introduces me to another section of its life-history, which I have studied the more intently because my late friend, John Curtis, has, as I believe, in his admirable—I must say beautiful—work on ‘Farm Insects’ left it entirely unnoticed. Greatly puzzled at the omission of a plant so important to farmers as the hop, and an insect so ruinously destructive as the hop-weevil, I thought I must have overlooked it, and have diligently consulted the excellent alphabetical index, and fail to find either the words “hop,” “hop-weevil,” “*Otiorhynchus notatus*,” or any mention of an insect which is especially injurious to the hop. I therefore think a notice of its life-history may not be unacceptable to hop-growers, seeing that I have made it the object of especial attention. The insects may be seen united in pairs in almost every hop-garden in Herefordshire or Kent at the period of hop-picking, the bines being then removed, and the weevils thus exposed the more readily to view. Immediately afterwards the fecundated female enters the earth in close proximity with the stool, and in this she excavates or gnaws a little hollow, in which to deposit her eggs, which are from half a dozen to a dozen in number: these have no particular character, and are sure to escape notice unless purposely sought after, by the summary process of taking up the stool and shaking it over a sheet of dark paper, when the eggs—small, whitish, and nearly round—tumble out and are perceptible; otherwise, the eggs left to themselves soon hatch and become maggots, without any apparent head, or legs, or antennæ, and almost colourless; indeed, they have a semi-transparent look, that rather reminds one of colourless jelly. They remain together in little companies or colonies all through the winter and spring, and probably families are the produce of one act of oviposition. They continue to grow all through the winter, feeding on the substance of the stool, in which they make very evident excavations; they continue thus until May, June, or July, when they separate and retire singly, for the great purpose of transformation. At this time they become chrysalids, very closely resembling the

larvæ in their size and whiteness, but differing from these, inasmuch as the legs are now distinctly pronounced, and separate from the body, except at one point of attachment, and each leg is enclosed in a skin or case of its own, and quite transparent. After a fortnight or three weeks, more or less (I do not pretend to say the exact time), the legs begin to assume a brownish hue, and the eyes are clearly perceptible as black points, one on each side of the head, a certain sign that the final change is approaching. The cases or covering of the several limbs then open, and the limbs themselves make their appearance through the fissures, the legs stretching themselves, and with the terminal hooks or claws take hold of any object that may answer the purpose of a fulcrum; then they seem to deliver themselves of the leg-cases, antenna-cases, and wing-cases, and stand revealed as weevils in their proper form, but for a short time continue to retain their white colour, excepting the eyes, which still have the appearance of black specks; the exterior covering of the weevil soon assumes consistency and colour. It is quite idle to propose a remedy, or to pretend that I can propose a remedy, for the destructive propensities of this insect. It is a great mistake also to suppose that it is any novelty. I have been familiar with it for many years, and have not observed either an increase or diminution in its numbers. Ferns in cultivation have a similar beetle—*Otiorhynchus sulcatus*—dependent on them for support; so have roses, of which I shall have more to say forthwith; so has the lily of the valley. The process of picking them off with the finger and thumb is too tedious to recommend, otherwise it would be attended with certain success; but how can we be remunerated for the time employed in picking off the weevils from a hop-garden,—they are scarcely larger than a large grain of wheat, and it would require thousands to fill a quart measure.—*Edward Newman.*]

W. H. Kynaston.—*How to Relax Butterflies and Moths.*—Will you kindly inform me in next month's 'Entomologist' the best method of relaxing butterflies and moths after they have become stiff?—*W. H. Kynaston; Montpellier Lodge, Cheltenham.*

[Prevention is better than cure. I do not advance this as an entirely new or original idea, yet it is so true and so

incontrovertible that I feel it will bear repetition. I will address myself therefore, in the first place, to prevention. In my early collecting days, when cyanide was unknown, I used to half-fill my collecting-box with bruised laurel twigs,—twigs I always preferred to leaves, as being more juicy, fuller of sap. I used a tin box to prevent evaporation. I spread a piece of muslin over the laurel twigs to keep them from moving; then, to keep both laurel and muslin in their places, I introduced transverse strips of thin cork and fitted them tightly,—so tightly, indeed, that they were unable to move. On these strips of cork I pinned my captures. The lid of the box may also be fitted with these strips of cork, but there is no occasion for a second supply of laurel. A strip of India-rubber on the inside of the lid, glued firmly down, assists in preventing evaporation. On reaching home I have always found that the process of desiccation had been arrested, and that both butterflies and moths were in a suitable state for what is called setting. So much for prevention; now for the cure. When the moth is stiff,—incorrigibly stiff,—pin it on a piece of cork, and float the cork on the surface of water in a milk-pan, soup-plate, foot-bath, or basin of any kind; a wet napkin should be spread over the top to prevent evaporation. I would recommend the manufacture of relaxing bath on this wise, to be always kept ready: first, the milk-pan, then a hoop, which should just cover the milk-pan, and over the hoop a cloth saturated with water may be strained tight, so that the hoop and cloth can be removed together at once. During the course of each day remove the hoop, examine the insects, and take out those which are sufficiently relaxed, replacing the others, for if left too long they will inevitably become mouldy, a calamity which it is almost impossible to mitigate or remove. Eschew laurel leaves on all occasions, except for killing, because of their promoting mould and grease; but laurel twigs have not the same effect,—the sap is expressed more readily, and ever after they remain in a dryer condition. I am aware there are a number of novel expedients, as ammonia and camphor, both for killing and relaxing, and earnest recommendations for using them. I incline to say “dout.” I find Mr. Greene’s ‘*Insect-Hunter’s Companion*’ the only good adviser in entomological matters; but there are some points on which I strongly differ from him. The

better way is to ask questions, as Mr. A. M. Brown and Mr. Kynaston have done, and they will be sure to elicit useful replies, and not the less useful because a slight difference of opinion may occasionally find expression. I trust I shall always be ready to give the best counsel within my reach; and if not in my own personal possession, it is certain to be within the reach of one or other of my numerous readers.—*Edward Newman.*]

Preserving Larvæ.—Perhaps the alum solution employed by Mr. Sharp was not sufficiently strong, for after steeping larvæ in it I have always found their skins hard enough to prevent unnatural distention, when subjected only to very slight pressure.—*H. A. Auld.*

Preserving Caterpillars.—I am sure Mr. Auld will pardon my suggesting one or two slight improvements which may be made in his mode of preserving larvæ (*Entom.* ix. 78, April). When I first began to practise this branch of Entomology, I did so from Mr. Auld's instructions, but I soon discovered two points on which there appeared a need for improvement. The first difficulty was with the two pieces of watch-spring affixed to the blowpipe, for, however well they were fastened, they were sure very soon to become sufficiently loose to slip either too much on one side or the other; or sometimes they were so tight that the skin of the last segment was broken; or else they did not fit sufficiently close to keep the distended skin air-tight when blown into. To get rid of this difficulty a very simple remedy suggested itself to Mr. S. L. Mosley, of this town, namely, to use fine cotton or silk instead of watch-spring: the cotton is simply wrapped round the blowpipe a few times, one fold, then being wound round the very smallest bit of the last segment, which is sufficient to hold it much more closely and firmly than the watch-spring does. The other difficulty I had was with what Mr. Auld terms the "oven." With his plan I found it rather difficult to get a sufficient amount of heat inside; but a still greater objection arose from the necessity of holding the face quite over it when blowing, which made it impossible to work long without feeling that one's eyes would soon be almost burnt out. In place of this I dispensed with the "oven," and simply placed over the tripod-stand a flat piece of fine wire gauze, through which, of course, however near the lamp may be placed

underneath, the flame will not pass through, but will allow all the heat from it to do so. The larva may then be blown over it from the side, and thus altogether avoid the unpleasantness of the other method.—*Geo. T. Porritt; Huddersfield, April 5, 1876.*

A. M. Brown.—Preserving Moths from Mites and Grease.—Can you tell me whether you have found dipping moths and butterflies into a solution of corrosive sublimate in spirits of wine a good plan for preserving them, instead of camphor? I tried the experiment the other day on two butterflies (*Brassicæ* and *Napi*), and found that even after they had been thoroughly dried at an open window, the silky hair on the thorax was matted together, and the sublimate had crusted in small cakes all over the wings, which cannot be removed by a camel-hair brush. I should be glad if you or any of your correspondents could tell me the cause of this, and suggest a remedy, or a more efficient way of preserving the insects. The objection to camphor is that, since it must evaporate, in such a small space as a cabinet-drawer the little particles will settle on the wings of the specimens.—*A. M. Brown; The Grammar School, Great Berkhamstead, Herts, May 9, 1876.*

[My plan is to wash the under side, that is the side not exposed to light, with the solution, using a camel's-hair brush, and afterwards making it thoroughly dry.—*Edward Newman.*]

E. F. Clark.—How to prevent Grease in Moths and Mites with Beetles.—Can you tell me how to best prevent grease in moths and mites with beetles? I find Mr. Greene's method in his book very difficult, for in taking the inside out I generally spoil the insects.—*E. F. Clark; Upton Rectory, Southam, Warwickshire, May 1, 1876.*

[I know of no better instructions than those in Mr. Greene's 'Insect-Hunter's Companion;' they appear to me to be excellent.—*Edward Newman.*]

Robert Service.—Name of Moth.—I shall feel greatly obliged if you can tell me the name of the small moths, a male and female, which I send you by this post. I regret to trouble you, but just now I have no books in which the *Micro-Lepidoptera* are described. These moths were very abundant in an oak plantation at Malice, near Dumfries, on

the 14th of April. They began to fly between five and six o'clock p.m.; earlier in the afternoon two or three of them were sitting on every oak-trunk. My companion and I were much interested in watching the intelligent way in which the males sought out the nearly-wingless females. We noticed two males rising out of the brushwood, at a distance of at least ten yards from where a female was sitting on a branch, and going straight to her in a curious, hesitating sort of flight, reminding us very much of the manner of a pointer-dog when taking up a difficult "scent." In another instance I was looking at a female crawling on a tree, when a male flew off another tree at a few yards distance, and, alighting close beside her, copulation at once took place. In these and other cases the males flew against the wind, and almost in a straight line to the females; and we therefore concluded that it was the sense of smell, or something very like it, that was guiding them. It was certainly not sight.—*Robert Service; Maxwelltown, Dumfries, N.B., April 20, 1876.*

[*Diurnea fagella*]; the most abundant of spring moths.—*Edward Newman.*]

W. Thomas.—*Asthenia pygmaëana*.—I have *Asthenia pygmaëana*, my own capture, in my cabinet, and should be most happy to show it to you or your correspondent Mr. Thomas.—*Charles Boden; 127, Tooley Street, April 19, 1876.*

Does Crocallis elinguaris hibernate?—Mr. Newman's reply to Mr. E. Holton (*Entom.* ix. 88) would lead us to infer that the larva of *Crocallis elinguaris* usually does hibernate. Is not this a mistake? I never knew an instance of this species hibernating in any other than the egg state.—*Geo. T. Porritt; Huddersfield, April 5, 1876.*

———— Mr. Holton's notice of the hibernation of *Crocallis elinguaris* in the egg state (*Entom.* ix. 88) is in strict conformity with my experience of that species. I have bred the species four years from eggs deposited by captured females. I have invariably found them hibernate in that state, and commence hatching the last week in February. The hatching generally extends over a period of from three to four weeks.—*Thos. H. Hedworth; Dunston, Gateshead, March 9, 1876.*

W. A. Forbes.—*Is not Zygæna nubigena a Scottish Insect?*
—In a conversation I had with you some weeks ago about our British Zygænæ, you doubted whether *Z. nubigena* had occurred elsewhere in these isles than in Ireland. At the time I stated to you my belief that it also occurs in Scotland; and in a letter I received from Dr. Buchanan White, dated March 9th, he says, amongst other things:—"Nubigena is not uncommon (I believe) near Oban, whence I have specimens, and I have seen a specimen that was taken in Forfarshire." This species is also noted as occurring in one or more localities in Scotland—all maritime, I believe—in the "Insecta Scotica," now publishing in the 'Scottish Naturalist.'—*W. A. Forbes*; 32, Gower Street, W.C., March 29, 1876.

[I have received several specimens of *Zygæna* from Scotland under the name of *Nubigena*, but they were so wasted that they might be almost anything. As I enacted the part of sponsor to Mr. Birchall's Irish *Nubigena*, I can positively say that I have seen no example of that species from Scotland, and I have rather fallen into the way of not trusting to the names kindly sent me without the specimens. I prefer, therefore, leaving the matter as it stands for the present. I believe Mr. Birchall and Mr. Carrington have seen the so-called Scotch specimen of *Nubigena*; and I shall be satisfied, and, more than that, gratified, if they will establish the claim of *Zygæna nubigena* to be considered indigenous to Scotland.—*Edward Newman.*]

G. Edwards.—*Hatching of Saturnia Carpini.*—I have some eggs of *Saturnia Carpini*, laid the second week in April. Will you tell me when the young larvæ ought to be out, and also if they can be fed upon anything that grows in London? Heath is difficult to procure.—*G. Edwards*; 10, Gloucester Terrace, April 23, 1876.

[Try them with blackthorn; I think the leaves are exposed now.—*Edward Newman.*]

Despatch of Humble Bees to New Zealand.—I send you cuttings from the 'Weekly Press' of January 15, 1876, of Christchurch, Canterbury, New Zealand, received by last mail, announcing the failure of Mr. John Hall's experiment to introduce the humble-bee into New Zealand,—a failure which many of your readers will be sorry to hear of.—

R. G. D. Tosswill; Shirley Villa, Rugby Road, Leamington, March 23, 1876.

“We regret to say that, as far as we are in a position to judge, the experiment of introducing humble-bees to this province has not been attended with success. The bees in question were carefully packed by Mr. F. Buckland, and forwarded by Dr. Featherston to the Hon. John Hall, at Plymouth, with full instructions as to their treatment on the voyage. The box containing them was slung right aft; there was a thermometer on the box to show the temperature, and when the weather was cold the Hon. John Hall took the bees into his own cabin, and kept a lamp burning night and day to keep up an equable temperature. Mr. Hall states that the lowest degree shown by the glass was 53; there was no ice used, Mr. Buckland stating that the heat would not injure them. In spite of all these precautions, however, there is every reason to fear that the bees are dead, as last Sunday week is the last time that Mr. Hall heard them give any signs of life.”

[See Mr. Smith's advice on the subject (Entom. ix. 15, No. 151). Directly I heard of the scheme of sending bees to New Zealand I entertained misgivings as to the success. It is absolutely necessary to know what species you are sending, what are its habits, what its food, and, finally, what its scientific name, in order that you might communicate with others what you were doing, and if possible obtain their co-operation. Now, as I said at the time, “the published observations” of Mr. Buckland and of the editor of ‘Nature’ conveyed no idea to my mind on these points, nor do I think they would to the minds of entomologists generally. The failure of the scheme was therefore certain.—*Edward Newman.*]

T. R. Archer Briggs.—Oak Galls.—The galls sent are those of *Aphilothrix corticalis*, *Hart.* (Germ. Zeit. ii. 190) = *A. Sieboldii*, *Hart.* (Germ. Zeit. iv. 406), a species widely distributed in England, but occurring nowhere, as far as I know, abundantly enough to be called common. The galls are of a dull red when fresh, and are tolerably conspicuous and curiously interesting. I have known them to be taken for fungi more than once; thus being something of a “set-off” against the large number of fungoid growths which are

constantly being associated with the idea of insect-work. Where is the analogy or anomaly of influence? A copy of Mayr's beautiful figure and his description has appeared in the 'Entomologist,' vol. vii. p. 52. I am now (middle of April) breeding the Aphilothrix from galls collected last autumn, in six or seven widely-separated localities in Essex, Suffolk, Surrey, Middlesex, and Hampshire, whence it has also been recorded by Mr. Moncreaff (Entom. vii. 93). It had been added to the British fauna four years previously by Mr. Müller ('Gardener's Chronicle,' 1870, p. 1312).—*Edward A. Fitch.*

W. A. Forbes.—*The Doubleday Collection.*—I paid a visit to Mr. Doubleday's collection at Bethnal Green a short time ago, and was of course exceedingly interested and gratified. Permission, however, to examine his types of European species, which are in book-boxes, was denied me, as it seems that for this purpose it is necessary to have an order from Mr. Owen, director (I believe) of the South Kensington Museum. As this would take a day or two to obtain,—and the entomologist cannot always fix beforehand a day for the purpose,—this regulation will, I fear, seriously invalidate against the use of this part of the collection. My object in writing this to you now is to ask if you cannot, by the exertion of your powerful influence in entomological circles, get the regulation repealed. As access to the collection at all is only allowed in the presence of one of the officials of the museum, this additional precaution seems to me superfluous. In any case, I think permission from the superintendent of the Bethnal Green Museum, who is of course on the spot, to view this part of the collection, ought to be sufficient. At present he is, I believe, powerless to give this.—*W. A. Forbes; 32, Gower Street, W.C.*

[I am perfectly satisfied to leave the matter in the hands of the three Trustees. They are gentlemen of unquestionably sound judgment in such matters, and I should be very reluctant to interfere with their arrangements. I will, however, consider the matter, and from time to time report in the 'Entomologist.' It is obvious, or rather it ought to be obvious, that open boxes without lock or key cannot safely be placed in the hands of every applicant.—*Edward Newman.*]

EDWARD NEWMAN

BORN May 13th, 1801.

DIED June 12th, 1876.

It is my sorrowful duty to record the death, after a short illness, of him who founded this Journal, and has conducted it during the term of its existence. Not only those who knew him personally, but that wide circle who knew him as a correspondent or through his writings, will feel a shock that one so long beloved has passed away, and will mourn him as a dear friend. As ready as he was able to impart information on every branch of Natural History, he will be regretted by many who sought—and as certainly obtained as sought—his kindly help. Even this number of the 'ENTOMOLOGIST' contains some of his numerous answers to correspondents.

His labours are finished, and his earthly career of usefulness is completed; but his memory will remain bright in the minds of those who had the benefit of his friendship.

THE ENTOMOLOGIST.

No. 157.]

JULY, MDCCCLXXVI.

[PRICE 6d.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S
'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 124.)



50. DRYOPHANTA LONGIVENTRIS.
51. D. DIVISA (and in section). 52. D. AGAMA (and in section).

50. *Dryophanta longiventris*,
Hart.—Up to this time I have
only found this gall on the com-
mon oak. It agrees with the
last-described species in size,
shape, substance, surface, at-
tachment, and inner structure,
but differs from it in colour.
50 The gall of this species is red,
and has rather broad, often a
little raised (rarely projecting
like papillæ), mostly circular,
52 yellow stripes. Another small
distinction is that it is flattened
at the base. Should the gall
51 be gathered in an unripe state
it shrivels up between the rings,
so that the rugose surface ex-
hibits red furrows, with yellow
tortuous borders; whilst the galls
of *D. folii* would, in such cases,
exhibit irregular tubercles. The
gall appears at the beginning of
June. Herr von Schlechtendal

states the flight time of the gall-fly as varying from the beginning of August to the end of October. I found great numbers of this species in the Leithagebirge mountains, but only bred a single fly in the winter, and extracted a living specimen from one of the galls in November.—*G. L. Mayr.*

Von Schlechtendal observes of this gall:—"It often happens that the galls of this species are distorted by inquilines before they are matured; in such cases they hardly attain the size of a pin's-head." I have frequently noticed these dwarfed specimens in the next species—*D. divisa*. The controllers of *D. longiventris* are *Synergus pallicornis*, *Syntomaspis cyanea*, *S. lazulina*, *Callimome abdominalis*, and *C. regius*; also *Elachestus Cynipidum*, according to Ratzeburg. This species has been recorded as British by Mr. Müller (*E. M. M.* vii. 108), who met with it rather sparingly in the neighbourhood of Norwood.—*E. A. Fitch*.

51. *Dryophanta divisa*, Hart.—Like the preceding, the gall of this species is also found on *Quercus pedunculata*. It is spherical, but distinctly flattened at the top and bottom, so that it has in the centre a perpendicular diameter of five millimetres, and an horizontal diameter of seven millimetres. It adheres at one point to a side rib, rarely to the midrib, on the under side of the leaf, and is not visible from the upper side. Its surface is glossy, smooth, bare, brownish yellow, and frequently red on the side which is exposed to the sun; it has a few very flat, scattered papillæ of a darker colour. In section it exhibits a radiating, but not close, parenchyma, and has a large larva-cell without an inner gall. It is distinguished from the two previously-described species by its smaller size, its flattened spherical shape, its shining surface, and by the size of its larva-cell, which is very large with respect to the size of the gall. Frequently there is a tolerably well-defined flat papilla opposite the basal attachment, which is a little darker than the surrounding colour. I have not bred the fly as yet.—*G. L. Mayr*.

There has been much uncertainty and confusion as to the specific differences in the galls of the three preceding species of *Dryophanta*. This has also been the case with this and the following species. The distinctive marks of the latter three are as follows:—The galls of *Divisa* are thick-walled, those of *Agama* are thin-walled, whilst *Disticha* exhibits a double cavity in section. Speaking of *Agama*, Von Schlechtendal says that in some years it occurs in such great numbers as to bend the twigs. With me *Agama* has occurred sparingly; and such I believe to be generally the case in

Britain, although, doubtless, like all the *Dryophanta* galls, it does occasionally occur in profusion; but it is *Divisa* which is so often met with, and in such great numbers. I have in my collection a small twig with eleven leaves, on which are ninety-four galls; and I believe Mr. Newman had specimens of leaves more densely populated than that. The range of *Divisa* in Britain is commensurate with that of the oak. Does Schlechtendal, in his notes, refer in part to *Divisa*? as he only mentions *Disticha* and *Agama* in the 'Zeitung,' from which we might infer that he had not then separated the two species, *Agama* and *Divisa*; for in Mayr's two essays on the *Synergi* and *Torymidæ* we have three species of *Synergi* and two species of *Torymidæ*, bred by Schlechtendal from *Divisa* galls; and only one species of *Synergi*, and none of the *Torymidæ*, from *Agama* or *Disticha*; clearly showing that *Divisa* must occur in Saxony, and, from the above, might reasonably be considered the commonest species of the three. Formerly he might have been following Hartig, who says of *Agama*,—"Sometimes in very great numbers on the leaves of young oaks;" and of *Divisa*—"Not common, near Brunswick." Under *Agama* we also have from Schlechtendal some interesting remarks on the inmates of the galls; he says—"Out of one hundred galls, which I collected for breeding from, eighty-eight were fully matured, and twelve remained small: the former only produced twelve specimens of the fly, and ten parasites and inquilines, in the same year; the remaining sixty-six wintered, and produced in the spring partly *Pteromalidæ* and partly *Synergi* species; no *Cynips*. Of the twelve small galls three produced parasites and inquilines in the same autumn; the remaining nine wintered." Here, again, we have evidence of *Divisa*, as reference is made to inquilines, both in autumn of the first year and spring of the second; a state of things, according to Mayr, existing commonly but in *Divisa*, where we have *Synergi albipes* occurring in August of the same year, and *Synergi Tscheki* and *S. pallicornis* in March and April of the second. All three species were received from Schlechtendal; *S. pallicornis*, also, from Reinhard (Saxony). In the 'Scottish Naturalist' (vol. ii. pp. 62, 161) Mr. Cameron has two notes on the mode of life of *Synergi* in these galls. The recorded parasites of this species are—*Syntomaspis cyanea*, *Boh.*,

spring of the second year; *Callimome abdominalis*, *Boh.*, August of the same year; *Callimome regius*, *Nees*, in the autumn of the same year, according to *Mayr*; *Pteromalus Saxesenii*, *Ratz.*, in the autumn of the same year; and *Pteromalus incrassatus*, *Ratz.*, in May of the second year, according to *Ratzeburg*. *Kaltenbach* gives the following parasites of *Agama*, but on what authority is not stated:—*Eurytoma signata*, *Ns.*; *Torymus pubescens*, *Frst.*; *Eupelmus urozonus*, *Dlm.*; *Pteromalus fasciculatus*, *Frst.*, and *Pteromalus fuscipalpis*, *Frst.* (of these the *E. signata* of *Nees* is a compound species; *T. pubescens*, *Frst.*, is also a doubtful species, now restricted to a rose species of *Syntomaspis*; *E. urozonus* occurs in many of the oak-galls, and the *Pteromali* are best left untouched).—*Germer's 'Zeitschrift.'* The other inhabitants of this gall are the same as those of the preceding species. *Hartig*, in support of his theory that the genus *Cynips* was agamic, relates his experience in breeding this species and *D. folii*. He says of *C. divisa* (called *C. disticha* at first, in error):—" *Cynips disticha* was so rare in 1839 that I could not discover a single specimen in my excursions. I first found it myself in 1838. In the summer of 1840 I found it in such immense numbers that with little trouble I collected about 28,000 galls. On an average, about every third gall contained a *Cynips*; but out of these 9000 to 10,000 flies there was not a single male." "In the summer of 1840, as mentioned above, I bred 9000 to 10,000 females of *C. divisa* from 28,000 galls. Notwithstanding this I found the galls quite as abundant in 1841 and 1842; and from galls collected, again bred nothing but females. The galls were not collected from one tree, but received each year from a large expanse of country." He also bred from 3000 to 4000 examples of *D. folii*, all females. The question of parthenogenesis in some of the genera of *Cynipide* still remains a puzzle, although it seems nearer solution with some of the entomologists of America, where a male *Cynips* has been found; but if the European species are not asexual, how exceedingly rare must be the occurrence of the male element to elude detection for so long in the fifty species or upwards, known only in the female sex. I have not found the proportion, which the *Cynips* bred bear to the number of galls, to be anything like so near as in *Hartig's*

case. The following is a record of parasitism in these galls; galls collected 30th July, 1875, inmates emerged as follows:—July, 1875: one *Eurytoma squamea*? *Walk.*, male. August, 1875: twenty-one *Synergus albipes*, *Hart.*; fifteen *Eurytoma squamea*? one *Decatoma biguttata*? *Swed.*; one *Callimome abdominalis*, *Boh.*, female; six *Pteromalus Saxesenii*? *Ratz.*; three *Pteromalus* sp.? September, 1875: two *Callimome regius*, *Nees*, male and female. November, 1875 (10th to 22nd): four *Dryophanta divisa*, *Hart.*, females. April, 1876: one *Synergus Tscheki*, *Mayr.*, male. May, 1876: ten *Eurytoma* sp.? nine males and one female; two *Decatoma biguttata*? ten *Syntomaspis cyanea*, *Boh.*, males. June, 1876: one *Eurytoma* sp.? male; eight *Syntomaspis cyanea*, females. Number of galls collected (including several double and many immature), two hundred and forty-eight; number of insects bred, eighty-six.—*E. A. Fitch.*

52. *Dryophanta agama*, *Hart.*—This gall, of the size of a hemp-seed, occurs on the side veins of the under side of the leaves of *Quercus sessiliflora* and *Q. pedunculata*. It appears first in June, when it is of a yellowish white colour, but later on changes to a more or less intense yellowish brown. It has a bare, smooth, slightly shining surface, and is covered with scattered, flat, brown and inconspicuous nodules. It is moderately hard, transversely oviform, and is much flattened next the leaf, to which it closely adheres, although only attached at the centre, and does not show on the upper side. In section it exhibits a loose parenchyma, from half to one millimetre in thickness, which surrounds a comparatively large larva-cell without an inner gall. Herr von Schlechtendal states October and November to be the flight time of the gall-fly.—*G. L. Mayr.*

Synergus pallicornis and *S. albipes*, *Syntomaspis cyanea* and *Torymus regius*, are the attendants of this species recorded by *Mayr.*—*E. A. Fitch.*

Entomological Notes, Captures, &c.

Relaxing, Grease, &c.—The following method of relaxing insects may be recommended for its extreme simplicity and handiness. Take a common glass cylinder,—say four inches

in diameter and eight inches in height; cut a piece of cork, so as to fit easily within it; soak the cork *thoroughly* in water; and having pinned on to it as many insects as it will conveniently hold, place the cork on any flat surface,—as a table, &c.,—and cover it over with the cylinder. Nothing more is required; and the whole operation may be effected in a couple of minutes. Twelve hours will be sufficient to relax most Noctuæ and all Geometræ. Sometimes in this and, as I suppose, in all other methods, the insect will become more or less damp. It is, therefore, desirable, after it has been re-set, to thoroughly dry it by exposure, at a safe distance, to the warmth of a fire. It may be observed that it is almost impossible to re-set a moth, and still more so a butterfly, so as to please a fastidious eye;—at any rate, I have failed to do so. While admiring, therefore, Mr. Newman's modest disclaimer of "originality," I must thoroughly endorse his motto—"Prevention is better than cure." As regards Mr. Brown's question about the employment of the solution of corrosive sublimate, the injury done to his insects arose from two causes:—first, the solution was too strong; and secondly, he used it improperly. The following extract, from a letter written to me by the late Mr. H. Doubleday, will give Mr. Brown the necessary information on these points:—"I am not an advocate for the use of camphor; it unquestionably tends to make moths greasy. If the *under sides* of the thorax and abdomen, and the antennæ, are carefully touched with a camel's-hair pencil dipped in a weak solution of corrosive sublimate, they are for ever proof against mites and mould. I believe that when insects are carefully touched with a weak solution of corrosive sublimate in pure alcohol, they will never mould or be destroyed by mites. A small piece of sublimate, about the size of a hemp-seed, is sufficient for an ounce of alcohol. It should never be strong enough to give visible crystals on a non-absorbing substance (black),—a piece of blackened ivory, for instance,—when it is wetted with the solution and allowed to evaporate. The best method of applying it is to take a small camel's-hair pencil and dip it in the solution, pass it along the antennæ, and then apply it to the under side of the thorax and abdomen." N.B. (by myself).—Extreme care is required in applying the solution

to the *antennæ*. I do not agree with Mr. Doubleday's opinion about camphor causing grease in insects. To speak more correctly, I should say that insects *will* grease, quite irrespective of camphor, which very probably may cause its more speedy appearance. Once more to quote Mr. Newman; to nothing is the aphorism—"Prevention," &c.—more applicable than to grease. I am sorry Mr. Clark finds my method of "prevention" so difficult. I am *quite* sure that the difficulties may be overcome by anyone gifted with an ordinary deftness of fingers. Let me urge him to try, and try again. Begin on some of the *common*, stout-bodied moths, having first carefully studied the directions. The method, doubtless, requires some little skill, and *much* patience; but he will be amply rewarded by seeing his insects, after the lapse of years, as fresh and neat as the day they were set. Lastly,—I have used camphor for twenty-five years, and find it quite guiltless of the many sins laid to its charge. I have always thought it, and still think it, the best preservative. Mr. Brown's objection—"As camphor must evaporate, little particles must settle on the wings of the specimens"—is new to me. Will not the particles themselves evaporate?—[Rev.] J. Greene; Clifton, Bristol.

Relaxing Butterflies.—In No. 156 of your valued 'Entomologist' (Entom. ix. 137) one of your correspondents wishes to know a good method of relaxing butterflies. Through the kindness of a Lepidopterist, Mr. Pickel, of Landsberg, I am able to give you a description of an apparatus for this purpose, communicated to me for my 'Entomological News.' The apparatus consists of an oval zinc-box, seven inches long by four inches wide, and two inches and a half deep, and is closed with a lid, which has an edge of half an inch to draw over it; in one of the sides of the box there is a hole half an inch from the upper edge, through which a zinc tube, quarter of an inch in breadth, is passed slantingly from the inner to the outer side, and is soldered in such a manner that the upper half of the tube reaches about half an inch on the inside of the box, but does not touch the lid, whilst the lower end terminates in a downward direction, about an inch and a half on the outside. In order to be able to place the pinned butterflies in the box there are cork strips on the bottom, which are held by thin

strips of tin soldered to the sides of the box. Before using the apparatus the spaces between the cork strips must be filled with water; then the butterflies are placed in the box, and the apparatus is locked. A circulation of air then takes place through the tube, and saturates the space inside with moisture, so that in a few hours the butterflies are just as pliable as if they had been just caught. But the chief use of the machine is that, when a Lepidopterist comes home tired at night from all the day's hunting, he need not sit up for hours in order to set his insects. Perhaps it will be useful to some of your readers to know of this apparatus. You are welcome to make use of my note.—*Dr. Katter; Putbus a. Rügen, June 3, 1876.*

Relaxing Insects (Entom. ix. 137).—One of our leading entomologists said many years ago that a well-set collection was worth a pilgrimage to look at; and I, for one, most cordially agree with the remark. It is, however, a thing never to be attained, unless one religiously re-sets something like fifty per cent. of the specimens received from correspondents. Many collectors, especially country ones, seem to think that the pin leaning—like Major Wellington De Boots's chimney—"several degrees from the per-pen-di-cu-lar," in any direction, is a matter rather to be admired than otherwise; while, of course, bodies, antennæ, and legs, are always left to shift for themselves. A good systematic plan of relaxing specimens, previous to re-setting, is consequently of considerable interest to those who take a pride in the appearance of their collections, and Mr. Kynaston's query leads me to recommend the method I use; a rather long experience enabling me to speak highly of it. A deep wooden box, with a loosely-fitting lid, is lined to the depth of an inch or so with plaster of Paris: this is easily managed by turning the box alternately on each side, and pouring in sufficient plaster (mixed to the consistency of cream) to cover it to that extent, keeping the plaster in its place till set by a slip of wood held against the box. By repeating this process for all the four sides, and filling up the bottom to the same depth, the box may be very neatly finished. The lid is, of course, to be coated in a similar way inside. The insects operated on are pinned on a tablet of wood coated with cork, which is mounted table-wise on little legs and placed inside the box,

so that in no part does it touch the plaster sides. When the box is used pour water on the plaster, so as to thoroughly saturate it; stick the specimens on the table, put on the lid, and place the whole in the pantry or cellar to be kept cool. To guard against fungi appearing in the box some corrosive sublimate (bichloride of mercury) may be dissolved either in the water mixed with the plaster or in that first used in damping the box; the former plan is perhaps preferable. From one or two days to a week, according to the size of the insect, will be needed for the specimens to get into fit condition for effective setting. The great point is to have them thoroughly relaxed, or they are apt to spring. To prevent this, also, they should be left for a long time on the boards,—a week or ten days at least is required; but with the above precautions I have never found it necessary to use any such clumsy contrivance as sticking the wings in position with liquid-glue, &c. This can only be required when the insects have not been sufficiently relaxed. Of course I claim no originality for the above method. I believe it is used by many entomologists, but I think it possesses several advantages compared with the plans mentioned in most books. Although immersed in a very moist atmosphere the specimens never become saturated with water, as is often the case when a simple wetted box is used. The bichloride of mercury seems effectually to prevent any appearance of mould, and the rapid evaporation from the porous plaster keeps the air in the box at so low a temperature that even in the height of summer no signs of decomposition are perceptible, while the neatness of the affair and its constant readiness for use are additional recommendations. I have employed one for several years, and it is still as serviceable as ever. When carefully manipulated, relaxed insects, particularly butterflies, &c., look quite as well as those set in their original state. I have hundreds of Diurni and Bombyces in my collection prepared in this way, and he would be a bold man who would undertake to pick them out from the others. Indeed, there is one element in connection with such perfect methods of relaxing worthy of consideration: inasmuch as the insects retain all their pristine beauty after undergoing the process, unscrupulous collectors and dealers are enabled to pass off foreign specimens as “true Britons” with impunity.

to those extraordinary brothers of the (silver) net who seem to think it a pleasure to be cheated, and who are willing to pay a high price for the doubtful gratification of spoiling their collections for all scientific purposes by the introduction of German specimens with a false pedigree. Tastes differ, of course; but were I infected with this comical phase of the "amor-habendi" mania, I should prefer manufacturing my own "true British specimens" myself, rather than pay some enterprising gentleman a premium of nineteen and sixpence in the pound for performing so simple an operation for me.—*B. G. Cole; The Common, Stoke Newington, N., June 7, 1876.*

Mode of Relaxing Insects.—A correspondent asks (Entom. ix. 137) how best to do this. I venture to offer the following suggestion, from the experience of an old collector. The plan I have adopted for some years, and found very successful, is at any rate a very simple one. I lay fine sand, about an inch deep, on the bottom of a common vegetable-dish, and saturate it with water. On this wet sand I lay a piece of cork, and distribute over it the specimens to be relaxed, always taking care that the wings do not touch the sand; and then put on the dish-cover to concentrate all the damp air. In twenty-four—or at most forty-eight—hours the insects will be quite sufficiently relaxed for laying out. I have in this way relaxed hundreds of specimens sent from abroad, chiefly from India, which came to me with their wings folded together and slipped into envelopes, and thus packed in cigar or biscuit boxes. I once relaxed above one hundred specimens from China, which had laid in their envelopes above twelve years. I found the most obstinate of them give way after being under the influence of this cold vapour-bath a couple of days.—[*Rev.*] *J. Cave-Browne; Detling Vicarage, Maidstone.*

Miles and Grease (Entom. ix. 140).—The use of corrosive sublimate is, in my opinion, always to be avoided: it rarely fails to seriously damage the appearance of the specimens to which it has been applied; causing, moreover the subsequent corrosion and brittleness of the pins. "En passant," it has often occurred to me to ask what the supposed advantage may be in the extreme pliability of the entomological pins; rather than an advantage, it seems to me a very great defect, as

should there happen to be (which is often the case) a hard place in the cork the pin doubles up, and thus many a valuable insect has been destroyed. When mites are detected, the spot where the little dust that betokens their presence is collected underneath the specimens should be well saturated with phœnic acid, or an alcoholic solution of carbolic acid, which will do as well and is cheaper; the body of the insect also, except in the case of green insects, when benzine should be employed. Grease, though troublesome, is by no means impossible to get rid of. In this case exception is to be taken to the established rule that "Prevention is better than cure." It is far better to let the specimens get greasy than try to prevent it, as with the most skilful manipulation stuffed bodies cannot but look unsightly. When they have become greasy the bodies must be broken off, and soaked for a time—varying according to size—in benzine. My friend Mr. Corbin showed me in his cabinet such large bodies as those of *Acherontia Atropos* treated in this way, every trace of grease being removed. He gave it as his experience that *Atropos* is very liable to grease: this varies with my own; I have never had a greasy specimen. It is well, unless absolutely necessary, not to saturate the wings with any preparation, as it frequently results in the disarrangement or matting together of the cilia, which cannot afterwards be put right. Dr. Lees tells me that he considers grease rather as a preservative than otherwise. To quote his words:—"I do not regard it as a putrefactive change, but in its nature rather the opposite (though it spoils the look of specimens), and more analogous to a peculiar fatty production which takes place in dead human and other bodies, after they have been interred some time. The whole body often becomes changed into this peculiar solid, greasy matter, which is very imperishable."—*Joseph Anderson, jun.; Chichester, Sussex.*

Grease and Mites.—I see several correspondents enquire about grease and mites. I am now pursuing a course with my collection which I believe to be a perfect preventative of both, and intend to replace all my common moths this season. My plan is this:—When the insect is killed I clip the body open (underneath), and take out the inside; I then fill the skin with plaster of Paris, and place it on the setting-board. When it is fit to remove I take it off the board, and,

by means of the setting-needle, poke all the plaster out again, and wash the inside of the dried skin with a solution of corrosive sublimate and spirits of wine. The body may then be filled with cotton, if thought proper. I have specimens of *Dicranura vinula* done in this way three or four years ago, which look as fresh as if bred but yesterday; and the person who gave me the hint had a long series of *Salicis*, every one with bodies as white as snow.—*S. L. Mosley; Almondbury Bank, Huddersfield.*

Preserving Larvæ.—I am glad to see entomologists are turning their attention to this branch of study. I do all mine by inflating over a spirit-lamp, and have preserved larvæ from *Ligniperda* down to a *Depressaria*, including *Chrysorrhœa*, *Auriflua*, &c. My greatest difficulty has been with the green larvæ, such as *Pieris Rapæ*, *Plusia chrysitis*, &c., which not only lose their beautiful green tint, but assume a very ugly brown. I have tried colouring, both internal and external, but with very little success; and have many times been very vexed when correspondents have sent me such larvæ to operate upon, and have had to return them in such an unsatisfactory state. I disagree with Dr. Knaggs, when he says that preserved larvæ, pupæ, &c., should be kept in cases separate from the imago; I think it is the very use of them, that they should be placed side by side in the same drawer. I not only do this, but include the food-plant as well, dried in a natural position, and the larvæ mounted upon it.—*Id.*

Podalirius and Machaon.—Having only quite recently returned to England from the Continent, I find a large accumulation of the 'Entomologist' at my house, which have not been forwarded to me by my friends during my absence; and, upon looking over them, I see numerous questions and answers relative to *Machaon* being double-brooded. In the neighbourhood of Coblenz, where I have been for the last two years and a half, *Machaon* is undoubtedly double-brooded. I find on reference to my last year's diary (1875, which was an extra good year for both *Machaon* and *Podalirius*, 1874 being quite the reverse) that I captured my first *Machaon* on the 13th of May, and captured them almost every day up to the 24th, when they ceased altogether, and did not reappear until August 10th, when they occurred in

equal profusion as in spring up to the 17th. During the intervening two months and a half numbers of the larvæ were found feeding on *Euphorbia Esula*. The difference in the size of the vernal and autumnal specimens was very striking, the earlier brood being so very much smaller. *Podalirius* absolutely swarmed during May. Of course, I am aware that it does not follow from the fact of *Machaon* being double-brooded on the Continent that it must also be the case in England; but anyhow it goes some way towards showing the probability of it. I have written these few remarks thinking they may interest the gentleman making enquiries about *Machaon*.—*George Eastham*; 13, *Manchester Road, Southport*.

Zygæna nubigena, Mann.—With reference to the occurrence of this species in Scotland (Entom. ix. 142) Mr. Birchall (Ent. Mo. Mag. iii. 33) says: "The specimens of *Zygæna* taken in Argyleshire, and noticed in the 'Zoologist' for 1861, p. 7716, as *Minos*, are *Nubigena*. I possess a pair of them, through the kindness of Professor Wyville Thomson.—*H. Jenner Fust, jun.*; *Hill Cottage, Falfield, Gloucestershire*.

Xanthia gilvago a Cannibal.—Early in June I beat from a wych-elm tree four larvæ of *X. gilvago* and two of *T. W-Album*. On reaching home the chip-box containing them was mislaid for about a week. On reopening it to-day I found not only the few seeds and leaves of elm had disappeared, but also the *Thecla* larvæ. I failed to find the slightest trace of their remains. To the best of my knowledge the larva of *Gilvago* has not been recorded as a cannibal, and was no doubt forced in this case by the mere necessity of hunger to content itself with this strange diet.—*Gilbert Raynor*; *Hazeleigh Rectory, Maldon, June 12, 1876*.

Oporabia filigrammaria and *Larentia cæsiata* near *Bury, Lancashire*.—Wishing to obtain larvæ of *L. cæsiata*, and, if possible, those of *O. filigrammaria*, I visited two localities in this neighbourhood, where I hoped to obtain both species; nor was I disappointed, although *Filigrammaria* was not known to have previously occurred at one of the places worked. Some of the larvæ, especially those of *O. filigrammaria*, were found feeding quite exposed; others at rest; but the majority were obtained by beating ling (*Erica vulgaris*).

Although taken on ling both species will eat whinberry (*Vaccinium myrtillus*) quite as freely in confinement. On referring to my notes I find my first captures were made May 20th, *viz.*—three *O. filigrammaria* and sixteen *L. cæsiata*. My last and most successful attempt was on June 4th, when my bag amounted to one hundred and forty-two *O. filigrammaria* and thirty-six *L. cæsiata*. *Larentia didymata* larvæ were very numerous along with the above, and equally common feeding on whinberry.—*R. Kay; Bury, Lancashire, June 9, 1876.*

New British Tinea.—I forwarded a few *Tinea* insects to Mr. Stainton to name, which he very obligingly did. Amongst them was a *Tinea angustipennis*, “an insect,” to use his own words, “very rare on the Continent, and unknown as British.” Also *Tinea* n. sp. ? “unless it is an aberration of *T. rusticella*, which I do not believe.—*H. S.*” Both were captured in the summer of 1874, amongst a wilderness of weeds, near the Acton railway; since ploughed up—alas! *T. angustipennis* feeds on rotten wood; size $5\frac{1}{2}$ lines; prettily marked with black, orange, and purple, transversely; orange tuft on head. *Tinea* — ? 9 lines; markings as nearly as possible similar to *Ferruginella*.—*Thomas Sorrell; Bolton House Collegiate School, Turnham Green, Chiswick, May 16, 1876.*

Bees.—Bees seem very uncertain in their appearance; in some seasons certain species appear in numbers, and the next season none, or next to none, are to be found anywhere. *Nomada Jacobææ* abounded last year, whilst this year I did not see a single specimen. *Andrena Smithella* was tolerably abundant this year, and before I had only taken a single female. Bees are only to be found during the really fine weather of spring, summer, and autumn, when the country is in its loveliest state; and the situations they take one to are the most attractive,—where the wild flowers bloom. Can anything be more delightful than to find oneself in such a place? the air laden with the perfume of many flowers, and alive with these industrious little creatures, many of them humming over their work with as much variation in their notes as there is in an Eolian harp (I say many of them, for some are silent flyers). Their hum on such occasions as these is the contented hum of a self-satisfied bee; but they

have far different notes to these: just disturb them, and they will sometimes fly about one's head with an angry, shrill, piping note; then, again, take them in your fingers, and they will emit quite a piteous whine; some, instead of the easy, comfortable drone, hum with an eager, restless note, as if they thought every minute ought to have ninety seconds instead of sixty; and all intermediate notes may be heard.—*J. B. Bridgman* (in *President's Address, Norfolk and Norwich Naturalists' Society*).

The Hop Weevil (Entom. ix. 134): Postscript.—My friend has employed about a dozen men and women, night and day, to hunt his hops for this destructive creature. They remove the soil round the hop-stool in the day-time, and at night (having a light) they pick the weevils off the hop bine. This they have been continually doing for some time. Prior to my having written you on the subject, I had advised him to try hand-picking by night.—*E. R. Sheppard*; 13, *Limes Villas, High Road, Lewisham, Kent, S.E., May 24, 1876*.

Entomological Pins.—I have for some time thought that there is need of a rearrangement of the sizes of entomological pins. I applied to Messrs. Tayler last year to know if they would make me a new size, but they declined. I think if you appealed to the entomological world, through the 'Entomologist,' as to whether the need is universally felt, and they replied in the affirmative, no doubt Messrs. Tayler would meet their wishes. The new sizes I suggest are—one same length as No. 10, one between No. 10 and No. 15, one same length as No. 5,—all the same strength as No. 7 (or No. 15; I am not sure whether these two are of the same strength or not). This would give a graduated scale from length of No. 10 to length of No. 5, all the same strength; a strength which I think is best suited for all specimens, except some of the larger moths.—*C. Lemesle Adams*; *Walford Manor, Shrewsbury, June 23, 1876*.

Answers to Correspondents.

S. Bradbury.—*Name of an Insect*.—I enclose you a fly which I found in my pupæ-box. How it came there is quite unknown to me, as I do not think it is one of the Ichneumon

tribe, and I do not recollect seeing its like before.—*S. Bradbury*; *May 22, 1876.*

[The name is *Rophidia Ophiopsis*, a Neuropterous insect.—*Edward Newman.*]

T. H. Ormston Pease.—*Margaritata Buff-coloured.*—Is *Margaritata* often found of a buff tone? One specimen of this moth came to my window last autumn, of about the same colour as *Elinguaria*; and though I am aware they are to be seen faded to almost the same shade, I have not hitherto come across a living specimen.—*T. H. Ormston Pease*; *Cole Bank, Westbury-on-Trym, May 1, 1876.*

[I have seen specimens of the colour described, but they are not frequent.—*Edward Newman.*]

————— *Name of a Micro.*—Can you tell me the best method of preserving pupa-cases in a collection? I find that gum will not hold the more polished ones, while they are so light as to blow away with the least breath if not fastened down. Could you identify the following description? *Male.*—Entirely of a dusky black, wings narrow and rounded, posterior wings slightly fringed. *Female.*—Apterous, scaly, with a brush of fine hairs on the last segment, giving the body a truncated appearance. Antennæ of female very short. I found two cocoons of a dirty white colour attached to the top of some park-railings, from which the above-described moths emerged last autumn.—*T. H. Ormston Pease.*

[I scarcely like to mention or suggest a name. Will any correspondent kindly help me?—*Edward Newman.*]

G. Tucker.—*Food of Saturnia cynthia.*—Will you kindly inform me, through the columns of the 'Entomologist,' of the food-plant of the larva of *Saturnia cynthia*? a species of silkworm moth.—*G. Tucker*; 242, *Prospect Place, High Street, Sheerness-on-Sea, April 21, 1876.*

[I have never bred this species, but have seen it feeding greedily on oak and plum: I cannot say with what ultimate success. Perhaps some entomologist who has successfully cultivated it will kindly give the required information. At the same time, information respecting the other silkworms, now so commonly cultivated, will be acceptable.—*Edward Newman.*]

Food of Saturnia carpini.—Mr. Edwards (*Entom. ix. 142*) may be interested to know that last season I fed up some

larvæ of Carpini on chestnut, which they seemed to prefer to anything else, as they would leave both heath and birch for it.—*H. Jones; Hawley, Farnborough Station.*

Extracts from the Proceedings of the Entomological Society of London.

JANUARY 5, 1876.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

Lepidoptera of the Higher Alps.—The Rev. R. P. Murray exhibited a collection of Lepidoptera taken by himself in the Higher Alps, amongst which were some interesting mountain varieties.

Æschna mixta at Norwood.—Mr. S. Stevens exhibited a specimen of a dragonfly, rare in this country (*Æschna mixta*), which he had picked up, nearly dead, in his garden at Upper Norwood, in the middle of November.

British Coleoptera.—Mr. Champion exhibited specimens of Coleoptera, *viz.*, *Alcochara hibernica*, *Rye*, taken at Slieve Donard, Ireland; *Homalota egregia*, *Rye*, from Caterham; and *Cryptophagus subfumatus*, *Gyll.*, taken in the London district.

Remarkable Species of Attacus.—Mr. W. H. Miskin, of Queensland, communicated a description of a new and remarkable species of moth belonging to the genus *Attacus*, of which a male and a female specimen had been taken in the neighbourhood of Cape York. He had named the species *A. Hercules*. The expanse of the wings measured nine inches, and the hind wings were furnished with tails. The specimens had been deposited in the Queensland Museum.

JANUARY 24, 1876—ANNUAL MEETING.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

[The President gave an able summary of the progress of Entomology during the year, from which the following are extracts.]

Bees and Wasps.—Sir John Lubbock has recorded in the 'Journal of the Linnean Society' (May, 1875, No. 69) various interesting experiments in continuation of his "Observations on Bees, Wasps, and Ants:" tending to show that bees "do

not communicate with their sisters, even if they find an untenanted comb full of honey;" that, far from exhibiting "any evidence of affection, they appear to be callous and utterly indifferent to one another;" that even "their devotion to their queen is of a most limited character;" and that their perception of differences of colour is incontestible,—a deduction equally applicable to wasps. Some experiments were also made "with the view of ascertaining whether the same bees act as sentinels." Having found that particular scents had the effect of calling the bees out, he marked twelve, in all, of those which first appeared on several successive days; and, in nine such experiments, "out of ninety-seven bees which came out first, no less than seventy-one were marked ones." He likewise tested some of the faculties attributed to ants, and especially their "power of communicating facts to one another," which his first recited experiments served to corroborate; although "some appeared to communicate more freely with their friends than others," which did not summon their companions to assist them. By a further series of "Observations" on these races, more recently read before the Linnean Society, and communicated by the author to 'Nature' (No. 315, November 11th), we are also informed that one ant made no less than one hundred and eighty-seven journeys in a day to carry off larvæ one by one, without bringing any other ant to assist her; but, in other instances, a different result was witnessed, the ants which had the heaviest task to perform having "brought far more friends to their assistance than those which had apparently only two or three larvæ to remove;" these latter being replaced by others from time to time as each was carried off. Thus, "of thirty ants which were observed, those placed to a large number of larvæ brought two hundred and fifty friends, while those placed to two or three larvæ under similar circumstances only brought eighty." We also find that ants prefer a beaten track, however circuitous, to hazarding a short cut by dropping even "one-tenth of an inch;" but had retreat been cut off altogether, their ingenuity to devise some other mode of escape might have been more sorely tested. In these and other experiments upon the aforesaid social tribes, the most striking evidence is afforded of the indefatigable industry with which such observations

have been closely followed up from early morn to "dewy eve," and recorded with a precision rarely, if ever, surpassed; thus affording an admirable illustration how time may be stolen, as it were, for such objects, from other vocations, by activity and perseverance.

An interesting account of the habits and metamorphoses of a new species of *Sitaris* (*S. Colletes*), parasitic, as its name implies, on a species of *Colletes* (*C. succincta*, *L.*), has been given by M. Valéry Mayet in the 'Annales' of the French Entomological Society (Ser. 5, tome v., 1875), with two plates exhibiting the various stages of both these insects, from larva to imago; and of *Epeolus tristis*, *Sm.*, obtained from the cells of this *Colletes*. The primitive larva of the aforesaid *Sitaris*, as carefully described and delineated in this memoir, is furnished with *triungiculate* tarsal claws, like that of *Meloë*; whereas, in M. Fabre's remarkable life-history of *Sitaris humeralis*, the tarsi of the latter, in this stage, are represented as terminating in a single powerful claw (*un ongle puissant, long, aigu, et très mobile*). The young larva of *S. Colletes* is supplied with a caudal apparatus (*appareil fixateur*, V. M.), consisting of two upcurved spiked appendages attached to the base of the eighth abdominal segment on the dorsal region, having a simultaneous action up and down, between which are two tubular processes emanating from a superincumbent plate, and directed backwards, from whence filaments issue from time to time when the larva desires to affix itself to a hair of the bee or other object. Fabre, however, appears to consider such filaments, in the larva of *S. humeralis*, as ordinary caudal setæ, which he describes as attached to the exterior margin of the ninth abdominal segment (*l. c.*, p. 310). The *Colletes*-egg is readily accessible to the young *Sitaris*, not being deposited by the bee, as in the cells of *Anthophora*, upon the honey-store itself, but affixed above this to the wall of the cell, whereby the difficulty and danger to be incurred in reaching the same, and the necessity of effecting this manœuvre at the moment of oviposition, are avoided. As this *Colletes* constructs her cells and deposits her eggs in the autumn, the *Sitaris*-larvæ, soon after their birth, attach themselves to their victims, instead of remaining, like those of *S. humeralis*, seven months fasting in suspense, from the end

of September to the end of April, waiting for the Anthophoræ to emerge from their hybernacula. When more than one of these larvæ occupy the same cell of the Colletes, they fight with great ferocity until one alone remains, the others being killed and thrown into the honey; although it not unfrequently happens that even the victor in this strife, finding the egg partially consumed by one of his former adversaries, and consequently insufficient for his maintenance, shares the fate of the vanquished; but no such pugnacious dispositions are evinced at other times when consorting together in multitudes. Such contests are avoided in the cells of Anthophora, where a single Sitaris-larva obtains possession of the egg unmolested at the moment of oviposition on the honey itself; a circumstance upon which M. Fabre comments as a wonderful display of instinct on the part of these larvæ (*l. c.*, p. 326). The secondary larva of Sitaris Colletes, which plunges into the honey, continues to feed thereon until April or May of the following year. It is destitute of eyes or ocelli, but still retains the vestiges of legs, and is furnished with spoon-shaped mandibles, acting alternately in the feeding-process. Eight or ten days after ceasing to feed, the adult larva assumes the pseudo-chrysalis stage of corneous consistency, within the detached, but still closely-enveloping, larval pellicle, which Fabre aptly compares to a bag of fine gauze. M. Valéry Mayet designates this stage as the "*pseudo-nymph*,"—an appellation which he incorrectly attributes to Newport; for the latter, in his several memoirs on the transformations of Meloë (Linn. Trans., vols. xx., xxi.), always speaks of the "adult or *pseudo-larva*," referred to in his last memoir as the only intermediate stage in which he had found this insect (*l. c.*, p. 177),—for which stage M. Fabre has substituted the more appropriate denomination of "*pseudo-chrysalide*" (p. 356), as not giving birth at once to the imago form, but evolving, within the indurated tegument, a semi-active larval form, followed by an ecdysis of the latter preparatory to assuming the condition of a true pupa or nymph (p. 338). Neither he nor Newport ever allude to a *pseudo-pupa* or *pseudo-nymph*, applicable rather to the aforesaid semi-active stage, which Fabre was the first to notice, and which, from its close resemblance to the antecedent larva, he designates as "*la troisième larve*."

The pseudo-chrysalis of *Sitaris Colletes* exhibits this interior metamorphosis—as seen through the semi-transparent corneous tegument—after about ten weeks, towards the end of July or the middle of August; the perfect beetle emerging usually the following month; although in some rare instances—attributable, as M. Valéry Mayet conceives, to insufficient nutriment in the primitive stage, when the *Colletes*-egg has been partially tapped by other competitors—the ultimate metamorphosis is protracted until the autumn of the following year. In *Sitaris humeralis*, however, such retardation is the general rule; it being only in exceptional cases that some of these remain scarcely more than a single month in the pseudo-chrysalis state, completing their metamorphoses in August, and emerging shortly after. But they usually *hibernate* in the former stage; and it is only in June of the second year that the interior quasi-larval form is separated from the pseudo-puparium, and about five weeks later becomes transformed to a true *pupa-nymph*; the same month, in fact, when the adult larva had assumed its corneous tegument in the previous year (Fabre, *l. c.*, pp. 339—343). M. Valéry Mayet recognises this pupa as “*la véritable nymphe*” (p. 75); therefore the antecedent stage, or “*troisième larve*” of Fabre, and not his “*pseudo-chrysalide*,” can alone constitute the *pseudo-pupa* or “*pseudo-nymphe*.” Thus the *Sitaris humeralis* usually requires two years to complete its metamorphoses, hibernating the first year in the primitive larval condition, and the second in that of the pseudo-chrysalis; whereas the *Sitaris Colletes*, commencing its operations seven months earlier, generally attains maturity within a single year. The early transformations of two other species of *Meloïdæ* have also been investigated by M. Jules Lichtenstein, of Montpellier, who succeeded in nurturing one of the primitive larvæ of *Meloë cicatricosus* on the egg of a *Vespa vulgaris* placed upon honey in a glass tube, and in witnessing its first metamorphosis five days later, when it plunged into the honey, but died after feeding thereon twelve days. This secondary form differed essentially from that of *Meloë*, described and figured by Fabre, apparently constituting an intermediate stage, closely resembling the antecedent larva, but destitute of caudal setæ, with lacteous head and black eyes (the subsequent stage being blind), looking like a

minute salamander, with its legs distended on the honey. Experiments were also tried with the primitive larvæ of the blister-beetle (*Cantharis vesicatoria*), which could not be induced to feed on the eggs of *Vespa* or *Polistes*, nor on simple honey, beyond a few feeble attempts; but eventually they accepted the honey-bag of the hive-bee as an available substitute for their ordinary food, affixing themselves to this and thriving thereon. In one instance also a compound of honey and young *Polistes* larvæ proved equally successful. These primitive larvæ are of a brownish black colour, with the second and third thoracical, and the first abdominal segments, more or less pallid, having the usual long caudal setæ and triunguiculate tarsal claws. After the lapse of nine days they changed to the secondary form as aforesaid. Three of these attained the third stage, having still well-developed legs (*pattes assez bien conformées*), but with no indication of eyes, coinciding in this respect with those of *Meloë* and *Sitaris*. After a time, becoming restless as adults, they were placed upon some earth, waerein they hastily buried themselves, for the supposed purpose of completing their transformations, but contrary, as it would seem, to their accustomed habits. Here they appear to have perished, being no longer discoverable; their death being attributed to insufficient moisture. From the localities frequented by this *Cantharis*, where the burrows of *Halicti* also abound, M. Lichtenstein considers it probable that the larvæ of the former are reared in the cells of these bees; but, in such case, they could not quit those abodes to undergo their ultimate metamorphoses in the earth.

Spiders in the Bark of Trees.—Our attention has been called to a new trap-door spider from South Africa, which forms its nest in the bark of trees, recently described and figured by the Rev. O. P. Cambridge in the 'Annals and Magazine of Natural History' (November), under the name of *Moggridgea Dyeri*. The nests, however, figured by Mr. Pickard Cambridge, differ essentially from two which were exhibited at the July meeting of this Society; these being wholly imbedded in the solid bark, and having a hinged lid closely resembling the surrounding parts of the cuticle itself, as if retained *in situ*; whereas, according to a fuller description of the nests submitted to Mr. Pickard Cambridge,

published in the 'Field' newspaper of the 28th August, they were stated to "consist of a silken tube, scarcely more than an inch in length, rugged on the outside in such parts as may be exposed, and formed in the folds and interstices of the rough bark ('Annals and Magazine,' *l. c.*, pl. x., fig. A); the outer side of the lid, like that of the exposed parts of the tube, exactly resembling the surrounding surface of the bark." One of these tubes was "constructed in the channelled groove of a piece of wood which had apparently formed part of some building" (*l. c.*, fig. B). Other nests, somewhat similar to those referred to by Mr. Pickard Cambridge, were exhibited by M. Lucas, at a meeting of the French Entomological Society (November 10th); the silken tubes—carefully concealed by, and interwoven with, particles of bark—constituting a longitudinal distension above the surface, and ceding to pressure. No reference, however, has been made in any of these descriptions to tubes entirely hidden within the solid bark, having only the lid exposed. From the occupants of these novel abodes being destitute of the spines with which the anterior extremity of the falces is crested in allied races, assisting them to burrow in the earth, Mr. Pickard Cambridge considers that these spiders, "not being furnished with the necessary implements," fix "upon a position where excavation is needless." But in the other instances referred to, where the tunnel is equally short, scarcely penetrating beyond an inch, and not corresponding, therefore, with that of any wood-boring larva of similar dimensions, the fortuitous discovery of such a retreat would seem open to question; the fangs being possibly more available than the spines on the falces for operating upon the fibrous tissues, and an economy of labour being effected by utilising any convenient receptacle, as frequently witnessed among other excavators. Some doubts have been entertained whether the access to these domiciles is from above or from below. Mr. Pickard Cambridge now inclines to the opinion that the lid is placed at the upper extremity of the tube as usual, although evidence is wanting upon this point. An instructive account of the habits of this and other allied species, comprising also the preliminary details published in the 'Field,' has been given in 'Newman's Entomologist' for November last by the talented Editor of that periodical.

THE ENTOMOLOGIST.

No. 158.]

AUGUST, MDCCCLXXVI.

[PRICE 6d.

Agrotis tritici and *Agrotis aquilina*.



FIG. 1.—*AGROTIS TRITICI*.



FIG. 2.—*AGROTIS AQUILINA*.

As there is often some little difficulty in identifying these two species, I think it desirable to point out the difference, with the aid of the above figures.

Agrotis tritici usually appears a few days before its ally; and, although not invariably the case, it is generally more littoral in its habitat; for though frequently found with *Agrotis aquilina* inland, the latter is seldom found in the same numbers near the coast. In fact, *A. aquilina* is a more scarce species, and I have never found it in large numbers in any locality; whereas *A. tritici* may usually be

taken from the last week in July to the second week in August in profusion, either at sugar or on the flowers of the ragwort, even by day, on all our sandhills and heaths from the North of Scotland to the south coast.

A. tritici may be distinguished by the colours being more sharply bright than in *A. aquilina*; the ground colour of the fore wings is grayish brown,—that is, the gray is more visible than in *A. aquilina*, where it is suffused with a brownish tint, having a strong inclination to ochreous. In *A. tritici* the streak, from the base near the costa, is more sharply defined and lighter in colour. The subterminal line in *A. tritici* is much more distinct than that of *A. aquilina*; also the hind margin of the reniform stigma is much better defined; whereas in many specimens of *A. aquilina* it is scarcely visible.

A. tritici is much more variable than *A. aquilina*: it varies from a strongly-marked, clean, black and white form,—very like *Agrotis obelisca*,—to an almost unicolorous brownish gray, without any distinct marking; while *A. aquilina* only varies in intensity and depth of colour. *A. aquilina* is larger, and a generally stronger moth.

Let me advise all who have any doubt about the identity of either species to rear each from its early larval state. The larva of *A. tritici* may be found commonly during May at the roots of the various species of stonecrop which abound on our coasts, especially *Sedum acre*, as well as at the roots of grass and of almost any flowering plant; while that of *A. aquilina* more frequently feeds upon the leaves than the roots. The larvæ of both species feed at night.

Agrotis tritici.

The head of the LARVA is shining pale brown, marbled with darker brown; the 2nd segment has a dark brown smooth plate; along the back is a broad gray-brown stripe, followed by a narrower line considerably paler, and a narrow lateral stripe on each side, also pale brown; the

Agrotis aquilina.

The LARVA of *Agrotis aquilina* is slightly larger than that of *Agrotis tritici*: the head is light gray-brown, marbled with very dark brown; the back dingy brown; the dorsal line pale brown, which with the subdorsal line runs through the blackish plate on the 2nd segment; below this

sides of the larva are dingy green, divided by a narrow gray stripe; spiracles black. Full fed middle to end of May.

The size of the IMAGO is 1 inch 1 line to 1 inch 4 lines. Fore wings grayish brown, a very pale gray streak from the base of the wing near the costa; stigma much paler; hind edge of the reniform stigma being well and distinctly marked; three black wedge-shaped spots precede the somewhat distinct subterminal line. The perfect insects appear end of July to middle of August.

is a line of blackish green, then a thin gray-brown line, followed by another broad stripe of dingy dark green; the black spiracles being beneath its lower edge: the whole aspect of the larva of *A. aquilina* being dingy. Full fed end of May.

The size of the IMAGO is 1 inch 4 lines to 1 inch 5 lines. Fore wings pale brownish, with a strong tendency to ochreous; a pale ochreous-brown streak from the base near the costa; stigma much paler, with the hind margin of the reniform stigma scarcely defined, or lost; three or four blackish wedge-shaped dashes precede a very indistinct subterminal line. The moth appears late in July and early in August.

JOHN T. CARRINGTON.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 150.)

53. *Dryophanta disticha*, Hart.—This gall appears on the under side of the leaves of *Quercus sessiliflora*, and is not visible on the upper side. It is of a cylindrically-spherical shape, and grows generally to a height of four millimetres, with a little longer transverse diameter. It adheres to a side rib by means of a very short pedicle, and is much compressed at that spot; it is also flattened at the top, and has in the centre an umbilicated papilla. It is



rather hard, bare, somewhat shining; at first (July and August) of a yellowish white, which changes later on to a yellowish brown, and often slightly rosy. This gall differs from the preceding species in having two cavities in the interior, one placed above the other, the lower of which contains the larva, and is only confined at the base by a thin wall; the small, upper cavity, however, is surrounded with a thick and loose layer of gall-substance, and separated from the larva-cell by a thin cellular diaphragm. The gall-fly is developed late in the autumn; and, according to Von Schlechtendal, leaves the gall in October and November; while Schenck gives spring as its flight-time.—*G. L. Mayr.*

Fig. 54.



D. CORNIFEX (and in section).

54. *Dryophanta cornifex*, Hart.
—This horn-shaped gall appears in June on the under side of the leaves of *Quercus pubescens*. It is at first green, but becomes yellowish brown, often with a reddish tinge; it is shining and moderately hard, and on an average attains to one millimetre in length by two millimetres in diameter; its base is situated in a cup, of from two and a half to three millimetres in diameter, the margin of which is angular, with a more or less depressed centre. It adheres to the rib of the leaf in such a manner that the point of attachment is not visible from the upper side. The gall is sometimes

a little narrowed below the middle. In rare cases it has a small lateral strobile or cone, and is also conical at the top. Interiorly the gall contains a vertically-placed larva-cell, without an inner gall. From galls collected in October, and kept in a room, the flies emerged in November and December, but they require to be kept rather moist.—*G. L. Mayr.*

This species is Hartig's *Cynips carnifex*, *Kollar* (Germ. Zeit. iv. 405). One specimen of *Synergus pallicornis* was bred by Tschek, as recorded by *Mayr*. The gall does not occur in Britain.—*E. A. Fitch.*

Goings and Observations among the Aculeate Hymenoptera during 1875. By J. B. BRIDGMAN, Esq.*

THE past season has been the worst I have had for working the Aculeate Hymenoptera since I commenced the study, for though in novelties and rarities I have had no reason to complain, yet the days on which they could be collected have been very few: a few in April, the end of May and beginning of June, and a fortnight in August, were about the only occasions when there was a succession of fine weather.

Many causes probably combined to render these insects so scarce. To the want of fine weather must be added, in some degree, the long-continued cold of the previous winter, which lasted till late in spring, the first fine warm day we had occurring on the 29th of April. Another cause may have been the unprecedented drought of the summer of 1874, which materially interfered with the growth and flowering of many plants, thereby causing a great falling off in the quantity of pollen and honey, both of which are essential for food for the larvæ of the bees. Still another fruitful cause of their scarceness was, no doubt, to be found in the prevalence of north and east winds, and sometimes the two combined. Cold winds or dull weather are very prejudicial to these insects: they will not stir from their burrows while either prevail; should a cloud even pass between them and the sun they will remain quiet on whatever flower they may happen to be till it is passed, and if of long duration they seem to fall into a deep sleep, or to be almost entirely numb.

In consequence of the cold spring all vegetation was backward; but when it did burst into bloom, and sunshine came, the early bees, which had been retarded by the cold, swarmed in some species. Amongst them was the hitherto unknown female of *Andrena binaculata*, a beautiful insect belonging to the division with red or partial red abdomens; the male was named by Kirby, who took it twice at Batham. Mr. Smith says in his book there are only two specimens known, and these are in the collection of the British Museum. I was fortunate enough to take a few males on

* ('Transactions of the Norfolk and Norwich Naturalists' Society' President's Address), 1875—6. Norwich: Fletcher & Son. Price 3s. 6d.

Mousehold three years ago; this year they literally swarmed, not only on Mousehold, but all round Norwich. This species seems to be free from the attacks of the parasitic *Stylops*. I suppose I handled over a hundred, but not one of them had a *Stylops*, although they were in abundance in *Andrena atriceps* and *A. convexiuscula*, both of which insects were found in the same place, at the same time.

Another *Andrena* was found in tolerable plenty at the shallows. The male and female of this bee greatly resembles the same sexes of *Andrena dorsata*, an insect not uncommon at the flower of the bramble during July and August. No bee like this latter has yet been recorded, that I know of, as having been captured in the early spring. Mr. F. Smith has identified this as *A. combinata* of Kirby, at one time thought to be a variety of the former insect. Kirby, unfortunately, frequently omitted to give the date of capture, which has in this and another instance given rise to a slight confusion of species.

I have not troubled you with a more lengthy description of these insects, because Mr. Frederick Smith is preparing a second edition of his 'Catalogue of British Bees,' and it will then be done by a far abler pen than mine, and, what is more important, correctly so. With these, at the shallows, the rare *Andrena Smithella* was not uncommonly found.

At Brundall, in the middle of April, I took a *Nomada*, which, I believe, is new to Britain. It is not much unlike *N. lateralis*; the latter, however, occurs about a month later. I am sorry to say the rough bank on which I found the two specimens (females) is now cut away to make a railway-siding. Though these species of *Andrena* were plentiful, many of the early ones were hardly represented: of *Andrena Gwynana* and *A. parvula*, which generally abound on the first fine day towards the end of March, scarcely a specimen was to be found. Kirby divided these little bees into three species,—*Parvula*, *Nana*, and *Minutula*; but recent writers have considered *Parvula* as simply a variety of *Minutula*. This appears to me to be an error, probably caused by the absence of a record of dates of the appearance of these species of *Andrena*. This genus, as I have before observed, has, as a rule, but one brood in the year, and the three species appear successively, commencing with the earliest

day of spring and continuing to the end of August. The black-faced male appears with *Parvula* at the end of March or beginning of April, and lasts till about the end of May. In the middle of May are to be found white-faced males, and the female *Nana*; and, at the end of June or beginning of July, there is another white-faced male, which differs from the previous one, and with this male appears a female, which at first sight might be mistaken for *Parvula*; but, as Kirby says in a footnote, the abdomen is of a different shape, and it is less hairy. These three species, being found in abundance close to the city, have enabled me to get a good series, with the dates of capture; and a close examination of these has led me to believe that Kirby was right in his belief of the three species.

Amongst the early bees is found one whose habits are veiled in mystery; it is a bee without the necessary hirsuties for conveying pollen. These are invariably absent in the parasitic bees, but it does not necessarily follow that all bees without these appendages are parasitic; for example,—the genus *Prosopis*, or *Hyleus*, is entirely without them, but are, nevertheless, constructive bees; the parasitic bee lays its eggs on the honey and pollen collected by another bee, when it finds one suited for its purpose. Many of these parasites are constant in their attacks on certain species of constructive bees; others (of which perhaps the best example is *Nomada ruficornis*) attack several species varying greatly in size, and consequently in the quantity of honey and pollen they collect for the future young. The *Nomada* vary in size according to the species they attack, the size being influenced by the quantity of food. The above-mentioned insect varies from three to six lines. As a rule there is not a great variation in the size of the constructive bees, but amongst the *Sphrecodes* there is just the same variation in size as there is in the *Nomada*; these insects are generally found running or flying about the dry banks infested by the *Halicti*, which, in the different species, vary as much in size as the specimens do in the species of *Sphrecodes*.

And it is not *Halictus* only that *Sphrecodes* attacks (that is supposing it to be parasitic), for in May last I found a large colony of *Andrena albicans*, which had made their holes in the hard ground by the side of a road, and flying about the

burrows were several large specimens of *Sphécodes rufescens*, busily hunting about the burrows, the entrances to which were not exposed, but each was covered by a little heap of dry dust, which is pushed out by the insect when forming the hole. Presently I saw a female *Andrena* turn its head downwards into one of the little heaps of dust, as they did when they wanted to enter the burrow; at the same instant up flew a *Sphécodes*, and, by tugging at its legs and wings, tried to pull the *Andrena* out, which at last—I suppose annoyed by the persistence of the *Sphécodes*—turned out and flew away, when the latter quartered the ground in all directions, as if searching for something it had lost, and, not being successful, prepared to fly away, when I captured it. These *Sphécodes* were large, and fairly corresponded in size to the *Andrena*, but there were no small ones about; and, as far as my recollection goes, I have not found large *Sphécodes* without finding large *Halicti* or *Andrenæ* in its vicinity, and small *Sphécodes* without small *Halicti*. Of course this may be only a coincidence, although I think it is more than that. Mr. Smith tells me he has seen them burrowing. This certainly goes far to prove that they are constructive bees; but still my opinion is that they are not so.

In the early spring I was struck with the enormous quantity of female wasps that were met with in every direction. This was not confined to this district, as many correspondents to the gardeners' periodicals noticed the same thing. One of them, who signs himself, "P. Grieve, Bury St. Edmunds," writing to the 'Gardeners' Chronicle' of June 19th, says:—"It has been his duty for the last twenty-eight years to count the slain wasps and hornets, for which one penny each is given, up to the end of the month of May. This season the numbers reached the enormous quantity of two thousand five hundred and sixty-six, and the sum paid for them was £10 13s. 10d.; about five or six per cent. of them were hornets. The numbers captured during the former seasons has varied from five hundred to six hundred, up to the unprecedented number of the present season." Several others have given statistics of numbers killed or paid for, all proving that the number of these insects has been enormous. The nests, however, in this neighbourhood, as far as my observation has gone, were not so plentiful as I expected they

would have been; many of the females must have been killed by the cold weather which occurred during the spring and summer.

The leaf-cutter bees, which make a thimble of pieces of leaves for their nest, and then close the entrance with circular pieces after having put in a sufficient mixture of honey and pollen, are said by Shuckard to fix the circular pieces in and hold them in their places by slightly springing them; but in a cell I examined of *Megachile maritima* the pieces were certainly cemented in their places round the edge with a substance which looked like wax laid on very thinly, but still clearly perceptible.

At Brundall, at the end of July, I had the good fortune to take another male specimen of *Macropis labiata*; it was at the little thistle. This makes the fifth specimen taken in Britain, which are all males; and I think, without doubt, establishes this as the locality for the one Mr. Brown took last year. There is hardly any doubt but that the female will yet be taken there, if looked for. At the same time and place I took two females of the rare *Nomada xanthostieta*; the bad weather, which prevailed at the time, most likely had something to do with my not taking more of either species. The day I took them the sun shone for full half an hour, when, as usual, a storm came on, and I got—instead of more insects—a wetting. *Andrena decorata* again abounded at the flowers of the bramble in this neighbourhood; and, though most plentiful, the red variety were very scarce indeed, nearly all being dark.

The flowers I have found most frequented by bees are willows, sallows, blackthorn, dandelions, veronica, sycamore, brambles, thistles, ragwort, hawkweed, heath, and the Umbelliferæ.

In conclusion, should any feel inclined to study this very interesting branch of natural history, I shall be most happy to render them any assistance that lies in my power.

J. B. BRIDGMAN.

Description of the Larva of Nola albulalis.—The larva of this insect has been known for some time past, but hitherto

no description has appeared in entomological journals, and no record of its habits has been supplied for the benefit of entomologists. During the present summer I have been able to search in the locality where Dr. Allchin and Mr. Chaney first captured this species twenty years ago, and I succeeded in finding a sufficient number of larvæ to take descriptions from, and to enable me to observe the method of pupation. Length half an inch when at rest, longer when crawling. Width one-fourth the length, nearly uniform; this gives the larva a short and stout appearance. Ground colour,—two very distinct varieties,—(1) pale yellowish green; (2) bright orange. There are six raised tubercles on each segment, forming two rows on the dorsal area, and two rows on each side; from each tubercle springs a tuft of long whitish hairs. The tubercles themselves are usually of the ground colour, but an intermediate variety of the larva occurs with the ground colour pale yellowish green and the tubercles orange. The markings are confined to the dorsal area. There are two rows of irregular-shaped black marks, forming in some instances well-defined lines, and in others merely rows of dots, each row being placed between the dorsal and second row of tubercles. In addition, the 7th and 11th segments possess a black band joining the two rows of markings together. The above markings vary much in distinctness. The head is small, sometimes of a pale brown colour, and in other instances almost black. Food-plant the dewberry. When full fed the larva selects a dry twig or culm of grass, upon which it spins its cocoon, formed of silk and portions of bark or grass interspersed. It commences by spinning the base of the cocoon in the shape of a flat boat, and when of sufficient size the edges are drawn together as a covering, fitting very closely round the larva. In this cocoon the change to pupa takes place, and the imago is prepared to emerge within the space of three weeks, or thereabouts.—*J. Platt Barrett; 34, Radnor Street, Peckham, July 12, 1876.*

Description of the Larva of Strenia clathrata.—Last year, at the end of May, the Rev. P. H. Jennings, M.A., of Longfield Rectory, kindly sent me a few eggs of this species: they were oblong-oval, and indented on the upper surface; the colour grass-green. On the 8th of June they hatched,

and the newly-emerged larvæ were dingy green, with the extremities tinged with yellow, and the head pale brown. On being supplied with the common white Dutch clover, they fed well until July 19th, by which time they were full grown, and description taken as follows:—Length about three-quarters of an inch, and of average bulk in proportion; the head has the lobes globular, is shining, rather hairy, and slightly notched on the crown; body cylindrical, and of nearly uniform width throughout; skin smooth, clothed with a few, almost imperceptible, very short hairs; segmental divisions distinct. The ground colour is bright green, darkest along the sides; the head green, with the mandibles brown; two parallel white lines extend through the centre of the dorsal area, enclosing between them an almost hair-like, white dorsal line through the centre of a band of the ground colour; the subdorsal lines are also white, as are also the broad spiracular lines, and there is another finer white line between the dorsal and subdorsal ones; segmental divisions yellowish; the spiracles very minute, black; ventral surface green, longitudinally striped with numerous very fine darker lines. Changes to pupa below the surface of the ground. The pupa is three-eighths of an inch long, rather stout, but tapering sharply towards the anal segment, which finishes with a fine point; the eye-, leg-, and wing-cases prominent; colour dark mahogany-brown. Part of the imagos emerged in the middle of the following month (August), but most remained over the winter, appearing as moths at the end of May and beginning of June last.—*Geo. T. Porritt; Huddersfield, July 10, 1876.*

Life-history of Agrotora nemoralis.—The eggs of this beautiful species are deposited on the twigs of its food-plant, *Carpinus Betulus*, singly or in small batches, about the first week in June, and are extremely flat and inconspicuous; on first seeing them one could hardly imagine them capable of containing life. Even when deposited on a smooth surface, like a pill-box, they are difficult to see, and when on the stem of the food-plant would almost defy the best pair of eyes to detect. The young larvæ hatch in about ten days, and at first feed on the under side of the leaves, beneath a loosely-spun web. After the second moult they gnaw little round holes in the leaf, just large enough for them to crawl

through on their feeding excursions, and through which they re-enter to their little silken abodes for rest and shelter. If touched or irritated, they crawl very quietly either backwards or forwards, Tortrix-like. When full grown they are about nine-tenths of an inch long, of a pale yellowish green colour, the head being of a slightly warmer tint of ochreous, and shiny; a few colourless bristly hairs are sparsely dispersed over the body, mostly along the spiracles. The larva spins up on a leaf, by neatly and compactly folding up a portion of it, in shape something like a "turnover-tart;" this it lines with silk, making it, doubtless, a secure and water-tight abode, to pass the winter, when of course it is detached from the tree,—a sport to the winds. The imago appears about the 20th of May following. It is extremely local, and I believe is entirely confined in this country to East Sussex, the reported capture at Willesden not being universally accepted.—*W. H. Tugwell; 3, Lewisham Road, Greenwich.*

Entomological Notes, Captures, &c.

Relaxing Moths and Butterflies.—If not over-working the subject, allow me to offer a few suggestions on the subject of relaxing moths and butterflies; as though your other correspondents say much that is most valuable on the subject, yet their various plans may not suit all hunters, especially those who have occasionally to trust their apparatus to a mule's back over high mountain-passes; and, notwithstanding all that has been written, one great principle, and which it appears to me is the principal one, appears to have escaped them,—that is, speedy relaxing and speedy drying. I find one of the ordinary pocket zinc boxes, corked top and bottom, the very best of all relaxing cases: damp both corks to saturation, place the box over a gentle heat (never more than you can bear your hand upon), and in six hours you may relax the most obstinate insect; shake off the dew-drops, or paint them off with a very soft brush, or even use blotting-paper carefully. Specimens thus relaxed dry in a very short space of time, and lose none of their freshness, because no putrefaction has time to commence. I have lately thus relaxed a large number of specimens sent me

from India with perfect success. For one large specimen I had to take the largest saucepan our small kitchen afforded, and by placing a piece of wood and cork across the middle, and filling the bottom with water, gave him a gentle vapour-bath, which relaxed him in five or six hours; and the specimen was perfectly dry on the setting-board in three days. Any plan which for five or six hours keeps the specimens in a gentle warm vapour will relax more speedily and dry more quickly than any other plan I have tried, and I do not find it affect either colour or plumage. For killing moths of all kinds I invariably use cyanide (poison) bottles of different sizes, filled very lightly with cotton-wool, which is placed in the bottles in small pieces, so that the contents may be carefully drawn out piece by piece. The moths bury themselves in the cotton-wool, and may be carried without shaking. Some, I know, have found this plan fail, and that small moths are rubbed. Much of this damage is caused in taking the cotton-wool out, if not placed in the bottles in small detached pieces. With all care some may possibly be damaged slightly. By what other plan can we ensure invariable success? Then I shall be answered: The process stiffens the specimens, and you cannot afterwards set them. I grant that it does, for twelve, and even twenty-four hours afterwards; but leave them in the bottle twenty-four hours and every specimen will be perfectly pliant, for the *rigor mortis* has ceased. I found this out by leaving some specimens by accident in a bottle for more than a week, and they set beautifully. When out for several days I pack all my small moths in layers between cotton-wool in one of my poison bottles (I drop one or two drops of water on the bottom and damp the cork), and can set them all with perfect ease at the end of a week; in fact, you might leave them three weeks without damage; and I find them travel admirably in this manner. I now never touch a moth with my fingers, except to insert the pin for setting; and the amount of midnight labour spared after a hard day's hunting on the mountains is a relief not to be despised. Can any of your correspondents give a hint as to the best means of handling the antennæ in setting? I mean the antennæ of Noctuæ, Geometræ, &c.; I cannot keep them straight on the setting-boards, do what I will. I have tried pins; small pieces of paper over them; but no plan satisfies

me: they will curl, or take the impress of the pins or paper.—[Rev.] *C. J. W. Tasker; Aigle, Canton de Vaud, La Suisse, July 13, 1876.*

Relaxing and Grease.—It long since occurred to me that if the common, cork-lined zinc collecting-box would, when the cork was damp, keep moths for hours in a fit state for setting, it would also relax those already stiff: and so it does—excellently, and in a short time; especially if, in winter, the box be placed a little way from the fire. Have any of your correspondents tried “Dyer’s spirit” for removing grease? It is more powerful than benzine; but, “Cave!” very inflammable. I just pour a little into a saucer and place the insects in it, and let them stay (in a draught) till the spirit is evaporated. A very greasy *C. ligniperda*, which benzine failed utterly to cleanse, yielded to the action of the above spirit.—[Rev.] *Windsor Hambrough; Worthing, July 6, 1876.*

Colias Edusa near Dublin.—It may doubtless interest the entomological readers of your journal to hear of the occurrence of this lovely butterfly in the immediate vicinity of the city. On the 25th of June I observed several individuals of this species newly-emerged from the chrysalis,—very brilliant insects,—in a locality where I had obtained this butterfly about nine years ago. I was then fortunate enough to capture both this species and the pale variety, *Colias Hyale*. Since that occasion, till the above-mentioned date, I have never seen the insect on the wing, although looked for yearly.—*Edward Williams; 2, Dame Street, Dublin, July 5, 1876.*

[*Colias Edusa* has often been reported from Ireland. We are glad to see another collector’s name from Dublin, as the lack of Irish collectors is to be deplored.—*Ed.*]

Colias Edusa.—*Colias Edusa* seems to be out rather early this season. I have already seen several in the neighbourhood of Plymouth; the first, June 23rd.—*J. Gatcombe; 8, Lower Durnford Street, Stonehouse, Devon.*

Early appearance of Colias Hyale.—On the 8th of June, while out collecting on the Folkestone Hills, I took a beautiful specimen of *Colias Hyale*. Is not this early? I never remember seeing it so early before.—*Charles Boden; 127, Tooley Street.*

Macroglossa stellatarum and *Charocampa porcellus*.—

Last August I was fortunate enough to find a number of the larvæ both of *Stellatarum* and *Porcellus*, which I was anxious to distribute amongst those who wanted them; but by the time the September number of the 'Entomologist' came out, nearly all had spun up, and consequently very many who were most anxious to obtain them were disappointed. As I believe I most likely shall find more, I should be glad to receive the address of correspondents wishing to obtain the larvæ I have before mentioned.—*H. Neale*; 22, *St. Martin's Church Street, Salisbury, July 22, 1876*.

Heliothis peltiger at *Blackpool*.—It may perhaps interest entomologists to learn that my brother captured a fine female of *Heliothis peltiger* on the 22nd of June, at Blackpool.—*J. W. Aspinwall*; 1, *Oak Bank, Withington, June 23, 1876*.

Lewania vitellina in the *New Forest*.—It may be interesting to record the capture of *L. vitellina*, at sugar, by Mr. George Tate, in the New Forest, in September last. He remained, however, in perfect ignorance of the importance of his capture, till the insect was recognised by a London entomologist. Mr. Tate has transferred it to my cabinet.—*J. G. Ross*; *Bathampton Lodge, Bathampton, near Bath, July 17, 1876*.

Cossus ligniperda at *Sugar*.—With reference to this species (as I do not think that it is generally known to be one of our sugar-visitors) I would just remark that I captured a fine specimen on the 20th July, which was freely partaking of the sweets; indeed, it seemed feasting upon the luxury to the same extent as a *Dersa* or *Batis* would.—*H. T. Dobson, jun.*; *New Malden, Surrey, July 24, 1876*.

Tillus unifasciatus and *Xylotrogus brunneus*.—On the 9th of July I detected a specimen of *T. unifasciatus* on some oak palings in this neighbourhood; on the following day I took another; and on the 12th two more, and lost another; on the 15th I missed another, as it fell amongst the long grass and escaped; on the 17th I took two more. *Lycetis caniculatus* was very abundant, and amongst them I detected seven specimens of the rare *Xylotrogus brunneus*. Is anything known in what trees these three species feed, as they evidently only come to suck the new wood? As the locality is close at hand, I visit the spot daily, morning and afternoon.

but most have occurred in the morning. Although I have been on the look-out for both of these species for the last thirty-five years, I never took them before.—*Samuel Stevens*; “*Loanda*,” *Beulah Hill, Upper Norwood, July 18, 1876*.

Entomological Pins.—I do not think Messrs. Tayler & Co. need make any additional pins for the use of British entomologists, but may safely cease making several sizes which are constantly used by some of my good-natured, but unpractical, correspondents. May I suggest to Mr. Adams, who writes upon this subject (*Entom.* ix. 160), that if he and other entomologists use the following pins for something like the purposes mentioned below, they will soon like these sizes to the exclusion of all others. Such is my own case, after having used them for about nineteen seasons. No. 6—gilt; for largest butterflies, Sphinges, &c. No. 8—gilt; for *Noctuina*, and other stout-bodied moths and larger Geometers. No. 10—gilt; for small Geometers, *Pyralides*, and large Tortrices. No. 18—gilt; for small Tortrices, and all *Tineæ*, excepting smallest. No. 20—gilt; for small *Tineæ*. The No. 18 is an especially useful pin. I wish if Messrs. Tayler & Co. are making any change, it would be to make the heads of all the pins somewhat smaller.—*John T. Carrington*.

Answers to Correspondents.

Eustace F. Clark.—(1) Can you tell me to what country the *Papilio*, *Helenus*, *Stalacthis*, *Susanna*, *Heliconea*, *Phyllis*, *Danais*, *Plerippus*, and *D. Chrysippus*, belong, as I have got them, but know nothing of their economy or habitat? (2) Do you know of any competent entomologist who would be willing to name beetles if I sent some to him? I prefer to go by the classification at the end of Mr. Rye's book. I can identify but few of my insects, and I know no entomologist—in fact, I doubt of there being many—in this neighbourhood. I have also many *Lepidoptera* I do not know by name. (3) I send you several wings of moths, found by me lying about all together on two successive days. I suppose they had fallen victims to some spider or beetle. Can you tell me to what moths they belong? There is one dark gray, with the

reniform and orbicular clear, and a zigzag line on each side of them, which I particularly want to ascertain among those I have sent.

[(1) You will readily ascertain the countries of your foreign Lepidoptera from Staudinger's list, which may be obtained through Trübner & Co., Ludgate Hill. (2) Any entomologist will be glad to name your captures, after you have done your best to do so for yourself from books; but it is hardly fair to depute *all* the labour to others; nor would such a course be useful to yourself, for you would learn much less from being told than from finding out by study. Newman's 'British Moths' and 'British Butterflies' will materially assist your labours, so far as Lepidoptera are concerned. (3) The wings are so damaged that—excepting *Noctua augur*, *Agrotis exclamationis*, and *Aplecta advena*, all of which you will be able to make out from 'British Moths'—it is impossible to identify the species. There was an interesting controversy, as to whether such a destruction of moths as you mention was caused by spider, or mouse, or bat, in the volume of the 'Zoologist' for 1866; and some additional notes were published in that journal in 1871.—*Ed.*]

S. Bradbury.—*Epunda nigra.*—Can you inform me if this species is double-brooded? as all the pupæ I have had emerged in May last year: one on the 11th this year; a very fine male on the 26th. I enclose a case, and I am of opinion that they feed upon the hawthorn, as I have only found them under that tree, and there is no other but ash. These trees grow in the middle of a fifteen-acre sheep pasture, with no herbage but turf. I will endeavour to find the larvæ as a proof.

[*Epunda nigra* is not double-brooded. You will see that the food given in the 'History of British Moths' is the great hedge bedstraw (*Galium mollugo*); also other herbaceous plants. The pupa having been found near the hawthorn is not proof that the larva feeds upon this tree. Many low-plant feeding larvæ go to the base of trees when turning to pupæ.—*Ed.*]

James Mudie.—*Insect Anatomy.*—I shall be obliged to you if you can tell me if the anatomy of insects is a subject which has been investigated to any extent, and, if so, what works would be the best guide for me in studying it?

[The subject of insect anatomy is treated in Newman's 'Grammar of Entomology,' and later, in his 'Familiar Introduction to the History of Insects.' Both these works are, however, out of print. There appears a demand for the latter, and it is to be hoped the publisher will eventually reprint it.—*Ed.*]

Saturnia Carpini.—In reply to Mr. Edwards and Mr. Jones (*Entom.* ix. 161), the larva of *Saturnia Carpini* will feed upon whitethorn as well as on anything; and, indeed, is sometimes found on the lower shoots of those whitethorn bushes which happen to be on or at the edges of our heaths.—*Geo. T. Porritt; Huddersfield, July 10, 1876.*

Extracts from the Proceedings of the Entomological Society of London.

JANUARY 24, 1876—ANNUAL MEETING.

Sir Sidney Smith Saunders, C.M.G., President, in the chair.

[The following is an extract from the President's Address.]

Relation of various Groups of Hymenoptera.—Dr. Müller has recently published a paper in the 'Bienen Zeitung' (July 2nd), whereof a summary appears in 'Nature' (No. 314, November 4th), to which a sequel is promised hereafter; wherein he treats of various groups of Hymenopterous insects, "in which we find a series of forms presenting more and more complex life-relations, accompanied by a higher and higher mental organisation;" the consideration of which gradations he considers "calculated to throw much light on the question—How has the honey-bee acquired its remarkable instincts?" Commencing with the Tenthredinidæ, as "amongst the lowest of Hymenoptera," exhibiting the simplest instincts in their mode of oviposition on the plant upon which they themselves subsist; he passes on to the Cynipidæ, where we meet with a new mode of life, their incision giving rise to the well-known galls; after which, proceeding to the "insect-piercing species," he considers that "this passage from phytophagous to carnivorous habits has not only led to the formation of many new species, but also to a greater complexity in the relation of the parents to

their young, and to a higher intellectual development, which is shown especially in the arrangements made for the nourishment of the larvæ; since it requires both greater energy and more intelligence to discover and attack a particular species of insect than merely to lay an egg on the plant which has served the mother herself for nourishment," the passage from the one to the other having, as he conceives, "been slow and gradual;" and, "on the basis of this increased energy, intelligence, and adaptability," a still further advance was made by other groups, which, to secure their eggs from molestation, transport their victims to a place of security, involving certain difficulties with which many may have found it impossible to cope. "Thus the ovipositor of the *Tenthredo* became the sting of the wasp; and thus those species which carried off their victim to a place of concealment would abandon the habit of laying their eggs inside the victim." But the *Tenthredinidæ* can in nowise be regarded as inferior in intellectual capacity to the *Cynipidæ*, which exercise no constructive ingenuity in the production of their gall-tenements, as exhibited by some of the former in the weaving of their reticulated cocoons and other artistic performances; while the admirable construction of their double-saws, whose "various modifications might furnish ideas for improved mechanical instruments," their multicellular wings, and, in some instances, highly developed fuscate and pectinate antennæ (*Schyzocerus* male, *Lophyrus* male) stamp them as infinitely superior in structural organisation to the *Cynipidæ*. Yet the natural affinities of these respective families prescribe their relative sequence and precedence in inverse ratio to their faculties and endowments. As regards the "insect-piercing species," their restrictive action being diffused over a vast extent of insect-life, as compensating influences against excessive fecundity, a multitude of these, distributed throughout the whole range, serves to maintain due equilibrium on either side; which is oracularly interpreted as having "led to the formation of many new species:" but this group consists of several very distinct races, the *Ichneumonidæ*, especially those consorting with the *Aculeate* tribes, being conspicuously superior in energy and intellectual development to the *Chalcididæ*, next in succession, reputed higher in the scale of structural

organisation and affinity. With respect to the further advance from the ovipositor to the sting, the non-existence of the first-mentioned instrument necessarily involves *external* deposition of the egg, with all the concomitant requirements of protection for the latter in a closed cell, and provision for the future progeny; but Dr. Müller would have us believe that, contrary to all analogy, some of the aforesaid "insect-piercing" races "carried off their victim to a place of concealment," and were thus led to abandon the habit of laying their eggs "*inside* the victim," when (as it would seem) *still furnished with the terebra*, whose presence or absence must necessarily determine, *ipso facto*, the mode of oviposition with its accessories; this organ, however (as we are taught), becoming converted into a sting by "slow and gradual" degrees, while, of course, in the active and essential exercise of its appropriate functions as an ovipositor, or otherwise not a single generation of these reforming groups, now become industrious constructors and purveyors, could have survived such transitional period! Moreover, it is not to the sting alone, but to the whole structural development, that such contrasts extend; comprising, *inter alia*, peculiar differences in the venation of the wings, corresponding among species allied in other respects, but having no functional advantage in the conservation of the race according to the modification theory; such characteristic exponents, in this and other orders, symbolizing the members of each kindred association with remarkable precision, and serving, coincidentally with other indications, to determine their otherwise natural alliances. Nor can it be averred that the relative expansion of wing or velocity of flight offer any solution of these diversities in the alary system; for the Tenthredinidæ, with their dilated wings and complex venation, are among the most sluggish of these races; while the Oxyuri, the Chrysididæ, and some of the Fossores, less amply endowed in these respects, are eminently prone to energy and vivacity. Dr. Müller, however, eventually demolishes his own superstructure, of progressive acquirements as a reliable principle of continuous advance to "more and more complex life-relations, accompanied by a higher and higher mental organization," by finally expressing his "opinion that the various proceedings by which the solitary wasps thus protect

their young against contingencies to which the insect-piercing species are liable, must have at first been arrived at with a consciousness of the object to be effected, but that they have gradually become instinctive, and are now unconsciously inherited from generation to generation." Thus the "increased energy, intelligence, and adaptability," which he adduces in the first instance as the "basis" of such advances made with a conscious object, have gradually lapsed into a retrograde stage of degenerate unconsciousness of purpose, merging into the more familiar phases of hereditary habit; although, as he subjoins, "it is impossible to watch a wasp at work without feeling that, with these inherited customs, or so-called instinct, much individual effort also comes into play." We have yet to wait for his ulterior comments on the instincts of the honey-bee, which, by a parity of reasoning, must be considered to emanate from conscious intellectual antecedents, since degraded to unconscious inheritance. Meanwhile another athlete, Dr. Anton Dohrn, has sprung up to contest the palm in a new arena, having published a pamphlet wherein he maintains the principle of universal degradation and retrogressive development, as opposed to, and entitled to supersede that of, universal progress!

"Who shall decide when doctors disagree?"

FEBRUARY 2, 1876.

Sir Sidney Smith Saunders, C.M.G., Vice-President, in the chair.

Habits of Cychnus cylindricollis.—Mr. McLachlan directed attention to an article, by M. Flaminio Baudi, in the 'Petites Nouvelles Entomologiques,' respecting the habits of *Cychnus cylindricollis*, which he had taken on Monte Codeno feeding on the body of a snail (*Helix frigida*), into the shell of which the beetle was enabled to thrust its head and long narrow prothorax. Some interesting remarks were made by Mr. Bates and others on the peculiar structure and habits of the insect, which appeared to have been found only on a very sterile portion of the plateau of the mountain, and in no other part.

Staphylinidæ of the Amazon Valley.—A valuable paper was communicated by Dr. D. Sharp, entitled "Contributions to an Insect Fauna of the Amazon Valley—(Staphylinidæ)."

Of this important group of Coleoptera 487 species were enumerated as inhabiting the valley, of which 463 were described as new, suggesting forcibly how little is really known of the Staphylinidæ of Tropical America. Dr. Sharp also stated that he had devised a method of covering and hermetically sealing the type specimens, which, he believed, would accomplish their almost complete preservation, and that he hoped soon to be able to publish a description of the method. The author concluded with remarking on the great importance of certain sexual characters in distinguishing the species.

MARCH 1, 1876.

Prof. J. O. Westwood, M.A., F.L.S., &c., President, in the chair.

Habits of Cychrus cylindricollis.—Mr. Bates read a letter from Mr. Tovey Blackmore to Mr. M'Lachlan, stating that he was much interested in observing a notice in the 'Proceedings' of this Society respecting the habits of *Cychrus cylindricollis*, reported by M. Baudi to feed on snails. He had already called attention (in the 'Entomologist's Monthly Magazine,' vol. xi., p. 214) to the fact that *Carabus stenocephalus*, Fairm., fed on snails, which in Morocco were so very abundant as to form a marked feature in the landscape by covering the bushes so thickly as to resemble, at a distance, clusters of blossom. He had captured in all eighteen specimens of this scarce *Carabus*, and of these fifteen were obtained either feeding on snails or climbing up bushes of *Retama*, which were covered with snails, especially *Helix planata*. The *Carabus* having an unusually long head, and the prothorax being narrowed anteriorly, enabled it to thrust its head and prothorax a considerable distance within the shell in search of its food. It belonged to a group comprising several species found in North Africa, which much resembled *Cychrus* in appearance, and which possessed characters sufficiently marked to entitle them to form, if not a genus distinct from *Carabus*, at least a subgenus of *Carabus*. One of them (possibly a *var.* of *C. stenocephalus*) occurred in the more northern parts of the Atlantic coast of Morocco, and had been named by Fairmaire *C. cychrocephalus*; and another species (*C. Aumonti*, Lucas) had been found at Oran

and in the Angera Mountains near Ceuta, which had a far narrower prothorax; but, as he had not met with it himself, he was unacquainted with its habits. He believed that other Carabi might be found whose habits were similar to those of *C. stenocephalus*.

Spring and Autumn Broods of Lepidoptera.—The President drew attention to a subject now being much discussed in Germany and the United States of America, with reference to the spring and autumn broods of Lepidoptera, which proved to be modifications of the same species. He was much interested in the subject, and would be greatly obliged to any entomologist who would furnish him with observations and notes as to the different broods.

APRIL 5, 1876.

Prof. J. O. Westwood, M.A., F.L.S., &c., President, in the chair.

Xylina lambda and Ebulea stachydalis.—Mr. F. Bond exhibited a specimen of *Xylina lambda*, taken near Erith, in September last, by Mr. W. Marshall, being the fifth instance of its having been taken in Britain. Also *Ebulea stachydalis*, taken by himself at Kingsbury, Middlesex, in June, 1862.

Common Gnat.—The President made some observations respecting the habits of the common gnat, in continuation of his remarks at the meeting of 4th November, 1872. [See 'Proceedings,' 1872, p. xxxi.] Large numbers of females had again appeared in his house at Oxford, not a single male having been observed; and he believed that they had hibernated in the house, appearing during the first warm days of spring. He also remarked that Dr. Leconte's valuable collection of Coleoptera had been presented to the University at Cambridge, Massachusetts.

Stylops Kirbii.—Sir Sidney S. Saunders exhibited two examples of *Stylops Kirbii*, taken on the wing by him at Hampstead, in the forenoon of the previous day. He had found eighteen males in all: one *Andrena* contained three undeveloped males. Mr. Enoch followed up this exhibition by an account of his own captures of male *Stylops* at the same time. He captured eleven on the wing, and one *Andrena* was taken with four individuals.

The Ephemeride.—Mr. Eaton stated that he was preparing

a Supplement (dealing with the limitation of the genera) to his "Monograph on the Ephemeroïdæ" (Trans. Ent. Soc., 1871). A considerable amount of new material had been most kindly submitted to him by Mr. Robert M'Lachlan, of Lewisham, and M. Herman Albarda, of Leeuwarden, comprising specimens from almost all parts of the world. Amongst the most interesting were some specimens in fluid from South America, and a collection from Sumatra. From the Amazonian collection in spirits, it would appear that the deficiency in legs in Campsurus and some of its allies was due to their being shed with the pupa-skin when the insect obtained well-developed wings. In some forms all the legs were then cast off by the female (this was apparently the case with Euthyplocia also); in others the anterior pair of legs was retained by the female, as it was seemingly by all males. The separation of the legs cast off takes place between the femur and the trochanter. The posterior legs would be useless to them, as on attaining the complete winged stage of development they retain the submarginal pellicle, and live but a few hours in the air. From Labat there were subimagines of a Cronicus, a genus known previously only from a fossil in amber from Prussia. Several new forms, whose existence was expected from analogy, were in these collections. The whole family seems to consist of associated series of genera. In every series the forms differ from one another in the number of setæ or wings; while in tarsi and neurulation and eyes they are very much alike. Such are a form distinguishable from Lachlania by the female possessing three long setæ instead of two only; another differing from Potamanthus (restricted) in the middle seta being extremely short and minute; and another which resembled Siphylurus, excepting in the possession of a long intermediate seta instead of a minute rudiment of one. There were many new genera allied to the typical Leptophlebia, in addition to the series of species associated with it in the Monograph as sections, which will now be separated as genera from it.

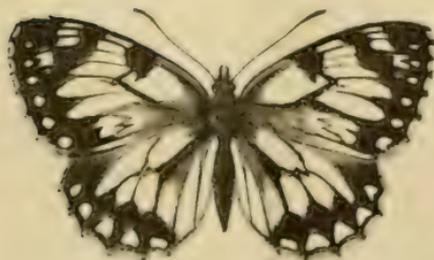
Japanese Butterflies.—The Rev. R. P. Murray stated that he was preparing a *resumé* of all the species of Japanese butterflies hitherto noticed, and that he would be grateful to any entomologist who could assist him with the loan of specimens.

THE ENTOMOLOGIST.

No. 159.]

SEPTEMBER, MDCCCLXXVI.

[PRICE 6d.



MELANAGRIA GALATHEA (varieties).

Varieties of Melanagria galathea.—The three specimens figured above were selected by the late Edward Newman from my collection, and have been carefully drawn by Mr. Willis. The upper specimen is a very singular *light*

variety, and is so very dissimilar from the type form that I need not describe the difference: the figure itself is, if anything, rather too dark, otherwise most beautifully represented; the under side is very light and remarkable: this specimen was taken on the south coast of Wales in the summer of 1871. The middle specimen is also a light variety of the insect; but its greatest peculiarity is the \approx mark placed sideways on the superior wings, and the form of the dark, somewhat triangular patch near the upper edge: this is a specimen I have had for some years, and was taken in Devonshire. The last, which is a very *dark* form of the insect, was captured near Dover three years ago: the white spots are mostly wanting round the superior, and partly round the inferior, wings. All the specimens are males.—*Samuel Stevens; "Loanda," Beulah Hill, Upper Norwood, August 18, 1876.*

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 172.)

Fig. 55.



A. URNÆFORMIS (and in section).

55. *Andricus urnæformis*, Fonscol.

—From July to late in the autumn we frequently meet with leaves of bushy *Quercus pubescens*, the upper sides of which are either turned down or partly rolled up, and more or less twisted and folded. On opening the leaf we find on the middle rib, at the point where it is thickest and most tightly rolled, a row of small, hard, barrel-shaped or oviform galls, of about the size of hemp-seeds, at first green, then of a rosy or reddish brown colour, with longitudinal striations. The gall is generally firmly attached to the midrib by a short peduncle, and has at the opposite end a saucer-shaped depression, with up-turned edges and a small wart in the centre. In section the gall exhibits

a moderately thin but hard wall, consisting of an outer layer, originally green in colour, but afterwards brown, covering the thin, brownish yellow, oviform inner gall. Most of the galls have fallen by the beginning of November; but in the following spring we often meet with leaves that have galls at their basal half, and have been prevented from falling by the thickening of the midrib. We have not been successful in breeding the gall-maker as yet. However, I have extracted a dead specimen from a gall.—*G. L. Mayr.*

The description of this specimen—a female—is given in a footnote. The gall is figured by both Malpighi and Réaumur. It does not occur in Britain. From the galls of this species, and from *N. ostreus* galls, Dr. Mayr bred a new *Synergus*,—*S. tristis*, *Mayr.*,—a species closely allied to *S. nervosus* and *S. Tscheki*. It occurred in the spring of the second year, as do also the other inquilines,—*Synergus vulgaris*, *Hart.*, and *Ceroptres arator*, *Hart.*—*E. A. Fitch.*

Fig. 56.



56. *Andricus curvator*, *Hart.* (*A. perfoliatus*, *Schk.*, *A. dimidiatus*, *Schk.*, *G. axillaris*, *Hart.*).—This very common gall appears by the end of April, when the leaves of *Quercus sessiliflora*, *Q. pedunculata*, and rarely those of *Q. pubescens*, begin to develop themselves. It appears on both sides of the leaf, often causing it to curl up, and looks like a green spherical swelling, of about the size of a pea. It often occurs at the margin of the leaf, when we find on the outer or exposed side a more or less distinct furrow, extending in a curve from the centre of the lower side to that of the upper side. This furrow is absent in those galls which grow in the middle of the leaf, and are surrounded by the parenchyma (*A. perfoliatus*). This gall is bare above, and covered with fine, short, sparse hairs below; only when on *Q. pubescens* is the gall piliferous on both sides. It is somewhat cartilaginous, and has a moderately thin wall enclosing a large cavity, to the sides of which the small, brown, thin-walled inner gall, which is scarcely the size of hemp-seed, loosely adheres.

A. CURVATOR ($\frac{1}{2}$ in section).

Two or three galls frequently grow together; then they all have but one cavity, with two or three inner galls. If the gall is developed at the petiole and extends to the base of the leaf, then the latter generally curls up, and does not fall off in the autumn, but, remaining somewhat undeveloped, decays in the course of the winter down to a few remains which adhere to the gall; and the axillar bud belonging to the leaf is developed into a short, crippled, bud-bearing axis (see Entom. ix. 51, fig. 38 a). This is the gall described by Hartig under the name of *C. axillaris*, and by Schenck of *Andricus inflator*. In other cases the gall is developed so near the base of the petiole that the whole stalk is affected by it and grows very crooked, and, being unable to develop itself any further, produces a swelling at the end of the small twig, which, on a superficial inspection, bears a strong resemblance to a curved gall of *Andricus inflator*. The gall-fly appears at the end of May or beginning of June.—*G. L. Mayr*.

This, as Mayr says, very common gall occurs throughout Britain, and its producer may be bred with very little trouble. It is particularly common in May; but I believe there is a second brood, rare compared with the first, the galls of which may be found in the autumn. *Synergus albipes*, *Hart.*, *S. facialis*, *Hart.*, *S. radiatus*, *Mayr*, are three inquilines occurring in its galls; *S. albipes* is by far the most frequent inhabitant of the three. Hartig also bred it from these galls, and I have frequently bred both it and *S. facialis*, with *Callimome auratus*, *Fonsc.* (= *C. mutabilis*, *Wlk.*, Zool., 1846, iv. 1458), *Callimome abdominalis*, *Boh.*, and *Platymesopus* (*Pteromalus*) *tibialis*, *Westw.*, from English specimens, all appearing in June and July of the first year. The following reference may also refer to parasitism in this gall:—"Eurytoma gracilis, a parasite, is from a gall formed on the midrib of an oak-leaf, which gave the leaf a very crumpled appearance; collected, August 3rd; imago out, August 10th." (F. Walker and H. Moncreaff, Entom. iv. 77.) Ratzburg's information is as follows:—*Entedon scianeurus*, *Ratz.*, very common in Terminalis galls, but bred from *Curvator* by Tischbein; amongst eighteen specimens so bred there was not a single male. This species is probably synonymous with *Olynx gallarum*, *L.* *Eulophus levissimus*, *Ratz.*, also bred by Tischbein: it was bred by Bouché from

Ornix avellanella; the male only is described. *Eurytoma* spec. *Pteromalus Cordairii*, *Ratz.*, bred by Tischbein, also from *Terminalis* galls. *Siphonura viridiænea*, *Ratz.*, one female, bred by Tischbein from "*Cynips curator*." *Torymus propinquus*, *Försk.* = *Callimome auratus*, *Fonsc.* *Mesopolobus fasciventris*, *Westw.*, a *Pteromalus* bred from many oak-galls: "Herr Tischbein again sent me some males in 1850, and they were from *Cynips fecundatrix* and *C. curator*." Although there is some little confusion in the above, all the specimens being bred by Tischbein show that we have several species of Chalcididæ parasitic in this gall.—*E. A. Fitch.*

Description of the Larva of Hemerophilla abruptaria.—Length an inch and a half; head prone, same size as the 2nd segment; body cylindrical, gradually increasing to the 11th segment; colour very light brown, mottled with various shades; the medio-dorsal line increases in width from its commencement to the middle of the 5th segment, and also deepens in colour; it then assumes a much lighter shade to the 8th segment, becoming darker on the folds of the segmental divisions; on the lighter portions there are two black dots above the middle of each segment, placed transversely; the 9th segment is again darker in colour, especially towards the edges of the line, which is irregularly defined; the 10th and 11th segments are darker on the divisions; on the 12th there is a black line running transversely, and assuming the shape of a bow; the sides are mottled with various shades of brown, being darkest towards the anterior portion of each segment, especially the 6th, 7th, 8th, and 9th; the spiracles are dark brown; the ventral surface is more mottled than the dorsal, with a black V-shaped mark appearing at the commencement of the 5th, 6th, 7th, 8th, and 9th segments; claspers slightly tinged with green, a black line on the first pair; the bow-shaped line on the 12th segment continues on the 11th, running under the 8th spiracle; a mark of the same colour runs under the 9th spiracle. I am indebted to Mr. R. L. Rolph, of Walthamstow, for the eggs of this species.—[*Rev.*] *P. H. Jennings.*

Description of the Larva of Hyria auroraria.—I am much pleased to be able to send a description of this species; and

for the opportunity of doing so I have to thank Mr. John Harrison, of Barnsley, who gave me a dozen larvæ on the 4th of September, 1875; and further sent me a supply of eggs on the 19th of July last. The egg is large for the size of the moth, is oblong-square, with the edges rounded, and considerably depressed on the upper side; the colour at first pink, afterwards olive-brown. The young larvæ fed, but grew slowly, on knotgrass until autumn, when they ceased feeding, and remained rigid on the sides of the cage or on bits of stick, &c., through the winter, and well into the summer of the present year; as, at the time in spring when most other hibernating larvæ were waking up, they persistently refused to show any signs of vitality beyond moving the front portion of the body backwards and forwards when touched. At this time they were about five-eighths of an inch in length, and were about the most soberly-attired larvæ I ever had, being in colour almost uniformly very dark dull brown (almost black in some specimens), and with the exception of a still darker double dorsal line, and being a little paler at the segmental divisions, there was no other colour or marking. The latter part of May having arrived, and finding they did not seem disposed to avail themselves of the various kinds of plants I endeavoured to induce them to accept as food, including *Plantago major*, *Anemone nemorosa*, &c., besides the *Polygonum aviculare*, I took them up into a warm room, and again gave them a plentiful and varied supply of provender. Here I had soon the satisfaction of finding that one of them had evidently set to work with a will, again on *Polygonum aviculare*, and by the 1st of July it was full grown, when I described it as follows:—Length three-quarters of an inch; can scarcely be called slender, though not stout; head the same width as the 2nd segment; it has the face flat, and is distinctly notched on the crown; body somewhat flat when viewed from above, but rounded ventrally; the 9th segment is the widest, and from it each becomes narrower to the head; the four posterior segments are of nearly uniform width, and about as wide as the 6th; the segments overlap each other considerably, rendering the divisions distinct, and also forming on each side a conspicuous lateral ridge; the skin is ribbed transversely throughout, and has a tough wiry appearance; in shape and habits it bears a very strong resemblance to many

larvæ of the *Acidalia*; ground colour a medium shade of brown, with a very faint pink tinge, and also appears to be slightly powdered with grayish; head brown, marked with grayish,—from it extends the distinct black double dorsal line; there are no perceptible subdorsal or spiracular lines, but the lateral ridge on each side is faintly outlined with pink; the ventral surface is a mixture of dull brown and smoke-colour, with a distinct slate-coloured median line. This larva spun up next day, and was the only one I reared to maturity; the cocoon was loosely constructed in an upper corner of the cage. I had no opportunity of describing the pupa until after the emergence of the imago, which event took place on the 18th of July. Afterwards I found the empty case to be five-eighths of an inch long, the wing-cases prominent, and the anal tip sharply cut; colour reddish brown, the wing-cases conspicuously streaked longitudinally with black.—*Geo. T. Porritt; Huddersfield, August 4, 1876.*

Entomological Notes, Captures, &c.

Pieris Rapæ var. *Aurea*.—Upon reading the paper, “On the Introduction of *Pieris Rapæ* into North America,” by the late Mr. E. Newman, I was anxious to discover the origin of the yellow variety now found there, and was induced to make experiments with a view to that discovery, and now send you an account of them, together with the results; but first I will quote Mr. Newman. After speaking of the rapid progress made by this destructive insect, and the ravages it has committed, he says:—“One curious circumstance attending the invasion of this butterfly is that in many parts of the country which it has colonised a new variety of a bright sulphur-yellow, called by Mr. Schudder *P. novangliæ*, has made its appearance. American entomologists are still in doubt whether this is a climatal or food change. It has been noticed by some of them that when the larvæ hatched from eggs laid by white individuals have been fed upon mignonette, the produce has been this yellow variety; whether the food was the cause or only an accidental coincidence is still under consideration. We do not know whether the experiment of rearing the larvæ of *P. Rapæ* entirely on mignonette

has been tried in this country, nor with what success, although, from the above facts being well known to our English Lepidopterists, it seems almost a foregone conclusion that the experiment has been tried." About the first week in June I planted a young cabbage in a pot, and taking a couple of females that were depositing their eggs placed them all under a bell-glass. They laid about thirty eggs; and after a week had elapsed I examined them every morning for the hatching of the larvæ, which appeared on the 18th. I then removed half and placed them upon a mignonette plant, also in a pot; these I bred under a bell-glass in the shade of a tree in the garden. The other half were left on the plant and placed in a hothouse, where the temperature was 65° to 70° , rising to 80° by day, and 85° when the sun shone: they changed to pupæ from the 30th of June to the 3rd of July, and emerged as perfect insects from the 9th to the 13th of July. The others, fed out of doors, were exactly a week later in changing to pupæ, and came out from the 18th to the 21st. Now for the results. I could not perceive any difference in colour between those fed upon mignonette and the others fed in heat: they were all the ordinary form of *P. Rapæ*; therefore it seems improbable that the food has anything to do with the change, as mine never tasted anything but mignonette from the day they were hatched. Now, it is well known that the variety of *Gonepteryx Rhamni* called *Cleopatra*, in which the orange spot on the upper wing is so enlarged as to be spread over nearly the whole of it, is found only in the south of Europe, and especially on the shores of the Mediterranean; and I think probably the yellow variety of *P. Rapæ* proceeds from the same cause, and is only another instance of the effect of increased warmth of climate in intensifying colour. Perhaps the failure of my experiments was due to my not having sufficient heat at command, as it was nothing like the temperature of some parts of North America. Mr. Curtis, in his 'Farm Insects,' mentions the capture near Oldham, in Lancashire, of a male specimen which had all the wings of a bright yellow colour. Have there been any similar captures in this country? If any readers of the 'Entomologist' have made similar experiments to mine, and been successful, I hope they will let us know the results; also any information with respect to where this

variety is most common, and the temperature of those parts would be most acceptable, and perhaps help to clear up what appears to me a very interesting question.—*R. A. Rolfe; Stuffynwood, near Mansfield.*

Vanessa Antiopa near Basingstoke.—A fine specimen of this insect was captured for me near this place, by a young friend, on the 17th inst. When given to me it was not quite dead.—*W. D. Milsom; Southern Road, Basingstoke, August 23, 1876.*

Vanessa Antiopa at Cheltenham.—This, like most other rarities, fell to my lot quite by accident, and when I was least expecting to make a capture. It was feeding upon the juice which was running down an elm tree, from a place where *Cossus* larvæ were feeding, in one of the public streets of Cheltenham. I climbed up the tree and endeavoured to catch it with my hat, as I had no net with me. It escaped, and flew into a gentleman's garden. Despatching a messenger for a net, in the cause of science I climbed over the palings, and pursued it over the flower-beds, capturing it eventually on some ivy. It was a fine female, and newly emerged. The date of the capture was the 5th August, 1871. Five other specimens were reported, as seen, to our College Natural History Society at Cheltenham; but mine was the only capture.—*E. K. Robinson; Sandcliffe, Rake, near Petersfield.*

Vanessa Antiopa in Filey Bay.—Yesterday, August 15th, whilst in a boat fishing in Filey Bay, I caught a *Vanessa Antiopa*, which settled on the sail of the boat.—*G. D. Armistage; North Dalton, Hull.*

Colias Edusa and var. Helice in Carmarthenshire.—My brother-in-law, Mr. C. A. Lord, this morning captured the first specimen of *Colias Edusa* that I have seen taken in Carmarthenshire since 1870, in which year males of the species were plentiful in this locality. The specimen taken by Mr. Lord is a female *var. Helice*, and was seen flying along the turnpike road. In the afternoon we repaired to the spot where *Edusa* had formerly been so abundant,—a steep hill-side covered with furze bushes, with here and there patches carpeted with flowers, and swarming with insect life. There were butterflies innumerable; but, being rather late on the ground, we only saw one *Edusa*, and that of the ordinary type. I have never seen this butterfly on the wing after four

o'clock in the afternoon.—*Owen Wilson; Cwmffrwd, Carmarthenshire, August 22, 1876.*

Colias Hyale—*Is it Double-brooded?*—Noticing several records of the occurrence of *C. Hyale* and *C. Edusa* in the 'Entomologist,' 'Field,' &c., for this year, as "early appearances," the question suggests itself whether it is generally thought they are specimens of a spring brood: this, I think, is undoubtedly the case. Last autumn *Hyale* was especially abundant in this neighbourhood; and Mr. G. H. Raynor had the good fortune to see one female deposit six eggs, which he collected. From this we can infer that the species does not hibernate; and from its appearance in May and June, and again in August and September, it must certainly be a double-brooded species, the spring generation, as with many other species, being much the rarer. My earliest *Hyale* taken this year was on the 10th June,—a beautifully fresh specimen; and since then I have seen five or six others. Last spring many specimens were seen and taken. It was abundant in the autumn that year. Should the weather be favourable we may expect a plentiful supply of the autumnal brood of both species—*C. Hyale* and *C. Edusa*.—*Edward A. Fitch; Maldon, Essex, August 7, 1876.*

Food-plants of Gonepteryx Rhamni.—After the statement of such an experienced entomologist as Mr. E. A. Fitch (Entom. viii. 302), that *Gonepteryx Rhamni* could be reared on "apple, pear, and medlar," I have this year made the experiment; and—whatever they may do in a wild state—in confinement, in this locality, the larva of this insect will not partake of any of these trees. Mr. G. C. Bignell was good enough to send me a larva, and I at once, and "without much trouble," set before it a tempting supply of the three trees mentioned by Mr. Fitch, leaving also a small portion of a somewhat dried-up leaf of buckthorn. By the following morning the scrap of buckthorn was entirely devoured, and not one of the other plants was touched. Having no buckthorn procurable in the neighbourhood, I sent to Mr. W. Holland, of Reading, for some; and for a day or two poor *Gonepteryx Rhamni* was left with nothing but the stale stalks of its natural food-plant. Apple, pear, and medlar, were all supplied with total unsuccess; not a particle was tried or tasted; and the unfortunate larva was compelled to seek a

resting-place on the side of the glass jar in which it was confined, and in which the stale stalks of the buckthorn remained, rather than take up a position on the other plants. Its food, however, arrived in time: Mr. Holland's supply was received on the morning that *Gonepteryx Rhamnii* stood a good chance of starving. The buckthorn was placed in the cage; the larva soon ascended the stalk, and that night rested happily in the midst of plenty. It is now a healthy pupa, and will probably be liberated shortly in the imago state to seek to propagate its species in a country where few are to be found.—*Owen Wilson; Carmarthen, July 21, 1876.*

Hermaphrodite Argynnis Adippe.—I have taken a perfect specimen of an hermaphrodite *Adippe*: the two right wings male, and two left wings female. Can you tell me if this is unusual?—*R. J. Stent; 70, Queen Street, Portsea.*

[This is both unusual and interesting.—*Ed.*]

In Search of Chortobius Davus, and what I obtained.—On my visiting the Albert Museum, at Exeter, to see the collection of insects of the late Mr. D'Orville, of Alphington, the curator in conversation informed me that *C. Davus* was taken many years ago on Yes Tor, near Okehampton, by a gentleman who collected butterflies, when on his school holidays. Knowing this to be an out-of-the-way place for entomologists to get at, I laid up the conversation in my breast, and determined to see for myself at the first opportunity. Thanks to the railway opening last autumn, that opportunity occurred this summer. Yes Tor is said to be the highest tor on Dartmoor; by the ordnance map it is 2050 feet in height. I started from Plymouth, 12th July, by the 10 o'clock train; and after passing through lovely valleys, woods, and moorland scenery,—for which the south of Devon is so famed,—I arrived at Okehampton at 11.40; and a beautiful bright day it was. I at once started for Yes Tor, net in hand, and ready for the first insect that turned up. On I trudged until I got on the top of the Tor, about 2.30; not a single *Davus* to be seen. While on the Tor I captured the only two insects I saw; after one I had a good run,—the wind blowing very fresh at that altitude, while 200 yards down it was a dead calm: they both turned out to be *L. pectinaria*. On my way up and down I only saw about fifty butterflies, nearly the whole of which were *C. pauphilus*.

I therefore conclude that the captor of the supposed *C. Davus* very likely was mistaken, and his *C. Davus* was *C. pamphilus*. Now, for what I obtained: not a single specimen for my cabinet, but on myself I was able to show the result of my walk, for the gnats (*Culex pipiens*) had served me most unmercifully, having bitten me on my neck, face, and hands, in about fifty places, each place swelling as big as a pea.—*G. C. Bignell*; 6, *Clarence Place, Stonehouse, Aug. 12, 1876.*

Lycæna Arion.—I went to Bolthead for *L. Arion* on the 17th of July, and only took one specimen. I was informed by a gentleman I met there, also collecting, that Mr. G. F. Mathew had visited it on the Friday before, and only took one. I should like to know Mr. Mathew's opinion as to whether it is likely that *L. Arion* will be exterminated in that locality.—*J. Brown*; *Exeter, August 7, 1876.*

Trochilium allantiformis.—A fine specimen of this rare insect was taken here by my cousin, Master S. W. Jenney, on July 15th, whilst basking in the hot sunshine on a laurel leaf.—[*Rev.*] *H. Harpur Crewe*; *Drayton-Beauchamp Rectory, Tring, July 28, 1876.*

Acronycta strigosa.—I have pleasure in recording a new locality for *Acronycta strigosa*. I took a single specimen flying at dusk along the side of a hedge of whitethorn and blackthorn, in Chatteris, on the 10th July last. A single specimen was also taken at sugar here two years ago. It does not seem to occur in any abundance here, as I subsequently sugared several times near the spot where mine was taken; but, as is usual with sugar this year, the result was a blank.—*A. Harold Ruston*; *Aylesby House, Chatteris, Cambridgeshire, August 12, 1876.*

Acronycta Alni.—I have had the good fortune this year also to breed *Acronycta Alni* from a larva, taken at Chatteris on the 18th August, 1875, the capture of which was recorded in the 'Entomologist' for October, 1875 (*Entom.* viii. 228). The insect emerged from the pupa on the 15th April, and is a female in perfect condition.—*Id.*

Acronycta Alni in *Carmarthenshire*.—On the 28th of July last my wife was so fortunate as to beat a larva of *A. Alni* from an oak tree, near here. This is the first time I have heard of this species having been taken in *Carmarthenshire*.—*Owen Wilson*; *Cwmffrwd, Carmarthen.*

Is Scopula decrepitalis Double-brooded?—In the last week of May this year I was in the Trosachs, in Scotland, beating the bushes, amongst which the whortleberry (*Vaccinium vitis-idaea*) grows in profusion: I then started three fine specimens of *Scopula decrepitalis*. I am not aware of its occurrence there before; but I am anxious to know from some of your northern readers if this moth is usually taken in May, as well as at its recorded time of capture, as given in books upon Lepidoptera, viz. July and August. I may add that the moth only occurred in a very limited area in the middle of this beautiful ravine. I had expected to have taken many good things, but the weather was so cold and wet that there were scarcely any insects about.—[Rev.] Windsor Hambrough; 40, Marine Parade, Worthing, July 20, 1876.

Variety of Geometra papilionaria.—Before this month I never had the pleasure of taking this insect; but since the 13th I have caught five specimens, all at light. One of these, which I caught on the 18th, is straw-colour, and not green, with the apex of the fore wing rather rounder than usual; the pale transverse lines are very faint, and the hind wings hardly so deeply dentate as usual. Is this a common variety or not?—H. H. Corbett; Ravenoak, Cheddleholme, Stockport, July 23, 1876.

Eupithecia satyrata var. *callunaria*.—In August and September, 1875, I collected a number of larvæ of *E. satyrata* var. *callunaria*, by sweeping the flowers of *Calluna vulgaris* on the Ross-shire Moors, near Alness. Very few moths appeared this spring; one couple, however, paired, and I obtained fertile eggs, from which I reared a small brood of larvæ, which fed up on the flowers of *Achillaea myriophylla*, *A. macrophylla*, and *Ptarmica mongolica*. They were very much larger and brighter, and more variable in colour, than their Ross-shire progenitors, and differed in no appreciable way from the larvæ of the typical *E. satyrata*, which I take in this neighbourhood. Mr. Buckler, to whom I sent specimens, says they are true, genuine, unmistakable *E. satyrata*. I take it, therefore, that it is now finally proved that *E. callunaria* is nothing but a northern variety of *E. satyrata*. [Rev.] H. Harpur Crewe.

Rearing the Larva of Bombyx Rubi.—There has always been a difficulty in rearing these caterpillars, as they usually

die in the winter. This year I have succeeded; and I believe the reason is that a bramble plant was growing in their box, and the larvæ constantly, even in mid-winter, used to come out of their hiding-place during the night and feed upon the leaves, of which there are always a few remaining till the spring.—*E. K. Robinson; Eagle House, St. Leonards.*

The time of Appearance of Pseudo Bombyces.—In Newman's 'British Moths' the time of pupation of *Ptilodontis palpina*, *Notodonta ziczac*, *N. dictæa*, *N. dromedarius*, and one of the *Drepanulæ*—*Platypteryx falcula*, is given as September or October. I have found both last year and this that the greater number of larvæ of these species spin up in the beginning of July, reaching their perfect condition a few weeks after; and this not only in breeding-cages, but in a state of nature. *Noctua brunnea* and *N. triangulum*, which I have bred from eggs laid in June, have already become pupæ instead of hibernating.—*F. K. Robinson; Eagle House, St. Leonards.*

Treatment of Larvæ of Chelonia villica and Pericallia syringaria during Hybernation; and of the Pupæ of Burrowing Larvæ.—Can any reader of the 'Entomologist' inform me the best mode of treatment of larvæ of *C. villica* and *P. syringaria* during hybernation? Mine have almost invariably died off or been attacked by fungus. Also, how to keep those pupæ which burrow underground? I have tried both damp and dry earth, and by the former mode lost many through rot or fungus; and by the latter they have become so dry as not to be able to escape from the pupal envelope. When damping them I kept them in a wooden cage, with a depth of earth about four inches, and a layer of moss above, and damped them about once a fortnight; by the latter mode I kept them in a friable earth, with moss above, and in a wooden box, as when damping.—*F. Stewart; New Cross.*

Acidalia emarginata, &c.—I took a nice series of this somewhat local species during the last week of July, and until the 8th of August: judging from their brightness and the perfect condition of the cilia, I should say the insects had but very recently emerged. Is not this unusually late for them? I should be obliged for information as to the food-plant of the larvæ. *Colias Edusa* and *C. Hyale* have both been captured here this month.—*Joseph Anderson, jun.; Chichester.*

Cidaria reticulata and *Hadena rectilinea* Larva at Windermere.—Yesterday I took a specimen of *Cidaria reticulata* at Windermere. In 1856 the late T. H. Allis and I took several specimens; from that time to the present (twenty years) I have gone every year, and to no purpose. It must be a rare insect. I must have gone at least fifty journeys, and it is over fifty miles to the lake side from Preston; then I have to row myself across, another mile: so this specimen has been hardly earned. The plant on which it is said to feed (*Noli-me-tangere*) I have this time found in plenty. A week or two ago I found a queer larva on the same plant, which puzzled Mr. Buckler; but from the last note I had from him it appears to be *Hadena rectilinea*. I suspect as there is bilberry near, that the moth has dropped eggs just where she alighted.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston, August 11, 1876.*

Lithosia sericea.—Last month I captured a few specimens of this insect. I should be glad to hear if anyone has met with this species in Cheshire this season? Newman's 'British Moths' gives Cheshire and Lancashire as the only counties where it has been observed. I have often enquired, but so far have failed to hear of anyone who has found the insect in Cheshire.—*R. Kay*; 2, *Spring Street, Bury, Lancashire, August 12, 1876.*

Hydræcia petasitis.—A brother collector, having noted a very likely place for *H. petasitis*, we agreed to attempt to find the pupa by digging. During the past week we have visited the place twice, for about an hour and a half on each occasion. The first time we each dug up about five dozen pupæ, and on the second occasion some three dozen, in addition to finding a few larvæ of the same species. We also found one imago at rest, which we considered very early.—*Id.*

PS.—I am pleased to be able to add that the imagos began to emerge on the 12th, and have appeared daily since; almost invariably emerging during dusk and night.—*R. K.*

Cossus ligniperda at Sugar.—Observing that Mr. H. T. Dobson has called attention to *C. ligniperda* as a "sugar visitor," I wish to state that scarcely a season passes without my capturing one or two specimens of this insect at sugar. Last July I caught two in one evening on sugared trees; but it has struck me as somewhat remarkable that every specimen thus caught is a female. This fact has given rise to a doubt

whether sugar attracts *C. ligniperda* in the same way that it does most of our Noctuæ. I am curious to know if males are ever found at sugar. Perhaps collectors will kindly favour us with their experience in this matter. I wish further to state with regard to this species that I have succeeded in rearing two fine male imagos from three larvæ found two years ago. I fed them on chips of fresh willow and sawdust, mixed with small blocks of the same wood. I kept them in a large flower-pot covered with glass. I mention this because *C. ligniperda*, like all internal feeders, is considered rather difficult to rear.—*W. McKae; Christchurch School, Hants, August 18, 1876.*

Cossus ligniperda at Sugar (Entom. ix. 183).—I have observed that *Cossus ligniperda* occasionally visits the sugar-bait. It may interest Mr. H. T. Dobson to know that I have on two occasions taken it: one specimen in August, 1871, and a fine female on July 20th of the present year. Both these were apparently feasting on the sugar with gusto.—*R. Laddiman; Upper Hellesdon, Norwich.*

Ephyra orbicularia and Acronycta auricoma.—On the 4th inst I was much pleased to find a beautiful specimen of *E. orbicularia* had emerged in one of my breeding-cages. I had beaten out the larva, but did not recognise it in that stage, never having seen it. *A. auricoma* I captured at sugar on the 18th inst. I have not taken either of these insects here before.—[Rev.] *P. H. Jennings; Longfield Rectory, Gravesend, August 21, 1876.*

Agrotera nemoralis near Herne.—I took a single *Agrotera nemoralis* in the Blean Woods, near Herne, on the 29th of May last; and have since ascertained that the woods are worked very regularly by persons interested in keeping the locality quiet, and that *Nemoralis* is one of the objects sought. This announcement may interest some of your readers.—*Fras. G. Whittle; 20, Cambridge Terrace, Lupus Street, S.W., August 23, 1876.*

Cnephasia lepidana Bred.—The last week in July, being at Witherslack, after *Elachista serricornella*, with my friend J. H. Threlfall, we came across a quantity of columbine in seed: we gathered some, and up to this time I have bred from it five specimens of *Cnephasia lepidana*; they are of the second brood. This cannot be its usual food-plant, as it does

not grow where the insect usually occurs.—*J. B. Hodgkinson* ; 15, *Spring Bank, Preston, August 3, 1876.*

Pachnobia alpina.—Can any of the readers of the 'Entomologist' suggest a food-plant for the larva of this species? The moths have been taken in considerable numbers this season, and timely information as to the food-plant may save the lives of many larvæ; it seems a pity to lose so good an opportunity of working out the life-history of this hitherto extreme rarity: 1876 may well be called the *P. alpina* year, as 1872 is that of *V. Antiopa*. One entomologist who knows the district where the captures have been made, perhaps better than any other, always prophesied that some day or other it would turn up in numbers. Like many other so-called rarities it only wanted hunting for; but Highland collecting is very different work to that of the woods and downs of Kent or Surrey.—*E. Howard Birchall*; *London, August 26, 1876.*

Entomological Pins.—I am glad to see the subject of pins mooted in the 'Entomologist.' We can hardly expect to reach perfect uniformity in regard to their use, but we may reasonably hope to obtain something more than we at present possess. I quite agree with Mr. Carrington that Messrs. Tayler & Co. might safely cease making several of the sizes they now place upon their list. I agree with Mr. Carrington as nearly as possible in the pins I use, with this exception, that I do not consider No. 6 large enough for all Sphinges, and he appears to recommend it for all, without exception. I use No. 12 for those which require a pin larger than No. 6. For all who do not collect Tortrices and Tineæ, I think the only other sizes required are No. 8, No. 15, and No. 18; No. 8 for almost all Noctuæ, and many butterflies; No. 15 for almost all Geometræ; No. 18 for small Geometræ, and most Pyrales. Nos. 8 and 15 are so nearly the same in length that their close proximity in the cabinet will only be marked by a keen observer. Mr. Greene, in the 'Insect-Hunter's Companion,' says, "No. 7 I consider indispensable." I imagine he only considers it so for a purpose he immediately proceeds to notice. Whilst on this subject there is another which presents itself, and which is next of kin, *i. e.* "pinning." At present pins are seen leaning fore or aft, to the right or to the left; and what a marring effect this has. I will not

venture to broach any suggestions of my own, but give the readers of the 'Entomologist' the benefit of another extract from Mr. Greene's most useful book:—"Insert the pin exactly in the centre of the thorax. The head of the pin must slope a very little forwards towards the *head* of the insect; this will not be noticed when the moth is set. The pin should be clear of the moth on the *under* side three-eighths of an inch. It is of *great* importance that the pin (the upper part of course) should not lean on either side." I can add nothing to this good advice. I only say—follow it strictly.—[Rev.] P. H. Jennings; *Longfield Rectory, Gravesend, August 21, 1876.*

Erratum.—In the article, "Agrotis tritici and Agrotis aquilina," in the August number of the 'Entomologist' (Entom. ix. 169), owing to an unfortunate error the two figures were transposed. Thus the figure named "Agrotis tritici" should have been named "Agrotis aquilina," and *vice versâ*.—*Ed.*

Answers to Correspondents.

Callimorpha Hera.—I have lately taken here two or three moths which seem different from any I have found in Great Britain. Perhaps some of your readers who have foreign insects may be able to give me the name through your magazine. It is about the size of *Chelonia villica* or *Callimorpha dominula*. It seems to me a species of *Arctia*.—*H. C. Hodges; Lannion, Bretagne, France, August 8, 1876.*

[The moth is *Callimorpha Hera*. It was figured in the 'Entomologist,' volume vi., page 33; and a description is there given of the larva and of the perfect insect. Other information is also given, from which the following extracts may be of interest:—"It is many years since Captain Russell announced the capture of several specimens of *Hera* in Wales. * * The announcement, however, like many others to the same purport, was disregarded, I believe, from an impression that the larvæ had been imported from the Channel Islands. This has certainly been the case in some instances; and therefore every instance of capture is open to the suspicion, seeing that, like *Clostera anachoreta*, the species has failed to establish a permanent footing in Britain." "In 1855 Mr. J. J. Reeve took a very good specimen at

Newhaven." "In the autumn of 1868 Miss Hore, a lady residing at Patcham, near Brighton, took a specimen at light." "In 1871 Mr. D'Orville, of Alphington, near Exeter, took a specimen at sugar, with which he had baited a corymb of the common tansy." "This beautiful species occurs throughout the central countries of Europe, extending abundantly into the Channel Islands; also in Western Asia, as Asia Minor and Palestine. It may now be safely added to the British list.—*Edward Newman*." This was written in March, 1872. 'British Moths' was completed in 1869; but the numbers containing the "tigers" were published, without the author's knowledge or consent, many years earlier.—*Ed.*]

Buff-coloured Metrocampa margaritata, &c.—I am inclined to think Mr. T. H. Ormston Pease's buff-coloured *Metrocampa margaritata* (Entom. ix. 161) was merely a faded specimen. Many of the green species of Lepidoptera seem liable to fade to this tint, and being tolerably perfect in other respects are often very deceptive. I remember ten years, or more, ago, taking a *Pseudopteryx cytisaria* of this colour, which stood for several years in my collection as a good variety, until I detected the error, when of course the wretched thing was at once turned out.—*Geo. T. Porritt; Huddersfield, July 10, 1876.*

C.—Zygæna filipendulæ.—Master Robertson has just caught a number of specimens of *Z. filipendulæ* at Dulwich. Is it not unusual for this insect to occur so near London?

[*Zygæna filipendulæ* used to occur in many localities nearer London than Dulwich. These have disappeared as the suburbs have steadily extended; but even yet there are several, one being in the grounds of the Crystal Palace, where they occur not unfrequently.—*Ed.*]

Miss Bayley.—Transmission of Lepidoptera by Post.—Can you kindly tell me which is the best method of transmitting imagos and larvæ by post? Cross pinning is recommended for the former; but it seems to me that the insects run a great chance of being rubbed. For larvæ, the difficulty would be to give them air.

[For the guidance of Miss Bayley and other readers we offer a few notes on the best way of succeeding in the transmission of entomological specimens by post without injury. Probably the most important matter is in the choice of postal boxes for sending away perfect insects. Those usually

sold by the dealers are too slight, and frequently carelessly made at the joints, although nicely finished and good looking. It is unwise to have postal boxes made too large; better to send two boxes, than risk the whole number of insects sent by placing them in one large box. Postal boxes should not exceed three inches by two and a half inches, the top and bottom being each three-quarters of an inch deep; all inside measurements. Of course have smaller sizes. They should be made as follows:—For all sizes, up to that above suggested, the sides of the box should be of quarter-inch deal; the ends the same, or even one-eighth thicker; let in the ends by half-cutting the sides to contain them; secure with wire nails and glue. The top and bottom to be of half to three-quarters inch cork, rough on the outside; this should be secured with glue and light sprigs. When dry the edges are to be filed down to a slight square bevel. The hinge may be of canvas or, better still, of American cloth, with the smooth side out, glued over one side of the closed box. Lastly, have a strong pair of pegs (strong pin points will do) to act as catches on the front edges of the box. When completely dry this box will be found strong enough to bear the weight of a man standing on it. It is a mistake to save weight of box or of surrounding packing, for postage is cheap enough now. Place the insects to be sent away securely in the box; a little—not too much—cotton-wool under each body,—too much is apt to prize up and off the body; then lay over the body a little more cotton-wool, and cross pin over that. It will be found by practice that then the insects are never rubbed. When completed, before sending away, place a piece of paper between the top and bottom of box; this will be secured by the pegs when the box is closed. In case a body should come loose, this will prevent it injuring all the insects in the box. Having done this, tie the box tightly round with thin string, so as to support it; surround the box with a liberal supply of cotton-wool, wrapping all with *black calico*; tie on a stamped and addressed loose label, and fear nothing for the safety of the contents. In this manner we know an instance of upwards of four thousand specimens of Lepidoptera (perfect insects) having been sent away in three months in boxes under that size, and *not a single* breakage occurred. We believe the postal officials are, as a rule, much more sinned against than sinning. In sending larvæ by post

simply put them in quarter or half pound empty mustard tins, with two or three punctures, one-eighth of an inch in diameter, in the lid and bottom of box; when wrapping with a piece of brown paper let the ends of the paper extend an inch over the ends of the box, but have the paper ends *open*, as in book postage; tie on an addressed label, with the string sealed to the paper to keep it fast. This has been found a very simple and successful method, especially when plenty of food is put in with the larvæ.—*Ed.*]

H. Wigglesworth.—*Work on Hymenoptera.*—Could you inform me of a good work on British Hymenoptera for a beginner? One with plates preferred.

[Mr. Smith's 'Bees of Great Britain' and 'British Fossorial Hymenoptera' complete the Aculeata. The volumes are price six shillings each, and are published by the Trustees of the British Museum. There is no monograph of the British Ichneumonidæ; but there is one of the Tenthredinidæ in hand.—*Ed.*]

Extracts from the Proceedings of the Entomological Society of London.

MAY 3, 1876.

Sir Sidney Smith Saunders, C.M.G., Vice-President, in the chair.

Varieties of, and Rare British Lepidoptera.—The Rev. J. Hellins sent for exhibition various British Lepidoptera, recently submitted to M. Guenée for his opinion and determination. The collection included a dark variety of *Acronycta myricæ* from Mr. Birchall; certain *Acidalia*, sent by Mr. Hellins and Mr. G. F. Mathew, apparently to be referred to *A. manconiata*; several extraordinary aberrations referred to *Melanippe rivata*, *Oporabia*, sp.?, *Coremia ferrugata*, &c., from Mr. Dale and Mr. Mathew; an example of *Polia Chi*, *var. olivacea*, from Major Hutchinson; several *Eupitheciæ*, from Dr. Buchanan White, including the *var. Oxydata* of *E. subfulvata*; and an insect which Dr. White proposed to name *Septentrionata*, not known to M. Guenée. The most important of all was a *Noctua*, bearing some resemblance to *Xanthia circellaris* (*Ferruginea*), not known to M. Guenée, taken at Queenstown, flying over bramble-blossoms, in July or August, 1872, by Mr. Mathew.

Concerning this insect it was remarked that it had been shown to Dr. Staudinger (now in London) by M. Guenée, and it was also unknown to him as European.

Corozo Nuts destroyed by a Caryoborus.—Mr. Douglas exhibited specimens of the Corozo nut (*Phytelephas macrocarpa*), the vegetable-ivory of commerce, of which the interiors were entirely eaten away by a species of *Caryoborus* (one of the Bruchides). A specimen of the beetle was shown with nuts, from the London Docks, which had been recently imported from Guyaquil.

Ravages of Locusts in Spain.—The Secretary read a letter he had received from the Foreign Office Department, enclosing a despatch from Her Majesty's Minister at Madrid relative to the steps taken to check the ravages of the locust in Spain. It appeared that considerable apprehension had been felt in many parts of Spain that the crops of various kinds would suffer greatly this year from the locust; and the Cortes had already voted a large sum to enable the Government to take measures to prevent this calamity; and by a circular addressed to the Provincial Governors by the Minister of 'Fomento,' published in the Official Gazette, they were directed to make use of the military forces, stationed within their respective districts, to aid the rural population in this object. It was stated that thirteen provinces were threatened with this plague.

JUNE 7, 1876.

Prof. J. O. Westwood, M.A., F.L.S., &c., President, in the chair.

The Destruction of Corozo Nuts by a Caryoborus.—Mr. Douglas made some further remarks on the "Corozo nuts," known as vegetable ivory, exhibited by him at the last meeting, which were attacked by a beetle belonging to the genus *Caryoborus*. The attention of the officials of the Dock Company had been drawn to the serious loss of weight that would be found when the nuts were to be delivered, and they were anxious to ascertain if there was any mode of arresting their depredations, and whether the beetles lived and bred among dried nuts, or entered the kernel in an earlier stage. It was suggested that the mischief originated in the parent beetles laying their eggs in the nuts when still in a green or soft state, and as there were several larvæ in each nut the

interior was completely destroyed. The metamorphosis took place inside the nut. Mr. M'Lachlan, in connexion with the above, exhibited another species of palm (*Copernicia conifera*) from Rio Janeiro, forwarded to him by Professor Dyer, which were also infested with a species of *Caryoborus* (*C. bactris*, *Lin.*). In this case each nut served as food for a single larva only, which bored in it a cylindrical hole of considerable size and depth.

Fungus on Insects.—The President exhibited the larva of an Australian species of *Hepialus* (he believed from Queensland), bearing a fungus with four or five different branches issuing from the back of the neck and the tail. Also a fungus growing from the back of a *Noctua* pupa.

Mimicry in South African Insects.—Mr. M'Lachlan, on behalf of Dr. Atherston, of South Africa, exhibited a pair of very singular Orthopteroous insects (belonging to the *Acrydiidæ*), which, in colour and in the granulated texture, so exactly mimicked the sand of the district as to render it almost impossible to detect it when in a quiescent state. The name of the insect was uncertain, but it was supposed to approach the *Trachyptera scutellaris*, *Walker*. Also some singular oval, flattened cases, open at each end, and from six to eight lines in length, formed of silk, to which was externally fixed a quantity of fine light brown sand. The cases were found under stones in sandy districts, and were stated by Mr. Charles O. Waterhouse to belong to a beetle of the genus *Paralichas* (one of the *Dascillidæ*). Also the cases of a species of *Oiketicus* of peculiar structure: the inner lining of the tube was, as usual, composed of toughened silk; but to this was attached, externally, a quantity of fine sand, and outside this a number of small angular pebbles, only the tail-end bearing a few rather long twigs and species of grass-stems. Thus the cases differed from those of most species in which substances exclusively vegetable were attached externally, the addition of the pebbles making the cases (which were nearly two inches in length) unusually heavy.

Singular Forms of Coleopterous Insects.—The President read descriptions and exhibited drawings of two very singular forms of Coleopterous insects from Mr. A. R. Wallace's private collection. For the first, which belonged to the family *Telephorida*, he proposed the generic term *Astychina*, remarkable for the form of the two terminal joints of the

antennæ, which were modified in one sex into what appeared to be a prehensile apparatus, different from anything in the insect world, but of which some analogous forms were found to occur in certain Entomostracous Crustacea. The other belonged to the family Cleridæ, and was named *Anisophyllus*, differing from all known beetles by the extremely elongated branch of the ninth joint of the antennæ.

JULY 5, 1876.

Prof. Westwood, M.A., President, in the chair.

Psyllidæ taken near Lee, Kent.—Mr. Douglas exhibited the following *Psyllidæ*, taken by himself near Lee, Kent:—*Psylla* —?: on birch trees; possibly *P. Betulæ*, *Linn., Flor.* *Psylla spartifoliella*, *Först.*: on broom bushes. *Aphalara renosa*, *Först.*: new to the British Fauna; now first identified as living on *Achillea millefolium*. *Rhinocola aceris*, *Linn.*: on maple trees (*Acer campestre*). *Rhinocola ericæ*, *Curtis*: on heather.

Twigs of Horse Chestnut attacked by a Larva.—The President brought for exhibition twigs of horse-chestnut, from Oxford, that had been attacked by some kind of larva, which had eaten away the inside of portions of the stem, causing the buds to drop off. He was in doubt whether the insect was *Zeuzera Æsculi*, or some other; but he would be glad to know if the destruction to trees had been noticed elsewhere.

Species of Coccus.—The President exhibited two species of *Coccus*, one of them on camellia leaves in his greenhouse, which he had previously described in the 'Gardener's Chronicle,' under the name of *C. Camelliæ*, and which had afterwards been observed by Dr. Verloren in his greenhouse in Holland. The female, which is one line in length, discharges a white waxy matter, having the appearance of the excrement of a young bird. The other species had been sent to him by the Rev. T. A. Preston, of Marlborough, on a species of *Euphorbia*, obtained from Dr. Hooker, of Kew. The leaves were covered with small scales, which, on close examination, were observed to have two small spines attached; and these proved to be the caudal extremities of the males. These insects emerge from the pupa backwards, and in consequence they make their appearance with the wings drawn forwards over the head.

THE ENTOMOLOGIST.

No. 160.]

OCTOBER, MDCCCLXXVI.

[PRICE 6d.

Ephyra pendularia, var. By FREDERICK BOND, Esq., F.Z.S.



EPHYRA PENDULARIA, var.

THIS very beautiful variety of *Ephyra pendularia* was exhibited by Mr. Miller at the meeting of the Entomological Society, held on the 7th of October, 1861, and was said to have been bred from a larva found near London, feeding on the exterior of the bedeguar, or mossy gall of the rose. This was probably a mistake, the larva having very likely fallen from a birch tree. I understood at the time that the larva was never seen actually feeding on the bedeguar. The moth is now in my collection.

FREDERICK BOND.

Staines, Middlesex, September 8, 1876.

Remarks on Colias Edusa and Colias Hyale.

By J. JENNER WEIR, Esq., F.L.S., F.Z.S.

ALTHOUGH I have collected the Lepidoptera of this country for at least thirty-six years I have never had opportunities for observing the habits of our two species of the genus *Colias* in England; but this summer having been unusually hot, I was induced to make a journey to my native town, Lewes, more particularly in hope that they might be plentiful; and I devoted the greater part of the month of August mainly to observing and capturing the two species in question.

I took my first specimen of both species on the 7th, and my last on the 28th, of August; I found them in about the proportion of five of *C. Edusa* to three of *C. Hyale*. The localities in which I took both species were in Oxsettle Bottom, near Lewes, and in a clover field of twenty-five acres in extent, at Beddingham, about three miles from the town, which field had been once mown, and the second crop left for seed. The habit of both species appeared to me to be for the males to fly very rapidly and wildly across the localities frequented, and rarely, in the case of the clover field, passing beyond its limits. The females were generally resting or flying languidly from flower to flower; but upon seeing the males they usually flew upwards to attract their attention; and I did not find that any of the males discovered the females when the latter were at rest.

During the whole of the period of my observations the two species were constantly emerging from the chrysalis, and nearly all the specimens taken were in fine condition. The males of *C. Edusa* varied but little in colour; the shade of orange in most was precisely the same, and but few were slightly lighter. None of the females, although but just out, were so brilliant an orange as those in my collection, taken near Brighton some years ago; and although I did not capture one of the variety *Helice*, still two of the females were scarcely orange in colour, but rather of a dark yellow colour; and one had the orange suffused with black, in the same manner as a specimen in Mr. Bond's collection, figured in Newman's 'British Butterflies.'

All the males of *C. Hyale* were of a rich yellow colour, the tint varying very slightly, but some were not nearly so black at the tips of the wings as usual; this remark applies to perfectly fresh examples. The females of *C. Hyale* were in some cases nearly white; but I took one specimen of this sex quite as yellow as the males usually are; and I am disposed to think that the ordinary colouration of the females in *C. Hyale* is the reverse of that which obtains in *C. Edusa*, the lighter variety *Helice* being rare in the latter species, and the darker variety in the former.

I find that all the continental specimens I possess of *C. Hyale*—taken by myself in Saxony, Bohemia, Tyrol, and Switzerland, and received from Russia—are coloured exactly

the same dark yellow in both sexes. The brightest specimen I possess was taken in Tyrol, in September, 1874.

I trust the remarks I have made may elicit further communications on the colouration of the females of *C. Hyale*, as I feel, in common with the views entertained by my lamented friend, the late Editor of the 'Zoologist' and 'Entomologist,' that many of us have too hastily assumed that the yellow specimens of *C. Hyale* were all males, and the white all females.

J. JENNER WEIR.

6, Haddo Villas, Blackheath.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 197.)

57. *Andricus testaceipes*, Hart.—This gall is formed by a swelling of the petiole, or a part of the midrib of the leaves of *Quercus sessiliflora*, in May. The larva-cell is situated in the centre; in many cases, however, the gall-parenchyma contains several dispersed inner galls, each containing a larva of *Andricus noduli*. The question, which still remains unanswered, is whether such petiolar galls were originally produced by *A. testaceipes*, and *A. noduli* has only introduced its eggs, or whether the galls are primarily produced by *A. noduli* alone. Although I found these galls by the hundred during the months of August and September, I could never solve this problem. *A. noduli*, inquilines and parasites, I have bred from them, but no *A. testaceipes*.

A. petioli, Hart.—This species is, in fact, *A. noduli*, according to typical specimens in the zoological cabinet at Vienna. Most Hymenopterists have taken the specimens of *A. noduli*, bred from these swellings of the petiole, for

Fig. 57.



ANDRICUS TESTACEIPES.

The spherical galls on the leaf are those of *A. curvator* (56).

A. testaceipes, a typical specimen of which is in the Vienna zoological cabinet.—*G. L. Mayr.*

The inquilines and parasites referred to are *Synergus apicalis*, *Hart.*, *Ceroptres arator*, *Hart.*, and *Megastigmus dorsalis*, *Fabr.* I have often found these galls on the petiole and midrib, but always took them for *A. noduli*. I have never bred their inmates.—*E. A. Fitch.*

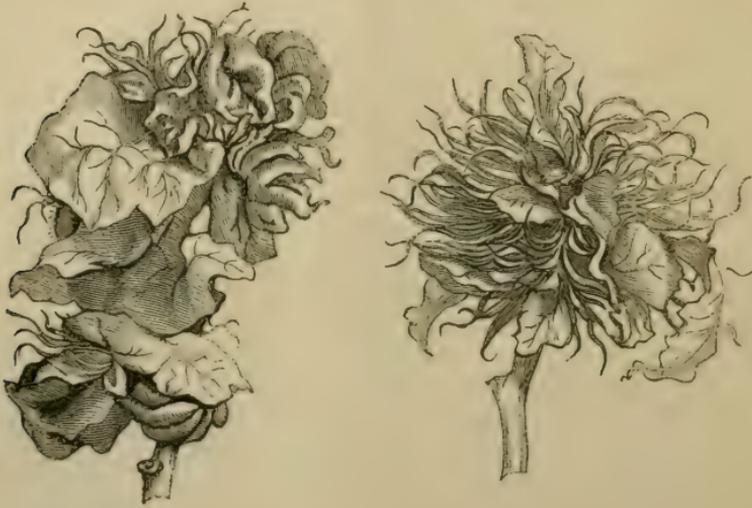


Fig. 58.—*ANDRICUS MULTIPLICATUS.*

58. *Andricus multiplicatus*, Gir.—At the end of May this gall appears on the Turkey oak. It forms at the end, rarely on the side, of the twig a coma, outwardly consisting of rudimentary crippled leaves. This coma rests on and surrounds an irregular, hard, very pilose disk: at the top of this disk there is, hidden by the rudimentary leaves, a number of small, irregularly placed, oviform, yellowish brown inner galls, each of which contains a larva. This interesting gall undoubtedly attains its peculiar shape through the parenchyma being pierced when still in the bud, which prevents the development of the axis; this, together with the thickened and comated parenchyma, forms the disk. The yellow gall-makers are produced in July; but the one-year

old galls may be found on the trees, and some even adhere after they have lost all the leaves. They then exhibit the opened, unprotected inner galls, surrounded by prickly projections.—*G. L. Mayr.*

The gall of this species occurs only on *Quercus cerris*, consequently is not known as British. From it *Ceroptres Cerri*, *Mayr*, and *Megastigmus dorsalis*, *Fabr.*, may be bred in July of the same year; the latter commonly. *Synergus evanescens*, *Mayr*, is another inquiline occurring in the following April; and *Callimome regius*, *Nees*, a parasite. Dr. Giraud says "the caterpillars of *Grapholita amygdalana* live frequently in these galls, feeding on the exterior substance, and even on the cellules when they are young enough." This *Tortrix* has also been bred from galls of *Lignicola* or *Kollari*.—*E. A. Fitch.*

*The peculiar Relations of Plants and Insects as exhibited in Islands.** By ALFRED R. WALLACE, Esq., F.L.S., &c.

EVER since Mr. Darwin showed the immense importance of insects in the fertilisation of flowers great attention has been paid to the subject, and the relation of these two very different classes of natural objects has been found to be more universal and more complex than could have been anticipated. Whole genera and families of plants have been so modified as first to attract, and then to be fertilised by, certain groups of insects; and this special adaptation seems in many cases to have determined the more or less wide range of the plants in question. It is also known that some species of plants can be fertilised only by particular species of insects, and the absence of these from any locality would necessarily prevent the continued existence of the plant in that area. Here, I believe, will be found the clue to much of the peculiarity of the floras of oceanic islands, since the methods by which these have been stocked with plants and insects will be often quite different. Many seeds are, no doubt, carried by oceanic currents; others probably by aquatic birds. Mr. H. N. Moseley informs me that the albatrosses, gulls, puffins, tropic

* Part of the President's Address, in Section D (Biology), at the recent Meeting of the British Association.

birds, and many others, nest inland, often amidst dense vegetation; and he believes they often carry seeds, attached to their feathers, from island to island for great distances. In the tropics they often nest on the mountains far inland, and may thus aid in the distribution even of mountain plants. Insects, on the other hand, are mostly conveyed by aerial currents, especially by violent gales; and it may thus often happen that totally unrelated plants and insects may be brought together, in which case the former must often perish for want of suitable insects to fertilise them. This will, I think, account for the strangely fragmentary nature of these insular floras, and the great differences that often exist between those which are situated in the same ocean, as well as for the preponderance of certain orders and genera. In Mr. Pickering's valuable work on the 'Geographical Distribution of Animals and Plants,' he gives a list of no less than sixty-six natural orders of plants *unexpectedly* absent from Tahiti, or which occur in many of the surrounding lands, some being abundant in other islands,—as the Labiatae at the Sandwich Islands. In these latter islands the flora is much richer, yet a large number of families which abound in other parts of Polynesia are totally wanting. Now much of the poverty and exceptional distribution of the plants of these islands is probably due to the great scarcity of flower-frequenting insects. Lepidoptera and Hymenoptera are exceedingly scarce in the eastern islands of the Pacific; and it is almost certain that many plants which require these insects for their fertilisation have been thereby prevented from establishing themselves. In the western islands, such as the Fijis, several species of butterflies occur in tolerable abundance, and no doubt some flower-haunting Hymenoptera accompany them; and in these islands the flora appears to be much more varied, and especially to be characterized by a much greater variety of showy flowers, as may be seen by examining the plates of Dr. Seeman's 'Flora Vitiensis.'

Darwin and Pickering both speak of the great preponderance of ferns at Tahiti; and Mr. Moseley, who spent several days in the interior of the island, informs me that "at an elevation of from 2000 to 3000 feet the dense vegetation is composed almost entirely of ferns. A tree-fern (*Alsophila Tahitensis*) forms a sort of forest, to the exclusion of almost

every other tree; and, with huge plants of two other ferns (*Angiopteris evecta* and *Asplenium nidus*), forms the main mass of the vegetation." And he adds, "I have nowhere seen ferns in so great proportionate abundance." This unusual proportion of ferns is a general feature of insular, as compared with continental, floras; but it has, I believe, been generally attributed to favourable conditions, especially to equable climate and perennial moisture. In this respect, however, Tahiti can hardly differ greatly from many other islands, which yet have no such vast preponderance of ferns. This is a question that cannot be decided by mere lists of species, since it is probable that in Tahiti they are less numerous than in some other islands where they form a far less conspicuous feature in the vegetation. The island most comparable with Tahiti in that respect is Juan Fernandez. Mr. Moseley writes to me:—"In a general view of any wide stretch of the densely-clothed mountainous surface of the island, the ferns—both tree-ferns and the unstemmed forms—are seen at once to compose a very large proportion of the mass of foliage." As to the insects of Juan Fernandez, Mr. Edwyn C. Reed, who made two visits, and spent several weeks there, has kindly furnished me with some exact information. Of butterflies there is only one (*Pyrameis carie*), and that rare—a Chilian species, and probably an accidental straggler. Four species of moths of moderate size were observed—all Chilian, and a few larvæ and pupæ. Of bees there were none, except one very minute species (allied to *Chilicola*); and of other Hymenoptera, a single specimen of *Ophion luteus*—a cosmopolitan Ichneumon. About twenty species of flies were observed, and these formed the most prominent feature of the Entomology of the island.

Now, as far as we know, this extreme entomological poverty agrees closely with that of Tahiti; and there are, probably, no other portions of the globe equally favoured in soil and climate, and with an equally luxuriant vegetation, where insect-life is so scantily developed. It is curious, therefore, to find that these two islands also agree in the wonderful predominance of ferns over the flowering plants—in individuals even more than in species; and there is no difficulty in connecting the two facts. The excessive minuteness and great abundance of fern-spores cause them

to be far more easily distributed by winds than the seeds of flowering plants, and they are thus always ready to occupy any vacant places in suitable localities, and to compete with the less vigorous flowering plants. But where insects are so scarce, all plants which require insect fertilisation, whether constantly to enable them to produce seed at all or occasionally to keep up their constitutional vigour by crossing, must be at a great disadvantage; and thus the scanty flora which oceanic islands must always possess, peopled as they usually are by waifs and strays from other lands, is rendered still more scanty by the weeding out of all such as depend largely on insect fertilisation for their full development. It seems probable, therefore, that the preponderance of ferns in islands (considered in mass of individuals, rather than in number of species) is largely due to the absence of competing phænogamous plants; and that this is in great part due to the scarcity of insects. In other oceanic islands—such as New Zealand and the Galapagos, where ferns, although tolerably abundant, form no such predominant feature in the vegetation, but where the scarcity of flower-haunting insects is almost equally marked—we find a great preponderance of small, green, or otherwise inconspicuous flowers, indicating that only such plants have been enabled to flourish there as are independent of insect fertilisation. In the Galapagos—which are, perhaps, even more deficient in flying insects than Juan Fernandez—this is so striking a feature that Mr. Darwin speaks of the vegetation as consisting in great part of “wretched-looking weeds,” and states that “it was some time before he discovered that almost every plant was in flower at the time of his visit.” He also says that he “did not see one beautiful flower” in the islands. It appears, however, that Compositæ, Leguminosæ, Rubiaceæ, and Solanaceæ, form a large proportion of the flowering plants; and, as these are orders which usually require insect fertilisation, we must suppose either that they have become modified so as to be self-fertilised, or that they are fertilised by the visits of the minute Diptera and Hymenoptera, which are the only insects recorded from these islands.

In Juan Fernandez, on the other hand, there is no such total deficiency of showy flowers. I am informed by Mr. Moseley that a variety of the magnoliaceous winter's bark

abounds, and has showy white flowers, and that a bignoniaceous shrub, with abundance of dark blue flowers, was also plentiful; while a white-flowered liliaceous plant formed large patches on the hill-sides. Besides these there were two species of woody Compositæ with conspicuous heads of yellow blossoms, and a species of white-flowered myrtle also abundant; so that, on the whole, flowers formed a rather conspicuous feature in the aspect of the vegetation of Juan Fernandez.

But this fact—which at first sight seems entirely at variance with the view we are upholding of the important relation between the distribution of insects and plants—is well explained by the existence of two species of humming-birds in Juan Fernandez, which, in their visits to these large and showy flowers, fertilise them as effectually as bees, moths, or butterflies. Mr. Moseley informs me that “these humming-birds are *extraordinarily abundant*, every tree or bush having one or two darting about it.” He also observed that “nearly all the specimens killed had the feathers round the base of the bill and front of the head clogged and coloured yellow with pollen.” Here, then, we have the clue to the perpetuation of large and showy flowers in Juan Fernandez; while the total absence of humming-birds in the Galapagos may explain why no such large-flowered plants have been able to establish themselves in those equatorial islands.

This leads to the observation that many other groups of birds also, no doubt, aid in the fertilisation of flowers. I have often observed the beaks and faces of the brush-tongued lorries of the Moluccas covered with pollen; and Mr. Moseley noted the same fact in a species of *Artamus*, or swallow-shrike, shot at Cape York, showing that this genus also frequents flowers and aids in their fertilisation. In the Australian region we have the immense group of the *Meliphagidæ*, which all frequent flowers; and, as these range over the islands of the Pacific, their presence will account for a certain proportion of showy flowers being found there, such as the scarlet *Metrosideros*,—one of the few conspicuous flowers in Tahiti. In the Sandwich Islands, too, there are forests of *Metrosideros*; and Mr. Charles Pickering writes me that they are visited by honey-sucking birds, one of which is captured by sweetened bird-lime, against which it

thrusts its extensile tongue. I am also informed that a considerable number of flowers are occasionally fertilised by humming-birds in North America; so that there can, I think, be little doubt that birds play a much more important part in this respect than has hitherto been imagined. It is not improbable that in Tropical America, where this family is so enormously developed, many flowers will be found to be expressly adapted to fertilisation by them, just as so many in our own country are specially adapted to the visits of certain families or genera of insects.

It must also be remembered, as Mr. Moseley has suggested to me, that a flower which had acquired a brilliant colour to attract insects might, on transference to another country, and becoming so modified as to be capable of self-fertilisation, retain the coloured petals for an indefinite period. Such is probably the explanation of the Pelargonium of Kerguelen's Land, which forms masses of bright colour near the shore during the flowering season; while most of the other plants of the island have colourless flowers, in accordance with the almost total absence of winged insects. The presence of many large and showy flowers among the indigenous flora of St. Helena must be an example of a similar persistence. Mr. Melliss, indeed, states it to be "a remarkable peculiarity that the indigenous flowers are, with very slight exceptions, all perfectly colourless;" but although this may apply to the general aspect of the remains of the indigenous flora, it is evidently not the case as regards the *species*, since the interesting plates of Mr. Melliss's volume show that about one-third of the indigenous flowering plants have more or less coloured or conspicuous flowers, while several of them are exceedingly showy and beautiful. Among these are a Lobelia, three Wahlenbergias, several Compositæ, and especially the handsome red flowers of the now almost extinct forest-trees, the ebony and redwood—species of Melhania (Byttneriaceæ). We have every reason to believe, however, that when St. Helena was covered with luxuriant forests, and especially at that remote period when it was much more extensive than it is now, it must have supported a certain number of indigenous birds and insects, which would have aided in the fertilisation of these gaily-coloured flowers. The researches of Dr. Hermann Müller have shown us by what

minute modifications of structure or of function many flowers are adapted for partial insect- and self-fertilisation in varying degrees, so that we have no difficulty in understanding how, as the insects diminished and finally disappeared, self-fertilisation may have become the rule, while the large and showy corollas remain to tell us plainly of a once different state of things.

Another interesting fact in connection with this subject is the presence of arborescent forms of *Compositæ* in so many of the remotest oceanic islands. They occur in the Galapagos, in Juan Fernandez, in St. Helena, in the Sandwich Islands, and in New Zealand; but they are not directly related to each other, representatives of totally different tribes of this extensive order becoming arborescent in each group of islands. The immense range and almost universal distribution of the *Compositæ* is due to the combination of a great facility of distribution (by their seeds), with a great attractiveness to insects, and the capacity of being fertilised by a variety of species of all orders, and especially by flies and small beetles. Thus they would be among the earliest of flowering plants to establish themselves on oceanic islands; but where insects of all kinds were very scarce it would be an advantage to gain increased size and longevity, so that fertilisation at an interval of several years might suffice for the continuance of the species. The arborescent form would combine with increased longevity the advantage of increased size in the struggle for existence with the ferns and other early colonists; and these advantages have led to its being independently produced in so many distant localities, whose chief feature in common is their remoteness from continents and the extreme poverty of their insect life.

As the sweet odours of flowers are known to act in combination with their colours, as an attraction to insects, it might be anticipated that where colour was deficient scent would be so also. On applying to my friend Dr. Hooker for information as to New Zealand plants, he informed me that this was certainly the case, and that the New Zealand flora is, speaking generally, as strikingly deficient in sweet odours as in conspicuous colours. Whether this peculiarity occurs in other islands I have not been able to obtain information, but we may certainly expect it to be so in such a marked instance as that of the Galapagos flora.

Another question which here comes before us is the origin and meaning of the odoriferous glands of leaves. Dr. Hooker informed me that not only are the New Zealand plants deficient in scented flowers, but equally so in scented leaves. This led me to think that perhaps such leaves were in some way an additional attraction to insects, though it is not easy to understand how this could be, except by adding a general attraction to the special attraction of the flowers, or by supporting the larvæ which, as perfect insects, aid in fertilisation. Mr. Darwin, however, informs me that he considers that leaf-glands bearing essential oils are a protection against the attacks of insects where these abound, and would thus not be required in countries where insects were very scarce. But it seems opposed to this view that highly aromatic plants are characteristic of deserts all over the world, and in such places insects are not abundant. Mr. Stainton informs me that the aromatic Labiatæ enjoy no immunity from insect attacks. The bitter leaves of the cherry-laurel are often eaten by the larvæ of moths that abound on our fruit-trees; while in the Tropics the leaves of the orange tribe are favourites with a large number of Lepidopterous larvæ; and our northern firs and pines, although abounding in a highly aromatic resin, are very subject to the attacks of beetles. My friend Dr. Richard Spruce—who, while travelling in South America, allowed nothing connected with plant-life to escape his observation—informs me that trees whose leaves have aromatic and often resinous secretions in immersed glands abound in the plains of tropical America, and that such are in great part, if not wholly, free from the attacks of leaf-eating ants, except where the secretion is only slightly bitter, as in the orange tribe, orange-trees being sometimes entirely denuded of their leaves in a single night. Aromatic plants abound in the Andes up to about 13,000 feet, as well as in the plains, but hardly more so than in Central and Southern Europe. They are, perhaps, most plentiful in the dry mountainous parts of Southern Europe; and, as neither here nor in the Andes do leaf-eating ants exist, Dr. Spruce infers that, although in the hot American forests where such ants swarm, the oil-bearing glands serve as a protection, yet they were not originally acquired for that purpose. Near the limits of perpetual snow on the Andes

such plants as occur are not, so far as Dr. Spruce has observed, aromatic; and, as plants in such situations can hardly depend on insect visits for their fertilisation, the fact is comparable with that of the flora of New Zealand, and would seem to imply some relation between the two phenomena, though what it exactly is cannot yet be determined.

I trust I have now been able to show you that there are a number of curious problems, lying as it were on the outskirts of biological inquiry, which well merit attention, and which may lead to valuable results. But these problems are, as you see, for the most part connected with questions of locality, and require full and accurate knowledge of the productions of a number of small islands and other limited areas, and the means of comparing them the one with the other. To make such comparisons is, however, now quite impossible. No museum contains any fair representation of the productions of these localities; and such specimens as do exist, being scattered through the general collection, are almost useless for this special purpose. If, then, we are to make any progress in this inquiry, it is absolutely essential that some collectors should begin to arrange their cabinets primarily on a geographical basis, keeping together the productions of every island or group of islands, and of such divisions of each continent as are found to possess any special or characteristic fauna or flora. We shall then be sure to detect many unsuspected relations between the animals and plants of certain localities; and we shall become much better acquainted with those complex reactions between the vegetable and animal kingdoms, and between the organic world and the inorganic, which have almost certainly played an important part in determining many of the most conspicuous features of living things.

ALFRED RUSSEL WALLACE.

Entomological Notes, Captures, &c.

Vanessa Antiopa at Lea Bridge Marshes.—I had the good fortune to capture a splendid female specimen of *V. Antiopa* on the 27th August; it appeared as though only just emerged from pupa. It was on a willow tree, sucking the sugar left

from the previous night; as the tree smelt very strong of rum and sugar it would, no doubt, be a good plan to sugar for them. The specimen is at present in possession of Mr. W. Craft.—*Henry Ashpole; Hyde Road, Hoxton.*

Vanessa Antiopa in Dumfriesshire.—I have just had given to me a live specimen in fair condition of *V. Antiopa*, which was captured to-day in the gardener's cottage at Mabie, about five miles from Dumfries.—*Robert Service; Maxwelltown, Dumfries, September 22, 1876.*

Papilio Machaon in Sussex.—I was very much surprised to see a fine female specimen of *Papilio Machaon* flying in a secluded valley branching off from Oxsettle Bottom, near Lewes. I captured her for the sake of making quite certain of the species, but released her in hopes she might found a colony there. I cannot find that *P. Machaon* has been reared by anyone at Lewes for the last twenty years. The spot in which she was taken is rarely visited by naturalists, except during the period *Procris globulariæ* appears; and the quiet of the place may be inferred from the fact that I saw those shy birds, *Cedricnemus crepitans*, almost every day on which I visited the locality.—*J. Jenner Weir; 6, Haddo Villas, Blackheath.*

Apatura Iris in Huntingdonshire.—I spent a few days in search of *A. Iris* in the middle of July last, and in woods near Huntingdon took the considerable number of twenty-seven specimens—twenty-one males and six females. My two best days were the 18th and 19th of July, which produced eighteen specimens. I tried carrion, in the shape of several dead hedgehogs, which I distributed about the woods, but only captured one in this way—a fine male. All the rest I took (mostly on the wing) with my net, fixed on an eighteen-foot ash pole. I write this thinking it may interest some of your readers to know that *A. Iris* is still to be taken in some plenty in our Midland Counties.—*Harold Conquest; West Lodge, St. Ann's Road, Stamford Hill, N., September 5, 1876.*

Colias Hyale and C. Edusa.—I should like to add one or two remarks on Mr. Fitch's interesting notes respecting these species being double-brooded; they may serve to encourage other collectors to give us their experience. Many years ago three of us were collecting in the Isle of Thanet; we all worked hard every day at the clover and lucerne

fields, the weather all the time being very fine and warm. This was early in June. We never caught a glimpse of either *C. Hyale*, *C. Edusa*, or its *var. Helice*, for some days; after which, in the same fields, *C. Hyale* and *C. Edusa* made a sudden appearance, *C. Edusa* being quite common; *C. Hyale* was scarce. But all the *C. Edusa* were miserable specimens, and the *C. Hyale* were much rubbed. Does this not seem to give one the idea that they had been hibernating, and were merely waiting for the early summer's sun to induce them to leave their winter retreats?—*H. Ramsay Cox; Thornleigh House, Forest Hill, September 11, 1876.*

Sphinx Convolvuli in Gloucestershire.—On the 7th September a very fresh specimen of *S. Convolvuli* was taken in my garden, attracted as usual by the petunias.—*F. R. Perkins; Wotton-under-Edge.*

Sphinx Convolvuli near St. Ives.—A *Sphinx Convolvuli* was brought to me in perfect condition, caught in a cottage in this parish, on the 22nd of August, 1876.—[*Rev.*] *J. H. White; Hemingford Grey, St. Ives.*

Sphinx Convolvuli at Salisbury.—I took a very fine and perfect specimen of *Sphinx Convolvuli* on a lamp-post, in this town, on the 7th of this month.—*Henry Neale; 22, St. Martin's Church Street, Salisbury, September 23, 1876.*

Rare Lepidoptera in the Isle of Wight.—The season has been a very uncertain one, but many good things have been taken; amongst them—*Triphæna subsequa*, *Diphthera orion*, *Leucania vitellina*, *Laphygma exigua*, a specimen of the very rare *Noctua flammatrix*, *Agrotis cinerea*, *A. lunigera*, *A. obelisca*, *Aporophila australis*, *Heliophobus hispida*, *Luperina cespitis*, *Pterophorus spilodactylus*, *Sphinx Convolvuli*, *Colias Edusa* and its *var. Helice* common, and a few specimens of *Colias Hyale*; also many others. Mr. Buckmaster and Mr. Blackburn have taken *Leucania albipuncta*. I hope next month to give you a longer list, as there is every prospect of a fine autumn.—*H. Rogers; Roseberry House, Freshwater, Isle of Wight, September 19, 1876.*

Chærocampa celerio at Brighton.—A specimen of *Chærocampa celerio* was taken at Brighton on the 13th of this month by my brother, who brought it to me in splendid condition. It is now on the setting-board.—*C. Hamlin; 47, Viaduct Road, Brighton, September 25, 1876.*

Larva of Acronycta Alni near Derby.—A larva of *A. Alni* was taken here last month by my young friend Master Godfrey Fitz Herbert.—[Rev.] *Hugh A. Stowell; Derby.*

Acronycta Alni near Retford.—A fine larva of this rare moth was taken by me at Grove Wood, near East Retford, on the 13th of August last. It was feeding upon hazel.—*E. H. Stenton; 14, Grove Street, East Retford, September 1, 1876.*

Clostera anachoreta.—Being informed that some entomologists doubt this moth being indigenous to Britain, I wish to state for their information that I found the pupa, though I did not know I had done so until the imago made its appearance in my pupæ cage on the 8th of May last. A friend of mine (Mr. Harbour), of this town, also found two imagos, which he picked up from the pavement in the street, rather the worse for wear. I did not know of its rarity, or I should have sent this before for the benefit of your readers.—*S. Norman; 11, Duke Street, Deal, August 21, 1876.*

Leucania albipuncta, Eremobia ochroleuca, and Sphinx Convolvuli, at Deal.—I had the pleasure of taking two specimens of *Leucania albipuncta* on sugar, at the Deal sand-hills, on Wednesday, August 23rd. The pair were not in such good condition as I should have wished, but were tolerable specimens nevertheless. The night was dark and windy, and moths were very abundant on the sugar, which was applied to a row of palings. I took *Eremobia ochroleuca* the same night; and also obtained a living specimen of *Sphinx Convolvuli*, which had been taken in the locality. I sugared for *L. albipuncta* in vain next night, which was the last of my stay at Deal.—*F. Andrewes; Grey Friar's House, Reading, September 20, 1876.*

Leucania albipuncta at St. Leonard's.—A very good specimen of *Leucania albipuncta* was taken here at sugar on Friday last, by Mr. C. Haggis, a friend of mine. I took one myself last year on the same tree, and within two days of the same date.—*John T. Sarll; Beauvoir House, Hollington Park, St. Leonard's-on-Sea, July 25, 1876.*

Dianthæcia irregularis.—I made four journeys this year for the purpose of finding the larva of this insect, and swept all the *Silene Otites* I could find at Tuddenham, Icklingham, and Lockford. I obtained less than a score of caterpillars,

everyone of which was the victim of an Ichneumon. Neither did I find any larvæ of *Anticlea sinuata*, as usual, on the *Galium verum* at these places — [Rev.] A. H. Wratistaw; School Hall, Bury St. Edmunds, September 4, 1876.

Cucullia schropulariæ.—May I be permitted to ask, through the medium of the 'Entomologist,' whether there is any well-authenticated instance of the recent occurrence of *Cucullia schropulariæ* in this country? I have frequently had "true *C. schropulariæ*" offered to me by correspondents, but they have invariably proved to be *Cucullia verbasci*. In Newman's 'British Moths' it is said that the perfect insects of the two species are hard to distinguish from each other; but, in my opinion, nobody who knows both could easily mistake the one for the other. It is, however, extremely difficult to distinguish between *Cucullia schropulariæ* and *Cucullia lychnitis*. The late Mr. Doubleday himself sent me a pair of the former species, which he had received from a correspondent in France as types; and I confess that had I taken them myself I should have mistaken them for *Cucullia lychnitis*. I believe some people labour under the delusion that all the larvæ found on *Schropularia nodosa* are true *Cucullia schropulariæ*; but it is not so, as *Cucullia verbasci* also feeds on that plant, as well as on *Schropularia aquatica*. I should be very glad if any competent entomologist can give reliable information on the subject, as I have never met with *Cucullia schropulariæ* myself; nor have I, during the time I have been a collector, ever seen any trustworthy record of its occurrence in Britain.—IV. II. Harwood; 8, West Stockwell Street, Colchester, Sept. 16, 1876.

Selidosema plumaria, &c., near Alverstoke.—Spending a few days at Alverstoke, on the Solent, last month, I was surprised to find *S. plumaria* occurring along the coast from that village westward, as far as my rambles extended,—some three or four miles: only males of course, and all more or less wasted. This is a new, or at least unrecorded, locality for the species; I had previously associated it with heaths. At the same place I took a few *Spilodes palealis* and *Phycis Davisella*. To these I may add *Pyrallis glaucinalis*, as I see by Mr. Jenner-Fust's list that it had not in 1868 been noted from sub-province 5. *Aspilates citraria* is, I fancy, supposed to be one of those species of which the males are

much more easily procured than the females. While the males occurred to us almost entirely by day, we found the females in great numbers at the gas-lamps at night, but hardly a male amongst them.—[Rev.] *Hugh A. Stowell*; *Breadsall Rectory, Derby, September 21, 1876.*

Swarm of Ants.—About a fortnight ago a swarm of ants—fourteen yards broad, and which took half an hour to pass—were observed by a neighbouring clergyman, whilst fishing in the Ouse in the next parish: thousands fell into the river, and were eagerly preyed on by the roach and dace. They were passing in a south-east direction.—[Rev.] *J. H. White*; *Hemingford Grey, St. Ives, Hunts, September 5, 1876.*

[Swarms of ants commonly take place about the middle of August,—a little earlier or later, according to the season. I have observed that these swarms take place usually after rain has fallen, and the air is moist and warm. The species that usually compose these large swarms belong to the division of stinging-ants—*Myrmicidæ*; and I should be inclined to believe that the swarm seen by the clergyman was composed of one of the following species:—*Myrmica scabrinodis*, *M. ruginodis*, or *M. lævinodis.*—*Frederick Smith.*]

Journalist's Entomology.—Single strength helpless against multitudinous weakness, a nation powerless against a scourge of animalculæ, is by this time an old spectacle. “The strong man, Kwasind,” was he not pelted to death by “the little people” on the river Taquamenaw? And the Abderites, had they not to desert their fatherland by reason of frogs? A fluffy little fly once devastated the pine forests of the Hartz; and a moth of a certain kind laying its eggs among the hops will still drive Kent into fits. A fly with a partiality for turnips has set all the farmers of bucolic England swearing; and very lately indeed a beetle that preferred potatoes convulsed the markets of the country. The “*Oidium*,” I see now, has appeared in strength in South Australia; and, unless the colony can defeat the insect, the cultivation of the vine will be retarded for many years to come. After all, though, it is an old story. It was “the little foxes” that ravaged the prophet’s vineyard.—*The ‘World.’*

[The above cutting from the ‘*World*,’ of September 6th (p. 13), is too rich to be lost. If we mistake not its author was, until recently, chairman of a Royal Natural History Society “Limited”!—*Ed.*]

Extracts from the Proceedings of the Entomological Society of London.

AUGUST 2, 1876.

Sir Sidney S. Saunders, C.M.G., Vice-President, in the chair.

Ravages of Locusts in Spain.—A letter was read from T. V. Lister, Esq., of the Foreign Office, transmitting, for the information of the Entomological Society, a copy of a despatch from Sir John Walsham, Her Majesty's Chargé d'Affaires at Madrid, relative to the plague of locusts, together with a box containing specimens of the insect, and a number of earthen egg-cases, each containing from thirty to forty eggs. The despatch stated that the Official Report, showing the progress of the plague and the steps taken to exterminate the insect, had not yet been published, but a copy would be sent to the Society in a few weeks. It was said that the damage done by the locusts this year was considerably less than that of last year, owing to the number of soldiers which the Government had been enabled to employ since the war was over to assist the inhabitants of the districts, where the plague existed, in destroying the insects. The insects sent were stated to be specimens of *Locusta migratoria*; but on examination they were ascertained to be the *Locusta albifrons*, *Fab.* (*Decticus albifrons*, *Savigny*).

Dragonfly infested by Red Parasite.—Mr. M'Lachlan exhibited a series of thirteen examples of a dragonfly (*Diplax meridionalis*, *Selys*), recently taken by him in the Alps of Dauphiné, between Grenoble and Briançon (the exact locality being near the village of La Grave, at the base of the Aiguille du Midi), remarkable for the extent to which nearly all were infested by the red parasite described by De Geer as *Acarus libellulæ* (perhaps a species of *Trombidium*). Of the thirteen examples captured casually only one was free from parasites, the number of them on the others being respectively 7, 8, 9, 15, 17, 19, 28, 47, 51, 73, 96, and 111, or a total of 481 on twelve individuals. They were firmly fixed on the nervures towards and at the base of the wing, almost invariably on the under side; but whatever might be the number on any particular dragonfly it was always divided nearly symmetrically on the two sides of the insect,—those much infested having a very pretty appearance, from the wings looking as if spotted with blood-red. He had no

doubt that the Acari must have attained their position by climbing up the legs of the dragonfly when at rest: probably they did not quit it till the dragonfly died, or perhaps they died with it, so firmly were they fixed. He remarked that the history of the Acari was involved in much obscurity, for it appeared by no means certain that all those existing could ever gain access to dragonflies; just as in the case of the bed-bug and the human-flea, where there must be myriads that never have an opportunity of tasting human blood. He further noticed that, at the meeting of this Society on the 1st of August, 1864, he exhibited a dragonfly from Montpellier similarly attacked, and it was recorded as *Diplax striolata* (Tr. Ent. Soc., 2nd series, vol. ii., Proc. xxxvi.). This was an error, the insect being *D. meridionalis*, which seemed to be particularly subject to attack.

Nematus gallicola, Steph.—Mr. Smith read the following note:—"This is one of the commonest species of sawfly found in Europe; it is the maker of the well-known red galls so plentiful on leaves of different species of willow. The galls are, as Mr. Cameron observes in his communication to the 'Scottish Naturalist,' somewhat local, but they are extremely abundant in many situations. I have on many occasions collected large quantities of leaves, more or less covered with galls, and have bred many hundreds of the flies—all proving on examination to be females. Mr. Cameron observes, in the paper alluded to, 'The male is quite unknown to me; and this appears to have been also the case with Hartig.' Last spring I collected, in the London district, a quantity of the galls, placing them in a large flower-pot half-filled with garden mould. The larvæ soon quitted the galls, and buried themselves in the mould for the purpose of undergoing their transformations. About a month after this the flies began to issue forth, probably to the number of from five to six hundred: among this number I had the satisfaction of finding two males. This sex closely resembles the female; but has a narrower body, longer antennæ, and the tip of the abdomen is pale; the abdomen is also narrower, and not, as in the female, widened towards the apex. This season I have repeated my experiment, and have obtained a single male out of several hundreds of flies. Mr. Cameron further observes: 'In all probability they, like *Cynips* (*lignicola*) *Kollari* and other *Cynipidæ*, propagate without the aid

of the male sex.' This observation was undoubtedly made in ignorance of the discovery made by Mr. Walsh in 1868. In the 'American Naturalist' for that year, the author records the fact of having himself bred both sexes of *Cynips spongifica* from galls of the black oak of North America. These galls resemble those of *Cynips Kollari*, being globular, rather larger than the European galls, but of the same hard woody consistency externally, and of the same spongy substance inside. Mr. Walsh adds: 'By the forepart or middle of June both male and female gall-flies eat their way out of a certain number, say about one-fourth part; the remainder are not developed until about two months later.' In a private communication from Mr. Walsh, I learnt that he had, like myself, bred hundreds of the gall-flies from galls collected late in the autumn, all these proving to be females; and that it was not until he made collections of galls in the summer, when a partial development of flies takes place, that he obtained the male, this sex being as one to many hundreds of females. At length he bred three males, one of which he kindly forwarded to me, and which I exhibited at a meeting of this Society. Following up Mr. Walsh's method of collecting the galls of *Cynips Kollari* early in the season,—that is, just at the time when they are becoming hardened, and before any flies have escaped from the fresh galls,—I have tried, but hitherto without success, to obtain males of *Cynips*; but I advise all who are interested in the matter to pursue the same plan, always remembering that these mysteries of Nature are only unfolded at intervals, and then only to favoured votaries. With respect to the obtaining of males of *Nematus gallicola*, I believe that anyone may collect, even early in the season, thousands of the galls of that insect without obtaining a male; but, in all probability, by persevering season after season, his efforts will, as in my own case, be crowned with success; but I feel assured that unless the galls are gathered before any of the flies have escaped he will have little or probably no chance of success. The same care must also be taken in collecting the galls of *Cynips Kollari*; collecting them early, just at the time when they harden and become woody, for it is out of the flies first developed that the male may be expected to be found. My having bred thousands upon thousands of flies without obtaining a male should prove a stimulus to others, for that a male exists I

think Mr. Walsh has determined beyond question. The impregnation of a single female may possibly be sufficient to render her progeny, and their descendants, for several generations, equally fertile; and the same may possibly be the history of *Nematus gallicola*. The male bred by Mr. Walsh is said not to belong to the restricted genus *Cynips*, but to one not represented in Europe. This may be the case; but in all essential generic characters it agrees in a remarkable manner: 'Spongifica,' like *Cynips* proper, has thirteen-jointed antennæ; the neuration of the wings is the same, and no difference is perceptible in the construction of the legs; the differences that are perceptible are in its abdomen being less compressed, and it is glabrous; there may be some other minor differences; the form of the thorax is apparently the same as that of *Cynips*. The question, 'Has *Cynips* a male?' remains, in the opinion of those who have attentively studied the group, unanswered; but surely more differences must exist between 'Spongifica' and the members of the restricted genus *Cynips* than a less compressed abdomen, and the absence of the downy pile that is observable on the sides of the abdomen of *Cynips Kollari* and its allies." A discussion ensued, in which Messrs. Dunning, M'Lachlan, E. A. Fitch, and others, took part; it appearing to some of the Members that there was still a considerable amount of uncertainty as to the precise generic rank of the presumed male *Cynips*.

Habits of a Lepidopterous Insect parasitic on Fulgora candelaria.—The President, who was unable to be at the Meeting, forwarded a paper, entitled: "Notes on the Habits of a Lepidopterous Insect parasitic on *Fulgora candelaria*, by J. C. Bowring; with a Description of the Species, by J. O. Westwood;" accompanied by drawings of the insect in its various stages. This curious insect, resembling a *Coccus*, had been brought to this country twenty-six years ago by Mr. Bowring; and on his return to India he had succeeded in rearing it to its perfect state, proving it to be the larva of a Lepidopterous insect, the general appearance of which induced the Professor to place it among the *Arctiidæ*. The larvæ were found attached to the dorsal surface of the *Fulgora*, and as they grew had a cottony covering, which also occurred in the pupa state (a period which appeared to be of very variable duration). The evidence appeared to prove that the larvæ fed on the waxy secretion of the

Fulgora, and the cocoon of the pupa was formed of the same substance. Prof. Westwood had previously noticed this extraordinary insect at the meeting of the British Association at Oxford in 1860, under the name of *Epipyrops anomala*.

SEPTEMBER 6, 1876.

J. Jenner Weir, Esq., F.L.S., in the chair.

Remedies for Attacks of the Harvest-bug.—Mr. Weir mentioned that, on a recent visit to the South Downs, he had suffered much annoyance from the attack of the harvest-bug, as many as eighty pustules appearing on each foot. Several remedies were suggested, especially rubbing the affected parts with brandy and water; but Mr. Smith stated that on one occasion when he was in the Isle of Wight, and exposed to their attacks, he had found that by taking a dose of milk of sulphur he was effectually relieved from all annoyance.

Enemies to Horse-chestnut Shoots.—Professor Westwood communicated a note with reference to some shoots of horse-chestnut, which he had exhibited at the July meeting of the Society, as having been destroyed, apparently by some Lepidopterous larvæ or wood-boring beetles; but he had since received from Mr. Stainton some shoots that had been forwarded to him by Sir Thomas Moucrieffe, which had been destroyed by squirrels in precisely the same manner. Sir Thomas had himself seen the squirrels at work splitting the shoots with their teeth and extracting the pith. Mr. Smith remarked that he had found the common buff-tip moth (*Pygæra bucephala*) very destructive of late to the Spanish chestnut, a tree on which the insect is not usually found.

Cræsus septentrionalis Bred.—Mr. Smith exhibited a series of sixty specimens of a sawfly (*Cræsus septentrionalis*), which he had bred from larvæ found feeding on young shoots of the alder, growing on the banks of the Sid, near Sidmouth, South Devon. The specimens of the fly were all bred in a single flower-pot, nine inches in diameter.

Mutilla europæa Parasitic on Bombus muscorum.—Mr. Smith also mentioned the fact of *Mutilla europæa* having been found parasitic on *Bombus muscorum*, by Miss M. Pasley, in an Orchard at Shedfield Grange, near Wickham, Hants. He also remarked on a coincidence somewhat remarkable, that on the day previous to his receiving Miss Pasley's communication, Professor Edward Brandt, of St.

Petersburgh, had informed him that he had found *Mutilla europæa* in a nest of *Bombus muscorum*; this being the first instance that had come to his knowledge of the parasite infesting the nests of that species of humble-bee.

Death of Mr. Edwin Brown.—We regret to have to record the death of Edwin Brown, of Burton-on-Trent, who has long been widely known for his great and varied knowledge of Natural History. His first contributions to scientific literature appeared in the year 1843, in the pages of the first volume of the 'Zoologist,'—quadrupeds, birds, insects, and shells, being the subjects,—thus early foreshadowing that breadth of study which he developed in later life. He continued to send various short papers to the 'Zoologist,' and afterwards contributed many and valuable papers to the Northern Entomological Society and the Midland Scientific Association. In 1863 appeared his chief work, the 'Fauna and Flora of the District surrounding Tutbury and Burton-on-Trent,' which formed a considerable part of the 'Natural History of Tutbury, by Sir Oswald Mosley, Bart., and Edwin Brown.' In 1865 and 1866 he read papers on Geology before the British Association; but for some years past his spare time was devoted almost entirely to Coleoptera, of certain sections of which he had formed magnificent collections. Unfortunately his published writings bear but small proportion to his vast store of information. Mr. Brown was a fellow of the Royal Geographical and of the Geological Society. He was born in the year 1818, and died at Tenby, of an apoplectic fit, on the 1st September, 1876.

Death of Mr. Blackmore.—We also have to record the death of Trovev Blackmore, son of the late Charles Philip Blackmore, who died at his residence, The Hollies, Wandsworth, somewhat suddenly, on the 3rd of September, 1876, in his forty-first year. As an entomologist Mr. Blackmore chiefly devoted his attention to Coleoptera. His writings consist of communications upon the Entomology of Algiers—in which country, his constitution being naturally delicate, he generally passed the winter—in the scientific serials of the day. He was also engaged upon a series of articles in the 'Miller,' on "Insects Injurious to Grain."

THE ENTOMOLOGIST.

No. 161.]

NOVEMBER, MDCCLXXVI.

[PRICE 6d.

Pachnobia hypoborea. By JOHN T. CARRINGTON.



PACHNOBIA HYPOBOREA (male and female).

As the year 1876 will hereafter be known amongst Lepidopterists as the "Alpina year,"—on account of the large number of specimens captured during the past season in the Highlands of Scotland,—some account of this species may be of interest. Before entering upon the history of its occurrence in Britain, I will explain its nomenclature.

Dalman was the first known entomologist who noticed this moth. He gave it the name of *Hypoborea* in MS.

Zettersedt, in 1840, published his 'Insecta Lapponica,' in which this moth was first described. He adopted Dalman's MS. specific name, and placed it in the genus *Hadena*.

Humphrey and Westwood, in 1843, in their 'British Moths,' figure this species under the name of *Agrotis alpina*. The specimen from which this figure was made was that taken by Mr. Douglas on Cairn Gower, Perthshire, in 1830.

In 1847 the late Mr. Doubleday published the first edition of his catalogue of British Lepidoptera: there this species is called *Tæniocampa hypoborea*, with ? after Dalman, and with *alpina*, *Westwood*, as a synonym.

M. Guenée describes and figures it in 1852, in vol. i. (p. 342, pl. iv.) of his 'Species Général des Lépidoptères, Noctuelites,' as *Pachnobia alpina*; *Pachnobia* being a generic name of his own creation.

In the last edition of Doubleday's catalogue this species stands as *Pachnobia alpina*, *Westwood*, with *Carnica*, *Heer*, as synonym. The name *hypoborea* does not appear; why I know not.

Carnica is the name under which Hering describes this species, in 1869, in the 'Stettiner entomologische Zeitung.' *Heer*, given as the nomenclator by Guenée, is clearly a misprint of *Hering*.

Glacialis is the name used by Herrich-Schäffer, in 1849, to describe and figure this insect in his 'Systematische Bearbeitung der Schmetterlinge von Europa.' He gives four fine figures of this local red variety on plate 82, vol. ii.

Stainton, in his 'Manual of British Butterflies and Moths,' published in 1857, shortly, but clearly, describes it as *Pachnobia alpina*.

Dr. Staudinger, of Dresden, in his 'Catalog der Lepidopteren des Europæischen Faunengebiets,' 1871, does not refer to *Alpina*; but his species, No. 1098, is *Agrotis hypoborea*, *Zett.* As synonyms he gives *Aquilonaris*, *Zett.*, *Alpicola*, *Zett.*, *Iveni*, *Huber Hor.*; with *Carnica*, *Hering*, and *Glacialis*, *H.-S.*, as varieties.

Newman, in his 'Natural History of British Moths,' describes it under the name of *Pachnobia carnica*.

Carnica, *Her.*, and *Glacialis*, *H.-S.*, appear to refer to the same—the red—variety found in Central Europe.

The reader will observe that this moth has had the following generic names:—*Hadena*, *Agrotis*, *Tæniocampa*, and *Pachnobia*. A careful examination of a long series of Scotch and continental examples leads me to conclude that this insect is not closely allied to any member of the three former genera, neither in structure, superficial appearance, nor habits in any stage. Therefore, until otherwise proved,

I propose to retain Guenée's generic name. It should stand in future—

PACHNOBIA, Gn.

HYPOBOREA, Zett.

Being most closely allied to some members of the genus *Tæniocampa*, I propose to let it remain where it now stands in the British list of Lepidoptera; so that the only alteration necessary in our cabinets will be to remove the label *ALPINA*, and place it as a synonym below the new label *HYPOBOREA*.

The history of the British examples of this species is shortly as follows:—In 1839 Mr. Douglas took the first example of this moth, as above stated. In 1854 the late James Foxcroft took another, I believe, at Rannoch, in Perthshire. Then for a long period no captures were recorded in Britain. In 1870 Mr. T. Eedle took a specimen at rest on Schiehallion, a mountain in Perthshire: this specimen is, I believe, in the collection of my friend Dr. Battershell Gill, of Regent's Park. A fourth was bred from a pupa shaken out of moss, while hunting for Coleoptera, by Mr. Allin: this occurred in Braemar, in Aberdeenshire. This was followed by a capture of one, a female, by myself in the Breadalbane district of Perthshire, where it was flying in sunshine between two and three a.m., on July 10th, 1874. The same year Mr. Eedle again took a worn one near the site of his former capture. During the summer of 1875 I searched very diligently and constantly for this species on the very ground where it has been taken this year; also where I took mine in 1874. In this search I was accompanied by Dr. Buchanan White, of Perth, and Duncan Robertson, the schoolmaster of Camghouran, whom I had trained as a Lepidopterist. None of us saw any trace of it, although constantly on the look out for the then great rarity.

In the early part of August this year, Mr. Robertson sent me a moth for identification, which had been bred from a pupa shaken from moss upon one of the mountains south of Loch Rannoch. I at once saw my old friend *Pachnobia*. I wrote to him and told him to work for it, and he did so, taking a fine series. A little later I heard that Mr. Wheeler, of Norwich, with a friend, were at Rannoch, and had taken several specimens. Mr. Meek, too, was there, with two professional collectors; they also got some. So that amongst

these and others there was a goodly number taken, most of which I have had the good fortune to see.

Mr. Wheeler has especially shown great kindness in lending for use in the 'Entomologist' his fine series of eight specimens, two of which, male and female, I selected for figuring, and they appear at the head of this article.

In examining these *Pachnobia hypoborea*, I find the first notable character is the wonderful variety of the markings; I have scarcely seen two alike, and certainly not three. In Mr. Wheeler's series, independently of those figured, is one which represents the true variety *carnica*; it is nearly like Herrich-Schäffer's figure 421, in fact is devoid of all the conspicuous dark markings, with the reddish ground colour of *Noctua festiva*. Other specimens are of a deep rich red colour, with a bloom upon them like that upon a newly bred specimen of *Agrotis agathina*. But by far the most handsome specimen is one I have seen which has a ground colour of bright blue: this was taken by Mr. Robertson.

As regards their comparison with continental examples, those from Finmark are very constant in the markings, while those from Central Europe are quite as variable as those from North Britain; in fact, were the two series mixed, it would be impossible to separate them, unless differently set.

Dr. Staudinger, in his 'Catalog,' says this species occurs in Lapland, Alpine Norway, the Swiss Alps, Mountains of Silesia, and Hungarian Alps. He adds, in a short note in E. M. M., p. 90, vol. xiii., "In 1860 I took this insect (in company with my friend Dr. Wocke), not unfrequently, in Finmark, in July; and we found pupæ, and also larvæ, at the end of May, in moss. Since then the species has been found on the Dovrefjeld in the centre of Norway, on the Riesengebirge (Silesia), and on the Alps of Switzerland and Tyrol. On the Alps of Carinthia it has a reddish (instead of bluish) coloration, and this form was described by Hering as *carnica*. * * * I saw in the Museum at Pesth a specimen, taken by the younger Frivaldsky in the Carpathian Mountains, which is intermediate between the two forms. * * * The species has a wide distribution on the Continent."

Mr. Wheeler, in a private letter, says:—"I think (writing of *P. hypoborea*) it is generally, though sparingly, distributed over the Perthshire mountains, above the level of 2000 or

2200 feet; what the upper limit may be I do not know. By day it hides closely amongst the rocks and heath, and at night the male flies wildly; the female I never saw on the wing at all." He also says he and his friend never took more than one or two on any night.

I think it probable that there will be few years in future without a recorded capture of *Pachnobia hypoborea* in Scotland; but I am not inclined to think it will be again taken in such number as has been the case this season, which was exceptionally hot and dry in the Highlands.

JOHN T. CARRINGTON.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 221.)



Fig. 59.—*ANDRICUS CYDONIÆ* (and in section).

59. *Andricus Cydoniæ*, Gir.—I hardly think I am wrong in closely connecting the development of the gall of this species, which also occurs on the Turkey oak, with that of the preceding one, and in stating that the principal difference between the two consists in the galls of *A. multiplicatus* having a rather flat disk surrounded by the crippled leaves, while those of *A. Cydoniæ* have a jug-shaped disk, from the top of which the more or less crippled leaves shoot. The gall appears either in the place of an axillar bud or at the end of a twig. It is either spherical or swollen into the shape of an egg, of the average size of a hazel-nut, green, and thickly covered with short gray hairs, which are either simple or twisted; on the basal half are several scattered

bud-scales on raised fleshy bases, which are developed into leaves towards the apex of the gall; a bunch of crippled, densely-crowded leaves grows out of and completely fills the mouth of the cup. The vertical section generally shows distinctly that the axillar part of the bud has not been developed in a longitudinal direction, but has been transformed into a cup, from the interior of which emanate the undeveloped leaves; and we further see that inner galls are sometimes formed from such leaves, and sometimes are developed from the axis, which proves that, strictly speaking, the gall of this species neither belongs to the true leaf- nor to the true bud-galls. The wall of the gall is at first sappy, but gradually hardens and becomes dry. It is difficult in some cases to distinguish this gall from that of *A. multiplicatus*. The flies emerge during the first fortnight of June.—*G. L. Mayr.*

Dr. Giraud, who found this gall on *Quercus cerris* at the end of May, but rarely, thus distinguishes it. Near *A. multiplicatus*, but "elle est toujours plus précoce, sa forme est mieux déterminée et elle n'est pas couvert des nombreux plis de la feuille qui distinguent cette dernière." One inquiline and one parasite are recorded from it by Dr. Mayr in *Synergus thaumacera*, *Dalm.*, and *Megastigmus dorsalis*, *Fabr.*, both of which occur in the summer. Another Turkey-oak species not occurring in Britain.—*E. A. Fitch.*

60. *Andricus nitidus*, Gir.—Of this species I have but one specimen, collected by Von Haimhoffen, which I have had figured for want of a better, though it differs somewhat from the usual shape. According to Giraud the gall adheres to a side vein on the under side of the leaves of *Quercus cerris*, has a very short and slender pedicle, is spherical (the specimen figured is oviform), with a diameter of from four to six millimetres, is light green, and clothed with very short but thick matted hairs. The wall of the gall is moderately thick, of a spongy substance,

Fig. 60.



ANDRICUS NITIDUS.

and surrounds the larva-cell. It appears in October, and falls in about three weeks, but preserves its freshness for some time when on the ground: it gradually becomes gray,

and at last brown. Dr. Giraud obtained the fly in the following August.—*G. L. Mayr.*

From galls of this species Mayr bred eight specimens of *Synergus variabilis*, *Mayr*, from April to June of the second year, and one male of *Sapholytus Haimi*, *Mayr*, in June of the second year; but no parasite is recorded.—*E. A. Fitch.*

Life-histories of Sawflies. Translated from the Dutch of Dr. S. C. SNELLEN VAN VOLLENHOVEN by J. W. MAY, Esq.

(Continued from p. 8.)

NEMATUS CONSOBRINUS, *Voll.*

Imago and larva undescribed.

Nematus niger, subnitidus, ore, scapulis, pedibus anticis et posteriorem coxis pro parte pallide flavis, pleurarum macula, abdomine subtus, segmentorum margine supra et pedum posteriorum femoribus et tibiis fulvis.

For a long time I considered that the sawfly larva, which in our country feeds on the leaf of the gooseberry and often strips whole rows of bushes, was the same species as the *Nematus* which treats the currant bushes in the same way, and whose life-history I described in the second volume of this publication ('*Tijdschrift voor Entomologie*,' vol. ii. p. 69, pl. 4; *Nematus ventricosus*, *Klug.*, '*Zoologist*' for 1862, p. 8079). It was only after I had made a drawing, some years ago, of the full-grown larva that I began to think that for a mere variety the difference was rather great; and I then determined, if possible, to rear the insect, so as to be able to see in how far the imago corresponded with that of *N. ventricosus*.

After having reared some larvæ, taken in a garden at Leyden, but without any good result, I received some others from Haarlem, through the kindness of my friend Ritsema, and from these I obtained, in the spring of 1871, a sufficient number of imagos, which enabled me to satisfy myself that the newly-reared species from the gooseberry differs specifically from that, with which we are already well acquainted, living on the currant. I could find no description, either in Hartig or Stephens, nor in St. Fargeau or Dahlbom, agreeing

with my insect, so that I was obliged to bethink me of a name; and, in consideration of its near relationship to *Nematus ventricosus*, I called it *Nematus consobrinus*. The points of difference between the two species are shown in plate 10, and will appear from the following description.

After I had already been in possession of full-grown larvæ, some very young examples were sent to me on the 21st of May, 1870, from Haarlem (fig. 1): they had shining black heads and black thoracic legs; the body was sordid pale green, having a few, but rather large, black spots on the back and sides. The full-grown larvæ are represented at figures 2 to 6; the description is as follows:—Head shining green, with numerous little black spots on the vertex, placed in curved rows, and reaching to the clypeus; each of these spots bears a hair. Eyes in round black spots at each side of the head. Body cylindrical, with twenty feet; colour sappy-green, with yellow and bluish green. The 1st segment is almost entirely yellow, as are also the large folds of the skin, or rather protuberances, on the sides of the 2nd and 3rd segments (faint); segments 4 to 10, and almost the whole of the 11th, are also yellow. The penultimate segment and the first half of the terminal segment are bluish, the other half of the latter being yellow. The dorsal line is very narrow, and somewhat bluer green than the ground colour. The segments have transverse rows of little, black, shining, wart-like spots, each bearing a hair. On either side of, and close to, the anus is a yellow spine, having a black tip.

The larvæ were in considerable numbers together; they were very voracious, and stripped a branch pretty speedily; their usual posture was that shown at fig. 3, or even a little more bent,—sickle-shape. About the 26th of May they changed their skin for the last time, when all the little wart-like projections or points, and all the hairs, disappeared. The head was now pale green, smooth and shining, but the eyes were still situate in round black spots; the jaws were brown. The body was of the same green tint as before, the dorsal line being blue and thicker; also there was more orange-yellow on the whole of the 1st segment, as also on the folds above the thoracic legs, and on large spots at the sides; the entire 11th segment was of this colour, as also the 12th, or last, at the anus.

From this time they scarcely took any more food, and descended to the ground; shortly after they spun up, some just below the surface and some above, among leaves. The cocoons were of two different sorts (figs. 8 and 9),—one of a chestnut-brown colour and very shining, as though varnished; the other straw-coloured, and less shining. With regard to this difference among the cocoons I simply attribute it to the greater or less vigour and healthy condition of the larvæ, the strongest larvæ producing the darkest-coloured cocoons.

Dahlbom mentions in his 'Conspectus' a *Nematus Grossulariæ* (the same as our *N. ventricosus*) and a *Nematus grossulariatus*; the latter was identical with his *Grossulariæ*, but constructed a single yellow cocoon on a twig, and not, as the other, a double cocoon of a black or brown colour in, or just on the surface of, the ground. It is evident that *Grossulariatus* was only a sickly example of *Grossulariæ*.

The cocoons spun by my larvæ were all single; both the brown and the yellow. One would have thought that larvæ which had become pupæ at the end of May would have produced imagos by June, and a second generation in July and August; however, this was not the case; and I found afterwards that the larvæ which I had got to spin up belonged to the second generation of that year. I never succeeded in rearing the perfect insect, except in March, 1871, from larvæ which had spun up at the end of May, 1870; and the imagos of that month paired and laid eggs, whence larvæ were produced, which would again have been full grown in May. From this it appears that the species in question has two early broods, and no summer or autumn brood. Between the 18th and the 22nd of March I obtained ten females and one male. They *all* differed from *Ventricosus* in the coloration of thorax, abdomen, and coxæ. The following is a description of the female, taken from a living specimen (see figs. 10 and 11):—Head dark brown, approaching black; the margins of the eyes, however, being yellowish. Eyes black. Trophi sordid white, with the exception of the tips of the mandibles, which are black. Antennæ entirely black. Dorsum of the thorax black, with a brown reflection; the pronotum, however, being yellow. Pectus black; only on the pleuræ, which are very shining, is an oval space of a red-brown colour, gradually

fading into black, giving an appearance similar to polished tortoiseshell. Wings yellow at their insertion; radius pale as far as the stigma; the latter, together with nervures, dark gray; membrane of the wing iridescent. Abdomen brown-yellow, having on the dorsum six black transverse lines (basis of the segments), diminishing in thickness towards the anus. All the coxæ black at the base, or with a black line towards the outer side; femora red-yellow; tibiæ yellow, the posterior pair being one-half blackish. Anterior tarsi having the ends of the joints brownish; posterior tarsi rather dark.

The only male I possessed was black on the upper side, the ventral surface and the legs being yellow. The antennæ were pretty robust, somewhat hairy, and entirely black. The head was black, with the exception of the trophi; and in these again the extreme points of the mandibles were black. The thorax was black, with the exception of the pronotum (yellow); scutellum black. The insertion of the wings was yellow; the principal nervures and the stigma deep brown. The dorsum of the abdomen was black, the margins of a brownish orange tint; the under side was also of this colour, but on the upper side the margins of the segments were yellowish. Legs yellow; the four anterior tarsi pale brown at the tips; the posterior coxæ had a black smear at the base; the posterior tibiæ for one-half and the posterior tarsi sordid brown.

It will be seen on comparison that there is a very great difference in the imagos between the present species and Klug's *Ventricosus*. It may be said that in general this new species is much more darkly marked.

As my insects died without having paired with the only male which I had succeeded in rearing, I requested Mr. Ritsema, who had got me the last examples from Haarlem, to see if he could send me some eggs. With a readiness for which I cannot sufficiently thank him he brought me a female from the same bushes, which female while in confinement had laid eggs on leaves of twigs placed in water. There was not the least doubt that the insect belonged to the same species.

To my astonishment I observed that the eggs were not placed, as I supposed they would have been, in the nervures

of the leaves, but were simply, and thus without the help of the saw, stuck here and there on to the under side of the leaf (see fig. 13). The eggs were cylindrical, and rounded off at either end (fig. 14); they were very small, of a yellow colour, smooth and shining. In the most developed ones a difference of colour could be observed between the middle and the extremities; whilst the latter remained green the middle became paler in colour, but afterwards more confused with markings; in fact, at last one could make out through the walls of the egg a little head with two black eyes. From two of these eggs young larvæ were developed in my room; they crept about half-way out of the shell, but were not able to liberate the whole of the body. It appeared to me very singular that one of these half-born larvæ began to feed, and, considering the size of its body, managed to eat a pretty large hole out of the leaf. However, they both soon died; probably in consequence of the very abnormal condition in which they were.

Note.—It is possible that this species may be the undescribed *Nematus cylindricus* of Dr. Th. Hartig (see *Entom. Zeitung.*, vol. ii. p. 24, No. 39).

Are the Colours of Lepidoptera influenced by Electricity?

By J. JENNER WEIR, Esq., F.L.S.

THE following history of an attempt to produce varieties of *Chelonia caja*, by feeding the larvæ upon other than the natural food-plants, is translated from No. 154 of the 'Petites Nouvelles Entomologiques':—

"*Chelonia caja* may well be considered injurious. In the Gatinais, where the vine is much cultivated, *C. caja* is found almost exclusively in the vine districts. It usually feeds on dandelion, groundsel, milfoil, and other low plants which grow in the furrows; but in a dry spring, when the grass fails, and the peasants take all they can find for their cattle, the caterpillars remorselessly devour the buds and young shoots of the vine. The vine dressers are well acquainted with the caterpillar, and the mischief it does in some years is really serious, for it is so common that a couple of hundred may easily be collected in an hour.

“As is well known, *Chelonia caja* is one of the most variable of species. Variation amongst insects is a question not less interesting than evolution, and by what circumstances it is produced has not yet been satisfactorily ascertained. Without pretending to have solved the problem, I will briefly relate the result of some experiments I have made with this species, of which I have had *six thousand* under my care. I had an idea, in common with other entomologists, that the food of the larva might influence the colour of the perfect insect. I therefore made separate trials with walnut, horse-chestnut, sumach, box, celandine, carrot, and lettuce; and some I have reared in complete darkness. It will be easily understood why I chose food so diverse. With the walnut, chestnut, and sumach,—trees having a bitter-sweet flavour,—I hoped to produce melanite varieties; with the box, carrot and celandine, yellow varieties; with the lettuce, light varieties; and from those kept in total darkness I hoped to obtain complete albinism.

“These, however, are the results of my experiments:—The walnut, chestnut and sumach killed many larvæ; a few, however, reached the perfect state, but they were mis-shapen, half-abortive and crippled; in fact, only worthy of figuring in a museum of curiosities. The box was eaten for a few days, but the larvæ would then eat no more; and as I did not change the food they all died of starvation. The celandine was eaten greedily; the greater part of the larvæ formed chrysalids, but all perished in the cocoon except one, which not having sufficient strength to develop emerged a cripple, without indicating any kind of variety. As for the carrot, I found nothing worthy of recording. The lettuce only produced pale, dull, discoloured specimens. Those brought up in total darkness all perished in the third change. Such is the account of my experience: food-plants so diverse as to give fair expectation of good varieties produced none worth record. The few varieties which are in my cabinet were all from larvæ bred on the usual food-plants, *viz.* dandelion, chickweed, dock, groundsel, plantain, &c. I have, however, remarked that it was always during *storms*, when the air was charged with electricity, that the varieties emerged. Is it possible that electricity is a chief agent in the variation of Lepidoptera?”

This drew forth the following communication from M. E. Bellier de Chavignerie:—

“Under the title of ‘Simple Notes’ there have appeared, in ‘Les Petites Nouvelles Entomologiques,’ several interesting articles by M. le Marquis de Lafitole regarding observations about Lepidoptera, which he has made during several years. In one of these articles M. de Lafitole, in writing of *Chelonia caja*, gives an account of some experiments which he made in order to obtain varieties of this very variable species, and concludes by suggesting whether electricity is not one of the principal causes of variation among Lepidoptera.

“This opinion of M. de Lafitole on the influence which electricity may have in causing varieties, coincides with that expressed by me many years ago in a ‘Note on the Accidental Variation of Lepidoptera,’ published in the ‘Annales de la Société entomologique de France,’ 1858, p. 299, and to support it I related a very remarkable fact which I had witnessed. The note is as follows:—‘On the 15th of August, 1847, I was in a locality where *Lycama Adonis* is found in abundance, in order to obtain a supply of its food-plant. The heat had been intense for several days, and a storm was evidently at hand. In fact, I had scarcely arrived at the hunting-ground, and had only time to pin my first five *Adonis*, when a violent storm burst and forced me hastily to return. What was my astonishment, on leisurely examining my captures at home,—the result of an excursion so suddenly interrupted,—to find that the colour of my five *Adonis*, which had emerged but a few hours, was a beautiful lilac, instead of the bright blue which is so noticeable in all the *Lycanidæ*. It was in vain that I frequently revisited the same locality; never again did I see this curious aberration. It would have been interesting to know whether all the *Adonis* which emerged on the 15th of August, 1847, in the same locality, under the influence of an atmosphere highly charged with electricity, were affected in the same way as the five specimens that I took on that day.’

“My reason for recording this incident—which is, alas! thirty years old, and which the labours of M. de Lafitole have brought to mind—is to draw the attention of entomologists to the subject, and to advise them to direct their investigations to, and to increase their experiences in, the

important part played by the electric fluid in the creation of varieties. Here is still a vast field for exploration."

With reference to the above notes I can scarcely deem it probable that electricity can be a "chief agent in the variation of Lepidoptera;" it is quite possible, however, that so delicate a blue as that of *Lycæna Adonis* might be affected by the moisture of the atmosphere during a storm. I once took some specimens of *Procris globulariæ* but just emerged, and then of a beautiful green colour; I placed them in a damp box, and was surprised, when proceeding to set them, that they were all of a dark bronze colour, but when they became dry they resumed the bright green colour. Still as the colour of Lepidoptera often does not arise from a pigment, but varies, apparently, according to the direction in which the light falls upon the scales, the same effect might be produced during a storm in the mode in which the scales overlapped each other. I once took, and still possess, a specimen of *Lycæna Icarus*, in which one of the wings, as compared with the other three, is decidedly of a more lilac colour. I have also seen specimens of *Procris statices*, which were of a bronze colour; but whether they emerged green I am not able to say. I believe that most of the cases, if not all, in which an attempt has been made to produce varieties of Lepidoptera, by feeding the larvæ on different kinds of food, have yielded but a negative result.

J. JENNER WEIR.

6, Haddo Villas, Blackheath,
October 13, 1876.

Description of the Larva of Eurymene dolabraria.—Length an inch and a half; head notched and rounded on the crown, rather smaller than the 2nd segment. When at rest, with the mouth tightly pressed to the legs, the first three segments much resemble a miniature dog's head, the head of the larva representing the dog's nose, and the protuberances of the 3rd segment the ears and crown of the animal's head. Head reddish brown, assuming a mottled appearance on the cheeks; 2nd and 3rd segments blackish brown, each increasing in size, the 3rd considerably so, especially at the sides, giving the larva when at rest the singular appearance mentioned above. Body, beyond the 3rd segment, with the exception

of the 9th, nearly uniform in size; dorsal surface reddish brown; the 4th segment has four very small black dots, arranged transversely on the 5th, 6th, 7th and 8th segments; these dots are arranged in pairs, the hinder pair being rather farther apart than the other two; the 9th segment bears a rounded protuberance of a colour slightly darker than that of the four preceding segments, and bounded anteriorly by a black band; the 10th, 11th and 12th segments are of much the same shade as the main portion of the body, and have the four black dots nearer together longitudinally; the anterior pair on the 9th segment are situated just behind the black band; the posterior pair behind the protuberance. The lateral skinfold is of a lighter shade of brown than the dorsal surface; the spiracles black, surrounded by a light-coloured ring. The claspers and anal flap are of the dark reddish brown of the 2nd and 3rd segments; on the ventral surface the 5th and 6th segments are marked with two large black spots, situated in close proximity to each other; the spots on the 7th, 8th and 9th segments are smaller and farther apart; the light shade of the lateral skinfold is continued on the posterior half of the ventral surface of the 5th, 6th, 7th and 8th segments, in the anterior portion of which the spots are situated. I am indebted to Mr. J. G. Ross, of Bathampton, and Mr. Peters, of Crawley, for a supply of this larva.—[*Rev.*] *P. H. Jennings; Longfield Rectory, Gravesend.*

Entomological Notes, Captures, &c.

Pyrameis Huntera in South Devon.—A very beautiful specimen of this insect was taken by Miss Caroline L. Pole Carew on the 20th September, at Antony, near Torpoint. I had the great pleasure of seeing it on her setting-board this afternoon. On reference to 'Morris's British Butterflies' I see a record of one taken at Withybush, Haverfordwest, South Wales, in July or August, 1828.—*G. C. Bignell; 6, Clarence Place, Stonehouse, September 23, 1876.*

[The above notice of the capture of *Pyrameis Virgeniensis*, *Dru.* (= *Huntera*, *Fabr.*), is interesting, as showing how insects from far distant localities frequently occur as foreign visitors to this country. There are several previous records

of the occurrence of this butterfly in Britain; chiefly from our southern coast. Its natural home is the eastern part of North America; it has no other permanent habitat. There, in some districts, it is as common as its ally *P. cardui* is here. On receiving this communication I wrote for further information to Mr. Bignell. He replies:—"I have made every enquiry, and cannot trace any plant or anything which has been imported from America into the extensive grounds where *P. Huntera* was taken. The Plymouth docks are—in a direct line—about four miles off; so that it may have been imported in one of the many troop-ships which lie there." *Virgeniensis* was first described by Drury, in his 'Illustrations on Natural History,' in 1773; and in 1775 Fabricius described the same species, under the name of *Huntera*.—*John T. Carrington.*]

Vanessa Antiopa in the Isle of Wight.—On the 14th of October *Vanessa Antiopa* was captured here by a fisherman. Unfortunately the insect was destroyed before I saw it, and I only saw the remains.—*Talbot K. Crossfield; Shanklin College, Isle of Wight.*

Colias Edusa at Handforth.—*Colias Edusa* has been seen in some numbers at Handforth, a village in Cheshire, about eleven miles south of Manchester, by a friend of mine while out rabbit-shooting. He saw many, and caught one male, which he brought to me this morning. This is a very unusual occurrence in this neighbourhood.—*H. H. Corbett; Cheadle Hulme, near Stockport, September 20, 1876.*

Colias Edusa var. *Helice* in South Wales.—I had the pleasure of taking a rather fine female specimen of *C. Edusa* var. *Helice* on September 4th, at a small village called Pendine, about fifteen miles from Tenby. As I had no net at that moment, I immediately gave chase with my hat, and succeeded in capturing it. When it was on the wing I mistook it for *C. Hyale*; but to my great delight it was otherwise. *C. Edusa* is very plentiful in this locality, and I have reared a good many.—*A. E. Wileman; Langharne Villa, Chertsey Road, Bristol, September 8, 1876.*

Colias Edusa.—About a week ago Mrs. Boley captured a female specimen of *Colias Edusa*, which, on being confined under a glass shade with some sprigs of lucerne, laid a few eggs. Some of these eggs have just hatched, and the larvæ

have commenced feeding. I had always understood that eggs of this species were laid in the spring by hibernated females.—*W. A. Luff; Guernsey, September 18, 1876.*

Colias Edusa.—The contributions you have lately published respecting *Colias Edusa* and *C. Hyale* embolden me to offer for record an instance of eggs of this species being laid before winter. On the 12th of August I captured a fine fresh female *C. Edusa* at rest: she laid in confinement ten eggs, exactly corresponding to the description in 'British Butterflies.' From these there emerged on the 18th August several larvæ; only two, however, lived for more than two or three days. These two fed well and grew fast till the 9th of September, when one died during a change of skin; the other, however, lived and grew fast till the beginning of this month, when it was killed by accident. At this time it was probably within ten days of changing, and still feeding fast.—*J. R. Phelps Farquharson; Windsor, October 12, 1876.*

Ravages of Pieris Brassicæ.—The larva of this insect has appeared near here in very great abundance this year. A turnip field near this town has suffered greatly from its ravages, the foliage of the turnips in many parts of the field being entirely eaten off.—*W. D. Cansdale; Witham, Essex, September 23, 1876.*

Lycæna argiolus.—I am pleased to be able to record a new food-plant for this species. Mrs. Boley, a lady much interested in rearing Lepidoptera, induced a female of *Lycæna argiolus* to deposit its eggs by enclosing it under a glass shade with some ivy blossom and other flowers. It took no notice of the ivy, but laid its eggs on blackberry (*Rubus*) blossom. The young larvæ are now feeding on the pollen of these flowers.—*W. A. Luff; Guernsey, September 18, 1876.*

Sphinx Convolvuli in Orkney.—In the autumn of last year *Sphinx Convolvuli* was abundant at Swanbister, on the south coast of the Mainland of Orkney, about half-way between Kirkwall and Stromness. The first I took was on the evening of the 12th August, 1875; and I saw several every night until the 16th or the morning of the 17th, when I left Orkney for the south. A week afterwards my niece, Miss Irvine Fortescue, in a letter, said—"The large moths have been in the garden in numbers every evening since you left." I caught ten specimens flying over honeysuckle and single

pheasant's-eye Pinks, mostly at the former. They appeared about eight p.m., and ceased flying about nine; but after packing up on the morning of the 17th I went out about one a.m., and heard the "whirr" of the moth. So I lighted a lantern, and in a few minutes caught four specimens. They were in fine condition when caught, but got much damaged in transit, as I had no means of packing them with me. I have no doubt they were bred in Orkney; but on what can the larvæ have fed? There is no *Convolvulus* in Orkney, so far as I know; for though Neill gives *C. arvensis* as an Orkney plant, no one has found it there since.—*J. T. Boswell; Balmuto, near Kirkcaldy. [From the 'Scottish Naturalist.']*

Sphinx Convolvuli at Clifton.—On the 13th of October I took a specimen of *Sphinx Convolvuli* in the conservatory attached to Granby House.—*W. K. Mann; 14, Wellington Terrace, Clifton, Bristol.*

Sphinx Convolvuli at Winchester.—I took a very fine specimen of *Sphinx Convolvuli*, while hovering over a bed of geraniums, in this city, during the first week of September.—*E. F. Johns; Winton House, Winchester.*

Deilephila Galii near Norwich.—On the 11th of August Mr. James Stally captured a fine specimen of *Deilephila Galii* at Lakenham, Norwich.—*John Parker; 6, Surrey Terrace, September 30, 1876.*

Deiopeia pulchella and *Sphinx Convolvuli* near Christchurch.—Some of your readers may be interested to know that *Deiopeia pulchella* has appeared this season in the neighbourhood of Christchurch. On the 6th of October, while walking with my pupils on the sand-hills between Christchurch and Bournemouth, I caught two fine specimens of this beautiful insect, evidently only recently emerged from the chrysalis. Unfortunately one made its escape, but the other is now on my setting-board. A few days previously one of the boys gave chase to another near the same place, but falling among the ferns he lost sight of it. I think this is the first instance of three having appeared at the same place during the same season. I have also to record the capture of a fine specimen of *Sphinx Convolvuli* on the 2nd of October, by one of my pupils.—*W. McRae; Christchurch School, Hants, October 11, 1876.*

Deiopeia pulchella at Bournemouth.—My pupils and

myself have had the good fortune to take within the last few days five specimens of this insect. They were all captured on the moorland close to the sea, either at rest or kicked up by the feet in walking. I hear also that another one has been taken in this locality.—[Rev.] E. Brackenbury; *Saugeon, Bournemouth.*

Deiopeia pulchella at Brighton.—A fine specimen of *D. pulchella* was captured by my son Charles on the 3rd inst., between five and six p.m., on the Race Hill.—N. McArthur; 3, Toronto Terrace, Brighton, October 12, 1876.

Deiopeia pulchella in Suffolk.—One of my pupils, Mr. C. J. Gross, found a fine *Deiopeia pulchella* in a stubble field at Rickingham, in Suffolk, at the beginning of this week.—[Rev.] A. H. Wratistlaw; School Hall, Bury St. Edmunds, October 20, 1876.

Deiopeia pulchella in the Isle of Wight.—Last year, on the 8th of July, I took a specimen of *Deiopeia pulchella*, which has not been hitherto recorded, in a field on the top of the cliff at Shanklin. Last Monday, October 16th, I had the good fortune to capture another specimen within about three hundred yards of the same spot. It was a female, and looked as if it had only just emerged from the pupa.—Talbot K. Crossfield, Shanklin, Isle of Wight, October 19, 1876.

Cucullia scrophulariæ.—I find that my remarks on this species, in the October number of the 'Entomologist' (Entom. ix. 233), have been in some measure misunderstood. I did not question the occurrence of the species in this country, but simply stated my own experience, and asked for well authenticated records of its *recent* occurrence. Nor did I wish to imply that Mr. Doubleday had no British specimens in his collection, but simply said that he kindly sent me two foreign specimens as types. On referring to his letter, however, dated March, 1870, I find that I had completely forgotten one well authenticated instance. This is what Mr. Doubleday says on the subject:—"Cucullia verbasei and *C. scrophulariæ* are as distinct as any two species of the genus; but I believe that few English entomologists are acquainted with the latter species, which appears to be very scarce in this country at the present time. The Rev. A. H. Wratistlaw, of Bury St. Edmunds, found a brood of larvæ three years since, but he has not met with them again.

M. Constant says it is sometimes abundant in autumn, and then disappears for several years. I sent three or four larvæ to Mr. Buckler, and bred a few moths myself. The larva is quite different to that of *C. verbasci*, being shorter and with fewer markings. The moths appear the middle or end of May, a month or six weeks later than *C. verbasci*. I send for your acceptance a pair which M. Constant gave me. You will see that this species is more like *C. lychnitis* than *C. verbasci*. The larva of *C. verbasci* often feeds upon *Scrophularia aquatica*, but I believe *Schrophulariæ* only feeds upon *Scrophularia nodosa*, which always grows in dry places."—*W. H. Harwood*.

Eupithecia Larvæ in Ireland.—Towards the end of August I was staying with friends near Queenstown. I had little or no opportunity of collecting, but one day I went out for about half an hour and beat the flowers, growing at the edge of the wood and between it and the sea, into an umbrella. The flowers were *Senecio Jacobæa*, *Angelica sylvestris*, *Solidago virgaurea*, and *Eupatorium cannabinum*. On the *Senecio* the larva of *Eupithecia virgaureata* was common, much more so than *E. absynthiata*, which occurred sparingly on this plant and the *Eupatorium*, together with *E. pumilata*, *E. coronata*, and *E. castigata*; on the *Angelica* there were plenty of small larvæ of *E. albipuncta*. The buds of *Clematis flammula* in the garden were much eaten by the larva of *E. isogrammata*. During a short visit to Killarney I found the larva of *E. satyrata* feeding upon the flowers of *Scabiosa succisa* in the wilder parts of the Gap of Dunloe.—[*Rev.*] *H. Harpur Crewe*; October 4, 1876.

Pyralis verticalis in Westmoreland.—In August I took this "pearl" at Witherslack; and I saw a specimen captured near here a short time ago. This is the first time I have known of its occurrence so far north. My mind always associated it with the neighbourhood of London: probably the railways bring specimens amongst us.—*J. B. Hodgkinson*; 15, *Spring Bank, Preston*, September 11, 1876.

Bees making Comb in a Hedge.—My neighbour Mr. Rowland, of Crestow, has just communicated to me the following singular circumstance. In the latter part of the month of June he had a swarm of bees, which, instead of settling in the immediate vicinity of the hive, flew away. As the swarm

was a small one, and its course of flight lay across some fields of tall mowing grass, he did not think it worth while to follow them. At the commencement of harvest the labourers on the farm discovered in a hedge, which lay in the line of flight of the wandering swarm, a mass of honeycomb, tenanted by a family of busily working bees. The mass consisted of three combs, the centre one about eight inches in length, flanked by two shorter ones on either side. There was a fair amount of honey in the comb. It was Mr. Rowland's intention to take the nest and present it to some museum, but unfortunately some cattle got into the field and destroyed it before he could carry his purpose into effect. The hedge in which the comb was built was in no way sheltered or protected.—[*Rev.*] *H. Harpur Crewe*; *Drayton-Beauchamp Rectory, Tring, October 5, 1876.*

Heliothis armiger.—Last autumn, while staying in the Isle of Wight, I found some larvæ feeding on the flower-heads of scarlet geranium. There was so much variety in their colour that I made no attempt at delineating them. The markings, which were almost suppressed in the brown specimens, were very distinct and ornamental in the green. They were so numerous that I supposed them to be the larvæ of a common moth, and did not keep more than half-a-dozen. I tried to feed them on other flowers, but they ate nothing but the flower-buds and petals of geranium. They were in the act of changing to the pupa state when I left the place, and in the journey were injured, so that only one has emerged. August 1st.—It proves to be *Heliothis armiger*. The pupa was light brown, the wing cases greenish; in a few months it darkened in colour. The shell was so thin as to be almost transparent.—*H. M. Golding Bird*; 45, *Elgin Crescent, Kensington, October 13, 1876.*

Pachytylus migratorius (*the true Locust*) near *Wells*.—I have often had "locusts," so-called, sent to me; but they have generally proved to be the large green grasshopper (*Acrida viridissima*), or larvæ of the privet, or of the death's-head hawk-moth. But last week a specimen of the true locust (*Pachytylus migratorius*) was brought to me, found at Woodford, near this city, in a bean-field. The specimen is identical with some I have in my cabinet from Egypt and Australia, the wing-cases being of a speckled-brown colour,

and the true wings greenish; and it measures about four inches across the wings. It is the first specimen I have ever seen alive.—*H. W. Livett; Wells, Somerset, September 6, 1876.*

Answers to Correspondents.

J. Peters.—*Orgyia pudibunda* Double-brooded.—Can you inform me if it is an unusual occurrence for a second brood of *Orgyia pudibunda* to appear in one year? I took some larvæ in the hop gardens in Kent during September, 1875. Imagos emerged May 8th, 1876; female laid eggs on 9th of May; the young larvæ appeared June 15th (thirty-eight days). They went to pupa July 29th. The second brood emerged October 9th, one male and three females; on the 11th two more appeared, male and female. The latter deposited a batch of eggs. Will the latter hatch during the cold season, or will they remain until the spring?—*John Peters; 8, Belgrave Road, St. John's Wood, N.W., October 19, 1876.*

[It is not unusual; your eggs will probably not hatch until early spring.—*Ed.*]

L. Benson.—*Name of a Moth.*—I caught a moth on the bracken, on the 18th of July, which had evidently only just come out. The antennæ are brown, the head is green, and the body nearly white; the fore wings are green, with three transverse white lines, which are bordered with darker green; the hind wings are white. I cannot find it in Newman's 'British Moths.' Will you kindly tell me what it is?

[The moth you have taken is *Halias prasinana*. It is by no means uncommon. The reason you did not find it described in Newman's 'British Moths' is that it is a Micro-Lepidopteron,—a Tortrix.—*Ed.*]

E. G. Browne (Eton College).—The pupæ, of which you and a companion found two hundred and sixteen by digging at the roots of a row of eight elm trees, are probably those of members of the genus *Tæniocampa*, in large proportion. These will emerge in the spring.—*Ed.*

N. Manders (Marlborough).—*Eremobia ochroleuca* is not uncommon, and is generally distributed south of York. Wasps frequently kill and eat Lepidoptera in their imago and larval states. To rear *Liparis dispar* give the young

larvæ leaves of whitethorn, plum, or apple, and feed liberally until they become pupæ.—*Ed.*

Extracts from the Proceedings of the Entomological Society of London.

OCTOBER 4, 1876.

Sir Sidney Smith Saunders, C.M.G., Vice-President, in the chair.

Crymodes exulis, Sericoris irriguana, &c., near Loch Laggan.—Mr. Bond exhibited, on behalf of Mr. N. Cooke, of Li-card, near Birkenhead, a female variety of *Hepialus humuli*, pale in colour, and with the usual markings; three fine specimens of *Crymodes exulis*; fifteen very fine dark (some nearly black) specimens of *Epunda lutulenta*; and six specimens of the Tortrix, *Sericoris irriguana*. All the above were taken near Loch Laggan this season.

Callimorpha Hera near Dover.—Mr. Stevens mentioned that a specimen of *Callimorpha Hera* (the Jersey tiger-moth) has been taken at St. Margaret's Bay, near Dover.

Worm in Abdomen of Earwig.—The Secretary read a note from the Rev. Fitzroy Kelly Lloyd, of Pittenweem, N.B., enclosing for inspection a worm measuring two inches in length, extracted from the abdomen of an earwig. Mr. Pascoe said that it was one of the Nematode worms, and was probably a *Filaria*.

Weevil new to Britain.—Mr. Forbes exhibited a weevil (evidently not indigenous to Britain), taken alive amongst some orchids at Highgate, supposed to have been imported from Ecuador. Mr. Pascoe pronounced it to be a *Cholus*. He subsequently gave a diagnosis under the name of *Cholus Forbesii*.

Variation of Lepidoptera according to Food.—Mr. William Cole exhibited numerous bred specimens of *Ennomos angularia*, bred from eggs laid by the same female, showing slight differences according as the larva had been fed on oak, hawthorn, lime, or lilac, and comparing them with a number of specimens taken at large. In all cases the yellowish tint of the captured specimens was more decided.

Locality for Food-plant of Deilephila Euphorbiæ.—A letter was read from Mr. F. Higgins with reference to some

specimens of *Deilephila Euphorbiæ*, exhibited at a meeting of the Society on the 17th of September, 1873, which were then stated to have been captured in the larva state in the neighbourhood of Harwich. Some doubt was expressed at the time, as it was stated that the food-plant did not grow in that neighbourhood; but about the middle of September last he had visited Harwich, in company with Mr. E. W. Janson, and they were afterwards joined by Mr. Durand (from whom he had received the specimens of *D. Euphorbiæ*), who undertook to show them the place of capture; and they not only found the food-plant growing there, but in three other places nearly half a mile further on.

Descriptions of New Species of Cryptoceridæ.—Mr. F. Smith communicated "Descriptions of New Species of Cryptoceridæ, belonging to the genera *Cryptocerus*, *Meranoplus*, and *Cataulacus*," accompanied by a plate containing figures of all the species, twelve in number; thus raising the number of species described by him to forty-eight. The descriptions were preceded by some interesting particulars relative to the habits of these insects, especially of *Meranoplus intrudens*, which constructs its formicarium in the thorns of a species of *Acacia*, some four to five inches in length; and at a distance of about half an inch from the pointed end a small round hole was made by the ants, which served for ingress and egress to and from the nest. The thorns contained a kind of spongy pith, in which the channels and chambers of the nest were constructed.

New Part of the Society's Catalogue of British Insects.—'A Catalogue of the British Hemiptera-Heteroptera and Homoptera (*Cidaria* and *Phytophthires*),' compiled by Messrs. J. W. Douglas and John Scott, was on the table. This was the fifth Catalogue of British Insects published by the Society.

Haggerston Entomological Society.—The Annual Exhibition of the Haggerston Entomological Society will be held at 10, Brownlow Street, Dalston, on Thursday and Friday, November 9th and 10th, from Six to Eleven p.m.; and on Saturday, the 11th (special), from Six to Ten p.m. Admission on Thursday by tickets only, which can be obtained of the Secretary, 48, Hadley Street, Kentish Town, N.W.

THE ENTOMOLOGIST.

Nos 162 & 163.] DECEMBER, MDCCCLXXVI. [PRICE 1s.

Danais Archippus in Sussex. By Rev. THOMAS E. CRALLAN.



LARVA OF DANAI8 ARCHIPPUS.

FOR some two or three years there have been rumours of the appearance in this neighbourhood of an unusual butterfly. The different people who have told me what they have seen have varied so much in their descriptions that it would be very difficult to believe that they had not seen as many different species, if it were not that persons not thoroughly familiar with the objects they attempt to describe are so very apt to give the most opposite descriptions of the same thing.

One lady saw a butterfly in her greenhouse, which she was sure was like some she had seen in India; but, neglecting to shut the windows before attempting to capture the insect, she had the mortification of seeing it escape. Another lady described to me a butterfly, which she had seen, as white, with a blue rim round its wings. I thought she had seen *Vanessa Antiopa*, and, being dazzled by sunlight, had transposed the colours. Then, another lady saw a butterfly drying its wings on the stem of a tree after emerging from the chrysalis, and described it as yellow, with black lines across its wings. Of course this was the appearance of the

under side, and was very puzzling, though, as it turns out, fairly accurate. Waiting till one of my party should pass that way, but occasionally looking at it, she allowed the day to slip away, and going to capture it in the evening—of course it was gone. Then my sister, who has been familiar with the habits and flight of our English butterflies from early days, and has observed those of insects in Southern Europe, brought me word that she had seen a butterfly unlike any English one she knew, and more resembling, in flight and general appearance, some which she had seen in the South of France. I was still too incredulous to make a search in the vicinity for the stranger, and did not come across it accidentally in my rambles. However, on the evening of October 17th, my housemaid brought me a collar-box, with the information that a young labourer, living about a quarter of a mile off, had caught a "bug" in a field at the back of his house at dinner-time, and thought I should like to have it. (Every insect is called a "bug," hereabouts.) From long experience I expected a larva of *Cossus ligniperda*, but on applying my ear to the box I heard a rustling of wings; and, opening it very carefully, beheld a fine specimen, almost perfect, of *Danais Archippus*.

We are an entomological household, and the excitement generated amongst us by the sight of so grand an insect fluttering in a gigantic cyanide bottle, to which it was at once transferred, may be more easily imagined than described. Upon setting the specimen the next morning I found a scratch across the corner of the left-hand upper wing, and a very slight rubbing of the upper surface, but that the lower wings were still wrinkled, showing that it had not long emerged from the chrysalis. Altogether, considering it had been caught in a hat, and kept seven hours in a box before it came into my hands, it may be considered in very good condition.

I have had the pleasure of showing the insect, soon after capture, to Mr. Jenner Weir and Mr. Douglas, of H.M. Customs, and of leaving a tolerably accurate drawing of it, natural size, with the former gentleman.

Considering the rumours mentioned above, I am inclined to hope this beautiful insect may have become naturalised in this district. I cannot understand this having been an

imported specimen, as we are forty miles from London, and sixteen or seventeen from Shoreham,—our nearest seaport,—to which, I think, no American ships come. If you can furnish any particulars as to larva, food-plant, chrysalis, and their respective seasons, which may help me in my search for it next year, I shall be much obliged.

THOMAS E. CRALLAN.

Hayward's Heath, November 6, 1876.

Danais Archippus. By J. JENNER WEIR, Esq., F.L.S.

THE specimen of *Danais Archippus*, which Mr. Crallan was kind enough to exhibit to me, and which forms the subject of the above communication, presents the appearance of a very fine female of the normal North-American type of the species. It had apparently but just emerged from the chrysalis, and there can be but little doubt that the larva had been reared in the neighbourhood. The accidental appearance of a North-American Lepidopteron in this country would, under ordinary circumstances, be of trivial importance, but there are reasons in the present case for attaching some value to the fact above recorded. *Danais Archippus* is a well-known American species, found as far north as Canada, and by Mr. Bates as far south as the Amazonian district (*vide* Trans. Linn. Soc., vol. xxxiii., p. 516). It has lately become naturalised in New Zealand and Australia, and Mr. Butler, of the British Museum, informs me it has been received from New Guinea; a specimen has also this year been taken near Neath, in Wales, as recorded in the 'Entomologist's Monthly Magazine,' 1876 (p. 107). It is, therefore, found distributed over a large part of the earth's surface, in three of the six Zoogeographical regions now generally recognised, *viz.* the Nearctic, Neotropical, and Australian; it is by no means improbable that the species may become also naturalised in this the Palearctic region. It becomes, therefore, important that its earliest appearance in this country should be recorded. A full account of the insect is given by Mr. C. V. Riley, the State Entomologist of Missouri, in his Third Annual Report, 1871 (pp. 143—152), and a copy of his woodcut of the full-grown larva is given herewith, in

order that entomologists may recognise the species if found in England in that state. The perfect insect is so well known that it has not been thought worth while to figure it, particularly as it is so large that its wings would extend beyond the width of the letterpress of this magazine. The larva feeds on several species of *Asclepias*, viz. *A. tuberosa*, *curassavica*, *cornuti*, and *purpurascens*: no species of the *Asclepiadaceæ* is indigenous to this country; one genus of the order, *Periploca*, is often grown in the open air, and many of the genera under glass. Mr. Riley states that according to some authors the larva also feeds upon Dogbane (*Apocynum*): but one genus of the *Apocynaceæ* is indigenous here, viz. *Vinca*; both *V. major* and *minor* are common in Mid-Sussex in the woods and in gardens; but whether the larva would feed upon either of these plants must remain an open question at present. The oleander, another *Apocynaceous* plant, is also very commonly grown in Sussex, with slight shelter during the winter. The colour of the larva is black, white, and yellow. Mr. Riley states that the females certainly hibernate, and deposit their eggs in his district, St. Louis, early in May; the imago appears about the middle of June; eggs are then again deposited, and a second brood of the butterfly appears in October. It is quite possible that the larva may be found to feed here on some indigenous plants of quite different orders to those which it usually frequents, and this becomes the more likely, as it would form by no means an exceptional case; *Bombyx Mori*, for instance, can be reared by feeding it either on lettuce or mulberry,—plants belonging to orders as widely different as any two arranged amongst the *Exogens*.

J. JENNER WEIR.

6, Haddo Villas, Blackheath.

Descriptions of Oak-galls. Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen' by E. A. FITCH, Esq.

(Continued from p. 247.)

61. *Andricus crispator*, Tschek.—This recently-discovered gall is found towards the end of May on the Turkey oak: many specimens are frequently crowded together on one leaf, so that it becomes quite crumpled, and forms an elongate

ball, which only shows the central and side veins, and the small galls of the size of a hemp-seed, while the parenchyma is completely wanting; the leaf-veins are curled at the top,



Fig. 61.—ANDRICUS CRISPATOR.

after the manner of fern fronds. Should the galls not occur in a mass the leaf becomes better developed, and the spherical galls may be seen projecting equally on each side of the leaf. If the galls appear on the upper side of the midrib, which frequently is the case, then the lower side of the vein swells, turns upwards and forms a curl. The galls occur between the crumpled and generally up-turned sides of the leaf in a central longitudinal furrow, which becomes formed in that manner: they are sappy, when recent, green or red in colour, and on the lower side scantily, on the upper side more thickly, covered with hairs. When mature the galls are hard and yellow; those galls which do not occur on the midrib are less conspicuous on the under side of the leaf. The section exhibits a hard inner gall, which is thoroughly united to the exterior gall substance. The dark-coloured males appear towards the middle of June (later in a cold summer), and after them the rufous females—*G. L. Mayr.*

Dr. Mayr bred two females of *Ceroptres Cerri* in the summer from fresh galls.—*E. A. Fitch.*

Observations upon the Larva of Stauropus Fagi.

By H. M. GOLDING BIRD.

As *Stauropus Fagi* is not a common insect some account of its larval state might be interesting to those who have had

no opportunity of watching it for themselves. Its peculiar form has been carefully described by Mr. Newman, and so often figures in groups of caterpillars that any description of mine would be superfluous.

About a score of eggs were laid by a worn female taken at sugar; one of the young larvæ was given to me. It was very small and very miserable looking when it came into my hands; it had ceased eating previous to moulting. In two days, that is, by the 21st of August, the mask fell from the face, and then it began the hard task of extricating itself from its old skin. The operation lasted about half an hour, the larva stopping every now and then for a few minutes' rest before resuming its struggles. I had never before had an opportunity of seeing this species moulting, and as it had used its long legs just before in walking (though certainly with very little vigour) I was not prepared to see them cast with the old skin; but soon two new pairs were perceived doubled up against the sides of the larva; and this accounts for the great difficulty Fagi found in freeing itself, as the comparative stiffness of the legs prevented its working backwards and forwards, after the wriggling fashion of other larvæ. The legs did not all get free till the skin had been pushed back to the 6th segment, and then even the flattened tail made its way out with comparative ease. It next proceeded to devour the cast skin, all but the head—which was either too tough, or else was not worth seeking, as it had fallen to the bottom of the cage—and one leg; these were the only relics of the grand struggle.

After a day's rest it began to eat beech, oak, and a little birch. I sketched it in its various stages, and observed that the two caudal horns are not alike in colour, one being rust-red and the other metallic-blue; this was more noticeable as the larva increased in size. It ate sometimes during the day, but was more often at rest, with the body curved round, so that the last segment touched the 1st, the long legs folded one over the other, and holding on to the twig by the four pairs of claspers. On Thursday, the 31st, it ceased eating; and by Sunday morning had again changed its skin.

After a few hours' rest Fagi seemed a different creature; began to feed with a voracity which I have seen in no other larva,—not even in *Chelonia caja*. All day long it was

eating: twelve or thirteen bites it took at the leaf to complete the curve; the last to see it at night and the earliest morning visitor found it feeding,—and on nothing but beech; the largest and juiciest leaves were daily put fresh into the cage; oak was always there, but not touched. It grew rapidly, as one might expect, till the head, which seemed large out of all proportion, looked but a sorry balance for its enormous tail; in fact, the posterior segments seemed almost too heavy to drag about; and on one occasion Fagi assumed a comical appearance by resting this imposing tail on a bed of moss, while it lost no time in eating as if for a wager. In the day-time the cage was kept out of doors; and if Fagi could be said to eat more greedily at one time than another, it was when the wind was so high as to blow the leaves about in the cage.

Instead of being alarmed when disturbed it either continued placidly eating or else curved its tail over its back, and pugnaciously threw out its long legs, as if to resent the interference. A small larva of *Orgyia fascelina* was feeding in the same cage, and happened once to be resting on a twig too near to Fagi for its own comfort, for, coolly enough, Fagi struck at it with one of its long legs, and sent the unlucky larva to the floor of the cage.

Fagi enjoyed life so thoroughly as a larva, it seemed as though it meant to remain one all its days; but on September 19th its appetite failed, and the next morning had for the first time forsaken its food, and was sitting disconsolately on the floor of its cage. It soon set about seeking a suitable winter dwelling, and in its ramble (to show that its strength was in no way diminished) crawled under a small saucer, tolerably heavy with earth and moss. Presently it began to draw together a large beech leaf and an oak by little columns of white silk, and by evening the leaves were entirely closed; so no more was to be seen of Fagi; and I wait for its appearance in another form next summer.

Other larvæ in spinning move their heads to and fro between the two surfaces they wish to unite, carrying the silk in their mouths; but Fagi scarcely moved its head at all, guiding the silk from side to side by means of one of its legs. The operation was an interesting one.

Although in eating Fagi's long legs seemed almost to be

hindrances,—for it steadied the food by means of the first pair, which are similar to those in other larvæ,—yet from the force with which it hit *Orgyia fascelina*, and the delicacy with which it used them in spinning, it is clear that the muscular development is considerable. It is difficult to understand how, in moulting, the connection is transferred from the old pairs, so recently in use, to the new ones, which are packed away under the old skin. It is hardly likely that there should be two sets of muscles, which are brought alternately into play at the different moultings. This almost refutes itself, as it suggests a waste in the economy of Nature.

It has been said that there is something similar in the case of a crustacean which renews its claws after an injury. But I can see no parallel, for the crab or lobster has no new claw ready to take the place of the one that has been wrenched off; the muscles are simply off duty till, by a slow process, a new claw, very small at first, grows in the place of the lost one. Now Fagi has the two sets of legs at one and the same time; true that one set is not visible till the moulting begins, but then, with scarcely any interval, the active force is transferred from the old to the new, the new pair being considerably longer and stouter than the old.

Of course with the claspers they are simply drawn out of the skin, and the muscular action is in no way interrupted or suspended, whilst with the long pairs the actual jointed legs themselves are cast aside, and in some mysterious manner the muscles transfer their service to the new.

H. M. GOLDING BIRD.

45, Elgin Crescent, Kensington,
October 13, 1876.

Capture of Lepidoptera at Sallow-bloom.

By JOHN T. CARRINGTON.

THE afternoon of June 17th, last year, was like many more afternoons in the Highlands of Scotland,—it was wet; but, in despite of the rain, I started, accompanied by two friends, from Camghouran for a walk of about twelve miles, over the moor of Rannoch, to a solitary shepherd's cottage, rejoicing in the Gaelic name of Croachan Dhu, meaning in English "at the black burn." This district is probably the loneliest,

wildest, and most barren of the Highlands: here was the home of the wild tribe, so graphically described by Sir Walter Scott in his 'Legend of Montrose.' These "Children of the Mist" lived for years in these mountain fastnesses, secure from the harrowing attacks of the great M'Cullum More's little less fierce followers, until hunted down by them and Allan M'Aulay, whose deep-rooted revenge against them never let him rest. I could not help thinking over all this as I stood on an eminence, from which I could see upwards of twenty mountain peaks, none of less altitude than 3000 feet, many then clad with patches of snow. I marvelled at the many changes which had passed since the days when Randal MacEagh, "Son of the Mist," and his son Kenneth trudged with brawny brown legs over perhaps the very ground now occupied by three peaceful "fly-catchers." But I must return to what I was going to say.

After a weary walk we reached the cottage; being received by a salute of barking collies, which to one of my friends, recently from London, was no source of pleasure. After refreshing ourselves with Miss Campbell's scones, oat-cake, and cream, we started work for the night: one contingent sugared high on the mountain-side, while the other two did the same on a mountain bog. Your readers will imagine the astonishment of all, as night drew near, to find the moths flying steadily in one direction, quite oblivious of the many patches of intoxicating sweets we had prepared. The next best thing to do was to find out what was the attraction. I need not ask my readers to guess what it was,—for who would think of sallow-blossoms at midsummer? But so they were; and an odd thing it seemed to find such a mixed company at the feast. Here is a list of them:—The genus *Hadena* seemed to replace our more familiar—at sal lows—genus *Tæniocampa*, for in hundreds were *Hadena adusta*, *H. glauca*, *H. dentina*, *H. pisi* (in all sorts of variety), *H. contigua*, and *H. rectilinea*; *H. dentina* being in decided majority. In addition to these we took an occasional *Acronycta myricæ*, with *A. menyanthidis*, *Noctua plecta*, *Rusina tenebrosa*, a few *Ypsipetes ruberata*, and one *Notodonta dictæoides*. Excepting the absence of a single decently rare moth, the above list is decidedly interesting, as being such an odd mixture of species captured on a single night at sal low-

bloom. We quite thought we might take something new, or at least of value at these sallows; but nothing beyond those mentioned in this list was seen. At about two o'clock in the morning we had to beat a retreat on account of the steady rain, which began to knock off the satiated moths from the bloom. Our troubles did not end there, for when we got to Miss Campbell's hospitable house it by no means meant shelter. Whether it is that Highland lairds think their tenants so hardy that little comfort does for them, I know not; but this I do know, that we had to sleep with umbrellas over our bed, which only concentrated the drippings, instead of all being evenly wet.

The locality where we found these sallows (*Salix caprea* var. *sphacelata*) in flower was at an altitude of upwards of 1400 feet, in a cold wet bog. There is no cultivated land within six or eight miles; and, excepting this shepherd's cottage, no other house within the same distance.

On our return we examined the place by daylight, but found nothing worth taking—further than a series of *Ypsipetes ruberata*.

I have worked the neighbourhood before and since, but always left it with the same feeling of depression; possibly this was caused by want of success in capturing anything rare, added to the dreary solitude. The shepherd's sister told me that during winter she seldom went further than a few hundred yards from the cottage.

JOHN T. CARRINGTON.

September 13, 1876.

Entomological Notes, Captures, &c.

Entomology in Cornwall.—Few counties seem to have received so little attention from entomologists as Cornwall; this is the more remarkable, as the varieties of soil and numerous genera of plants found there make it a likely resort of many of our rarer Lepidoptera.

Being at St. Austell on a visit, in August last, I used the net in the immediate neighbourhood; without anything like hard work I obtained the following result:—*Colias Edusa* in large numbers, the proportion being one female to about five males; the colour of the males seems to vary more than those

I have seen from any other district. Of *C. Hyale* I got only two. *Argynnis Paphia* was seen in some abundance, though I was too late to take many in good condition. *A. Adippe* also occurred, but much worn. *Pyrameis Cardui* moderately plentiful, and in first-rate condition. *Lycæna Argiolus* swarmed on one particular ivy-hedge bordering on a wood, where I also took one *Thecla Quercus*.

I did not go after moths at all, but *Macroglossa stellatarum*, *Xanthia silvago*, and *Ptilodontis palpina*, came in my way, and were secured. For a fine specimen of *Sphinx Convoluti* I am indebted to Mr. Brewer, the station master, who brought it to me alive in very good condition; I heard of another being taken in the town soon after. *Nonagria Typhæ* pupæ also occurred freely in reeds on the moors; they were easily found by splitting open the thick stems of plants that presented a faded appearance. I also took three nearly full-grown *Chærocampa Elpenor* larvæ feeding on *Fuchsia fulgens*. Two *Sphinx Ligustri* larvæ were found feeding on variegated holly.

Wasps have long been included in the list of enemies which an entomologist has to contend against; but I think they have rarely been guilty of so impudent an outrage as the following:—I was setting *Colias Edusa* at a table before an open window; a specimen I had just killed was lying before me; a wasp flew in, and almost immediately settling upon it, bit off the wings with an audible snap of its jaws, and then flew away with the body. It may be wondered why I allowed the wasp to proceed without molestation; but it did not strike me that it would spoil the insect until I heard it bite off the first wing, which rendered the specimen useless. So curiosity prevented me from disturbing it.

If any entomologist contemplates a visit to this neglected county next season, I would strongly advise him to arrange his expedition to terminate with August, as after that month it usually rains frequently.—*T. Hodge*; 33, *Almorah Road, Islington, N., October, 1876.*

Deiopeia pulchella and *Argynnis Lathonia* at *Hastings*.—*Deiopeia pulchella* has occurred at *Hastings* again this year: three specimens have been met with (two on October 18th, and one about a week before). They were all in excellent condition, and were taken at almost the same spot, a

distance of about two miles from the locality of last year. I have also seen a specimen of *Argynnis Lathonia*, taken here on the 14th of August, by Mr. S. Hume.—*E. A. Butler; University School, Hastings, November 7, 1876.*

Deiopeia pulchella at the Land's End.—This autumn, being at the Land's End, where I captured *Deiopeia pulchella* last year, I searched carefully for it up to the time of my leaving at the end of September, but without success. Since my return I have received three specimens in good condition, taken soon after my departure: one by Mr. W. A. Michael; the others by residents in the neighbourhood.—*Annie Michael; 27, York Road, Brighton, Nov. 23, 1876.*

Acherontia Atropos at Folkestone.—A large specimen of *Acherontia atropos* was brought to me by a friend, a few days ago, in excellent condition.—*J. J. Giles; Folkestone, October 21, 1876.*

Chærocampa Celerio.—Mr. W. Shaw, of Ayton, took a specimen of *C. Celerio*, in Berwickshire, in 1873. I think the capture of so scarce a species should be recorded, even if somewhat late.—*W. Prest; York.*

Chærocampa Celerio.—On the 29th of last September a fair specimen of *C. Celerio* was taken at rest on a clothes-line, in a garden at Edwinstowe. It is now in my possession.—*Arthur Doncaster; Broom Hall Road, Sheffield, November 20, 1876.*

Acronycta Alni.—On the 21st of June last I had the pleasure of taking a perfect specimen of *A. Alni*: it was at rest on a wooden fence in this neighbourhood.—*Id.*

Scarcity of Lithosidæ.—It is well known that all the British species of *Lithosidæ* are more or less local; but has it been observed that during the past season the various species have been unusually scarce in their especial localities? Such has been my own experience. In 1875 one particular spot, near a wood, swarmed with *Lithosia stramineola* and its near ally (if not variety) *L. griseola*; but this season I have not seen a specimen of either. *Eulepia cribrum*, too, has been unusually scarce in its favoured haunts, as well as *Lithosia mesomella* and *L. complana*; neither has its commoner and more generally distributed relative, *L. complanula*, been taken in any numbers. *L. helveola* and *L. aureola* I have never found in plenty; but this season not a specimen of either has rewarded

my search. Whether they have been taken in any part of the forest, or whether *L. quadra* has turned up in the same locality, I am not prepared to say. It is true I have not had an abundance of leisure to devote to entomological pursuits, but I have spent sufficient time in the forest and elsewhere to prove that in this locality there has been a paucity of this particular class. There is a belt of tall fir trees skirting a young oak wood in one part of my forest hunting-ground, and in previous seasons I have seen *L. rubricollis* flying around the tops of those trees in countless numbers. This season, however, it has not been so; not that their occurrence in such a situation is at all a guarantee of a good day's "take," even if they are common, for their capture is a difficult matter. Fortunately they fly in the daytime, and are more easily seen than they would be at dusk. It would be interesting to know if this class of moths—the majority of which are lichen feeders—have been scarce in other localities; and, if such has been the case, what cause has effected it? Is it possible the continued drought in this neighbourhood has had anything to do with such a scarcity? Surely the heat has been sufficient to develop an unusual number of insects. However, lichens prefer a humid atmosphere and situation in which to grow; and the great heat and drought might have been detrimental to their growth. But even in this case I am not so sure that a scarcity of food could have been the cause of a scarcity of moths this season, as many of them were full-fed larvæ before the drought began; still it seems extraordinary that in a season when some insects are so common others should be unusually scarce. This, be it understood, is only an observation made in this immediate locality; and my experience may differ considerably from that of others at a distance.—*G. B. Corbin.*

Hybernia leucophearia.—Will any entomologist publish his geological experiences of *Hybernia leucophearia*? Here, on the lower greensand, it is about as common as *Vanessa Antiopa* or *Deilephila livornica*, yet generally it is considered as an insect more profuse than welcome. Within a few miles it occurs in plenty, *i.e.* on the London clay north of the Downs (gravel and sand), and Wealden (clay) on the south. My captures in the immediate neighbourhood have been as

follows:—One specimen previous to 1864, three in 1872, and one in 1874. I have only occasionally seen it in local cabinets.—*Sydney Webb; Redstone Manor House, Redhill, Surrey.*

Ennomos alniaria.—My friend the Rev. E. Austen, who lives a few miles from Dover, presented me last week with two specimens of *Ennomos alniaria*, which he reared from larvæ by beating. The food-plant was oak, birch, or willow; most probably one of the two former. The caterpillars spun up between leaves; the moths appeared about the 20th of September. This being his second season of larvæ rearing, he had no idea of the extreme rarity of his captures until the moths appeared.—*W. W. Blest; Broomscroft, Watlingtonbury, Kent, November 7, 1876.*

Dasycampa rubiginea at Hawley.—I have had the good fortune to take two specimens of *Dasycampa rubiginea* at ivy this season; one on the 12th October, and the second on the 13th. Both specimens are in perfect condition.—*H. Jones; Hawley, Farnborough Station, October 20, 1876.*

Catocala Fraxini.—My friend Mr. W. Shaw, of Ayton, Berwickshire, took a rather wasted specimen of this rare species at Netherbyres, in the same county, on the 9th September, 1876. He has kindly added the insect to my collection.—*W. Prest; York, November 1, 1876.*

Pionea margaritalis.—Last July a specimen of what I then thought was a variety of *P. forficalis* was caught in my garden at Mile End. However, upon comparing it with the *P. margaritalis* in the Doubleday collection, I find it is undoubtedly this latter species.—*D. Pratt; 398, Mile End Road, London, E., November, 1876.*

Spilodes palealis.—It may interest the readers of the 'Entomologist' to know that my friend Mr. Whitewick, of Bootle, captured a fine female specimen of *S. palealis* on the 12th of August, while beating for *Agrotis præcox* on the banks of the River Mersey. This is, I believe, the first instance of its capture near here.—*Thos. J. Roxburgh; 120, Harlow Street, Park Road, Liverpool, Nov. 20, 1876.*

Botys verticalis.—Mr. Hodgkinson seems surprised to find (*Entom. ix. 260*) *Botys verticalis* as far north as Witherslack. Its range is much further north, as it is reported to me by Dr. Trail from Aberdeen, and I myself have seen it at

Dunkeld. This is not a common species in Scotland.—*F. Buchanan White, Perth, November, 1876.*

Doubleday Collection.—As many of the readers of the 'Entomologist' are aware, the hours for visiting this Collection have hitherto been from 10 a. m. until 5 p. m. I beg to forward the following letter for publication in the 'Entomologist.'—*D. Pratt (Sec. to East London Entomological Society); 333, Mile End Road, E.*

"South Kensington Museum, London, S.W.,
November 1, 1876.

Bethnal Green Branch Museum.

Sir,—In compliance with the wish expressed by the members of the East London Entomological Society, in the letter received from you to-day, I beg to acquaint you that arrangements have been made for the Doubleday Collection, at the Bethnal Green Branch Museum, to be open for inspection until 9.30 p. m. on Tuesdays.—I am, Sir, your obedient servant,

P. CUNLIFFE OWEN, *Director S. K. M.*"

"*Valeria oleagina*:" *Correction of an Error* (Entom. viii. 164).—I have ascertained that the insect recorded by me as *Valeria oleagina* is *Mamestra persicariæ*. I regret having made so great a blunder.—*Benjamin Brown; Deard's End, Knebworth.*

[The footnote to the announcement shows that the specimen did not receive editorial sanction.—*Ed.*]

Pachnobia hyperborea and *Pyrameis Virginiensis*: *Errata.*—By an unfortunate error, detected when too late for alteration, these two specific names were incorrectly spelt in last month's number. They should be *hyperborea* and *Virginiensis*. I would suggest that the readers of the 'Entomologist' should at once correct these errors in their copies, to prevent further confusion.—*John T. Carrington.*

West London Entomological Society.—The fourth annual Exhibition of this Society will take place in the Church Room (adjoining St. Mark's Institute), George Street, Oxford Street, near Grosvenor Square, on December 7th and 8th, 1876, between the hours of 6 and 11 p. m.

Commencing with the Number for January, 1877,

THE ENTOMOLOGIST

WILL BE EDITED BY

JOHN T. CARRINGTON,

WITH THE ASSISTANCE OF

FREDERICK BOND, F.Z.S.

EDWARD A. FITCH.

JOHN A. POWER, M.D.

FREDERICK SMITH.

J. JENNER WEIR, F.L.S., F.Z.S.

F. BUCHANAN WHITE, M.D., F.L.S.

During the Year 1877 it is intended to publish in the 'ENTOMOLOGIST' an

EPITOME OF NOVELTIES AND RARITIES

which have occurred in the Entomological Fauna of Great Britain and Ireland since January, 1874,—the date of the last 'Entomologist's Annual.' Dr. Power has undertaken the Coleoptera; Mr. Carrington, the Lepidoptera; Dr. Buchanan White, the Hemiptera; Mr. Frederick Smith, the Aculeate Hymenoptera and Diptera; Mr. Fitch, the Galls; &c. To further this object it is requested that notice of all unrecorded occurrences of New and Rare Insects may be sent before the 10th December next.

It is also intended to publish frequently Biographical Notices of Eminent Naturalists, accompanied by

PHOTOGRAPHIC PORTRAITS.

The first of these will be a memoir of the late Mr. Henry Doubleday.

Every Number will contain one or more

WOODCUT ILLUSTRATIONS

of Economic Entomology, or other subject of interest. Mr. Bond, Mr. Stevens, and several other Entomologists, have kindly placed at the disposal of the Editor, for figuring, many

FINE VARIETIES OF LEPIDOPTERA.

Also, in the coming Volume of the 'ENTOMOLOGIST,' may be expected, besides numerous articles upon Lepidoptera; a List of the Coleoptera of the neighbourhood of Waterford, by Dr. Power, giving localities and other interesting information; and a valuable paper on the Mimicry existing between Hymenoptera and Diptera, besides occasional notes on the Anatomy of Insects, by Dr. Lowne. Mr. Fitch will continue his translations of Dr. Mayr's valuable work upon Galls; this series will be liberally Illustrated as heretofore. A continuance of Mr. May's interesting translations of Life-histories of Sawflies will likewise appear. There will also appear from time to time Reviews, with extracts, of new Entomological works.

EXCHANGE LISTS

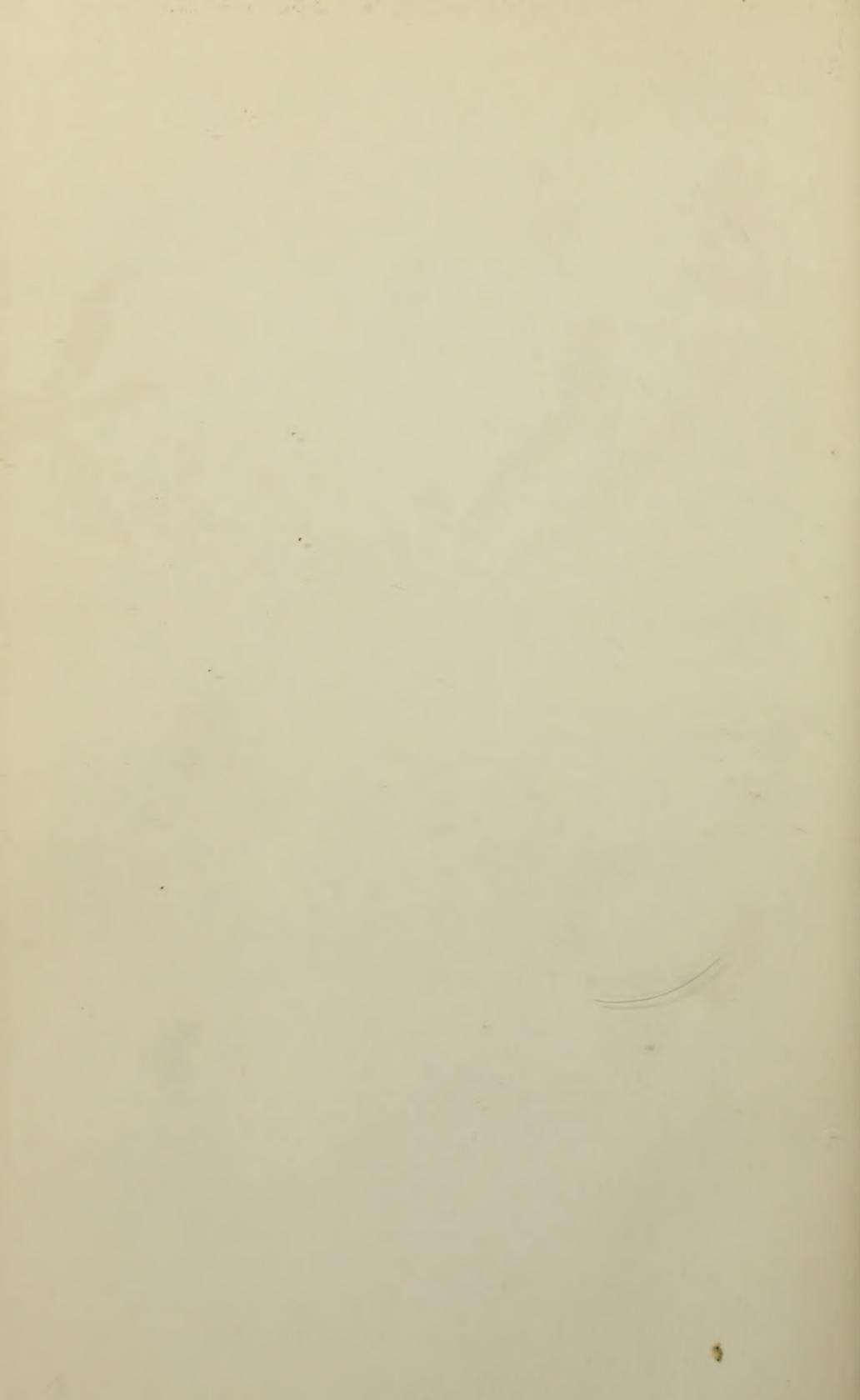
of Entomological Specimens will be inserted, as now, free of charge.

SCIENTIFIC DISCUSSION

will receive every encouragement. The Editors avow their determination, in conducting the 'ENTOMOLOGIST,' to avoid all illiberal or personal allusions likely to promote an unpleasant feeling between contributors. They confidently appeal to all who are desirous of the success of the 'ENTOMOLOGIST' to give it not only their personal support, but also their warmest recommendation; remembering that its ultimate prosperity depends not only upon collective, but upon individual, effort.

Contributors are earnestly requested to send their communications as early in each month as convenient, addressed to *The Editors of the 'ENTOMOLOGIST,' care of T. P. NEWMAN, 32, Botolph Lane, London, E.C.*

LONDON, December 1st, 1876.



BINDING SECT. MAY 4 1968

P The Entomologist
Eiol
E
v.7-9

Biological
& Medical
Serials

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE

