









THE  
LEPIDOPTERA  
OF THE  
BRITISH ISLANDS  
*VOL. XI.*





42  
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1910  
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List.

THE  
LEPIDOPTERA  
OF THE  
BRITISH ISLANDS

*A DESCRIPTIVE ACCOUNT OF THE FAMILIES, GENERA, AND  
SPECIES INDIGENOUS TO GREAT BRITAIN AND  
IRELAND, THEIR PREPARATORY STATES,  
HABITS, AND LOCALITIES*

BY  
CHARLES G. BARRETT, F.E.S.  
III

*VOL. XI.*  
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3



## CONTENTS OF PLATES

### PLATE 1, VOL. 1

- FIG.  
 1. *Papilio Machaon*  
     male  
 1*a.* female  
 1*b.* larva  
 1*c.* pupa  
 2. *Aporia Crataegi*  
     male  
 2*a.* female  
 2*b.* larva  
 2*c.* pupa

### PLATE 2, VOL. 1

1. *Pieris brassicae*  
     male  
 1*a.* female  
 1*b.* larva  
 1*c.* pupa  
 2. *Pieris rapae*  
     male  
 2*a.* female  
 2*b.* female var.  
 2*c.* underside  
 2*d.* larva  
 2*e.* pupa

### PLATE 3, VOL. 1

1. *Pieris napi*  
     male  
 1*a.* female  
 1*b.* female var. South Wales  
 1*c.* female var. North Scotland,  
     from Mr. R. Adkin's collec-  
     tion  
 1*d.* male, North Ireland  
 1*e.* female, North Ireland  
 1*f.* undersides  
 1*g.* larva  
 1*h.* pupa

VOL. XI

### PLATE 4, VOL. 1

- FIG.  
 1. *Pieris Daplidice*  
     male, Dr. Wheeler's collec-  
     tion  
 1*a.* female  
 1*b.* underside  
 1*c.* larva  
 1*d.* pupa  
 2. *Anthocharis Cardamines*  
     male  
 2*a.* female  
 2*b.* male, small race  
 2*c.* female, small race  
 2*d.* gynandrous specimen, Mr.  
     C. A. Briggs' collection  
 2*e.* underside - aberration. - Dr.  
     Mason's collection  
 2*f.* underside (at rest)  
 2*g.* larva  
 2*h.* pupa (enlarged)

### PLATE 5, VOL. 1

1. *Leucophasia sinapis*  
     male  
 1*a.* female  
 1*b.* larva  
 1*c.* pupa  
 2. *Colias Hyale*  
     male  
 2*a.* female  
 2*b.* male var. from Mr. Robson's  
     collection  
 2*c.* male var.  
 2*d.* female var. from Mr. S.  
     Webb's collection  
 2*e.* underside

### PLATE 6, VOL. 1

1. *Colias Edusa*  
     male  
 1*a.* female

*b*

- FIG.  
 1b. *Colias Edusa*, male, yellow var.  
 1c. female, var. *Helice*  
 1d. female, intermediate var. from Mr. S. Webb's collection  
 1e. female, white var., margin hardly spotted, Mr. S. Webb's collection  
 1f. female, unsymmetrical, Mr. Webb's collection  
 1g. female, spotted margin  
 1h. larva  
 1i. pupa

## PLATE 7, VOL. I

1. *Gonepteryx rhamni*  
 male  
 1a. female  
 1b. underside  
 1c. larva  
 1d. pupa  
 2. *Thecla betulae*  
 male  
 2a. female  
 2b. underside  
 2c. larva  
 2d. pupa

## PLATE 8, VOL. I

1. *Thecla W. album*  
 1a. underside  
 1b. larva  
 1c. pupa  
 2. *Thecla pruni*  
 male  
 2a. female  
 2b. underside  
 3. *Thecla quercus*  
 male  
 3a. female  
 3b. underside  
 3c. larva  
 4. *Thecla rubi*  
 4a. underside  
 4b. larva  
 4c. pupa

## PLATE 9, VOL. I

1. *Chrysophanus dispar*  
 male  
 1a. female  
 1b. female, under side, from the collection of Mr. S. Stevens

- FIG.  
 2. *Chrysophanus Phleas*  
 2a. white var. from Mr. S. Webb's collection  
 2b. smoky var. ditto  
 2c. banded var. ditto  
 2d. var. ditto  
 2e. albino, Reigate, ditto  
 2f. hind wings black, Norfolk  
 2g. dark nervures, ditto  
 2h. underside  
 2i. larva  
 2j. pupa

## PLATE 10, VOL. I

1. *Lycena Bactica*  
 male  
 1a. underside  
 2. *Lycena Argiades*  
 male  
 2a. female  
 2b. underside  
 3. *Polyommatus Agestis*  
 male  
 3a. female  
 3b. underside  
 3c. var. *Artaxerxes*, male  
 3d. female  
 3e. underside  
 3f. underside, var. taken by Mr. Robson  
 3g. var. *Salmacis*  
 3h. larva  
 3i. pupa

## PLATE 11, VOL. I

1. *Polyommatus Egon*  
 male  
 1a. female  
 1b. gynandro  
 1c. underside  
 1d. larva  
 1e. pupa  
 2. *Polyommatus Alexis*  
 male  
 2a. female  
 2b. female, var. North of Ireland  
 2c. female, var. Dover, Mr. Webb  
 2d. female, var. ditto ditto  
 2e. gynandro, ditto ditto  
 2f. gynandro, ditto ditto  
 2g. underside  
 2h. underside, var. Mr. Webb  
 2i. pupa  
 2j. larva



FIG.

## PLATE 12 VOL. I

1. *Polyommatus Corydon*
  - male
  - 1*a.* female
  - 1*b.* male var. Mr. Webb
  - 1*c.* female var. ditto
  - 1*d.* female var. Mr. S. Stevens
  - 1*e.* gynandro, Dover, Mr. Webb
  - 1*f.* male var. ditto ditto
  - 1*g.* underside, male
  - 1*h.* underside, male var. Mr. Webb
  - 1*i.* underside, female var. Mr. Webb
  - 1*j.* underside, female var. Mr. Webb
  - 1*k.* larva
  - 1*l.* pupa

## PLATE 13, VOL.

1. *Polyommatus Adonis*
  - male
  - 1*a.* female
  - 1*b.* male, var. from Mr. S. Webb's collection
  - 1*c.* male, var. ditto ditto
  - 1*d.* underside, var. ditto ditto
  - 1*e.* larva
  - 1*f.* pupa
2. *Polyommatus Argiolus*
  - male
  - 2*a.* female
  - 2*b.* female var.
  - 2*c.* underside
  - 2*d.* larva
  - 2*e.* pupa

## PLATE 14, VOL. I

1. *Polyommatus Alsus*
  - 1*a.* underside
  - 1*b.* larva
  - 1*c.* pupa
2. *Polyommatus Acis*
  - male
  - 2*a.* female
  - 2*b.* underside
3. *Polyommatus Arion*
  - male
  - 3*a.* female
  - 3*b.* female, var.
  - 3*c.* underside

FIG.

## PLATE 15, VOL. I

1. *Nemeobius Lucina*
  - male
  - 1*a.* female
  - 1*b.* female, var.
  - 1*c.* underside
  - 1*d.* larva
  - 1*e.* pupa
2. *Danaüs Archippus*

## PLATE 16, VOL. I

1. *Apatura Iris*
  - male
  - 1*a.* female
  - 1*b.* male, var. from Mr. S. Webb's collection
  - 1*c.* male, var. ditto ditto
  - 1*d.* larva
  - 1*e.* pupa

## PLATE 17, VOL. I

1. *Limenitis Sibylla*
  - 1*a.* var. Mr. Webb
  - 1*b.* var. Mr. Webb
  - 1*c.* underside
  - 1*d.* larva
  - 1*e.* pupa

## PLATE 18, VOL. I

1. *Vanessa c. album*
  - male
  - 1*a.* female
  - 1*b.* male, under side
  - 1*c.* female, under side
  - 1*d.* larva
  - 1*e.* pupa
2. *Vanessa polychlora*
  - 2*a.* larva
  - 2*b.* pupa

## PLATE 19, VOL. I

1. *Vanessa urticae*
  - 1*a.* var. North Ireland
  - 1*b.* larva
  - 1*c.* pupa
2. *Vanessa Io*
  - 2*a.* var. Mr. Sabine
  - 2*b.* underside
  - 2*c.* larva
  - 2*d.* pupa

FIG.

## PLATE 20, VOL. 1

1. *Vanessa Antiopa*
- 1*a.* larva
- 1*b.* pupa
2. *Vanessa Atalanta*
- 2*a.* var. Mr. S. Stevens
- 2*b.* underside
- 2*c.* larva
- 2*d.* pupa

## PLATE 21, VOL. 1

1. *Vanessa cardui*
- male
- 1*a.* female
- 1*b.* var. Mr. S. Stevens' collection
- 1*c.* underside
- 1*d.* larva
- 1*e.* pupa

## PLATE 22, VOL. 1

1. *Argynnis Paphia*
- male
- 1*a.* female
- 1*b.* var. *Valezina*
- 1*c.* var. *Valezina*
- 1*d.* underside
- 1*e.* larva
- 1*f.* pupa

## PLATE 23, VOL. 1

1. *Argynnis Adippe*
- male
- 1*a.* female, var. Mr. Webb
- 1*b.* dark var. Mr. Webb
- 1*c.* dark var. Mr. Webb
- 1*d.* underside
- 1*e.* underside, var. *Cleodoxa*, Mr. Webb
- 1*f.* underside, var. Mr. Webb
- 1*g.* larva
- 1*h.* pupa

## PLATE 24, VOL. 1

1. *Argynnis Aglaia*
- male
- 1*a.* female
- 1*b.* var. Dr. F. D. Wheeler
- 1*c.* var. Dr. P. H. Mason
- 1*d.* underside
- 1*e.* larva
- 1*f.* pupa

FIG.

## PLATE 25, VOL. 1

1. *Argynnis Lathonia*
- 1*a.* var. Mr. Sabine
- 1*b.* underside
2. *Argynnis Euphrosyne*
- 2*a.* var. Dr. Mason
- 2*b.* var. Dr. Mason
- 2*c.* var. Mr. Sabine
- 2*d.* underside
- 2*e.* larva
- 2*f.* pupa

## PLATE 26, VOL. 1

1. *Argynnis Selene*
- 1*a.* var. Mr. Sabine
- 1*b.* var. Dr. Mason
- 1*c.* var. Dr. Mason
- 1*d.* underside
- 1*e.* larva
- 1*f.* pupa
2. *Melitæa Athalia*
- 2*a.* var. Mr. S. Stevens
- 2*b.* underside
- 2*c.* underside, var. *Eos*, Haw. Mr. S. Stevens
- 2*d.* larva
- 2*e.* pupa

## PLATE 27, VOL. 1

1. *Melitæa Cinxia*
- 1*a.* var. Dr. Mason
- 1*b.* underside
- 1*c.* larva
- 1*d.* pupa
2. *Melitæa Artemis*
- male, southern type
- 2*a.* male, western type
- 2*b.* female, western type
- 2*c.* female, var. South Wales
- 2*d.* underside
- 2*e.* larva
- 2*f.* pupa

## PLATE 28, VOL. 1

1. *Melanargia Galathea*
- 1*a.* var. Mr. S. Stevens
- 1*b.* var. Mr. S. Webb
- 1*c.* var. Mr. S. Webb
- 1*d.* underside, male
- 1*e.* underside, female
- 1*f.* larva
- 1*g.* pupa

FIG.

## PLATE 29, VOL. I

1. *Erebia epiphron*, Perthshire, Dr. White
  - 1*a.* var. *Cassiope*, Perthshire
  - 1*b.* underside
2. *Erebia Blandina*
  - male
  - 2*a.* female
  - 2*b.* male, underside
  - 2*c.* female, underside
  - 2*d.* larva
  - 2*e.* pupa

## PLATE 30, VOL. I

1. *Satyrus Semele*
  - male
  - 1*a.* female
  - 1*b.* female, var. Mr. S. Webb
  - 1*c.* female, var. Mr. S. Webb
  - 1*d.* underside
  - 1*e.* underside, var. N. Ireland
  - 1*f.* larva
  - 1*g.* pupa

## PLATE 31, VOL. I

1. *Pararge Aegeria*
  - male
  - 1*a.* female
  - 1*b.* female, var. Surrey
  - 1*c.* male, var. Devon. Major J. N. Still
  - 1*d.* female, var. N. Ireland
  - 1*e.* underside
  - 1*f.* larva
  - 1*g.* pupa

## PLATE 32, VOL. I

1. *Pararge Megara*
  - male
  - 1*a.* female
  - 1*b.* male, var. Dr. Mason
  - 1*c.* male, var. Mr. S. Webb
  - 1*d.* female, var. Mr. S. Webb
  - 1*e.* female, var. Pembrokeshire
  - 1*f.* underside
  - 1*g.* larva
  - 1*h.* pupa

## PLATE 33, VOL. I

1. *Epinephile Janira*
  - male
  - 1*a.* female

FIG.

- 1*b.* *Epinephile Janira*, male, var. N. Ireland
  - 1*c.* female, var. N. Ireland
  - 1*d.* male, var. from Rev. J. Greene
  - 1*e.* female, var. Dr. P. H. Mason
  - 1*f.* underside of female
  - 1*g.* larva
  - 1*h.* pupa

## PLATE 34, VOL. I

1. *Epinephile Tithonus*
  - male
  - 1*a.* female
  - 1*b.* male, var. Dr. P. H. Mason
  - 1*c.* male, var. Mr. S. Webb
  - 1*d.* female, var. Mr. S. Webb
  - 1*e.* female, var. Major J. N. Still
  - 1*f.* male, Major J. N. Still
  - 1*g.* underside
  - 1*h.* larva
  - 1*i.* pupa

## PLATE 35, VOL. I

1. *Epinephile Hyperanthus*
  - 1*a.* female, var. N. Ireland, from Rev. W. F. Johnson
  - 1*b.* underside
  - 1*c.* underside, var. Mr. S. Webb, Dover
  - 1*d.* underside, var. Arete, Mr. S. Webb, Dover
  - 1*e.* underside, var. New Forest, from Mr. F. W. Frohawk
  - 1*f.* larva
  - 1*g.* pupa

## PLATE 36, VOL. I

1. *Cænonympha Davus*
  - male
  - 1*a.* female, mountain form
  - 1*b.* male, Mosses, Lancashire, from Mr. Collins
  - 1*c.* female, var. *Rothliebii*
  - 1*d.* underside, var. *Rothliebii*
  - 1*e.* underside, mountain form
  - 1*f.* larva
  - 1*g.* pupa
2. *Cænonympha Pamphilus*
  - male
  - 2*a.* female
  - 2*b.* female, var. Mr. S. Webb
  - 2*c.* female, var. Dr. P. H. Mason
  - 2*d.* underside
  - 2*e.* larva
  - 2*f.* pupa

FIG.

## PLATE 37, VOL. 1

1. *Syrichthus alveolus*
  - 1a. var.
  - 1b. var. *Taras*, Mr. S. Webb
  - 1c. var. *intermediate*
  - 1d. underside
  - 1e. larva
  - 1f. pupa
2. *Syrichthus alveus* Rev. T. H. Marsh
3. *Hesperia Actæon*
  - male
  - 3a. female
  - 3b. underside
  - 3c. larva
  - 3d. pupa

## PLATE 38, VOL. 1

1. *Hesperia Linea*
  - male
  - 1a. female
  - 1b. female, var. Dr. P. B. Mason
  - 1c. underside
  - 1d. larva
  - 1e. pupa
2. *Hesperia Lineola*
  - male
  - 2a. female
  - 2b. female, var.
  - 2c. underside
  - 2d. larva

## PLATE 39, VOL. 1

1. *Hesperia Sylvanus*
  - male
  - 1a. female
  - 1b. underside
  - 1c. larva
  - 1d. pupa
2. *Hesperia comma*
  - male
  - 2a. female
  - 2b. male, var. Dr. P. B. Mason
  - 2c. underside
  - 2d. underside, var. Mr. S. Webb

## PLATE 40, VOL. 1

1. *Cyclopides Paniscus*
  - male
  - 1a. female
  - 1b. var. Mr. F. J. Hambury
  - 1c. underside
  - 1d. larva

FIG.

2. *Nisoniades Tages*
  - male
  - 2a. female
  - 2b. underside
  - 2c. sleeping posture, Mr. F. W. Frohawk
  - 2d. larva

## PLATE 41, VOL. 2

1. *Smerinthus ocellatus*
  - male
  - 1a. female
  - 1b. larva
  - 1c. larva, var.
  - 1d. pupa
2. Hybrid between *Smerinthus ocellatus* and *S. populi*

## PLATE 42, VOL. 2

1. *Smerinthus populi*
  - male
  - 1a. female
  - 1b. male, var.
  - 1c. larva
  - 1d. larva var. from figure by Mr. G. C. Bignell

## PLATE 43, VOL. 2

1. *Smerinthus tiliæ*
  - male
  - 1a. female
  - 1b. female, var.
  - 1c. var.
  - 1d. larva
  - 1e. pupa

## PLATE 44, VOL. 2

1. *Acherontia Atropos*
  - 1a. larva
  - 1b. pupa

## PLATE 45, VOL. 2

1. *Sphinx Convolvuli*
  - male
  - 1a. female
  - 1b. larva, from a figure by Mr. G. C. Bignell
  - 1c. pupa

## PLATE 46, VOL. 2

1. *Sphinx Pinastri*
  - male. Mr. W. H. B. Fletcher
  - 1a. female, Lord Rendlesham



FIG.

- 1b. *Sphinx Pinastris*. larva, from figure by the Hon. Mrs Carpenter  
 1c. larva ditto ditto  
 1d. young larva ditto ditto

## PLATE 47, VOL. 2

1. *Sphinx Ligustri*  
 male  
 1a. female  
 1b. larva  
 1c. pupa

## PLATE 48, VOL. 2

1. *Deilephila Euphorbiae*  
 male, Norfolk  
 1a. female, from Devon. Dr. P. B. Mason  
 1b. larva, from a figure by Mr. G. C. Bignell  
 1c. larva, from figure by Mr. W. Buekler  
 1d. larva ditto ditto

## PLATE 49, VOL. 2

1. *Deilephila galii*  
 male  
 1a. female  
 1b. larva  
 1c. var. from figure by Mr. G. C. Bignell  
 1d. pupa

## PLATE 50, VOL. 2

1. *Deilephila livornica*  
 male  
 1a. female, Dr. Mason  
 1b. larva, from figure by Mr. G. C. Bignell  
 1c. larva, var.

## PLATE 51, VOL. 2

1. *Charocampa celerio*  
 male  
 1a. female, Dr. Mason  
 1b. larva

## PLATE 52, VOL. 2

1. *Charocampa Elpenor*  
 1a. larva, from figure by Mr. G. C. Bignell  
 1b. with segments retracted

FIG.

- 1c. *Charocampa Elpenor*. pupa  
 2. *Charocampa porcellus*  
 2a. larva

## PLATE 53, VOL. 2

1. *Charocampa nerii*  
 male  
 1a. female, Mr. G. T. Porritt  
 1b. larva, Hoffmann  
 1c. pupa, Hoffmann

## PLATE 54, VOL. 2

1. *Macroglossa stellatarum*  
 1a. var. Mr. W. H. B. Fletcher  
 1b. larva, M. Alfred Sich  
 1c. pupa  
 2. *Macroglossa fuciformis*, just emerged  
 2a. after flight  
 2b. larva  
 3. *Macroglossa bombylifomis*  
 3a. larva

## PLATE 55, VOL. 2

1. *Sesia asiliformis*  
 male, Dr. Mason  
 1a. female  
 2. *Sesia scoliiformis*  
 male, Mr. W. H. B. Fletcher  
 2a. female, Mr. S. Webb  
 3. *Sesia sphecoformis*  
 male, Mr. A. Robinson  
 3a. female  
 3b. larva  
 3c. pupa, Mr. A. F. Griffiths  
 4. *Sesia andraeniformis*, Mr. S. Webb

## PLATE 56, VOL. 2

1. *Sesia tipuliformis*  
 1a. larva  
 2. *Sesia cynipiformis*  
 male  
 2a. female  
 2b. larva  
 3. *Sesia myopaeformis*  
 male  
 3a. female  
 3b. larva, Mr. A. Sich  
 4. *Sesia culiciformis*  
 male  
 4a. female  
 4b. larva  
 4c. pupa

FIG.

## PLATE 57, VOL. 2

1. *Sesia formica-formis*
- 1*a.* larva
2. *Sesia ichneumoniformis*
- male
- 2*a.* female
- 2*b.* larva
3. *Sesia philanthiformis*
4. *Sesia chrysidiformis*
- 4*a.* larva
- 4*b.* pupa
5. *Sphæcia bembeciformis*
- 5*a.* larva
6. *Sphæcia apiformis*
- male
- 6*a.* female
- 6*b.* larva

## PLATE 58, VOL. 2

1. *Procris globularia*
- 1*a.* larva (Buckler)
2. *Procris statices*
- male
- 2*a.* female
- 2*b.* larva
3. *Procris Geryon*
- 3*a.* larva (Buckler)
4. *Zygæna Minos*
- male
- 4*a.* female
- 4*b.* larva (Buckler)
5. *Zygæna exulans*
- male
- 5*a.* female
- 5*b.* larva (Buckler)

## PLATE 59, VOL. 2

1. *Zygæna meliloti*
- 1*a.* var.
- 1*b.* var. Mr. S. Webb
- 1*c.* larva
2. *Zygæna trifolii*
- 2*a.* var.
- 2*b.* var.
- 2*c.* var. Mr. W. Christy
- 2*d.* var. Mr. W. Christy
- 2*e.* larva
3. *Zygæna lonicera*
- 3*a.* var.
- 3*b.* var. Mr. S. Webb
- 3*c.* var. Mr. S. Webb
- 3*d.* larva

FIG.

## PLATE 60, VOL. 2

1. *Zygæna filipendule*
- 1*a.* var.
- 1*b.* var. Mr. B. G. Rye
- 1*c.* var. Mr. S. Webb
- 1*d.* var. Mr. S. Webb
- 1*e.* var. Mr. S. Webb
- 1*f.* var. Mr. S. Webb
- 1*g.* var. Mr. S. Webb
- 1*h.* var. Mr. S. Webb
- 1*i.* larva
- 1*j.* cocoon
- 1*k.* under side of a specimen  
having five wings. Drawn  
by Mrs. Richardson

## PLATE 61, VOL. 2

1. *Macrogaster arundinis*
- male
- 1*a.* female
- 1*b.* larva (Buckler)
2. *Zeuzera asculi*
- male
- 2*a.* female
- 2*b.* larva (Buckler)
- 2*c.* pupa (Buckler)
3. *Cossus ligniperda*
- 3*a.* larva

## PLATE 62, VOL. 2

1. *Hepialus hectus*
- male
- 1*a.* female
- 1*b.* larva (Buckler)
2. *Hepialus lupulinaus*
- male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* larva
3. *Hepialus vellela*
- male
- 3*a.* male, var.
- 3*b.* female
- 3*c.* var. Gallica
- 3*d.* larva

## PLATE 63, VOL. 2

1. *Hepialus humuli*
- male
- 1*a.* female
- 1*b.* male, var. Shetlands
- 1*c.* male, var. Shetlands
- 1*d.* male, var. Shetlands

- FIG.  
1c. *Hepialus humuli*, female var.  
Yorks., Mr. Porritt  
1j. larva

PLATE 64, VOL. 2.

1. *Hepialus sylvinus*  
male  
1a. female  
1b. larva  
2. *Limacodes testudo*  
male  
2a. female  
2b. larva (Mr. Sich)  
3. *Heterogenes asella*  
male  
3a. female  
3b. larva  
4. *Earias chlorana*.  
4a. larva  
5. *Halias prasinana*  
male  
5a. female  
5b. larva  
6. *Halias quercana*  
6a. larva

PLATE 65, VOL. 2.

1. *Nola cucullatella*  
1a. var.  
1b. larva, from drawing by Mr.  
A. Sich  
2. *Nola strigula*  
2a. larva, Mr. Buckler  
2b. *Nola confusalis*  
3. larva, Mr. Buckler  
3a. pupa  
4. *Nola centonalis*  
4a. var. Mr. R. Adkin  
4b. var. Mr. R. Adkin  
4c. larva, Mr. Buckler  
4d. cocoons, Mr. R. Adkin  
5. *Nola albulalis*  
male  
5a. female  
5b. larva, Mr. Buckler  
5c. cocoon, Mr. W. H. Tugwell

PLATE 66, VOL. 2.

1. *Nudaria senex*  
1a. larva, Mr. Buckler  
2. *Nudaria mundana*  
male  
2a. female

- FIG.  
2b. *Nudaria mundana*, larva  
3. *Calligenia miniata*  
3a. larva, Mr. Buckler  
4. *Setina irrorella*  
male  
4a. female  
4b. larva, Mr. Buckler  
5. *Setina mesomella*  
5a. var.  
5b. larva, Mr. Buckler  
6. *Lithosia muscerda*  
male  
6a. female  
6b. larva

PLATE 67, VOL. 2.

1. *Lithosia aureola*  
1a. larva, Mr. Buckler  
2. *Lithosia helveola*  
male  
2a. female  
2b. larva  
3. *Lithosia pygmaola*  
male  
3a. female  
3b. larva, Mr. Buckler  
4. *Lithosia caniola*  
4a. larva, Mr. Buckler  
4b. pupa  
5. *Lithosia complana*  
var. *sericea*, from Mr. Gregson  
5a. larva, Mr. Buckler  
6. *Lithosia complanula*  
6a. larva

PLATE 68, VOL. 2.

1. *Lithosia Griseola*  
1a. var. *stramineola*  
1b. var. *intermediate*  
1c. larva, Mr. Buckler  
2. *Lithosia rubricollis*  
male  
2a. female  
2b. larva, Mr. G. C. Biguell  
3. *Enistis quadra*  
male  
3a. female  
3b. larva, Mr. Buckler

PLATE 69, VOL. 2.

1. *Eulepia grammica*  
male  
1a. female  
1b. larva

FIG.

2. *Eulepia cribrum*  
 2a. var.  
 2b. larva  
*Deiopia pulchella*  
 male, Dr. Mason  
 3a. female  
 3b. larva  
 4. *Euchelia jacobaeae*  
 male  
 4a. female  
 4b. var. Mr. A. Robinson  
 4c. larva

## PLATE 70, VOL. 2.

1. *Callimorpha dominula*  
 1a. var. Mr. S. Webb  
 1b. var. Mr. S. Webb  
 1c. var. Mr. S. Webb  
 1d. var. Dr. Mason  
 1e. var. Dr. Mason  
 1f. larva, Mr. Buckler  
 2. *Callimorpha Hera*, Mr. A. Robinson  
 2a. var. Mr. A. Robinson  
 2b. larva

## PLATE 71, VOL. 2.

1. *Arctia caja*  
 1a. var. Dr. Mason  
 1b. var. Mr. S. Webb  
 1c. var. Dr. Mason  
 1d. var. Mr. S. Webb  
 1e. var. Mr. S. Webb  
 1f. larva

## PLATE 72, VOL. 2.

1. *Arctia caja*, var. Dr. Mason  
 1a. var. Mr. S. Webb  
 1b. var. Mr. C. A. Briggs  
 1c. var. Mr. S. Webb  
 1d. var. Mr. S. Webb  
 1e. var. Mr. S. Webb  
 1f. var. Mr. S. Webb  
 1g. var. Mr. S. Webb

## PLATE 73, VOL. 2.

1. *Arctia villica*  
 male  
 1a. female  
 1b. male, var. Mr. S. Webb  
 1c. male, var. Mr. S. Webb  
 1d. male, var. Mr. S. Webb  
 1e. female, var. Mr. S. Webb  
 1f. female, var. Mr. S. Webb  
 1g. larva

FIG.

## PLATE 74, VOL. 2.

1. *Euthemodia russula*  
 male  
 1a. female  
 1b. male, var.  
 1c. larva, Mr. W. Buckler  
 2. *Nemeophila plantaginis*  
 male  
 2a. female  
 2b. var. *hospita*, male  
 2c. var. *hospita*, female, Mr. S. Webb  
 2d. var. Mr. S. Webb  
 2e. var. Mr. S. Webb  
 2f. larva

## PLATE 75, VOL. 2.

1. *Phragmatobia fuliginosa*  
 male  
 1a. female  
 1b. var. S. of England, Mrs. Bazett  
 1c. var. N. of England and Scotland  
 1d. larva  
 2. *Spilosoma mendica*  
 male  
 2a. female  
 2b. male, var. Yorkshire, Mr. G. T. Porritt  
 2c. female, var. Mr. G. T. Porritt  
 2d. female, var. Mr. G. T. Porritt  
 2e. female, var. Mr. G. T. Porritt  
 2f. male, var. *rustica*, Ireland  
 2g. female var. *rustica*, Ireland  
 2h. male, intermediate var.  
 2i. larva

## PLATE 76, VOL. 2.

1. *Spilosoma lubricepeda*  
 male  
 1a. female  
 1b. male, var. Yorkshire, Mr. J. Harrison  
 1c. male var. Yorkshire, Mr. J. Harrison  
 1d. female, var. Yorkshire, Mr. G. T. Porritt  
 1e. male, var. Yorkshire, Mr. G. T. Porritt  
 1f. male, var. Yorkshire, Mr. J. Harrison  
 1g. male, var. *radiata*, Mr. W. H. Tugwell



- FIG.  
 1k. *Spilosoma lubricepeda*, female.  
     var. *radiata*, Mr. W. H.  
     Tugwell  
 1l. female, var. *radiata*, Mr. W. H.  
     Tugwell  
 1j. female, var. *radiata*, Mr. J.  
     Harrison  
 1k. larva

## PLATE 77, VOL. 2.

1. *Spilosoma menthastri*  
     male  
 1a. female, creamy var.  
 1b. male, var.  
 1c. male, var.  
 1d. male, North of Ireland  
 1e. male, Dr. Mason  
 1f. female, var. Mr. S. J. Capper  
 1g. male, var. *Walkeri*, Curt. Dr.  
     Mason  
 1h. larva, Mr. G. C. Bignell

## PLATE 78, VOL. 2.

1. *Spilosoma urtica*  
     male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Porthesia chrysorrhoea*  
     male  
 2a. female  
 2b. male, var.  
 2c. larva, Mr. G. C. Bignell  
 3. *Porthesia auriflua*  
     male  
 3a. female  
 3b. larva, Mr. G. C. Bignell

## PLATE 79, VOL. 2.

1. *Liparis salicis*  
     male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 1c. larva, var. Mr. A. Sich  
 2. *Hypogymna dispar*  
     male  
 2a. female, old English form  
 2b. male, var.  
 2c. male, var.  
 2d. female, present form  
 2c. larva, Mr. G. C. Bignell

## PLATE 80, VOL. 2.

1. *Psilura monacha*  
     male

- FIG.  
 1a. *Psilura monacha*, female  
 1b. male, var.  
 1c. female, var.  
 1d. female, var. Mr. W. H. B.  
     Fletcher  
 1e. female, var. Mr. W. H. B.  
     Fletcher  
 1f.  $\frac{1}{2}$  male, var. Mr. W. H. B.  
     Fletcher  
 1g. larva

## PLATE 81, VOL. 2.

1. *Laelia canosa*  
     male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Dasychira pudibunda*  
     male  
 2a. female  
 2b. male, var.  
 2c. female, var.  
 2d. larva, Mr. G. C. Bignell  
 2e. larva, var.

## PLATE 82, VOL. 2.

1. *Dasychira fascelina*  
     male  
 1a. female  
 1b. female, var. Mr. S. J. Capper  
 1c. female, var. Mr. S. J. Capper  
 1d. larva  
 2. *Demas coryli*  
     male  
 2a. male, var.  
 2b. female, var.  
 2c. female, var.  
 2d. larva, Mr. G. C. Bignell

## PLATE 83, VOL. 2.

1. *Orgyia Gonostigma*  
     male  
 1a. male, var.  
 1b. female  
 1c. larva, Mr. W. Buckler  
 2. *Orgyia antiqua*  
     male, London form  
 2a. male, Yorkshire, Mr. G. T.  
     Porritt  
 2b. male, Sutherlandshire, Mr.  
     W. H. B. Fletcher  
 2c. female  
 2d. larva  
 2e. pupa  
 2f. cocoon

FIG.

## PLATE 84, VOL. 2

1. *Psyche villosella*  
male
- 1*a.* female, Mr. W. C. Boyd
- 1*b.* larva, Mr. W. C. Boyd
- 1*c.* larva, half-grown, Mr. W. C. Boyd
2. *Psyche opacella*  
male, Scotland, Dr. Mason
- 2*a.* male, Berkshire, Mr. Holland
- 2*b.* case
- 2*c.* case, var.
3. *Epichnopteryx calvella*  
male
- 3*a.* female, with case

## PLATE 85, VOL. 2

1. *Epichnopteryx pulla*  
male (enlarged)
- 1*a.* large var. (enlarged)
- 1*b.* female
- 1*c.* larva and case
2. *Epichnopteryx reticella*  
male (enlarged)
- 2*a.* male, var. (enlarged)
- 2*b.* larva, extracted from case,  
Mr. W. H. B. Fletcher
- 2*c.* case (enlarged)
3. *Fumea crassiolella*  
male (enlarged), Dr. Mason
- 3*a.* female, Bruand
- 3*b.* larva and case, Bruand
4. *Fumea intermediella*  
male (enlarged)
- 4*a.* female and case
- 4*b.* larva and case
- 4*c.* case with pupa skin

## PLATE 86, VOL. 2

1. *Fumea roboricolella*  
male (enlarged)
- 1*a.* female, in case
- 1*b.* larva with case
2. *Fumea betulina*  
male (enlarged)
- 2*a.* female
- 2*b.* larva and case
- 2*c.* pupa skin and case
3. *Fumea salicolella*  
male, Bruand, (enlarged)
- 3*a.* larva and case, Bruand
4. *Fumea tabulella*  
male, Bruand, (enlarged)

FIG.

- 4*a.* *Fumea tabulella*, female and case, Mr. J. E. Fletcher

## PLATE 87, VOL. 3

1. *Pacilocampa populi*  
male
- 1*a.* female
- 1*b.* larva
2. *Trichiura cratagia*  
male
- 2*a.* female
- 2*b.* female, var.
- 2*c.* larva
3. *Eriogaster lanestris*  
male
- 3*a.* female
- 3*b.* male, var.
- 3*c.* larva

## PLATE 88, VOL. 3

1. *Clisiocampa neustria*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
- 1*d.* male, var.
- 1*e.* female, var.
- 1*f.* female, var.
- 1*g.* larva, Mr. G. C. Bignell

## PLATE 89, VOL. 3

1. *Clisiocampa castrensis*  
male
- 1*a.* female
- 1*b.* male, var., Mr. S. Webb
- 1*c.* male, var., Mr. S. Webb
- 1*d.* male, var., Mr. S. Webb
- 1*e.* male, var., Mr. S. Webb
- 1*f.* male, var., Mr. S. Webb
- 1*g.* female, var.
- 1*h.* female, var.
- 1*i.* larva

## PLATE 90, VOL. 3

1. *Lasiocampa trifolii*  
male
- 1*a.* female
- 1*b.* male var., Lancashire
- 1*c.* male var., Kent, Mr. S. Webb
- 1*d.* male var., Lancashire
- 1*e.* female var., Lancashire
- 1*f.* female, var., Lancashire
- 1*g.* larva, Mr. G. C. Bignell

FIG.

## PLATE 91, VOL. 3

1. *Lasiocampa quercus*  
male, South of England
- 1*a.* female, South of England
- 1*b.* male, var., South of England
- 1*c.* male, var., Pembroke
- 1*d.* male, var., Yorkshire, Mr. G.  
T. Porritt
- 1*e.* male, var., Dr. Mason
- 1*f.* larva

## PLATE 92, VOL. 3

1. *Lasiocampa quercus*, var. *calluna*  
male
- 1*a.* female
- 1*b.* male
- 1*c.* male, Dr. Mason
- 1*d.* female
- 1*e.* female
- 1*f.* young larva, Mr. W. Buckler

## PLATE 93, VOL. 3

1. *Lasiocampa rubi*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var., Mr. S. J. Capper
- 1*d.* female, var., North of Ireland
- 1*e.* female, var., North of Eng-  
land
- 1*f.* larva, Mr. G. C. Bignell
- 1*g.* young larva, Mr. W. Buckler

## PLATE 94, VOL. 3

1. *Odonestis potatoria*  
male
- 1*a.* female
- 1*b.* male, var., Cambridgeshire
- 1*c.* male, var., Pembrokeshire
- 1*d.* male, var., Mr. S. Webb
- 1*e.* female, var., Mr. S. Webb
- 1*f.* larva, Mr. W. Buckler

## PLATE 95, VOL. 3

1. *Gastropacha quercifolia*  
male
- 1*a.* female
- 1*b.* female, var.
- 1*c.* at rest, Mr. S. Webb
- 1*d.* larva, Mr. G. C. Bignell

## PLATE 96, VOL. 3

1. *Gastropacha ilicifolia*  
male, Mr. S. Webb

FIG.

- 1*a.* *Gastropacha ilicifolia*, female,  
Mr. S. Webb
- 1*b.* larva, Mr. W. Buckler
2. *Endromis versicolora*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* larva, Mr. W. Buckler

## PLATE 97, VOL. 3

1. *Saturnia carpini*  
male
- 1*a.* female
- 1*b.* male, South of England
- 1*c.* male, Norfolk Fens
- 1*d.* female, var., Mr. R. Newstead
- 1*e.* larva, Mr. W. Buckler
- 1*f.* cocoon

## PLATE 98, VOL. 3

1. *Saturnia carpini*  
male, var., Mr. S. J. Capper
- 1*a.* male, var., Mr. S. Webb
- 1*b.* gynandrous, var., Dr. Mason
2. *Drepana falcataria*  
male
- 2*a.* female
- 2*b.* female, var.
- 2*c.* male, var., Mr. W. H. B.  
Fletcher (Sutherlandshire)
- 2*d.* female, var., Mr. W. H. B.  
Fletcher (Sutherlandshire)
- 2*e.* larva, Mr. G. C. Bignell

## PLATE 99, VOL. 3

1. *Drepana sicula*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Drepana hamula*  
male
- 2*a.* female
- 2*b.* male, 2nd brood
- 2*c.* larva, Mr. G. C. Bignell
3. *Drepana unguicula*  
male
- 3*a.* female
- 3*b.* male, var.
- 3*c.* larva, Mr. W. Buckler

## PLATE 100, VOL. 3

1. *Platypteryx lacertinaria*  
male
- 1*a.* female

- FIG.  
 1*b*. *Platypteryx lacertinaria*, female  
 var., Mr. W. H. B. Fletcher  
 1*c*. larva, Mr. W. Buckler  
 2. *Cilix spinula*  
 male  
 2*a*. female  
 2*b*. male, var.  
 2*c*. larva, Mr. W. Buckler  
 3. *Cerura bicuspis*  
 male, Mr. S. Webb  
 3*a*. female, Mr. S. Webb  
 3*b*. male, var., Mr. S. Webb  
 3*c*. larva, Mr. W. Buckler

## PLATE 101, VOL. 3

1. *Cerura bicuspis*  
 var., Mr. A. Robinson  
 2. *Cerura furecula*  
 male  
 2*a*. female  
 2*b*. male, var.  
 2*c*. female, var.  
 2*d*. larva, Mr. W. Buckler  
 3. *Cerura biifida*  
 male  
 3*a*. female  
 3*b*. larva, Mr. W. Buckler

## PLATE 102, VOL. 3

1. *Cerura vinula*  
 male  
 1*a*. female  
 1*b*. male, var.  
 1*c*. female, var.  
 1*d*. female, var., Mr. S. Stevens  
 1*e*. at rest  
 1*f*. larva, Mr. G. C. Bignell

## PLATE 103, VOL. 3

1. *Stauropus fagi*  
 male  
 1*a*. female  
 1*b*. male, var., Mr. W. Holland  
 1*c*. female, Mr. W. Holland  
 1*d*. female, Mr. W. Holland  
 1*e*. at rest, Mr. W. Holland  
 1*f*. larva, Mr. W. Buckler  
 1*g*. larva, Mr. W. Buckler

## PLATE 104, VOL. 3

1. *Notodonta dictæa*  
 male  
 1*a*. female  
 1*b*. var., Scotland, Mr. J. Ross

- FIG.  
 1*c*. *Notodonta dictæa*, var., Can-  
 nock, Dr. Freer  
 1*d*. larva, Mr. W. Buckler  
 1*e*. larva, var.  
 2. *Notodonta dictæoides*  
 male  
 2*a*. female  
 2*b*. female, var., Sherwood, Mr.  
 S. Stevens  
 2*c*. male, var., Cannock, Dr.  
 Freer  
 2*d*. larva, Mr. W. Buckler

## PLATE 105, VOL. 3

1. *Notodonta ziezac*  
 male  
 1*a*. female  
 1*b*. male, var.  
 1*c*. female, var.  
 1*d*. female, var.  
 1*e*. male, var., Mr. S. Webb  
 1*f*. male, var., Mr. S. Stevens  
 1*g*. larva, Mr. G. C. Bignell

## PLATE 106, VOL. 3

1. *Notodonta tritophus*  
 male, Dr. Mason  
 1*a*. female, Dr. Mason  
 1*b*. larva, Mr. W. Buckler  
 2. *Notodonta trepida*  
 male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler

## PLATE 107, VOL. 3

1. *Notodonta torva*  
 male  
 1*a*. female, Mr. F. Norgate  
 2. *Notodonta dromedarius*  
 male  
 2*a*. female  
 2*b*. female, var.  
 2*c*. female, var., *perfusca*  
 2*d*. female, var.  
 2*e*. larva, Mr. G. C. Bignell

## PLATE 108, VOL. 3

1. *Notodonta bicolora*,  
 Dr. Mason  
 1*a*. larva, Mr. W. Buckler  
 2. *Drymonia chaonia*  
 male  
 2*a*. female

FIG.

- 2*b*. *Drymonia chaonia*, female, var.,  
Mr. W. H. B. Fletcher  
2*c*. female, var., Dr. Mason  
2*d*. female, var., Dr. Mason  
2*e*. male, var., Dr. Mason  
2*f*. male, var., Dr. Mason  
2*g*. larva, Mr. W. Buckler

## PLATE 109, VOL. 3

1. *Drymonia Dodonca*  
male  
1*a*. female  
1*b*. male, var., Mr. Sydney Webb  
1*c*. male, var., Mr. S. Stevens  
1*d*. female, Dr. P. B. Mason  
1*e*. female, Dr. P. B. Mason  
1*f*. female, Dr. P. B. Mason  
1*g*. larva, Mr. G. C. Bignell  
2. *Lophopteryx carmelita*  
male  
2*a*. female  
2*b*. larva, Mr. G. C. Bignell

## PLATE 110, VOL. 3

1. *Lophopteryx Camelina*  
male  
1*a*. female  
1*b*. male, South Wales  
1*c*. male, Scotland  
1*d*. male, Dartmoor, Devon, Major  
Still  
1*e*. female, Scotland  
1*f*. male, var., Mr. Sydney Webb  
1*g*. larva, Mr. A. Sich  
2. *Lophopteryx cucullina*  
male  
2*a*. female  
2*b*. larva, Mr. W. Buckler

## PLATE 111, VOL. 3

1. *Pterostoma palpina*  
male  
1*a*. female  
1*b*. male, var., Mr. S. Stevens  
1*c*. larva, Mr. A. Sich  
2. *Ptilophora plumigera*  
male  
2*a*. female  
2*b*. male, var.  
2*c*. male, var., Dr. P. B. Mason  
2*d*. female, var., Dr. P. B. Mason  
2*e*. larva, Mr. W. Buckler

FIG.

## PLATE 112, VOL. 3

1. *Gluphisia crenata*  
male, Rev. J. Greene  
1*a*. female  
1*b*. larva  
2. *Petasia cassinea*  
male  
2*a*. female  
2*b*. larva, Mr. G. C. Bignell  
3. *Petasia nubeculosa*  
male  
3*a*. female  
3*b*. larva, Mr. W. Buckler

## PLATE 113, VOL. 3

1. *Pygæra bucephala*  
male  
1*a*. female  
1*b*. male, var., Yorkshire  
1*c*. female, var., Cheshire  
1*d*. female, var., Mr. S. Webb  
1*e*. at rest  
1*f*. larva, Mr. G. C. Bignell  
1*g*. pupa, destroyed by *Cordiceps*  
*militaris*, Mr. E. W. Lifton

## PLATE 114, VOL. 3

1. *Clostera curtula*  
male, Spring form  
1*a*. male, Summer form  
1*b*. female, Summer form  
1*c*. female, Autumn form, Mr. S.  
Webb  
1*d*. female, var., Mr. S. Webb  
1*e*. larva, Mr. G. C. Bignell  
2. *Clostera anachoreta*  
male  
2*a*. female  
2*b*. male, var., Rev. E. N. Bloom-  
field  
2*c*. female, Rev. E. N. Bloomfield  
2*d*. larva, Mr. W. Buckler

## PLATE 115, VOL. 3

1. *Clostera reclusa*  
male  
1*a*. female  
1*b*. male, var.  
1*c*. female, var.  
1*d*. at rest, tail curled up  
1*e*. larva, Mr. A. Sich  
2. *Diloba caruleocephala*  
male

- FIG.  
 2*a*. *Diloba caruleocephala*, female  
 2*b*. var., Dr. R. Freer  
 2*c*. var., Mr. S. Stevens  
 2*d*. larva, Mr. W. Buckler

PLATE 116, VOL. 3

1. *Gonophora derasus*  
 male  
 1*a*. female  
 1*b*. larva  
 2. *Thyatira batis*  
 male  
 2*a*. female  
 2*b*. var., North of Ireland  
 2*c*. larva, Mr. G. C. Bignell  
 3. *Cymatophora duplais*  
 male  
 3*a*. female  
 3*b*. var., Scotland  
 3*c*. var., Cannoek Chase  
 3*d*. larva, Mr. W. Buckler

PLATE 117, VOL. 3

1. *Cymatophora fluctuosa*  
 male  
 1*a*. female  
 1*b*. larva, Mr. W. Buckler  
 2. *Cymatophora*, or South of Eng-  
 land  
 2*a*. or Scotland  
 2*b*. or var., Dr. P. B. Mason  
 2*c*. or larva, Mr. W. Buckler  
 3. *Cymatophora ocularis*  
 male  
 3*a*. female  
 3*b*. larva, Mr. W. Buckler  
 4. Hybrid between *C.* or and *C.*  
*ocularis*: reared by Mr. W.  
 H. B. Fletcher

PLATE 118, VOL. 3

1. *Asphalia diluta*  
 male  
 1*a*. female  
 1*b*. var., Yorks, Mr. S. J. Capper  
 1*c*. var., Yorks, Mr. S. J. Capper  
 1*d*. larva, Mr. W. Buckler  
 2. *Asphalia flavicornis*,  
 South of England  
 2*a*. Yorkshire, Dr. H. H. Corbett  
 2*b*. Cannoek Chase, Dr. R. Freer  
 2*c*. Cannoek Chase, Dr. R. Freer  
 2*d*. Scotland, Mr. S. J. Capper  
 2*e*. larva, Mr. W. Buckler

FIG.

PLATE 119, VOL. 3

1. *Asphalia ridens*  
 1*a*. var.  
 1*b*. var.  
 1*c*. var.  
 1*d*. var.  
 1*e*. var., Mr. S. J. Capper  
 1*f*. larva, Mr. A. Sich  
 2. *Diphthera Orion*  
 2*a*. var., Dr. T. A. Chapman  
 2*b*. var., Mr. S. J. Capper  
 2*c*. larva, Mr. W. Buckler

PLATE 120, VOL. 3

1. *Acronycta leporina*  
 1*a*. var., bradyporina  
 1*b*. intermediate, var.  
 1*c*. intermediate, var.  
 1*d*. larva  
 2. *Acronycta aceris*  
 2*a*. var., infuscata, Dr. Mason  
 2*b*. larva  
 2*c*. larva, coiled  
 3. *Acronycta megacephala*  
 3*a*. var.  
 3*b*. larva

PLATE 121, VOL. 3

1. *Acronycta alni*  
 male  
 1*a*. female  
 1*b*. var., Dr. P. B. Mason  
 1*c*. larva, Mr. W. Buckler  
 1*d*. young larva, Mr. G. C. Bignell  
 2. *Acronycta strigosa*  
 2*a*. larva  
 3. *Acronycta menyanthidis*  
 male  
 3*a*. female  
 3*b*. var., Mr. S. J. Capper  
 3*c*. larva  
 4. *Acronycta auricoma*  
 male  
 4*a*. female  
 4*b*. larva, Mr. W. Buckler

PLATE 122, VOL. 3

1. *Acronycta tridens*  
 male  
 1*a*. female  
 1*b*. var., Dr. T. A. Chapman  
 1*c*. larva, Mr. A. Sich

- FIG.  
2. *Aeronycta psi*  
male  
2*a.* female  
2*b.* var., Dr. T. A. Chapman  
2*c.* var., London suburbs  
2*d.* larva  
3. *Aeronycta euphorbie*  
male  
3*a.* female  
3*b.* larva, Mr. G. C. Bignell

## PLATE 123, VOL. 3

1. *Aeronycta rumicis*  
male  
1*a.* female  
1*b.* var., *salicis*  
1*c.* var., Mr. F. J. Hanbury  
1*d.* var., larva, Mr. G. C. Bignell  
2. *Aeronycta ligustri*  
2*a.* var., Mr. G. T. Porritt  
2*b.* var., Mr. G. T. Porritt, Yorks  
2*c.* var.  
2*d.* larva, Mr. W. Buckler  
3. *Arsilochne Venosa*  
male  
3*a.* female  
3*b.* larva

## PLATE 124, VOL. 3

1. *Agrotis valligera*  
male  
1*a.* female  
1*b.* male, var.  
1*c.* female, var.  
1*d.* female, var.  
1*e.* female, var.  
1*f.* larva, Mr. W. Buckler  
2. *Agrotis sulfusa*  
male  
2*a.* female  
2*b.* male, var.  
2*c.* larva

## PLATE 125, VOL. 3

1. *Agrotis segetum*  
male  
1*a.* female  
1*b.* male, var., Mr. F. J. Hanbury  
1*c.* male, var., Mr. F. J. Hanbury  
1*d.* female, var., Dr. P. B. Mason  
1*e.* female, var., Dr. P. B. Mason  
1*f.* female, var., Mr. F. J. Hanbury  
1*g.* larva

VOL. XI.

- FIG.  
2. *Agrotis puta*  
male  
2*a.* female  
2*b.* male, var.  
2*c.* female, var., Colonel Part-  
ridge  
2*d.* larva

## PLATE 126, VOL. 3

1. *Agrotis corticea*  
male  
1*a.* female  
1*b.* male, var., Mr. F. J. Hanbury  
1*c.* male, var., Mr. G. T. Porritt  
1*d.* male, var., Mr. F. J. Hanbury  
1*e.* female, var., Mr. F. J. Hanbury  
1*f.* larva  
2. *Agrotis cinerea*  
male, Mr. F. J. Hanbury  
2*a.* female, Mr. F. J. Hanbury  
2*b.* male, var., Mr. F. J. Hanbury  
2*c.* male, var., Mr. F. J. Hanbury  
2*d.* male, var., Mr. F. J. Hanbury  
2*e.* female, var.  
2*f.* larva, Mr. W. Buckler

## PLATE 127, VOL. 3

1. *Agrotis exclamations*  
male  
1*a.* female  
1*b.* male, var.  
1*c.* male, var.  
1*d.* male, var.  
1*e.* male, var.  
1*f.* male, var., Dr. P. B. Mason  
1*g.* male, var.  
1*h.* female, var.  
1*i.* female, var., Mr. F. J. Hanbury  
1*j.* female, var., Mr. F. J. Hanbury  
1*k.* female, var., Mr. G. T. Porritt  
1*l.* larva

## PLATE 128, VOL. 3

1. *Agrotis lunigera*  
male  
1*a.* female  
1*b.* male, var.  
1*c.* gynauro, Lieut. E. W. Browne  
1*d.* larva, Mr. W. Buckler

c

- FIG.  
 2. *Agrotis ripa*  
     male  
 2*a.* female  
 2*b.* female, var.  
 2*c.* female, var., Dr. P. B. Mason  
 2*d.* female, var., Mr. F. J. Hanbury  
 2*e.* female, var., Mr. F. J. Hanbury  
 2*f.* female, var., Mr. F. J. Hanbury  
 2*g.* larva

## PLATE 129, VOL. 3

1. *Agrotis eursoria*  
     male  
 1*a.* female  
 1*b.* var., Eastern Counties  
 1*c.* var., Eastern Counties  
 1*d.* var., Eastern Counties  
 1*e.* var., Eastern Counties  
 1*f.* var., Eastern Counties  
 1*g.* var., East of Scotland, Mr. A. Horne  
 1*h.* var., East of Scotland, Mr. A. Horne  
 1*i.* var., West of Ireland, Mr. P. Russ  
 1*j.* var., Dr. P. B. Mason  
 1*k.* larva, Mr. W. Buckler

## PLATE 130, VOL. 3

1. *Agrotis nigricans*  
     male  
 1*a.* female  
 1*b.* var.  
 1*c.* var.  
 1*d.* var.  
 1*e.* var.  
 1*f.* var.  
 1*g.* var.  
 1*h.* var., Mr. G. T. Porritt  
 1*i.* larva, Mr. W. Buckler

## PLATE 131, VOL. 3

1. *Agrotis tritici*  
     male  
 1*a.* female  
 1*b.* var., Norfolk  
 1*c.* var., Norfolk  
 1*d.* var., Norfolk  
 1*e.* var., East of Ireland  
 1*f.* var., West of Ireland

- FIG.  
 1*g.* *Agrotis tritici*, var., West of Ireland  
 1*h.* var., West of Ireland  
 1*i.* var., North of Ireland  
 1*j.* larva, specimen furnished by Mr. C. S. Gregson

## PLATE 132, VOL. 3

1. *Agrotis tritici*  
     var., resembling *A. subgothica*  
 1*a.* var., Mr. F. J. Hanbury  
 1*b.* var., North-East Scotland, Mr. A. Horne  
 1*c.* var., North-East Scotland, Mr. A. Horne  
 2. *Agrotis subgothica*  
     original type, Dr. P. B. Mason  
 3. *Agrotis aquilina*  
     male  
 3*a.* female  
 3*b.* var.  
 3*c.* larva, Mr. W. Buckler

## PLATE 133, VOL. 3

1. *Agrotis obelisca*  
     male  
 1*a.* female, Mr. F. J. Hanbury  
 1*b.* var., Ireland  
 1*c.* var., Isle of Wight, Mr. A. J. Hodges  
 1*d.* larva, Mr. W. Buckler  
 2. *Agrotis agathina*  
     Norfolk, Mr. E. A. Atmore  
 2*a.* var., Dr. P. B. Mason  
 2*b.* var., Ireland  
 2*c.* var., Scotland  
 2*d.* larva, Mr. G. C. Bignell

## PLATE 134, VOL. 3

1. *Agrotis porphyrea*  
     male  
 1*a.* female  
 1*b.* male, var., Shetland  
 1*c.* female, var., Shetland, Mr. J. F. X. King  
 1*d.* larva, Mr. W. Buckler  
 2. *Agrotis praecox*  
     var.  
 2*a.* var., Mr. F. N. Pierce  
 2*c.* larva, Mr. G. C. Bignell

## PLATE 135, VOL. 3

1. *Agrotis Saucia*  
 1*a.* var.



116.  
 1*b*. *Agrotis Saucia*, var., Mr. F. J. Hambury  
 1*c*. var.  
 1*d*. larva, Mr. W. Buckler  
 2. *Agrotis pyrophila*  
 Isle of Portland, Mr. N. M. Richardson  
 2*a*. var., Scotland, Dr. P. B. Mason

## PLATE 136, VOL. 3

1. *Agrotis ravidata*  
 male  
 1*a*. female  
 1*b*. larva, Mr. W. Buckler  
 2. *Agrotis Ashworthii*  
 male, Mr. C. S. Gregson  
 2*a*. female, Mr. C. S. Gregson  
 2*b*. larva, Mr. W. Buckler  
 3. *Agrotis lucerneæ*  
 3*a*. var., North Wales, Dr. P. B. Mason  
 3*b*. var., South Coast, Dr. P. B. Mason  
 3*c*. larva, Mr. W. Buckler

## PLATE 137, VOL. 4

1. *Axylia putris*  
 male  
 1*a*. female  
 1*b*. larva, Mr. W. Buckler  
 2. *Triphaena fimbria*  
 male  
 2*a*. female  
 2*b*. var.  
 2*c*. var., Mr. G. T. Porritt  
 2*d*. larva, Mr. W. Buckler

## PLATE 138, VOL. 4

1. *Triphaena janthina*  
 1*a*. var.  
 1*b*. var.  
 larva, Mr. W. Buckler  
 2. *Triphaena interjecta*  
 male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler  
 3. *Triphaena subsepta*  
 3*a*. var., Scotland  
 3*b*. larva, Mr. W. Buckler

## PLATE 139, VOL. 4

1. *Triphaena orbata*  
 1*a*. var., North Ireland

116.  
 1*b*. *Triphaena orbata*, var., South England  
 1*c*. var., North-East Scotland  
 1*d*. var., North-East Scotland  
 1*e*. var., North-East Scotland  
 1*f*. var., North-East Scotland  
 1*g*. var., North-East Scotland  
 1*h*. var., North-East Scotland  
 1*i*. var., South Wales  
 1*j*. larva, Mr. W. Buckler

## PLATE 140, VOL. 4

1. *Triphaena pronuba*  
 1*a*. *Triphaena pronuba*  
 1*b*. *Triphaena pronuba*  
 1*c*. *Triphaena pronuba*  
 1*d*. *Triphaena pronuba*  
 1*e*. small var.  
 1*f*. var., Mr. W. Holland  
 1*g*. larva, Mr. G. C. Bignell

## PLATE 141, VOL. 4

1. *Noctua glaucosa*  
 1*a*. var.  
 1*b*. var., Shetland Isles  
 1*c*. larva, Mr. W. Buckler  
 2. *Noctua plecta*  
 var.  
 2*b*. larva, Mr. W. Buckler  
 3. *Noctua angur*  
 male  
 3*a*. female  
 3*b*. var., recorded as *A. Helvetiana*,  
 Dr. P. B. Mason  
 3*c*. larva, Mr. W. Buckler.

## PLATE 142, VOL. 4

1. *Noctua depuncta*  
 1*a*. var.  
 1*b*. larva, Mr. W. Buckler  
 2. *Noctua triangulum*  
 male  
 2*a*. female  
 2*b*. larva, Mr. G. C. Bignell  
 3. *Noctua c-nigrum*  
 3*a*. var.  
 3*b*. larva, Mr. W. Buckler  
 4. *Noctua flammata*  
 Norfolk, Mr. W. H. Thornthwaite

## PLATE 143, VOL. 4

1. *Noctua ditrapezium*  
 male

- FIG.  
 1*a*. *Noctua ditrapezium*, female  
 1*b*. larva, Mr. W. Buckler  
 2. *Noctua rhomboidea*  
   male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler  
 3. *Noctua brunnea*  
   male  
 3*a*. female  
 3*b*. var.  
 3*c*. var. Yorkshire, Mr. G. T.  
   Porritt  
 3*d*. larva, Mr. W. Buckler

## PLATE 144, VOL. 4

1. *Noctua dahlia*  
   male  
 1*a*. female  
 1*b*. var. West of Ireland  
 1*c*. larva, Mr. W. Buckler  
 2. *Noctua sobrina*  
   male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler  
 3. *Noctua subrosea*  
   male  
 3*a*. female, Dr. P. B. Mason  
 3*b*. male, var. Dr. P. B. Mason

## PLATE 145, VOL. 4

1. *Noctua festiva*  
   male  
 1*a*. female, var.  
 1*b*. male, var. Mr. F. J. Hanbury  
 1*c*. male, var. Mr. F. J. Hanbury  
 1*d*. male, var. Mr. F. J. Hanbury  
 1*e*. male, var.  
 1*f*. male, var.  
 1*g*. male, var.  
 1*h*. male, var.  
 1*i*. larva, Mr. W. Buckler

## PLATE 146, VOL. 4

1. *Noctua festiva*  
   var. *confusa*, male  
 1*a*. var. *confusa*, female  
 1*b*. var. *borealis*, male, Shetland,  
   Mr. F. J. Hanbury  
 1*c*. var. *borealis*, male, Shetland,  
   Mr. F. J. Hanbury  
 1*d*. var. *borealis*, male, Shetland,  
   Mr. F. J. Hanbury  
 1*e*. var. *borealis*, male, Shetland,  
   Mr. F. J. Hanbury

- FIG.  
 1*f*. *Noctua festiva*, var. *borealis*,  
   female, Shetland, Mr. F. J.  
   Hanbury  
 1*g*. var. *borealis*, female, Shetland,  
   Mr. F. J. Hanbury  
 1*h*. var. *borealis*, female, Shetland,  
   Mr. F. J. Hanbury  
 1*i*. var. *borealis*, male  
 1*k*. var. *borealis*, male

## PLATE 147, VOL. 4

1. *Noctua baja*  
   male  
 1*a*. female  
 1*b*. larva, Mr. W. Buckler  
 2. *Noctua rubi*  
   male  
 2*a*. female  
 2*b*. var. Dr. P. B. Mason  
 2*c*. larva, Mr. W. Buckler  
 3. *Noctua umbrosa*  
   male  
 3*a*. female  
 3*b*. larva, Mr. W. Buckler

## PLATE 148, VOL. 4

1. *Noctua xanthographa*  
   male  
 1*a*. female  
 1*b*. male, var.  
 1*c*. male, var.  
 1*d*. male, var.  
 1*e*. larva, Mr. W. Buckler  
 2. *Noctua neglecta*  
 2*a*. var. Mr. G. T. Porritt  
 2*b*. var. Mr. F. C. Woodforde  
 2*c*. var. larva, Mr. W. Buckler

## PLATE 149, VOL. 4

1. *Eurois herbida*  
 1*a*. var. Dr. H. H. Corbett  
 1*b*. var. Dr. H. H. Corbett  
 1*c*. var. Dr. H. H. Corbett  
 1*d*. var. Mr. G. T. Porritt  
 1*e*. larva, Mr. W. Buckler  
 2. *Eurois satura*  
   male  
 2*a*. female  
 2*b*. larva

## PLATE 150, VOL. 4

1. *Eurois occulta*  
 1*a*. var. Scotland  
 1*b*. var. bred by Mr. R. Adkin

FIG.

- 1c. *Eurois occulta*, larva, Mr. W. Buckler  
 2. *Eurois adusta*  
     male  
 2a. female  
 2b. var. Yorkshire, Mr. G. T. Porritt  
 2c. var. Perthshire, Mrs. A. Fraser  
 2d. larva, Mr. W. Buckler

## PLATE 151, VOL. 4

1. *Crymodes exulis*  
     Perthshire  
 1a. Shetland  
 1b. var. Maillardi, Shetland  
 2. *Charaxas graminis*  
     male  
 2a. female  
 2b. male, var.  
 2c. male, var.  
 2d. female, var.  
 2e. female, var.  
 2f. female, var.  
 2g. larva, Mr. W. Buckler

## PLATE 152, VOL. 4

1. *Heliophobus popularis*  
     male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Heliophobus cespitis*  
     male  
 2a. female  
 2b. larva, Mr. W. Buckler  
 3. *Xylomiges conspicillaris*  
 3a. var. Dr. John H. Wood  
 3b. var. Dr. John H. Wood  
 3c. larva, Mr. W. Buckler

## PLATE 153, VOL. 4

1. *Pachetra leucophaea*  
     male, Mr. F. J. Hanbury  
 1a. female, Mr. F. J. Hanbury  
 1b. male, var. Mr. F. J. Hanbury  
 1c. male, var. Mr. F. J. Hanbury  
 1d. female, Mr. F. J. Hanbury  
 1e. female, Mr. F. J. Hanbury  
 1f. larva, Mr. W. Buckler  
 2. *Neuria saponariae*  
     male  
 2a. female  
 2b. larva, Mr. W. Buckler

FIG.

## PLATE 154, VOL. 4

1. *Aplecta advena*  
     male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Aplecta tineta*  
     male, South of England  
 2a. female, South of England  
 2b. Scotland  
 2c. Staffordshire, Mr. F. C. Woodforde  
 2d. var. Staffordshire, Mr. F. C. Woodforde  
 2e. larva, Mr. W. Buckler

## PLATE 155, VOL. 4

1. *Aplecta nebulosa*  
     male  
 1a. female  
 1b. male, var. Pembroke  
 1c. female, var. Pembroke  
 1d. female, var.  
 1e. male, var. Norfolk  
 1f. male, var. Cheshire  
 1g. male, var. Cheshire, Mr. J. Collins  
 1h. larva, Mr. W. Buckler

## PLATE 156, VOL. 4

1. *Hadena contigua*  
     male  
 1a. female  
 1b. var. Scotland  
 1c. larva, Mr. W. Buckler  
 2. *Hadena thalassina*  
     male  
 2a. female  
 2b. male, var. Dr. H. H. Corbett  
 2c. female, var.  
 2d. larva, Mr. W. Buckler  
 3. *Hadena peregrina*  
     Mr. R. McLachlan

## PLATE 157, VOL. 4

1. *Hadena suasa*  
     male  
 1a. female  
 1b. var.  
 1c. var. Chatmoss  
 1d. larva, Mr. W. Buckler  
 2. *Hadena pisi*  
     male  
 2a. female

- FIG.  
 2*b*. *Hadena pisi*, var.  
 2*c*. var. Mr. P. M. Bright  
 2*d*. var. Mr. P. M. Bright  
 2*e*. larva, Mr. W. Buckler

## PLATE 158, VOL. 4

1. *Hadena oleracea*  
 1*a*. var. Scotland  
    *b*. larva, Mr. W. Buckler  
 2. *Hadena genista*  
    male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler  
 3. *Hadena glauca*  
    male  
 3*a*. female  
 3*b*. var.  
 3*c*. larva, Mr. W. Buckler

## PLATE 159, VOL. 4

1. *Hadena dentina*  
    male  
 1*a*. female  
 1*b*. var.  
 1*c*. var.  
 1*d*. var.  
 1*e*. larva, Mr. W. Buckler  
 2. *Hadena chenopodii*  
    male  
 2*a*. female  
 2*b*. var.  
 2*c*. var. *albifusa*  
 2*d*. larva, Mr. W. Buckler

## PLATE 160, VOL. 4

1. *Mamestra Albicollis*  
    male  
 1*a*. female  
 1*b*. larva, Mr. W. Buckler  
 2. *Mamestra brassicae*  
    male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler  
 3. *Mamestra persicaria*  
    male  
 3*a*. female  
 3*b*. larva, Mr. W. Buckler

## PLATE 161, VOL. 4

1. *Hecatera dysodea*  
    male  
 1*a*. female, Mr. P. M. Bright  
 1*b*. var.  
 1*c*. larva, Mr. W. Buckler

- FIG.  
 2. *Hecatera serena*  
 2*a*. var. Pembrokeshire  
 2*b*. larva, Mr. W. Buckler  
 3. *Dianthoecia irregularis*  
    male, Mr. S. Webb  
 3*a*. female, Mr. S. Webb  
 3*b*. larva, Mr. W. Buckler

## PLATE 162, VOL. 4

1. *Dianthoecia carpophaga*  
    South of England  
 1*a*. var. Suffolk  
 1*b*. var. Suffolk  
 1*c*. var. Sussex  
 1*d*. var. Mr. S. Webb  
 1*e*. var. South Scotland, Mr. A. Elliot  
 1*f*. var. South Wales, Mr. W. F. H. Blandford  
 1*g*. var. South Wales, Mr. W. F. H. Blandford  
 1*h*. var. capsophila, Ireland  
 1*i*. var. capsophila, Ireland  
 1*j*. var. capsophila, Ireland, Mr. S. Webb  
 1*k*. larva, type, Mr. W. Buckler  
 1*l*. larva, var. capsophila, Mr. W. Buckler

## PLATE 163, VOL. 4

1. *Dianthoecia cucubali*  
    male, Mr. S. Webb  
 1*a*. female, Mr. S. Webb  
 1*b*. larva, Mr. W. Buckler  
 2. *Dianthoecia capsicola*  
    male  
 2*a*. female  
 2*b*. var. Mr. S. Webb  
 2*c*. larva, Mr. W. Buckler  
 3. *Dianthoecia albimacula*  
    male, Mr. J. W. Downing  
 3*a*. female, Mr. S. Webb  
 3*b*. larva, Mr. W. Buckler

## PLATE 164, VOL. 4

1. *Dianthoecia conspersa*  
    Mr. S. Webb  
 1*a*. var. Mr. S. Webb  
 1*b*. var. Mr. W. C. Boyd  
 1*c*. var. Forres, Mr. S. Webb  
 1*d*. var. Aberdeen, Mr. S. Webb  
 1*e*. var. Shetland, Mr. S. Webb  
 1*f*. var. Shetland, Mr. S. Webb  
 1*g*. var. N. Wales, Mr. S. Webb  
 1*h*. larva, Mr. W. H. B. Fletcher

FIG.

## PLATE 165, VOL. 4

1. *Dianthocæcia casia*  
male  
1*a.* female  
1*b.* larva, Mr. W. Buckler
2. *Dianthocæcia luteago*  
var. *Barrettii*, male (original  
specimen)  
2*a.* var. *Barrettii*, female  
2*b.* var. South Wales, Mr. W. F. H.  
Blandford  
2*c.* var. North Devon, Mr. W. C.  
Boyd  
2*d.* larva, Mr. W. Buckler
3. *Flochlena hispida*  
male  
3*a.* female  
3*b.* var. Dr. P. B. Mason  
3*c.* larva, Mr. W. Buckler

## PLATE 166, VOL. 4

1. *Aporophyla bitulenta*  
male  
1*a.* female  
1*b.* var. Kent, Major A. Ficklin  
1*c.* var. Sligo, Mr. P. Russ  
1*d.* var. Sligo, Mr. P. Russ  
1*e.* larva, Mr. W. Buckler
2. *Aporophyla nigra*  
2*a.* var. Carlisle, Mr. G. B. Rout-  
ledge  
2*b.* female, var. Carlisle, Mr. G. B.  
Routledge  
2*c.* larva, Mr. W. Buckler

## PLATE 167, VOL. 4

1. *Aporophyla Australis*  
male, Mr. F. J. Hambury  
1*a.* female, Mr. F. J. Hambury  
1*b.* male, var. Mr. F. J. Hambury  
1*c.* female, var. Mr. F. J. Hambury  
1*d.* larva, Mr. W. Buckler
2. *Epundula lichenea*  
male  
2*a.* female  
2*b.* male, var. Portland, Mr. N.  
M. Richardson  
2*c.* female, var. Pembroke  
2*d.* larva, Mr. W. Buckler

## PLATE 168, VOL. 4

1. *Dasytopia templi*  
male  
1*a.* female, Major A. Ficklin

FIG.

- 1*b.* *Dasytopia templi*, male, var.  
1*c.* female, var.  
1*d.* larva, Mr. W. Buckler
2. *Polia xanthomista*  
male, Mr. S. J. Capper  
2*a.* female, Mr. S. J. Capper  
2*b.* larva, Mr. W. Buckler

## PLATE 169, VOL. 4

1. *Polia flavicincta*  
male  
1*a.* female  
1*b.* var. Huddersfield, Mr. G. T.  
Porritt  
1*c.* var. Huddersfield, Mr. G. T.  
Porritt  
1*d.* var. Norfolk  
1*e.* var. Mr. Sydney Webb  
1*f.* larva, Mr. W. Buckler

## PLATE 170, VOL. 4

1. *Polia chi*  
male  
1*a.* female  
1*b.* var. Mr. Sydney Webb  
1*c.* var. Mr. G. T. Porritt  
1*d.* var. Mr. G. T. Porritt  
1*e.* var. Mr. G. T. Porritt  
1*f.* var. Mr. G. T. Porritt  
1*g.* var.  
1*h.* var. *olivacea*, Dr. Mason  
1*i.* larva, Mr. W. Buckler

## PLATE 171, VOL. 4

1. *Dryobota protea*  
male  
1*a.* female  
1*b.* var.  
1*c.* var. Dr. Mason  
1*d.* var. Dr. Mason  
1*e.* larva, Mr. W. Buckler
2. *Cleoceris viminalis*  
male  
2*a.* female  
2*b.* var. Reading, Mr. A. H.  
Hamm  
2*c.* var. Scotland, Mr. P. M.  
Bright  
2*d.* var. N. England, Mr. P. M.  
Bright  
2*e.* var. N. England  
2*f.* larva, Mr. W. Buckler

FIG.

## PLATE 172, VOL. 4

1. *Chariptera aprilius*
- 1*a.* var. Ireland, Capt. E. W. Browne
- 1*b.* var. Ireland, Capt. E. W. Browne
- 1*c.* var. Rev. E. N. Bloomfield
- 1*d.* var. Mr. G. T. Porritt
- 1*e.* larva, Mr. G. C. Bignell
2. *Miselia oxyacanthæ*
- 2*a.* var.
- 2*b.* var. *capucina*
- 2*c.* larva, Mr. W. Buckler

## PLATE 173, VOL. 4

1. *Luperina testacea*
- male
- 1*a.* female
- 1*b.* male var. Mr. E. A. Atmore
- 1*c.* female var. West of Ireland
- 1*d.* female var. Mr. G. T. Porritt
- 1*e.* female var. Dublin coast
- 1*f.* female var. Isle of Wight
- 1*g.* female var. Dr. P. B. Mason
- 1*h.* male var. Guenéei, Dr. P. B. Mason
- 1*i.* male, intermediate. Dr. P. B. Mason
- 1*j.* male var. Mr. G. T. Porritt
- 1*k.* larva, Mr. W. Buckler

## PLATE 174, VOL. 4

1. *Luperina Dumerilii*
- male
- 1*a.* female
2. *Valeria oleagina*
- male
- 2*a.* female
3. *Cerigo cytherea*
- male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler

## PLATE 175, VOL. 4

1. *Hama abjecta*
- male
- 1*a.* female
- 1*b.* var.
- 1*c.* larva, Mr. W. Buckler
2. *Hama anceps*
- male
- 2*a.* female
- 2*b.* var. Ireland
- 2*c.* var.

FIG.

## PLATE 176, VOL. 4

1. *Hama furva*
- male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Xylophasia lithoxylea*
- male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Xylophasia subulstris*
- male
- 3*a.* female
- 3*b.* var.

## PLATE 177, VOL. 4

1. *Xylophasia polyodon*
- male
- 1*a.* female
- 1*b.* var. Pembroke
- 1*c.* var. Norfolk
- 1*d.* var. Norfolk
- 1*e.* var. Surrey
- 1*f.* var. Dublin
- 1*g.* var. Sutherland, Mr. F. J. Hanbury
- 1*h.* larva, Mr. W. Buckler

## PLATE 178, VOL. 4

1. *Xylophasia polyodon*
- var. Galway
- 1*a.* var. Sutherlandshire, Mr. F. J. Hanbury
- 1*b.* var. Sutherlandshire, Mr. F. J. Hanbury
- 1*c.* var. Sutherlandshire, Mr. F. J. Hanbury
- 1*d.* var. Sutherlandshire, Mr. F. J. Hanbury
- 1*e.* var. Yorkshire, Mr. G. T. Porritt
- 1*f.* var.
- 1*g.* var. West of Ireland

## PLATE 179, VOL. 4

1. *Xylophasia rurea*
- male
- 1*a.* female
- 1*b.* var. Aberdeen, Mr. A. Horne
- 1*c.* var. Aberdeen, Mr. A. Horne
- 1*d.* var. Aberdeen, Mr. A. Horne
- 1*e.* var. Lanark, Mr. K. J. Morton
- 1*f.* var. Haslemere, Surrey
- 1*g.* var. Mr. P. M. Bright
- 1*h.* var. larva, Mr. W. Buckler

FIG.

## PLATE 180, VOL. 4

1. *Xylophasia rurea*  
var. *combusta*, Surrey
- 1*a.* var. *combusta*, Yorkshire
- 1*b.* var. *combusta*, Aberdeen, Mr.  
A. Horne
- 1*c.* var. *combusta*, Shetland
2. *Xylophasia hepatica*  
male
- 2*a.* female
- 2*b.* var.
- 2*c.* var.
- 2*d.* larva, Mr. W. Buckler

## PLATE 181, VOL. 4

1. *Xylophasia scolopacina*  
male
- 1*a.* female
- 1*b.* var. London district
- 1*c.* var.
- 1*d.* larva, Mr. W. Buckler
2. *Apamea basilinea*  
male
- 2*a.* female
- 2*b.* var.
- 2*c.* var.
- 2*d.* larva, Mr. W. Buckler

## PLATE 182, VOL. 4

1. *Apamea gemina*  
male
- 1*a.* female
- 1*b.* var.
- 1*c.* var. West of Ireland
- 1*d.* var.
- 1*e.* var. Wiltshire
- 1*f.* var. *remissa*
- 1*g.* var. *remissa*, South Wales
- 1*h.* larva, Mr. W. Buckler

## PLATE 183, VOL. 4

1. *Apamea oculata*  
var. *Pembroke*
- 1*b.* var. *Norfolk*
- 1*c.* var. *Norfolk*
- 1*d.* var.
- 1*e.* var.
- 1*f.* var.
- 1*g.* var. *Pembroke*
- 1*h.* var.
- 1*i.* var. *Norwich*
- 1*j.* var. Mr. A. Ficklin
- 1*k.* larva, Mr. W. Buckler

FIG.

## PLATE 184, VOL. 4

1. *Apamea connexa*  
male
- 1*a.* female
- 1*b.* var. Dr. P. B. Mason
2. *Apamea unanimitis*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Apamea ophiogramma*  
male, Mr. F. J. Haubury
- 3*a.* female, Mr. F. J. Haubury
- 3*b.* var. Mr. F. J. Haubury
- 3*c.* var. Mr. F. J. Haubury
- 3*d.* larva, furnished alive, by Mr.  
F. J. Haubury

## PLATE 185, VOL. 5

1. *Celena Haworthi*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* var., Norfolk Fens
- 1*d.* var., *laucea*, Steph., type from  
Dr. P. B. Mason's collection
- 1*e.* var., Mr. G. T. Porritt
- 1*f.* larva, Mr. W. Buckler
2. *Miana literosa*  
male *laucea*
- 2*a.* female
- 2*b.* var., Mr. G. T. Porritt
- 2*c.* var.
- 2*d.* larva, Mr. W. Buckler

## PLATE 186, VOL. 5

1. *Miana strigilis*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
- 1*d.* female, var.
- 1*e.* female, var.
- 1*f.* female, var.
- 1*g.* female, var.
- 1*h.* male, var.
- 1*i.* male, var.
- 1*j.* male, var.
- 1*k.* larva, Mr. W. Buckler
2. *Miana fasciuncula*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* larva, Mr. W. Buckler

FIG.

## PLATE 187, VOL. 5

1. *Miana furuncula*
  - male
  - 1*a.* female
  - 1*b.* male, var.
  - 1*c.* male, var.
  - 1*d.* female, var.
  - 1*e.* female, var.
  - 1*f.* male, var. *bicoloria*
  - 1*g.* female, var. *bicoloria*
  - 1*h.* male, var. South Coast
  - 1*i.* male, var. South Coast
  - 1*j.* male, var. Irish Coast
  - 1*k.* male, var. Mr. P. M. Bright
  - 1*l.* male, var. Mr. P. M. Bright
  - 1*m.* larva, Mr. W. Buckler

## PLATE 188, VOL. 5

1. *Miana captiuncula*
  - male
  - 1*a.* male, var.
  - 1*b.* female
  - 1*c.* larva, Mr. W. Buckler
2. *Eremobia ochroleuca*
  - male
  - 2*a.* female
  - 2*b.* larva, Mr. W. Buckler
3. *Dipterygia pinastri*
  - male
  - 3*a.* female
  - 3*b.* larva, Mr. W. Buckler

## PLATE 189, VOL. 5

1. *Hyppa rectilinea*
  - male
  - 1*a.* female
  - 1*b.* larva, Mr. W. Buckler
2. *Cloantha perspicillaris*
  - male
  - 2*a.* female
3. *Trachœa atriplicis*
  - male, Major Ficklin
  - 3*a.* female, Major Ficklin
  - 3*b.* larva, Mr. W. Buckler

## PLATE 190, VOL. 5

1. *Trigonophora empyrea*
  - male
  - 1*a.* female
  - 1*b.* larva, Mr. W. Buckler
2. *Euplexia lucipara*
  - male
  - 2*a.* female
  - 2*b.* larva, Mr. W. Buckler

FIG.

3. *Phlogophora meticulosa*
  - male
  - 3*a.* female
  - 3*b.* larva, Mr. W. Buckler

## PLATE 191, VOL. 5

1. *Helotropha fibrosa*
  - 1*a.* var.
  - 1*b.* var.
  - 1*c.* var., Rev. C. F. Thornehill
  - 1*d.* larva, Mr. W. Buckler
2. *Hydrœcia petasitis*
  - male
  - 2*a.* female
  - 2*b.* larva, Mr. W. Buckler

## PLATE 192, VOL. 5

1. *Hydrœcia nietitans*
  - male
  - 1*a.* female
  - 1*b.* male, var.
  - 1*c.* female, var.
  - 1*d.* male, var., Mr. G. T. Porritt
  - 1*e.* female, var., Dr. P. B. Mason
  - 1*f.* male, var., Dr. P. B. Mason
  - 1*g.* male, var., Mr. G. F. Mathew
  - 1*h.* male, var., Lancashire mosses,  
Mr. J. Collins
  - 1*i.* larva, Mr. W. Buckler

## PLATE 193, VOL. 5

1. *Hydrœcia micacea*
  - male
  - 1*a.* female
  - 1*b.* var., Mr. P. M. Bright
  - 1*c.* var., North of Ireland
  - 1*d.* larva, Mr. W. Buckler
2. *Gortyna flavago*
  - male
  - 2*a.* female
  - 2*b.* var., Mr. P. M. Bright
  - 2*c.* larva, Mr. W. Buckler

## PLATE 194, VOL. 5

1. *Nonagria cauna*
  - male
  - 1*a.* female
  - 1*b.* male, var.
2. *Nonagria sparganii*
  - male, Mr. F. J. Hanbury
  - 2*a.* female, Mr. F. J. Hanbury
  - 2*b.* male, var., Mr. F. J. Hanbury
  - 2*c.* female, var., Mr. F. J. Hanbury
  - 2*d.* larva, Mr. W. Buckler



FIG.

## PLATE 195, VOL. 5

1. *Nonagria typhae*  
male
- 1*a.* female
- 1*b.* male, var., Dr. F. D. Wheeler
- 1*c.* female, var., Dr. F. D. Wheeler  
larva, Mr. W. Buckler
2. *Nonagria geminipuncta*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* larva, Mr. W. Buckler

## PLATE 196, VOL. 5

1. *Nonagria neurica*  
male
- 1*a.* female
- 1*b.* male, var., Dr. F. D. Wheeler
- 1*c.* larva, Mr. W. Buckler
2. *Oenobia rufa*  
male
- 2*a.* female
3. *Senta ulvae*  
male
- 3*a.* female
- 3*b.* var. *bipunctata*, Dr. F. D. Wheeler
- 3*c.* var. *Wismariensis*, Dr. P. B. Mason

## PLATE 197, VOL. 5

1. *Tapinostola musculosa*  
Mr. S. Webb
2. *Tapinostola fulva*  
male
- 2*a.* female
- 2*b.* male, var., Norfolk Fens
- 2*c.* male, var., Norfolk Fens
- 2*d.* male, var., Scotland
- 2*e.* larva, Mr. W. Buckler
3. *Tapinostola concolor*  
male, Mr. S. Webb
- 3*a.* female, Mr. S. Webb
- 3*b.* male, var., Mr. S. Webb

## PLATE 198, VOL. 5

1. *Tapinostola Helmanni*  
male
- 1*a.* female
- 1*b.* male, var.
2. *Tapinostola Bondii*  
male
- 2*a.* female

FIG.

3. *Tapinostola elymi*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler

## PLATE 199, VOL. 5

1. *Calamia lutosa*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* female, var. Mr. S. Webb
- 1*d.* female, var. Vectis
- 1*e.* larva, Mr. W. Buckler
2. *Calamia phragmitidis*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* larva, Mr. W. Buckler

## PLATE 200, VOL. 5

1. *Calamia brevilinea*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var. Dr. F. D. Wheeler
- 1*d.* larva, Miss V. E. Barrett
2. *Meliana flammica*  
male, Dr. F. D. Wheeler
- 2*a.* female, Dr. F. D. Wheeler
- 2*b.* male, var. Dr. F. D. Wheeler
- 2*c.* larva, Mr. W. Buckler

## PLATE 201, VOL. 5

1. *Leucania pudorina*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Leucania impura*  
male
- 2*a.* female
- 2*b.* male, var. North of Ireland
- 2*c.* larva, Mr. W. Buckler
3. *Leucania favicolor*  
male, Mr. G. F. Mathew, R.N.
- 3*a.* female, Mr. G. F. Mathew, R.N.
- 3*b.* female, var. Mr. G. F. Mathew, R.N.

## PLATE 202, VOL. 5

1. *Leucania pallens*  
male
- 1*a.* female
- 1*b.* female, var.

- FIG.  
 1c. *Leucania pallens*, male, var.  
 1d. larva, Mr. W. Buckler  
 2. *Leucania straminea*  
 male  
 2a. female  
 2b. female var. Mr. G. F. Mathew,  
 R.N.  
 2c. female var. Mr. G. F. Mathew,  
 R.N.  
 2d. larva, Mr. W. Buckler

## PLATE 203, VOL. 5

1. *Leucania obsoleta*  
 male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Leucania putrescens*  
 male  
 2a. female  
 2b. larva, Mr. W. Buckler  
 3. *Leucania comma*  
 male  
 3a. female  
 3b. female var.  
 3c. larva, Mr. W. Buckler

## PLATE 204, VOL. 5

1. *Leucania littoralis*  
 male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Leucania loreyi*  
 3. *Leucania unipuncta*  
 male  
 3a. female, Professor Meldola  
 4. *Leucania Vitellina*  
 male  
 4a. female, Mr. F. J. Hambury  
 5. *Tapinostola Boudii*  
 larva, Mr. W. Buckler \*  
 5a. larva, Mr. W. Buckler \*  
 \* Omitted from Plate 198.

## PLATE 205, VOL. 5

1. *Leucania conigera*  
 male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Leucania albipuncta*  
 male, Mr. Sydney Webb  
 2a. female, Mr. Sydney Webb  
 2b. var. Mr. F. C. Woodforde

- FIG.  
 3. *Leucania lithargyria*  
 male  
 3a. female  
 3b. larva, Mr. W. Buckler

## PLATE 206, VOL. 5

1. *Leucania turca*  
 male  
 1a. female  
 1b. var. Essex  
 1c. larva, Mr. W. Buckler  
 2. *Patolis piniperla*  
 male  
 2a. female  
 2b. male, var.  
 2c. male, var. Rev. J. Greene  
 2d. male, var. Mr. G. T. Porritt  
 2e. larva, Mr. W. Buckler

## PLATE 207, VOL. 5

1. *Tæniocampa gothica*  
 male  
 1a. female  
 1b. male, var. Surrey  
 1c. female, var. Surrey  
 1d. female, var. Surrey  
 1e. male, var. Durham  
 1f. male, var. Durham  
 1g. male, var. North of Ireland,  
 Rev. W. F. Johnson  
 1h. male, var. North of Ireland,  
 Rev. W. F. Johnson  
 1i. larva, Mr. W. Buckler

## PLATE 208, VOL. 5

1. *Tæniocampa gothica*  
 female, var. Yorkshire, Mr.  
 G. T. Porritt  
 1a. male, var. Perthshire, Mr. W.  
 Reid  
 1b. male, var. Perthshire, Mr. W.  
 Reid  
 1c. male, var. Perthshire, Mr. W.  
 Reid  
 1d. female, var. Perthshire, Mr. W.  
 Reid  
 2. *Tæniocampa miniosa*  
 male  
 2a. female  
 2b. male, var. Mr. P. M. Bright  
 2c. male, var. Dr. T. A. Chapman  
 2d. larva, Mr. W. Buckler

## FIG. PLATE 209, VOL. 5

1. *Tæniocampa cruda*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Tæniocampa stabilis*  
male
- 2*a.* female
- 2*b.* male, var. Ireland
- 2*c.* male, var. Ireland
- 2*d.* female, var. Mr. G. T. Porritt
- 2*e.* female, var. Mr. F. C. Wood-  
ford
- 2*f.* male, var. Mr. W. M. Christy
- 2*g.* larva, Mr. W. Buckler

## PLATE 210, VOL. 5

1. *Tæniocampa populeti*  
male
- 1*a.* female
- 1*b.* male, var. Mr. Sydney Webb
- 1*c.* larva, Mr. W. Buckler
- Tæniocampa opima*  
male
- 2*a.* female
- 2*b.* male var.
- 2*c.* female var.
- 2*d.* larva, Mr. W. Buckler

## PLATE 211, VOL. 5

1. *Tæniocampa instabilis*  
male
- 1*a.* female
- 1*b.* male, var. Mr. P. M. Bright
- 1*c.* male, var. Mr. P. M. Bright
- 1*d.* female, var. Mr. C. G. Clutter-  
buck
- 1*e.* female, var. Mr. S. J. Capper
- 1*f.* male, var. Mr. Sydney Webb
- 1*g.* female, var. Mr. Sydney Webb
- 1*h.* female, var. Mr. Sydney Webb
- 1*i.* larva, Mr. W. Buckler

## PLATE 212, VOL. 5

1. *Tæniocampa instabilis*  
male, var. London Suburbs
- 1*a.* female, var. South of England
- 1*b.* male, var. Forres, Morayshire
- 1*c.* female, var. Forres, Morayshire
2. *Tæniocampa munda*  
male
- 2*a.* female, var. Surrey
- 2*b.* male, var. Surrey

- FIG.
- 2*c.* *Tæniocampa munda*, male, var.  
Pembroke
- 2*d.* female, var. Surrey
- 2*e.* male, var. Surrey
- 2*f.* larva, Mr. W. Buckler

## PLATE 213, VOL. 5

1. *Tæniocampa gracilis*  
male
- 1*a.* female
- 1*b.* male var. Scotland, Mr. W. M.  
Christy
- 1*c.* male var. New Forest, Mr. W.  
M. Christy
- 1*d.* female var. Wicken Fen, Mr.  
W. M. Christy
- 1*e.* male var. New Forest, Mr. P.  
M. Bright
- 1*f.* male var. New Forest, Mr. P.  
M. Bright
- 1*g.* female var. New Forest, Mr.  
P. M. Bright
- 1*h.* female var. New Forest, Mr.  
P. M. Bright
- 1*i.* larva, Mr. W. Buckler

## PLATE 214, VOL. 5

1. *Pachnobia leucographa*  
male
- 1*a.* female
- 1*b.* male, var. Dr. T. A. Chapman
- 1*c.* larva, Mr. W. Buckler
2. *Pachnobia rubricosa*  
male
- 2*a.* female
- 2*b.* male var. Surrey
- 2*c.* male var. Yorkshire
- 2*d.* male var. Dumbartonshire,  
Mr. J. R. Malloch
- 2*e.* larva, Mr. W. Buckler

## PLATE 215, VOL. 5

1. *Pachnobia hyperborea*  
male
- 1*a.* female
- 1*b.* male var. Dr. F. D. Wheeler
- 1*c.* female var. Dr. F. D. Wheeler
- 1*d.* female var. Dr. F. D. Wheeler
- 1*e.* female var. Mr. S. J. Capper
- 1*f.* male var. Mr. P. M. Bright
- 1*g.* male var. Shetland
- 1*h.* larva, Mr. W. Buckler

FIG.

## PLATE 216, VOL. 5

1. *Rusina tenebrosa*  
male  
1*a.* female  
1*b.* male, var. South Wales  
1*c.* larva, Mr. W. Buckler
2. *Mania naura*  
male  
2*a.* female  
2*b.* var. Yorkshire, Mr. G. T. Porritt  
2*c.* var. Yorkshire, Mr. G. T. Porritt  
2*d.* larva, Mr. W. Buckler

## PLATE 217, VOL. 5

1. *Nania typica*  
male  
1*a.* female  
1*b.* var. Rev. J. Greene  
1*c.* var. Mr. G. T. Porritt  
1*d.* var. Mr. G. T. Porritt  
1*e.* larva, Mr. W. Buckler
2. *Amphipyra tragopogonis*  
male  
2*a.* female  
2*b.* var.  
2*c.* larva, Mr. W. Buckler

## PLATE 218, VOL. 5

1. *Amphipyra pyramidea*  
male  
1*a.* female  
1*b.* var. New Forest  
1*c.* var. Mr. W. M. Christy  
1*d.* larva, Mr. W. Buckler
2. *Toxocampa pastinum*  
male  
2*a.* female  
2*b.* var. Mr. S. J. Copper  
2*c.* larva, Mr. W. Buckler

## PLATE 219, VOL. 5

1. *Toxocampa cracca*  
male, Mr. P. M. Bright  
1*a.* female, Mr. P. M. Bright  
1*b.* larva, Mr. W. Buckler
2. *Acosmetia caliginosa*  
male, Mr. P. M. Bright  
2*a.* female, Mr. P. M. Bright
3. *Hydrilla palustris*  
male, Norwich  
3*a.* female, Mr. S. Webb

FIG.

4. *Hydrilla arcuosa*  
male  
4*a.* female  
1*b.* male var. West of Ireland  
1*c.* larva, Mr. W. Buckler

## PLATE 220, VOL. 5

1. *Laphygma exigua*  
male, Mr. F. C. Woodforde  
1*a.* female, Mr. F. C. Woodforde
2. *Stilbia anomala*  
male  
2*a.* female  
2*b.* male, var. West of Ireland  
2*c.* larva, Mr. W. Buckler
3. *Caradrina morpheus*  
male  
3*a.* female  
3*b.* var. London Suburbs  
3*c.* larva, Mr. W. Buckler

## PLATE 221, VOL. 5

1. *Caradrina ambigua*  
male, Mr. F. C. Woodforde  
1*a.* female, var. Mr. F. C. Woodforde  
1*b.* larva, Miss Violet Barrett
2. *Caradrina alsines*  
male  
2*a.* female, Mr. P. M. Bright  
2*b.* larva, Mr. W. Buckler
3. *Caradrina blanda*  
male  
3*a.* female  
3*b.* larva, Mr. W. Buckler
4. *Caradrina cubicularis*  
male  
4*a.* female  
4*b.* larva, Mr. W. Buckler

## PLATE 222, VOL. 5

1. *Grammesia trilinea*  
male  
1*a.* var.  
1*b.* var. bilinea  
1*c.* var.  
1*d.* larva, Mr. W. Buckler
2. *Dyschorista suspecta*  
male  
2*a.* var. Mr. F. C. Woodforde  
2*b.* var. Mr. F. C. Woodforde  
2*c.* var. Mr. P. M. Bright  
2*d.* var. Mr. P. M. Bright  
2*e.* larva, Mr. W. Buckler

- FIG. PLATE 223, VOL. 5
1. *Dyschorista upsilon*  
male
  - 1*a.* female
  - 1*b.* var.
  - 1*c.* larva, Mr. W. Buckler
  2. *Euperia fulvago*  
male
  - 2*a.* female
  - 2*b.* larva, Mr. W. Buckler
  3. *Dicycla oo*  
male
  - 3*a.* female
  - 3*b.* var. *renago*, Mr. S. Webb
  - 3*c.* larva, Mr. W. Buckler

- PLATE 224, VOL. 5
1. *Calymnia trapezina*  
male
  - 1*a.* female
  - 1*b.* var.
  - 1*c.* var. Mr. P. M. Bright
  - 1*d.* var. Mr. P. M. Bright
  - 1*e.* var. Mr. S. J. Capper
  - 1*f.* var. Mr. G. T. Porritt
  - 1*g.* larva, Mr. W. Buckler
  2. *Calymnia pyralina*  
male, Mr. S. Webb
  - 2*a.* female, Mr. S. Webb

- PLATE 225, VOL. 5
1. *Calymnia diffinis*  
male
  - 1*a.* female
  - 1*b.* larva, Mr. W. Buckler
  2. *Calymnia affinis*  
male
  - 2*a.* female
  - 2*b.* var. Rev. J. Greene
  - 2*c.* var. Mr. Sydney Webb
  - 2*d.* var. Mr. Sydney Webb
  - 2*e.* larva, Mr. W. Buckler
  3. *Tethea subtusa*  
male
  - 3*a.* female
  - 3*b.* larva, Mr. W. Buckler

- PLATE 226, VOL. 5
1. *Tethea retusa*  
male
  - 1*a.* female, Mr. S. Webb
  - 1*b.* larva, Mr. W. Buckler
  2. *Orthosia rutina*  
male

- FIG.
- 2*a.* *Orthosia rutina*, female
  - 2*b.* var.
  - 2*c.* var. Mr. S. Webb
  - 2*d.* larva, Mr. W. Buckler
  3. *Orthosia ferruginea*  
male
  - 3*a.* female
  - 3*b.* var. Dr. H. H. Corbett
  - 3*c.* larva, Mr. W. Buckler

- PLATE 227, VOL. 5
1. *Orthosia pistacina*  
male
  - 1*a.* female
  - 1*b.* var.
  - 1*c.* var. Essex, Rev. W. Claxton
  - 1*d.* var. Essex, Rev. W. Claxton
  - 1*e.* var. Mr. W. C. Boyd
  - 1*f.* var. Mr. W. C. Boyd
  - 1*g.* var. Mr. G. T. Porritt
  - 1*h.* larva, Mr. W. Buckler

- PLATE 228, VOL. 5
1. *Orthosia litura*  
male
  - 1*a.* female
  - 1*b.* var.
  - 1*c.* larva, Mr. W. Buckler
  2. *Orthosia humosa*  
male
  - 2*a.* female
  - 2*b.* var.
  - 2*c.* var.
  - 2*d.* var. larva, Mr. W. Buckler

- PLATE 229, VOL. 5
1. *Orthosia lota*  
male
  - 1*a.* female, var. *Pembroke*
  - 1*b.* larva, Mr. W. Buckler
  2. *Orthosia macilenta*  
male
  - 2*a.* female
  - 2*b.* larva, Mr. W. Buckler
  3. *Cirradia Xerampelina*  
male
  - 3*a.* female, Rev. J. Greene
  - 3*b.* var. Rev. J. Greene
  - 3*c.* var. Rev. J. Greene
  - 3*d.* var. Rev. J. Greene
  - 3*e.* var. Mr. Sydney Webb
  - 3*f.* larva, Mr. W. Buckler

FIG.

## PLATE 230, VOL. 5

1. *Xanthia citrigo*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* larva, Mr. W. Buckler
2. *Xanthia cerago*  
male
- 2*a.* female, var. Berks.
- 2*b.* var. Surrey
- 2*c.* var. North Wales, Mr. C. S. Gregson
- 2*d.* larva, Mr. W. Buckler

## PLATE 231, VOL. 5

1. *Xanthia silago*  
male
- 1*a.* female
- 1*b.* var. Mr. F. C. Woodforde
- 1*c.* larva, Mr. W. Buckler
2. *Xanthia gilvago*  
male
- 2*a.* female
- 2*b.* var. Brighton
- 2*c.* larva, Mr. W. Buckler
3. *Xanthia ocellaris*  
male, Mr. E. H. Taylor
- 3*a.* female, Prof. R. Meldola

## PLATE 232, VOL. 5

1. *Xanthia aurago*  
male
- 1*a.* female
- 1*b.* male, var. Norfolk
- 1*c.* male, var. Mr. W. Holland, Reading
- 1*d.* male, var. Mr. W. Holland, Reading
- 1*e.* female, var. Mr. W. Holland, Reading
- 1*f.* female, Mrs. Bazett, Reading
- 1*g.* female, Mr. W. Holland, Reading
- 1*h.* larva, Mr. W. Buckler

## PLATE 233, VOL. 6

1. *Hoporina croceago*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Dasycaampa rubiginea*  
var. Mr. Sydney Webb
- 2*b.* var. Mr. Sydney Webb

FIG.

- 2*c.* *Dasycaampa rubiginea*, larva, Mr. W. Buckler
3. *Cerastis erythrocephala*, Mr. S. Webb
- 3*a.* var. *glabra*, Mr. S. Webb

## PLATE 234, VOL. 6

1. *Cerastis vaccini*
- 1*a.* var. *mixta*
- 1*b.* var. *spadicea*
- 1*c.* larva, Mr. W. Buckler
2. *Cerastis ligula*
- 2*a.* var.
- 2*b.* var. larva, Mr. W. Buckler
- 2*c.* larva, Mr. W. Buckler
3. *Scopelosoma satellitia*
- 3*a.* var.
- 3*b.* var. Mr. S. Webb
- 3*c.* larva, Mr. W. Buckler

## PLATE 235, VOL. 6

1. *Xylina semibrunnea*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Xylina petrificata*  
var.
- 2*a.* var. Mr. S. Webb
- 2*b.* larva, Mr. W. Buckler
3. *Xylina conformis*  
Mr. Evan John
- 3*a.* larva, Mr. W. Buckler
4. *Xylina lambda*, Mr. S. Webb

## PLATE 236, VOL. 6

1. *Xylina rhizolitha*
- 1*a.* var.
- 1*b.* larva, Mr. W. Buckler
2. *Xylocampa lithoriza*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Lithomia solidaginis*  
male
- 3*a.* female
- 3*b.* var. Mr. G. T. Porritt
- 3*c.* var. Cammock Chase, Mr. F. C. Woodforde
- 3*d.* larva, Mr. W. Buckler

## PLATE 237, VOL. 6

1. *Calocampa exoleta*  
var. Dr. H. H. Corbett
- 1*b.* larva, Mr. W. Buckler

- FIG.  
 2. *Calocampa vetusta*  
 2*a.* var. Scotland  
 2*b.* var. South England  
 2*c.* larva, Mr. W. Buckler

PLATE 238, VOL. 6

1. *Cucullia verbasci*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Cucullia scrophulariæ*  
 male, Dr. F. D. Wheeler  
 2*a.* female, Dr. F. D. Wheeler  
 2*b.* larva, Mr. W. Buckler  
 3. *Cucullia lychnitis*  
 male  
 3*a.* female  
 3*b.* larva, Mr. W. Buckler

PLATE 239, VOL. 6

1. *Cucullia asteris*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Cucullia gnaphalii*  
 larva, Mr. W. Buckler  
 3. *Cucullia absynthii*  
 male  
 3*a.* female  
 3*b.* larva, Mr. W. Buckler  
 4. *Cucullia abrotani*, Dr. P. B. Mason.

PLATE 240, VOL. 6

1. *Cucullia chamomilla*  
 male  
 1*a.* female  
 1*b.* larva, Mr. F. C. Woodforde  
 2. *Cucullia umbratica*  
 male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler  
 3. *Plusia illustris*  
 4. *Plusia chryson*  
 male  
 4*a.* female  
 4*b.* larva

PLATE 241, VOL. 6

1. *Plusia chrysitis*  
 male  
 1*a.* female  
 1*b.* var.  
 1*c.* larva, Mr. W. Buckler

VOL. XI.

- FIG.  
 2. *Plusia moneta*  
 male  
 2*a.* female  
 2*b.* larva  
 3. *Plusia bractea*  
 male  
 3*a.* female  
 3*b.* larva, Mr. W. Buckler

PLATE 242, VOL. 6

1. *Plusia festucae*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Plusia pulchra*  
 male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler  
 3. *Plusia iota*  
 male  
 3*a.* female  
 3*b.* larva, Mr. W. Buckler

PLATE 243, VOL. 6

1. *Plusia gamma*  
 male  
 1*a.* female  
 1*b.* var.  
 1*c.* small form, Mr. G. T. Porritt  
 1*d.* var. Devon, Mr. F. J. Haubury  
 1*e.* larva, Mr. W. Buckler  
 2. *Plusia ni*, Mr. W. R. Jeffrey  
 3. *Plusia interrogationis*  
 var. N. of Ireland  
 3*a.* var. N. of Ireland  
 3*b.* larva, Mr. W. Buckler

PLATE 244, VOL. 6

1. *Habrostola urticae*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Habrostola triplasia*  
 male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler  
 3. *Chariclea delphinii*  
 4. *Chariclea marginata*  
 male  
 4*a.* female var.  
 4*b.* dwarf, Mr. G. T. Porritt  
 4*c.* larva, Mr. W. Buckler

d

FIG.

## PLATE 245, VOL. 6

1. *Heliothis armigera*  
male
- 1*a.* female
- 1*b.* larva
2. *Heliothis peltigera*  
male, Mr. F. C. Woodforde
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Heliothis dipsacea*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Heliothis scutosa*, Mr. W. H. Thornthwaite

## PLATE 246, VOL. 6

1. *Heliodes arbuti*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Acontia luctuosa*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Acontia solaris*
4. *Acontia venustula*  
male
- 4*a.* female
- 4*b.* larva, Mr. W. Buckler

## PLATE 247, VOL. 6

1. *Hydrelia argentula*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Hydrelia uncaua*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Thalpochares ostrina*
4. *Thalpochares parva*
5. *Thalpochares paula*

## PLATE 248, VOL. 6

1. *Agrophila sulphuralis*  
male
- 1*a.* female
- 1*b.* var.
- 1*c.* larva, Mr. W. Buckler
2. *Erastria fuscula*  
male

FIG.

- 2*a.* *Erastria fuscula*, female
- 2*b.* larva, Mr. W. Buckler
3. *Phytometra anea*  
male
- 3*a.* female
- 3*b.* var.
- 3*c.* var.
- 3*d.* larva, Mr. W. Buckler

## PLATE 249, VOL. 6

1. *Bryophila glandifera*  
male
- 1*a.* female
- 1*b.* var. Devon, Mr. F. C. Woodforde
- 1*c.* var. Devon, Rev. C. F. Benthall
- 1*d.* var. Devon, Rev. C. F. Benthall
- 1*e.* var. Devon, Rev. C. F. Benthall
- 1*f.* var. Devon, Rev. C. F. Benthall
- 1*g.* var. Devon, Rev. C. F. Benthall
- 1*h.* var. Devon, Rev. C. F. Benthall
- 1*i.* var. Cambridge, Mr. W. Warren
- 1*j.* larva, Mr. W. Buckler

## PLATE 250, VOL. 6

1. *Bryophila perla*  
male
- 1*a.* female
- 1*b.* var.
- 1*c.* var. Mr. S. J. Capper
- 1*d.* var. Mr. S. J. Capper
- 1*e.* larva, Mr. W. Buckler
2. *Anarta melanopa*  
male, Mrs. Fraser
- 2*a.* female, Mrs. Fraser
- 2*b.* larva, Mr. W. Buckler
3. *Anarta cordigera*  
male
- 3*a.* female
- 3*b.* var.
- 3*c.* larva Mr. W. Buckler

## PLATE 251, VOL. 6

1. *Anarta myrtilli*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler



- FIG.  
 2. *Catephia alchemysta*, Sussex.  
     Mr. W. Borrer  
 3. *Sarothripa revayana*  
 3*a.* var.  
 3*b.* var.  
 3*c.* var.  
 3*d.* var.  
 3*e.* var.  
 3*f.* var.

PLATE 252, VOL. 6

1. *Gonoptera libatrix*  
     male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Ophiodes lunaris*  
 3. *Catocala fraxini*  
 3*a.* larva, Mr. W. Buckler

PLATE 253, VOL. 6

1. *Catocala electa*, Mr. E. Bankes  
 2. *Catocala nupta*  
     male  
 2*a.* female  
 2*b.* at rest  
 2*c.* larva, Mr. W. Buckler  
 2*d.* egg (magnified), Mr. E.  
     Wheeler

PLATE 254, VOL. 6

1. *Catocala spona*  
     male  
 1*a.* female  
 1*b.* var. Mr. P. M. Bright  
 1*c.* larva, Mr. W. Buckler  
 1*d.* egg (magnified), Mr. E.  
     Wheeler.  
 2. *Catocala fraxini* egg (magnified).  
     Mr. E. Wheeler

PLATE 255, VOL. 6

1. *Catocala promissa*  
     male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Euclidia mi*  
     male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler  
 3. *Euclidia glyphica*  
     male  
 3*a.* female  
 3*b.* larva, Mr. W. Buckler

FIG. PLATE 256, VOL. 6

1. Egg (magnified)  
     *Orthosia rufoa*, Mr. E.  
     Wheeler  
 2. *Orthosia ferruginea*, Mr. E.  
     Wheeler  
 3. *Orthosia pistacina*, Mr. E.  
     Wheeler  
 4. *Orthosia macilentata*, Mr. E.  
     Wheeler  
 5. *Xanthia aurago*, Mr. E.  
     Wheeler  
 6. *Xylocampa lithoriza*, Mr.  
     E. Wheeler  
 7. *Calocampa exoleta*, Mr. E.  
     Wheeler  
 8. *Cucullia verbasci*, Mr. E.  
     Wheeler.  
 9. *Cucullia absynthii*, Mr. E.  
     Wheeler  
 10. *Plusia interrogationis*, Mr. E.  
     Wheeler

PLATE 257, VOL. 6

1. Egg (magnified)  
     *Cymatophora flavicornis*  
 2. *Acronycta megalcephala*  
 3. *Acronycta alni*  
 4. *Acronycta alni*  
 5. *Acronycta psi*  
 6. *Acronycta psi*  
 7. *Acronycta myrica*  
 8. *Acronycta myrica*  
 9. *Agrotis cinerea*  
 10. *Noctua festiva*

\* \* \* From drawings by Mr. E.  
 Wheeler, Bristol.

PLATE 258, VOL. 6

1. Egg (magnified)  
     *Noctua sobrina*  
 2. *Xylomiges conspicillaris*  
 3. *Pachetra leucophaea*  
 4. *Hadena contigua*  
 5. *Hadena suasa*  
 6. *Mamestra persicariae*  
 7. *Epunda nigra*  
 8. *Dasytopia templi*  
 9. *Polia flavicincta*  
 10. *Polia chi*

\* \* \* From drawings by Mr. E. Wheeler,  
 Bristol.

FIG.

PLATE 259, VOL. 6

1. Egg (magnified)  
Dryobota protea
2. Dryobota protea (reversed)
3. Chariptera aprilina
4. Miselia oxyacantha
5. Valeria oleagina
6. Cerigo cytherea
7. Xylophasia polyodon
8. Apamea oculus
9. Hyppa rectilinea
10. Trachana atriplicis

\* \* \* *From drawings by Mr. E. Wheeler,  
Bristol.*

PLATE 260, VOL. 6

1. Egg (magnified)  
Euplexia lucipara
2. Nonagria geminipuncta
3. Tapiuostola fulva
4. Taniocampa gothica
5. Taniocampa gracilis
6. Taniocampa gracilis
7. Amphipyra pyramidea
8. Amphipyra pyramidea
9. Toxocampa pastinum
10. Calymnia affinis

\* \* \* *From drawings by Mr. E. Wheeler,  
Bristol.*

PLATE 261, VOL. 6

1. Acentia flexula  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. Boletobia fuliginaria
- 2*a.* Boletobia fuliginaria
3. Madopa salicalis  
male
- 3*a.* female
- 3*b.* larva (Hofmann)
4. Ethia emortualis
5. Herminia derivialis  
male
- 5*a.* female

PLATE 262, VOL. 6

1. Herminia bathalis  
male
- 1*a.* female
2. Herminia tarsipennalis  
male
- 2*a.* female

FIG.

3. Herminia griscales  
male
- 3*a.* female
4. Herminia cribralis  
male
- 4*a.* female
5. Schrankia turfosalis  
male
- 5*a.* female

PLATE 263, VOL. 6

1. Hypenodes albistrigalis  
male
- 1*a.* female
2. Hypenodes costæstrigalis  
male
- 2*a.* female
3. Bomolocha crassalis  
male
- 3*a.* female
- 3*b.* larva
4. Hypena rostralis  
male
- 4*a.* female
- 4*b.* var.
- 4*c.* larva

PLATE 264, VOL. 6

1. Hypena proboscidalis  
male
- 1*a.* female
2. Rivula sericealis  
male
- 2*a.* female
3. Brepheos parthenias  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. Brepheos notha  
male, Major Ficklin
- 4*a.* female, Major Ficklin
- 4*b.* larva, Mr. W. Buckler

PLATE 265, VOL. 6

1. Egg (magnified)  
Petasia nubeculosa
2. Diloba ceruleocephala
3. Ptilophora plumigera
4. Clostera reclusa
5. Clostera curtula
6. Cerura bicuspis
7. Pygara bucephala
8. Pœcilocampa populi
9. Pœcilocampa populi

\* \* \* *From drawings by Mr. E.  
Wheeler.*

FIG.

## PLATE 266, VOL. 6

1. Egg (magnified)  
*Trichiura cratagi*
2. *Liparis dispar*
3. *Liparis dispar*, covered with  
down
4. *Liparis salicis*
5. *Dasychira fuscelina*
6. *Liparis monacha*
7. *Eriogaster lanestris*
8. *Clisiocampa castrensis*
9. *Clisiocampa neustria*

\* \* \* *From drawings by Mr. E.  
Wheler.*

## PLATE 267, VOL. 6

1. Egg (magnified)
2. *Odonestis potatoria*
3. *Lasiocampa rubi*
4. *Lasiocampa quercus*, var.  
*calluna*
5. *Endromis versicolor*
6. *Gastropacha quercifolia*
7. *Zenura assenti*
8. *Cossus ligniperda*
9. *Limacodes testudo*

\* \* \* *From drawings by Mr. E.  
Wheler.*

## PLATE 268, VOL. 6

1. Egg (magnified)
2. *Setina irrorella*
3. *Gnistis quadra*
4. *Nemeophila plantaginis*
5. *Hepialus sylvinus*
6. *Macroglossa fuciformis*
7. *Chacrocampa Elpenor*
8. *Smerinthus tiliae*
9. *Smerinthus populi*
9. *Smerinthus ocellatus*

\* \* \* *From drawings by Mr. E.  
Wheler.*

## PLATE 269, VOL. 6

1. *Ourapteryx sambucata*  
male
- 1a. female
- 1b. male, var. Mr. S. Webb
- 1c. larva, Mr. W. Buckler
- 1d. cocoon
2. *Angerona prunaria*  
male

FIG.

- 2a. *Angerona prunaria*, male, var.
- 2b. female
- 2c. female, var.
- 2d. larva, Mr. W. Buckler

## PLATE 270, VOL. 6

1. *Angerona prunaria*  
male, var. Mr. S. Webb
- 1a. male, var. Mr. S. Webb
- 1b. male, var. Mr. S. Webb
- 1c. male, var. Mr. S. Webb
- 1d. male, var. Mr. S. Webb
- 1e. male, var. Mr. S. Webb
- 1f. male, var. Mr. S. Webb
- 1g. female, var. Mr. S. Webb
- 1h. female, var. Mr. S. Webb
- 1i. female, var. Mr. S. Webb

## PLATE 271, VOL. 6

1. *Rumia cratagata*  
male
- 1a. female
- 1b. male, var.
- 1c. male var. Mr. S. J. Capper
- 1d. male, var. Mr. S. J. Capper
- 1e. male, var. Mr. S. J. Capper
- 1f. female, var. Mr. S. J. Capper
- 1g. male, var. Mr. S. Webb
- 1h. female, var. Mr. S. Webb
- 1i. larva, Mr. W. Buckler

## PLATE 272, VOL. 6

1. *Venilia maculata*  
male
- 1a. female
- 1b. male, var. Mr. S. Webb
- 1c. female, var. Mr. S. Webb
- 1d. female, var. Mr. S. Webb
- 1e. female, var. Mr. S. Webb
- 1f. male, var. Mr. S. Webb
- 1g. male, var. Mr. S. Webb
- 1h. male, var. *quadrifaculata*,  
Mr. S. Webb
- 1i. larva, Mr. W. Buckler

## PLATE 273, VOL. 6.

1. *Cabera pusaria*  
male
- 1a. female
- 1b. male, var. Mr. E. A. Atmore
- 1c. female, var. Mr. E. A. Atmore
- 1d. female, var. Mr. Sydney Webb
- 1e. male, var. Mr. Sydney Webb

FIG.

- 1*f* Cabera pusaria, male, var. rotundaria, Mr. E. A. Atmore  
 1*g*. female, var. rotundaria, Mr. G. T. Porritt  
 1*h*. female, var. intermediate and unsymmetrical, Mr. E. A. Atmore  
 1*i* larva, Mr. W. Buckler

## PLATE 274, VOL. 6

1. Cabera exanthemaria male  
 1*a*. female  
 1*b*. male, var. Mr. G. T. Porritt  
 1*c*. larva, Mr. W. Buckler  
 2. Bapta temerata male  
 2*a*. female  
 2*b*. var. Mr. Sydney Webb  
 2*c*. larva, Mr. W. Buckler  
 3. Bapta taminata male  
 3*a*. female  
 3*b*. var. Mr. Sydney Webb  
 3*c*. larva, Mr. W. Buckler

## PLATE 275, VOL. 6

1. Alencis pictaria  
 1*a*. larva, Mr. W. Buckler  
 2. Macaria alternata  
 2*a*. var. Mr. S. J. Capper  
 2*b*. var. Mr. Sydney Webb  
 2*c*. larva, Mr. W. Buckler  
 3. Macaria notata male, Mr. F. C. Woodforde  
 3*a*. female, Mr. F. C. Woodforde  
 3*b*. var. Mr. F. C. Woodforde  
 3*c*. larva, Mr. W. Buckler

## PLATE 276, VOL. 6

1. Macaria liturata male  
 1*a*. female  
 1*b*. var. Delamere Forest, Mr. F. N. Pierce  
 1*c*. larva, Mr. W. Buckler  
 2. Halia wauaria male  
 2*a*. female  
 2*b*. var.  
 2*c*. var. Mr. Sydney Webb  
 2*d*. var. Mr. Sydney Webb  
 2*e*. larva Mr. W. Buckler

FIG.

## PLATE 277, VOL. 6

1. Egg (magnified)  
 Ourapteryx sambucata  
 2. Rumia crategata  
 3. Cabera exanthemaria  
 4. Bapta taminata  
 5. Macaria alternata  
 6. Halia wauaria  
 7. Fidonia atomaria  
 8. Numeria pulveraria  
 9. Scoria dealbata  
 10. Selenia illustraria

\* \* \* From drawings by Mr. E. Wheeler.

## PLATE 278, VOL. 6

1. Egg (magnified)  
 Ennomos alniaria  
 2. Ennomos fuscautaria  
 3. Ennomos erosaria  
 4. Ennomos angularia  
 5. Crocallis elingularia  
 6. Pericallia syringaria  
 7. Epione apiciaria  
 8. Metrocampa margaritata  
 9. Ellopiia fasciaria  
 10. Biston hirtaria

\* \* \* From drawings by Mr. E. Wheeler.

## PLATE 279, VOL. 6

1. Egg (magnified)  
 Tephrosia biundularia  
 2. Tephrosia extersaria  
 3. Tephrosia punctulata  
 4. Boarmia rhomboidaria  
 5. Hemerophila abruptaria  
 6. Abraxas ulmata  
 7. Lomaspilis marginata  
 8. Phorodesma bajularia  
 9. Ephyra trilinearia  
 10. Ephyra omicronaria

\* \* \* From drawings by Mr. E. Wheeler.

## PLATE 280, VOL. 6

1. Egg (magnified)  
 Acidalia ochrata  
 2. Acidalia promutata  
 3. Timandra inuitaria  
 4. Coremia pectinitaria  
 5. Coremia multistrigaria

FIG.

6. Egg (magnified)  
*Cidaria pyraliata*  
 7. *Cidaria testata*  
 8. *Camptogramma bilineata*  
 9. *Lobophora lobulata*  
 10. *Eubolia bipunctata*

\*\* \* From drawings by Mr. E. Wheeler.

## PLATE 281, VOL. 7

1. *Strenia clathrata*  
 male  
 1*a.* female  
 1*b.* male, var.  
 1*c.* male, var., Surrey  
 1*d.* male, var. Dr. P. B. Mason  
 1*e.* male, var., Mr. S. Webb  
 1*f.* male, var., Mr. S. Webb  
 1*g.* male, var., Mr. S. J. Capper  
 1*h.* male, var., Mr. S. J. Capper  
 1*i.* male, var., Mr. S. J. Capper  
 1*j.* larva, Mr. W. Buckler

## PLATE 282, VOL. 7

1. *Panagra petrarica*  
 1*a.* var. Ranworth Fen  
 1*b.* larva, Mr. W. Buckler  
 2. *Fidonia pinaria*  
 male, South of England  
 2*a.* female, South of England  
 2*b.* male, Midlands  
 2*c.* female, Midlands  
 2*d.* female, Midlands  
 2*e.* male, var. Mr. W. P. Blackburn-Maze  
 2*f.* gynandro, Mr. W. P. Blackburn-Maze  
 2*g.* larva, Mr. W. Buckler

## PLATE 283, VOL. 7

1. *Fidonia atomaria*  
 male  
 1*a.* female  
 1*b.* male, var. Mr. S. Webb  
 1*c.* male, var. Mr. S. Webb  
 1*d.* male, var. Mr. S. Webb  
 1*e.* male, Dr. P. B. Mason  
 1*f.* female, Mr. S. Webb  
 1*g.* female, Mr. S. Webb  
 1*h.* male, Mr. S. Webb  
 1*i.* gynandro, Mr. S. Webb  
 1*j.* larva, Mr. W. Buckler

FIG.

## PLATE 284, VOL. 7

1. *Fidonia pinetaria*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Fidonia conspicuata*  
 male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler  
 3. *Fidonia carbonaria*  
 male  
 3*a.* female

## PLATE 285, VOL. 7

1. *Fidonia conspicuata*  
 male, var. Mr. Sydney Webb  
 2. *Fidonia carbonaria*  
 var. Mr. S. J. Capper  
 3. *Scodionia belgaria*  
 male  
 3*a.* female  
 3*b.* male, var. Mr. S. J. Capper  
 3*c.* male, var. Mr. S. Webb  
 3*d.* female, var. Mr. S. Webb  
 3*e.* male, var. Yorks, Mr. G. T. Porritt  
 3*f.* female, var. Yorks, Mr. G. T. Porritt  
 3*g.* larva, Mr. W. Buckler

## PLATE 286, VOL. 7

1. *Numeria pulveraria*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Selidosema plumaria*  
 male  
 2*a.* male, var. New Forest  
 2*b.* male, var. North Ireland  
 2*c.* female, North Ireland  
 2*d.* larva, Mr. W. Buckler  
 3. *Scoria dealbata*  
 male  
 3*a.* female  
 3*b.* larva, Mr. W. Buckler

## PLATE 287, VOL. 7

1. *Aspilates strigillaria*  
 male  
 1*a.* female  
 1*b.* male, var. Mr. S. Webb  
 1*c.* female, var. Mr. S. Webb  
 1*d.* female, var. Lanca-shire

- FIG.  
 1*c.* *Aspilates strigillaria*, female.  
     var. Lancashire, Mr. S. J.  
     Capper  
 1*f.* larva, Mr. W. Buckler  
 2. *Aspilates gilvaria*  
     male  
 2*a.* female  
 2*b.* male, var. Mr. S. Webb  
 2*c.* female, var. Mr. S. Webb  
 2*d.* larva, Mr. W. Buckler

PLATE 288, VOL. 7

1. *Aspilates citraria*  
     male  
 1*a.* female  
 1*b.* male, var.  
 1*c.* male, var. Mr. S. Webb  
 1*d.* female, var. Mr. S. Webb  
 1*e.* larva, Mr. W. Buckler  
 2. *Eurymene dolobraria*  
     male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler

PLATE 289, VOL. 7

1. *Odontoptera bidentata*  
     male  
 1*a.* female  
 1*b.* male, var. Norfolk  
 1*c.* female, var. Surrey  
 1*d.* male, var. Moray  
 1*e.* male, var. Mr. S. J. Capper  
 1*f.* male, var. Yorkshire, Mr. G.  
     T. Porritt  
 1*g.* female, var. Mr. G. T. Porritt  
 1*h.* larva, Mr. W. Buckler

PLATE 290, VOL. 7

1. *Ennomos autumnaria*  
     male  
 1*a.* female  
 1*b.* male, var.  
 1*c.* female, var.  
 1*d.* larva  
 2. *Ennomos alniaria*  
     male  
 2*a.* female  
 2*b.* male, var.  
 2*c.* female, var. Mr. S. Webb  
 2*d.* larva, Mr. W. Buckler

FIG.

PLATE 291, VOL. 7

1. *Ennomos fuscantaria*  
     male  
 1*a.* female  
 1*b.* female var. Yorkshire, Mr. G.  
     T. Porritt  
 1*c.* male, var. Yorkshire, Mr. G.  
     T. Porritt  
 1*d.* male, var. Mr. S. Webb  
 1*e.* larva, Mr. W. Buckler  
 2. *Ennomos erosaria*  
     male  
 2*a.* female  
 2*b.* female, var.  
 2*c.* larva, Mr. W. Buckler

PLATE 292, VOL. 7

1. *Ennomos angularia*  
     male  
 1*a.* female  
 1*b.* male, var.  
 1*c.* male, var.  
 1*d.* female, var. London  
 1*e.* male, var. Dr. P. B. Mason  
 1*f.* male, var. Mr. S. Webb  
 1*g.* female, var.  
 1*h.* female, var.  
 1*i.* female, var.  
 1*j.* larva, Mr. W. Buckler

PLATE 293, VOL. 7

1. *Crocallis elinguarina*  
     male  
 1*a.* female  
 1*b.* male, var.  
 1*c.* female, var.  
 1*d.* male, var. Mr. S. J. Capper  
 1*e.* male, var. Mr. S. J. Capper  
 1*f.* female, var. Mr. G. T. Porritt  
 1*g.* female, var. Mr. G. T. Porritt  
 1*h.* larva, Mr. W. Buckler

PLATE 294, VOL. 7

1. *Himera pennaria*  
     male  
 1*a.* female  
 1*b.* male, var. Mr. S. Webb  
 1*c.* male, var. Mr. S. Webb  
 1*d.* female, var. Mr. S. Webb  
 1*e.* female, Dr. Mason  
 1*f.* male, var.  
 1*g.* female, var.  
 1*h.* female, var.  
 1*i.* larva, Mr. W. Buckler

FIG.

## PLATE 295, VOL. 7

1. *Selenia illustraria*  
male
- 1*a.* female
- 1*b.* male, summer brood
- 1*c.* female, summer brood
- 1*d.* male, var. Mr. F. Merrifield
- 1*e.* female, var. Mr. F. Merrifield
- 1*f.* female, var. Mr. F. Merrifield
- 1*g.* female, var. Mr. F. Merrifield
- 1*h.* male, var. Mr. S. Webb
- 1*i.* larva, Mr. W. Buckler

## PLATE 296, VOL. 7

1. *Selenia lunaria*  
male
- 1*a.* female
- 1*b.* female var.
- 1*c.* female, var. Mr. G. T. Porritt
- 1*d.* larva, Mr. W. Buckler
2. *Selenia illunaria*  
male
- 2*a.* female
- 2*b.* male, summer brood
- 2*c.* female, summer brood
- 2*d.* larva, Mr. W. Buckler

## PLATE 297, VOL. 7

1. *Pericallia syringaria*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Epione apiciaria*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* male, var.
- 2*d.* male, var. Mr. S. Webb
- 2*e.* female, var. Mr. S. Webb
- 2*f.* larva, Mr. W. Buckler

## PLATE 298, VOL. 7

1. *Epione advenaria*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* larva, Mr. W. Buckler
2. *Epione vespertaria*  
male
- 2*a.* female
- 2*b.* female, var.

FIG.

- 2*c.* *Epione vespertaria*, male, var.  
Mr. S. Webb
- 2*d.* male, var. Mr. S. Webb
- 2*e.* gynandro, Mr. S. Webb
- 2*f.* larva, Mr. W. Buckler

## PLATE 299, VOL. 7

1. *Metrocampa margaritana*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Ellopia fasciaria*  
male
- 2*a.* female
- 2*b.* female, var. Mr. F. C. Wood-  
forde
- 2*c.* male, var. Mr. S. Webb
- 2*d.* female, var. prasinaria
- 2*e.* larva, Mr. W. Buckler

## PLATE 300, VOL. 7

1. *Biston hirtarius*  
male
- 1*a.* female
- 1*b.* female, var. Mr. S. J. Capper
- 1*c.* male var. London
- 1*d.* larva, Mr. W. Buckler
2. *Biston prodromarius*  
male
- 2*a.* female
- 2*b.* male, var. Mr. S. Webb
- 2*c.* female, var. Mr. S. Webb
- 2*d.* female, var. Mr. G. T. Porritt
- 2*e.* larva, Mr. W. Buckler

## PLATE 301, VOL. 7

1. *Biston betularius*  
male
- 1*a.* female
- 1*b.* male, var. Dr. Mason
- 1*c.* female, var.
- 1*d.* male, var.
- 1*e.* female, var.
- 1*f.* male, black form
- 1*g.* female, black form
- 1*h.* larva, Mr. W. Buckler

## PLATE 302, VOL. 7

1. *Phigalia pilosaria*  
male
- 1*a.* female
- 1*b.* male, var.

FIG.

- 1c. *Phigalia pilosaria*, male, var.  
 1d. male, var. Mr. S. J. Capper  
 1e. male, var. Mr. G. T. Porritt  
 1f. male, var. Mr. G. T. Porritt  
 1g. male, var. Dr. Mason  
 1h. larva, Mr. W. Buckler

## PLATE 303, VOL. 7

1. *Nyssia hispidaria*  
 male  
 1a. female  
 1b. male, var. Dr. Mason  
 1c. male, var.  
 1d. male, var.  
 1e. larva, Mr. W. Buckler  
 2. *Nyssia lapponaria*  
 male, Mr. W. M. Christy  
 2a. female, Mr. W. M. Christy  
 2b. larva, Miss Violet Barrett

## PLATE 304, VOL. 7

1. *Nyssia zonaria*  
 male  
 1a. female  
 1b. male, var.  
 1c. male, var.  
 1d. male, var. Mr. S. Webb  
 1e. larva, Mr. D. C. Campbell  
 2. *Dasydia obfuscaria*  
 male  
 2a. female  
 2b. male, var. Dr. Mason  
 2c. female, var.  
 2d. larva, Mr. W. Buckler

## PLATE 305, VOL. 7

1. *Gnophos obscurata*  
 male  
 1a. female  
 1b. male, var. New Forest  
 1c. female, var. Kent Coast  
 1d. female, var. Kent Coast, Mr. Sydney Webb  
 1e. male, var. Sussex Downs  
 1f. female, var. Sussex Downs, Mr. G. T. Porritt  
 1g. male, var. West of England, Mr. Sydney Webb  
 1h. male, var. South Wales  
 1i. female, var. South Wales  
 1j. female, var. Mr. S. J. Capper  
 1k. larva, Mr. W. Buckler

FIG.

## PLATE 306, VOL. 7

1. *Cleora lichendaria*  
 male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Cleora glabraria*  
 male, New Forest  
 2a. female  
 2b. male, Roxburgh, N.B., Mr. A. Elliot  
 2c. male, var. New Forest, Mr. S. J. Capper  
 2d. female, var. New Forest, Mr. S. J. Capper  
 2e. larva, Mr. W. Buckler  
 3. *Cleora viduaria*  
 male, Mr. Sydney Webb  
 3a. female, Mr. Sydney Webb

## PLATE 307, VOL. 7

1. *Tephrosia consonaria*  
 male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Tephrosia biundularia*  
 male, June form  
 2a. female, June form  
 2b. male, April form  
 2c. female, April form  
 2d. male, var. Mr. S. Webb  
 2e. female var. Mr. S. Webb  
 2f. female var. Mr. S. Webb

## PLATE 308, VOL. 7

1. *Tephrosia biundularia*  
 var. Mr. Sydney Webb  
 1a. var. English Midlands  
 1b. var. English Midlands  
 1c. var. English Midlands, un-symmetrical  
 1d. var. South Wales, Major Robertson  
 1e. var. South Wales, Major Robertson  
 1f. second generation  
 1g. black var. South Wales  
 1h. black var. South Wales  
 1i. larva of April race  
 1j.\* larva of April race  
 1k.\* larva of June race  
 1l.\* larva of June race

\* Figured by Mrs. Anderson for her father, Mr. W. H. Tugwell.



FIG.

## PLATE 309, VOL. 7

1. *Tephrosia extersaria*  
male
- 1*a.* female  
(For larva see plate 314)
2. *Tephrosia punctularia*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* male, var.
- 2*d.* female, var.
- 2*e.* female var. Dr. Mason  
(For larva, see plate 314)

## PLATE 310, VOL. 7

1. *Boarmia roboraria*  
male
- 1*a.* female
- 1*b.* male, var. Surrey
- 1*c.* male, black, Mr. S. J. Capper
- 1*d.* larva, Mr. W. Buckler
2. *Boarmia consortaria*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler

## PLATE 311, VOL. 7

1. *Boarmia cinctaria*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
- 1*d.* female, var.
- 1*e.* female, var.
- 1*f.* female, var. Mr. S. J. Capper
- 1*g.* female, var. Mr. S. J. Capper
- 1*h.* male, var. Mr. S. J. Capper
- 1*i.* male, black, var. Mr. S. J. Capper
- 1*j.* male, black, var. Mr. S. J. Capper  
(For larva, see plate 314)

## PLATE 312, VOL. 7

1. *Boarmia abietaria*  
male, Mr. S. J. Capper
- 1*a.* female
- 1*b.* male, var. Mr. G. T. Porritt
- 1*c.* female, var. Mr. G. T. Porritt
- 1*d.* female, var. (intermediate)
- 1*e.* male, var. black, Surrey
- 1*f.* female, var. black, Surrey
- 1*g.* larva, Mr. W. Buckler

FIG.

## PLATE 313, VOL. 7

1. *Boarmia repandata*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
- 1*d.* male, var.
- 1*e.* female, var. Yorkshire
- 1*f.* female, var. Yorkshire, Mr. G. T. Porritt
- 1*g.* female, var. Yorkshire, Mr. G. T. Porritt
- 1*h.* female, var. Yorkshire, Mr. G. T. Porritt
- 1*i.* larva, Mr. W. Buckler

## PLATE 314, VOL. 7

1. *Boarmia repandata*  
male var. Hebrides
- 1*a.* female, var. Hebrides, Dr. Mason
- 1*b.* male, var. Hebrides, Mr. G. T. Porritt
- 1*c.* female, var. Devon, Mr. G. T. Porritt
- 1*d.* male, var. Pembroke
- 1*e.* male, var. Mr. S. J. Capper
- 1*f.* male, var. Surrey
- 1*g.* female, var. Moray, Dr. Mason
2. Larva of *Boarmia cinctaria*. See plate 311.
3. Larva of *Tephrosia extersaria*. See plate 309.
1. Larva of *Tephrosia punctularia*. See plate 309.

## PLATE 315, VOL. 7

1. *Boarmia rhomboidaria*  
male
- 1*a.* female
- 1*b.* male, var. Dr. Mason
- 1*c.* female, var.
- 1*d.* male, var. perfumaria
- 1*e.* male, var. perfumaria (aberration)
- 1*f.* female, var. perfumaria
- 1*g.* male, var. Norwich, Messrs. Tillett
- 1*h.* female, var. Norwich, Messrs. Tillett
- 1*i.* larva, Mr. W. Buckler

## PLATE 316, VOL. 7

1. *Hemerophila abruptaria*  
male

FIG.

- 1*a.* *Hemeshophila abruptaria*, female
- 1*b.* male, var. London
- 1*c.* female, var. London, Dr. Mason
- 1*d.* male, var. second brood
- 1*e.* female, var. second brood
- 1*f.* larva, Mr. W. Buckler
- 2. *Hibernia aurantiaria*  
male
- 2*a.* female—sub-apterous
- 2*b.* male, var. Yorkshire
- 2*c.* larva, Mr. W. Buckler

PLATE 317, VOL. 7

- 1. *Hibernia defoliaria*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
- 1*d.* male, var.
- 1*e.* larva, Mr. W. Buckler
- 2. *Hibernia progemmaria*  
male
- 2*a.* female
- 2*b.* male, var. Yorkshire, Mr. G. T. Porritt
- 2*c.* female, var. Yorkshire, Mr. G. T. Porritt
- 2*d.* female, var. Yorkshire, Mr. G. T. Porritt
- 2*e.* larva, Mr. W. Buckler

PLATE 318, VOL. 7

- 1. *Hibernia leucophaea*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var. Pembrokeshire
- 1*d.* male, var. Richmond Park, Mr. P. Richards
- 1*e.* gynandro, Dr. P. B. Mason
- 1*f.* larva, Mr. W. Buckler
- 2. *Hibernia rupicapra*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler

PLATE 319, VOL. 7

- 1. *Anisopteryx aescularia*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
- 2. *Paehyenemia hippocastanaria*  
male

FIG.

- 2*a.* *Paehyenemia hippocastanaria*  
female
- 2*b.* larva, Mr. W. Buckler
- 3. *Psodos coracina*  
male
- 3*a.* female
- 3*b.* male, var.

PLATE 320, VOL. 7

- 1. *Abraxas ulmata*  
male
- 1*a.* female
- 1*b.* var. Mr. S. J. Capper
- 1*c.* var. Mr. Sydney Webb
- 1*d.* var. Mr. Sydney Webb
- 1*e.* var. Mr. B. H. Crabtree
- 1*f.* var. Mr. B. H. Crabtree
- 1*g.* var. Mr. G. T. Porritt
- 1*h.* larva, Mr. W. Buckler

PLATE 321, VOL. 7

- 1. *Abraxas grossulariata*  
male
- 1*a.* female
- 1*b.* var. Mr. Sydney Webb
- 1*c.* var. Mr. Sydney Webb
- 1*d.* var. Mr. Sydney Webb
- 1*e.* var. Mr. Sydney Webb
- 1*f.* var. Mr. Sydney Webb
- 1*g.* var. Mr. Sydney Webb
- 1*h.* var. Mr. Sydney Webb
- 1*i.* larva, Mr. W. Buckler

PLATE 322, VOL. 7

- 1. *Abraxas grossulariata*  
var. Mr. S. J. Capper
- 1*a.* var. Mr. S. J. Capper
- 1*b.* var. Mr. S. J. Capper
- 1*c.* var. Mr. G. T. Porritt
- 1*d.* var. Mr. Percy Richards
- 1*e.* var. Mr. G. T. Porritt
- 1*f.* var.
- 1*g.* var.
- 1*h.* var.
- 1*i.* var.

PLATE 323, VOL. 7

- 1. *Ligdia adustata*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
- 2. *Lomasipilis marginata*  
var. Mr. S. J. Capper
- 2*a.* var. Dr. P. B. Mason
- 2*b.* var. Dr. P. B. Mason
- 2*c.* var. Dr. P. B. Mason

- FIG.  
 2*d*. *Lomaspilis marginata*, var. Mr  
 G. T. Porritt  
 2*e*. var. Mr. E. A. Atmore  
 2*f*. var. Mr. Sydney Webb  
 2*g*. larva, Mr. W. Buckler

## PLATE 324, VOL. 7

1. *Pseudoterpna cytisaria*  
 male  
 1*a*. female  
 1*b*. larva, Mr. W. Buckler  
 2. *Geometra papilionaria*  
 male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler  
 3. *Iodis vernaria*  
 male  
 3*a*. female  
 3*b*. larva, Mr. W. Buckler

## PLATE 325, VOL. 7

1. *Iodis lactearia*  
 male  
 1*a*. larva, Mr. W. Buckler  
 2. *Nemoria viridata*  
 male  
 2*a*. female  
 2*b*. larva, Miss Violet Barrett  
 3. *Phorodesma smaragdaria*  
 3*a*. var. Mr. F. J. Hanbury  
 3*b*. larva, Mr. R. Morgan (kindly  
 furnished by Mr. H. J.  
 Turner)  
 4. *Phorodesma bajularia*  
 male  
 4*a*. female  
 4*b*. larva, Mr. W. Buckler  
 5. *Hemithea thymiararia*  
 male  
 5*a*. female  
 5*b*. larva, Mr. W. Buckler

## PLATE 326, VOL. 7

1. *Ephyra porata*  
 male  
 1*a*. male, var. Mr. Sydney Webb  
 1*b*. female, var. Mr. F. C. Wood-  
 forde  
 1*c*. female, var. Mr. F. C. Wood-  
 forde  
 1*d*. larva, Mr. W. Buckler  
 2. *Ephyra punctaria*  
 male  
 2*a*. male, var. Mr. Sydney Webb

- FIG.  
 2*b*. *Ephyra punctaria*, female, var.  
 Mr. Sydney Webb  
 2*c*. female, var. Mr. Sydney Webb  
 2*d*. female, var. Mr. F. C. Wood-  
 forde  
 2*e*. male, var. Mr. F. C. Woodforde  
 2*f*. larva, Mr. W. Buckler

## PLATE 327, VOL. 7

1. *Ephyra trilinearia*  
 male  
 1*a*. female, var. Major Ficklin  
 1*b*. male, var. Mr. F. J. Hanbury  
 1*c*. male, var. Mr. Sydney Webb  
 1*d*. female, var. Mr. Sydney Webb  
 1*e*. female, var. Mr. Sydney Webb  
 1*f*. larva, Mr. W. Buckler  
 2. *Ephyra omicronaria*  
 male  
 2*a*. male, var. Mr. Sydney Webb  
 2*b*. female, var. Mr. Sydney Webb  
 2*c*. male, var. Mr. F. C. Wood-  
 forde  
 2*d*. larva, Mr. W. Buckler

## PLATE 328, VOL. 7

1. *Ephyra orbicularia*  
 male  
 1*a*. larva, Mr. W. Buckler  
 2. *Ephyra pendularia*  
 male  
 2*a*. female, var. Mr. E. A. Atmore  
 2*b*. male, var. Mr. F. C. Woodforde  
 2*c*. male, var. Mr. Sydney Webb  
 2*d*. female, var. Mr. Sydney Webb  
 2*e*. larva, Mr. W. Buckler  
 3. *Hyria auroraria*  
 male  
 3*a*. male, var. Lancashire  
 3*b*. larva, Mr. W. Buckler

## PLATE 329, VOL. 8

1. *Acidalia rubricata*  
 male  
 1*a*. female  
 1*b*. var. from boggy heaths, Nor-  
 folk  
 1*c*. larva, Mr. W. Buckler  
 2. *Acidalia ochrata*  
 3. *Acidalia perochraria*  
 4. *Acidalia scutulata*  
 4*a*. var. Mr. G. T. Porritt  
 4*b*. larva, Mr. W. Buckler

- fig.  
5. *Acidalia bisetata*  
5*a.* var.  
5*b.* larva, Mr. W. Buckler

PLATE 330, VOL. 8

1. *Acidalia trigeminata*, Mr. S. J. Capper  
1*a.* larva, Mr. W. Buckler  
2. *Acidalia herbariata*, Mr. S. Webb  
3. *Acidalia contiguaria*  
3*a.* var.  
3*b.* var. Mr. S. J. Capper  
3*c.* larva, Mr. W. Buckler  
4. *Acidalia rusticata*  
4*a.* larva, Mr. W. Buckler  
5. *Acidalia osseata*  
6. *Acidalia dilutaria*  
6*a.* larva, Mr. W. Buckler

PLATE 331, VOL. 8

1. *Acidalia holosericata*  
1*a.* larva, Mr. W. Buckler  
2. *Acidalia incanaria*  
2*a.* var. Mr. G. T. Porritt  
2*b.* var. Mr. G. T. Porritt  
2*c.* larva, Mr. W. Buckler  
3. *Acidalia straminata*  
3*a.* var. circellata  
3*b.* larva, Mr. W. Buckler  
4. *Acidalia pronutata*  
4*a.* var. Mr. R. Adkin  
4*b.* var. Mr. R. Adkin  
4*c.* var.  
4*d.* larva, Mr. W. Buckler

PLATE 332, VOL. 8

1. *Acidalia ornata*  
1*a.* larva, Mr. W. Buckler  
2. *Acidalia immorata*  
3. *Acidalia subsericeata*  
3*a.* var. manconiata  
3*b.* larva, Mr. W. Buckler  
4. *Acidalia immutata*  
male  
4*a.* female  
4*b.* larva, Mr. W. Buckler  
5. *Acidalia remutaria*  
5*a.* larva, Mr. W. Buckler

PLATE 333, VOL. 8

1. *Acidalia holosericata*, var. Bristol, Mr. G. T. Porritt

- fig.  
2. *Acidalia fumata*, male, Mr. F. C. Woodforde  
2*a.* female, Mr. F. C. Woodforde  
2*b.* female, var.  
2*c.* larva, Mr. W. Buckler  
3. *Acidalia aversata*  
3*a.* var.  
3*b.* var. Mr. S. J. Capper  
3*c.* var.  
3*d.* var. Brandon, Suffolk  
3*e.* larva, Mr. W. Buckler  
4. *Acidalia inornata*  
male  
4*a.* female  
4*b.* larva, Mr. W. Buckler

PLATE 334, VOL. 8

1. *Acidalia degeneraria*  
male  
1*a.* female, Mr. S. J. Capper  
1*b.* var. Mr. Sydney Webb  
1*c.* larva, Mr. W. Buckler  
2. *Timandra strigilata*  
male  
2*a.* female  
2*b.* larva, Mr. W. Buckler  
3. *Timandra emutaria*  
male, Mr. G. T. Porritt  
3*a.* female, Mr. G. T. Porritt  
3*b.* var. Mr. G. T. Porritt  
3*c.* var. New Forest  
3*d.* larva, Mr. W. Buckler

PLATE 335, VOL. 8

1. *Timandra imitaria*  
male  
1*a.* female  
1*b.* larva, Mr. W. Buckler  
2. *Bradypetes amataria*  
male  
2*a.* female  
2*b.* male, var. Mr. Sydney Webb  
2*c.* male, var. Mr. S. J. Capper  
2*d.* larva, Mr. W. Buckler  
3. *Ania emarginata*, male  
3*a.* female var.  
3*b.* larva, Mr. W. Buckler

PLATE 336, VOL. 8

1. *Melauippe hastata*  
male, South of England

FIG.

- 1a. *Melanippe hastata*, female. South of England
- 1b. var. Mr. Sydney Webb
- 1c. var. Mr. Sydney Webb
- 1d. male, North of Scotland
- 1e. female, North of Scotland
- 1f. var. Hebrides
- 1g. var. Hebrides
- 1h. var. W. Yorkshire. Mr. G. T. Porritt
- 1i. larva, Mr. W. Buckler

PLATE 337, VOL. 8

- 1. *Melanippe tristata*  
1st emergence
- 1a. 2nd emergence. Mr. S. Webb
- 1b. var. Mr. S. Webb
- 1c. larva, Mr. W. Buckler
- 2. *Melanippe rivata*
- 2a. var. Mr. S. Webb
- 2b. larva, Mr. W. Buckler
- 3. *Melanippe subtristata*
- 3a. var. Mr. S. Webb
- 3b. var. Orkney, Mr. S. J. Capper
- 3c. larva, Mr. W. Buckler
- 4. *Melanippe galiata*, Western race  
Chalk districts
- 4b. var. Mr. F. J. Hambury
- 4c. larva, Mr. W. Buckler

PLATE 338, VOL. 8

- 1. *Melanthia rubiginata*  
male
- 1a. female
- 1b. var. Mr. L. B. Prout
- 1c. var. Mr. L. B. Prout
- 1d. var. Mr. S. J. Capper
- 1e. var. Mr. S. Webb
- 1f. larva, Mr. W. Buckler
- 2. *Melanthia ocellata*
- 2a. var. Mr. S. Webb
- 2b. var. Mr. L. B. Prout
- 2c. larva, Mr. W. Buckler

PLATE 339, VOL. 8

- 1. *Melanthia albicollata*
- 1a. var. Mr. S. Webb
- 1b. larva, Mr. W. Buckler
- 2. *Melanthia procellata*  
male
- 2a. female
- 2b. larva, Mr. W. Buckler

FIG.

- 3. *Melanthia unangulata*
- 3a. var. Mr. S. Webb
- 3b. larva, Mr. W. Buckler
- 4. *Anticlea sinuata*
- 4a. larva, Mr. W. Buckler

PLATE 340, VOL. 8

- 1. *Anticlea rubidata*
- 1a. larva, Mr. W. Buckler
- 2. *Anticlea badiata*
- 2a. var.
- 2b. var. Mr. G. T. Porritt
- 2c. var. Mr. G. T. Porritt
- 2d. larva, Mr. W. Buckler
- 3. *Anticlea derivata*
- 3a. larva, Mr. W. Buckler
- 4. *Anticlea berberata*  
male
- 4a. female
- 4b. larva, Mr. W. Buckler

PLATE 341, VOL. 8

- 1. *Coremia montanata*  
male
- 1a. female
- 1b. female
- 1c. var. Mr. Sydney Webb
- 1d. var. Mr. Sydney Webb
- 1e. var. Mr. Sydney Webb
- 1f. var. Shetland, Mr. Sydney Webb
- 1g. var. Shetland, Mr. F. J. Hambury
- 1h. var. Shetland, Mr. G. T. Porritt
- 1i. var. Orkney
- 1j. var. Mr. G. T. Porritt
- 1k. var. Mr. G. F. Mathew
- 1l. larva, Mr. W. Buckler

PLATE 342, VOL. 8

- 1. *Coremia fluctuata*
- 1a. var.
- 1b. var.
- 1c. var. S. London, Mr. C. G. Barrett, Jun.
- 1d. var. Mr. S. J. Capper
- 1e. var. Yorkshire, Mr. G. T. Porritt
- 1f. var. South Wales
- 1g. var. Scotland
- 1h. var. North of Ireland
- 1i. var. Mr. Sydney Webb
- 1j. larva, Mr. W. Buckler

FIG.

## PLATE 343, VOL. 8

1. *Coremia munitata*
- 1*a.* var.
- 1*b.* var. Shetland
- 1*c.* larva, Mr. W. Buckler
2. *Coremia propugnata*
- 2*a.* var. Mr. S. J. Capper
- 2*b.* var. Mr. Sydney Webb
- 2*c.* larva, Mr. W. Buckler
3. *Coremia quadrifasciaria*
- 3*a.* var.
- 3*b.* larva, Mr. W. Buckler

## PLATE 344, VOL. 8

1. *Anticlea sinuata*
  - var. Mr. S. Webb \*
  2. *Anticlea berberata*
  - var. Mr. S. Webb †
  3. *Coremia ferrugata*
  - male, Mr. Louis B. Prout
  - 3*a.* female, Mr. Louis B. Prout
  - 3*b.* var. Mr. Louis B. Prout
  - 3*c.* var. Mr. F. J. Hanbury
  - 3*d.* var. Mr. Sydney Webb
  - 3*e.* var. Mr. C. Granville Clutter-  
buck
  - 3*f.* var. Mr. Gervase F. Mathew
  - 3*g.* var. Rev. Canon Fowler
  - 3*h.* larva, Mr. W. Buckler
- \* Omitted from Plate 339.  
† Omitted from Plate 340.

## PLATE 345, VOL. 8

1. *Coremia unidentaria* Mr. L. B.  
Prout
- 1*a.* var. Mr. L. B. Prout
- 1*b.* var. Mr. L. B. Prout
- 1*c.* var. Mr. Sydney Webb
- 1*d.* var. Mr. Sydney Webb
- 1*e.* larva, Mr. W. Buckler
2. *Coremia pectinitaria*
- 2*a.* var. Mr. Sydney Webb
- 2*b.* var. Mr. Sydney Webb
- 2*c.* var. Scotland, Mr. K. J.  
Morton
- 2*d.* larva, Mr. W. Buckler

## PLATE 346, VOL. 8

1. *Coremia salicata*
- male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler

FIG.

2. *Coremia Didymata*
- male
- 2*a.* female, Southern form
- 2*b.* male, var. Mr. Sydney Webb
- 2*c.* male, var. Mr. Sydney Webb
- 2*d.* female, hill form, Mr. S. Webb
- 2*e.* female, hill form, Mr. S. Webb
- 2*f.* female, hill form, Mr. S. J.  
Capper
- 2*g.* female, Shetland, Mr. R.  
Adkin
- 2*h.* larva, Mr. W. Buckler

## PLATE 347, VOL. 8

1. *Coremia multistrigaria*
- male
- 1*a.* female
- 1*b.* male, var. Yorks., Mr. S. J.  
Capper
- 1*c.* female var. Yorks., Mr. G. T.  
Porritt
- 1*d.* larva, Mr. W. Buckler
2. *Larentia flavicinctata*
- male
- 2*a.* female
- 2*b.* var. Mr. Sydney Webb
- 2*c.* larva, Mr. W. Buckler
3. *Larentia olivata*
- var.
- 3*a.* var.
- 3*b.* larva, Mr. W. Buckler

## PLATE 348, VOL. 8

1. *Larentia caesiata*
- 1*a.* female, var. Mr. S. J. Capper
- 1*b.* male, var. Mr. S. J. Capper
- 1*c.* male, var. Mr. Sydney Webb
- 1*d.* male, var. Shetland, Mr.  
Sydney Webb
- 1*e.* male, var. Shetland, Mr. F. J.  
Hanbury
- 1*f.* male, var. Yorks., Mr. G. T.  
Porritt
- 1*g.* female, var. Yorks., Mr. G. T.  
Porritt
- 1*h.* male, var. Perthshire
- 1*i.* larva, Mr. W. Buckler

## PLATE 349, VOL. 8

1. *Venusia cambrica*
- 1*a.* var. Mr. Sydney Webb
- 1*b.* var. Mr. Sydney Webb
- 1*c.* var. Mr. G. T. Porritt
- 1*d.* larva, Mr. W. Buckler

## FIG.

2. *Asthena luteata*  
male  
2*a.* female  
2*b.* larva, Mr. W. Buckler  
3. *Asthena candidata*  
3*a.* larva, Mr. W. Buckler  
4. *Asthena sylvata*  
4*a.* larva, Mr. W. Buckler

## PLATE 350, VOL. 8

1. *Asthena Bloméri*  
1*a.* var. Mr. F. C. Woodforde  
1*b.* larva, Mr. W. Buckler  
2. *Eupisteria heparata*  
male  
2*a.* female  
2*b.* larva, Mr. W. Buckler  
3. *Minoa ephorbiata*  
3*a.* larva, Mr. W. Buckler  
4. *Sterria sacaria*  
South London  
4*a.* var. Mr. Sydney Webb  
4*b.* var. Liverpool, Mr. S. J. Capper  
4*c.* var.  
4*d.* larva, Mr. W. Buckler

## PLATE 351, VOL. 8

1. *Emmelesia affinitata*  
1*a.* var. Mr. Sydney Webb  
1*b.* var. Mr. Sydney Webb  
1*c.* larva, Mr. W. Buckler  
2. *Emmelesia alchemillata*  
2*a.* larva, Mr. W. Buckler  
3. *Emmelesia albulata*  
3*a.* var. Mr. Sydney Webb  
3*b.* var. Shetland  
3*c.* var. Shetland, Mr. F. J. Hambury  
3*d.* larva, Mr. W. Buckler  
4. *Emmelesia decolorata*  
4*a.* larva, Mr. W. Buckler

## PLATE 352, VOL. 8

1. *Emmelesia ericetata*  
1*a.* var. Mr. S. J. Capper  
2. *Emmelesia tenuata*  
var. Mr. S. J. Capper  
2*a.* var. Mr. Sydney Webb  
2*b.* var. Mr. Sydney Webb  
3. *Emmelesia unifasciata*  
3*a.* larva, Mr. W. Buckler  
4. *Emmelesia blandiata*  
4*a.* var. Shetland  
4*b.* larva, Mr. W. Buckler

VOL. XI.

## FIG.

## PLATE 353, VOL. 8

1. *Lygris reticulata*  
male, Mr. Sydney Webb  
1*a.* female, Mr. S. J. Capper  
1*b.* larva, Mr. W. Buckler  
2. *Cidaria psittacata*  
2*a.* var.  
2*b.* var.  
2*c.* larva, Mr. W. Buckler  
3. *Cidaria miata*  
3*a.* var.  
3*b.* larva, Mr. W. Buckler

## PLATE 354, VOL. 8

1. *Cidaria corylata*  
woods in the South  
1*a.* var. woods in the South  
1*b.* var. Midland hills  
1*c.* var. Midland hills  
1*d.* var. Midland hills  
1*e.* var. Mr. Sydney Webb  
1*f.* var. Mr. Sydney Webb  
1*g.* larva, Mr. W. Buckler  
2. *Cidaria picata*  
2*a.* larva, Mr. W. Buckler  
3. *Cidaria sagittata*  
3*a.* larva, Mr. W. Buckler

## PLATE 355, VOL. 8

1. *Cidaria russata*  
1*a.* var.  
1*b.* var.  
1*c.* var.  
1*d.* var. Isle of Arran  
1*e.* var. Hebrides  
1*f.* var. Hebrides  
1*g.* var. Shetland  
1*h.* var. Shetland  
1*i.* larva, Mr. W. Buckler

## PLATE 356, VOL. 8.

1. *Cidaria russata*  
var. Yorks, Mr. G. T. Porritt  
1*a.* var. Yorks, Mr. G. T. Porritt  
1*b.* var. Yorks, Mr. G. T. Porritt  
1*c.* var. Yorks, Mr. G. T. Porritt  
1*d.* var. Yorks, Mr. G. T. Porritt  
1*e.* var. Mr. Sydney Webb  
1*f.* var. Mr. Sydney Webb  
1*g.* var. Mr. Sydney Webb  
1*h.* var. Mr. Sydney Webb  
1*i.* var. Mr. Sydney Webb  
1*j.* var. Mr. Sydney Webb

FIG.

## PLATE 357, VOL. 8

1. *Cidaria immanata*
- 1a. var.
- 1b. var. South Wales
- 1c. var.
- 1d. var.
- 1e. var. Orkney
- 1f. var. West Scotland
- 1g. var. West Scotland
- 1h. var. Yorkshire
- 1i. larva, Mr. W. Buckler

## PLATE 358, VOL. 8

1. *Cidaria immanata*
- var. Mr. S. J. Capper
- 1a. var. Mr. G. T. Porritt
- 1b. var. Mr. Sydney Webb
- 1c. var. Mr. Sydney Webb
- 1d. var. Mr. Sydney Webb
- 1e. var. Mr. Sydney Webb
- 1f. var. Mr. Sydney Webb
- 1g. var. Mr. Sydney Webb
- 1h. var. Mr. Sydney Webb
- 1i. var.

## PLATE 359, VOL. 8

1. *Cidaria suffumata*
- var. Ireland
- 1a. var. Yorkshire, Mr. G. T. Porritt
- 1b. var. Yorkshire, Mr. G. T. Porritt
- 1c. var. North of England, Mr. Sydney Webb
- 1d. var. North of England, Mr. Sydney Webb
- 1e. var. North of England, Mr. Sydney Webb
- 1f. var. North of England, Mr. Sydney Webb
- 1g. var. Dover, Mr. Sydney Webb
- 1h. var. Dover, Mr. Sydney Webb
- 1i. second brood, South Wales
- 1j. larva, Mr. W. Buckler

## PLATE 360, VOL. 8

1. *Cidaria silacea*
- 1a. var.
- 1b. var. Mr. S. J. Capper
- 1c. var. Mr. Sydney Webb
- 1d. larva, Mr. W. Buckler
2. *Cidaria prunata*
- 2a. var. South Wales
- 2b. larva, Mr. W. Buckler
3. *Cidaria dotata*
- 3a. larva, Mr. W. Buckler

FIG.

## PLATE 361, VOL. 8

1. *Cidaria fulvata*
- 1a. var. Mr. Sydney Webb
- 1b. larva, Mr. W. Buckler
2. *Cidaria pyraliata*
- 2a. var. West of Ireland
- 2b. var. Mr. Sydney Webb
- 2c. larva, Mr. W. Buckler
3. *Cidaria populata*
- male
- 3a. female
- 3b. male, var. Mr. G. T. Porritt
- 3c. male, var. Mr. G. T. Porritt
- 3d. female, var. Mr. G. T. Porritt
- 3e. larva, Mr. W. Buckler

## PLATE 362, VOL. 8

1. *Cidaria testata*
- male
- 1a. female
- 1b. male, var. Mr. Sydney Webb
- 1c. male, var. Mr. G. T. Porritt
- 1d. female, var. Mr. Sydney Webb
- 1e. female, var. Mr. G. T. Porritt
- 1f. larva, Mr. W. Buckler
2. *Pelurga comitata*
- male
- 2a. female
- 2b. larva, Mr. W. Buckler

## PLATE 363, VOL. 8

1. *Scotosia vetulata*
- male
- 1a. female
- 1b. larva, Mr. W. Buckler
2. *Scotosia rhamnata*
- male
- 2a. female
- 2b. female, var. Mr. Sydney Webb
- 2c. female, var. Mr. Sydney Webb
- 2d. larva, Mr. W. Buckler
3. *Scotosia undulata*
- 3a. var. Mr. Sydney Webb
- 3b. var. Mr. Sydney Webb
- 3c. larva, Mr. W. Buckler
4. *Scotosia dubitata*
- var. Mr. L. B. Prout
- 4a. var. Mr. L. B. Prout
- 4b. larva, Mr. W. Buckler

## PLATE 364, VOL. 8

1. *Scotosia certata*
- 1a. var. Mr. F. C. Woodforde
- 1b. var. Mr. Sydney Webb
- 1c. larva, Mr. W. Buckler



- FIG.  
 . *Camptogramma bilineata*  
 2*a.* var.  
 2*b.* var. Mr. Sydney Webb  
   *c.* var. Mr. Sydney Webb  
 2*d.* var. Shetland, Mr. Sydney Webb  
 2*c.* var. Shetland, Mr. G. T. Porritt  
 2*f.* var. West of Ireland, Mr. S. J. Capper  
 2*g.* larva, Mr. W. Buckler

## PLATE 365, VOL. 8

1. *Phibalapteryx fluviata*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Phibalapteryx polygrammata*  
 male, Mr. Sydney Webb  
 2*a.* female, Mr. Sydney Webb  
 2*b.* male, var. Mr. Sydney Webb  
 3. *Phibalapteryx lignata*  
 male  
 3*a.* female  
 3*b.* male, var.  
 3*c.* larva, Mr. W. Buckler  
 4. *Phibalapteryx vitalbata*  
 male, Mr. F. J. Hanbury  
 4*a.* female, Mr. F. J. Hanbury  
 4*b.* larva, Mr. W. Buckler

## PLATE 366, VOL. 8

1. *Phibalapteryx tersata*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler  
 2. *Phibalapteryx lapidata*  
 male, Mr. K. J. Morton  
 2*a.* female, Mr. K. J. Morton  
 2*b.* larva, Mr. W. Buckler  
 3. *Thera variata*  
 male  
 3*a.* female  
 3*b.* male, var.  
 3*c.* female, var. Mr. Sydney Webb  
 3*d.* female, var. Mr. G. T. Porritt  
 3*e.* female, var.  
 3*f.* female, var.  
 3*g.* larva, Mr. W. Buckler

## PLATE 367, VOL. 8

1. *Thera firmata*  
 male  
 1*a.* female  
 1*b.* larva, Mr. W. Buckler

- FIG.  
 2. *Thera simulata*  
 male  
 2*a.* female  
 2*b.* larva, Mr. W. Buckler  
 3. *Thera juniperata*  
 male  
 3*a.* female  
 3*b.* var. Mr. Sydney Webb  
 3*c.* var. Shetland, Mr. F. J. Hanbury  
 3*d.* larva, Mr. W. Buckler  
 4. *Hypsipetes ruberata*  
 male  
 4*a.* female  
 4*b.* var. Orkney, Mr. R. Adkin  
 4*c.* var. Orkney, Mr. R. Adkin  
 4*d.* larva, Mr. W. Buckler

## PLATE 368, VOL. 8

1. *Hypsipetes elutata*  
 var.  
 1*a.* var.  
 1*b.* var.  
 1*c.* var.  
 1*d.* var.  
 1*e.* var. Mr. S. J. Capper  
 1*f.* var. Mr. S. J. Capper  
 1*g.* var. Mr. Sydney Webb  
 1*h.* var. Mr. Sydney Webb  
 1*i.* var. Mr. Sydney Webb  
 1*j.* var. Mr. Sydney Webb  
 1*k.* larva, Mr. W. Buckler

## PLATE 369, VOL. 8

1. *Hypsipetes elutata*  
 var.  
 1*a.* var. Mr. S. J. Capper  
 1*b.* var. Mr. Sydney Webb  
 1*c.* var. Mr. L. B. Prout  
 1*d.* var. Mr. G. T. Porritt  
 1*e.* var. Mr. G. T. Porritt  
 1*f.* var. Mr. G. T. Porritt  
 1*g.* var. Mr. G. T. Porritt  
 1*h.* var. Mr. G. T. Porritt  
 1*i.* var. Mr. G. T. Porritt

## PLATE 370, VOL. 8

1. *Hypsipetes impluviata*  
 male  
 1*a.* female  
 1*b.* var. Scotland  
 1*c.* var. Scotland  
 1*d.* var.  
 1*e.* var. Mr. Sydney Webb  
 1*f.* var. Mr. S. J. Capper

FIG.

- 1*g.* *Hypsipetes impluviata*, var.  
Arran, Mr. L. B. Prout  
1*h.* larva, Mr. W. Buckler

## PLATE 371, VOL. 8

1. *Oporabia dilutata*  
male  
1*a.* female  
1*b.* female, var.  
1*c.* male, var.  
1*d.* female, var. Mr. Sydney Webb  
1*e.* female, var. Mr. Sydney Webb  
1*f.* male, var. autumnaria, Mr. G.  
T. Porritt  
1*g.* male, var. autumnaria, Mr. S.  
J. Capper  
1*h.* larva, Mr. W. Buckler  
2. *Cheimatobia boreata*  
male  
2*a.* female  
2*b.* male, var. Mr. G. T. Porritt  
2*c.* larva, Mr. W. Buckler

## PLATE 372, VOL. 8

1. *Oporabia filigrammaria*  
male  
1*a.* female  
1*b.* male, var. Mr. S. J. Capper  
1*c.* male, var. Mr. G. T. Porritt  
1*d.* female, var. Mr. L. B. Prout  
1*e.* female, var. Pennine Hills  
1*f.* male, var. Mr. Sydney Webb  
1*g.* larva, Mr. W. Buckler  
2. *Cheimatobia brunnata*  
male  
2*a.* female  
2*b.* male, var.  
2*c.* male, var. Mr. Sydney Webb  
2*d.* larva, Mr. W. Buckler

## PLATE 373, VOL. 8

1. *Lobophora lobulata*  
male  
1*a.* female  
1*b.* female, var. Mr. F. J. Han-  
bury  
1*c.* female, var. Mr. Sydney Webb  
1*d.* female, var. Mr. G. T. Porritt  
1*e.* larva, Mr. W. Buckler  
2. *Lobophora hexapterata*  
male  
2*a.* female  
2*b.* var. Mr. S. J. Capper  
2*c.* var. Mr. S. J. Capper  
2*d.* larva, Mr. W. Buckler

FIG.

## PLATE 374, VOL. 8

1. *Lobophora sexalata*  
male  
1*a.* female  
1*b.* larva, Mr. W. Buckler  
2. *Lobophora viretata*  
male  
2*a.* female  
2*b.* female, var.  
2*c.* larva, Mr. W. Buckler  
3. *Lobophora polycommata*  
male  
3*a.* female  
3*b.* female, var.  
3*c.* larva, Mr. W. Buckler

## PLATE 375, VOL. 8

1. *Lithostege grisenta*  
male  
1*a.* female  
1*b.* larva, Mr. W. Buckler  
2. *Chesias spartiata*  
male  
2*a.* female  
2*b.* larva, Mr. W. Buckler  
3. *Chesias obliquaria*  
male, Mr. F. C. Woodforde  
3*a.* female, Mr. F. C. Woodforde  
3*b.* larva, Mr. W. Buckler  
4. *Carsia imbutata*  
male  
4*a.* female  
4*b.* larva, Mr. W. Buckler

## PLATE 376, VOL. 8

1. *Anaitis plagiata*  
male  
1*a.* female  
1*b.* female, var. Mr. S. J. Capper  
1*c.* male, var. Mr. Sydney Webb  
1*d.* male, var. Mr. F. J. Hanbury  
1*e.* larva, Mr. W. Buckler  
2. { Larva of *Calymnia pyralina*,  
due to Vol. V. Plate 224;  
supplied by Mr. E. H. Thornhill  
3. } *Cordiceps entomorrhiza*, a fun-  
gus springing from the body of  
3*a.* { a larva of *Hepialus lupulinus*.  
(See Vol. II. Plate 62). Furn-  
ished by Mr. W. H. B.  
3*b.* } Fletcher, M.A.

## PLATE 377, VOL. 9

1. *Mesotype lineolata*  
male

## FIG.

- 1*a*. Mesotype lineolata, female  
 1*b*. male, var.  
 1*c*. male, var.  
 1*d*. male, var.  
 1*e*. male, var. Mr. S. J. Capper  
 1*f*. female, var. Mr. S. J. Capper  
 1*g*. female, var. Mr. Sydney Webb  
 1*h*. female, var.  
 1*i*. female, var.  
 1*j*. female, var.  
 1*k*. larva, Mr. W. Buckler

## PLATE 378, VOL. 9

1. *Eubolia palumbaria*  
 male  
 1*a*. female  
 1*b*. female, var.  
 1*c*. female, var.  
 1*d*. male, var.  
 1*e*. male, var. Mr. G. T. Porritt  
 1*f*. female, var. Mr. S. J. Capper  
 1*g*. female, var. Mr. S. J. Capper  
 1*h*. female, var. Mr. Sydney Webb  
 1*i*. male, var. Mr. Sydney Webb  
 1*j*. larva, Mr. W. Buckler

## PLATE 379, VOL. 9

1. *Eubolia bipunctaria*  
 male, chalk districts  
 1*a*. female, chalk districts  
 1*b*. male, limestone  
 1*c*. female, limestone  
 1*d*. male, var. Mr. Sydney Webb  
 1*e*. male, var. Mr. Sydney Webb  
 1*f*. larva, Mr. W. Buckler  
 2. *Eubolia Cervinata*  
 male  
 2*a*. female  
 2*b*. male, var.  
 2*c*. male, var. Rev. C. F. Thorne-  
 will  
 2*d*. larva, Mr. W. Buckler

## PLATE 380, VOL. 9

1. *Eubolia mensuraria*  
 male  
 1*a*. female  
 1*b*. male, var.  
 1*c*. female, var.  
 1*d*. female, var. Mr. S. J. Capper  
 1*e*. larva, Mr. W. Buckler  
 2. *Collix sparsata*  
 male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler

## FIG.

## PLATE 381, VOL. 9

1. *Eupithecia togata*  
 male, Perthshire  
 1*a*. female, Perthshire  
 1*b*. var. Perthshire  
 1*c*. var. Perthshire  
 1*d*. var. Perthshire  
 1*e*. var. Perthshire  
 1*f*. var. Perthshire  
 1*g*. var. South of England  
 1*h*. larva, Mr. W. Buckler  
 2. *Eupithecia consignata*  
 male  
 2*a*. female  
 2*b*. larva, Mr. W. Buckler

## PLATE 382, VOL. 9

1. *Eupithecia venosata*  
 male  
 1*a*. female  
 1*b*. var. Mr. Sydney Webb  
 1*c*. var. North Wales. Mr. Sydney  
 Webb  
 1*d*. var. North Wales  
 1*e*. var. Forres, N.B.  
 1*f*. male, var. Isle of Lewis  
 1*g*. female, var. Isle of Lewis  
 1*h*. var. Orkney, Mr. F. J. Han-  
 bury  
 1*i*. var. Shetland  
 1*j*. var. Shetland  
 1*k*. larva, Mr. W. Buckler

## PLATE 383, VOL. 9

1. *Eupithecia extensaria*  
 male  
 1*a*. female  
 1*b*. female, var.  
 1*c*. female, var.  
 1*d*. male, var.  
 1*e*. male, var.  
 1*f*. male, var.  
 1*g*. female, var. Mr. E. A. Atmore  
 1*h*. female, var. Mr. E. A. Atmore  
 1*i*. female, var. Mr. E. A. Atmore  
 1*j*. female, var. Mr. E. A. Atmore  
 1*k*. larva, Miss Violet Barrett

## PLATE 384, VOL. 9

1. *Eupithecia pulchellata*  
 male (enlarged)  
 1*a*. female (enlarged)  
 1*b*. var. (enlarged)

## FIG.

- 1c. *Eupithecia pulchellata*, var. (enlarged) Mr. Sydney Webb  
 1d. var. (enlarged) Mr. Sydney Webb  
 1e. var. (enlarged) Yorkshire, Mr. G. T. Porritt  
 1f. var. (enlarged) Yorkshire, Mr. G. T. Porritt  
 1g. larva, Mr. W. Buckler  
 2. *Eupithecia linariata*  
 male (enlarged)  
 2a. female (enlarged)  
 2b. var. (enlarged)  
 2c. larva, Mr. W. Buckler

## PLATE 385, VOL. 9

1. *Eupithecia centaureata*  
 1a. var.  
 1b. larva, Mr. W. Buckler  
 2. *Eupithecia succenturiata*  
 2a. var. Mr. S. J. Capper  
 2b. var. Mr. Sydney Webb  
 2c. larva, Mr. W. Buckler  
 3. *Eupithecia subfulvata*  
 3a. var. Mr. Sydney Webb  
 3b. var. Mr. Sydney Webb  
 3c. var. Mr. Sydney Webb  
 3d. larva, Mr. W. Buckler

## PLATE 386, VOL. 9

1. *Eupithecia subumbrata*  
 male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Eupithecia irriguata*  
 2a. var.  
 2b. larva, Mr. W. Buckler  
 3. *Eupithecia pusillata*  
 male, Mr. Sydney Webb  
 3a. female  
 3b. larva, Mr. W. Buckler  
 4. *Eupithecia indigata*  
 male  
 4a. female  
 4b. larva, Mr. W. Buckler

## PLATE 387, VOL. 9

1. *Eupithecia nanata*  
 male  
 1a. female  
 1b. var. Mr. Sydney Webb  
 1c. var. Mr. S. J. Capper  
 1d. var. Mr. S. J. Capper  
 1e. larva, Mr. W. Buckler

## FIG.

2. *Eupithecia constrictata*  
 2a. var.  
 2b. larva, Mr. W. Buckler  
 3. *Eupithecia virgaureata*  
 3a. larva, Mr. W. Buckler

## PLATE 388, VOL. 9

1. *Eupithecia lariciata*  
 1a. var.  
 1b. larva, Mr. W. Buckler  
 2. *Eupithecia castigata*  
 2a. var.  
 2b. larva, Mr. W. Buckler  
 3. *Eupithecia albipunctata*  
 3a. var.  
 3b. larva, Mr. W. Buckler  
 4. *Eupithecia pimpinellata*  
 4a. var. Mr. Sydney Webb  
 4b. larva, Mr. W. Buckler

## PLATE 389, VOL. 9

1. *Eupithecia helveticaria*  
 1a. var. *arceuthata*  
 1b. larva, Mr. W. Buckler  
 2. *Eupithecia satyrata*  
 2a. var. *callunaria*  
 2b. var. *Curzoni*  
 2c. var. *Curzoni*, Mr. F. J. Hanbury  
 2d. var. Mr. Sydney Webb  
 2e. larva, Mr. W. Buckler  
 3. *Eupithecia plumbeolata*  
 3a. larva, Mr. W. Buckler  
 4. *Eupithecia isogrammata*  
 4a. larva, Mr. W. Buckler

## PLATE 390, VOL. 9

1. *Eupithecia pygmaeata*  
 1a. larva, Mr. W. Buckler  
 2. *Eupithecia trisignata*  
 2a. larva, Mr. W. Buckler  
 3. *Eupithecia valerianata*  
 3a. larva, Mr. W. Buckler  
 4. *Eupithecia fraxinata*  
 4a. larva, Mr. W. Buckler  
 5. *Eupithecia innotata*  
 5a. larva, Mr. W. Buckler  
 6. *Eupithecia subnotata*  
 male  
 6a. female  
 6b. larva, Mr. W. Buckler  
 7. *Eupithecia campanulata*  
 7a. larva, Mr. W. Buckler

FIG.

## PLATE 391, VOL. 9

1. *Eupithecia vulgata*  
male
- 1*a.* female
- 1*b.* var.
- 1*c.* larva, Mr. W. Buckler
2. *Eupithecia expallidata*  
larva, Mr. W. Buckler
- 2*a.* larva, Mr. W. Buckler
3. *Eupithecia absynthiata*  
var.
- 3*a.* larva, Mr. W. Buckler
4. *Eupithecia minutata*  
larva, Mr. W. Buckler
- 4*a.* larva, Mr. W. Buckler
5. *Eupithecia assimillata*  
var. Mr. Sydney Webb
- 5*a.* larva, Mr. W. Buckler
- 5*b.* larva, Mr. W. Buckler

## PLATE 392, VOL. 9

1. *Eupithecia jasioeata*  
Mr. Sydney Webb
- 1*a.* larva, Mr. W. Buckler
2. *Eupithecia tenuiata*  
larva, Mr. W. Buckler
- 2*a.* larva, Mr. W. Buckler
3. *Eupithecia subciliata*  
larva, Mr. W. Buckler
- 3*a.* larva, Mr. W. Buckler
4. *Eupithecia dodonæata*—Oak  
—Hawthorn
- 4*a.* larva, Mr. W. Buckler
- 4*b.* larva, Mr. W. Buckler
5. *Eupithecia abbreviata*  
male
- 5*a.* female
- 5*b.* var. Pembrokeshire
- 5*c.* larva, Mr. W. Buckler

## PLATE 393, VOL. 9

1. *Eupithecia exiguata*  
larva, Mr. W. Buckler
- 1*a.* larva, Mr. W. Buckler
2. *Eupithecia sobrinata*  
var. Scotland
- 2*a.* var. Scotland
- 2*b.* var. Scotland
- 2*c.* var. Stevensata
- 2*d.* var. Stevensata, Mr. Sydney Webb
- 2*e.* larva, Mr. W. Buckler
3. *Eupithecia debiliata*  
var. Mr. F. C. Woodforde
- 3*a.* var. Mr. F. C. Woodforde
- 3*b.* larva, Mr. W. Buckler
- 3*b.* larva, Mr. W. Buckler
4. *Eupithecia coronata*  
larva, Mr. W. Buckler
- 4*a.* larva, Mr. W. Buckler

## PLATE 394, VOL. 9

1. *Eupithecia rectangularata*  
var.
- 1*a.* var.
- 1*b.* var. Mr. S. J. Capper

FIG.

- 1*c.* *Eupithecia rectangularata*, var.  
London
- 1*d.* larva, Mr. W. Buckler
2. *Eupithecia pumilata*  
male
- 2*a.* female
- 2*b.* var.
- 2*c.* larva, Mr. W. Buckler
3. *Tanagra charophyllata*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Aplasta ononaria*

## PLATE 395, VOL. 9

1. *Odontia dentalis*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Pyrausta purpuralis*  
male
- 2*a.* female
- 2*b.* var.
3. *Pyrausta ostrinalis*  
male
- 3*a.* female
4. *Pyrausta punicealis*  
male
- 4*a.* female
- 4*b.* larva, Mr. W. Buckler
5. *Pyrausta sanguinalis*  
Lancashire
- 5*a.* West of Ireland

## PLATE 396, VOL. 9

1. *Pyrausta cespitalis*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Pyrausta cingulalis*  
male
- 2*a.* female
3. *Pyrausta anguinalis*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Pyrausta octomaculalis*  
male
- 4*a.* female
- 4*b.* male, var.
- 4*c.* larva, Mr. W. Buckler

## PLATE 397, VOL. 9

1. *Botys nubilalis*  
male

## FIG.

- 1*a.* *Botys nubilalis*, female  
 2. *Botys flavalis*  
     male  
 2*a.*      female  
 3. *Botys pandalis*  
     male  
 3*a.*      female  
 3*b.*      larva, Mr. W. Buckler  
 4. *Botys hyalinalis*  
     male  
 4*a.*      female  
 4*b.*      larva, Mr. W. Buckler

## PLATE 398, VOL. 9

1. *Botys uliginosalis*  
     male  
 1*a.*      male, var.  
 1*b.*      female  
 1*c.*      female, var.  
 2. *Botys fuscalis*  
     male  
 2*a.*      female  
 2*b.*      larva, Mr. W. Buckler  
 3. *Botys terrealis*  
     male  
 3*a.*      female  
 3*b.*      larva, Mr. W. Buckler

## PLATE 399, VOL. 9

1. *Botys asinatis*  
     male  
 1*a.*      female  
 1*b.*      larva, Mr. W. Buckler  
 2. *Botys repandalis*  
 3. *Botys verbascalis*  
     male  
 3*a.*      female  
 3*b.*      var.  
 3*c.*      larva, Mr. W. Buckler  
 4. *Botys simbulcalis*  
     male  
 4*a.*      female  
 4*b.*      larva, Mr. W. Buckler

## PLATE 400, VOL. 9

1. *Botys stachydalis*  
     male  
 1*a.*      female  
 1*b.*      larva, Mr. W. Buckler  
 2. *Botys crocealis*  
     male  
 2*a.*      female  
 2*b.*      larva, Mr. W. Buckler

## FIG.

3. *Botys ferrugalis*  
     male  
 3*a.*      female  
 3*b.*      var.  
 3*c.*      var.  
 3*d.*      larva, Mr. W. Buckler

## PLATE 401, VOL. 9

1. *Botys forficalis*  
 1*a.*      larva, Mr. W. Buckler  
 2. *Botys lutealis*  
     male  
 2*a.*      female  
 2*b.*      larva, Mr. W. Buckler  
 3. *Botys decrepitalis*  
     male  
 3*a.*      female  
 4. *Botys olivialis*  
 4*a.*      larva, Mr. W. Buckler  
 5. *Botys prunalis*  
     male  
 5*a.*      female  
 5*b.*      larva, Mr. W. Buckler

## PLATE 402, VOL. 9

1. *Pionea margaritalis*  
     male  
 1*a.*      female  
 1*b.*      larva, Mr. W. Buckler  
 2. *Pionea stramentalis*  
     male  
 2*a.*      female  
 2*b.*      larva, Mr. W. Buckler  
 3. *Nascia ciliaris*  
     male  
 3*a.*      female  
 3*b.*      larva { Miss Violet Barrett,  
                   from larva furnished  
                   by Mr. W. H. B.  
                   Fletcher, J.P.  
 4. *Perinephile lancealis*  
     male  
 4*a.*      female  
 4*b.*      larva, Mr. W. Buckler

## PLATE 403 VOL. 9

1. *Spilodes sticticalis*  
     male  
 1*a.*      female  
 1*b.*      larva, Mr. W. Buckler  
 2. *Spilodes palealis*  
     male  
 2*a.*      female

- FIG.  
 2b. *Spilodes palealis*, var.  
 2c. larva { Miss Violet Barrett,  
           { from larva furnished  
           { by Mr. C. W. Watts  
 3. *Spilodes einctalis*  
    male  
 3a. female  
 4. *Spilodes verticalis*  
 4a. larva, Mr. W. Buckler

## PLATE 404, VOL. 9

1. *Spilodes urticalis*  
    male  
 1a. female  
 1b. var. London  
 1c. larva, Mr. W. Buckler  
 2. *Mecyna polygonalis*  
    male  
 2a. female  
 3. *Margarodes unionalis*  
    male  
 3a. female { Yarmouth, Norfolk,  
           { Dr. Wheeler  
 4. *Antigastra catalaunalis*, Mr. W.  
    C. Boyd

## PLATE 405, VOL. 9

1. *Diasemia literalis*  
    male  
 1a. female  
 2. *Diasemia ramburialis*  
 3. *Agrotera nemoralis*  
    male  
 3a. female  
 3b. larva, Mr. W. Buckler  
 4. *Lemiodes pulveralis*  
    male  
 4a. female  
 5. *Nomophila hybridalis*  
    male  
 5a. female  
 5b. male, var.  
 5c. larva, Mr. E. P. Felt

## PLATE 406, VOL. 9

1. *Cledeobia angustalis*  
    male  
 1a. female  
 1b. male, var.  
 1c. larva, Mr. W. Buckler  
 2. *Pyralis farinalis*  
    male  
 2a. female

- FIG.  
 2b. *Pyralis farinalis*, male, var.  
 2c. larva, Mr. W. Buckler  
 3. *Pyralis lienigialis*  
 4. *Pyralis costalis*  
    male  
 4a. female

## PLATE 407, VOL. 9

1. *Pyralis glaucinalis*  
    male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Aglossa pinguinalis*  
    male  
 2a. female  
 2b. larva, Mr. W. Buckler  
 3. *Aglossa cuprealis*  
    male  
 3a. female  
 3b. larva, Mr. W. Buckler  
 4. *Cataclysta lemmalis*  
    male  
 4a. female  
 4b. larva, Mr. W. Buckler

## PLATE 408, VOL. 9

1. *Paraponyx stratiotalis*  
    male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Hydrocampa nymphaealis*  
    male  
 2a. female  
 2b. var.  
 2c. var.  
 2d. larva, Mr. W. Buckler  
 2e. larva-case, Mr. W. Buckler  
 3. *Hydrocampa stagnalis*  
    male  
 3a. female  
 3b. var. Norfolk Fens  
 3c. var. Norfolk Fens  
 3d. var. Ireland, Mr. G. T. Porritt  
 3e. larva, Mr. W. Buckler

## PLATE 409, VOL. 9

1. *Stenia punctalis*  
    male  
 1a. female  
 1b. larva, Mr. W. Buckler  
 2. *Acetropus niveus*  
    male  
 2a. female  
 2b. larva, Mr. W. Buckler

## FIG.

3. *Endotricha flammealis*  
male  
3*a.* female  
3*b.* var.  
3*c.* larva, Mr. W. Buckler  
4. *Scoparia cembra*  
male  
4*a.* female  
4*b.* var.  
4*c.* var. Zelleri

## PLATE 410, VOL. 9

1. *Scoparia basistrigalis*  
male  
1*a.* female  
1*b.* var.  
2. *Scoparia ambigualis*  
male  
2*a.* female  
2*b.* var.—marshes  
3. *Scoparia atomalis*  
male  
3*a.* female  
4. *Scoparia ulmella*  
male  
4*a.* female  
5. *Scoparia dubitalis*  
5*a.* var.  
5*b.* var. ingrattella  
5*c.* white var.

## PLATE 411, VOL. 9

1. *Scoparia murana*  
male  
1*a.* female  
2. *Scoparia truncicoella*  
male  
2*a.* female  
3. *Scoparia resinosa*  
4. *Scoparia cratagella*  
4*a.* var.  
4*b.* larva, Mr. W. Buckler  
5. *Scoparia mercurella*  
male  
5*a.* female  
5*b.* var.  
5*c.* var. portlandica, male  
5*d.* var. portlandica, female  
5*e.* larva, Mr. W. Buckler

## PLATE 412, VOL. 9

1. *Scoparia lineola*  
male

## FIG.

- 1*a.* *Scoparia lineola*, female  
1*b.* larva, Mr. W. Buckler  
2. *Scoparia angustea*  
male  
2*a.* female  
2*b.* var.  
2*c.* larva, Mr. W. Buckler  
3. *Scoparia alpina*  
male, Mr. K. J. Morton  
3*a.* female, Mr. K. J. Morton  
3*b.* var., Mr. K. J. Morton  
3*c.* male, var. gracilialis, lent by  
Mr. Kenneth J. Morton,  
captured by Mrs. Fraser  
4. *Scoparia pallida*  
male  
4*a.* female  
4*b.* var.

## PLATE 413, VOL. 9

1. *Agdistis bennettii*  
male  
1*a.* female  
1*b.* larva, Mr. W. Buckler  
2. *Cnemidophorus rhododactylus*  
male  
2*a.* female  
2*b.* larva, Mr. W. Buckler  
3. *Platyptilus ochrodactylus*  
male  
3*a.* female  
3*b.* var. diehodactylus  
3*c.* larva, Mr. W. Buckler  
4. *Platyptilus isodactylus*  
male  
4*a.* female  
4*b.* second generation  
4*c.* larva, Mr. W. Buckler

## PLATE 414, VOL. 9

1. *Platyptilus gonodactylus*  
male  
1*a.* female  
2. *Platyptilus zetterstedtii*  
3. *Platyptilus tesseraedactylus*  
4. *Amblyptilus acanthodactylus*  
4*a.* larva, Mr. W. Buckler  
5. *Amblyptilus punctidactylus*  
5*a.* larva, Mr. W. Buckler  
6. *Oxyptilus parvidactylus*  
7. *Oxyptilus distans*  
male  
7*a.* female



FIG.

## PLATE 415, VOL. 9

1. *Oxyptilus hieracii*
2. *Oxyptilus pilosella*
3. *Oxyptilus teucarii*
  - male
  - 3a. female
  - 3b. larva, Mr. W. Buckler
4. *Mimasioptilus phaeodactylus*
  - male
  - 4a. female
  - 4b. larva, Mr. W. Buckler
5. *Mimasioptilus bipunctidactylus*
  - 5a. var. *plagiodactylus*
  - 5b. var. from Lancashire
  - 5c. larva, Mr. W. Buckler

## PLATE 416, VOL. 9

1. *Mimasioptilus zophodactylus*
2. *Mimasioptilus pterodactylus* (*tuscus*)
3. *Edemaphorus lithodactylus*
  - male
  - 3a. female
  - 3b. larva, Mr. W. Buckler
4. *Pterophorus monodactylus*
  - 4a. var.
5. *Leioptilus lienigianus*
  - 5a. var. Mr. W. Buckler
6. *Leioptilus tephrodactylus*
  - 6a. larva, Mr. W. Buckler

## PLATE 417, VOL. 9

1. *Leioptilus osteodactylus*
  - male
  - 1a. female
  - 1b. larva, Mr. W. Buckler
2. *Leioptilus microdactylus*
  - male
  - 2a. female
  - 2b. var.
  - 2c. larva, Mr. W. Buckler
3. *Leioptilus brachydactylus*
  - male
  - 3a. female
4. *Trichoptilus paludum*

## PLATE 418, VOL. 9

1. *Aciptilus galactodactylus*
  - male
  - 1a. female
  - 1b. larva, Mr. W. Buckler

FIG.

2. *Aciptilus spilodactylus*
  - male
  - 2a. female
  - 2b. var.
  - 2c. larva, Mr. W. Buckler
3. *Aciptilus haliodactylus*
  - male
  - 3a. female
  - 3b. var.
  - 3c. larva, Mr. W. Buckler

## PLATE 419, VOL. 9

1. *Aciptilus tetradactylus*
  - male
  - 1a. female
  - 1b. var.
2. *Aciptilus pentadactylus*
  - male
  - 2a. female
  - 2b. larva, Mr. W. Buckler
3. *Orneodes polydactyla*
  - male
  - 3a. female
  - 3b. var.
  - 3c. small var. Scotland
  - 3d. larva, Mr. W. Buckler

## PLATE 420, VOL. 9

1. *Phycita spissicella*
  - male
  - 1a. female
  - 1b. larva, Mr. W. Buckler
  - 1c. Part head of male, showing thickened antenna
2. *Dioryctria decuriella*
  - male
  - 2a. female
3. *Dioryctria splendidella*
  - male
  - 3a. female
  - 3b. larva, Mr. W. Buckler
4. *Dioryctria palumbella*
  - male
  - 4a. female

## PLATE 421, VOL. 9

1. *Nephopteryx genistella*
  - male
  - 1a. female
  - 1b. larva, Mr. W. Buckler

## FIG.

2. *Nephoteryx similella*
3. *Salebria hostilis*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Salebria betula*  
male
- 4*a.* female
- 4*b.* larva, Mr. W. Buckler

## PLATE 422, VOL. 9

1. *Salebria fusca*  
male
- 1*a.* female
2. *Salebria formosa*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Salebria obductella*  
3*a.* var.
4. *Salebria carnella*  
male
- 4*a.* female
- 4*b.* var.
- 4*c.* larva, Mr. W. Buckler

## PLATE 423, VOL. 9

1. *Pempelia ornatella*  
male
- 1*a.* female
2. *Pempelia dilatella*  
male
- 2*a.* female
- 2*b.* var. *adornatella*, male, Surrey
- 2*c.* female, Gloucestershire
- 2*d.* var. *subornatella*, male, South  
Wales
- 2*e.* var. *subornatella*, female,  
South Wales
- 2*f.* var. *subornatella*, Scotland
- 2*g.* var. *subornatella*, Ireland
- 2*h.* larva, Mr. W. Buckler

## PLATE 424, VOL. 9

1. *Epischnia banksiella*  
male, Mr. N. M. Richardson
- 1*a.* female, Mr. N. M. Richardson
- 1*b.* at rest, Mrs. Richardson
- 1*c.* larva, Mrs. Richardson
2. *Epischnia farrella*
3. *Hypochealcia ahenella*  
male
- 3*a.* female
- 3*b.* male, var.

## FIG.

4. *Leucania 1-album*
5. *Xylophasia zollikoferi*

## PLATE 425, VOL. 10

1. *Cateremna terebrella*  
male
- 1*a.* female
2. *Cryptoblabes bistriga*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Acrobasis consociella*  
male
- 3*a.* female
- 3*b.* western var.
- 3*c.* larva, Mr. W. Buckler
4. *Acrobasis verrucella*  
male
- 4*a.* female

## PLATE 426, VOL. 10

1. *Acrobasis tumidella*  
male
- 1*a.* female
- 1*b.* var.
- 1*c.* var.
2. *Acrobasis rubrotibiella*
3. *Rhodophaea advenella*  
male
- 3*a.* female
4. *Rhodophaea marmorea*  
male
- 4*a.* female
- 4*b.* larva, Mr. W. Buckler

## PLATE 427, VOL. 10

1. *Rhodophaea suavella*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Myelois cribrella*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Myelois cirrigerella*
4. *Myelois ceratonia*  
male
- 4*a.* female
5. *Nyctegretes achatinella*  
male
- 5*a.* female
- 5*b.* var.

FIG.  
PLATE 428, VOL. 10

1. *Euzophera pinguis*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Euzophera cinerosella*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Gynnancylla canella*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Heterographis oblitella*

## PLATE 429, VOL. 10

1. *Alispa Angustella*  
male
- 1*a.* female
- 1*b.* larva, Mr. W. Buckler
2. *Homæosoma sinuella*  
male
- 2*a.* male, var.
- 2*b.* female
- 2*c.* female, var.
- 2*d.* larva, Mr. W. Buckler
3. *Homæosoma nebulella*
- 3*a.* larva, Mr. W. Buckler
4. *Homæosoma bina-vella*
- 4*a.* larva, Mr. W. Buckler

## PLATE 430, VOL. 10

1. *Homæosoma cretacella*
- 1*a.* larva, Mr. W. Buckler
2. *Homæosoma nimbella*
- 2*a.* larva, Mr. W. Buckler
3. *Ephestia calidella*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Ephestia ficulella*
5. *Ephestia kulmiella*  
male
- 5*a.* female
6. *Ephestia cabiritella*  
male
- 6*a.* female
- 6*b.* larva, Mr. W. Buckler

## PLATE 431, VOL. 10

1. *Ephestia elutella*  
male
- 1*a.* dwarf male

- FIG.
- 1*b.* *Ephestia elutella*, female
- 1*c.* female, var.
- 1*d.* larva, Mr. W. Buckler
2. *Ephestia semirufa*
3. *Plodia interpunctella*  
male
- 3*a.* female
- 3*b.* larva, Mr. W. Buckler
4. *Anerastia lotella*  
male.
- 4*a.* male, var.
- 4*b.* male, var.
- 4*c.* female
- 4*d.* larva, Mr. W. Buckler

## PLATE 432, VOL. 10

1. *Eromene ocellæa*
2. *Platytes cerussellus*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Crambus Verellus*
4. *Crambus alpinellus*
5. *Crambus falsellus*  
male
- 5*a.* var.
- 5*b.* female
- 5*c.* larva, Mr. W. Buckler

## PLATE 433, VOL. 10

1. *Crambus pratellus*  
male
- 1*a.* female
- 1*b.* male, var.
2. *Crambus dumetellus*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Crambus ericellus*  
male
- 3*a.* female
4. *Crambus sylvellus*  
male
- 4*a.* female

## PLATE 434, VOL. 10

1. *Crambus hamellus*  
male
- 1*a.* female
2. *Crambus pascuellus*  
male
- 2*a.* female

FIG.

3. *Crambus oliginosellus*  
male
- 3*a.* female
4. *Crambus latistrius*  
male
- 4*a.* female
5. *Crambus furcatellus*  
male
- 5*a.* female

## PLATE 435, VOL. 10

1. *Crambus margaritellus*  
male
- 1*a.* female
2. *Crambus pinetellus*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Crambus myellus*
4. *Crambus selasellus*  
male
- 4*a.* female
- 4*b.* larva, Mr. W. Buckler

## PLATE 436, VOL. 10

1. *Crambus perlellus*
- 1*a.* var.
- 1*b.* var.
- 1*c.* var. *warringtonellus*
- 1*d.* var.
- 1*e.* var. *rostellus*
- 1*f.* larva, Mr. W. Buckler
2. *Crambus tristellus*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* male, var.
- 2*d.* male, var.
- 2*e.* larva, Mr. W. Buckler

## PLATE 437, VOL. 10

1. *Crambus fascelinellus*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
- 1*d.* larva, Mr. W. Buckler
2. *Crambus inquinatellus*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* male, var.
- 2*d.* larva, Mr. W. Buckler

FIG.

## PLATE 438, VOL. 10

1. *Crambus contaminellus*  
male
- 1*a.* female
2. *Crambus salinellus*  
male
- 2*a.* female
- 2*b.* larva, Mr. W. Buckler
3. *Crambus chrysonuchellus*  
male
- 3*a.* female
- 3*b.* male, var.
4. *Crambus craterellus*
- 4*a.* var.

## PLATE 439, VOL. 10

1. *Crambus geniculeus*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* larva, Mr. W. Buckler
2. *Crambus culmellus*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* larva, Mr. W. Buckler
3. *Crambus hortuellus*  
male
- 3*a.* female
- 3*b.* male, var.
- 3*c.* male, var.

## PLATE 440, VOL. 10

1. *Calamotropha paludella*  
male
- 1*a.* female
- 1*b.* male, var.
- 1*c.* male, var.
2. *Chilo phragmitellus*  
male
- 2*a.* female
- 2*b.* male, var.
- 2*c.* male, var.
- 2*d.* *Schenobius mucronellus*  
larva, Mr. W. Buckler

## PLATE 441, VOL. 10

1. *Schenobius gigantellus*  
male
- 1*a.* male, var.
- 1*b.* female
- 1*c.* female, var.

## FIG.

2. *Schaenobius forficellus*  
male  
2*a.* male, var.  
2*b.* female  
2*c.* female, var.  
3. *Schaenobius mucronellus*  
male  
3*a.* female  
3*b.* larva, Mr. W. Buckler  
4. *Chilo phragmitellus*  
larva, Mr. W. Buckler (cor-  
rection of Plate 440)

## PLATE 442, VOL. 10

1. *Galleria mellonella*  
male  
1*a.* male, var.  
1*b.* female  
1*c.* larva, Mr. W. Buckler  
2. *Aphomia sociella*  
male  
2*a.* male, var.  
2*b.* female  
2*c.* female var.  
2*d.* larva, Miss V. Barrett  
3. *Melissoblyptus bipunctatus*  
male  
3*a.* female

## PLATE 443, VOL. 10

1. *Corecya cephalonica*  
male  
1*a.* female  
1*b.* male, var.  
1*c.* female, var.  
2. *Achroia grisella*  
male  
2*a.* female  
2*b.* larva, Mr. W. Buckler  
3. *Tortrix podana*  
male  
3*a.* female  
3*b.* male, var.  
3*c.* female, var.  
3*d.* larva, Mr. W. Buckler

## PLATE 444, VOL. 10

1. *Tortrix picana*  
male  
1*a.* female  
2. *Tortrix decretana*  
male  
2*a.* female  
2*b.* male, var.

## FIG.

- 2*c.* *Tortrix decretana*, female, var.  
3. *Tortrix cratagana*  
male  
3*a.* female  
3*b.* male, var.  
4. *Tortrix xylosteana*  
male  
4*a.* female  
4*b.* female, var.

## PLATE 445, VOL. 10

1. *Tortrix rosana*  
male  
1*a.* female  
2. *Tortrix sorbiana*  
male  
2*a.* female  
3. *Tortrix lafauryana*  
male  
3*a.* male, var.  
3*b.* female  
3*c.* female, var.  
4. *Tortrix semialbana*  
5. *Tortrix costana*  
male  
5*a.* female  
5*b.* male, var.

## PLATE 446, VOL. 10

1. *Pandemis corylana*  
male  
1*a.* female  
2. *Pandemis ribeana*  
male  
2*a.* female  
2*b.* male, var.  
2*c.* female, var.  
3. *Pandemis cinnamomeana*  
male  
3*a.* female  
4. *Pandemis heparana*  
male  
4*a.* female  
5. *Pandemis dumetana*

## PLATE 447, VOL. 10

1. *Pandemis diversana*  
male  
1*a.* female  
2. *Lozotenia unifasciana*  
male  
2*a.* female

## FIG.

3. *Lozotaenia musculana*  
male  
3*a.* female  
3*b.* male, northern var.  
4. *Ptycholoma lecheana*  
male  
4*a.* female  
5. *Enectra pilleriana*  
male  
5*a.* female  
5*b.* male, var.

## PLATE 448, VOL. 10

1. *Lophoderus ministrana*  
male  
1*a.* female  
1*b.* male, var.  
2. *Lophoderus politana*  
male  
2*a.* female  
3. *Lophoderus cinctana*  
4. *Idiographis inopiana*  
male  
4*a.* female  
5. *Heterognomon forsterana*  
male  
5*a.* female  
5*b.* female, var.  
5*c.* larva, Mr. W. Buckler

## PLATE 449, VOL. 10

1. *Heterognomon viridana*  
2. *Heterognomon icterana*  
male  
2*a.* female  
3. *Heterognomon viburniana*  
male  
3*a.* female  
3*b.* female, var.  
4. *Dictyopteryx loeflingiana*  
4*a.* var.  
5. *Dictyopteryx bergmanniana*  
6. *Dictyopteryx bifasciana*  
7. *Dictyopteryx conwayana*  
7*a.* var.

## PLATE 450, VOL. 10

1. *Dictyopteryx holmiana*  
2. *Dictyopteryx forskaleana*  
2*a.* var.  
3. *Dictyopteryx contaminana*  
3*a.* var.  
3*b.* var.

## FIG.

4. *Batodes angustiorana*  
male  
4*a.* female  
5. *Clepsis rusticana*  
male  
5*a.* female  
6. *Amphysa gerningana*  
7. *Amphysa prodromana*  
male  
7*a.* female

## PLATE 451, VOL. 10

1. *Dichelia grotiana*  
2. *Teras caudana*  
2*a.* var.  
2*b.* var.  
2*c.* var.  
3. *Leptogramma literana*  
3*a.* var.  
3*b.* var.  
4. *Leptogramma boscana*  
4*a.* var. scabrana  
5. *Leptogramma niveana*  
5*a.* var.

## PLATE 452, VOL. 10

1. *Peronea cristana*  
1*a.* var.  
1*b.* var.  
1*c.* var.  
1*d.* var.  
1*e.* var.  
1*f.* var.  
1*g.* var.  
1*h.* var.  
2. *Peronea umbrana*  
var.  
2*a.* var.

## PLATE 453, VOL. 10

1. *Peronea hastiana*  
1*a.* var.  
1*b.* var.  
1*c.* var.  
1*d.* var.  
1*e.* var.  
2. *Peronea maccana*  
3. *Peronea logiana*  
3*a.* var.  
3*b.* var.  
4. *Peronea mixtana*  
4*a.* var.

FIG.

## PLATE 454, VOL. 10

1. *Peronea permutana*
2. *Peronea variegana*
- 2*a.* var.
- 2*b.* var.
- 2*c.* var.
3. *Peronea lipsiana*
4. *Peronea rufana*
- 4*a.* var.
5. *Peronea sponsana*
- 5*a.* var.
6. *Peronea perplexana*
- 6*a.* var.

## PLATE 455, VOL. 10

1. *Peronea schalleriana*
- 1*a.* var. *latifasciana*
2. *Peronea comparana*
3. *Peronea caledoniana*
4. *Peronea comariana*
- 4*a.* var.
5. *Peronea lorquiniana*
- 5*a.* var.
- 5*b.* var.
6. *Peronea ferrugana*
- 6*a.* var.

## PLATE 456, VOL. 10

1. *Peronea shepherdana*  
male
- 1*a.* female
2. *Peronea aspersana*  
male
- 2*a.* female
3. *Capua favillacea*  
male
- 3*a.* female
4. *Ablabia osseana*  
male
- 4*a.* female
5. *Ablabia argentana*
6. *Sphaleroptera ictericana*  
male
- 6*a.* female

## PLATE 457, VOL. 10

1. *Sciaphila bellana*
2. *Sciaphila colquhounana*
- 2*a.* var.
3. *Sciaphila octomaculana*
4. *Sciaphila conspersana*  
male
- 4*a.* female

VOL. XI.

FIG.

- 4*b.* *Sciaphila conspersana*, male, var.
5. *Sciaphila communana*
6. *Sciaphila chrysantheana*
7. *Sciaphila pascuana*
- 7*a.* var.
8. *Sciaphila incanana* (*sinuana*)

## PLATE 458, VOL. 10

1. *Sciaphila virgaureana*
2. *Sciaphila subjectana*
3. *Sciaphila abrasana*
4. *Sciaphila nubilana*  
male
- 4*a.* female
5. *Cheimatophila tortricella*  
male
- 5*a.* female
6. *Olindia hybridana*  
male
- 6*a.* female
7. *Olindia ulmana*  
male
- 7*a.* female

## PLATE 459, VOL. 10

1. *Conchylis maculosana*
2. *Eupecilia atricapitana*
3. *Eupecilia pallidana*
4. *Eupecilia dubitana*
5. *Eupecilia hybridella*
6. *Eupecilia ambiguella*
7. *Eupecilia angustana*
- 7*a.* var. *thuleana*
8. *Eupecilia curvistrigana*
9. *Eupecilia gilvicomana*
10. *Eupecilia notulana*
11. *Eupecilia manniana*

## PLATE 460, VOL. 10

1. *Eupecilia mussehlana*
2. *Eupecilia geyeriana*
3. *Eupecilia alismana*
4. *Eupecilia vectisana*
- 4*a.* Fen var.
5. *Eupecilia affinitana*
6. *Eupecilia rupicola*
7. *Eupecilia roseana*
8. *Eupecilia degreyana*
9. *Eupecilia flavicilliana*
10. *Eupecilia subroseana*
11. *Eupecilia implicitana*
- 11*a.* var. second brood

f

FIG.

## PLATE 461, VOL. 10

1. *Eupcecilia ciliella*
- 1*a.* var. (Norfolk bogs)
2. *Eupcecilia erigerana*
- male
- 2*a.* female
3. *Eupcecilia nana*
- male
- 3*a.* female
4. *Lozopera diplotella*
5. *Lozopera dilucidana*
6. *Lozopera francillana*
7. *Lozopera beatricella*
- male
- 7*a.* female

## PLATE 462, VOL. 10

1. *Lozopera smeathmanniana*
- male
- 1*a.* female
2. *Lozopera straminea*
- male
- 2*a.* female
3. *Lozopera alternana*
- male
- 3*a.* female
4. *Argyrolepia badiana*
- male
- 4*a.* female
5. *Argyrolepia euciana*
- male
- 5*a.* female

## PLATE 463, VOL. 10

1. *Argyrolepia tesserana*
- 1*a.* var.
- 1*b.* var.
- 1*c.* var.
2. *Argyrolepia baumanniana*
- male
- 2*a.* female
- 2*b.* var. (Hebrides)
3. *Argyrolepia subbaumanniana*
4. *Argyrolepia schreibersiana*
5. *Argyrolepia teneana*
- male
- 5*a.* female

## PLATE 464, VOL. 10

1. *Argyrolepia zephyrana*
2. *Argyrolepia maritimana*
3. *Dapsilia rutilana*

FIG.

4. *Xanthosetia zөгana*
- 4*a.* var. (ferrugana)
- 4*b.* var. (intermediate)
5. *Xanthosetia hamana*
- 5*a.* var.
- 5*b.* var.
- 5*c.* var.

## PLATE 465, VOL. 10

1. *Phtheochroa rugosana*
- 1*a.* female
2. *Phtheochroa sodaliana*
3. *Brachytenia semifasciana*
- 3*a.* female
4. *Brachytenia hartmanniana*
- 4*a.* female
5. *Brachytenia woodiana*
- 5*a.* female
6. *Artithesia salicella*

## PLATE 466, VOL. 10

1. *Pecilochroma profundana*
- 1*a.* female
- 1*b.* var.
- 1*c.* var.
- 1*d.* var.
- 1*e.* var.
2. *Pecilochroma corticana*
- 2*a.* female
- 2*b.* var.
- 2*c.* var.
- 2*d.* var.
- 2*e.* var.

## PLATE 467, VOL. 10

1. *Pecilochroma occultana*
- 1*a.* female
2. *Pecilochroma signatana*
- 2*a.* female
3. *Penthina capreana*
- 3*a.* female
1. *Penthina picana*
- 1*a.* female
5. *Penthina betulatana*
- 5*a.* female
6. *Penthina pruniana*

## PLATE 468, VOL. 10

1. *Penthina sororelulana*
- 1*a.* female
2. *Penthina ochroleucana*
3. *Penthina variegana*
- 3*a.* female
- 3*b.* var.



- FIG.  
 4. *Penthina sauciana*  
 4*a.* female  
 5. *Penthina staintoniana*  
 6. *Penthina dimidiana*  
 6*a.* female

## PLATE 469, VOL. 10

1. *Penthina marginana*  
 male  
 1*a.* female  
 2. *Penthina gentiana* (*gentianana*)  
 male  
 2*a.* female  
 3. *Penthina sellana*  
 male  
 3*a.* female  
 4. *Penthina postrema*  
 male  
 4*a.* female  
 5. *Penthina carbonana*  
 6. *Penthina fuligana*

## PLATE 470, VOL. 11

1. *Penthina nigricostana*  
 male  
 1*a.* female  
 2. *Hedya ocellana*  
 male  
 2*a.* female  
 2*b.* var. male  
 2*c.* var. female  
 3. *Hedya lariciana*  
 male  
 3*a.* female  
 4. *Hedya aceriana*  
 male  
 5. *Hedya dealbana*  
 male  
 5*a.* female  
 5*b.* var. alnetana

## PLATE 471, VOL. 11

1. *Hedya neglectana*  
 male  
 1*a.* female  
 2. *Hedya simplana*  
 2*a.* *Hedya simplana*  
 3. *Hedya pauperana*  
 male  
 4. *Hedya oppressana*  
 male  
 4*a.* female

- FIG.  
 5. *Spilonota tripunctana*  
 male  
 5*a.* female  
 6. *Spilonota incarnatana*  
 var. (*Malahide*)

## PLATE 472, VOL. 11

1. *Spilonota roborana*  
 male  
 1*a.* female  
 2. *Spilonota rosacolorana*  
 male  
 2*a.* female  
 3. *Spilonota suffusana*  
 male  
 3*a.* female  
 4. *Spilonota incarnatana*  
 male  
 4*a.* female  
 5. *Aspis addmanniana*  
 male  
 5*a.* female

## PLATE 473, VOL. 11

1. *Orthotania branderiana*  
 1*a.* female  
 1*b.* var.  
 2. *Orthotania antiquana*  
 2*a.* *Orthotania antiquana*  
 2*b.* var.  
 3. *Orthotania ericetana*  
 4. *Orthotania striana*  
 4*a.* female  
 5. *Orthotania purpurana*  
 5*a.* female  
 6. *Orthotania rufana*

## PLATE 474, VOL. 11

1. *Orthotania arbutella*  
 1*a.* female  
 2. *Orthotania mygindana*  
 2*a.* female  
 3. *Retinia buoliana*  
 3*a.* female  
 4. *Retinia pinicolana*  
 4*a.* female  
 5. *Retinia turionana*  
 5*a.* female  
 6. *Retinia posticana*  
 (*Dumbarton. Atmore*)  
 6*a.* *Retinia posticana*  
 (*King's Lynn. Atmore*)

FIG.

PLATE 475, VOL. 11

1. *Retinia pinivorana*
- 1*a.* female
- 1*b.* var.
- 1*c.* var.
2. *Retinia resinella*
- 2*a.* female
- 2*b.* female
3. *Retinia sylvestrana*
- 3*a.* female
4. *Retinia retiferana*  
(Webb)

PLATE 476, VOL. 11

1. *Sideria achataua*
- 1*a.* female
2. *Retinia duplana*
3. *Mixodia ratzeburgiana*
- 3*a.* female
4. *Mixodia schulziana*
- 4*a.* female
- 4*b.* var.
5. *Mixodia palustrana*
- 5*a.* female
6. *Sericoris micana*
- 6*a.* female

PLATE 477, VOL. 11

1. *Sericoris irriguana*
- 1*a.* female
- 1*b.* var.
2. *Sericoris metallicana*
- 2*a.* female
3. *Sericoris lacumana*
- 3*a.* (Fen form)
- 3*b.* (Hill form)
4. *Sericoris urticana*
- 4*a.* male
- 4*b.* var.
- 4*c.* var.
5. *Sericoris rivulana*
- 5*a.* female

PLATE 478, VOL. 11

1. *Sericoris cespitana*
- male
- 1*a.* var. (Sand hills)
- 1*b.* var. (Limestone hills)
2. *Sericoris doubledayana*
- male
3. *Eudemis fuligana*
- 3*a.* female

FIG.

4. *Eudemis littoralis*
- male (Pembroke)
- 4*a.* (Kincardine)
- 4*b.* (Dublin)
- 4*c.* (Devonshire)
5. *Eudemis bifasciana*
- 5*a.* female

PLATE 479, VOL. 11

1. *Eudemis euphorbiana*
- 1*a.* female
2. *Eudemis latifasciana*
- male
3. *Acrolita consequana*
- 3*a.* female
4. *Acrolita Servillana*
- 4*a.* female
5. *Roxana arcuella*
- male
6. *Eriopsala fractifasciana*
- 6*a.* female
7. *Eriopsala quadrana*
- male

PLATE 480, VOL. 11

1. *Steganoptycha rubiginosa*
- male
2. *Steganoptycha obtusana*
- male
3. *Steganoptycha minutana*
- female
4. *Steganoptycha cruciana*
- 4*a.* female
- 4*b.* var.
5. *Steganoptycha angustana*
- 5*a.* var.
- 5*b.* var.
6. *Steganoptycha nigromaculana*
- male
7. *Steganoptycha ramella*
- male
- 7*a.* var.

PLATE 481, VOL. 11

1. *Steganoptycha trimaculana*
- 1*a.* female
- 1*b.* var.
- 1*c.* var.
2. *Steganoptycha rufimitrana*
- 2*a.* female
3. *Steganoptycha nevana*
- 3*a.* female
- 3*b.* var.
- 3*c.* var.

- FIG.  
4. *Steganoptycha geminana*  
4*a.* female  
4*b.* var.

## PLATE 482, VOL. 11

1. *Phleodes tetraquetra*  
1*a.* female  
1*b.* var.  
2. *Phleodes immundana*  
2*a.* female  
2*b.* var.  
3. *Phleodes demarniana*  
3*a.* female  
4. *Phleodes crenana*  
4*a.* female  
4*b.* var.  
5. *Cartella bilunana*  
5*a.* female

## PLATE 483, VOL. 11

1. *Lithographia subocellana*  
1*a.* female  
2. *Lithographia nisella*  
2*a.* female  
2*b.* var. *pavonana*  
2*c.* var. *decorana*  
2*d.* var. *rhombifasciana*  
2*e.* var. (Wisley, Surrey)  
3. *Lithographia cinerea*  
3*a.* female  
4. *Lithographia penkeleriana*  
4*a.* female  
4*b.* var.  
4*c.* var.

## PLATE 484, VOL. 11

1. *Anchylopera siculana*  
1*a.* female  
2. *Anchylopera unguicella*  
2*a.* female  
2*b.* var.  
3. *Anchylopera uncana*  
3*a.* female  
4. *Anchylopera biarcuana*  
4*a.* female  
5. *Anchylopera inornatana*  
5*a.* female  
5*b.* (pale form)

## PLATE 485, VOL. 11

1. *Anchylopera comptana*  
1*a.* female  
2. *Anchylopera myrtillana*  
2*a.* female

- FIG.  
3. *Anchylopera lundana*  
3*a.* female  
4. *Anchylopera paludana*  
4*a.* female  
5. *Anchylopera derasana*  
5*a.* female  
6. *Anchylopera diminutana*  
6*a.* female

## PLATE 486, VOL. 11

1. *Anchylopera mitterbacheriana*  
1*a.* female  
2. *Anchylopera upnana*  
3. *Anchylopera letana*  
3*a.* female  
4. *Bactra lanceolana*  
4*a.* female  
4*b.* var. (Pembroke)  
4*c.* var.  
4*d.* var. (Pembroke)  
5. *Bactra furfurana*  
5*a.* female

## PLATE 487, VOL. 11

1. *Pædisca ophthalmicana*  
1*a.* female  
2. *Pædisca solandriana*  
2*a.* female  
2*b.* var. *parmatana*  
2*c.* var. *sinuana*  
2*d.* var. *trapezana*  
2*e.* var. *sylvana*  
2*f.* var.  
3. *Pædisca semifuscana*  
3*a.* var.  
3*b.* var.

## PLATE 488, VOL. 11

1. *Pædisca sordidana*  
1*a.* female  
2. *Halonota similana*  
2*a.* female  
3. *Halonota pflugiana*  
3*a.* female  
4. *Halonota cirsiana*  
4*a.* female  
5. *Halonota brunnichiana*  
5*a.* female  
6. *Halonota grandævana*  
6*a.* female

## PLATE 489, VOL. 11

1. *Halonota turbidana*  
1*a.* female

## FIG.

2. *Halonota fenella*
- 2*a.* female
- 2*b.* var.
3. *Halonota trigeminana*
- 3*a.* female
4. *Halonota tetragonana*
- 4*a.* female
5. *Carpocapsa splendana*

## PLATE 490, VOL. 11

1. *Carpocapsa pomonella*
- 1*a.* female
2. *Carpocapsa grossana*
- 2*a.* female
3. *Carpocapsa juliana*
- 3*a.* female
4. *Carpocapsa nimbana*
- 4*a.* female
5. *Semasia populana*
- 5*a.* female

## PLATE 491, VOL. 11

1. *Semasia gallicolana*
- 1*a.* female
2. *Semasia obscurana*
3. *Semasia woerberiana*
- 3*a.* female
4. *Semasia rufillana*
5. *Semasia janthinana*
- 5*a.* female
6. *Semasia spiniana*
- 6*a.* female

## PLATE 492, VOL. 11

1. *Asthenia ochsenheimeriana*
- 1*a.* female
2. *Asthenia cosmophorana*
- 2*a.* female
3. *Asthenia scopariana*
4. *Asthenia strobilella*
- 4*a.* female
5. *Asthenia splendidulana*
- 5*a.* female
- 5*b.* var.

## PLATE 493, VOL. 11

1. *Asthenia fimbriana*
- 1*a.* female
2. *Asthenia argyrana*
- 2*a.* female
- 2*b.* var.
3. *Asthenia subsequana*
- 3*a.* female

## FIG.

4. *Asthenia pygmaeana*
5. *Asthenia ustomaculana*
- 5*a.* female

## PLATE 494, VOL. 11

1. *Asthenia nanana*
- 1*a.* female
2. *Asthenia vacciniana*
- 2*a.* female
3. *Coccyx tedella*
- 3*a.* female
- 3*b.* var.
- 3*c.* var.
4. *Coccyx nemorivaga*
- 4*a.* female

## PLATE 495, VOL. 11

1. *Coccyx distinctana*
- 1*a.* female
2. *Coccyx nigricana*
- 2*a.* female
3. *Endopisa nebritana*
- 3*a.* female
4. *Endopisa gemmiferana*
- 4*a.* female
5. *Endopisa funebrana*
- 5*a.* female
6. *Pampluria mercuriana*
- 6*a.* female

## PLATE 496, VOL. 11

1. *Catoptria expallidana*
- 1*a.* female
2. *Catoptria scopoliانا*
- 2*a.* female
3. *Catoptria fulvana*
- 3*a.* female
4. *Catoptria cana*
- 4*a.* female
5. *Catoptria ceciniaculana*
- 5*a.* female

## PLATE 497, VOL. 11

1. *Grapholitha fumulana*
- 1*a.* female
2. *Grapholitha tripoliانا*
- 2*a.* female
3. *Grapholitha citrana*
- 3*a.* female
4. *Grapholitha pupillana*
- 4*a.* female
5. *Grapholitha candidulana*
- 5*a.* female

FIG.

## PLATE 498, VOL. 11

1. *Grapholitha conterminana*
- 1*a.* female
2. *Grapholitha aspidiscana*
- 2*a.* female
3. *Grapholitha hypericana*
- 3*a.* female
4. *Grapholitha albersana*
- 4*a.* female
5. *Grapholitha microgrammana*
- 5*a.* female

## PLATE 499, VOL. 11

1. *Grapholitha caccana*
2. *Grapholitha ulicetana*
- 2*a.* female
- 2*b.* ab.
- 2*c.* ab. (Ireland)
- 2*d.* small form
3. *Pyrodes rhediella*
- 3*a.* female
4. *Stigmonota dorsana*
- 4*a.* female

## PLATE 500, VOL. 11

1. *Stigmonota orobana*
- 1*a.* female
2. *Stigmonota leguminana*
- 2*a.* female
3. *Stigmonota leplastriana*
- 3*a.* female
4. *Stigmonota cognatana*
- 4*a.* female
5. *Stigmonota coniferana*
- 5*a.* female

## PLATE 501, VOL. 11

1. *Stigmonota perlepidana*
- 1*a.* female
2. *Stigmonota pallifrontana*
- 2*a.* female
3. *Stigmonota interbana*
- 3*a.* female

FIG.

1. *Stigmonota compositella*
- 4*a.* female
5. *Stigmonota flexana*
- 5*a.* female

## PLATE 502, VOL. 11

1. *Stigmonota nitidana*
- 1*a.* female
2. *Stigmonota trauniana*
- 2*a.* female
3. *Stigmonota regiana*
- 3*a.* female
4. *Stigmonota germarana*
5. *Stigmonota roseticolana*
6. *Trycheris aurana*
7. *Lobesia permixtana*
- 7*a.* female

## PLATE 503, VOL. 11

1. *Dichrorampha petiverella*
- 1*a.* female
2. *Dichrorampha alpinana*
- 2*a.* female
3. *Dichrorampha flavidorsana*
- 3*a.* female
4. *Dichrorampha sequana*
- 4*a.* female
5. *Dichrorampha consortana*
- 5*a.* female
6. *Dichrorampha alpestrana*

## PLATE 504, VOL. 11

1. *Dichrorampha plumbagana*
- 1*a.* female
2. *Dichrorampha senectana*
3. *Dichrorampha herbosana*
4. *Dichrorampha acuminatana*
- 4*a.* female
5. *Dichrorampha simpliciana*
6. *Lipoptycha plumbana*
- 6*a.* female
7. *Lipoptycha saturnana*
8. *Tortrix pronubana* (nat. size)
- 8*a.* female (nat. size)



# LEPIDOPTERA.

## DIVISION 2. HETEROCERA.

### Group 5. *PYRALIDINA*.

#### Family 4. **SERICORIDÆ**.

##### Genus 5. **HEDYA**.

ANTENNÆ slender, rather long; palpi short, blunt, hardly thickened; thorax slender, very faintly crested at the back; fore wings without a fold, narrow, drawn closely in at the sides; hind wings untufted.

We have eight species—readily recognised—all of rather small size.

A. Fore wings white or nearly white, basal blotch conspicuous, dark coloured, complete.

B. Basal blotch nearly rounded or very bluntly angulated outwardly; head brown or grey.

C. Fore wings moderately broad, somewhat ovate.

*H. ocellana.*

C<sup>2</sup>. Fore wings narrow.

*H. lariciana.*

B<sup>2</sup>. Basal blotch very oblique, its margin smoothly curved; fore wings very long.

*H. pauperana.*

B<sup>3</sup>. Margin of basal blotch rather sinuous, not angulated; wings not long.

*H. aceriana.*

4. Margin of basal blotch angulated.  
 D. Face brown or whitish-brown with white palpi. *H. dealbana*.  
 D<sup>2</sup>. Face and palpi white.  
 E. Marking blue-black. *H. neglectana*.  
 E<sup>2</sup>. Markings black, white area softly clouded. *H. simplana*.  
 B<sup>5</sup>. Basal blotch broken or incomplete. *H. oppressana*.

1. **H. ocellana**, *Schiff.*.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.).—Fore wings rather broad, somewhat ovate, white with basal blotch and hinder area slate-black.

Antennæ, palpi, and head black-brown; thorax smoky black, often shaded with white; abdomen glossy dark brown. Fore wings moderately broad and somewhat ovate, costa not folded and flatly arched, apex blunt; white, softly clouded with grey; basal blotch large, complete, slate-black, its outer margin curved, or rounded with a very blunt elbow; at the anal angle is an erect brown-black triangular spot, dotted with black, and usually included in a large curved cloud of blue-black and orange-brown lines, which fills the hinder area from apex to anal angle; in this is a marginal row of deep black dots; cilia grey. Hind wings with their cilia smoky black or dark smoky brown. Female similar.

Underside of the fore wings smoky black, with white costal dots. Hind wings smoky black.

Very variable; the ground colour of the fore wings in the middle area is sometimes pure white; on the other hand, it is often so shaded with grey, grey-black, or slate colour, that the entire area is darkened or blackened, or else a white blotch appears only upon the dorsal margin.

On the wing in June and July.

LARVA sluggish, rather plump, wrinkled, and with deeply divided segments; pale liver-colour, or very pale grey-brown; darker when young; raised dots shining pale grey; head and back plates shining black; anterior feet black.



May and June, on sweet gale, alder, mountain ash, apple, pear, hawthorn, and the various species of *Prunus*, also on sea buckthorn, hornbeam, and oak, spinning together the top leaves and shoots and feeding upon them, spinning up in the larval habitation.

In the United States of North America this species is known as the "Bud moth," and is too well-known as a most destructive enemy of the apple crop. Its history is worked out in extreme detail in New York by Mr. G. V. Slingerland. It seems to be an introduced species in that country, having first been noticed there about the year 1841, but it is now widely distributed. With us it is most abundant throughout the southern half of England, and extends so far north as Yorkshire and Durham, but I find no record for Wales; and in Scotland only one for Midlothian. In Ireland it is recorded, doubtfully, from Sligo. It is abundant throughout Central Europe, and almost all Southern Europe; also found in Scandinavia.

2. *H. lariciana*, *Hein.*—Expanse  $\frac{1}{2}$  an inch (12 mm.) Very much like *H. ocellana*, but with narrower fore wings, and a more slender general appearance.

Antennæ brown; palpi and head hoary-grey; thorax black-brown dusted with white; abdomen grey-brown. Fore wings rather narrow, costa gently arched, apex bluntly angulated; white, dusted and clouded with grey; basal blotch large, black-brown, its outer edge obtusely angulated; before the anal angle is an erect brown isosceles-triangular spot, beyond which the whole hinder area is clouded with black and grey in delicate lines; costa dotted with black; cilia grey-black. Hind wings and their cilia dark smoky brown. Female similar.

Undersides of all the wings leaden-brown; costa of the fore wings faintly dotted with white.

On the wing from the end of May to the beginning of August, but whether in one brood only appears uncertain.

LARVA brownish flesh-colour; head, dorsal plate, and front feet dark brown; anal plate broad, darkest at its upper edge; spots of the ground colour only visible by appearing rather rough.

May and June; on larch (*Pinus larix*), drawing together the fine needle-like leaves and eating down them from the tips, then removing to another fascicle of leaves. (A. Balding.)

PUPA in the latest larval habitation.

The moth hides during the day in larch trees, or if driven out of them by a rough wind will sit on a fence or a tree trunk, or any adjacent shelter. It will fly gently in the day-time if beaten out, but at early dusk flies vigorously over the larch trees, rather high up. Probably in larch plantations in all parts of England, since it is recorded from Kent to Devon, and to Norfolk; also in Herefordshire, Worcestershire, Leicestershire, Yorkshire, and Westmoreland, but not yet recorded from Wales or Ireland; and in Scotland only in Perthshire, where it was taken by Sir Thomas Moncrieff at Moncrieff Hill. Abroad it is known to inhabit Central Europe.

3. **H. aceriana**, *Munn.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.).—Face pale brown or creamy brown; fore wings white with a brownish-pink or salmon tinge; basal blotch, and often the apex, umbreous, the former with a gently curved margin.

Antennæ black, ringed regularly with white; palpi brown, tipped with white; head light grey-brown, face paler; thorax black-brown; abdomen silvery-brown. Fore wings not very broad, costa almost straight, apex bluntly angulated; creamy-white, faintly shaded with salmon colour; basal blotch large, dark umbreous, its outer margin faintly sinuous and a little oblique; central band faintly visible,

oblique, soft pale brown, dotted with black; costa dotted with brown; two brown or black spots in the apical region; cilia creamy white with dark shading. Hind wings and their cilia pale smoky brown. Female similar, or a little larger.

Underside of the fore wings pale smoky brown, with a few white costal dots. Hind wings smoky white.

On the wing in July and August.

LARVA active, wrinkled, slightly flattened, broadest toward the head and decidedly tapering toward the tail; dull, dirty white, with the raised dots large and of the same colour; head rather flat, and, with the dorsal plate, jet black; anal plate light brown; feet grey.

May and June on poplars—*P. nigra*, *P. alba*, *P. balsamifera*, *P. tremula*, and other species—in a chamber hollowed in a twig, generally just below the origin of a leaf, or in *P. balsamifera* eating out the pith of the petiole quite into a leaf, in which it exudes its frass through a small hole in such a manner that the excrement stands up like a little brown horn. This in other poplars takes place in the twig or shoot.

PUPA light brown; in a silken cocoon among rubbish, anywhere, or sometimes in the larval burrow.

The moth, here in the suburbs of London, is during its season one of our most constantly familiar objects. It sits by day on the trunks of poplars, never hiding itself within the fissures, but sitting across them or on any projecting bit of bark as though scorning concealment, or on fences, or walls, or on almost any solid object near the trees; neat, compact, and in a more than ordinary degree pretty. If disturbed it flies swiftly to some similar resting-place, but at sunset begins to move, and then may be seen buzzing about the poplar branches and twigs till dusk. Probably more plentiful in the London suburbs than anywhere else, but tolerably common throughout Kent, Surrey, Sussex, Hants,

Dorset, Somerset, Gloucestershire, Herefordshire, Cambs, Essex, Suffolk, Norfolk, and Herts; also found rarely in Cheshire, Lancashire, and Durham. These are, so far as I know, its limits in the United Kingdom. Abroad it is found throughout Central Europe, and in Sardinia, Spain, and Norway.

4. **H. dealbana**, *Fröhl.*; **incarnana**, *Haur.* (?).—Expanse  $\frac{1}{2}$  inch (12 mm.). Head yellow-brown, with white palpi; fore wings rather narrow, white; basal blotch sharply angulated, black-brown, followed by a faint brownish oblique central band, and a brown spot in the apex.

Antennæ brown; palpi and lower part of the face white, head yellow-brown; thorax black-brown dusted with white; abdomen grey-brown. Fore wings rather narrow, costa very little arched, apex rather pointed; white faintly shaded with yellow-brown and grey; basal blotch black-brown, dusted with orange and silvery blue, its edge strongly angulated; central band a mere shade of grey or orange-brown dusting; hinder area similar with an orange-brown spot at the tip; cilia brownish grey. Hind wings and their cilia smoky brown. Female similar.

Underside of the fore wings shining leaden black, with white costal dots. Hind wings leaden white.

There is constant variation, in both sexes, in the ground colour, and in the depth and brightness of the markings; very often the whole ground colour is obscured by shading of slate-grey, or of dark brown, or black, the markings being then also often obscured.

On the wing at the end of June, and in July.

LARVA rather short, tapering at both ends but more especially behind; semi-transparent, very pale yellowish green; raised dots rather inconspicuous, pale brown; head small and pointed, shining black, as also is the dorsal plate; anal plate light brown; legs black. (Dr. J. H. Wood.)

September till April or May, on sallow, hawthorn and aspen; sometimes on oak and hazel; feeding in spring on the young shoots, eating into the substance at the heart, hibernating in a little gallery on the surface of a twig and under the shelter of a bud; Sorhagen says that it pupates under moss in a thick cocoon; Fischer says in an earth cocoon.

A lively, bright-looking, active species, sitting by day in trees and bushes and easily disturbed, when it flies swiftly to a similar hiding-place. At sunset to dusk it flies high round the upper branches of trees and seems especially partial to oaks. Very common throughout the southern half of England; more local in Staffordshire, Cheshire, Lancashire, Yorkshire, and Durham; and in Scotland very local in the Clyde district. In Wales common in Glamorganshire and Pembrokeshire; and in Ireland found at Cork, Sligo and Derry. Abroad it inhabits the whole of Central Europe, and Northern Europe except the polar region, also found in Central and Northern Italy; and in North America recorded from California.

5. *H. neglectana*, *Dup.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Face and palpi white; fore wings also white with faint clouding; basal blotch and partial central band, blue-black.

Antennæ glossy black-brown; palpi and face snow-white; back of head and the thorax black-brown, the latter with a whitish spot on either side; abdomen dull brown-black. Fore wings moderately broad, costa gently arched at the base, apex angulated and faintly projecting; white faintly clouded with grey; basal blotch blue-black mottled with white, its outer margin angulated; central band formed of a large blue-black costal spot and a following series of black and blue-black shades; apex occupied by brown-black dots clouded below with blue-black; costa dotted with deep black;

cilia blue-black. Hind wings and their cilia dark smoky brown. Female similar, rather larger.

Underside of the fore wings smoky black; costa dotted with white. Hind wings smoky white.

On the wing in June and July.

LARVA plump but wrinkled, having numerous fine hairs arising from hardly noticeable raised dots; rather glossy, pale flesh colour tinged, especially in the front, with grey; head, feet, and both plates shining black.

April and May, on willow, aspen, and poplar, feeding inside the shoots upon the woody substance—making its way in through a bud.

PUPA glossy rich reddish brown, in a close white cocoon, covered with gnawings of bark. oval in shape, and attached to the twigs (Wilkinson). The late Mr. Machin informed me that it goes to pupa always on a leaf.

A beautiful species, loving to hide by day upon the branches of willow and sometimes on aspen, or poplar trunks, sitting conspicuously across the fissures of the bark but easily disturbed, when it will hide itself among grass or herbage. After sunset it flies of its own accord high up about the outsides of the same trees or, in the London suburbs, about those of black poplar. Rather local yet to be found in the southern counties of England from Kent to Devon and Somerset; and in the eastern counties to Cambs and Norfolk sometimes commonly; also in Herts, Oxfordshire, Herefordshire, Gloucestershire, Leicestershire, Cheshire, Lancashire, Yorkshire and Northumberland; but I have no record for Wales; in Scotland it is found, but not commonly, in Roxburghshire, the Edinburgh district, Renfrew and elsewhere in the Clyde valley, and in Aberdeenshire. I am not satisfied that it has, as yet, been found in Ireland. Abroad its range

seems limited, but extends to Germany, Corinthia, and the Tyrol.

6. **H. simplana**, *Fisch.*—Expanse  $\frac{1}{2}$  inch (12 mm.).—Head white; fore wings soft creamy white; basal blotch, costal spot, and apical cilia brown-black, or black.

Antennæ black-brown, faintly barred with white; palpi and head white; thorax black dusted with white; abdomen pale brown. Fore wings rather narrow, costa straight, apex bluntly angulated, hind margin curved; bright white, softly shaded with two clouds of very pale buff; basal blotch deep black, whitened at the extreme base, its outer edge very oblique, and sharply bordered with pure white; central band only represented by a semi-circular black costal spot, and a few black dorsal dots; hind margin dotted with deep black; cilia dark grey. Hind wings and their cilia smoky brown; legs white. Female similar.

Underside of the fore wings smoky black, with white costal dots towards the apex. Hind wings leaden white.

Immediately after emergence from the pupa the white area is beautifully flushed with pink, but this colour soon fades to a mere shade of pale buff.

On the wing in June.

LARVA apparently undescribed. Said to feed in shoots of *Populus tremula* in July and September; assuming the pupa state under a turned-down leaf, but Mr. E. R. Bankes states that it is full fed in April or May, and assumes the pupa state among rubbish on the ground. I have no personal knowledge of its habits.

A very rare and local species here, apparently restricted to Kent and Sussex—except that the late Mr. H. T. Stainton recorded it from Cambridgeshire. Abroad it is found in France, Germany, Switzerland, Holland, Belgium, and Hungary.

7. *H. pauperana*, Frey.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.).—Fore wings long, narrow and pointed, white clouded with grey; basal blotch very oblique, dark brown; before the anal angle is an erect pale brown triangular spot,

Antennæ, palpi, and head black-brown; thorax similar but dusted with white; abdomen brown. Fore wings long and narrow, costa nearly straight, apex sharply angulated, hind margin very oblique and nearly straight; white much rippled with faint grey clouding; costa dotted with the same; basal blotch large, extended on the dorsal margin, grey-brown, its outer edge very oblique and sometimes blackened; before the anal angle is a pale brown triangular spot, edged by two or three black dots; of these a few more lie in the hinder area; cilia grey-brown. Hind wings pale grey-brown with whiter cilia. Female similar.

Underside of the fore wings grey-black, with two or three whitish costal dots. Hind wings leaden white.

It is stated by Mr. W. Warren that, in a perfectly fresh specimen, the margins of the markings were marked by *slightly raised* scales, as in some species of *Peronea*.

On the wing in April and the beginning of May.

LARVA apparently undescribed. Herr Schmid says “In June on field roses,” and Mr. Thurnall suggests “In the young fruit and flowers of wild sweet briar (*Rosa rubiginosa*).”

This also is a species very scarce in this country, and of which I have no personal knowledge in a living state. It is taken rarely, in the late afternoon or early evening, among wild rose on chalk-hills, and in lanes, but is said to have been found flying in the early morning. Mr. B. A. Bower records the capture of about thirty specimens in the year 1891, either by beating, or flying round rose bushes late in the afternoon. Apparently confined with us to the south-east corner of England—the counties of Kent, Sussex, Surrey, and Essex—and in them exceedingly local; but abroad, though perhaps not very common, known to occur in Ger-



many, Switzerland, Austria, Hungary, Spain, Central Italy, and Dalmatia.

8. **H. oppressana**, *Tr.*—Expanse  $\frac{5}{8}$  inch (15mm.). Fore wings not long, somewhat ovate, grey-white; basal blotch incomplete, its margin black, shaded off or broken within; central band imperfect, and with the hinder area clouded with black.

Antennæ grey-brown, ringed with paler; palpi, head, and thorax dark grey mottled with white; abdomen brown. Fore wings short, not narrow, costa arched, apex bluntly angulated, hind margin oblique; brownish white, profusely dotted with minute brown and grey clouds; basal blotch black-brown, marbled with white, bluntly angulated outside; central band restricted to a large grey-black costal cloud and a small dorsal dot—or these sometimes united by a black-brown cloud—a smaller dot lies near the hind margin, and a round black spot in the apex; cilia grey-black. Hind wings and their cilia smoky brown. Female similar.

Undersides of the fore wings pale smoky brown with dull black and white costal dots. Hind wings leaden grey.

On the wing in June and July.

LARVA semi-transparent, somewhat shining, short, fat, and soft-looking, and of a pale brown colour; head very small, deep black; thoracic plate and also prolegs deep black; a small black plate on the anal segment. (Dr. J. H. Wood.)

March, April, and the beginning of May, and from the previous autumn, on *Populus nigra* (black poplar), feeding in the spring in a bud, which it empties, and then moving to another; but when very young on the underside of a leaf in an angle where it gnaws away the surface and hides under a small silken web. Before hibernation it removes to the bark of the tree and there makes a cocoon-like habitation in which it resides till roused by the spring weather to enter a

bud. From this it projects a curious little tube of frass and silk, by which it may readily be recognised.

PUPA undescribed ; spun up among rubbish on the ground.

The moth sits during the day upon the trunk of a poplar, often squeezing itself closely into a chink or crevice, but if the weather is warm will dart suddenly away to settle quickly on some other tree-trunk. Doubtless it flies at dusk, but has hardly been observed at that time ; indeed, it is so local and usually so scarce that there is difficulty in observing its habits. In the year 1864 it was suddenly noticed in some numbers at Edmonton, London, and here in the following years many specimens were taken. Previously it had been almost unknown in this country. In addition to this locality, in Middlesex, it has been found in Surrey, Kent, Herts, Wilts, Herefordshire, Essex, Suffolk, and Norfolk, but so far as I know not elsewhere in the United Kingdom. Abroad its range appears to be restricted to Central Europe and the northern half of Italy.

#### Genus 6. **SPILONOTA.**

Antennæ simple, ciliated ; palpi blunt, not thick ; thorax very flatly crested at the back ; fore wings elongated, squared behind, costa strongly folded for nearly one half its length ; hind wings without tufts of hair-scales.

We have five species, rather closely allied.

- A. Costal margin scarcely arched.
- B. Fore wings white with smoky black markings ; palpi yellow. *S. tripunctana.*
- B<sup>2</sup>. Fore wings white or pinkish white with umbreous markings, palpi brown. *S. roborana.*
- B<sup>3</sup>. Fore wings greyish white with rich brown markings. *S. suffusana.*
- B<sup>4</sup>. Fore wings rosy white or brownish white, with brown markings. *S. incarnatana.*
- A<sup>2</sup>. Costal margin much arched. *S. rosevolana.*

1. **S. tripunctana**, *Schiff.*—Expanse  $\frac{3}{4}$  inch (18–19 mm.). Fore wings elongate, broad behind, white, with the base, apex, and intermediate clouds smoky-black.

Antennæ notched, ciliated, black-brown; palpi light yellow; head brown; thorax black-brown; abdomen grey-brown, with a yellow anal tuft. Fore wings elongate, costa deeply folded from the base to the middle, beyond a little arched; apex bluntly rounded, hind margin straight; white; basal blotch large, smoky black, its outer margin oblique and much produced and clouded along the costa; toward the anal angle is a triangular smoky black dorsal spot; and the hind marginal region is much clouded with the same colour; intermediate white space dotted with one or more similar clouds; cilia smoky black. Hind wings and their cilia smoky white. Female similar, but without folded costa.

LARVA dirty brown-yellow with blackish longitudinal stripes; head and dorsal plate black-brown.

May and June on rose, in the young shoots, or between two united leaves; also on bramble. Feeding indifferently on wild roses, and on those cultivated in gardens.

PUPA blackish green, the segments ringed with black; in the larval habitation.

The moth hides during the day in rose bushes, and if disturbed flies briskly about them for some little time before settling again. It is not often in any abundance in any one place, but may be found about almost every rose-bush in any hedge, and probably every bed of roses in the gardens, occurring even in the suburbs of London, and apparently everywhere in the United Kingdom except the extreme north of Scotland, and the Isles—though it has been noticed in the Isle of Skye. Abroad it is common all over the temperate regions of Europe, also in Asia Minor and the Trans-Caspian region.

2. **S. roborana**, *Schiff., Tr.*; **cynosbana**, *Fab. (?)*.—  
 Expanse  $\frac{5}{8}$  to  $\frac{7}{8}$  inch (16–22 mm.). Fore wings elongated  
 and rather even in width, apex sharp; white or pinkish  
 white dusted with grey or brown; basal blotch and anal and  
 apical spots reddish brown or umbreous.

Antennæ notched, ciliated, brown; palpi, head, and thorax  
 dull umbreous; abdomen whitish-brown. Fore wings elon-  
 gated, of very even width; costa folded narrowly and evenly,  
 apex bluntly angulated; white, much sprinkled with small  
 grey or rosy brown clouds; basal blotch large, its margin  
 oblique, and nearly straight except that it is narrowly and  
 faintly produced along the costa; near the anal angle is  
 a brown dorsal triangular spot and above it some black dots;  
 the large white area above and around it neatly stippled with  
 lines of minute brown clouds; apex clouded with chestnut  
 brown and grey; costa rather irregularly and sparsely dotted  
 with brown; cilia grey. Hind wings and their cilia smoky  
 white. Female similar, but without the costal fold.

Underside of the fore wings smoky black, with four pairs of  
 white dots on the costa. Hind wings white, with the apex  
 smoky black.

Usually rather constant in colour, but on the coast among  
 the little burnet-rose it is often very prettily tinged and  
 stippled with pink and grey.

On the wing from June till August.

LARVA short and obese, tapering almost from the middle to  
 the extremities; head small, light brown; dorsal plate black;  
 anal plate very small, also black; body shining brown, or  
 liver-colour, semi-transparent, with the intestinal canal  
 visible.

End of May and June, in the young shoots of rose—both  
 wild and cultivated—drawing and twisting the leaves tightly  
 together, and eating out the heart, and also the young  
 buds.

PUPA light brown. In the larval habitation.

The moth sits in rose-bushes during the day and is then easily induced to fly; but moves about of its own accord in the evening and night, and comes readily to a strong light. Common everywhere in the south of England to Leicestershire even sometimes most abundant along the beds of *Rosa spinosissima* on the coast; also frequent in the eastern and western counties; apparently rare or absent in some parts of the Midlands, though found in Staffordshire, Cheshire, Lancashire, Yorkshire, Durham, and Northumberland. In Wales in Glamorganshire and Pembrokeshire; in Scotland in the Edinburgh district, Renfrew, Ayrshire, and Argyle; and in Ireland on the Dublin coast and in Derry. Abroad all over Europe, and the trans-Caspian regions.

3. **S. rosæcolana**, *Dbl.*.—Expanse  $\frac{5}{8}$  to  $\frac{7}{8}$  in. (15–22 mm.) Fore wings broad, with arched and thickly dotted costa; white, with reddish brown basal blotch and apical region; ocellus tinged with slate-blue.

Antennæ notched, ciliated, brown; palpi, head, thorax, and abdomen dull brown. Fore wings broad, and strongly arched at the costa, which is folded from the base; apex squarely angulated, white, faintly clouded with grey; basal blotch not very large, dark brown, its margin nearly erect, but rounded or faintly indented; from the dorsal margin a narrow, erect but broken, yellow-brown spot, edged with black dots, is enclosed between pale grey shaded lines or surrounded by faint brown cloudy dots; apex crossed by chestnut red and grey-brown streaks; ocellus faintly indicated in slate-blue; costa thickly and very regularly dotted with pairs of short black streaks in brown clouding; cilia grey-brown. Hind wings pale smoky brown, with whiter cilia. Female similar but larger, with the costa plain, but often still more strongly arched.

On the wing late in June and in July.

LARVA thick, fat, rather wrinkled, somewhat cylindrical, yet tapering at each extremity; head brown; dorsal plate

black; anal plate brown; body hairy, the whole dorsal surface purplish brown down to the spiracles; ventral surface yellowish white. Curiously like an infant larva of *Cossus ligniperda*.

May and the early part of June on sweet-briar (*Rosa rubiginosa*) and other roses, especially cultivated varieties, in the young growing shoots, drawing together the leaves and eating out the heart; if the shoot is succulent, boring down into it, if not, moving readily to a fresh shoot; but generally sluggish in its movements.

PUPA light brown; in a cocoon among rubbish.

This moth also hides among rose bushes, and is easily induced to fly, especially in the afternoon, but its natural time of flight is rather late in the dusk and on through the night, so that with a lantern it may often be seen on the wing towards midnight. Not recognised as a distinct species till the year 1850, when it was described by the late Mr. H. Doubleday. Now sufficiently common even in the London suburbs, I might almost say *especially* in the suburbs of London, but it is common in the gardens of other cities and large towns more even than in the country. Apparently to be found throughout England to Lancashire and even Durham, though not so commonly in the north; and in Wales in Glamorganshire and Pembrokeshire. Said also to have been noticed in Scotland—in the botanical gardens at Glasgow—but I find no satisfactory record elsewhere nor in Ireland. Abroad it may be found in Germany, Lower Austria, Jutland, and the trans-Caspian region; but it is probably not yet fully recognised everywhere.

4. *S. suffusana*, Zell.; *trimaculana*, Haw.—Expanse  $\frac{5}{8}$  inch (16 mm.) Fore wings comparatively narrow; white dusted with grey and brown; basal blotch large, brown; ocellus also large, brown and golden brown, with silvery lines; apex brown and orange brown.

Antennæ notched, ciliated, dark brown; palpi, head, and thorax blackish brown; abdomen pale brown. Fore wings rather elongated, costa arched beyond the middle, apex bluntly angulated; white obscured by much grey clouding; basal blotch large, black-brown, its outer edge erect and faintly curved; a tall irregular brown spot on the dorsal margin is formed into a large blotch, or ocellus, by an edging and clouding of grey enclosing lustrous lines; apex black-brown edged by a broad curved chestnut-brown stripe or line, which meanders to the anal angle; in its costal portion are three pairs of white dots; cilia black-brown. Hind wings and their cilia smoky brown. Female similar, but without the costal fold.

Underside of the fore wings dark smoky brown, with faint white costal dots. Hind wings pale smoky brown.

On the wing from the end of May till July.

LARVA short and obese, tapering to both ends from near the middle; liver-brown, tinged with greenish brown, sometimes yellowish beneath; head light brown; dorsal plate black; anal plate dull yellow.

April and May on hawthorn, in the young shoots, drawing the leaves together and eating out the heart; preferring a strong terminal shoot which shows the distortion very little, and usually one which is placed high up in the bush; moving readily from shoot to shoot, but when full-fed leaving it to spin up among rubbish.

PUPA light red-brown; rather short and stout; anal segment very blunt and rounded; abdominal spines few and short. In the larval habitation.

The moth hides itself in tall hawthorn hedges, and is rather sluggish, flying unwillingly when disturbed, but much more active toward dusk. Common throughout the southern half of England, including the eastern counties, where it is plentiful; also found less frequently in Stafford-

shire, Cheshire, Lancashire, and Yorkshire, but common in Northumberland and Durham; in Wales in Glamorganshire and Pembrokeshire; in Scotland in Roxburghshire and the Edinburgh and Clyde districts; and in Ireland in Galway and Sligo. Abroad it is widely distributed through Central and Southern Europe, Sweden, Livonia, Bithynia, and Persia.

5. *S. incarnatana*, *Hüb.*; *amœnana*, *Hüb.*.—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–19 mm.). Fore wings rosy white or brownish white with the basal blotch, a slender imperfect central band, and the apex, rosy brown.

Antennæ light brown; palpi and head umbreous; thorax purplish brown dusted with pinkish white; abdomen silky, pale grey-brown. Fore wings not broad, costa folded and nearly straight, apex bluntly angulated; bright pinkish white or rosy white, rippled with fine smoky grey lines; basal blotch umbreous, containing slender erect whitish lines, its outer edge perpendicular; central band narrow, ill-defined, oblique, reddish brown, joining a triangular upright black-brown dorsal spot; apex broadly clouded with chestnut, in which are two pairs of white costal streaks, and some white hind-marginal dots; costa spotted with brown; cilia grey. Hind wings and their cilia smoky-white. Female similar, but without the costal fold.

Underside of the fore wings leaden brown with minute white costal dots. Hind wings leaden white.

Variable in colour and in size according to situation. On the sandhills of the coast are found, in abundance, small specimens having dark brown markings or a general tendency to ochreous brown; in other places where the sandhills are more elevated there are larger forms with clearer pink colouring, and on some of our chalk-hills, in Surrey and Essex, really brilliant pink specimens, almost as large as *S. roborana*.

On the wing in July and August.



LARVA apparently undescribed. Treitschke says that it is very similar to that of *S. roborana*, but smaller. There can be no doubt that the smaller forms feed upon *Rosa spinosissima* on the coast; the larger are said to substitute *Rosa canina*. I strongly doubt its feeding on birch, with us.

PUCPA light brown with darker wing cases (Treitschke).

The moth seems to hide always among rose of some species; on the sea sandhills in abundance in the great beds of the pretty little burnet-rose (*Rosa spinosissima*), springing up and flitting away in numbers from the footstep in the afternoon; inland, usually in chalk districts, among *Rosa micrantha*, *R. rubiginosa*, and *R. canina*. When disturbed it flies but a short distance to settle again among rose; but at sunset begins to move about of its own will, and may sometimes then be seen buzzing about in hundreds; and continuing its flight till darkness hides it from view. The scarce, inland, larger form is found in Epping Forest, Essex, on Box Hill, and elsewhere in Surrey and Sussex; and rarely in Norfolk, Herefordshire and Gloucestershire; the small coast form in Dorset, Cornwall, Cheshire, Lancashire, Westmoreland, Durham and Cumberland; in South Wales in Glamorganshire, and in North Wales at Conway Bay, and Llandudno; while a larger—intermediate—form is common on the Pembroke coast. In Ireland the small varieties abound at the Hill of Houth and at Malahide on the Dublin coast near Cork, and on the sandhills of Down and Derry; but I find no record in Scotland.

Abroad its range extends over Central and Southern Europe, Finland, Livonia, Asia Minor, Southern Siberia, and the trans-Caspian region.

Genus 7. **ASPIS.**

Antennæ ciliated; palpi thick, porrected; thorax rather stout; fore wings broad with a long costal fold; hind wings smooth, broad and short.

1, **A. uddmanniana**, *Linm.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.). Fore wings broad and squared, very pale purplish brown with a large chocolate dorsal, upright blotch.

Antennæ notched, ciliated, umbreous dotted with paler, palpi, head and thorax grey-brown; abdomen glossy and rather long, grey-brown. Fore wings broad, costa folded, yet much arched; apex squarely angulated, hind margin straight and almost perpendicular; pale grey-brown, with a purplish flush, abundantly rippled with faint olive-brown lines, in which the basal blotch is just visibly darker, and rather large, its margin oblique but incomplete, throwing off a cloud of the same colour near the costa; on the dorsal margin is a large, upright, somewhat trigonate, rich chocolate spot, reaching to the middle of the wing; across the apex lies an olive-brown cloud, in which are several pairs of white costal streaks; cilia olive brown. Hind wings and their cilia light smoky brown. Female similar, but without the costal fold.

Underside of the fore wings smoky brown with faint whitish costal spots. Hind wings leaden white, latticed at the apex with short brown lines.

On the wing in June and July.

LARVA sluggish and fleshy, dirty red-brown; head small, shining black; mouth brown; dorsal plate black, edged at the sides with brown, and in front divided by a slender dorsal line; raised dots chestnut-brown; anal plate black, edged with brown; legs shining black.

May and June on bramble, drawing together the leaves at the tip of a shoot so as to form a solid ball, feeding inside on the heart leaves, but not burrowing into the stem, forming

a chamber which is stuffed tightly with frass. Abroad said to feed also on raspberry.

PUPA black-brown. Sorhagen says spun up in a white cocoon in moss.

The moth frequents bramble in the daytime, sometimes sitting conspicuously on the leaves, but usually hidden among them, preferring scattered plants on a hillside, or in the most open parts of a wood; when disturbed by a footstep it is very active and lively, flying swiftly to another bramble-bush, and hiding near the ground. Its natural flight is rather late in the evening, and after dusk it will come to a strong light. Found occasionally in the suburbs of London, and common throughout the South of England to Oxfordshire, often abundant; also in the eastern and western counties, and more locally in Cheshire, Lancashire, Yorkshire, Durham and Northumberland. In Wales in Pembrokeshire; in Scotland in Renfrew, Ayr, and Arran; and in Ireland on the Dublin coast, in the County Cork, and in Derry. Abroad it is distributed throughout Central and Southern Europe, Finland, Scandinavia, Asia Minor and Syria.

#### Genus 8. **ORTHOTÆNIA.**

Antennæ moderately thick, naked; palpi short and thick, broadly tufted; thorax smooth; fore wings broad, without fold; hind wings ample, having a short tuft of hair-scales in the middle of the base.

We have eight species.

A. Fore wings silky olive-brown, often banded with darker.

*O. branderiana.*

A<sup>2</sup>. Fore wings reddish-drab, with a narrow darker central band.

*O. striana.*

A<sup>3</sup>. Fore wings pale, or reddish, umbreous.

B. A paler straight stripe runs in from the apex.

*O. antiquana.*

- B<sup>2</sup>. A large obscure dark brown spot occupies the middle of the wing. *O. cricetana*.
- A<sup>4</sup>. Fore wings purplish-brown. *O. rufana*.
- A<sup>5</sup>. Fore wings glistening light purple-red. *O. purpurana*.
- A<sup>6</sup>. Fore wings dark crimson, faintly dotted with silvery white. *O. arbutella*.
- A<sup>7</sup>. Fore wings purple-crimson, faintly latticed with darker. *O. mygindana*.

1. **O. branderiana**, *Linn.*.—Expanse  $\frac{7}{8}$  to 1 inch (21–25 mm.). A large species, silky olive-brown; fore wings often with one or two broad transverse dark brown bands.

Antennæ dark brown; palpi, head, and thorax olive-brown; abdomen paler brown. Fore wings ample, broad and without fold, silky or faintly glistening; costa arched toward the base, apex bluntly angulated; soft olive-brown without markings, or else paler olive-brown with, more or less distinctly, a large deep umbreous basal blotch with its outer margin in part erect, the rest oblique; and a dark brown central band, irregular, but very broad on the dorsal margin, and diminishing to a mere point at the costa; cilia olive-brown. Hind wings smoky brown with a golden gloss; cilia dull white. Female similar, or sometimes having the markings more distinct.

Underside of the fore wings dull leaden-brown. Hind wings leaden-white.

On the wing at the end of June and in July and August, occasionally to the beginning of September.

LARVA slender, very active, when young nearly black, with raised black dots, bearing hairs; when more grown, head, dorsal plate, and claw-feet black, the dorsal plate bordered in front with white. (*Zeller.*) When full grown, dirty pale green.

May, in a folded, joined, or rolled leaf of aspen (*Populus tremula*); also on *Populus canadensis*.

PUPA dull black ; in the larval habitation.

The moth prefers to sit by day high up in an aspen or poplar tree, and when disturbed will fly back to near the same height so that it is difficult to secure ; at dusk it flies wildly over the same trees. A local species, but rather common where it occurs ; recorded from various parts of Kent, Essex, and Suffolk ; also in Middlesex, Herts, Hants, Herefordshire, and Worcestershire, rarely in Surrey and Warwickshire, and near Sheffield, Yorkshire. Except that Mr. A. Horne, of Aberdeen, has a specimen which he took himself at Collieston, on the east coast of Scotland, I know of no other localities for it in these Islands. Abroad it is found throughout Central Europe except in Holland ; also in North Italy, Scandinavia, Southern Siberia, and Japan.

2. *O. antiquana*, *Hüb.*—Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings broad, especially so behind, pale brown or dull brown, with a roughly trigonate central dark cloud, towards which a pale dash points from the apex.

Antennæ ciliated, dark brown ; palpi, head, and thorax dull brown ; abdomen pale brown. Fore wings broad, especially so behind ; costa not folded, gently arched ; apex sharply angulated and retuse ; pale brown-drab, or rosy brown ; the dorsal area broadly plain, forming a unicolorous pale stripe ; basal blotch faintly suggested by two or three grey-brown dashes or dots ; central band by a sharply cut-off trigonate black or brown blotch in the middle, having above it a similar blotch on the costa ; a sharp cloudy black shade edged by a very pale stripe runs between them into the apex, across which runs a slender brown or black streak ; cilia pale brown, dashed with black. Hind wings smoky brown with paler cilia. Female similar or with fainter markings.

Underside of the fore wings smoky black ; costa and hind margin narrowly pale brown. Hind wings leaden-white.

As already suggested, somewhat variable; ranging into forms distinctly pink or red-brown, or with only the markings red-brown, or to uniform dark brown, or equally plain pale drab varieties.

On the wing in June, July, and August.

LARVA moderately slender: white faintly tinged with primrose-yellow; dorsal line slender, rather darker; head clear pale brown, its lobes oval; plates hardly visible, very faintly tinged with brown.

October to May or June in the underground stems, or fleshy roots, of *Stachys*, eating regularly through the long, constricted root stems of the plant during the winter, and moving therein quite freely backwards or forwards. There is some doubt about the species of *Stachys*. Apparently it cannot be *S. arvensis*, which is an annual; perhaps *S. ambigua* or *S. palustris*—certainly a field-growing plant.

PUPA light brown—very restless. Spun up among earth or rubbish on the ground; not in the larval habitation.

The moth hides during the day close to the ground among the herbage about its food plant: and is not willing to be roused except late in the afternoon; but from sunset to dusk it flies actively and rather swiftly, yet with a buzzing action over the plants, and continues its flight into the night, coming sometimes to a strong light. Rather partial to damp fields and moist places, and to be found in snitable places in the south of England from Kent to Dorset and Somerset; in the east to Norfolk and Cambridgeshire; and in the west from Gloucestershire to Lancashire; also in Staffordshire, Yorkshire, Northumberland, and Durham; in Wales in Carnarvonshire and Pembrokeshire; in Scotland apparently everywhere, indeed a single specimen is recorded from Shetland; and in Ireland in various counties from Cork to Derry. Abroad it is found in Iceland, throughout Central Europe, and in South-east Russia.

3. **O. striana**, *Schiff.*—Expanse—male,  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.), female  $\frac{5}{8}$  inch (15 mm.). Fore wings rather elongated, pale brown with a reddish flush, and a narrow erect dark brown central band.

Antennæ ciliated, dark brown; palpi, head, and thorax dull umbreous; abdomen black-brown, barred with pale grey; anal tuft pale yellow. Fore wings elongated, costa flatly arched, apex bluntly angulated; pale brown or pale reddish-brown, stippled all over with fine irregular brown lines; central band umbreous, narrow and irregular but nearly upright, most narrow at the wing margins; at the apex of the wing a small umbreous oblique line, pointing inwards, meets another a little below so as to form an elbow not far from the hind margin; costa dotted with brown; cilia pale brown. Hind wings and their cilia smoky brown. Female much smaller, but stouter; the markings often more sharply defined.

Underside of the fore wings dark leaden-brown; costa dotted, and hind margin shaded, with white. Hind wings leaden-white.

Usually very constant in colour and markings, but when reared some, females especially, show very pretty pink and reddish variations in the ground colour.

On the wing from May till August, but whether in one or two generations is not clearly ascertained.

LARVA when young dirty white, with a large dark grey dorsal vessel; head light brown; dorsal and anal plates pale brown. At full growth whiter but very little changed except in size.

March till June—but probably from the previous autumn—on common dandelion (*Taraxacum officinale*), feeding when young on the skin of the tap-root, but when older eating out its entire substance. Probably on other tap-rooted *Compositæ*.

PUPA light brown, in a cocoon in the hollow space eaten out of the root-stock of dandelion.

♀ Rather a common species in barren pastures and on hill sides, sitting during the day among herbage; but the male is exceedingly lively in fine weather and flies most freely in the sunshine if disturbed, in so lively a manner indeed as to give it the appearance of a day-flier. Its natural time of flight, however, is at dusk and in the night, and it will come readily to light. The female sits upon the food plants in the sunshine as well as at night and is always sluggish. To be found occasionally on grass lawns in the London suburbs, and commonly throughout the southern, eastern and western counties of England, but not recorded beyond Yorkshire, Lancashire and Durham with the exception of Renfrew in Scotland; in Wales it is common in Pembrokeshire and Glamorganshire, but I have no record for Ireland.

Abroad it is common throughout Central and Southern Europe and found in Sweden.

4. *O ericetana*, *Bent.*; *Westw.*; *trifoliana*, *H.-S.*—  
 Expanse  $\frac{5}{8}$  to  $\frac{7}{8}$  inch (16–21 mm.). Fore wings rich dark velvety brown or reddish-brown, with an ill-defined darker velvety central cloud.

Antennæ ciliated, black-brown; palpi, head, and thorax umbreous; abdomen grey-brown. Fore wings moderately broad, costa nearly straight, apex squarely angulated, hind margin somewhat retuse; soft warm umbreous or reddish-brown; basal blotch large but only faintly suggested, hardly darker; central band represented by a large, dark, velvety-chocolate cloud, the lower portion of which is darker, and throws off a fine undulating line to the base of the wing; toward the hind margin are one or two chocolate cross-streaks. Hind wings smoky brown, with dull white cilia. Female similar; but often larger and darker.

Underside of the fore wings smoky black; costa and hind margin pale brown. Hind wings leaden-brown.

Northern specimens are paler in colour.

On the wing from June till August.



LARVA undescribed. I reared a moth from roots of *Stachys* along with *O. antiquana*, but the larva was not observed.

Mr. Atmore informs me that it feeds in roots of *Mentha arvensis*; Stange says in those of *Picris*; others in those of grass and clover. The balance of evidence seems to be in favour of the mint (*Mentha*).

The moth hides during the day among short herbage, close to the ground, and is rather sluggish; but at sunset begins to be active, and very soon after flies freely about mint, clover, and other low-growing plants; and from its rather slow and buzzing flight is easily caught. Not usually a common species, but probably, from its unwillingness to fly much by day, often overlooked. Recorded as occurring in Kent, Surrey, Sussex, the Isle of Wight, Dorset, Cornwall, Wilts, Berks, Oxfordshire, Essex, Suffolk, Norfolk—sometimes commonly—Cambridgeshire, Gloucestershire, Herefordshire, Worcestershire, Cheshire, Lancashire, Yorkshire, Durham, and Westmoreland. In Wales I found it in plenty in Pembrokeshire in the clover fields; in Scotland the Rev. Canon Cruttwell discovered it four years ago *abundantly* on a slope at the foot of Ben Lawers, Perthshire, and Sir Thomas Moncrieff had, long before, found it at Moncrieff Hill. In Ireland the only record that I have is that of Mr. Donovan at Cork. Abroad its range is through Central Europe, Italy, Dalmatia, Livonia, Sweden, and Bithynia.

5. *O. purpurana*, *Haw.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings purple-pink, or purple-drab, frosted with white, but without markings.

Antennæ light brown; palpi, head, and thorax light purplish-pink; abdomen silvery grey. Fore wings rather elongated, even in width; costa very gently arched; apex bluntly angulated; hind margin slightly oblique; dull pink or purple-pink, without markings, but with a general fine frosting of white atoms, and a series of minute white dots on

the costal margin; the hind margin is edged with a fine carmine line; cilia pink. Hind wings and their cilia smoky white. Female stouter, but less in expanse of wing, and of equally brilliant colour.

Underside of the fore wings pale leaden-brown; costa paler brown; cilia bright pink. Hind wings leaden-white.

Apparently variable in colour, but this arises mainly from the great rapidity with which its brilliant colour fades during life toward dull drab or dirty buff.

On the wing at the end of June and in July.

LARVA active, wriggling sharply backwards when disturbed; long and rather thin; head small, reddish-brown, mouth parts darker; body of yellowish-white, dorsal plate pale ochreous; pulsating vessel showing as a narrow darker dorsal line; raised dots small and very inconspicuous, each bearing a very short, fine, dark bristle; legs yellow; ventral area paler, prolegs concolorous. (W. H. B. Fletcher.)

May, June and the beginning of July on the roots of *Sonchus arvensis* and *S. asper* (sow-thistles), gnawing the exterior of the fleshy root, and living underground in a silken tube. Feeding also, in a similar manner, on roots of dandelion.

PUPA light red; the abdominal segments furnished on the back with two rows each of short teeth, those of the first row the larger. (W. H. B. Fletcher.) In a tough white fusiform cocoon, twice as long as the pupa; just beneath the surface of the ground.

The moth sits all day among low-growing herbage and is unwilling to fly, yet if roused goes away with great swiftness. It is most easily obtained about sunset and after, when it buzzes quietly about the herbage and will sit conspicuously on the leaves of clover, where its great beauty is especially visible. Its favourite haunts are rough fields, railway banks, hill slopes and poor pastures generally,

and it may be attracted by a strong light after dark. A local species, but rather common in favoured spots; found in Surrey, Kent, Sussex, Middlesex, Dorset, Somerset, Gloucestershire, Herefordshire, Berks, Herts, Oxfordshire, Cambridgeshire, Norfolk, and Suffolk. In Wales I found it commonly in Pembrokeshire; in Scotland Mr. K. J. Morton secured it in Wigtownshire; and in Ireland it is not rare in the counties Dublin and Cork. Abroad it is known to occur in Germany and Finland, but it is usually confounded with the next species.

6. **O. rufana**, Scop.—Expanse  $\frac{3}{4}$  inch (18 mm.). Fore wings dull purple-brown or olive-brown, with darker dusting but without definite markings.

Antennæ ciliated, dark brown; palpi and head light brown; thorax umbreous; abdomen rather long, grey-brown. Fore wings broad, especially so behind; costa very slightly arched, apex bluntly angulated; purplish-brown or olive-brown, without distinct markings but rippled all over with soft olive-brown lines, which sometimes thicken into a faint central cloud; cilia brown. Hind wings and their cilia smoky brown. Female similar.

Underside of the fore wings leaden-black; costa and hind margin whitish-brown. Hind wings leaden-white.

On the wing in July and August.

LARVA apparently unknown—the published statements quite unsatisfactory.

Apparently first noticed in this country about the year 1863 in Westmoreland and North Lancashire. The captor, the late Mr. J. R. Hodgkinson, stated that it appeared to be most active at mid-day under a hot sun, and that the females appeared in the proportion of about one in twenty. Probably it is still to be found in that district, but I have no other records in the United Kingdom. Its *shape* is so different from that of the last named species that I feel sure of their distinctness,

apart from the very different range of colour. Abroad it is said to be common throughout Central and Northern Europe, Central and North Italy, Dalmatia and Norway, but doubtless these records include *O. purpurana*.

7. **O. arbutella**, *Lin.*—Expanse  $\frac{1}{2}$  inch (12 mm.). A small species—fore wings rich purple-red with several irregular steel-blue transverse lines.

Antennæ ciliated, black-brown; palpi dull black; head and thorax purple-red; abdomen black-brown. Fore wings narrow, costa but little arched, apex blunt; rich dark red or purple-red; crossed everywhere by slender, irregular, silvery or steel-blue lines and without other definite markings; cilia dull red. Hind wings and their cilia smoky brown. Female similar.

Underside of fore wings smoky black, of the hind wings pale lead colour.

On the wing at the end of May and through June.

LARVA grey-brown or blackish, slightly hairy; head black; dorsal plate pale brown.

May, on *Arctostaphylos uva-ursi*, among the spun-together terminal leaves, eating out the heart of the shoot. It is elsewhere stated that the larva feeds in August, but this requires confirmation, and also some indication as to whether it refers to a second brood or to the young larva before hybernation.

PUPA undescribed—in the larval habitation.

The moth is said to fly in the afternoon sunshine; it is apparently found exclusively on the higher parts of mountains where its food-plant grows in sheltered hollows, and is very local. So far as I am aware, we have it only on mountains in Scotland, especially those of Perthshire and Aberdeenshire, but probably further investigation is desirable. Abroad it is found on the mountains of Southern France,

Germany, Switzerland, Carinthia, the Tyrol, Norway, Lapland, and Western Russia.

8. *O. mygindana*, *Schiff.*; *flammeana*, *Fvrl.*; *fulvipunctana*, *Haw.(?)*.—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings long, shining, ashy purple with a thick latticing and dusting of deep purple-red. Female decidedly smaller, with narrower wings.

Antennæ ciliated, smoky black; palpi, head, and thorax dark purple-brown; abdomen silvery brown. Fore wings elongated, costa faintly arched, apex sharply angulated, yet the extreme tips rounded; hind margin oblique; silvery or ashy purple, abundantly latticed and clouded with rich deep purple-crimson; markings faint or absent; central band, when visible, oblique, narrow, and obscure, deep purple or blackish-purple; beyond this the nervules are much streaked with the same; cilia purple. Hind wings and their cilia smoke-colour. Female smaller—often decidedly so—with narrower fore wings; and the hind wings darker.

Underside of the fore wings pale, smoky, purplish-brown. Hind wings leaden-white.

On the wing in June and July.

LARVA fleshy, dark red, head shining black. (Wilkinson.)

April to June, on *Vaccinium vitis-idaea*, *V. myrtillus*, *Myrica gale*, and *Arctostaphylos uva-ursi*, drawing together the leaves of a terminal shoot, eating out the heart, and also the parenchyma of the leaves.

PUPA shining chestnut-brown, abdomen paler.

The moth flies in hot afternoon sunshine about *Vaccinium* and its other food-plants in moorland and mountain districts, usually confining itself to the higher parts of the hills, though common among *Vaccinium* in the mosses of Cheshire

and the north of England. There is, however, a tradition of its former existence in the fens of Norfolk; it was reported nearly half a century ago as common in Worcestershire, and more recently to occur in Somerset. Its usual range, however, is more to the north, from Cheshire through Lancashire, Yorkshire, and Westmoreland, and in Scotland in the Edinburgh district, and Perthshire. Abroad it is well distributed in Norway and other parts of northern Europe, the Alps, the mountains of Germany and Galicia, and in Armenia.

### Genus 9. **RETINIA.**

Antennæ moderately stout, naked; palpi short and thick, but porrected and narrowly tufted; head very rough with upstanding scales; thorax smooth; fore wings rather evenly narrow, without fold, blunt behind; median nervure of the hind wings very shortly tufted.

We have seven well-known species, and possibly two more, as follows.

- A. Fore wings rich orange-red or brick-red, with paler stripes and lines.
- B. The stripes and lines bright white, extending to the dorsal margin. *R. pinicolana.*
- B<sup>2</sup>. Stripes yellowish-white; dorsal area occupied by a yellowish shade. *R. buoliana.*
- A<sup>2</sup>. Fore wings silvery grey.
- C. Fore wings narrow, pointed, tipped with purple. *R. duplana.*
- C<sup>2</sup>. Fore wings narrow, blunt, tipped with rusty-brown. *R. posticana.*
- C<sup>3</sup>. Fore wings moderately broad, blunt, tipped with rust-red. *R. turionana.*
- C<sup>4</sup>. Fore wings moderately broad, blunt, markings dark brown, irregular. *R. resinella.*

- C<sup>5</sup>. Fore wings short, blunt, markings dull brown, in straight bands. *R. sylvestrana*.
- A<sup>3</sup>. Fore wings silvery-brown.
- D. Markings irregular, deeper brown. *R. pinicorana*.
- D<sup>2</sup>. Markings regularly reticulated, red-brown. *R. retiferana*.

1. **R. buoliana**, *Schiff.*—Expanse  $\frac{3}{8}$  to  $\frac{7}{8}$  inch (15–21 mm.). Fore wings rich brick-red, with two smeared yellowish shades from the base to the middle, followed by similar cross lines.

Antennæ dark brown, dusted with white; palpi and head white above, orange-red at the sides; thorax pale orange-red; abdomen hoary brown. Fore wings rather elongated, costa flatly arched but without fold, apex bluntly rounded, hind margin curved; bright orange-red with paler shades especially toward the dorsal margin, which is dull yellow: subcostal nervure also broadly shaded with dull yellow: the area from before the middle throughout is variegated with silvery-white or pale yellow transverse lines, two of which, beyond the middle, ordinarily in some part coalesce, producing an inverted **V** or **Y**-mark, or one of these lines is quite straight and perpendicular; cilia white with a black basal line. Female similar but often larger and having the pale lines more silvery and sharper.

Underside of the fore wings smoky brown; the costa pink, with white dots; hind margin white. Hind wings smoky brown, with white cilia.

On the wing in June and July.

LARVA fleshy, sluggish, dirty red-brown; head small, black, shining; dorsal plate divided by a pale line; sides reddish-brown; underside paler; anal segment crossed by a row of dark spots; legs tipped with black. (Wilkinson.)

Autumn to April. May and even June on Scotch fir (*Pinus sylvestris*), feeding on the young shoots, which it checks and

distorts in their growth, sometimes causing them conspicuously to droop. This is, however, only after hibernation. The very young larva feeds very obscurely in buds in the same trees in autumn. It is said also to feed on *Pinus insignis*, *P. austriaca* and *P. excelsa*.

PUPA dark brown, very glossy; abdomen more dull and paler, each segment roughened with two rows of minute spines. In a cocoon in the infested shoot of fir, emerging through a hole in the side of the drooping portion.

The moth rests during the day in fir-trees, and if disturbed dashes about the tree and soon settles again. In bright sunny afternoons it is very lively and will sometimes fly freely of its own accord. Its usual time of flight is however after sunset and till dusk, when it is to be seen in numbers dashing about over young firs, or around the larger trees. Its flight is evidently continued into the night, since it comes not infrequently to a strong light. Plentiful among Scotch firs throughout the Southern and Eastern counties of England and tolerably common in the remainder to Yorkshire; but I find no record for Scotland or Wales, and in Ireland only in Antrim, but there surely must be need of more extensive observation. Abroad it is found throughout Europe and Siberia, and in the Korea.

2. **R. pinicolana**, *Dbl.*.—Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings bright orange-red with numerous silvery-white meandering markings which distinctly attain the dorsal margin.

Antennæ dark brown, barred with paler; palpi and head white, dusted with orange-red; thorax orange-red, the sides white; abdomen silvery-grey. Fore wings elongated, costa flatly arched, apex and hind margin rounded; bright orange-red; before the middle is a slender erect silvery-white transverse stripe, broadly forked toward the costa.



beyond the middle a broader similar line or stripe, more broadly forked toward the dorsal margin; between is a distinct white costal dot, and beyond a fine erect submarginal line—the bright ground colour and the shining white lines are all distinct and well marked to the extreme dorsal margin—cilia silvery-white. Hind wings pale smoky brown with white cilia. Female larger, and having the hinder silvery-white stripe more distinct, otherwise similar.

Underside of the fore wings dark smoke-colour; costal spots and cilia white. Hind wings smoky white.

On the wing in July and August.

LARVA apparently undescribed; in the shoots of Scotch fir (*Pinus sylvestris*)—said to prefer a leading shoot—and also in spruce fir (*P. abies*).

The moth is not of so lively a disposition as the last species, and if disturbed in its haunt in a fir-tree by day will fall to the ground rather than fly; its natural flight towards dusk is straighter and more sedate, though it then flies over the trees and high branches. Found with us throughout the Southern Counties of England from Kent to Somerset, and the Eastern to Norfolk; also in Berks, Herts, Herefordshire, Cheshire, Lancashire, and Yorkshire; but I have no record of its more extensive distribution in these Islands, and abroad it seems to have been usually confounded with the last species.

3. **R. turionana**, *Hüb.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.). Head and thorax orange-yellow. Fore wings silvery-grey with numerous brown perpendicular stripes; apex broadly rust-colour.

Antennæ dark brown; palpi, head, and thorax yellow-brown; abdomen silvery-white. Fore wings elongated, costa nearly straight, apex and hind margin rounded; pale silvery-grey, dusted and cross-striped from the base with brown; shading in the middle to pale tawny, and to yellow-

brown or rust-colour toward the apex and hind margin ; still crossed by silvery-brown slender stripes which originate in costal brown twin-spots ; cilia greyish-white, tipped with black. Hind wings white, dusted with brown ; cilia white. Female usually larger and with a stouter body, but with somewhat browner hind wings.

Underside of the fore wings smoky black ; costa dotted with white. Hind wings smoky white.

On the wing in May and June.

LARVA yellow-brown, each segment crossed on the upper surface by two parallel darker girdles ; dorsal plate and legs black.

October till April on Scotch fir (*Pinus sylvestris*) inside the *centre* short at the tip of a branch, or more usually in the centre shoot at the top of a young tree ; eating out the large bud and mining down into the pith of the stem below ; making a hole in the side, among the needles, through which excrement is ejected ; around which resin gradually collects, and through which the moth afterwards emerges. Also said to feed in the shoots of *Pinus peuce*.

PUPA dark red-brown ; wing-covers and thorax brilliantly glossy ; abdomen less so ; and paler in colour, the segments doubly ringed with fine points ; cremaster thick and blunt, set with minute hooked bristles. In the larval habitation, at the top of the burrow, placed head downwards. Readily found in the spring, the infested shoot remaining as a small conical capsule in the midst of a ring of growing shoots, Very often this capsule, however, only covers the spun-up Ichneumon, which has previously destroyed the larva.

The moth is sluggish in the daytime, sitting in the young trees of Scotch fir, but if disturbed usually dropping down, and scarcely to be induced to fly ; more active at dusk, and then flying around the young trees. So greatly infested

here, in the larva state by Ichneumons, as to be, almost always, scarce, but known to occur about fir woods; and especially among the young trees springing up in adjacent heaths, in Kent, Surrey, Sussex, Hants, Somerset, Bucks. Norfolk, and formerly in Lancashire; also in Scotland in Renfrew and near Aberdeen. I find no other record in the United Kingdom, but abroad it is widely distributed—Germany, Switzerland, Austria, Hungary, Belgium, Scandinavia, Finland, Western Russia, and Japan; and even in North America in Nevada.

4. **R. posticana**, Zett. (*turionana*, var. ?).—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (10–12 mm.) Darker in colour than the last species, and less than one-half its size, otherwise similar—possibly not distinct.

Antennæ dull black; palpi, head, and thorax orange-brown or dull yellow; abdomen black-brown, dusted with white. Fore wings narrow, costa nearly straight, apex almost angulated, hind margin oblique; dark silvery-grey, thickly dusted and dappled with dark brown; but shading about the middle into dull tawny; the whole faintly sprinkled with silvery-grey lines; no definite markings; cilia dark grey. Hind wings blackish-brown, with dull white cilia. Female similar.

Underside of the fore wings leaden-black with three or four whitish costal dots. Hind wings leaden-white.

Occasional specimens have a cloudy brown band or cross stripe on the fore wings before the tawny cloud; others are dark and devoid of distinct shades or markings.

On the wing in May and June.

LARVA apparently not described. Zetterstedt says: "living entirely in the manner of *R. turionana* in the buds of young fir trees; but always emerging one week earlier." Mr. Warren says: "I began by examining the central buds of terminal shoots, but found no trace. . . . While col-

lecting larvæ of *R. pinivorana* in side shoots, I found small lateral buds that contained full-fed larvæ and small glossy black pupæ, resting, like *turionana*, head downwards in an oblique passage; . . . after more careful searching I secured six brown undeveloped buds each containing a pupa, from which I have now bred two female *R. posticana*. The larvæ evidently prefer small *single* lateral buds, near the ground, on stunted trees."

This species was introduced under the present name to the British Fauna in the year 1888, specimens having been captured near Cambridge by Mr. W. Warren. Previously it had been known to occur near Paisley and elsewhere in Scotland, but had been supposed to be the allied *R. duplana*. From this species it is at once distinguished by the dull yellow colour of its head and thorax and the shortness of its fore wings. Yet it had stood under that name—*duplana*—in collections from the year 1856. My own impression is that it is simply a dwarfed form of *R. turionana*, but its specific distinctness is urged so strongly by Mr. Warren and other competent Entomologists that I feel constrained to give it the present position. It may be beaten out of small fir-trees by day, and also found flying around them at dusk. Casual specimens have been taken in England by Mr. Warren at Newmarket; and by Mr. A. E. Atmore near Norwich; but its natural range is certainly much further north—in the Edinburgh and Clyde districts, in Perthshire, Inverness, and even the Shetland Isles. Abroad it is recorded from the Alps and Germany and most parts of Northern Europe.

5. **R. pinivorana**, Zell.—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.). Fore wings elongated, pale silvery-brown, with numerous chocolate-brown transverse markings.

Antennæ brown; palpi, head, and thorax light brown; abdomen hoary-brown. Fore wings elongated, rather narrow, costa gently arched, apex and hind margin rounded; pale

silvery-brown, rippled all over with deeper brown irregular lines and broader, more chocolate-brown, incomplete bands—one before the middle nearly complete and upright, a central band broken up and bulging greatly beneath the costa, a large dark spot or patch over the anal angle, and a still larger one near the wing-apex—though some specimens show a succession of four or five incomplete bands; cilia pale brown. Hind wings and their cilia smoky brown. Female similar.

Underside of the fore wings smoky brown, with yellowish costal dots, and a whitish brown hind margin. Hind wings pale smoky brown.

On the wing in June and July.

LARVA uniformly dark red or liver colour; head and dorsal plate brown.

April and May, but probably from the previous autumn; on Scotch fir (*Pinus sylvestris*), feeding in the tender young shoots, commonly in a side shoot rather than the main or centre one, hollowing it out while still young.

PUPA not very glossy; thorax reddish-brown: abdomen pale, and dull; the rings bristling with minute points: cremaster blunt and rounded, furnished with minute hooked bristles. In the shoot in which the larva has fed, emerging from a hole in the apex which has been concealed by the bracts.

This is a lively species. It sits by day in the young fir-trees, and will sometimes dash straight away from them as though to examine an intruder, and then return or travel to a more distant group of trees. Those which are scattered about an open heath are much favoured. Sometimes it will fly briskly about the trees in bright sunshine; and at dusk it is very brisk over and around them, and on their sheltered side. Not rare in the outskirts of London and in Kensington

Gardens: very common in the Eastern Counties and throughout the South of England to Dorset and Somerset, also to be found elsewhere to Yorkshire, Durham, and Cumberland, where Scotch fir-trees are plentiful; but I can find no record for Wales. Widely distributed in Scotland to Perthshire and Moray: and in Ireland noticed in Galway, Down, and Armagh. Abroad its range extends through Central and Northern Europe and North Italy; and it is reported to exist in North America in Oregon.

6. **R. duplana**, *Hüb.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (14–18 mm.). Head rust-red; thorax grey-brown; fore wings narrow and pointed, silky, dark grey, the apex purple.

Antennæ and palpi dull black; head rust-red; thorax dark grey-brown, dusted at the sides with pale grey; abdomen dull black. Fore wings long and narrow, costa straight to the middle, then arched; apex and hind margin rounded; dull grey-brown or black-brown, repeatedly but faintly barred with double silvery lines and shading beyond the middle to rich dark purple-tawny, which also is crossed by silvery lines; cilia smoky grey. Hind wings smoky black-brown; cilia hardly paler. Female similar.

Underside of the fore wings shining leaden-black, with a fine white line along the base of the cilia. Hind wings paler shining leaden-brown.

On the wing in April.

LARVA apparently hardly described. Ratzeburg says that it is very similar in form and colour to that of *R. buoliana*, and that it lives in the same manner in the buds of Scotch fir; also that it is full-fed from June to August, and *remains eight months in the pupa state!* Sorhagen says that it feeds in May and June in the buds, later in the young shoots of the taller fir-trees; attaining the pupa state in the hollowed shoot.

This is a rare species in these Islands and very little

known. It was recorded as British nearly half a century ago, and may have been genuinely captured at that time, for there exist specimens in the collection of Dr. Mason which had been in that of the late Mr. Edwin Brown, and may probably have been of British capture; but all those placed under this name for many years turned out to belong to the form or species here described as *R. posticana*, and it was not till about 1890 that real and reliable *R. duplana* were found by Mr. T. W. Salvage at Forres, in Moray, Scotland. This district, with the neighbouring county of Aberdeen, is still the only locality, so far as I know, for this species in the United Kingdom. Abroad it is widely distributed throughout Central Europe, Spain, Scandinavia, and Western Russia, and is reported from Japan, and in North America from Oregon.

7. **R. resinella**, *Lin.*.—Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18-22 mm.). Head, thorax, and fore wings silvery-grey, the latter irregularly crossed by broken black-brown lines and bands.

Antennæ thick, dark brown; palpi, head, and thorax deep umbreous, the latter dusted at the sides with white; abdomen black-brown. Fore wings elongated, costa gently arched, apex bluntly angulated, hind margin rather shortly rounded off at the anal angle; pale silvery-grey sprinkled with dark brown atoms placed in lines, these being, at intervals, condensed into irregular bands: one such before the middle is often complete and angulated outwards, another, springing from the anal angle, usually crosses the wing obliquely, in two sections; and the apical area is set off with well-marked costal spots, the largest of which is at the apex; cilia black-brown. Hind wings smoky brown, with white cilia. Female similar, rather larger.

Underside of the fore wings leaden-black, dotted on the costa and hind margin with black. Hind wings leaden white.

On the wing in May and June.

LARVA very glossy, pale red or reddish-white; head dark chestnut; dorsal plate broadly divided, dull black; anal plate small, round, dull black; raised dots small, black.

July to the second April, in a most singular chamber on Scotch fir (*Pinus sylvestris*), the chambers composed wholly of the yellowish-white resin of the tree. It appears that the very young larva bites a hole in the side of a twig of a young tree, and eats its way in, mining until it reaches the next young growing shoot, which it hollows out; then bores another hole at the other side of the twig and gnaws the bark, thus inducing a rapid flow of sap, which congeals around the hole and seems to be formed by the larva into a large rounded rough nodule, divided within into two chambers communicating together. Here it lives, apparently feeding mainly upon the resin, through the winter, becoming full fed about June, remaining in the nodule in that condition during the second winter and spinning up therein in the spring. Thus two years are occupied in its cycle of metamorphosis.

PUPA brilliantly glossy, pitchy-brown; in a silken cocoon in the upper part of the nodule of resin, in which is a weak place through which the moth emerges.

I have little knowledge of the moth in a living state, and none of it *at liberty*. When reared from the resinous nodules—about which there is no difficulty—it sits in a sluggish manner on the fir needles and scarcely attempts to escape, from which I infer that it is naturally sluggish. Doubtless it flies at dusk like other species; but so far I am not aware of the capture of a single specimen in the perfect state in these Islands. The nodules in which the larvæ live, hibernate and pupate, are easily collected, and I think that all the specimens in our collections have probably been reared from these habitations, which, as I understand, are almost



always within reach upon the small trees. They are common in every alternate year in the woods of Elgin and Moray, and in Aberdeenshire and Ross, and to be found, though not plentifully, in Dumbartonshire and Renfrew; but I know of no other locality in the United Kingdom.

Abroad it is widely distributed through Northern and Central Europe, Spain, and the north of Italy.

8. **R. sylvestrana**, *Curt.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12-16 mm.). Fore wings short and blunt; silvery-grey with dark brown, straight-edged transverse bands.

Antennæ black-brown, ringed with silvery-white; palpi, head, and thorax dark brown, frosted with white; abdomen pale brown, anal tuft whitish. Fore wings somewhat ovate, costa flatly arched, apex and hind margin bluntly rounded; pale silvery-grey with a purplish flush, and shaded with silvery-white; two-thirds from the base is divided into about six regular erect darker purple-brown lines, very perpendicular, and each shaded off inwardly; apical area clouded with golden-brown; cilia dark grey. Hind wings and their cilia pale smoky brown. Female similar, but stouter.

Underside of the fore wings glossy pale leaden-brown, with four whitish costal dots. Hind wings very pale leaden-brown.

On the wing in June and July.

LARVA dirty white with a leaden tinge, or yellowish-white; wrinkled, rather flattened; head black or brown-black; dorsal plate dull brown, blackened behind, divided in the middle; anal plate and legs black; prolegs of the colour of the body.

May, on the stone pine (*Pinus pinca*), feeding in the unexpanded leaf buds and surrounding them with silk. It has been asserted that several larvæ feed in one shoot.

The moth flies before dusk about the stone pine, in which

it sits during the day. At night it will come to light, even to a window. Its principal locality with us is in and near Bournemouth in Hants—and here it has been both captured and reared in some numbers—also near Poole, Dorset; and casual specimens have been obtained at West Wickham Wood, Kent; Guestling, Sussex; in Surrey, and in Herefordshire; but I have no other records in these Islands. Abroad it does not seem to be common, but is found in the South of France, Belgium, and Northern Germany; and Lord Walsingham found it in Oregon, North America.

♀. **R. retiferana**, *Hcin.*—Expanse  $\frac{5}{8}$  inch (15 mm.). Fore wings pale silvery-brown, with transverse bands of rich red-brown, edged with black.

Antennæ, palpi, and head reddish-brown; thorax similar with a silvery shading; abdomen light brown. Fore wings elongated, costa very slightly arched, apex rounded; pale silvery-brown reticulated with red-brown; basal blotch indicated by an indented perpendicular red-brown outer edge; central band very narrow, erect, reddish-brown *edged with black*, only distinct at its edges, which form a broad fork from the middle to the dorsal margin; from this last point a black thread or crooked streak passes to the apical area, which is barred and streaked with red-brown; costa streaked toward the apex with pale yellow; cilia pale smoky brown. Hind wings and their cilia very pale brown. Female similar.

Underside of the fore wings pale leaden-brown; of hind wings leaden-white.

LARVA apparently undescribed.

When looking through the collection of Mr. J. B. Hodgkinson, at Ashton on Ribble, in company with Mr. S. J. Capper and Mr. Sydney Webb in the year 1890, two specimens of this pretty species were found, overlooked, among

SERICORIDÆ—SIDERIA.

Mr. Hodgkinson's *R. pinivorana*; and were recorded by me, under the name of *R. margarotana*—which, however, was soon corrected to the present name. It seems uncertain whether these supposed *pinivorana* were taken in Scotland or in Lancashire, and since no subsequent specimens have been reported in these Islands, the title of the species to rank as British may be disputed, and must be left to future observation. Abroad it seems not to be very common, but to be found in Silesia and Central France.

Genus 10. **SIDERIA.**

Antennæ thick; palpi short, but broad and blunt, almost fan-shaped; thorax smooth; fore wings without fold, broad and somewhat acuminate; hind wings shortly tufted on the median nervure.

We have one species.

1. **S. achatana**, *Schiff.*—Expanse  $\frac{5}{8}$  inch (15–16 mm.). Fore wings pale silvery-grey, with large squared chocolate-red markings.

Antennæ and palpi black-brown; head and thorax reddish-brown; abdomen grey-brown, anal tuft paler. Fore wings rather squared, the costa not folded, arched at the base, thence very slightly so; apex pointed, hind margin retuse; purplish-white, much rippled with slender purple-brown lines; basal blotch large, red-brown, its outer edge very bluntly angulated and nearly erect; central band suggested by a small red-brown flattened triangle at the costa, and a far larger, similar, squared or triangular blotch on the dorsal margin; apex chestnut-red, containing one hind-marginal and two costal white dots; cilia smoky grey. Hind wings and their cilia pale smoke colour. Female similar, with darker hind wings.

Underside of the fore wings dark smoky-brown, with a few whitish costal dots; hind wings paler smoky brown.

On the wing in July.

LARVA smoky-black, beneath rather yellowish; head and thoracic plate shining black. May, on hawthorn and black-thorn, in a web covered with dry leaves and attached to the lower twigs. (W. Warren.) This larva is said to live, usually in company with that of *Rhodophaea suavelle*, and closely to resemble it in appearance. It spins up and assumes the pupa state in the larval habitation of that species, which then has become a bunch of leaves.

The moth especially frequents hawthorn hedges, not despising those which are somewhat closely cut, and may sometimes be seen sitting upon them in the daytime, though it is much more commonly to be beaten out, when it will fly, in bright sunshine, but if it is dull will fly to the ground. Its time of natural flight is after sunset. Still to be found, not uncommonly, in the suburbs and outskirts of London, and in the Southern Counties from Kent and Essex to Devon, though more or less locally; more rarely in Suffolk, Norfolk, Cambs., Herts, Oxfordshire, Berks, Somerset, Gloucestershire, Herefordshire and Worcestershire, but this seems to be the extent of its range in the British Isles. Abroad it is common in Central and Southern Europe, and is found in Sweden, Livonia, and Asia Minor.

#### Genus 11. **MIXODIA.**

Antennæ thick; palpi broad and blunt, brush-like, the third joint just perceptible; thorax minutely crested at the back; fore wings elongated, blunt; costa not folded; hind wings ample, with hardly any tuft.

We have three species—readily distinguished.

- A. Fore wings red-brown with silvery-white transverse lines.
- B. Silvery transverse lines numerous—size nearly one-inch  
*M. schulziana.*

B<sup>2</sup>. Transverse lines few—size one-half inch.

*M. palustrana*.

A<sup>2</sup>. Fore wings lurid red-brown, with a paler dorsal triangle.

*M. ratzeburgiana*.

1. **M. ratzeburgiana**, *Sax.*; **tenerana**, *Wilk.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{8}$  inch (12–16 mm.). Fore wings dark chestnut-brown, with a large paler triangular dorsal blotch.

Antennæ brown, barred with paler; palpi and head dull brown; thorax orange brown; abdomen silky pale brown. Fore wings not broad, costa not folded but flatly arched apex blunt; tawny brown, basal area edged and dotted with black; in the middle of the dorsal area is a large triangular pale brown blotch, slenderly edged with black and closely followed by an oblique dark tawny band; hinder and apical area reddish brown, plain; costa dotted with white; hind margin with white and black; cilia grey. Hind wings and their cilia smoky brown. Female similar.

Underside of the fore wings leaden black; costa dotted with white. Hind wings pale leaden brown.

On the wing from the end of June till August.

LARVA swollen, colourless, simply yellowish-white with a rather small head and small-centred raised dots in pairs and rows. (Ratzeburg.)

May, in the terminal buds of strong young trees of *Pinus pecca*, noticeable by the loose hanging scales. Also on *P. smithiana*, which it appears especially to frequent when planted in this country; and *P. cephalonica*.

The moth is a rather quiet, sluggish species, and frequents silver-spruce and introduced firs in gardens and other sheltered situations; but will fly about them a little when disturbed, quickly hiding again in the same trees. At sunset, however, it flies about the tops, out of reach. A very local species, but to be found in favoured spots in Kent, Surrey, Hants, Dorset, Wilts, Berks, Oxfordshire, Herts, Suffolk, Norfolk.

Herefordshire, Leicestershire, Yorkshire, Westmoreland, Durham, and Northumberland; also in Scotland in Fife and elsewhere in the Edinburgh district, Perthshire, and apparently even in Moray; but I have no record for Ireland or Wales. Abroad it is found in many parts of Central and Northern Europe, and Mr. E. Meyrick records it in North America.

2. **M. schulziana**, *Fab.*—Expanse  $\frac{3}{4}$  to 1 inch (18–25 mm.). Fore wings rich red-brown or crimson-brown, with numerous silvery-white transverse lines and streaks, and a central round white dot.

Antennæ rather short, black; palpi and head chestnut-red; thorax similar, but the shoulder-lappets white; abdomen black, barred behind with white. Fore wings rather broad, costa gently arched, apex bluntly angulated, hind margin oblique; rich red-brown, often almost crimson; with numerous short transverse silvery-white markings disposed in three series of irregular and looped fragmentary lines, the outermost series connected with the hind margin; these lines originate in twin short streaks on the costa: cilia white chequered with red-brown. Hind wings and their cilia smoky white. Female similar but smaller, with darker hind wings.

Underside of the fore wings black-brown; costa lightly dotted with yellowish geminated streaks; apex and hind margin with repeated series of curved similar dotted lines. Hind wings yellowish-white.

Variable in size—specimens from Scotch and Irish mountain districts sometimes are very large, but the size seems to diminish towards the tops of the mountains. Those from the very isolated locality—Woolmer Forest—in Hants, though rather smaller, are especially bright in colour and markings.

On the wing from the end of June till August.

LARVA apparently unknown. The suggestion that it may feed on *Vaccinium* or *Calluna* is reasonable—that which makes it feed on fir-needles is quite otherwise!

This is usually a northern species: it is very extensively distributed in mountain districts, occurring from the sea-level to a height of 4000 feet; emerging earlier in the season in the valleys, latest on the tops of the mountains; always found among heather, on mosses, moors, or mountain-heaths. There are several isolated southern localities—as at Bagshot and Weybridge. Surrey, and the New Forest, Hants, and I was much gratified many years ago at finding it, in great beauty, on the heaths of Woolmer Forest, in the same county. It is not, I think, as yet reported from the seemingly more suitable localities in the South-west of England or from Wales, but reappears in the mosses and on the hills of Cheshire, Lancashire, Yorkshire, Westmoreland, and Cumberland, and in plenty in Northumberland and Durham. In Scotland it is common in suitable places throughout to the Outer Hebrides, Orkneys, and Shetlands; and in suitable localities all over Ireland, having even been taken on the Hill of Howth, Dublin. Abroad it has an extensive range through Germany and the Alps, Holland, Iceland, Scandinavia, Lapland, and Western Russia; and in Arctic America.

3. **M. palustrana**, *Liéniq.*—Expanse  $\frac{1}{2}$  inch (12 mm.) Fore wings rich chocolate-red with bright silvery white irregular transverse markings forming two lines or series.

Antennæ black-brown; palpi, head, and thorax reddish brown; abdomen grey-brown. Fore wings rather narrow, costa very little arched, apex bluntly angulated; rich orange-brown with silvery white markings—a slender, sinuous, perpendicular stripe not far from the base, two thread-like oblique lines which cross one another beyond the middle, and four partially germinated spots on the costa;

close to the crossing of the oblique lines is a round white discal dot; several horizontal streaks of black dusting lie in the middle and hinder area; cilia white, clouded with black. Hind wings dark smoke colour; cilia whiter. Female similar, or sometimes with the ground colour paler.

Underside of the fore wings pale smoke colour, with large yellowish white costal dots and a white cloud on the hinder cilia. Hind wings smoky white.

Variable in the colour of the markings from silvery white to yellowish white, and in the ground colour from tawny brown to brown-black. Specimens from Ireland seem to be unusually bright in colour.

On the wing in June and July.

LARVA unknown. Sorhagen suggests that it may feed on heather or whortleberry; Heinemann says the latter.

The moth is a bright and active species, flying in the sunshine about heather and bilberry in sheltered places, yet moving more naturally, like the allied species, towards evening, and having a tolerably direct flight. Extremely local, or indeed scarcely known, in England, though Lord Walsingham records a single specimen taken in Norfolk. Mr. J. Gardner found it in 1897 and 1898 in some plenty in a wood in Durham, and it is said to occur in Cumberland, and along the Cheviots into Northumberland. In Scotland it is much more widely distributed, flying over the heather in birch and fir woods and on hill-sides. In Perthshire Sir Thomas Moncrieff recorded that it seemed to frequent the bell-heath (*Erica tetralix*), and besides being plentiful in that county it is known to occur, often commonly, in Argyleshire, Dumbartonshire, Stirlingshire, Ross, Inverness, and Aberdeenshire. In Ireland it is but little known, but Colonel Partridge found it on moors near Euniskillen, and Mr. G. V. Hart took specimens of unusual beauty on the Wicklow Mountains. Abroad it is widely distributed in Holland



Germany, Switzerland, East Hungary, Norway, Lapland Finland, Russia, and the Trans-Caucasian region.

Genus 12. **SERICORIS.**

Antennæ closely notched, not thick; palpi densely scaled and blunt; thorax furnished with a thick crest at the back, and uplifted shoulder-lappets; fore wings blunt, costa without fold; hind wings ample, with scarcely any basal tuft.

We have eight species, some of which are among our most lively and familiar insects.

Not easy to tabulate from the extreme variability of some of the species.

- A. Fore wings shining reddish white with chocolate markings.  
 B. The marking placed in sinuous stripes and lines. *S. virelana.*  
 B<sup>2</sup>. The marking in cloudy bands with a central white round dot. *S. micana.*  
 A<sup>2</sup>. Fore wings rather narrow, dull reddish white with chocolate markings.  
 C. Fore wings pointed at the apex. *S. vespitana.*  
 C<sup>2</sup>. Fore wings blunt at the apex. *S. doubleclayana.*  
 A<sup>3</sup>. Fore wings white or reddish white with umbreous markings. *S. ertiana.*  
 A<sup>4</sup>. Fore wings pale olive brown with darker markings.  
 D. The dark central band broad nearly divided across by a straight pale streak. *S. lucanana.*  
 D<sup>2</sup>. The dark central band narrow and with angular edges. *S. irriguana.*  
 D<sup>3</sup>. Central band broad, ill-defined, almost absorbed in ground colour. *S. metallicana.*

1. **S. micana**, *Hub. olivana*, *Tr.*—Expanse, male  $\frac{3}{4}$  in. (mm.). Fore wings rich glossy reddish white with three

chocolate bands, the middlemost containing a round white or reddish white dot. Hind wings smoky brown.

Antennæ dark brown; palpi, head, and thorax light brown; abdomen grey-brown. Fore wings rather broad, costa gently arched, not folded, apex blunt, hind margin hardly oblique; ground colour reddish white; markings rich chocolate brown, consisting of a large complete basal blotch with oblique margin, bounded by a narrow stripe of ground colour, and a broad central band containing a central white round dot, and edged by a narrow sinuous oblique pale stripe often forked towards both costal and dorsal margin; on the costa towards the apex are several whitish spots; apical and hinder area otherwise dark; cilia creamy white, shaded with brown. Female decidedly smaller but stouter, the colour and markings more bright and glistening.

Underside of the fore wings shining leaden brown; costa and hind margin dotted with creamy white. Hind wings dark lead colour.

On the wing in July and August.

LARVA apparently undescribed; polyphagous upon low-growing plants from September till spring. (Sorhagen.)

The moth frequents very wet spots in marshy ground, sometimes patches of only a few yards in extent, and in them is rather plentiful; here it sits in the day time, the males among the grass and herbage in the moist open places, the female preferring to hide under the shelter of willow bushes. Extraordinarily local, the little spot of a few yards in extent to which it will confine itself differing often to no appreciable extent from the surrounding fen or bog. Lively and easily disturbed, the males more particularly, in the sunshine but flying of its own accord towards sunset. To be found in this remarkably secluded manner in suitable localities in Surrey, Hants, Wilts, Cambs, Suffolk, Norfolk, Worcestershire, Lancashire, Yorkshire, Durham, Cumber-

land, and Northumberland, always excessively local, yet apparently becoming more generally distributed in the North: and frequent in Scotland in the Edinburgh district, in Renfrew, Lanark, Aberdeenshire, and Moray. It is recorded in North Wales by Mr. A. F. Griffith, but I have not found it in South Wales nor is there any record that I know of for Ireland. Abroad it is generally distributed in Central and Northern Europe and occurs in Piedmont.

2. *S. irriguana*, *H.-S.*—Expanse  $\frac{5}{8}$  inch (15–16 mm.). Fore wings rather narrow, with oblique hind margin, pale olive brown, with a narrow jagged central band followed by faint cloudy markings.

Antennæ dark brown; palpi, head, and thorax olive brown; abdomen dark olive brown. Fore wings rather narrow, costa nearly straight, apex sharply angulated, hind margin gently curved; very pale olive brown; basal blotch large, dull olive-brown, its margin jagged; central band not broad nearly upright, angulated and jagged outwardly; beyond it are, often, a faint round cloud upon the dorsal margin, some costal pale dots, and a large olive brown cloud before the apex; but sometimes these markings are partially obliterated; cilia whitish brown. Hind wings black-brown; cilia paler. Female similar.

Underside of the fore wings leaden black, with pale brown costal dots. Hind wings leaden white.

Occasional specimens are devoid of markings, and closely resemble the form known on the Continent as *S. sudetana*.

On the wing in June and July.

LARVA and PUPA unknown.

This species is, apparently, confined to the higher slopes of mountains and is said not to be found at a less elevation than from 2000 to 3000 feet above the sea. Here it seems to hide more especially among *Arctostaphylos uva-ursi* but

no other indication of its especial attachment to that plant is furnished. It flies in the sunshine if disturbed, and then settles again on moss or grass, but it is fully on the wing in the morning before and after sunrise. It was first recorded as British in 1871 by the late Mr. Nicholas Cooke, who took it in abundance on Craig Maige, a mountain in the County of Inverness; since then it has been found on other mountains in the same district, and in Ross, Aberdeenshire, Forfarshire, and Perthshire. The capture of two or three specimens on Helvellyn was recorded in 1874 by Mr. J. C. Wasserman, but I can find no confirmation of the presence of the insect in this locality nor any record of the capture in any other part of England, nor in Wales or Ireland. Abroad it seems to be common on the mountains of Europe and Central Asia.

3. **S. metallicana**, *Hüb.*; **daleana**, *Dtl.*; **alternana**, *Willk.*.—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15-18 mm.). Fore wings rather broad, glossy pale olive brown with rather darker basal, central, and apical bands.

Antennæ brown with whiter downy cilia; palpi, head, thorax, and abdomen olive brown. Fore wings rather broad, costa gently arched, apex blunt, hind margin rounded and filled out; olive brown, faintly darker in the middle; sometimes showing an erect, roughly edged, central band, and occasionally an equally erect and rough basal blotch; beyond the middle is often an oblique olive brown cloudy band and a broad apical patch, but usually all these markings are indefinite and indistinct, or simply indicated by silvery scales at their margins; cilia dull white. Hind wings smoky brown, with whitish cilia. Female rather smaller, its markings sometimes more definite and distinct.

Underside of the fore wings leaden brown. Hind wings leaden white.

In specimens from the mountains of Central Europe the

silvery lines at the margins of the markings on the fore wings are usually very much more distinct, while in many of our specimens hardly a trace of them is to be seen.

On the wing in June and July.

LARVA apparently undescribed. Sorhagen says that it is to be found in May and June on whortleberry.

This species has long been known with us under the name of *S. dubiana*—apparently a mere catalogue name and unconnected with any description—and it was only by the discovery in a large collection of specimens which, as varieties, coincided with Continental forms, that its identity was here established. It is common—sometimes abundant—in Scottish mountain districts, frequenting bushy places on the borders of highland woods and glens and the open parts of the woods, among whortleberry, from which it is readily disturbed in the daytime, flying in every direction from the footstep and appearing in the afternoon as though on the wing of its own accord. This, however, really takes place more toward sunset and till dusk. Although common in such spots on the lower hills and glens, it is extremely local with us, and seems at present to be known only in Perthshire and Aberdeenshire though one would expect to find it in other mountain districts in Scotland. No record is known to me in England, Wales, or Ireland. Abroad it is found in Norway and Sweden, Germany, Galicia, Jutland, Russia, Siberia, and Tartary.

4. **S. lacunana**, *Schiff.*—Expanse  $\frac{3}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.). Fore wings pale olive brown with a broad darker central band nearly divided by a straight whitish streak.

Antennæ black-brown, dotted with white; palpi and head olive brown; thorax black mixed with olive-brown; abdomen leaden brown. Fore wings narrow at the base, rather broad behind; costa gently arched, apex bluntly angulated; pale

olive brown with the markings mottled black-brown; basal blotch large, roughly angulated outside, and rather extended upon the dorsal margin; central band erect, broadest on the same margin, just above the middle nearly divided by a straight horizontal streak or lacuna; costa dotted with black; a larger black spot in the apex, and beneath it an oblique smoky brown cloud; cilia dull brownish white. Hind wings smoky black, cilia whiter. Female similar.

Underside of the fore wings smoky black, with white costal dots and clouded cilia. Hind wings smoky white, apex blackish.

A very beautiful variety which is found more especially in fens and marshes has the fore wings velvety black, or dull black, with the usual markings indicated by lustrous silvery lines. It was at first, when discovered, supposed to be *S. herbana*, Gn., but it is reared as well as taken with the present species and united with it by intermediate forms. In hill and mountain districts in the North a small form is abundant, having the typical colour and markings; this variety has been supposed to be *S. rupestrana*, Dnp.—sometimes written *rupestrana* in error.

On the wing from the end of May till July, and occasionally as a very partial second generation, in September.

LARVA cylindrical, rather elongated, very active, most puzzling from its great variability; smoky brown, smoky black, green or liver colour with head and plates shining black; or else pale grey, blue-grey, dull white or pale yellow with the head and plates light brown, or with the head and dorsal plate black and the anal plate brown, or yellow with a brown dot.

May and June in the young shoots of almost all kinds of herbaceous plants and shrubs, feeding also in many instances in the blossoms and the joined or drawn together leaves, also

on birch and other trees. The variations in the colour in the larva seem in many instances to be influenced by their food : but have no bearing on the perfect insect—all the most singular forms of the larva producing ordinary and typical moths.

PUPA shining, dark brown or black-brown. In a silken cocoon spun up anywhere except in the larval habitation.

This is one of the most abundant species, occurring occasionally even in London suburban gardens; but in multitudes in fields, hedges, open woodlands, on railway banks; and in marshes, fens, valleys and hills, throughout the United Kingdom, usually in abundance, rarely or never sitting upon tree-trunks but hiding among undergrowth of bushes and all kinds of herbage; everywhere bustling about with a buzzing flight at the least disturbance and keeping the attention of the collector always on the alert to discover the various scarcer species which are sheltered from notice by its multitudes. Common even on the mountains, and to be found on hill-sides and in grassy places even in the Orkney and Shetland Isles. Also plentiful throughout Europe and found in Bithynia and Western China.

5. *S. urtica*na, *Hüb.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–20 mm.). Fore wings brownish white or reddish white with broad jagged umbreous markings, the central band broad and undivided.

Antennæ notched, thickly ciliated, dark brown; palpi and head pale brown; thorax black-brown, dusted with white; abdomen grey-brown. Fore wings broad, costa well arched, apex squared, hind margin almost perpendicular; reddish white or brownish white, the markings umbreous, dark red-brown, or black-brown; basal blotch large, its margin nearly erect but roughly angulated; central band broad, erect, notched outwardly and extended on the dorsal margin, but

undivided; in the apical space are four costal dots, and below them an oblique stripe running into the hind margin: cilia of the ground colour. Hind wings smoky brown; cilia dusky white. Female similar but stouter.

Underside of the fore wings leaden black; costa dotted with pinkish white; hind margin lined with white. Hind wings smoky white.

Variable in colour; the ground colour in Welsh and other Western districts being often of very bright and pretty tints of pink and rosy brown; but in the Highlands of Scotland becoming of a clear dull white; the markings also varying from very dull umbreous to rich dark red-brown.

On the wing from the end of May till July.

LARVA active, cylindrical but with the extremities slightly tapering; dark chestnut or liver colour, raised dots similar, head and both plates brilliant jet black.

May and June on whortleberry (*Vaccinium myrtillus*), drawing together the young shoots and eating them out; also on birch, willow, bramble, honeysuckle, raspberry, and many low-growing plants, spinning together the leaves and devouring the young shoots.

PUPA light brown, with dark brown wing-covers, in a loose silken cocoon among rubbish on the ground.

This species loves open woodlands especially where whortleberry is abundant, or wood-sage in the North, but also frequents all kinds of rough places among bushes and in hedges, hiding therein, flying out in a restless manner at a footstep, and sometimes almost filling the air with its numbers towards sunset. Fairly common throughout England, but in wooded districts in the South and West very abundant, also in Wales and Ireland; in Scotland extending to the Clyde Valley, Perthshire and Aberdeenshire, where it becomes scarce. Abroad it is common throughout Central



Europe, Italy, Dalmatia, Norway, Russia, Armenia, Asia Minor, and in North America in California.

6. **S. rivulana**, Scop.; **conchana**, Hüb.—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings reddish white with broad red-brown basal, central and apical cross bands, the intermediate spaces intersected with fine lines.

Antennæ ciliated, light brown; palpi darker brown; head very rough, light brown; thorax red-brown; abdomen pale grey-brown; anal tuft pale yellow. Fore wings of rather even breadth, costa arched, apex bluntly angulated; silvery white, or reddish white, with the markings sharply distinct, chocolate-red; basal blotch large, angulated outwardly; central band less broad, deeply indented on both sides and bent outwardly; beyond is a large trigonate, erect dorsal spot, also a stripe obliquely from the costa to the hind margin, and several broad costal dots united by a similar cloud; all the intervals between the markings form stripes of the ground colour intersected or divided by fine lines; cilia white, clouded with red-brown. Hind wings pale smoky brown, with paler cilia. Female decidedly smaller, the fore wings narrow and sharply angulated at the apex, otherwise similar.

Underside of the fore wings smoky black, with yellowish costal dots. Hind wings smoky white.

On the wing in July and August.

LARVA very active, cylindrical, dirty yellow-green; spots hardly visible but with the usual hairs; head and dorsal plate black; anal plate dull green.

End of May and June on *Spiræa fitipendula* and other low-growing plants apparently preferring the flower spikes—I have reared it from those of *Genista tinctoria* and *Orehis maculata*—boring into the soft stem, causing the flowers to droop and feeding among them. Abroad it is said to feed in terminal shoots of *Ribes*, *Galium*, *Genista*, and *Rubus*.

PPPA light brown with the back of the thorax darker. In a slight cocoon among leaves of the food-plant.

An exceedingly brisk and lively species, darting about in the sunshine in marshes, damp meadows and open sunny places especially in the borders of woods; and from the brightness of its colours and sharpness of its markings exceedingly attractive. Although so active by day it flies only short distances, settling again upon plants close to the ground, to dart away again instantly if disturbed; but late in the afternoon it flies freely of its own accord, and till sunset. Occasionally it is found in plenty also on hill-sides and especially on the sides of old and well-carpeted slopes of sea sand-hills, or on chalk downs. Locally abundant throughout the South of England and to be found more sparingly northward to Cumberland and Durham, and in the South of Scotland to Argyleshire and Perthshire. In Wales plentiful in Pembrokeshire and Glamorganshire, and in Ireland found at Howth, near Dublin; Armagh, and Sligo. Abroad it is widely distributed over Central and Northern Europe, Southern France, Italy, Dalmatia, Asia Minor, Armenia, Siberia; and was found by Lord Walsingham in Oregon. North America.

7. *S. cespitana*, *Hüb.*—Expanse  $\frac{5}{8}$  inch (14–15 mm.). Fore wings rather narrow and sharply pointed, reddish white with three ragged and irregular cross bands.

Antennæ thickly ciliated, black-brown: palpi, head and thorax dull brown; abdomen grey-brown. Fore wings rather narrow, costa flatly arched, apex sharply angulated, hind margin oblique; reddish white, brownish white, or olive white the markings red-brown, black-brown, or olive brown; basal blotch large, dusted with white, its outer edge angulated; central band erect, not very broad, jagged on the outer edge, and usually united to an upright dorsal spot; a

large cloudy triangular blotch lies across the apex and is preceded by some geminated white costal dots; cilia brownish-white. Hind wings pale smoky brown; cilia paler. Female a little smaller and with narrower fore wings.

Underside of the fore wings smoky brown, with obscurely paler costal dots. Hind wings smoky white.

Excessively variable and in permanent local forms. On the slopes of sandy cliffs, and old sand-hills facing the sea, it abounds in sheltered spots where the ground is covered with moss, thyme, and other close herbage, appearing then of various shades of rich red-brown with deeper markings; on hills of limestone and trap of a similar colour mixed with specimens in which the red-brown has become suffused and the dark markings scarcely visible; on the other hand in more level chalky and sandy places all shades of olive brown and grey-brown with dull markings.

On the wing in June, July and August.

LARVA apparently undescribed. Mr. W. H. B. Fletcher obtained eggs and fed the resulting larvæ before hybernation upon thyme (*Thymus serpyllum*), but they do not appear to have survived. I have on the other hand reared specimens from larvæ collected in the spring along with those of *Eudemis littoralis*, on *Statice armeria*, but these larvæ were unfortunately not noticed. Mr. A. Thurnall has also reared it from a pupa spun up upon *Trucium scorodonia*. Probably it frequents various low-growing plants.

Also an exceedingly lively species, starting up from among herbage in its favourite localities in multitudes in the afternoon, but less swift in its movements than the last species, and less brilliant in its appearance. Flying naturally for some time before sunset. Excessively abundant on the "Breck" sands of the Eastern Counties to Norfolk, on coast sands elsewhere, and all over the chalk-hills, downs, and rough fields in chalky districts throughout the South of England to

Oxfordshire and Cambridgeshire; also found but far less commonly in Cheshire and Lancashire and rarely in Durham and Northumberland. In Wales it is common on slopes of high sea sand-hills in Pembrokeshire and Glamorganshire; in Scotland in the Edinburgh district and along the East coast to Aberdeenshire, also abundant in Perthshire and found in the West in Renfrew, Dumbartonshire, Argyle and Arran; in Ireland on the slopes of the cliffs at Howth, Dublin; in Waterford, Galway, Sligo and on the extensive coast sand-hills of Donegal. Abroad it is generally distributed over Europe, Asia Minor and Armenia.

8. **S. doubledayana**, *Bar.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings short and blunt, not broad, reddish white with three ragged irregular cross bands.

Antennae black-brown; palpi and head tawny brown; thorax red-brown; abdomen grey-brown. Fore wings rather short and blunt, costa arched, apex bluntly angulated, almost squared; hind margin rather straight and perpendicular; reddish white with rich chocolate markings; basal blotch rather large, its outer edge twice angulated; central band erect, having two pointed projections on its outer margin; followed by a rounded dorsal spot and above this by a long oblique stripe, slender near the costa, broader in its middle and to the hind margin; above it are several oblique costal dots; cilia whitish, tipped with chocolate. Hind wings pale smoky brown; cilia white. Female similar.

Underside of all the wings glossy leaden brown.

On the wing in July and the beginning of August.

LARVA and PUPA unknown—except that a note supposed to have been furnished by M. Constant appears in M. Raginot's copy of Standinger's List, that it feeds on *Lotus rectus*. For this information I am indebted to Lord Walsingham.

This species was separated as distinct in the year 1871,

though it had been noticed two years earlier. It was then met with only in Ranworth Fen, Norfolk; and at sunset was there tolerably common, flying in a lively manner at sunset and till dusk about rough herbage such as *Spiraea ulmaria*, sallow bushes and large sedges in the middle of the open fen, also hiding among the same plants and easily disturbed from them on warm afternoons. More recently found in similar situations in Wicken Fen, Cambs. Its only localities here, as far as I know, are in these two counties. Abroad it is reported from Germany and the South of France.

### Genus 13. EUDEMIS.

Antennæ thick and finely notched; palpi depressed, beak-like; thorax with a minute crest or flat tuft at the back; fore wings rather narrow, without fold; hind wings smooth.

We have five species, all rather small, which may be tabulated thus:

A. Fore wings long and narrow.

B. Fore wings reddish white with slender brown bands.

*E. littoralis.*

B<sup>2</sup>. Fore wings dull yellow with broad brown bands.

*E. latifasciana.*

A<sup>2</sup>. Fore wings of ordinary length, rather blunt.

B<sup>3</sup>. Fore wings reddish white with two broad brown bands.

*E. bifasciana.*

B<sup>4</sup>. Fore wings rich orange-brown with one yellow band.

*E. euphorbiana.*

B<sup>5</sup>. Fore wings black-brown with two reddish white bands.

*E. fuligana.*

1. **E. fuligana**, *How.*; **abscissana**, *Gu.*—Expanse,  $\frac{5}{8}$  inch (15 mm.). Fore wings reddish white, basal blotch, central band, and apical blotch all oblique, black-brown. Hind wings grey-brown.

Antennae thick, ciliated, dull brown ; palpi and head pale brown ; thorax black-brown dusted with white ; abdomen grey-brown. Fore wings blunt, not broad, the costa gently arched but not folded ; apex bluntly angulated ; white or reddish white, dusted with brown atoms ; basal blotch large, black-brown, its outer edge oblique ; central band broad, rather oblique, olive brown, not sharply defined outside ; a broad olive brown cloud lies across the apical area, and throws off a round spot into the apex ; costa olive brown with four twin white streaks ; cilia white, tipped with grey. Hind wings grey-brown ; cilia white. Female similar or a little darker.

Underside of the fore wings smoky brown with three white costal dots and a white patch at the anal angle. Hind wings smoky white.

On the wing at the end of May and in June, and a second generation in July and August.

LARVA rather sluggish, slender, cylindrical, wrinkled, especially so towards the head ; dull bluish green, with slightly shining raised dots and very minute hairs ; head shining olive brown ; plates and feet similar but paler ; prolegs bluish green. June and a second generation in August and September in *Carduus arvensis* (common creeping-rooted thistle) in the small side shoots, drawing together the young leaves and eating out the pith and the heart of the shoot, when this is exhausted passing to a fresh shoot. When full fed leaving the plant to spin up in paper or any dry rubbish.

PUPA very pretty, pale brown with green wing-covers ; in a neat tight cocoon.

A local species, frequenting thickets of tall common thistles in fields and waste places ; not easily disturbed or induced to fly in the daytime, but very lively on the wing on warm evenings

before dusk, and keeping closely about these plants. The statement that it frequents flea-bane is not confirmed by my own experience. Its flight evidently continues after dark, since it will come to a strong light. Very local in this country, but found in Kent, Dorset, Devon, Oxfordshire, Essex, Cambs and Norfolk. Except that Mr. F. W. de V. Kane records it at "Minehead, Co. Waterford," in Ireland, this seems to be the extent of its range with us. Abroad it appears to be very little known and seems only to be recorded from France and Holland.

2. **E. littoralis**, Curt.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings long, narrow and pointed; reddish white with two transverse narrow brown bands and an oblique brown cloud running into the apex.

Antennæ dull brown; palpi, head and thorax light brown; abdomen slender, grey-brown. Fore wings elongated, rather narrow, costa almost straight, apex sharply angulated, hind margin oblique; brownish white or reddish white, with a tinge of fawn colour; basal blotch indicated by an erect red-brown half-stripe placed outside some similar clouding: central band of the same colour, very narrow, angulated and pointed outwardly in the middle; running into the apex is a long similar cloudy streak; costa dotted with brown and the hind margin with black; cilia pale fawn colour. Hind wings pale smoky brown; cilia white. Female somewhat smaller, the fore wings rather more narrow and also more sharply marked.

Underside of fore wings dark smoky brown; costa and hind margin shaded with white. Hind wings smoky-white.

Variable in colour and markings, the red-brown colour sometimes suffused over the paler ground-colour, sometimes absent, leaving the whole surface without markings. Sometimes even the darker colour of the markings is displaced

and run into shades, as has been previously noticed in the so-called "*nubiferana*" form of *Penthina variegana*. In the Scottish Isles specimens are common in which the ground-colour is clear white, while the markings are rich in colour and sharply defined.

On the wing in June and July, and as a scarce and partially second generation in August and September.

LARVA very active, wriggling violently when disturbed; cylindrical, dull pale greenish grey, the spots hardly visible but having distinct hairs; head light brown; jaws blackish; dorsal plate black; anal plate of the body colour.

April and a second generation in June, on *Statice armeria* (common thrift), the first brood feeding in the young shoots, the second brood partly in the flowers; sometimes making a silken tube among the leaves, but feeding still on the heart leaves.

PUPA light olive brown, spun up among the leaves of the thrift, close to the eaten shoots; or in the second brood, in the eaten-out flower heads.

This very pretty and attractive species follows its food-plant, the common thrift, not only upon rocks and cliffs at the seaside, but also upon salt marshes and sand hills, the banks of rivers and any rough ground upon which this plant abounds. It may occasionally be disturbed by the footstep, but is unwilling to stir much in the daytime, though active and lively upon the wing towards dusk. Always confined to the coast and most plentiful on rocky portions thereof, but found on the lower banks of the Thames in Kent and Essex as well as on the outer coasts, and in Sussex, Hants, with the Isle of Wight, Dorset, Devon, Cornwall, Suffolk, Cheshire, Lancashire and plentifully in the Isle of Man; in Wales at Dolgelly and probably all round that coast, certainly common in Pembrokeshire. Also on the coasts of Scotland to the



Hebrides, Orkneys and Shetland Isles; and in Ireland on those of Howth near Dublin, Waterford, Cork, Sligo, Antrim and Derry. Abroad it inhabits France, Holland, Spain, Sweden and Iceland.

3. **E. bifasciana**, *Haw.*; **decrepitana**, *H.S.*—Expanse  $\frac{1}{2}$  inch (12–14 mm.). Fore wings soft reddish white or salmon white, with few broad pale brown transverse bands.

Antennæ notched, black-brown; palpi and head dull drab; thorax dark brown; abdomen grey-brown. Fore wings of moderate breadth, blunt, costa gently and evenly arched; apex bluntly angulated, almost rounded; rosy white or white clouded with salmon colour or pale buff; basal blotch large, dusky black, its outer margin oblique and nearly straight; central band of the same colour, broad and even in width, and slightly oblique; a dull black line or slender cloud passes down the hind margin; cilia cloudy grey. Hind wings smoky brown; cilia paler. Female similar.

Underside of the fore wings smoky brown; costa and hind margin dotted with white. Hind wings smoky-white.

In freshly emerged specimens the ground colour is often very brightly tinged with pink. In a very few hours of flight this becomes faded to dull reddish white.

On the wing in June and July.

LARVA apparently undescribed; feeding in the young shoots and among the male blossom-scales and pollen masses of Scotch fir (*Pinus sylvestris*), also on the stone pine (*P. pinea*).

The moth often sits upon the same masses of scales and pollen of the pine on low branches and from the tinge of red in its ground colour is admirably protected from notice, but if disturbed will fly a short distance to hide again in the tree, not darting about but proceeding straight and steadily

to another resting-place. Before dusk it begins to move about of its own accord and then flies about the trees, continuing active till late at night and coming readily to a strong light. Rather a local species; plentiful in the New Forest and about Bournemouth. Hants, and also in the fir-woods of Norfolk. Occasionally to be found in the suburbs of London and elsewhere among fir-trees in Middlesex, Surrey and Kent, also in Dorset, Wilts, Berks, Herts, Essex, Suffolk, Herefordshire, Worcestershire, Cheshire and North Lancashire. I have no records in other parts of the United Kingdom. Abroad it inhabits the South of France, South Germany, Holland, Belgium, Austria, the Tyrol, Norway and Dalmatia.

4. **E. euphorbiana**, *Fr.*—Expanse,  $\frac{3}{8}$  inch (10 mm.). Fore wings rich dark orange-brown with a straight yellow transverse band near the base. Hind wings black-brown.

Antennæ and palpi black-brown; head and thorax of the same colour but with orange dusting; abdomen dark brown. Fore wings somewhat ovate, costa gently arched, apex very bluntly angulated; black-brown, dusted with golden yellow, or orange-brown; just before the middle is an orange-yellow transverse band; which separates the broad basal blotch from the equally broad central band, and is broadest in the dorsal margin, and almost the only bright coloured marking; apical area faintly clouded with yellow; costa and hind margin dotted with the same; cilia orange-yellow shaded with black-brown. Hind wings and cilia smoky black or brown-black. Female similar.

Undersides of all the wings smoky black, with a thin yellow line along the hind margins; costa of fore wings dotted with yellow.

On the wing at the end of May and in June, and a partial second generation in August and September.

LARVA cylindrical, active, dark green, slightly paler beneath; head very pale brown; dorsal and anal plates black; legs also black; raised dots green; hairs short. July and a second generation at the end of August and in September; on *Euphorbia paralias* (sea spurge) in the shoots, drawing together the terminal leaves into a bundle, eating the heart completely out and boring down the shoots, forming a chamber much lined with frass in the hollowed space. Also on *Euphorbia lucida*, *E. aquatica* and *E. amygdaloides*.

PUPA light chestnut-brown; its whole surface shining; ridges of the abdomen very small, with almost imperceptible spines; cremaster short and broad, furnished with a number of hooked bristles. In a closely constructed, delicate, white, cocoon of papery silk, between two dead leaves of the food plant, or among rubbish.

The moth is rather sluggish and seldom observed on the wing, yet on a bright sunny afternoon may sometimes be seen flying in a lively manner. Its natural time of flight is towards dusk, and at that time one or two may occasionally be seen buzzing about the spurge, but the great majority of our specimens are reared from the larva state. Its principal locality with us has been on the Kent coast, especially at Folkestone, whence it has been, I fear, nearly exterminated; it has, however, been found in Savernake Forest, Wilts, and very rarely in Somerset; also in the Malvern district of Worcestershire, at Farrington, Herefordshire (where it has been taken among wood spurge by Dr. Wood), and it is reported, rarely, from Warwickshire by Mr. Bradley and from Bedfordshire by Dr. Sharpin. This is, I think, the extent of its range in these Islands. Abroad it is found over the greater part of Central Europe—Professor Zeller wrote of it as especially plentiful in the valley of the Oder—and in Sicily; also as a larger variety in Asia Minor.

5. **E. latifasciana**, *Haw.*; **dormoyana**, *Dup.*.—Expanse  $\frac{1}{2}$  inch (12–14 mm.). Fore wings long, somewhat ovate, dull brown dusted with yellow: before the middle is a very broad pale yellow band divided by three or four fine parallel lines.

Antennæ finely ciliated, dark brown; palpi and face dull white; head dull brown; thorax brown shaded with yellow; abdomen black-brown. Fore wings long, somewhat ovate, costa much arched, apex bluntly angulated; dark brown dusted with pale yellow; before the middle is a broad, almost straight, pale yellow band intersected by three or four faint parallel lines of the dark ground-colour; apical region crossed obliquely by a faint red-brown stripe; costa dotted towards the apex with yellow; cilia pale yellow shaded with brown. Hind wings smoky brown; cilia whiter. Female similar.

Undersides of all the wings leaden brown.

On the wing from June till August.

LARVA shining pale yellow, with the alimentary canal in places showing blackish green; head round, black; thoracic plate reddish; anal plate rather large, shining, reddish or reddish black.

April and May. “Feeding in silken galleries in the small patches of *Hepatica* which grow on smooth-barked trees as lilac, ash, &c. There is no visible external sign of the presence of the larva within the tufts of liverwort, but if these are gently sundered from the trunks the galleries at once become visible; these are of thick white silk, covered with gnawings from the bark and debris of the liverwort.” (W. Warren.) Other writers say upon plum, cherry, oak and birch trees.

PUFA long, pointed, shining red; spun up within the larval gallery.

The moth sits in the tree on the trunk of which it has fed as a larva, and may readily be beaten out from the branches. Usually a rare species, though long known, in these Islands; but in the year 1894 Mr. A. C. Vine of Brighton found it in abundance frequenting one ash tree in Sussex. He told me that the neighbouring ash trees were not frequented, and that this tree had no special clothing of moss or *Hepatica*, and that nothing could be discovered to explain the extraordinary circumstance. Larvæ were searched for on the tree that season, but none were found, and so far as I know the species has not since been noticed there. The series of specimens taken by Mr. Vine is still in evidence in my (and many other) cabinets. Elsewhere it has been taken, though never commonly, in Kent, Surrey, Hants—the New Forest especially—Dorset, Worcestershire, and at Monkswood, Hunts. The only other record in these Islands, known to me, is of a single specimen taken at Killarney, Ireland, by Mr. J. J. F. X. King. This specimen I have seen. Its range abroad is through Central Europe, the South of Sweden and Norway, Piedmont, Dalmatia and Bithynia.

#### Genus 14. ACROLITA.

Antennæ thick, ciliated: palpi very short, broadly tufted, placed horizontally below the head; thorax smooth; fore wings without fold; costa flatly arched; apex blunt.

We have two species, not very similar.

A. Fore wings pale tawny brown with browner markings.

*A. consequana*.

A<sup>2</sup>. Fore wings white, clouded at the base and apex with blue-black.

*A. serrillana*.

1. **A. consequana**, *H.-S.*; **hawkerana**, *Sta.* Fore wings pale tawny brown with rather darker brown basal blotch and slender oblique central band.

Antennæ brown; palpi, head and thorax reddish drab; abdomen light brown. Fore wings somewhat squared and of rather even width; costa not folded, nearly straight; apex squarely angulated, hind margin nearly straight; pale tawny brown or nut-brown; costa regularly dotted with darker brown; basal blotch rather indistinct, brown dusted with black, more particularly upon the median nervure, and there also somewhat squarely angulated; central band narrow and very oblique, also dull brown and usually broken in the middle; cilia brown shaded with smoky black. Hind wings and their cilia pale smoky brown. Female similar.

Underside of the fore wings leaden brown; costa dotted with white; dorsal region broadly leaden white. Hind wings smoky white.

On the wing from the end of April till June and as a second generation from the end of July till September.

LARVA stout, tapering to each end, greenish brown with black raised dots, from each of which grows a single hair; head pale brown, darker on the crown; a delicate V-like mark edges the lobes in front; dorsal plate shining umbreous, divided in the middle by a milk-white line. (H. Moncreaf.)

April and May and a second generation in July and August, on *Euphorbia paralias*, *E. portlandica*, *E. characias* and other species of spurge, especially those growing at the seaside; cutting off and partially devouring the leaves and fastening them together with silk so as to form a bunchy tunnel in which it lives, coming out at night from the top of this tube to feed; ultimately also spinning up therein. Apparently to be found upon the plants in the larva or pupa state almost throughout the year.

The moth flies freely about the spurge at dusk, and probably may be disturbed from among it in the daytime,

but I have no personal acquaintance with it in its natural haunts. These are on sandy flats near the sea where the various spurges grow freely, but in these Islands it is only known to be found in Hayling Island, Bournemouth, the Isle of Portland and the Chesil Beach in the counties of Hants and Dorset. Abroad its range is on the coast of the South of France, Spain, Sardinia, Sicily and the Canaries.

2. **A. servillana**, *Dup.*.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.).—Fore wings white with large blue-black or black-brown clouds at the base and apex; hind wings white in the male, nearly black in the female.

Antennæ, palpi, head and thorax of male smoky black; abdomen silky black, white behind. Fore wings blunt, not broad, costa faintly arched and without fold, apex bluntly rounded; white shaded with blue-black; basal blotch large, composed of lines of blue-black dusting, its outer edge angulated but not very clearly defined; beyond is a small cloud of black dusting on the costa, and a large one at the anal angle; hind marginal area striped with a dusting of black and blue-black, in which is a row of deep black dots; cilia dull black. Hind wings white tipped with dark brown dusting. Female similar but larger and having the hind wings very dark smoky brown or smoky black, with white cilia.

Underside of the fore wings leaden black, sprinkled at the hind margin with white. Hind wings white.

On the wing in May and June.

LARVA cylindrical, moderately stout, tapering slightly from the tenth segment; pale grey changing to white with a tinge of yellow when full grown; raised dots conspicuous, dark grey, from each of which springs a small white hair; head small, jet black and shining; dorsal plate similar, divided down the middle by a pale line; legs and anal plate

dark grey; the dorsal vessel in some specimens is partially visible as a red line; spiracles round and black and surrounded by a pale ring (Dr. J. H. Wood). August to April on sallow (*Salix caprea*) and rarely on willow; inside a young shoot which it causes to swell in a symmetrical manner into a long-ovate gall-like enlargement, out of which the pith and some portion of the woody tissue is eaten; the frass being closely packed away in the upper end of the burrow. Dr. Wood states that the whole length of the mine has never exceeded, and seldom reached the length of one inch, and the substance removed is so small that he is inclined to think that the larva derives a considerable portion of its nourishment from the sap which it probably licks up from the walls of its chamber. In the hollow of this chamber it finally assumes the pupa state, but on one occasion the pupa was found, by Mr. J. E. Collin, to inhabit the gall of *Cecidomyia salicis*, a minute gall-gnat parasitic on the sallow.

The moth sits usually in sallows in the daytime, and may be occasionally beaten out of them and secured, but is not active by day; in the late afternoon and at sunset it flies of its own accord—often quite out of reach—over them. Apparently found only in and about woods, preferring the open portions where trees are few and the ground is damp; very local and usually scarce but found in Kent, Surrey, Sussex, Hants, Dorset, Wilts, Middlesex, Essex, Cambs, Huntingdonshire, Herefordshire and Worcestershire. So far as I know that is the extent of its range in these Islands. Abroad it is found through Central Europe, Spain and Piedmont.

#### Genus 15. **ROXANA.**

Antennæ thick, ciliated; palpi short, broadly tufted, carried horizontally beneath the head; thorax smooth;



fore wings without fold, very broad, costa strongly arched; hind wings tufted at the base.

We have only one species.

1. **R. arcuella**, *Linm.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings rich orange, crossed with silvery lines, and containing a large ocellus, white above, black with silvery streaks below; hind wings black-brown.

Antennæ ciliated, dull black; palpi, head and thorax smoky black-brown; abdomen grey-brown. Fore wings rather broad; costa well arched, not folded; apex very bluntly angulated; rich orange-red, in the middle is a sort of large ocellus containing two steel blue dots placed in a horizontal black dash, and among black dots, the whole surmounted by a white dash and a cloud of yellow streaks; before and beyond this ocellus are narrow black-edged steel blue lines—perpendicular, oblique and horizontal—and a series of short similar streaks on the costa; cilia smoky grey. Hind wings smoky black, with whitish cilia. Female similar.

Undersides of all the wings smoky-black.

On the wing at the end of May and in June and July.

LARVA not satisfactorily described, nor indeed certainly known. Statements (which appear to be guesses) as to its habits are not rare. The most reliable suggestion which has reached me is that by Mr. W. Warren, that it “feeds on low-growing plants, skeletonizing their leaves, and not particular as to what plants.”

This is a very lively and active species; it loves to sit in the daytime in the sun upon oak bushes or bracken, upon the leaves, and evidently delighting in the hottest sunshine; when disturbed buzzing swiftly away to settle again at a short distance. Found only in woods, frequenting the broad paths and open spaces among bushes, but not to be found

in dull weather, and difficult to see upon the wing from the darkness of colour of its hind wings. Not known to fly at all at night. Sufficiently common in the woods of the South of England from Kent and Essex to Dorset, and Wilts and Berks, and in Oxfordshire, Herefordshire and Worcestershire; found also in Suffolk, Staffordshire, Cheshire, Lancashire, Yorkshire and Westmoreland; and in Wales I have met with it in Canaston Wood, Pembrokeshire. In Scotland it is recorded in Perthshire by Dr. White and Sir Thos. Moncrieff, but I find no other notice of its occurrence in that country, nor any in Ireland. Abroad it is widely distributed over Central and Southern Europe, Scandinavia, Armenia, Asia Minor, the Trans-Caucasian region, Siberia, Corea and Japan.

#### Genus 16. **ERIOPELA.**

Antennæ short, thick, notched and ciliated; palpi long, diverging, broadly tufted; thorax smooth; fore wings rhomboid, pointed at the apex; not folded; hind wings tufted at the base.

A. Central band of fore wings broad over the anal angle.

*E. quadrata.*

A<sup>2</sup>. Central band narrow or absent over the anal angle.

*E. fractifasciata.*

1. **E. fractifasciata**, *How.*—Expanse about  $\frac{1}{2}$  inch (10-12 mm.). Fore wings narrow and pointed at the apex; grey with a squared brown basal blotch and narrow oblique central band often very obscure.

Antennæ ciliated, black-brown; palpi, head and thorax dark umbrous; abdomen grey-black. Fore wings rather elongated; costa scarcely arched, not folded; apex rather produced and sharply rounded, hind margin oblique and straight; colour leaden grey thickly dusted with brown;

basal blotch squared grey-black, angulated outwardly; central band of the same colour, slender, irregular but oblique, often cut off below the middle, and thence obsolete; costa and apex dotted with black: cilia leaden grey. Hind wings and their cilia leaden white. Female smaller with narrower fore wings, the markings more distinct and sharp, red-brown; ground-colour paler. Hind wings also rather paler.

Underside of the fore wings leaden black, paler towards the dorsal margin. Hind wings leaden grey.

There is a little local variation in size, specimens from Sutherlandshire and the Hebrides being rather large.

On the wing in April and May, and as a second generation from July to September.

LARVA dirty green with darker raised dots, dark brown head; dorsal plate yellow edged with paler. (Hofmann.)

June, and a second generation in August and September, on *Scabiosa succisa* and *S. columbaria*, feeding in autumn on the spun-together vertical leaves, but in the earlier brood on the stems and flower-heads. Sorhagen says that it passes the winter in a cocoon in the earth.

This species especially frequents chalky places, sitting during the day among grass and low-growing plants, but is readily disturbed by a passing footstep, and flies in a lively manner before dusk. Rather local, but sometimes abundant in its restricted localities, which are especially in the Southern counties—Kent, Sussex, Surrey, the Isle of Wight, Dorset and Somerset—also, but much less commonly, in the Eastern Counties, and Oxfordshire, and Westward in Gloucestershire, Cheshire, North Lancashire, and Westmoreland. and a single specimen has been taken in Durham. In Scotland it is found, more frequently, in the Clyde district and in Argyleshire and Sutherlandshire as well as in the Hebrides. Abroad

it is common in Central and Northern Europe, North and Central Italy, Dalmatia, and Bithynia.

2. **E. quadrana**, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.) Fore wings brownish white with numerous transverse brown lines and two transverse bands which are mainly visible on the dorsal region. Hind wings pale smoky brown.

Antennæ ciliated, black-brown; palpi, head, and thorax pale grey-brown; abdomen silky grey. Fore wings elongate, narrow at the base; costa straight, without fold; apex bluntly angulated; hind margin straight and rather oblique; pale brownish grey with numerous slender transverse brown lines; on the dorsal margin are two brown blotches, the first somewhat squared the second broad and semi-ovate, almost joined by two slender oblique stripes from the costa; beyond is a brown costal spot; cilia pale grey, intersected by one or two black-brown lines. Hind wings and their cilia pale smoky brown. Female similar.

Underside of the fore wings dark smoky brown; costa edged and dotted with yellowish white; a white streak lies in the hind margin, and another at the anal angle. Hind wings pale smoky brown.

On the wing in May.

LARVA apparently undescribed. Sorhagen says that it lives, sociably, close to the earth, on the stem of *Scabiosa arvensis*; pupating in a papery cocoon.

The moth is found principally upon chalky downs and in open woodlands, but it is very scarce with us. It seems usually to be taken among field scabions, and flies gently over rough ground in the late afternoon. It is local, and appears confined to the counties Kent, Surrey, Sussex, Hants, with the Isle of Wight, and in the North to North Lancashire and Westmoreland. Except that Mr. J. Gardner has taken a

single specimen in Durham, this seems to be the extent of its range in these Isles. Abroad it is widely distributed over Central and Northern Europe, including Norway, and is found in Dalmatia.

Genus 17. **STEGANOPTYCHA.**

Antennæ short, ciliated; palpi stout, placed low down; thorax with a very flat crest, or the scales merely drawn together at the back; fore wings narrow, without fold; anal angle rather drawn in; hind wings smooth.

We have eleven species, somewhat diverse.

- A. Fore wings reddish brown with a square white central dorsal blotch. *S. rubiginosana.*
- A<sup>2</sup>. Fore wings orange-red with oblique grey streaks. *S. obtusana.*
- A<sup>3</sup>. Fore wings dark dull brown, with a dark red curved blotch before the apex. *S. angustana.*
- A<sup>4</sup>. Fore wings white or greyish white.
- B. Head white; fore wings with a squared black dorsal spot near the base. *S. nigromaculana.*
- B<sup>2</sup>. Head buff; a sharply triangular black dorsal spot near the base. *S. ramella.*
- B<sup>3</sup>. Head dull white; a large brick-red loop on the costa, to the apex. *S. eruciana.*
- A<sup>5</sup>. Fore wings pale orange-brown or pale reddish-buff.
- C. Basal blotch large, broken up into brown transverse stripes. *S. minutana.*
- C<sup>2</sup>. Basal blotch large, strongly angulated outside. *S. rufimitrana.*
- C<sup>3</sup>. Basal blotch dappled with white, followed by a white dorsal blotch. *S. trimaculana.*
- A<sup>6</sup>. Fore wings brown or olive brown with two pale dorsal blotches.

D. Fore wings squarely oblong with the apex pointed.

*S. naryana*.

D<sup>2</sup>. Fore wings blunt, with rounded costa.

*S. geminana*.

1. **S. rubiginosana**, *H.-S.*; **bouchardana**, *Dbl.*.—Expansion  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.) Fore wings long and evenly narrow, mottled reddish-brown with a large central white dorsal blotch.

Antennæ, palpi, head and thorax dull brown; abdomen grey-brown. Fore wings rather narrow, costa nearly straight, not folded, apex rounded and hind margin nearly straight; light umbreous dusted with red; the space between the broad umbreous basal blotch and the central band forming a squared white spot on the dorsal margin; central band oblique and ill-defined; beyond it there are first some white dusting, then two upright tawny shades, and some reddish clouding; costa dotted with white; cilia blackish-brown. Hind wings pale smoky brown; cilia whiter. Female similar.

Underside of the fore wings smoky brown, with white costal dots. Hind wings smoky white.

Usually not variable, but in the collection of the late Mr. H. Doubleday, in Bethual Green Museum, is a specimen which is purple-red with a bright white edging to the costa.

On the wing from the end of May till the beginning of July.

LARVA apparently unknown.

The moth sits in the daytime in Scotch fir trees (*Pinus sylvestris*), very often in the smaller trees resting in the branches, and when beaten out flies heavily towards another tree. Said by Mr. C. Fenn to fly naturally around the tops of the boughs of Scotch fir trees in the afternoon and till sunset. In Scotland it is said to sit on the trunks of the fir trees, where it is not easily to be seen. Formerly only

known to occur in Scotland, and there scarce, but more recently it has become comparatively common, and has made its way southward. This was first noticed in 1882, when it was found in Norfolk by Mr. E. A. Atmore. More recently it has been taken at Box Hill and elsewhere in Surrey, in Kent, and Hants; northward also in Lancashire, Cumberland, and Northumberland. In Scotland it is distributed over the Edinburgh district, Perthshire, Renfrew, Dumbartonshire, and other parts of the Clyde district, and also through Moray and Aberdeenshire. I know of no other localities for it in these Islands. Abroad it is found in the South of France, Holland, Germany, Galicia, Livonia, and the South of Sweden.

2. *S. obtusana*, *Hww.*—Expanse  $\frac{1}{2}$  inch (12 mm.) Fore wings rich soft velvety chestnut-brown with a long curved grey central stripe and a similar spot over the anal angle.

Antennæ red-brown; palpi drab; head and thorax orange-brown; abdomen pale brown. Fore wings exceedingly pretty; costa arched, not folded; apex blunt, hind margin filled out; soft rich chestnut or orange-brown with grey shading; between the basal blotch, which is large and extended on the dorsal margin, and the central band and apical space, is a slender curved grey central stripe, which runs from the base along the costa to the middle, and then crosses to the anal angle; above this angle is a grey-brown ocellus, dusted with black; on the costa toward the apex are some white dots, and in the apex a minute white ring; cilia white and brown. Hind wings with their cilia smoky brown. Female similar.

Underside of the fore wings leaden-brown, the costa dotted with white. Hind wings leaden-white.

On the wing from the end of May till July.

LARVA unknown.

The economy of this species is very puzzling. The moth loves open woods and bushy places on heaths. Sometimes it is quite common among stunted oak bushes, sitting on the upper side of the leaves in the afternoon sunshine, where it has an exquisitely beautiful appearance, but instantly buzzing away if at all disturbed; sometimes frequenting hazel in the same manner. In the more open heaths frequenting low-growing thick willow bushes (*Salix fusca*), sitting on the leaves or hiding in the dense masses, but flying out instantly if disturbed, and particularly active in the latest afternoon sunshine; but apparently affording no evidence of attachment to any particular plant, and at dusk frequenting the bushes on which it rested in the daytime; yet all search for its larva on oak, willow, or hazel seems to result in disappointment. In localities such as here described in the Southern Counties from Kent to Devon, in the Eastern to Norfolk—where it is common—also in Gloucestershire, Herefordshire, Worcestershire, Huntingdonshire; northward in Yorkshire and Cumberland, and formerly in Lancashire: but I find no records in other parts of the United Kingdom. Abroad it is common through Central Europe, and found in Southern Russia, Finland, and Bithynia.

3. **S. minutana**, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12-16 mm.). Fore wings pale reddish-yellow, mottled all over with transverse dark brown streaks which obscure the darker basal and central markings.

Antennæ brown, ringed with paler; palpi, head, and thorax pale brownish drab; abdomen pale brown. Fore wings rather even in breadth, not long; costa flatly arched, apex faintly projecting, hind margin retuse; reddish-white or pale reddish-yellow, thickly sprinkled with brown dots and cross streaks; basal blotch large, angulated outwardly, composed of small black streaks shaded with brown; central band oblique, similar but more clouded with black; beyond



it is a large ocellus, containing short lines of black dusting surrounded by red-brown shades; costal dots black-brown; cilia reddish-white on a black line, and streaked with black. Hind wings and their cilia smoky-brown. Female similar.

Underside of the fore wings smoky-brown, the costa spotted and hind margin shaded with white. Hind wings smoky brown.

On the wing in June and July.

LARVA dirty white with colourless raised dots; head pale yellow; jaws black-brown; two dark spots on each side and another on the dorsal plate. June on *Populus italica* and *P. alba* between two joined together leaves. Pupating in the same place (Treitschke). Also on *Populus nigra*, *P. tremula*, and other species; feeding on the buds and young leaves, much attached to large trees.

PUPA red-brown; in a slight web.

This is a rather retiring species, sitting by day on poplar trees, and very often in the higher branches thereof. If shaken off or disturbed by a violent blow to the trunk of the tree, flying quickly to another branch; but sometimes driven out of the trees by rough weather and induced to settle on a tree-trunk or paling, when it may easily be secured. Flying naturally in the late afternoon sunshine but usually keeping to the trees. Rather frequent in the suburbs of London, but there more particularly attached to white poplar; also taken in other parts of Kent, Surrey, and Middlesex; also in Essex, Suffolk, Norfolk, Gloucestershire, and Lancashire; but so far as can be ascertained not more widely distributed in these Islands. Abroad it is found all over Europe except the polar portion, and in Algeria and other parts of Northern Africa.

4. **S. cruciana**, L.—Expanse  $\frac{1}{2}$  to  $\frac{3}{8}$  in (12–15 mm.). Fore wings grey brown at the base, then white or pale

brown, with a broad chestnut-red central band curved up at the anal angle, and produced to the apex.

Antennæ black-brown, barred with white; palpi, head, and thorax olive-brown; abdomen dull brown. Fore wings not much elongated but of even width; the costa not folded, yet a little raised at the edge; apex bluntly angulated; dull white or whitish olive-brown; basal blotch large, dark olive-brown, its outer edge oblique; central band broad, dull red or chestnut-red; very oblique and running into the anal angle where it throws off a similar dark-red cloudy blotch along the hind margin to the apex; cilia white, shaded with brown. Hind wings smoky brown; cilia white. Female similar.

Underside of the fore wings leaden-black; costa and cilia shaded with white. Hind wings pale lead-colour, with white cilia.

Variable, more especially in the direction of more dusky colouring, the olive-brown of the basal blotch often spreading over and suffusing the rest of the fore wings. On the other hand, this basal blotch is sometimes nearly obliterated by the white ground colour.

On the wing in June and July.

LARVA active, rather flattened, pale yellow with an indistinct greenish dorsal vessel, and the raised dots hardly perceptible; head light brown; plates yellow.

April, May, and the beginning of June on sallow, feeding in the young shoots, eating out their hearts, and drawing together the terminal leaves.

PUPA light brown or amber-coloured, in a snug little silken cocoon in the fold of a dead leaf on the ground.

The moth is always to be found about sallow bushes, and is easily disturbed by the beating-stick through the day; flying freely around the same bushes at dusk. Very common in the south of England—except in West Cornwall—to

Oxfordshire and Bucks, also in the Eastern Counties, and in the west from Somerset to Lancashire, but apparently almost absent from the Midland Counties. Very local in Yorkshire and Durham, also in some parts of Scotland, as the Edinburgh district, Roxburghshire, Perthshire, and the Clyde Valley, and not wholly absent from the Orkney Isles. Probably well distributed in Wales, but my only record is in Pembrokeshire. In Ireland it is widely distributed, being recorded from Kerry and Connemara, the Dublin district, Enniskillen, Sligo, and Derry. Abroad common throughout Central and Northern Europe, including Lapland, and in North America, in California, and the Hudson's Bay territory.

5. *S. augustana*, *Hüb.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings narrow, pointed, grey-brown, the markings strikingly similar to those of *S. cruciana*.

Antennæ slender, whitish-brown; palpi, head, and thorax drab-brown; abdomen leaden-brown. Fore wings narrow, especially so behind; costa not folded but its edge slightly raised, rarely straight; apex bluntly angulated; pale olive-brown shading to white along the costa; basal blotch large, reddish olive-brown, its margin very oblique; central band parallel with the margin, dull red, almost attaining the anal angle; apical spot large, red-brown, and the hind margin edged with the same; cilia white, tinged with olive-brown. Hind wings dark smoky brown; cilia tipped with white. Female similar.

Undersides of all the wings lead-colour; costa of fore wings edged with white.

Variable in colour, many specimens being much darkened from suffusion of smoky brown; others, more rarely, equally suffused with rust red. Some specimens have the markings more or less edged with silvery lines, but our native specimens show this far less than those from the Continent.

On the wing in June and July, and in a second generation,

equally plentifully, in the middle of August and through September.

LARVA sluggish, yellowish or whitish green with hardly visible raised dots; head shining dark brown; dorsal plate like the body but somewhat dotted.

April and May, in the still unopened leaf-buds of sallow (*Salix aurea*, *S. caprea*, *S. arbuscula*) (Treitschke); second generation in July, said by Hoffmann to feed sometimes on *Gentiana pneumonanthe*.

PUPA slender, light brown, in a cocoon under moss, on the ground.

There is some doubt about this species. It was long considered to be a mere variety of the last, and for this there was strong reason, since the markings of the moths are nearly identical. Yet the narrower fore wings, and the presence, often, of silvery lines upon them, as well as the existence of a well developed second generation in the season, present difficulties which it is not easy to surmount. It is apparently confined to the north, and I have no personal knowledge of its habits, but it is found on the hills of Durham, and in Scotland in Perthshire and the Clyde district, and also in the Orkneys. Its range abroad is much confused with that of the preceding species, but it is distinctly pointed out as *double-brooded* in Alpine regions.

6. **S. nigromaculana**, *Haw.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.). Head white; fore wings white with two black dorsal streaked spots, one brown apical cloud and some black costal dots.

Antennæ whitish brown; palpi, head, and back of the shoulder-lappets snow-white; rest of thorax black; abdomen black, ringed and tufted with white. Fore wings rather broad behind, costa nearly straight, apex bluntly rounded,

hind margin straight and squared; snow-white, costa spotted with black before the middle, with brown beyond: on the dorsal margin before the middle is an erect squared spot divided by the ground colour into four dots; nearer the anal angle is an erect black and brown triangular spot which edges a large ocellus containing black dots; above this to the apex is clouded with tawny-brown; cilia white, shaded with smoky black. Hind wings smoky white, with white cilia. Female similar.

Underside of the fore wings light leaden brown; costa dotted and hind margin shaded with white. Hind wings smoky white.

On the wing in July and August.

LARVA apparently undescribed. In the flowers and seed-heads of ragwort (*Senecio jacobea*) in September; also on *S. nemorensis* and other allied species, sometimes going down into the stem, and said also to enter the roots. Pupating in an oval cocoon in the earth, having passed the winter as a larva therein.

This moth is an exceedingly pretty and bright-looking species. It sits during the day on plants of ragwort, on the stems or under the leaves, and if disturbed flies steadily to another plant. After sunset and towards dusk it buzzes gently about the same plants, and is whenever flying very conspicuous from the clear whiteness of its fore wings. After dark it will occasionally come to a strong light. To be found occasionally in the South London suburbs, and more frequently throughout the southern counties to Devon and to Oxfordshire; and in the eastern to Norfolk and Cambs, showing a partiality for chalky places, dry gravel pits, commons, and other waste land; in the west from Gloucestershire to Lancashire; also in Yorkshire and Durham. In Wales not scarce on the coast about Pembroke; in Scotland in the Edinburgh district, including Fife; in the

Clyde district, including Renfrew and Dumbartonshire, and in Aberdeenshire. In Ireland, near Cork, Carlow, Galway, Sligo, and in Donegal and Derry. Abroad it occurs in many parts of Central Europe and in Croatia.

7. **S. ramella**, *Linna.*; **paykulliana**, *Fab* — Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.).—Fore wings white clouded with grey; on the dorsal margin near the base is an erect triangular sharply-pointed black spot, and beyond it a smoky-black cloud in the apex, and another at the anal angle.

Antennæ ciliated, light brown; palpi and head greyish-white; thorax brownish-white; abdomen pale brown. Fore wings rather narrow, costa arched, apex rather pointed, hind margin gently curved; white shaded with smoke colour and dusted with black; near the base is an erect black dorsal triangle; and beyond it over the anal angle a more obscure smoky-black cloud edging a faint ocellus; costa minutely double-dotted with black and with longer streaks at intervals; apical region clouded with smoky black; cilia smoky white. Hinds wings and their cilia smoky brown. Female similar.

Underside of the fore wings smoky black with faint, twin, costal whitish dots. Hind wings leaden white.

A very frequent variation, perhaps most common in the female, has the deep black of the dorsal triangle extended more or less over the entire fore wings except a broad costal stripe, which remains white; often this black extension absorbs and obliterates the other markings.

On the wing in July and August.

LARVA apparently undescribed. Said to feed in April and May in the buds, catkins, and twigs of birch.

The moth sits upon the trunks, and especially upon the branches and twigs of birch, very often upon birch bushes, and is easily beaten out in the day-time, when it flies steadily

and not very swiftly to another bush or tree. At dusk it flies freely over the same trees and bushes. Usually common among birch, and probably to be found throughout England, except perhaps in the Midland Counties, where records are rare; also throughout the south of Scotland to Perthshire and Aberdeenshire; but I have no record for Wales, and in Ireland only from Howth, Wicklow; Mayo, Enniskillen, and Tyrone. Abroad it is generally distributed in Central and Northern Europe and South Siberia.

8. **S. trimaculana**, *Don.*—Expanse  $\frac{3}{4}$  inch (15–17 mm.) Fore wings rather pointed at the apex, yellowish white almost covered with golden brown or dark brown markings—a much angulated basal blotch, central band and apical cloud—all much mottled and dusted.

Antennæ brown; palpi brownish white; head and thorax yellow-brown; abdomen silvery grey. Fore wings even in width, costa very flatly arched, apex bluntly angulated; whitish brown or yellowish white, dusted with brown; basal blotch large, shortly angulated externally, darker red-brown or yellow-brown rippled with paler colour; this is followed by ground colour on an angulated transverse pale band, usually conspicuous; central band oblique, broad on the dorsal margin, yellow-brown or dark brown; apical area mottled with streaks of the same colour; above are some geminated white costal streaks, below a faint whitish or pale brown ocellus; cilia mottled grey-brown and white. Hind wings with their cilia pale smoky brown. Female similar but with darker hind wings.

Underside of the fore wings pale lead-colour with white costal dots. Hind wings leaden white.

Always and everywhere exceedingly variable, ranging from pale ochreous with only the faintest trace of markings to smooth blackish brown or reddish brown.

On the wing from late in June till August.

LARVA rather stout and slightly flattened; pale yellow—greener when young—dorsal region tinged with light brown or pink; raised dots minute, black; head and the broad dorsal plate shining jet black; anal plate green.

May and June on elm (*Ulmus campestris*) between united leaves, also in rolled leaves and shoots, more especially frequenting trees and not bushes.

PUPA pale yellowish brown; spun up in the larval habitation.

This species sits in elm trees, on the trunk and branches, and among the leaves, from which it may be beaten out in clouds, almost throughout England, including the London suburbs, yet is rather scarce in the northern counties. It flies about the trees and along elm hedges in abundance at dusk. Common also in Wales and all the lowlands of Scotland to Perthshire; and probably throughout Ireland, though apparently recorded only from Wicklow, Cork, Dublin, and Antrim. Abroad its range extends almost all over the Continent of Europe.

♀. **S. rufimitrana**, *H.-S.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings rather narrow; pale reddish white or yellowish buff with umbreous, sharply angulated, basal blotch, slender oblique central band, with apical dots and clouding. Hind wings pale smoky brown.

Antennæ, palpi, and head dark yellow; thorax ochreous-brown; abdomen grey-brown. Fore wings rather narrow but even in width, costa very slightly arched, apex angulated; pale reddish brown or reddish white; basal blotch dark brown, strongly angulated outwards on the median nervure, indented below the costa; central band narrow, very oblique and straight, or else indented in the middle, umbreous dotted with black; hinder area clouded with the



same colour and having a short upright black-brown streak before the margin and some geminated silvery white streaks on the costa separated by black dots; a raised black dot at the apex; cilia smoky brown. Hind wings and their cilia pale smoky brown. Female similar.

On the wing in July and the beginning of August.

LARVA whitish green or yellowish green, semi-transparent so that the contents of the intestinal canal are visible; raised dots large and shining, but of the body-colour; head yellow-brown, jaws darker; dorsal plate pale green; anal plate pale yellow; legs and underside of the body greenish white.

May and June on *Pinus cephalonica* (an introduced fir), hollowing out the young needles, spinning together the terminal shoots, afterwards uniting the older needles in bunches, and eating some of them through, near the base. Sorhagen says also on *Pinus picea*.

PUPA rust-red, tapering towards the head as well as towards the tail. In a silken cocoon among rubbish on the ground. (Wachtl).

This species was first noticed in this country about the 1875-6, when two specimens were taken at light at night at Trinity College, Cambridge, by Mr. F. J. H. Jenkinson. More recently it has been found by Mr. N. M. Richardson near Weymouth, Dorset, about silver fir, flying at dusk near the tops of the trees, whence it was difficult to induce them to descend. Elsewhere it has been found in North Devon, Hants, Essex, and Norfolk. So far as I know these six counties comprise its whole range, as yet, in the British Isles. Abroad it is found almost all over Central Europe and in North-west Russia.

10. **S. nævana**, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12-16 mm.) Fore wings narrow, brown-grey or brownish white; basal

blotch broad, outwardly squared, black-brown ; central band very oblique, clouded ; costa clouded to the apex.

Antennæ black-brown ; palpi, head, and thorax pale brown or dark brown ; abdomen light brown. Fore wings elongate, rather narrow, costa nearly straight, apex bluntly angulated, hind margin perpendicular and short ; greyish white or brownish white ; basal blotch dark brown or black, elongated in the dorsal portion, its edge angulated and bent obliquely back ; costal portion often obliterated ; central band very oblique, slender, cloudy black-brown ; costa from the middle broadly dark brown with twin white streaks at the edge ; ocellus pale brown, obscure, but with two or three brown dots ; hind margin edged with black ; cilia grey. Hind wings and their cilia smoky brown. Female similar, often larger.

Underside of the fore wings leaden brown, with minute white costal dots in pairs. Hind wings leaden white.

Very variable, more especially in the degree of suffusion of the fore wings, with some darker shade of brown or black, but every possible degree of variation is shown, from pale or whitish ground colour, with sharp black-brown or red-brown markings, to black-brown and unicolorous.

On the wing from the end of July till September.

LARVA active, cylindrical, dirty pale yellow, or greyish white ; with the dorsal vessel darker ; head and dorsal plate black ; anal plate green ; raised dots shining but obscure.

May and June on holly (*Ilex aquifolium*) in a young shoot, which is very closely spun up and having the youngest leaves drawn together. Also in the young shoots of fruit trees, living in the heart of the shoot, and in hawthorn, blackthorn, crab, mountain ash, and buckthorn.

PUPA light brown ; spun up among rubbish.

The moth is exceedingly abundant, in hedges and among fruit trees, in England and Wales, flying out in response to

the beating-stick in multitudes, and most confusing from its variation in colour and depth of markings. Towards dusk it flies voluntarily about the branches of trees and the tops of hedges. In Scotland it seems to frequent the Lowlands everywhere, but it is hardly recorded beyond Perthshire; in Ireland recorded from Cork, but more commonly from Antrim, Sligo, and Enniskillen. Abroad it is plentiful all over Central and Northern Europe, the south of Spain, and of Italy.

11. **S. geminana**, *Steph.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.) Fore wings rather short and blunt, pale silvery grey with the broad basal blotch, narrow central band, and apical spots reddish brown or slate brown.

Antennæ deep brown; palpi, head, and thorax dull brown or brownish drab; abdomen grey-brown; fore wings shorter and broader than in the last species, costa arched, apex minutely pointed and projecting; hind margin filled out; pale silvery grey; basal blotch reddish brown, extended on the dorsal margin, its edge outwardly squarely angulated and very oblique back to the costa; central band slender and oblique, hardly defined, reddish brown, its colour extended on the costa to the apex; ocellus obscure, very large, but almost immaculate; costa dotted with white; cilia grey. Hind wings and their cilia pale smoky brown. Female similar.

Underside of the fore wings leaden black; costa dotted, and cilia shaded, with white. Hind wings leaden grey.

Only a very little variable, and this in the depth of the ground colour. Very similar to the last species, but with broader and more ovate fore wings.

On the wing from the end of June till August.

LARVA active, cylindrical, dusky pale yellow strongly tinged on the back with grey-green and showing a darker

dorsal vessel; head black-brown; dorsal plate black, anal plate green; raised dots obscure but shining.

May and June on *Vaccinium myrtillus* (whortleberry) in the tops of the young shoots, uniting together the leaves and eating them, but not boring into the shoot, making a silken passage from shoot to shoot so that the plants become distorted and disfigured. Also said to feed on *V. uliginosum* and *Erica carnea*.

PUPA slender, smooth, wing and limb covers glossy, segments less so, each segment with two raised rows of minute teeth; cremaster pointed and furnished with a tuft of hooked bristles. In a cocoon of white silk between two leaves of its food-plant.

This species is brisk and lively in the day-time, rising in numbers from among *Vaccinium*, buzzing about in the afternoon sunshine, and till sunset, keeping almost constantly close to the food-plant on moors, mosses, hill-sides, and in woods in the south, but seldom seen away from it. Sometimes common on the hills of the south of Surrey, where the *Vaccinium* grows, and in the New Forest, Hants; in Kent, Sussex, Dorset, Devon, and Herefordshire. More plentiful in Staffordshire, Cheshire, Lancashire, Yorkshire, Durham, and Westmoreland; in Wales on the hills of Pembrokeshire; in Scotland in Perthshire and Aberdeenshire; and in Ireland on the Wicklow mountains, in Sligo, Donegal, and Derry. Abroad it is not always distinguished from the last species, but is known to occur in Lapland, and doubtless accompanies its food-plant in other mountainous districts.

#### Genus 18. **PHLÆODES.**

Antennæ ciliated; palpi small and blunt; thorax smooth; fore wings narrow, squared, strongly folded towards the base of the costa; apex rather pointed; hind wings smooth.

We have four species—rather closely allied.

- A. Fore wings umbreous or black-brown.
- B. Fore wings with a single, flattened and oblique, white or pale brown, dorsal blotch. *P. immundana*.
- B<sup>2</sup>. Fore wings with a broad erect grey-brown or whitish dorsal blotch, followed by another. *P. tetraquetrana*.
- B<sup>3</sup>. Fore wings with two large brightly white dorsal blotches. *P. demarniana*.
- B<sup>4</sup>. Fore wings with three dorsal connected paler blotches. *P. crenana*.

1. **P. tetraquetrana**, *Haw.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.) Fore wings narrow; costa folded; red-brown or black-brown with a large somewhat squared paler dorsal blotch, followed by another at the anal angle.

Antennæ black-brown; palpi, head, and thorax umbreous mottled with paler brown; abdomen grey-brown. Fore wings elongated, and of even width; costa folded at the base and very flatly arched, apex bluntly angulated, hind margin straight and but slightly oblique; grey-brown, black-brown, or red-brown; basal blotch umbreous rippled with white (but not extending to the costa, which is paler), its outer margin perpendicular; immediately beyond it is a large somewhat squared dorsal blotch—greyish white, dusted and rippled with dark brown atoms—central band very oblique, almost pointed at the costa, reddish brown; beyond is a large pale cloud resembling the dorsal blotch, but placed over the anal angle; some tawny clouding runs into the apex, and includes some minute geminated costal white dots; hind margin edged by a black line which is cut below the apex by a white dash; cilia smoky brown. Hind wings smoky brown with paler cilia. Female similar but with the costa plain.

Undersides of all the wings leaden brown; costa of fore wings dotted with white.

Variable in colour from pale ochreous brown to brown-

black, and in that of the pale dorsal blotches, which often are much obscured by the darker colour.

On the wing in May and June, in the north remaining into July, but in the south sometimes to be found in April.

LARVA rather stout, cylindrical, tapering somewhat behind; pale yellowish green; head dark or pale brown; thoracic plate also dark or pale brown with a darker edging behind and a pale line down the middle; anal flap yellow; legs brown; spots distinct, dark brown or black, sometimes small or devoid of the dark colouring. Occasionally, as a variety, with a rather broad, faint, red subdorsal stripe.

July to September on birch, living at first within a slightly swollen twig, or a young upright shoot of a birch bush, remaining and feeding in a mine in the twig until the last moult, which occurs in September; then leaving the mine to turn down the edge of a birch leaf, in which it feeds up in about another week. (Dr. J. H. Wood.) Said to feed also on alder.

PUPA pale red-brown, spun up among rubbish (Dr. Wood). Probably the winter is passed in cocoon in the *larva* state.

The moth is everywhere to be found, sitting in birch and other bushes in the day time, and very readily induced to fly, especially in the afternoon. At that time the male is often on the wing of its own accord, flying wildly over the trees, and this continues in increasing numbers till dusk.

Common throughout the United Kingdom—except that I have no records from the Hebrides or the Shetland Isles. Abroad also common all over Central and Northern Europe, Hungary, and the north of Italy.

2. **P. immundana**, *Fisch.*—Expanse  $\frac{1}{2}$  inch (12-13mm.). Fore wings black-brown with a broad flattened dorsal triangular spot, either white or brownish white.

Antennæ black-brown; palpi, head, and thorax umbreous mottled with paler brown; abdomen grey-brown. Fore wings narrow, the costa folded at the base and flatly arched, apex bluntly angulated; black-brown; on the middle of the dorsal margin is a large, flattened, white, whitish or pale brown blotch, edged at the back by a deep black streak, occupying the place of the margin of the basal blotch—this and the other normal markings being absorbed in the ground colour—the anterior and posterior margins of this pale blotch being *both very oblique*; close to the hind margin is an obscure ocellus, above which are one or two white sub-marginal streaks; costa dotted with geminated whitish streaks; cilia smoky brown. Hind wings and their cilia smoky brown. Female similar, but with the costa plain, and often having the dorsal pale blotch obscured by dark clouding.

Underside of the fore wings leaden black, with twin white costal streaks, and the cilia shaded with white. Hind wings pale lead colour.

Variable in the colour of the dorsal blotch, which very often is partially, or wholly, shaded with brown. Much like the preceding species, but smaller and with even narrower fore wings, but the most obvious distinction is in the shape of the dorsal pale blotch. Occasional specimens, especially in the second brood, are sometimes suffused with pale brown.

On the wing at the end of May and in June, and a second generation in August and September.

LARVA purplish brown on the back, dusky flesh colour beneath and in the incisions of the segments; spiracles very minute and faintly darker; raised dots shining brown, scarcely distinguishable unless examined with a lens; head brown, lighter in front, dorsal plate black-brown with a whitish middle line. (A. Balding.)

November till April or May, in catkins of alder and birch, and a second generation in July in rolled alder leaves. Spinning up among moss.

The moth sits on trunks of alders and sometimes birches during the day, and if disturbed falls down and flies away; but towards dusk flies swiftly over the same trees. Sometimes if the weather is very warm and still it will fly off the trunks, as one passes, in little clouds, which quickly return to the trees to rest. Not so plentiful as the last species, but almost as widely spread, and sometimes quite common among alder.

Common in all the Southern and Eastern counties of England, but apparently scarce or absent in most of the Midlands and some of the Western counties, but recorded in Herefordshire, Derbyshire, Cheshire, Lancashire, Yorkshire, and Cumberland. In Wales it is not rare in Pembrokeshire; and in Scotland is to be found in Dumbartonshire and other parts of the Clyde district, and in Arran, Ross-shire, and Aberdeenshire. In Ireland, found in Cork County, Wicklow, Galway, Sligo, Fermanagh, and Derry. Abroad it has a wide range through Central Europe, Northern Spain, Scandinavia, Finland, South-East Russia, and the Caucasian district.

3. **P. demarniana**, *Fisch.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings black-brown with two large white dorsal blotches.

Antennæ grey-brown; palpi and head dusky white; thorax blackish brown; abdomen reddish brown. Fore wings moderately broad, costa strongly folded at the base, very faintly arched; apex bluntly angulated, hind margin straight, and hardly oblique, black-brown, dusted and rippled with white; on the middle of the dorsal margin is a large white blotch, its inner edge perpendicular; at the anal angle another, more rounded; between these is the



central band, of the ground colour, notched and toothed outwardly; costa spotted with twin white dots; apex brown-black; cilia grey tipped with black. Hind wings and their cilia smoky brown. Female similar, but devoid of the costal fold.

Underside of the fore wings leaden black, with white costal twin dots. Hind wings pale lead colour.

On the wing from the end of May till the beginning of July.

LARVA apparently undescribed. Reported to feed in April and May in the catkins of birch. There can hardly be a doubt that it feeds on birch, but some authors add poplar, or alder, which are less probable.

A local species, and difficult to obtain, since it sits during the day high up in birch trees, probably on the branches, and is hard to beat out; however, when disturbed it flies away so quickly that a confederate collector is usually necessary to stand far back to leeward and catch it as it approaches the ground. It is said to have been at one time fairly common in Kent, but for very many years has been rare, and scarcely ever taken anywhere, till it was found twenty-five years ago in Norfolk. So far as can be ascertained, it is confined with us to these two counties, and Surrey, Sussex and Essex. Abroad it inhabits Central Europe and Armenia.

4. *P. crenana*, *Hüb.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings narrow, squared behind, very glossy, rich black-brown with the dorsal region occupied by three lighter or even white blotches.

Antennæ black; palpi, head, and thorax brown-black; abdomen reddish brown. Fore wings narrow, costa folded at the base and nearly straight, apex squared, hind margin perpendicular; black-brown or reddish brown; in the middle of the dorsal margin is a rounded white blotch, followed by

another over the anal angle, and very often preceded by another, smaller, near the base of the wing; sometimes these are shaded with brown lines, or filled up with velvety, dark brown clouding; or, on the other hand, they are united, and form an irregular stripe extending the whole length of the dorsal margin, and often occupying one-half the breadth of the wings; costal dots either very minute or absent; cilia dark brown. Hind wings clear light smoke colour, cilia more tinged with red. Female similar, but without the costal fold.

Underside of the fore wings reddish brown marbled with black. Hind wings pale lead colour.

Very variable in colour, the darker portion often varied with different shades of brown, the dorsal pale portion with ochreous or grey. It is always recognisable by the squared hinder portion of its narrow fore wings.

On the wing in March and April. Abroad there are said to be later emergences, in July, August, and September.

LARVA whitish or pale green; the head pale brown. It feeds on sallows and willows. (Mdme. Lienig.) Sorhagen says that it feeds on both downy and glossy leaved willows in June, July, and October.

I have no personal knowledge of this species in a living state. The late Mr. T. Wilkinson wrote: "I took them on Seamu Moor, two miles west of Scarborough; they were freely on the wing on fine sunny mornings from 10 A.M. to 1 P.M., amongst heather, stunted oaks, birches, sallows, nut bushes, and furze bushes; they seemed to frequent the sallows the most." The late Mr. J. B. Hodgkinson recorded it in Westmoreland and North Lancashire "flying in the afternoon." It seems with us to be confined to these counties, Yorkshire, Durham and Cumberland, and in Scotland to Perthshire; but there are curious records which have not been explained nor contradicted—one of a specimen

*bred in the autumn* from a larva found in Surrey; and one each, taken near Ipswich, and at Lakenheath, Suffolk. These seem to indicate a more extensive range toward the South. Abroad it is found in Belgium, Germany, Switzerland, Scandinavia, Livonia, and Russia.

### Genus 19. CARTELLA.

Antennæ short, ciliated; palpi short, depressed; thorax hardly crested; fore wings moderately broad; costa very shortly and faintly folded close to the base; hind wings not tufted.

We have only one species.

1. **C. bilunana**, *Hw.*.—Expanse  $\frac{5}{8}$  inch (15–17 mm.). Fore wings snowy white, with two angulated black dorsal spots, many minute black costal dots, and some similar dusting.

Antennæ yellowish white; palpi, head, and thorax white, abdomen pale brown. Fore wings with the costa decidedly arched and slightly folded, apex bluntly angulated, hind margin oblique and rounded off; snowy white, dusted with a few black atoms, and faintly shaded behind with brown; outer edge of the basal blotch distinct, erect, forming a triangular black streak or spot shaded off within, cut off at the median nervure; central band oblique, but hardly perceptible, except near the anal angle, where it forms a squared black spot; costa obscurely dotted with minute black streaks; cilia white. Hind wings pale smoky purplish brown, with whiter cilia. Female similar or having the clouding darker, but with no trace of a costal fold.

Underside of the fore wings smoky brown dotted on the costa with dull white; cilia and a stripe along the dorsal margin white. Hind wings smoky white.

On the wing in June and July.

LARVA rather short and stout, with the extremities attenuated; dull red or liver colour, the raised dots shining horn colour, each bearing a hair; head chestnut, dorsal plate darker brown, broadly divided; anal plate narrow, divided, brown.

April in the catkins of birch, which it completely hollows out, lining the hollow with silk.

PUPA in the larval habitation, or under dead leaves, in a silken cocoon.

The moth loves to sit during the day on the trunks or branches of birch trees, and often looks very pretty and conspicuous on a birch-trunk in a suburban garden, though not equally so on the white papery bark of the same trees. It is lively and active, and not to be captured too easily unless the weather is chilly. It flies rather late in the twilight over the birch trees, and is not very easily seen on the wing at that time. Not rare in the London parks and suburbs, and to be found throughout England wherever birch trees are in any plenty, doubtless also in Wales, though I have no records. In Scotland it is just discovered by Mr. W. Evans in the Edinburgh district, and is found in the Clyde valley, Perthshire and Aberdeenshire; and in Ireland, in Kerry, Galway, Sligo, Fermanagh, Armagh and Antrim. Abroad its range is throughout Central Europe, Northern Italy, Scandinavia, and Russia.

#### Genus 20. **LITHOGRAPHIA.**

Antennæ short, ciliated; palpi short, placed below the head; thorax very faintly crested; fore wings rather broad, costa folded to about one-third its length; hind wings smooth.

We have four species.

- A. Fore wings white with grey markings and a large blue-black ocellus *L. subocellana*.
- A<sup>2</sup>. Fore wings red-brown, with darker basal blotch and white or pale brown dorsal blotch. *L. penkteriana*.
- A<sup>3</sup>. Fore wings slate-grey, with faintly blacker markings. *L. cinerana*.
- A<sup>4</sup>. Fore wings black-brown, or dark grey, dorsal blotch orange or red, or pale grey, or obliterated. *L. nisella*.

1. **L. subocellana.** *Don*; **campoliliana,** *Tr.*—EX-pause  $\frac{1}{2}$  inch (12 mm.). Fore wings white with a grey basal blotch, and a great blue-black ocellus above the anal angle.

Antennæ greyish white; palpi, head, and thorax dull white; abdomen pale grey. Fore wings narrow at the base, where is a deep costal fold, costa otherwise gently arched; apex bluntly angulated; white dusted faintly with grey; basal blotch a group of erect brown streaks, not reaching the costa; area beyond the middle broadly clouded with black and blue-black, into which run alternate black costal lines and dots; in the blue-black area above the anal angle is a large steel-blue ocellus; hind margin edged with a deep black line; cilia white, tipped with black. Hind wings frosted, smoky brown; cilia whiter. Female similar, but without the costal fold.

Underside of the fore wings leaden brown, costa dotted with white; anal angle white. Hind wings smoky white.

Usually not variable, but in the collection of the late Mr. H. Doubleday, in Bethnal Green Museum, is a specimen almost wholly white.

On the wing in May and June, and casually, but rarely, in July and August.

LARVA yellowish, with visible internal dorsal vessel and rather shining raised dots; head rather honey yellow, with two black markings.

September and October in drawn down leaves of willow,

sparingly mining out the undersurface. (Zeller.) Sorhagen adds, leaves of willow and buckthorn.

PUPA yellow-brown—Zeller says in the same place as the larva, but Sorhagen says among moss and leaves on the earth, after passing the winter in cocoon.

This is a brisk and lively species, always hiding during the day in sallow bushes, especially the large and woolly leaved fallows, flying out instantly when disturbed, to buzz about a little before again hiding. At sunset flying in numbers over the sallow bushes, resting for a moment on a leaf and then dancing aloft and around, and continuing this amusement till dusk; looking conspicuously white when on the wing. Abundant where fallows are found, throughout England, and probably Wales, where it is common in Pembrokeshire; in Scotland throughout the Lowlands to Perthshire, Fife and Dumbartonshire, and in the Hebrides and Orkneys. In Ireland recorded from Kerry, Sligo, Enniskillen, and Antrim. Abroad it is found throughout Central Europe, Italy, Finland, and Scandinavia.

2. **L. nisella**, *Linna.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings moderately broad, pointed, grey, with dark brown basal blotch, and yellow-brown, chestnut, or red-brown dorsal blotch or central space, and a black streak running into the apex.

Antennæ thick, ciliated, black-brown; palpi, head, and thorax brown, the latter dusted with paler; abdomen reddish brown. Fore wings moderately broad, even in width, costa sharply folded at the base, apex bluntly projecting, hind margin retuse; grey, grey-brown or grey-black; basal blotch large, complete, angulated outside, black or black-brown, sprinkled with white; middle area extremely variable—red-brown, orange-brown, grey or grey-brown—plain or clouded with black; sometimes the dorsal half only red or

red-brown; on the costal margin is a series of white twin dots; apical and hind marginal areas rippled with mingled black and grey and containing a faint ocellus; cilia grey, tipped with black. Hind wings smoky brown, the base and cilia paler. Female similar, but often larger, and with the costa always plain.

Underside of the fore wings glossy leaden brown; costal dots white. Hind wings leaden brown.

Extremely variable, as already shown; and often having a long red-brown or dark brown streak or blotch from the base along the dorsal margin or toward the costa, or a wedge-shaped black cloud lying along the disk, but the shape of the fore wings always reliably the same.

On the wing in July and August.

LARVA apparently undescribed. From March till May in the catkins of willow.

The moth, in my own experience, almost always frequents willows; occasionally it may be seen to sit on a neighbouring tree-trunk, but usually it is hidden in a large willow bush, and very often one which grows in the hedge of a damp lane; when disturbed, by hard beating, it darts straight out, and with great swiftness makes long zig-zags before hiding in a similar bush; indeed, its flight is so sharp that it is not a very easy insect to catch. At sunset it is on the wing on its own account, and from this time till dusk flies swiftly over willows.

Very widely distributed, but not usually found in any abundance; yet existing apparently in every county of England, and in most parts of Scotland—at least to the Edinburgh district, Perthshire, and Dumfriesshire. In Wales I have found it in Pembrokeshire; and in Ireland it has been found in Wicklow, Cork, Enniskillen, and Tyrone. Abroad its distribution is not large—Central Europe, Italy, and Spain.

3. *L. cinereana*, *How.*; *cinerana*, *Willk.*—Expanse  $\frac{5}{8}$  inch (15 mm.). Fore wings long and narrow, pale grey, with the outer portion of its basal blotch black grey, and a little dark clouding beyond.

Antennæ grey dotted with white; palpi, head, and thorax white clouded with dark grey; abdomen pale brown. Fore wings rather long and narrow, strongly folded at the base of the costa, which is somewhat arched; apex rather pointed, hind margin perpendicular; grey-white covered with delicate grey lines; basal blotch darker or blackened at its outer edge, which also is squarely angulated, but paler at the base and toward the costa; before the hind margin is a faintly indicated ocellus containing large grey dots; costa loosely dotted with dark grey, with a round black dot at the apex; cilia blackish grey. Hind wings and their cilia smoky white. Female similar, but with the costa plain.

Underside of the fore wings leaden brown with geminated white costal dots. Hind wings leaden white.

Not very variable, but the markings in some specimens are pale grey and faint, in others an additional blackish cloud lies just beyond the middle of the wing.

On the wing late in July and August.

LARVA lively, but not very active, plump, smooth, rather shiny, flattened beneath, and of equal thickness, except the anal segment, which is small; pale yellow-green, with a dark green irregular dorsal vessel, spots invisible, hairs very delicate; head chestnut-brown with darker eyes and jaws; dorsal plate faintly tinged with brown; anal plate hardly perceptible. When full-fed, yellow, with brownish dorsal vessel.

May and June, on aspen, feeding between two leaves, which it unites flatly together, and does not roll or fold, but eats away the parenchyma from between.

PUPA light brown; between the leaves where the larva has fed.



This species loves to sit upon the trunks of aspens and grey poplars (*Populus tremula* and *P. canescens*), and if disturbed in the daytime flies back to the same or another trunk. Continental entomologists regard it as a form of *L. nisella*, and Professor Zeller told me that it is the more common form abroad; yet taking into consideration especially its greater length, and less breadth, of fore wings, the decided difference in its colour and markings, and its different habits, I feel satisfied that Haworth was justified in describing it as a distinct species. It is unfortunate that its name is misquoted by almost every writer who has noticed it. With us it occurs, very locally, in Kent, Surrey, Hants, Dorset, Middlesex, Essex, Somerset, Gloucestershire, Worcestershire, Lancashire, and Durham; in Wales, in Glamorganshire; and in Scotland, much more plentifully, in Perthshire and Aberdeenshire; but in Ireland or abroad I find no separate records.

4. **L. penkleriana**, *Schiff.*.—Expanse  $\frac{1}{2}$  to  $\frac{2}{3}$  inch (12–16 mm.). Fore wings of even width, somewhat squared behind, rich red-brown, with a large angular dorsal paler blotch, which often is white.

Antennæ brown, whiter in front; palpi, head, and thorax dull red-brown; abdomen smoky brown. Fore wings very even in width, costa folded at the base and flatly arched, apex squared; red-brown, almost liver colour; basal blotch deeper red-brown, its outer margin straight and conspicuously erect but not attaining the costa; the dorsal area outside this is the palest portion of the wing, and often forms a bright white squared blotch, yet is more frequently of some shade of red; hinder half of the wing deep red-brown, with a faint pale streak toward the anal angle and four geminated white dots upon the costa; cilia grey-brown, with whitish dashes. Hind wings smoky brown; cilia dull white. Female similar, but without the costal fold.

Underside of the fore wings leaden brown, with four pairs of costal white dots. Hind wings pale smoke colour.

On the wing at the end of June, and in July.

LARVA when young pale green, tapering gradually from the third to the anal segment; head and dorsal plate large, shining black, and having somewhat the appearance of a helmet; thoracic feet black. As it approaches full growth the third to sixth segments become slightly smaller, and the head and second segment are proportionately less, and lose their blackness, but are slightly darker than the rest of the body, with some brownish markings; spiracles very small, with a spot above, and one below, very faintly darker; a few shining dots on the anal segment.

November to March in catkins of nut and alder, and thence to June in the buds of the same trees, or when the leaves appear sometimes eating their ribs on the underside. (A. Balding.)

PUPA light brown, with large wing-covers meeting at a projecting point in front; eye-covers large, round, and conspicuously black-brown. (A. Balding.) Pupating in the ground, or among moss, or dead leaves.

This moth hides during the day in alder trees and very generally in hedges, and flies out readily if disturbed; flying also, on its own account, at dusk.

Abundant in all parts of England, Wales, and Ireland, and in Scotland to the Orkneys. Abroad it is common throughout Central and Northern Europe, Italy, the North of Spain, Dalmatia, and the Caucasian region.

### Genus 21. **ANCHYLOPERA.**

Antennæ stout, naked; palpi slender, depressed, tufted; thorax smooth; fore wings devoid of costal fold, apex hooked; hind wings rather pointed.

We have fourteen species.

- A. Fore wings pale drab or pale grey-brown.  
 B. Fore wings with slender longitudinal black lines. *A. siculana.*  
 B<sup>2</sup>. Fore wings with an undulating longitudinal dark brown middle line. *A. inornatana.*  
 A<sup>2</sup>. Fore wings light slate grey with irregular red-brown marking. *A. unguicella.*  
 A<sup>3</sup>. Fore wings red-brown.  
 C. Fore wings with a large grey dorsal blotch and a separate hind-marginal one. *A. unana.*  
 C<sup>2</sup>. Fore wings with two connected large dorsal grey blotches. *A. biarcuana.*  
 C<sup>3</sup>. With an angulated basal blotch and central band, darker. *A. complana.*  
 A<sup>4</sup>. Fore wings brownish white or pale grey.  
 D. Dorsal blotch large, red-brown, distinctly humped. *A. myrtillana.*  
 D<sup>2</sup>. Dorsal blotch rather flattened, followed by a sharply pointed band. *A. paludana.*  
 D<sup>3</sup>. Dorsal blotch rounded above, dark red. *A. ludana.*  
 D<sup>4</sup>. Dorsal blotch rich chocolate-red, followed by a similar costal cloud. *A. derasana.*  
 D<sup>5</sup>. Dorsal region pale grey, edged by an undulating line which runs into the apex. *A. diminutana.*  
 A<sup>5</sup>. Fore wings shining tawny red with a darker basal blotch. *A. mitterbacheriana.*  
 A<sup>6</sup>. Fore wings black-brown shaded with orange-brown toward the apex. *A. pupana.*  
 A<sup>7</sup>. Fore wings white with blue-black dorsal and hind-marginal clouds. *A. latana.*

1. **A. siculana**, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–18 mm.). Fore wings hooked, pale drab with a longitudinal black line through the middle of the wing attended by short similar streaks.

Antennæ light brown; palpi, head, and thorax chocolate-brown, but shoulder-lappets pale brown; abdomen grey-brown. Fore wings narrow, elongated; costa not folded, but gently arched; apex very acute and hooked, hind margin retuse; pale brownish drab with the costa obliquely dotted with brown; from the base a nearly straight black line runs to the middle of the wing and, with slender interruptions, is continued in a more slender form to the apex, thus dividing the wing lengthwise; dorsal margin shaded or streaked with similar parallel lines and clouds; above the anal angle is a faint pale brown ocellus containing one or two black streaks; cilia brownish white. Hind wings very pale smoky brown, with paler cilia. Female similar, often larger.

Underside of the fore wings leaden brown; costa dotted with pale yellow-brown; a white dash lies under the apex. Hind wings smoky white.

On the wing at the end of May and in June, and a partial second generation in August.

LARVA black-green with two whitish raised dots on each segment; head and dorsal plate pale yellow with a few black-brown dots; on the anal plate are two large spots. (Treitschke.)

June and July, and another generation in September and October, in folded leaves of *Rhamnus frangula* and *R. catharticus*, gnawing the leaves and causing them to show white spots. Wilkinson, however, states that it feeds on *Myrica gale*; Sorhagen says that it is polyphagous, and mentions *Cornus sanguinea*, *Ligustrum vulgare*, and *Prunus avium*.

PUPA in the larval habitation, or in another spun-up leaf.

The moth hides itself during the day in bushes, especially those of *Rhamnus*, but is easily induced to fly by the beating stick. At sunset it flies quietly about its food-plant.

Not a generally distributed or very common species, yet sometimes to be taken freely in favourite spots, especially the

more open parts of marshy woods, in Kent, Sussex, Surrey, Hants, Dorset, Devon, Berks, Herts, Essex, Norfolk—where it inhabits the fens and bogs—Cambs, Herefordshire, Cheshire, Lancashire, and Westmoreland. In Scotland it has been taken in Aberdeenshire and Kincardineshire, and in Ireland is recorded from Kerry. Abroad common in Central and Northern Europe, Italy, Dalmatia, South-East Russia, and Asia Minor.

2. **A. unguicella**, *Linn.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12-18 mm.).—Fore wings not very narrow, hooked at the tip, glossy pale slate-grey, with red-brown basal blotch, and oblique slender central band.

Antennæ black-brown; palpi, head, and thorax umbreous; abdomen grey-brown. Fore wings even in width, costa flatly arched, apex produced to a sharp hook, hind margin beneath it hollowed; whitish grey, clouded with brown; costa regularly streaked from the base with short brown lines; basal blotch large but not reaching the costa, dark brown, its outer edge oblique; central band oblique, narrow, red-brown, with two projections outside; apical region red-brown, much streaked with white from the costa; cilia white with brown dashes. Hind wings smoky brown, with dull white cilia. Female similar.

Underside of the fore wings leaden brown; costa and apex dotted with white; hind margin shaded with the same. Hind wings smoky white.

Variable in the distinctness of the markings, which in rare instances become so completely obliterated that the insect can only be recognised by the *shape* of its fore wings, which are greyish white.

On the wing in May and June.

LARVA undescribed—"on heather in April."

This moth frequents heaths, especially in the North; but has been taken in Surrey, Berks, Dorset, and North Devon,

also occasionally in Woolmer Forest, Hants, and in some plenty in the New Forest; rarely in Cambs, Suffolk, and Norfolk, but more commonly from Cheshire northwards, and throughout Scotland to the Shetland Isles. In Ireland in Wicklow, Tyrone, and Fermanagh, but I have no record in Wales. Abroad it is widely distributed through Central and Northern Europe, Italy, Aragon, Dalmatia, and South-East Russia.

3. **A. uncana**, *Hüb.*; **uncella**, *Hein.*.—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings rather broad, rich red-brown with a large rounded grey dorsal blotch, and another over the anal angle; apex hooked.

Antennæ and palpi black-brown; head and thorax chocolate-brown; abdomen dull brown. Fore wings of moderate breadth, costa strongly arched, apex very sharply pointed and produced or hooked; hind margin rounded, rather full below; rich red-brown or tawny red, shading paler toward the costa; on the dorsal margin is a large rounded grey blotch, and on the anal angle another which is invaded by a red-brown hook; costa faintly clouded with richer red-brown, and dotted with white. Hind wings smoky brown, cilia paler. Female similar, or a little smaller.

Underside of the fore wings shining leaden black, with white costal dots and a black apical spot; cilia dull white. Hind wings leaden white.

On the wing in May and June.

LARVA apparently undescribed. It is said to feed in April on heather (*Calluna vulgaris*).

This is a lively restless species, hiding usually among heather, but starting quickly up at the footstep to fly briskly to another tuft. In some localities it shows a preference for birch bushes, especially when there is no heather. It usually frequents damp portions of heaths where both plants grow mixed together. Even when flying of its own accord, which

takes place after sunset, it seems to show no preference for any particular plant. Common in such portions of the Eastern and Southern counties and sometimes plentiful, also to be found throughout England and in Scotland in the Clyde district, Perthshire, and Sutherlandshire. I find no record in Wales, though it must be present; in Ireland it is recorded from Cork, Galway, Sligo, Armagh, and Antrim. Abroad its range is through Central and Northern Europe, Italy, and Russia; and it is reported to be found in New Hampshire in the United States.

4. **A. biarcuana**, *Steph.*—Expanse  $\frac{3}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings forked; costal region pale grey-brown; dorsal region greyish white, separated by an undulating longitudinal black-brown central stripe.

Antennæ pale brown; palpi whitish brown; head and thorax red-brown; abdomen grey-brown. Costa of the fore wings strongly arched, apex shortly hooked, hind margin retuse, but filled out and rounded below; grey-brown, or reddish-umbreous, dusted with white, along the costal area; dorsal area from the base to the anal angle white dusted with grey; separating these areas a dark red-brown stripe bordered with black arising at the base of the wing, and undulating so as to form two considerable arches—one in the middle, the other over the anal angle—runs right into the apex; the costal margin is occupied throughout by oblique light brown streaks; in the white space above the anal angle are two round red-brown dots; cilia white with a smoky shading. Hind wings smoky brown with a whiter cilia. Female similar.

Underside of the fore wings leaden black; costa shaded with dirty white. Hind wings leaden white with brown dusting along the front area.

On the wing at the end of May and through June.

LARVA very active—wriggling vigorously when disturbed; slightly flattened and with the segments deeply divided; dark

smoky grey with a greenish tinge, second segment pale yellow; subdorsal lines broadly blackish, in which the shining pale grey raised dots are very distinct; head light brown with a row of four black dots across its hinder portion; dorsal plate whitish, also with a row of four black elongate spots (when older these marks coalesce in pairs); under-surface and prolegs pale yellowish grey; legs black.

August to October on willow, especially *Salix fusca*, folding a leaf longitudinally together, joining it into a tube with silk and living within. Hibernating and becoming a pupa in the larval habitation.

The moth hides during the day in patches of dwarf willow growing on damp heaths, or sometimes among such willows in lanes and the open parts of woods, and occasionally in fens; thence it is easily roused, but after flying swiftly about, retreats to a similar concealment, whence it may be disturbed again and again. At its time of natural flight, at early dusk, it flies about the same plants, but is not very conspicuous. Formerly it was an inhabitant of Barnes Common and Wimbledon, in the London district, and it still may be found in more distant parts of Surrey, and in Kent, Sussex, Hants, Dorset, Berks, Essex, Cambs, Norfolk in plenty, Somerset, Gloucestershire, Leicestershire, Cheshire, Lancashire and all the northern counties of England. In Scotland it is recorded from the Edinburgh and Clyde districts, Perthshire, Moray and Sutherlandshire; in Ireland in Galway, Sligo, Tyrone, and Fermanagh; but I have no record for Wales. Abroad it is an inhabitant of Central Europe; and in North America Lord Walsingham has found it in California.

5. **A. inornatana**, *H.-S.*; **subarcuana**, *Dougl. Willk.*  
—Expanse  $\frac{1}{2}$  to  $\frac{3}{8}$  inch (12–16 mm.). Fore wings hooked, pale grey-drab or pale brownish grey, very plain, but having



a faint brown shade as a stripe through the middle to the apex, and slightly arched in its course.

Antennæ black-brown; palpi grey; head and thorax brownish grey; abdomen pale brown. Fore wings with the costa decidedly arched, the apex hooked and acute, hind margin retuse; very pale grey-brown or grey-drab, with a washed-out appearance; costa faintly streaked with grey-brown; from the middle of the base a light brown shade takes its course through the middle of the wing to the apex, forming a faint arch over the middle of the dorsal margin and a larger one over the anal angle; between them is a short brown-black horizontal streak; cilia brownish white. Hind wings smoky white with white cilia. Female similar.

Underside of the fore wings leaden brown, of the hind brownish white.

Variation in this species is mainly local; specimens from the New Forest, Hants, have a distinct shade of pale grey; those from Surrey and the Eastern Counties have constantly a browner tinge, while specimens from the north of Scotland are whiter and have brighter markings.

On the wing in May and June, and in a second generation from the end of July till September.

LARVA apparently not described. Sorhagen states that it feeds on *Salix depressa*, *S. repens*, and *S. fusca*.

The moth frequents open parts of fens, and boggy spots on heaths when the dwarf willows are plentiful. In my own experience it abounds among *Salix fusca*, and hides during the day in the broad flat patches of that plant, almost refusing to allow itself to be roused to flight except in very warm and sunny afternoons. Toward sunset, and after, it flies most freely and abundantly, darting about the same masses of willow, and giving them a really lively appearance. Abroad it seems to be regarded merely as a variety of *A. biarcuana* which it somewhat resembles—or rather looks

like a faded and worn variety thereof. But since its fore wings are a little narrower than in that species and their apices sharper and more hooked, and since, though flying along with that species, no intermediate varieties seem to occur, and it is distinctly and very fully double-brooded while that species has but one generation in the year, there seems to be little reason for doubting its distinctness. Common in the fens, and abundant in the boggy heaths of Norfolk, Suffolk, Cambs, and Hants, also in the New Forest, Hants; and found more sparingly in Kent, Sussex, Surrey, Dorset, Berks, and Yorkshire; also in Scotland in Aberdeenshire and Sutherlandshire. So far as I know this is the extent of its range in these Islands; abroad it is found in Holland, Jutland, Germany, Livonia, and Lapland.

6. **A. comptana**, *Froel.*—Expanse  $\frac{1}{2}$  inch (12–14 mm.). Fore wings very narrow, red-brown with a darker angulated basal blotch and central band.

Antennæ purplish brown; palpi whitish brown, head and thorax red-brown; abdomen grey-brown. Fore wings narrow with the costa but little arched, apex bent over into a blunt hook, hind margin retuse; chocolate-red; costa from the base to near the middle grey-brown, with oblique chocolate streaks; basal blotch large, rounded above but not reaching the costa, red-brown; from the middle of the costa an oblique slender grey-brown stripe runs to the dorsal margin, and from it a double similar line points toward the apex; outer portion of the costa broadly dashed with pairs of oblique shining whitish streaks; cilia dusky white, intersected by a chocolate shade. Hind wings and their cilia smoky white. Female similar or with the markings more suffused—and confused.

Underside of the fore wings leaden brown; of the hind leaden white.

On the wing from April to the beginning of June, and in a second generation in August and September.

LARVA dirty green with paler hair-bearing raised dots; head pale brown with two black horse shoe-shaped markings on its hinder edge; dorsal plate pale yellow with two small black dots.

June in spun together root-leaves of *Poterium sanguisorba*, *Potentilla*, *Teucrium*, in *Thymus*, and in high mountain districts on *Dryas octopetala*. (O. Hofmann.) Second generation in September and hibernating full grown. In North America it is said to feed on strawberry and sometimes to be very mischievous.

Exceedingly abundant on chalk hills in the South of England, buzzing quietly about in every direction in the afternoon sunshine: and even more plentifully about sunset. It keeps very near the ground, darting in and out among the short herbage, and requires a quick eye for capture.

In chalky places, on hills especially, in Kent, Sussex, Surrey, the Isle of Wight, Dorset, Devon, Somerset, Wilts, Berks, Oxfordshire, Bucks, Gloucestershire, Cambs, and Suffolk; also in Wales in Glamorganshire. Single records in one or two distant districts seem to be suggestive of error as to the species, and are therefore omitted. Abroad it is found in most parts of Central Europe, Sweden, Italy, the north of Spain, Dalmatia, Livonia, Finland, and Asia Minor; and in North America in Nova Scotia, Maine, Massachusetts and California.

7. **A. myrtillana**, Tr.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings very sharply hooked at the apex; pale silvery grey or greyish white, with a large chocolate-coloured dorsal blotch, at the top of which is an angulated projection.

Antennæ dark brown; palpi, head, and thorax dull pale chocolate; abdomen silvery-grey. Costa of the fore wings very flatly arched, apex very pointed and hooked, hind margin retuse; pale silvery-grey dusted with brown; basal

blotch large, but existing rather as a large dorsal blotch, and entirely cut off from the costa though having a projection towards it in the middle, rich chocolate-brown or olive-brown; central band narrow and not very distinct, throwing off, below the middle, a branch which points outward, and runs into the apex; costa dotted and hind margin dashed with tawny, and the apex occupied by a large similar dot; cilia white. Hind wings and their cilia smoky white. Female similar.

Underside of the fore wings shining lead colour; cilia and costal dots white. Hind wings leaden white.

Variable in the size of the dorsal blotch, which sometimes is much depressed, or partially obliterated, but often has the upper projection very distinct and almost forming a spot; also in the central band, which often is partly obliterated.

On the wing at the end of May and in June.

LARVA thus described by Hofmann: "Dirty green with dark through-shining dorsal vessel, and whitish, hair-bearing raised dots; head and dorsal plate pale brown, shining, upon it and on the anal segment, two black dots." But he adds, "in July on *Vicia*." Heinemann, however, says, on bilberry, and *this* is obviously correct! Sorhagen says, in *April* and *May* on *Vaccinium myrtillus* and *V. uliginosum*. Evidently this species requires careful working out.

Generally to be found on high hills and elevated commons, wherever the whortleberry grows freely; but on the extensive hill districts of the Midlands most abundant, sitting among the plants but flying up every moment, in sunshine, at the footstep; and at sunset so confusing the eye with its multitudes that it is difficult to see any other species flying with it. This may be observed in a most striking degree on the great beds of *Vaccinium* on the hills of Cannock Chase, Staffordshire, and on the Pennine Hills further north. To be found, though not in equal numbers, in Kent, Surrey,

Sussex, Dorset, Essex, Berks, Herefordshire, Cheshire, Lancashire, Yorkshire, and Cumberland; also in North Wales and throughout Scotland to the Orkneys; in Ireland found on the Wicklow mountains and in Antrim. Abroad plentiful on the hills of Central and Northern Europe, and of the North of Italy.

8. **A. lundana**, *Fab.*; **badiana**, *Hein.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings acuminate, the apex sharply hooked, bright red-brown with a strongly arched narrow yellow-white stripe from the base, along the costa and across to the dorsal margin.

Antennæ black-brown; palpi white; head and shoulder-lappets brownish-white; thorax red-brown; abdomen grey-brown. Fore wings moderately broad, costa gently arched, apex sharply hooked, hind margin retuse; cream colour, or rather a narrow stripe of this colour, commencing at the base and running along the costa, forms a high arch reaching to the middle of the dorsal margin, and enclosing a large chocolate-brown dorsal blotch; beyond this arch the hinder area is soft pale chocolate, daintily zigzagged with slender silvery lines; costa decorated with short white streaks: cilia yellowish white. Hind wings and their cilia pale smoky brown. Female similar.

Underside of the fore wings leaden black; costal streaks and cilia pale yellow. Hind wings leaden white.

On the wing in May and June, and as a second generation in August.

LARVA transparent yellow, with a green dorsal vessel, and white, glossy, hair-bearing raised dots; head small, pale yellow, with two spots; dorsal plate somewhat smaller and similarly marked. (Gartn.)

May and June and also in September and October, on clover, *Lotus corniculatus*, and various species of *Vicia*, *Lathyrus*, *Orobus* and *Trifolium*—perhaps on all vetches;

joining together two leaflets most accurately at the edges and eating out the parenchyma.

PUPA stout, pale brown. This condition is assumed in the spring, in a spun-together leaf.

The moth is said to fly in plenty about grassy banks, among flowers, from half past five to six in the morning. It certainly is thoroughly lively at midday and throughout the afternoon and is one of the most reliable inhabitants of meadows and clover fields, always lively and brisk, but not timid, settling again when disturbed, close at hand. Inhabiting the suburbs of London and to be found commonly throughout England and South Wales, also everywhere in Ireland. In Scotland it is found throughout the Lowlands to Perthshire and Moray, but I have no record further north. Abroad it occurs all over Europe, Asia Minor and the Caucasian region; and Lord Walsingham has found it in Oregon, North America.

9. **A. paludana**, *Barr.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings rather narrow; apex sharply hooked; yellowish white, with a flattened dorsal chocolate blotch; followed by a similar streak which runs into the apex.

Antennæ dark brown; palpi dull white; head and shoulder lappets white shaded with brown; thorax dull chocolate; abdomen grey-brown. Fore wings narrow, the costa flatly arched, apex produced and hooked, silvery-white or creamy-white with pale chocolate markings: from the base a large flattened blotch lies upon the dorsal margin; beyond it the central band is clouded, thickened in the middle, and there throws off a large pointed tooth towards the apex; the arch of ground colour before it is very broad; hinder area faintly clouded with chocolate; costal streaks and cilia white, the latter having a short black line along their base, and a chocolate-red tinge at their tips. Hind wings smoky white; cilia white. Female similar.

Underside of the fore wings leaden brown ; of the hind white.

On the wing in June and August, in two generations.

LARVA unknown.

This pretty little species seems with us to be confined to fens, and to their wettest portions. Here it hides during the day among the shorter herbage, and can scarcely be induced by any disturbance to show itself at that time. Just before dusk it begins to move, but then only takes short flights and shows no especial preference for any plant, or any indication which might lead to a discovery of its food at an earlier stage. First noticed and described as a new species in the year 1871, having then been found in the fens of Norfolk and Cambridgeshire. No previous notice of it seems to exist, even as a supposed variety of the last species, and the only other suggestion of its existence with us, so far as I am aware, is a notice by the late Mr. John Sang, of his discovery of specimens in an extremely marshy spot in Durham ; with regard to this capture Mr. J. E. Robson writes me : " it appears to be just the place for this insect ; there are deep water holes with swampy land between," also that the capture of this species is twice entered in Mr. Sang's diary. The greatest possible interest attaches to the occurrence in any new locality of a species so exceedingly restricted in its distribution. I know as yet of no other locality in the United Kingdom, and abroad only that it occurs in Germany.

10. **A. derasana**, *Hüb.* — Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings shortly and bluntly hooked ; very pale grey, with a large, rich chocolate dorsal blotch, rounded above ; and beyond a bright red, flattened, triangular blotch extending to the apex.

Antennæ and palpi dull brown ; head and thorax chocolate red, but the shoulder lappets white ; abdomen silvery-grey.

Fore wings moderately broad, costa arched but straighter toward the apex, apex bluntly hooked, hind margin retuse; on the dorsal margin from the base to the middle is a large semi-circular blotch of rich velvety chocolate; extending over it from the base to the middle of the costa, thence crossing to the anal angle is a broad arched white stripe, dusted and clouded with grey and light brown atoms; space above this from the middle of the costa to the apex occupied by a brilliant chocolate-red triangular blotch in which are a few faint yellow costal dots and an oblique silvery-brown line; cilia white, tipped with dark brown. Hind wings and their cilia smoky brownish white. Female similar.

Underside of the fore wings shining lead-colour, with yellowish costal dots, and pale cilia. Hind wings leaden white.

On the wing at the end of May and in June, and as a partial second generation, in August.

LARVA of average stoutness, tapering much to the anal extremity; head and whole body shaded with indistinct hairs; head narrow, glaucous, light brown, spotted round the mouth with black; on the dorsal portion where it joins the second segment, are two elongate black dashes; second segment of the colour of the head but dotted with black; dorsal plate bounded on each side by a black blotch; body dark putty-colour, segments somewhat swollen; raised dots pale, each emitting a hair; anal plate shining black; prolegs tipped with black. Young larva active, light green, with the dorsal vessel plainly visible. (W. G. Sheldon.)

September and October, and a partial brood in July on *Rhamnus frangula* and *R. catharticus* "in a neat and symmetrical domicile which it forms by folding down a leaf and joining the edges together with silk; within this abode it feeds upon the lower cuticle; when all this is devoured it issues forth and forms another retreat. As it grows larger it eats irregularly-shaped holes through the



leaf, and within spins a web for protection against its enemies." (Mr. Sheldon.) When full-grown it forms a cocoon among rubbish on the ground, and in this remains unchanged till the spring; emerges to spin up in rotten wood or a hollow stick, often taking exercise for a day or two, and then changes to a brownish yellow pupa.

This remarkably lovely species is rather common among buckthorn on chalk hills, and sometimes in open woods and the neighbouring lanes, among this and *Rhamnus frangula*. It hides in these bushes during the day, but readily flies out on disturbance, and is not excessively active. About sunset it flies of its own accord about the same plants. Found locally in Kent, Surrey, Sussex, Devon, Somerset, Wilts, Berks, Oxfordshire, Cambs, and Norfolk; but so far as I know not elsewhere in the United Kingdom. Abroad it inhabits Central Europe, Italy, the north of Spain, Dalmatia, and Bithynia.

11. **A. diminutana**, *How.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings rather narrow, hooked at the tip; pale grey-brown with a deeply undulating longitudinal central line, the area above which is chestnut brown to the apex.

Antennæ dull brown; palpi, head, and thorax brownish drab; abdomen silvery grey. Fore wings rather narrow; costa scarcely arched; apex pointed and slightly hooked; pale brownish grey with a reddish brown shade at the base of the dorsal margin; above this, at the base, arises an undulating yellowish white line, which, after forming a faint arch in the middle of the wing, runs directly into the apex, and then edges a broad tawny red costal cloud, of which the very oblique outer margin is of the deepest colour; cilia white, tipped with smoky black. Hind wings and their cilia smoky brown. Female similar.

Underside of the fore wings shining leaden black, the

costa and hind margin edged with white. Hind wings leaden white.

On the wing in June and July. Hofmann says also in September, but this seems not to be the case here.

LARVA of a gelatinous shining appearance and nearly colourless, with a grey intestinal dorsal marking on the first body-segment, and on each side a more distinct spot.

September, in folded leaves of the pointed foliaged willows and sallows, sometimes broadly folding the edge of the leaf. Sorhagen says, "from July in pod-shaped, spun-together leaves of *Salix repens* and other small-leaved sallows."

Rather a lazy sluggish species, sitting during the day in sallow bushes, especially *Salix caprea*, when disturbed flying but a very short distance, and usually to the ground, where it hides among grass or dead leaves. At sunset it is out on the wing of its own accord, but then darts about so sharply that it is not very readily captured, and being nowhere plentiful usually figures as an uncommon species in collections. Nevertheless, it is very generally distributed with us, found in Kent, Sussex, Surrey, Hants, Dorset, Wilts, Berks, Herts, Hunts, Cambs, Essex, Norfolk, Gloucestershire, Herefordshire, Leicestershire, Cheshire, Lancashire, Yorks, and Westmorland; but I know of no localities elsewhere in the United Kingdom. Abroad it is distributed over Central Europe, Northern Italy, Spain, Portugal, and Norway.

12. **A. mitterbacheriana**, *Schiff.*—Expanse  $\frac{5}{8}$  inch (15–17 mm.). Fore wings rather broad, hooked, tawny red with a large, straight-edged, chocolate red basal blotch which does not reach the costa.

Antennæ dull brown; palpi pale grey-brown; head and thorax chocolate red; abdomen dull brown. Fore wings rather broad; costa strongly arched, apex well hooked,

hind margin retuse and fully rounded below; orange red or tawny red; costal area from the base grey-brown; beneath it is a large, rich chocolate, basal, dorsal blotch, its outside edge perpendicular, sharply defined, and edged with white; costa dotted with brown and white; beneath the apex is a short black streak, and below this a very faint greyish ocellus; cilia pale orange brown, white under the apex. Hind wings and their cilia smoky brown. Female similar, rather larger.

Underside of the fore wings glossy leaden brown; costa and apex dotted with white. Hind wings leaden white.

On the wing at the end of May and in June.

LARVA dull green; head heart-shaped, diaphanous, yellowish brown with black wedge-shaped marks at the base, their point directed towards the mouth; dorsal plate yellowish, paler in front, with a transverse row of uneven black spots; raised dots shining pale green; a dusky patch on the anal segment. (Wilkinson.)

September and October on oak and beech, drawing the sides of a leaf together either in the whole or in part, and forming what Mr. Stainton used to call a "vaulted chamber," within which it feeds, gnawing the inner surface and parenchyma and removing to another leaf, to act in a similar manner when its food is exhausted. Passing the winter in the final habitation and therein assuming the pupa state in the spring.

The moth hides during the day in oak or beech trees, and is easily disturbed by the beating stick; but at from 6 to 8 P.M. it flies wildly of its own accord high up about these trees, and in very favourable weather moves earlier in the afternoon. Moderately common in oak woods and occasionally plentiful in them, and about beech, throughout England, and probably Wales, where there are woods, though my only record is in Pembrokeshire. In Scotland it is recorded from Perthshire, Argyleshire, Dumbartonshire, Lanark, Fife, and

Aberdeen; and in Ireland from Dublin, Galway, Antrim, and Derry. Abroad it is generally distributed over Central Europe, Scandinavia, Italy, Dalmatia, and Armenia.

13. **A. upupana**, *Tr.* — Expanse  $\frac{5}{8}$  inch (15 mm.). Fore wings rather broad, very shortly hooked at the apex, dark orange umbreous shaded with tawny toward the apex.

Antennæ black-brown; palpi and head dull brown; thorax red-brown; abdomen blackish brown. Fore wings rather broad and short, costa regularly arched, apex stoutly hooked, hind margin retuse and very full; blackish chocolate shading to light chocolate or tawny toward the apex; costa beyond the middle dotted with bright yellow; in the middle of the hind margin is a pale yellow streak edged by a short black line; cilia pale brown, with one or two white dashes beneath the apex. Hind wings brown-black with brownish white cilia. Female similar.

Undersides of all the wings blackish brown, finely dusted with pale yellow; costa and tips of the cilia of the fore wings dotted with white.

On the wing at the end of May and in June.

LARVA cylindrical, slightly tapering towards either extremity, olive green, dusted with olive brown, especially so on the third, fourth, eleventh, twelfth, and thirteenth segments; spiracular region olive green; head black; dorsal plate black, divided in the middle and having two black tubercles on either side of the division; the raised dots each with light glistening tubercles, emitting a light coloured hair; anal plate wanting; prolegs olive green; spiracles black. (B. A. Bower.)

September, on birch, uniting two leaves, forming a flat and decidedly circular chamber with its edges neatly fastened together, eating the interior surfaces of the leaves, and hibernating in one of these chambers, assuming the pupa state late the following spring. (B. A. B.) There is some

confusion among authors about the food of this species; some suggest oak, others elm.

This moth hides during the day in birch trees or neighbouring oaks, but is not often taken—indeed, is extremely local and usually rare. Mr. Charles Fenn states that it flies in the sunshine from about 2 P.M. until an hour before sunset, also that its flight is very rapid over the tops of oaks, birches, and neighbouring trees. Formerly it was taken in West Wickham Wood, not very far from the populous districts of Croydon and South Norwood; apparently it has deserted that locality, but is still to be found, very locally, in other parts of Kent and Surrey, and in Sussex, Essex, Suffolk, Hants, Oxfordshire, and Bucks. This appears to be the extent of its range in these Islands. Abroad it is recorded from most parts of Central Europe, and from Sweden and Western Russia.

14. **A. lætana**, *Fab.*; **ramella**, *Willk. Stainton*; **harpána**, *Hein.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{8}$  inch (13–16 mm.). Fore wings moderately broad; apex sharply hooked; clear white with broad blue-black marbling toward the dorsal and hind margins.

Antennæ brown beneath, whitish above; palpi white; head white, clouded with brown; thorax white, spotted with black; abdomen silvery grey. Fore wings rather broad but elongated; costa gently arched; apex shortly hooked; hind margin retuse and fully rounded out below; clear bright white with the central margin faintly dotted with brown, but toward the apex pale brown with oblique white streaks; dorsal margin spotted with black in a bluish black clouding, above which is a large rounded blue-black cloud; before the hind margin is a large blue-black ocellus, shaded outwardly with white; above it are some cloudy black streaks; apical area chestnut brown; cilia white, with black clouding.

Hind wings white at the base, shading to smoky brown; cilia white. Female similar, rather larger.

Underside of the fore wings smoky brown; costa dotted, and hind margin shaded with white; two white streaks lie below the apex. Hind wings white, tipped with smoky brown.

On the wing at the end of May and in June, and sometimes a very partial second generation in August.

LARVA rather flattened, attenuated behind, segments deeply divided; yellowish white with slightly browner dorsal vessel; hairs very minute, only visible under a good magnifier; head black; dorsal plate whitish with two large triangular black spots along its posterior edge; anal plate dull white.

September, on aspen, between united leaves, under a white web, gnawing away the surface of the leaves. Through the winter and till April, as a larva, in a chamber formed of a turned-down corner of a leaf.

PUPA yellow-brown; in the same place.

The moth when flying has a conspicuously milky-white appearance. It loves to hide in the daytime in the little bushes of aspen which are plentiful in some of our more open woods. Here it is easily disturbed, but only to fly to another bush; and at sunset begins to buzz quietly about them, so that it is very easy to capture. It is not the least pretty of this lovely genus. In the north it is said to frequent white poplar, but this I have not observed, for I have never seen it away from the woods and the little aspen bushes. Locally common in Kent, Surrey, Sussex, Dorset, Somerset, Gloucestershire, Herefordshire, Herts, Essex, Suffolk, and Cambs; also found in Yorkshire; and in Scotland in Perthshire, Moray, Inverness, Ross-shire and Sutherlandshire; but I have no record for Wales or Ireland. Abroad its range is through Central Europe, North and Central Italy, Scandinavia and Russia.

Genus 22. **BACTRA.**

Antennæ thick; palpi thick, short, but protruding; thorax smooth, fore wings narrow, pointed, but not hooked nor squared; costa not folded; hind wings rather pointed, not tufted.

We have two species.

- A. Fore wings very plain, narrowly trigonate. *B. lanceolana*.  
 A<sup>2</sup>. Fore wings mottled with dark markings; narrow and strap-shaped. *B. furfurana*.

1. **B. lanceolana**, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–20 mm.). Fore wings elongate-trigonate, pointed, pale drab, yellow-brown, or grey-brown; without markings or with two dashes in the middle of the disk, or a longitudinal dark shade through the middle of the wing.

Antennæ black-brown, barred at the back with white; palpi, head, and thorax drab, shaded with brown; abdomen blackish brown; anal tips yellowish. Fore wings large and rather narrowly trigonate, costa very flatly arched and not folded, apex sharply pointed, hind margin oblique; drab yellow-brown, or pale grey-brown, often without markings, sometimes with only a dark brown stripe occupying the middle of the wing from the base to the apex, sometimes in this, near the base, is a wedge-shaped black spot, beyond it on the disk a similar thick curved streak, and beyond, close to the hind margin a row of rough black dots, and a brown cloud running into the apex; cilia drab. Hind wings and their cilia smoky brown. Female similar, except that the fore wings are a little narrower.

Underside of the fore wings leaden brown; of the hind wings leaden white.

Exceedingly variable in the depth of ground colour and in the shade of the longitudinal brown stripe, when present, as well as in the presence or absence of the few markings above

described : but even more so in size, specimens of the infrequent second generation being only about one-third the size, or little more than one-half the expanse of normal specimens, while those which have the good fortune to inhabit sea-marshes and the adjacent ditches, where *Scirpus maritimus* abounds, are so much larger than usual, that, again and again, this form has been mistaken for a novelty, and has only escaped being brought forward as a distinct species, because, excepting size, no single character can be found by which to separate it from the present.

On the wing from the latter part of May to July ; and a very small and partial second generation in September.

LARVA greenish ; head and dorsal plate both black ; each segment after the second contains six plainly visible blackish spots. (A. Thurnall.)

April and May on *Cyperus longus*, *Juncus conglomeratus* and other rushes, and the large variety on *Scirpus maritimus* and *S. lacustris* ; feeding in the stems. Second generation in July and August.

PUPA remarkably straight and cylindrical. amber yellow. (R. F. Logan.) In the larval habitation, in a light silken cocoon.

I have never, so far as I can recollect, walked into a bed of rushes at the proper time of year, without disturbing this species. It flies out equally vigorously at any time of the day and is on the wing quite late in the night ; and is the most universally present, in suitable places, of any species with which I am acquainted. Not only is this the case throughout England, Wales, and Ireland, but in Scotland it is *common* in the Shetland Isles, as in all other districts. Abroad it abounds throughout Europe and Northern Africa, also found in North America in Texas, and is said to exist throughout the North Temperate region of the World. There



is even a report that it is not absent from the South Temperate region, occurring even in Australia!

2. **B. furfurana**, *How.*—Expanse  $\frac{5}{8}$  inch (15 mm.) Fore wings very narrow—almost linear—pale brown, pale buff, a faintly olive-brown, with three irregular jagged bright brown bands.

Antennæ black-brown; palpi and head pale brown; thorax darker; abdomen grey-brown. Fore wings very narrow, almost linear; costa folded, flatly arched, apex rather produced, yet blunt: hind margin very short, hardly oblique; pale brown, usually dusted and marbled with dark umbreous; basal blotch rather mottled, rounded at the outer edge, and reaching the costa: central band narrow, nearly erect, but a little curved, throwing out a tooth in the middle; over the anal angle is a flattened streak, and running into the apex another, more curved and more clouded; cilia pale brown. Hind wings and their cilia smoky brown. Female similar, but rather larger.

Underside of the fore wings smoky brown; of the hind wings smoky white.

Somewhat variable in the degree, or the absence of the markings, occasional specimens being quite immaculate.

On the wing in June, and sometimes a very partial second generation in August.

LARVA somewhat attenuated yellowish green, very shining and smooth; head black, divided by a whitish line; dorsal plate very dark brown; dorsal canal plainly visible through the semi-transparent skin. (A. Thurnall.)

April and May on *Elcocharis palustris*, feeding in the stems, moving from stem to stem, hollowing each one out and stunting its growth, frequently causing the stems to turn brown, and gradually decay.

This species inhabits the wettest marshes—places where one's feet are constantly soaking in water when catching it.

Here it sits on the little rush-like plants of *Elodea acicularis* and *E. palustris* and flies quietly about them in the afternoon, continuing briskly on the wing till sunset and near dusk. A very obscure-looking little species and easily overlooked; abundant where it occurs and very probably to be found, if searched for, in many districts from which we have, at present, no records; since a little wet spot at the edge of a pond furnishes it with plenty of space in which to exist. Known to occur in Kent, Sussex, the Isle of Wight, Wilts, Devon, East Cornwall, in Essex, Suffolk, Norfolk, Cambs, Leicestershire, Cheshire, and Yorkshire; in Wales I find it in plenty at Pembroke; in Scotland it is on record from the Edinburgh district, Perthshire, Argyll, Arran, and Renfrew; and Mr. A. F. Griffiths found it "abundantly in a marshy hole in one of the Hebrides." In Ireland it is reported from Kerry, Cork, and Donegal. Abroad it is distributed through Central Europe, Spain, Central Italy, Roumania, Sweden, and Southern Russia; and in North America it is said to occur in Massachusetts.

### Genus 23. **PÆDISCA.**

Antennæ thick, closely notched, ciliated; palpi rather long, slender, drooping; thorax smooth; fore wings somewhat elongated and bluntly pointed; costa folded from the base; hind wings ample, furnished with a ridge of hair-scales upon the median nervure.

We have four species.

- A. Fore wings slate-black with two black dorsal spots.  
*P. ophthalmicana.*
- A<sup>2</sup>. Fore wings dull brown, with a large, sharply defined dorsal blotch.  
*P. solandriana.*
- A<sup>3</sup>. Fore wings shining silky brown with various markings.  
*P. semifusca.*

A<sup>4</sup>. Fore wings velvety reddish brown, with an obscure paler dorsal blotch *P. sordidana*.

1. ***P. ophthalmicana***, *Hüb.*  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings elongated, dark slate-grey or slate-black with two black spots on the dorsal margin.

Antennæ and palpi black-brown; head dull brown; thorax purple-brown; abdomen dull ochreous-brown. Fore wings elongated, even in width; costa strongly folded back at the base, rather arched beyond; apex bluntly angulated, hind margin curved, not very oblique; dark slate-grey or slate-black; on the dorsal margin near the base is an erect, narrow, black-brown or black spot, and above the anal angle another, broader, which is closely followed by a large grey ocellus, edged with black; cilia purple-brown. Hind wings pale smoky brown with the base paler and cilia white. Female, costa plain, otherwise similar, or darker and more obscurely marked.

Underside of the fore wings leaden black; costa dotted with white. Hind wings leaden white.

On the wing from the end of July till September.

LARVA short, thick and wrinkled, segments swollen; dirty greenish white; raised dots prominent, olive-grey; head shining black; dorsal plate olive-brown, with a white collar; last two segments somewhat retracted, anal plate light brown.

May and June upon aspen (*Populus tremula*) in rolled leaves; also sometimes upon *P. canescens*, *P. alba* and *P. nigra*.

PUPA light brown, in a cocoon of earth and silk in the ground.

This handsome species sits by day on the trunks or bushes of poplars or aspens to which it flies back—or to another tree

—if disturbed in the daytime, but it is reported sometimes to fly of its own accord about the trees in afternoon sunshine. At dusk it flies in a lively manner around the branches of these trees. It is rather a local species, and usually scarce in the south, but far more plentiful in the west and north; especially about clumps of poplars growing on the moors or mosses. It is recorded in Kent, Sussex, Surrey, Middlesex, Essex, Staffordshire, Herts, Wilts, Somerset, Gloucestershire, Herefordshire, Worcestershire, Derbyshire, Cheshire, Lancashire, Yorkshire, Durham, and Northumberland; and in Scotland in the Edinburgh district, Perthshire, Dumbartonshire, and the rest of the Clyde district; and Aberdeenshire. I find no record in Wales, and in Ireland, only that of Colonel Partridge at Enniskillen. Abroad it inhabits Central Europe, Spain, Italy, Sweden, Roumania; and Southern Russia.

2. **P. solandriana**, *Linna.* — Expanse  $\frac{3}{4}$  inch (18–20 mm.). Fore wings elongated, broad, brown, red-brown, or purple-brown, with a large paler, or white, triangular dorsal blotch; or with an elongated darker dorsal blotch.

Antennæ and palpi brown; head and thorax red-brown or umbreous; abdomen pale brown. Fore wings elongated, costa folded at the base and strongly arched beyond; apex bluntly angulated, hind margin straight and not very oblique; red-brown, umbreous, pale brown or purple-brown; basal blotch large and strongly but bluntly angulated outside, the margin oblique each way, often lost in the ground colour; adjoining this is a large somewhat trigonate dorsal blotch, sometimes white, more usually some paler shade of brown; central band cloudy, oblique, not very broad, often hardly distinguishable; sometimes there are brown clouds towards the apex; cilia colorous. Hind wings smoky brown, cilia paler. Female

without the costal fold, in other respects resembling the male in every phase of variation.

Underside of the fore wings glossy leaden brown; costa and hind margin shaded with the ground colour of the upper side. Hind wings pale leaden brown.

Always and everywhere variable, not only as already suggested, but also on quite different lines. One range of forms always found along with typical specimens has a dorsal blotch extending along almost the whole dorsal margin and doubly humped; in this form the dorsal blotch is nearly always red-brown and usually *darker* than the ground colour—which in this case is sometimes nearly white. Another form, found freely in Scottish mountain districts, has the ground colour usually of a bright light red or terra-cotta colour, with the markings sharply defined and either broken or added to, or even changed to elongated dashes producing varieties which are extremely pretty but tedious to describe.

On the wing from the end of June till August.

LARVA sluggish, flattened yet swollen in the middle; dull white, tinged faintly on the back with bluish grey, which is interrupted at each segmental division; head pale brown, with the jaws dark brown; dorsal and anal plates whitish.

When younger, more greenish grey with the raised dots black and the hairs rather long; head and dorsal plate black; the anal plate dull green; feet black.

May and June on willow, birch, hazel, aspen, dogwood and alder; drawing together the leaves and young shoots and feeding within.

PUPA yellow-brown; in a cocoon in the earth.

This species is particularly noticeable at harvest time when the great glut of summer species is over. It hides during the day in bushes and hedges, and rushes out with great vigour when disturbed by the beating stick, to fly often, to a consider-

able distance. At dusk it flies vigorously over the hedges, and over bushes in the more open parts of the woods, continues on the wing into the night, and will often come to the sugar placed on tree trunks as a bait for Noctuæ. Generally distributed throughout the United Kingdom, and often abundant. Also distributed abroad throughout Central and Northern Europe, Spain, and Italy.

3. **P. semifuscana**, *Huw.*; **piceana**, *Wilk.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings elongate, *shining*, grey-brown with an obscure, paler, dorsal blotch, on each side of which is a round dark spot.

Antennæ and palpi pale brown, head and thorax dull brown; abdomen pale grey-brown. Fore wings elongated, costa folded at the base and strongly arched; apex blunt, hind margin nearly perpendicular and straight; almost any shade of brown, but always shining—umbreous, purplish-brown, brownish drab or ochreous brown;—basal blotch obscure, usually indicated by the base of its outer margin, which is angulated—brown or black—and small fragments of the margin, particularly a cloudy round dot on either side; central band, when perceptible, reduced to a narrow brown central cloud, and some slender suggestions of extension to the margins; sometimes a faint cloud lies before the apex; cilia brown. Hind wings smoky white, cilia whiter. Female similar, but without the costal fold.

Underside of the fore wings smoky black; costal and hind margins broadly clouded with pale brown. Hind wings shining yellowish white.

Variable through many shades of grey-brown, golden brown, rosy brown, grey-brown and grey-drab, the usual inconspicuous markings often absent or obscured; but in few districts a form very different from the rest, and on which the original name *semifuscana* seems to have been based, is not at all rare. In it the costal half of the fore wings is dark

purple-brown, but the dorsal area *white* to the hind margin and apex, and the white portion throws off projections into the dark colour and produces a very pretty variety of this otherwise monotonous looking insect. A rare variety is wholly of a deep rich red; one or two such have been found in North Wales. In some other hill districts specimens are found far smaller than the type and of a pale and faded appearance. In all the peculiarly shining appearance of the fore wings, which distinguishes this species from its allies, is fully observable.

On the wing from June till August, and, possibly in a restricted second generation, in September and October.

LARVA rather flattened; dorsal region slate colour, whitish green at the sides and below, and also on the last three segments; raised dots white, furnished with bristles; head dark umbreous, eyes paler, dorsal and anal plates whitish green. When younger pale blue-green, with distinct, minute black dots; head and plates black.

April and May, and even to July, on sallow, feeding in drawn-together shoots and rolled leaves; also on sweet gale (*Myrica gale*).

PUPA light chestnut brown, spun up among dead leaves of sallow.

This moth is especially abundant in fens and marshes, also in the north in mosses, attached apparently to the wettest spots, and hiding during the day in the thick growth of grass, sedges, and fen plants with which the bases of the sallow bushes are then crowded. It is not readily aroused in the day time, but at dusk crawls up and flits about the same bushes, or crowds about rushes and other low-growing plants. As darkness comes on it flies freely, and then is easily attracted by a strong light; indeed, I have known a

lamp used for collecting in a fen to be crowded to an inconvenient extent by these moths. Probably in suitable places throughout England, Wales, and Scotland, though in the latter country I have no records north of Aberdeen. In Ireland it is reported only from Cork County, Enniskillen, and Sligo. Abroad it is found throughout Central Europe, and in Sweden, and South-west Russia.

4. **P. sordidana**, *Hüb.*; **stabilana**, *Stroph. Wilk.*—  
 Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings elongated but broad, nearly uniform, soft golden brown or reddish brown, often with faint umbreous cloudy spots bordering a rather paler dorsal space.

Antennæ thickly ciliated, dull umbreous; palpi, head, and thorax dark umbreous; abdomen pale brown. Fore wings elongated, but rather broad; costa folded and rather strongly arched, apex bluntly and squarely angulated, hind margin straight; velvety brown irrorated with darker brown; basal blotch faintly indicated by the dorsal half of what would be its outer margin, which is curved, dark umbreous; no other markings except a faint darker cloud in the place usually occupied by a central band, and some exceedingly fine brown streaks toward the apex; cilia brown. Hind wings with their cilia pale smoky brown with a faint purplish gloss. Female similar, but without the central fold.

Underside of the fore wings leaden brown; of the hind yellowish white.

On the wing in September and October.

LARVA undescribed—on alder, folding the leaves, in June. (R. South.) Pupating among rubbish on the ground.

This species hides in alder bushes and trees during the day, and may be readily beaten out, when it flies vigorously a short distance; in fen districts it is common, and flies at dusk rather low down about the alder bushes, but is not very



easy to see from the darkness of both fore and hind wings. It is rather an obscure species, and often mistaken for *P. semifuscana* or *P. solandriana*, but may be known by its rather uniform soft, but dull, brown colour and its somewhat grey-brown hind wings. Usually considered a rather local species, but found in Kent, Surrey, Sussex, Hants, Berks, Dorset, Devon, Gloucestershire, Herefordshire, Essex, Cambs, Hunts, Norfolk, Derbyshire, Cheshire, Lancashire, Yorkshire, and Durham; also in Scotland in the Edinburgh district, the Clyde Valley with Dumbartonshire, Perthshire, and Aberdeenshire; but I have no record for Wales or Ireland. Abroad it is found in most parts of Central Europe, Piedmont, Sweden, Finland, and Western Russia.

#### Genus 24. HALONOTA.

Antennæ stout, closely notched; palpi drooping, rather long; thorax smooth; fore wings broad, not elongated; costa folded from the base; hind wings with a ridge of hair-scales along the median nervure.

We have nine species, the following is a rough attempt to tabulate them:

- A. Fore wings with two large dorsal white spots.
- B. Fore wings purple-brown. *H. similana*.
- B<sup>2</sup>. Fore wings black-brown marbled with white.  
*H. pflugiana*.
- A<sup>2</sup>. Fore wings with one large dorsal white spot.
- B<sup>3</sup>. Fore wings marbled black-brown. *H. virsiana*.
- B<sup>4</sup>. Fore wings dull umbreous. *H. brunniciana*.
- B<sup>5</sup>. Fore wings bright brown with paler cross marbling.  
*H. trigeminana*.
- B<sup>6</sup>. Fore wings brown-black with faint leaden lines.  
*H. tetragonana*.
- A<sup>3</sup>. Fore wings without any dorsal white spot.

- B<sup>7</sup>. Fore wings drab, dusted with umbreous. *H. grandarona*.  
 B<sup>8</sup>. Fore wings dull leaden brown. *H. turbidana*.  
 A<sup>4</sup>. Fore wings with a large sickle-shaped dorsal marking. *H. foenella*.

1. **H. similana**, *Hüb.*; **bimaculana**, *Don.*—Expanse  $\frac{3}{4}$  inch (18 mm.). Fore wings rich dark purple-brown, with a large white dorsal blotch, followed by another at the anal angle.

Antennæ and palpi black-brown; head and thorax reddish brown; abdomen silvery brown. Fore wings rather elongated; costa strongly folded, yet regularly arched; apex bluntly angulated, hind margin straight and slightly oblique; purple-brown rather tinged with red toward the apex, and the costa faintly dotted with the same; in the middle of the dorsal margin is a large, semi-circular creamy white spot; and beyond it, over the anal angle, a still larger, more squared, similar blotch, both containing some brown dusting; in the apex is a round black dot; and outside it a black line passes down the hind margin; cilia white, tipped with purple-brown. Hind wings and their cilia smoky white. Female similar, but with the base of the costa plain, and the hind wings darker.

Underside of the fore wings shining pale lead colour; costa dotted with yellowish white; hind margin shaded with white. Hind wings leaden white.

On the wing from the end of July till September.

LARVA plump, white or greyish white; raised dots black; head yellow-brown; plates yellowish green; feet black.

May and June on birch, folding and crumpling the leaves, and spinning them together; Sorhagen says, "in a bag-like, spun-together, leaf." Abroad it is reported also to feed on alder and hazle.

PUPA slender, red-brown; in a cocoon in the earth. (Hoffmann.)

This species regularly accompanies *Pentolina betulatana*, emerging from pupa almost at the same time, and frequenting, more particularly, the birches which grow on open heaths and bogs; it is easily disturbed in the day time, and flies with vigour a short distance; but at dusk it is rather later on the wing and more slow of flight. After dark it will visit the sugar placed on tree-trunks to attract Noctuæ. Widely distributed and to be found in suitable places throughout England and the Lowlands of Scotland to Moray; but I find no record for Wales; and for Ireland only Kerry, Tyrone, and Antrim. Abroad it is distributed throughout Central Europe, Scandinavia, Piedmont, and Eastern Siberia, and in North America is recorded from Maine and Massachusetts.

2. **H. pflugiana**, *Har.*; **scutulana**, *Schiff.*—Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings black-brown, marbled with white; having a large white dorsal blotch and a whitish ocellus, nearly as large, over the anal angle. Female far blacker and with smaller spots.

Antennæ thick, black-brown; palpi black, tipped with white; head and thorax black or black-brown; abdomen dark brown. Fore wings broad and ample; costa broadly folded at the base, but fully arched; apex squared, hind margin almost straight; black-brown, handsomely marbled and interspersed with white; basal blotch black, complete, its outer margin curved and indented; closely followed by a broad white dorsal spot; central band indicated by a large, squared, dorsal, black and grey blotch, almost united to a costal black cloud, which is produced to the apex; this edges a blue-black costal blotch which encloses four pairs of bright white costal streaks; ocellus very large, white, enclosing a row of deep black dots; apex reddish-brown; hind margin

and cilia white, shaded with brown. Hind wings pale smoky brown, shading to white at the base; cilia white. Female very different, rather *smaller*; the fore wings without fold, black, mottled with blue-black and reddish-brown; dorsal spot much smaller and squared, ocellus rather obscured; costal dots smaller; hind wings brown-black with white cilia.

Underside of the fore wings of the male smoky black, shading to white on the dorsal and hind margins; costal white dots very large, undivided. Hind wings white with black dusting in front. Female black or smoky black, with white costal dots.

On the wing from the end of May till July.

LARVA bright pink, paler beneath; head heart-shaped shining black; dorsal plate also shining black, with the anterior margin pale, also divided by the dorsal line; anal plate oval, shining black; raised dots oval, shining brown. (Wilkinson.)

From the autumn till May on various thistles, especially those growing in wet places—*Cnicus palustris*, *C. lanceolatus*, *Carduus nutans* and other large species, feeding when young in the axils of the leaves, or in the flower-heads; later in the stem, in which also it passes the winter.

PUPA about five lines long, dark brown, in a rough cocoon of white silk mixed with the gnawed pith, in old thistle stems. (Wilkinson.)

This handsome moth is almost always to be found near the large strong growing thistles, and very commonly in damp places, but hides either in them or in any other rough plants, and is readily stirred up by the footstep in the daytime, dashing boldly away with a fine and striking appearance. At dusk it flies freely, and the female is then more commonly seen. Common in wild, rough open ground, especially when partly marshy, also in open woods, and to be found throughout

England, Wales, and Ireland; throughout Scotland to the Orkneys; and abroad well known in Central Europe, the northern half of Italy, Dalmatia, and Bithynia.

3. **H. cirsiana**, Zell.; **luctuosana**, Dup.; *Stand. Cat.*  
—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–16 mm.). Fore wings black-brown tinged with blue-black behind, and having a conspicuous somewhat squared, creamy-white spot in the middle of the dorsal margin.

Antennæ, palpi, head, and thorax black-brown; abdomen dull dark brown. Fore wings not very broad, costa folded at the base and nearly straight, apex squarely angulated; black-brown, faintly mottled with blue and orange-brown; on the middle of the dorsal margin is a creamy white spot or blotch, either squared or with its upper edge sloping back; above the anal angle is a large ocellus, dull brown with a whitish tinge and having dull blue-grey streaks; costa dotted with two pairs of white streaks, the outermost longer and curving round the orange-brown apical spot; cilia dark brown, dusted with white. Hind wings dark smoky brown, with a white cilia. Female very similar, but rather larger and without costal fold, and having the white dorsal spot dotted on its margin with black.

Underside of the fore wings leaden black, with yellow costal dots. Hind wings leaden brown, with dapplings of white.

Variable in size, some of the largest females approaching in appearance to the smaller females of the last species; some of the smallest males, especially those found in fens, so small, and having the fore wings so narrow, that it is difficult to believe them the same species. In some instances, moreover, the hind wings are nearly white.

On the wing in June and July.

LARVA apparently hardly described. Herrich-Schaeffer says, "the reddish larva lives in the pith of stems of *Cirsium*

*palustre* and *Seuccio jacobæ*." Mr. Thurnall confirms this, but Mr. N. M. Richardson has reared it from the stems of *Iunla dysenterica*, "feeding quite at the bottom of the old flower-stalk, and into the root of the plant." Others mention *Centaurea nigra*, and I have myself reared from this plant the narrow-winged, small form, already mentioned. It hibernates in the stem, where it has fed, and there assumes the pupa state.

The habits of the moth point strongly to *Centaurea nigra* as the favourite food-plant, since it is especially fond of sitting upon, and hiding among, this plant in the daytime. It is easily disturbed and very swift in its movements when so disturbed, and almost seems to be disposed to enjoy the sunshine, yet its principal time of flight is after sunset. Very common in all sorts of rough stony ground, hill-sides, quarries, and rocky places generally, and to be found apparently throughout England and Wales, and Scotland to the Orkneys; and in Ireland in the Dublin district, Galway, Sligo, Armagh and Antrim. Abroad its range seems to extend through Germany, Switzerland, Italy, Spain, Jutland, and Western Russia, but probably it is still more extended, seeing that some entomologists regard this species as a form of the last (*H. pflugianæ*), a conclusion which seems to be contradicted by the *opposite proportions* of the sexes, as well as the contrasts in size and shape.

4. **H. brunnichiana**, *Schiff.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings umber-brown with lustrous leaden lines in the apical area, and a large creamy-white mid-dorsal spot.

Antennæ, palpi, head, and thorax dull olive-brown; abdomen dull brown. Fore wings moderately broad; costa folded at the base, flatly arched, apex bluntly angulated, hind margin a little oblique; umbreous or olive-brown with the hinder area rather paler; basal blotch faintly darker,

squarely angulated, and forming one portion of the margin of a large, clear, creamy-white dorsal spot; costa dotted with yellow-brown, from this proceed some faint lustrous leaden lines through the hinder area; above the anal angle a large ocellus is indicated by a row of aggregated black dots; cilia olive-brown. Hind wings dark smoky-brown; cilia dull white. Female rather larger, similar or often darker, and having numerous, more distinct costal dots, but without the fold. Hind wings blacker.

Usually constant in markings and fairly so in colour, but a bone-white variety corresponding closely with that of *Penthina variegana*, known as *nubiferana*, has been taken near York, while in the adjoining County of Durham many specimens have been obtained of which the white dorsal blotch is obliterated, leaving the fore wings uniformly dark brown. These seem to have been limited to a disused quarry, and were taken by Mr. J. E. Robson and Mr. J. Gardner. There is reason to think that the insect described by Haworth as *costipunctana* was a variety of the present species.

On the wing from June till August.

LARVA when young naked, fat-white; later reddish; and after the winter brick-red, with the head light brown and the dorsal plate clay-yellow. (Hofmann.)

Autumn to March in the root of *Tussilago farfara* (colts-foot), but in the spring it is said to ascend into the flower stalks, though it becomes a pupa in the root. Of this I am not fully satisfied.

This is a lively species during the day, flying about in the afternoon sunshine over the beds of coltsfoot, and settling frequently thereon, continuing on the wing till dusk. Usually a very common species, and to be found among its food plant throughout the United Kingdom, except that I have no record from the Scottish Isles.

Abroad it is common throughout Central Europe, Scandinavia, Spain, Greece, and Asia Minor.

5. **H. grandævana**, Zell.—Expanse  $\frac{3}{4}$  to  $1\frac{1}{4}$  inch (18-28 mm.). Fore wings very broad, pale drab dusted almost all over with faint brown dots and clouds; hind wings ample, pale smoky-brown.

Antennæ pale grey; palpi, head, and thorax dark brown; abdomen dull pale brown. Fore wings large and broad; costa folded and gently arched, apex very bluntly angulated, almost rounded; hind margin curved; pale drab, sprinkled almost all over with faint white dots and brown cloudy spots and dots; on the costa is a long series of such spots; sometimes the curved outer edge of a large basal blotch is perceptible; or in other cases the brown cloudy dots cluster together along the disk, but there are no other definite markings; cilia drab. Hind wings and their cilia smoky whitish-brown. Female similar but larger and stouter and without the costal fold.

Underside of the fore wings pale leaden-brown; costa dotted with white. Hind wings dull white.

On the wing in July.

LARVA thick, yellow, more reddish above; with strong brown single hair-bearing raised dots; head brown; dorsal plate paler, shining, brown on both sides. (Hofmann.)

March and April in the roots of coltsfoot (*Tussilago farfara*), also in those of *Petasites albus* and *P. nircus*. Mr. J. Gardner informs me as follows: "It at first feeds inside the root of coltsfoot, working downwards from the crown of the root, where I presume the eggs are laid. When it becomes about three-fourths of an inch in length, which is in September or October, it spins long pipe-stem-like tubes, in which it winters, apparently without eating. I found other, smaller, larvæ during the winter, without tubes, but lower down in the soil than those having webs. In the spring



these tubes have an opening to a root of the food-plant, which the larva feeds upon, retiring to its tube again. In May, before closing the tube, it brings it up to within an inch or two of the surface of the sand. The larvæ are nearly an inch long, unicolorous, and about the colour of a carrot."

PUPA rather glossy, pale chestnut; antenna cases separated on emergence, but previously laid closely together with the limbs; moveable segments of the abdomen each twice ribbed, the ridges very sharp and bent back and thickly set with short spines; cremaster short, squared and bristly. In the larval habitation, in a portion placed upright a little below the surface of the sand and thickly lined with silk.

This fine species, one of the largest of the Tortrices, seems to be confined to loose sandy or gravelly soil, and with us, to a large extent, to the loose *ballast* which has been deposited from time to time on our north-east coast, and which in all probability has been the means of conveying the insect in the larva stage from the shores of the Baltic. It was first found here about the year 1864 by Mr. J. Gardner of Hartiepool, but was not introduced as a British species till 1873, when it had become somewhat common on the waste tract which it had colonised. Here it flies at dusk very low over the sand, and to but short distances, from one patch of coltsfoot to another, and from its resemblance in colour to the sand is difficult to see on the wing. At night it sits on the plants or on the adjacent sand, and may be found by the help of a lantern. It does not appear as yet to have spread much beyond its early locality on the Durham coast. Abroad it is, as already remarked, common on the Baltic coast, and is said to be attached also to mountain regions, including the Alps, North-west Germany, and Livonia. It is a curious circumstance that, at a meeting of the Entomological Society in

1873, the late Mr. H. T. Stainton foretold the probable discovery of this species here, and narrated how, on the shores of the Baltic, the larva-tubes became often exposed through the blowing away of the sand; so that the fine pupa became the ready prey of birds.

6. **H. turbidana**, *Tr.*—Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings short and rather broad, olive-brown thickly dotted with dark brown; sometimes having a faint indication of a paler roughly formed dorsal blotch.

Antennæ dark brown; palpi and head dull ochreous-brown; thorax and abdomen dull umbreous. Fore wings only moderately broad; costa folded and flatly arched, apex bluntly angulated; dull pale olive-brown rippled and dusted all over with umbreous streaks, though less so toward the base; costa regularly streaked with olive-brown; on the dorsal margin are two very faint erect olive-brown streaks, shaded outwardly and indicating a faint dorsal blotch; cilia olive-brown. Female similar, but larger and darker, and devoid of the costal fold.

Underside of the fore wings leaden-brown; of the hind wings leaden-white.

On the wing from the end of May till July.

LARVA undescribed. It is believed to live through the winter, and till May, in the stems and roots of *Petasites vulgaris* (butter-bur).

This is one of our most local species, and one with which I have no living acquaintance. More than half a century ago my lamented friend Mr. Stainton paid a visit to Chudleigh, Devonshire, and near there, under Haldon Hill, he found this species—which he called the hippopotamus tortrix, because it is “large, brown, moderately ugly, and sleeps its time away in marshy places on the banks of rivers.” He found specimens sitting on the leaves of butter-bur in the

day time, and again in the evening, but between 4 and 5 P.M. found it flying, and captured a fair number. More recently Mr. R. South found it among the same plant in North Devon; he noticed that it flew for a short time between 3 and 4 P.M., and that afterwards it might be found sitting on the upper side of the leaves, singly or in pairs. I find no record for any other Southern County, but it is found locally in Herefordshire, Lancashire, Yorkshire, Durham, and Cumberland. In Scotland Sir Robert Moncreiffe took it in Perthshire; Mr. Dalgleish records it at Crookstown, Renfrew; and the late Mr. R. F. Logan discovered it long before at Duddingstone, Edinburgh. Abroad it inhabits the South of France, Holland, Germany, Switzerland, Hungary, and Austria.

7. *H. foenella*, Linn.—Expanse  $\frac{3}{4}$  to 1 inch (18–25 mm.). Fore wings broad purple-brown with a large angulated scythe-shaped dorsal white marking.

Antennæ dull brown; palpi dull white; head brownish-white; thorax reddish-brown; abdomen rather paler. Fore legs elongated and broad; costa folded yet well arched; apex squarely angulated; rich purple-brown with a tall oblique, silvery-white dorsal blotch, which is produced above and bent somewhat into the shape of a scythe or flagellum; ocellus large but obscure, greyish-white, containing a line of black dots, its inner edge perpendicular; costa dotted with four small twin brownish-white streaks; cilia red-brown. Hind wings dark smoky-brown; cilia white. Female similar but larger, and with the costa devoid of fold.

Underside of the fore wings smoky-brown; hind wings a shade paler.

A variety occurs now and then in which the white marking is quite obliterated by the ground colour.

On the wing from the end of June till August.

LARVA yellowish-white, head heart-shaped, dark chestnut-

brown, shining; dorsal plate diaphanous, shining hazel colour, divided by a pale dorsal line, on either side of which, near the base, is a darker undefined patch; anal segment, suddenly attenuated, bears a hazel-brown cloud. (Wilkinson.)

September till April or May in the root-stock of common mugwort (*Artemisia vulgaris*), eating the pith of the thick stem and the rough root-stock, especially in the strong side shoots; spinning up in the same place.

PUPA rather compressed and of even thickness; head, thorax, and wing-case smooth, shining black; abdominal portion pale hazel on the ventral, and deep red-brown on the dorsal surface; cremaster armed with coarse, deep chestnut-coloured hooklets. (Wilkinson.)

This is a very vigorous and active species; it flies in a wild manner and rather high about tall plants of mugwort growing in hedges or waste ground in the late afternoon sunshine and till dusk; also it sits from time to time upon the plants, and in dull weather may often be disturbed by the beating stick. It also certainly flies at night, since it is strongly attracted by a light at that time. Rather a local species, and usually not very common. Still to be found occasionally in the southern suburbs of London and elsewhere in Kent and Surrey, also in Hants, Devon, Somerset, Herts, the Eastern counties, including Cambs.; also in Oxfordshire, Gloucestershire, Worcestershire, and rarely in Durham and Cumberland. But, so far as I can ascertain, this is the extent of its range in these Islands. Abroad it is widely distributed through Central Europe, the north of Italy, Scandinavia, Finland, Greece, Armenia, and Turcomania.

8. **H. trigeminana**; *Steph.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings mottled, red-brown with olive-brown, with a dusted creamy-white dorsal blotch.

Antennæ dull brown ; palpi silky white, tipped with dark brown ; head silky pale brown ; thorax darker brown but the shoulder-lappets paler ; abdomen dull brown. Fore wings not broad, but with the costa folded at the base and very slightly arched ; apex squarely angulated ; reddish-umbreous clouded and dusted with grey and white ; basal blotch rich dark brown, clouded at the base with white, its outer margin indented ; closely followed by an erect, somewhat squared, creamy-white, dorsal blotch, which contains some upright brown streaks ; ocellus large, squared, brownish-grey, very obscure ; on the costa are four pairs of short white streaks ; cilia dark brown. Female a little larger, similar or darker ; in it often a white shade passes from the creamy-white dorsal blotch to the costa. Costal fold absent.

Undersides of all the wings smoky-brown, but the costa of the fore wings dotted with white.

On the wing in June and July.

LARVA cylindrical, plump and smooth, with rather deeply divided segments ; pinkish-yellow, the dorsal region sometimes a beautiful light pink, paler below ; head chestnut-brown with darker jaws ; dorsal plate very pale brown with a crescent-shaped blotch behind each lobe of the head ; anal plate hardly perceptible ; raised dots faintly shining, with very minute hairs.

September till December in the root-stocks of *Senecio jacobaea* (ragwort), when young feeding on the outer skin and making covered ways meandering about the root-stock, constructed of silk and frass or having a little chamber in the end of the burrow in which it lies when not feeding ; afterwards penetrating to the middle of the root-stock and feeding on the pith. Ultimately eating its way out of the plant, to spin up among rubbish on the ground, and there to lie unchanged until the spring.

This species is always to be found among ragwort ; and in the corners of commons where large patches of this plant grow, and on railway embankments, is common ; also in the open parts of the borders of woods and on sand-hills and rough open land generally. It sits upon the plants during the day, and often is to be seen on the upper side of the leaves ; also buzzes actively about among them in the late afternoon sunshine, continuing on the wing till near dusk. Not uncommon in the suburbs of London, and to be found sometimes plentifully, in suitable places throughout England and Wales ; and in Scotland in the Edinburgh district and Roxburghshire, also in Perthshire, the Clyde district, and Aberdeenshire. In Ireland it is recorded from the Dublin district, Cork, Sligo, Tyrone, Donegal, Antrim, and Derry. Though so well known, and often abundant here, it seems to be but little known abroad, and reported mainly from Central Europe, yet in North America it is found in California and Oregon.

9. **H. tetragonana**, *Steph.* ; **luctuosana**, *Hein.* Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings short, broad, and very blunt, black-brown marbled with lustrous leaden lines and having a large creamy white central dorsal spot.

Antennæ black ; palpi, head, thorax, and abdomen brown-black. Fore wings rather short and broad ; costa folded but hardly curved, apex very blunt, hind margin perpendicular ; black-brown faintly rippled with brown ; on the middle of the dorsal margin is a large, ovate, creamy-white blotch, slightly dusted or shaded at its base with black ; beyond it are some irregular transverse steel-blue lines ; and on the costa, close to the apex, three pairs of faint white dots ; cilia brown-black. Hind wings and their cilia smoky black. Female similar, but without the costal fold.

Undersides of all the wings smoky-black, the pale blotch of the upper side of the fore wings faintly visible through.

On the wing from June to the middle of August.

LARVA apparently undescribed. The late Mr. J. Sang reared several of the moths from larvæ feeding upon *Rosa spinosissima*, supposed, when found, to belong to another species, of which no description was taken. Mr. Wilkinson seems to have been misled about this species; the larva to which he refers is probably that of *Carpocapsa nimbana*.

This is a very lively, swift, and active species, flying at great speed along hedges and the edges of woods in the late afternoon sunshine. Sometimes it seems to confine itself to the shelter of rose bushes, but I have often seen it dashing wildly backward and forward along the sheltered side of great masses of the climbing black bryony and other thick hedge plants. Without some suitable background it is a difficult species to see upon the wing. Although a local species it has rather a wide distribution, occurring from Kent and Surrey to Devon and Somerset; also in Middlesex, Herts, Essex, Norfolk, the western counties from Gloucestershire to Lancashire and even Westmoreland, and very locally in Durham. In Wales it is recorded in Brecon; in Scotland, in the Edinburgh district, Perthshire, and Dumbartonshire, but I am not sure of its existence in Ireland. Abroad it inhabits Germany, Galicia, Switzerland, Piedmont and Livonia.

#### Genus 25. CARPOCAPSA.

Antennæ thick, notched, densely ciliated; palpi small and slender; thorax robust, smooth; fore wings broad and almost squared, costa not folded; hind wings smooth and even.

We have five species.

- A. Fore wings deep slate colour, with a very large purple ocellus. *C. pomonella*.

- A<sup>2</sup>. Fore wings pale grey, with a large purple-black ocellus.  
*C. splendana*.
- A<sup>3</sup>. Fore wings pale grey, with dark basal blotch and  
obscure ocellus. *C. grossana*.
- A<sup>4</sup>. Fore wings white, clouded with grey, with a large blue-  
black ocellus. *C. juliana*.
- A<sup>5</sup>. Fore wings bluish-grey, with a white dorsal blotch and  
obscure ocellus. *C. nimbana*.

1. **C. pomonella**, *Linna.* Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Fore wings grey, covered with dark grey transverse lines; ocellus lustrous purple, filling the entire hind marginal area.

Antennæ black-brown; palpi, head and thorax grey-brown, dusted with pale grey; abdomen dull brown. Fore wings elongate, very blunt; costa not folded, flatly arched; apex bluntly angulated; hind margin perpendicular but slightly curved; grey with numerous darker grey rippled transverse lines, parallel to each other throughout; among them the basal blotch is indicated by a shade of darker colour having, an erect but curved edge; no central band; ocellus quite unusually large, purple-brown, with several erect glowing-red lustrous lines, edged in front with black; along the hind margin is a black line; cilia blackish-grey. Hind wings very dark brown; base paler, cilia dusky white. Female similar.

Underside of the fore wings black-brown, dotted along the costa with grey. Hind wings brownish-white, much reticulated with golden-brown.

On the wing in June and July; usually I think single-brooded with us, but the late Mr. Parfitt stated that, in Devon, a second generation emerged in August. Kollar moreover states that on the Continent of Europe there are two generations in the year; while Professor T. D. A. Cockerell assured me that in New Mexico it has several



broods in the course of the summer, and that they become quite irregular.

LARVA flesh-pink with grey raised dots, each of which bears a rather long hair; head and the divided dorsal plate red-brown. When young paler, or white.

July, August and September in apples, eating a hole right through the fruit in order to feed on the pips; if the seeds of one apple are insufficient attacking another. The apples thus "worm-eaten" fall before they are ripe, and quickly become rotten; the larva therefore becomes a most destructive pest, particularly as it shows excellent taste in the selection of apples of the best kinds, yet does not despise the common wild crab. Found also occasionally feeding in the same manner in pears, and on the much smaller fruit of *Sorbus aria* (white bean), and even on fig, walnut, and common nuts. With us hibernating in a niche in a chink of bark, and changing to a brown pupa in the same place; or under loose bark, or odd corners and chinks of wood or flooring in an apple-store.

In the warmer parts of North America, where several broods are produced in the season, it is stated by Professor Cockerell that in New Mexico they find plenty of food in the hay season, since the late apples are not gathered till October. He says that "Early in the season only a few apples are wormy, but the number increases rapidly with each brood, and the broods are quite irregular. Just now (July 20) the second generation is pupating."

Since the larva passes from one apple to another eating only the pips, it has been found that by examining the young apples on standard trees, and removing those the skin of which is pierced *only on one side*, the larva may be secured and destroyed, and thus a portion of the crop saved.

The moth sits, during the day, on the trunks of apple-

trees and on their branches, but is then sluggish, and unless the weather is very hot, unwilling to fly, but from about 7 P.M. till dark flies swiftly over and about the trees. To be found among apple-trees throughout the United Kingdom; also all over Europe, Northern Africa, North America to New Mexico, Australia, Tasmania, New Zealand, and indeed wherever the apple grows throughout the world.

2. **C. splendana**, *Hb.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–20 mm.). Fore wings obtuse, greyish-white, obscured with closely placed lines of grey-brown dusting; hinder area filled by a large blackish-purple ocellus.

Antennae, palpi, head, and thorax grey-brown; abdomen dull brown. Fore wings broad and rather short; costa not folded, gently arched; apex squarely angulated, hind margin rather filled out; whitish-grey, costa lined throughout with faintly oblique grey-brown lines, running into transverse dusted lines, and with white gemmated dots toward the apex; basal blotch large, angulated outwardly, and formed of faint brown-grey lines; no definite central band; ocellus usually large, occupying the entire hinder area, purple-black, crossed by a series of black streaks, and perpendicularly by faint silvery lines and edged in front by a pale shade; hind margin dotted with black; cilia blackish-grey. Hind wings dark brown with whiter cilia. Female similar, often larger.

Underside of the fore wings smoky-brown, with the hind margin paler. Hind wings pale smoky-brown.

Occasional specimens are found suffused with smoky-black, the ocellus only being faintly visible and darker.

On the wing from June till August.

LARVA sluggish, stout, dirty greyish-white, with the dorsal vessel grey and raised dots of the same colour; head small, yellow-brown; dorsal plate paler.

August to October in acorns, leaving them when they fall, and spinning up in any crevice under moss, or among rubbish, remaining in cocoon as a larva through the winter. It has been known to spin up in old decayed galls of *Cynips lignivola*. Occasionally also feeding in walnuts and Spanish chestnuts.

The moth sits during the day on the branches of oaks, or hides in any hedge or other shelter beneath, and may occasionally be beaten out and induced to fly. Late in the day and towards dusk it flies freely around oak trees, especially those situated in woods. Not usually found in any abundance, but fairly frequent in oak woods throughout the southern half of England to Oxfordshire and Bucks, and in the eastern and western counties extending even to Durham and Cumberland; but records from the Midlands are almost wholly wanting, and in Scotland there is only a report of its occurrence in the Clyde district. In Wales I found it in Pembrokeshire; and in Ireland it seems to have been taken in Donegal; but it may reasonably be expected to occur in any oak wood in these Islands. Abroad it is distributed throughout Central and Southern Europe, Sweden, Bithynia and Madeira.

3. **C. grossana**, *Haw.*—Expanse  $\frac{3}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings broad, pale grey, wholly covered with transverse dark grey lines, the basal blotch darker, and the dorsal spot paler; ocellus grey, obscure.

Antennæ blackish-brown; palpi. head. and thorax grey-brown, dusted with pale grey; abdomen dull grey-brown with the base more ochreous. Fore wings rather short and moderately broad; costa not folded, well arched; apex sharply angulated. hind margin retuse and filled out; pale grey marbled with darker grey transverse streaks and lines; costa dotted with brown-grey; basal blotch composed of brown-grey streaks, but its outer edge sharply angulated:

adjoining it is usually a paler dorsal blotch, rather curved back, and divided in the middle by a similarly curved black streak; a blackish cloud lies near the anal angle, and another at the apex, the ocellus between being pale grey, dotted and edged with black; cilia grey. Hind wings black-brown with whitish cilia. Female similar but larger.

Undersides of all the wings smoky-black, shading to whiter at the margins.

On the wing in June and July.

LARVA somewhat flattened, narrowed behind, dull pale amber-yellow, with longitudinal stripes of faint orange-colour; raised dots shining orange; head pale brown; dorsal plate pale yellow; anal plate similar; on the middle of the twelfth segment is a dull lead-coloured spot. (Wilkinson.)

August to October in beech-mast, usually hollowing out two adjoining kernels; leaving them when they fall, in autumn, and spinning up in any dry place among rubbish, especially preferring rotten wood, and forming a tough cocoon, in which it sometimes remains unchanged more than one year.

The moth sits during the day on beech trees, especially upon the branches, from which it may occasionally be beaten out. It flies naturally from 6 P.M. till sunset or even dusk, rather high about the same trees. Rather a local species, frequenting beech-woods, and sometimes common in those of the chalk districts of the South of England, and found in Kent, Surrey, Sussex, Hants, Dorset, Wilts, Berks, Oxfordshire, Gloucestershire, Herefordshire, Herts, Cambs. Essex, Suffolk and Norfolk, also recorded by the late Mr. T. Wilkinson at Scarborough, Yorkshire, but so far as I know not present elsewhere in these Islands. Abroad its range is through Central and Southern Europe, and it is found in Madeira.

4. **C. juliana**, *Curt.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{8}$  inch (12–16 mm.). Fore wings blunt, white in the middle, base thickly dusted with blue-black; ocellus and hind margin deeply clouded with the same.

Antennæ greyish-white; palpi and head white; thorax slate-grey, shading to white; abdomen black-brown. Fore wings not broad; costa without fold, very flatly arched; apex bluntly angulated, hind margin filled out; white, the basal area to the middle of the costa obliquely filled with fine blue-black cloudy lines and shading; this is closely followed by a large curved band of the white ground colour which occupies the middle of the wing and bends out towards the apex; costa dotted with black; ocellus large, filled by a double series of horizontal deep black streaks and two lustrous blue patches; hind margin clouded with blue-black and brown, and edged with black; cilia slate-black. Hind wings dark smoky-brown with the base paler; cilia white. Female similar.

Underside of the fore wings black-brown with ochreous margins; costa dotted with black; hind margin shaded with lustrous blue. Hind wings glistening white with blackish clouding.

On the wing in June and July.

LARVA sluggish; cylindrical, rather plump and wrinkled; dull white, with a cross-bar of pale brown on the back of each segment from the fourth to the twelfth; raised dots prominent, shining dark-red, bearing minute hairs; head pale brown; dorsal plate dull white with a necklace of black markings, forming a crescent round its posterior edge; anal plate black, shading paler behind.

September and October; in acorns and edible chestnuts; leaving them when they fall to spin up in or under the bark of trees. It has also been known to spin up in an oak-gall, and in rotten oak wood, and remains in this cocoon as a

larva until April or May. Sometimes the cocoons are formed in groups upon the rotten wood.

The moth sits on the rough bark of oak-trunks during the day or sometimes upon the rougher branches. It is shy and restless and darts down or away when disturbed; but at about 8 P.M. flies boldly and vigorously over and about the trees. It is rather frequently to be found in the London parks and suburbs, looking somewhat conspicuous as it rests upon the dark trees, but by no means always allowing itself to be boxed. Also found upon oaks elsewhere in Surrey, Middlesex, and Kent, and also in Sussex, Dorset, Devon, Somerset, Wilts, Essex, Suffolk, Norfolk, Herefordshire, and very locally in Lancashire, Yorkshire and Westmoreland. This, so far as I have any certain knowledge, is the extent of its range in these Islands. Abroad it is known in most parts of Central Europe, and also in Sweden and Dalmatia.

5. **C. nimbana**, *H.S.*—Expanse  $\frac{5}{8}$  inch (16 mm.). Fore wings blunt, dull slate-black with a trigonate dull white dorsal blotch followed by a very obscure ocellus.

Antennæ black-brown; palpi, head and thorax dull slate-brown; abdomen more glossy, black-brown. Fore wings rather narrow, blunt; the costa flatly arched, apex squarely angulated, hind margin nearly perpendicular; grey-black or slate-black, faintly streaked behind with golden-brown; on the middle of the dorsal margin is a broad upright dull white blotch, somewhat trigonate in shape, and having a faint cloudy dark dot in the middle of its base; on the costa are six or seven partially gemmated white dots; cilia black-brown. Hind wings dark smoky-brown with dull white cilia. Female similar.

Underside of the fore wings leaden black; costa dotted with white. Hind wings leaden brown.

On the wing in May.

LARVA not certainly described. Mr. A. Thurnall has reared the moth from beech-nuts gathered in September, as well as from spun-up larva on the trunks.

So far as is yet known, a rare species in this country. It was first obtained here by Lord Walsingham about the year 1868 or 1869 from larvæ found by him in cocoons under small patches of moss on the trunks of beech-trees at Little Kimble, Buckinghamshire. More recently Mr. Thurnall has taken the moth on the trunks of beech-trees in Essex. The only other capture here of which I have any knowledge is that by Mr. N. M. Richardson, of a specimen in Hants, in the year 1874.

By some Continental entomologists it is passed over as a variety of the previous species, and its range abroad does not seem to be noted.

#### Family 5. STIGMONOTIDÆ.

Fore wings narrow and elongated, usually even in width, closely clasped, when at rest, to the sides, especially closely behind; apex usually blunt; ocellus present or indicated; silvery lustrous lines visible, arising usually from the costa.

#### Genus 1. SEMASIA.

Antennæ thick, ciliated; palpi very small, drooping or depressed; thorax smooth; fore wings narrow, without fold; hind wings having a small tuft of hair-scales near the base.

We have seven species:

- A. Fore wings blackish-brown, with a paler dorsal blotch.
- B. The blotch pale yellow, broad and blunt. *S. gallicolanæ*.
- B<sup>2</sup>. The blotch bright yellow, pointed, containing a brown basal spot. *S. populana*.
- B<sup>3</sup>. The blotch whitish yellow, trigonate, spotless. *S. spiniana*.

- B<sup>4</sup>. The blotch very little paler than the ground colour.  
*S. obscurana.*
- A<sup>2</sup>. Fore wings mottled, brown, without dorsal blotch.
- C. The mottling rich chocolate, with numerous yellow streaks.  
*S. wæberiana.*
- C<sup>2</sup>. The mottling purplish chocolate.  
*S. janthinana.*
- C<sup>3</sup>. The mottling pale silvery-purple.  
*S. rufillana.*

1. **S. populana**, *Fab*; **ephippana**, *Hüb.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Slender; fore wings rather narrow, black brown, with faint irregular yellowish lines and a conspicuous yellow dorsal blotch sharply pointed back at the apex.

Antennæ, palpi, head, thorax, and abdomen black-brown. Fore wings rather narrow, costa almost straight, apex very bluntly rounded; black brown, much dusted behind with golden yellow; on the costa are three or four pairs of curved pale yellow streaks or dots; on the middle of the dorsal margin is an erect, somewhat triangular pale yellow spot or blotch with the apex pointed and bent; in the middle of its base is a triangular brown-black dot; on the hinder area are some extremely faint silvery and yellowish lines, and a hardly perceptible ocellus containing three black lines; cilia black-brown. Hind wings and their cilia black-brown. Female similar.

Undersides of all the wings leaden-black, except some pale yellow costal dots.

On the wing in July and August.

LARVA moderately active, plump, thickest in the middle and having rather swollen segments; dirty yellowish-white tinged behind with green; internal dorsal vessel irregular, broad, brown two-thirds of its length, then dark green; raised dots indistinct, bearing delicate hairs; head rather small black; dorsal plate semi-circular, divided, shiny black-brown; anal plate and feet black.



May and June on willow—*Salix caprea*, *S. repens*, *S. viminalis*, in the shoots, drawing together the young leaves, but living in a chamber constructed of small withered bits of leaf, lined with silk, which it is very unwilling to leave, and to which if removed it quickly returns. When full fed it moves to the stem or any other piece of soft wood, into which it burrows to spin up.

PUPA light chestnut-colour. In a cocoon in the soft wood just mentioned, or in rotten wood, or a twig of osier, or even in the dead sticks of *Eupatorium cannabinum*.

The moth loves to sit in the sun on willow leaves in the afternoon, and I have seen it at that time at rest in a blossom of the lovely white *Parnassia palustris*, where it looked somewhat conspicuous. Usually about marshy woods and also in fens among the willows; found in such situations in Kent, Sussex, Surrey, Hants, Dorset, Devon, Somerset, Berks, Herts, Essex, Norfolk, Cambs, Gloucestershire, Hertfordshire, Lancashire, Yorkshire, and rarely in Durham and Northumberland. In Wales, in Pembrokeshire, where it frequents lanes; and in Ireland, where Colonel Partridge has taken it near Enniskillen, ; but I have no record for Scotland. Abroad it inhabits Central Europe, Piedmont, Scandinavia, and South East Russia.

2. **S. gallicolana**, Zell; **obscurana**, *Stn. Manual*; **vernana**, *Knaggs*.—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (9–13 mm.). Fore wings narrow, rich brown-black with pale yellow costal dots, and a broad blunt pale yellow central dorsal blotch.

Antennæ black-brown; palpi, head, and thorax black-brown, mottled with white; abdomen grey-black. Fore wings rather narrow, costa nearly straight, apex bluntly angulated; black-brown dusted behind with yellow; costa dotted throughout with yellow, and on its hinder portion having short white streaks; in the middle of the dorsal margin

is a broad bluish creamy-white blotch, sometimes having faintly dusted darker lines in the middle of its base; before the hind margin are faint yellowish streaks; and a similar line along the base of the cilia is shaded outwardly with black-brown over the latter. Hind wings black-brown, paler at the base; cilia white. Female similar.

Underside of the fore wings smoky-black, shaded towards the middle with white; costa dotted with white. Hind wings leaden-white shading to black at the margins.

On the wing in May and the beginning of June; sometimes before the end of April.

LARVA up to the last moult pinkish-white; often much obscured by the dark intestinal canal; afterwards it becomes white; raised dots red and conspicuous; anal plate grey, and a band of the same colour crosses the base of the anal flap; head black; dorsal plate at first shining brown, finally pale yellow mottled with black, and with a black border behind.

September and October in the oak-apple, and woolly-gall of oak (galls of *Andricus terminalis* and *A. ramuli*) living on the internal vegetable substance when the galls are ripe and dry; giving no outward indication of its presence, but easily obtained by gathering the galls from the trees scattered about in fields and hedgerows. When full fed spinning up under bark or in a crevice in an old gall of *Cynips kollari*. (Dr. J. Wood.)

The moth hides in oak trees, and is not very easy to capture or obtain. Mr. C. Fenn says that it flies round the tops of the higher branches of oak trees in woods from 4 or 5 to 7.30 P.M. Earlier in the day it sits on the boughs and twigs, often on the outside sprays of small oaks, and may then be disturbed by the beating-stick, when it flies rather high, and rarely descends toward the ground. Inhabiting oak woods in Kent, Surrey, Sussex, Middlesex, Dorset,

Devon, Somerset, Essex, Cambs, Herefordshire and Worcestershire. So far as I know this is the extent of its range in these Islands. Abroad it is found through Southern and Central Europe, and in Asia Minor.

3. **S. obscurana**, *Steph*; **ravulana**, *H.-S.*; **tomiana**, *Zell.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Wholly obscure brown-black, except a faintly paler double dorsal blotch.

Antennæ black-brown; palpi, head, and thorax grey-black; abdomen black. Fore wings rather narrow, costal gently arched, apex bluntly angulated; dark grey-brown or black-brown; costa faintly dotted with white; on the middle of the dorsal margin is a faint obscure upright blotch formed of two contiguous dusky grey streaks; before the hind margin is a faint curved white line; cilia grey-black. Hind wings, with their cilia, smoky-black. Female similar.

Undersides of all the wings pale leaden-grey.

On the wing in May and June.

LARVA apparently unknown.

A very rare species with us, and one of which the habits are but little known. It certainly flies in the afternoon sunshine, usually around and over trees, and seems to be more particularly attached to birch. Originally described by the late J. T. Stephens in his "Illustrations," but lost sight of, and introduced as a new species, under the name of *ravulana*, in 1867. It seems to be confined to woods and woody heaths, and may probably prove in time to be well distributed in this country. It has hitherto been taken rarely in Kent, Sussex, and Essex; more frequently in Norfolk, and casually in Lancashire and Yorks. In Scotland a single specimen has been taken in the Edinburgh district and another is reported from Renfrew. In Ireland Colonel Partridge has taken a lovely specimen near Enniskillen, and it is said to have occurred at Killarney. Abroad

it has been found in Northern Germany, Lower Austria, Holland, Finland, Norway, and Lapland.

4. *S. wœberiana*, *Schiff.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.). Fore wings rich dark golden brown thickly marbled with golden-yellow and silvery lines.

Antennæ dull brown; palpi dull white, tipped with brown; head and thorax rich brown; abdomen blackish-brown. Fore wings ample, not narrow; costa gently arched; apex bluntly angulated; rich dark brown, marbled all over with golden yellow lines and dusting, hidden among which is a dorsal blotch of two double golden-yellow oblique streaks; costa distinctly dotted with yellow streaks, which are separated by black-brown clouds edged with blue; ocellus large, deep black, divided, and edged by yellow lines; cilia blue-black dashed with pale brown. Hind wings smoky-brown, with dull white cilia. Female similar, rather larger.

Undersides of all the wings leaden-brown; fore wings with faint white costal dots.

June to August or even September in one generation; abroad, however, it is understood to be double brooded, the first emerging at the end of May.

LARVA dirty green with a red head; body sprinkled with a few small hairs. (Kollar.) Feeding almost throughout the year in the inner bark of fruit trees, especially plum, cherry and apricot trees, sometimes also on pear, almond, laurel and apple. Fastidious in its tastes; in one place frequenting only one species of tree; in another place, a different tree; forming a cylindrical burrow under the outer bark, which is thus loosened; but the excrement is mostly pushed outside through a small hole.

PUPA yellow-brown, rather small, in the larval habitation,

The moth sits on the trunks of fruit trees, often close to the place from which it emerged from pupa. If disturbed it

darts hastily away and goes to another tree, but late in the afternoon, and till dusk, flies swiftly about the higher branches. Common in gardens and orchards throughout England and Wales, even abundant in the London suburbs; found also in Scotland to Perthshire and the Edinburgh and Clyde districts. In Ireland recorded only from Belfast, but probably to be found elsewhere. Abroad common wherever fruit trees grow throughout Europe and Siberia.

5. *S. rufillana*, Zell; *gallicana*, Staud. Cat.—Expanse  $\frac{1}{2}$  inch (12-mm.). Fore wings rich black-brown, much mottled with faint silvery purple.

Antennæ dull brown; palpi and head pale ochreous-brown; thorax dull brown; abdomen blackish-brown. Fore wings not very narrow; costa flatly arched, apex bluntly angulated, hind margin rather oblique; dark brown mottled with black and dusted a little with golden yellow; three or four pairs of whitish costal streaks are prolonged into lustrous silvery purple transverse irregular lines; ocellus composed of silvery purple streaks, outside which are two faintly yellow upright lines; cilia pale smoke colour. Hind wings smoky black; cilia dull black. Female similar.

Undersides of all the wings dark leaden-brown; costa of fore wings minutely dotted with pale yellow.

On the wing from the end of June till August.

LARVA somewhat swollen, with sharply constricted segments, bone colour; head honey-yellow; dorsal plate oval, yellowish with a cross-mark; anal plate round, curtailed. (Hofmann.) When full grown more tinged with pink.

September and October in the seeds of wild carrot (*Daucus carota*), also in those of *Angelica sylvestris*, *Heracleum sphondylium*, *Silaus pratensis*, *Pastinaca sativa* and *Peucedanum palustre*, spinning two or three seeds together and eating out their substance. Several larvæ are said

sometimes to feed in one umbel! When full-fed leaving the seed-head to spin up in the earth, where it remains as a larva until the spring.

The moth sits among the herbage in fields, especially those in which wild carrot is plentiful, and may sometimes be trodden up in the afternoon sunshine. At sunset it flies about rather quickly, keeping usually low down among the herbage. Most plentiful near the sea coast, but to be found in chalky districts throughout England, and doubtless Wales, where it is not rare in the limestone of Pembroke-shire. In Scotland apparently restricted to the West—Ayrshire, Renfrew and elsewhere in the Clyde district. In Ireland it has been taken on the Dublin coast and near Galway and Tyrone.

Abroad it seems only to be recorded from France, Holland, Germany, and Sweden.

6. **S. janthinana**, Dup.—Expanse  $\frac{3}{8}$  inch (10-mm.). Fore wings rich dark brown, minutely marbled with golden yellow; apical cilia yellow.

Antennæ brown; palpi whitish-brown; head and thorax yellow-brown; abdomen black-brown. Fore wings short, somewhat ovate; costa flatly arched, apex bluntly angulated, hind margin nearly perpendicular; rich yellowish-umbreous, dusted with yellow; basal blotch indicated by an angulated darker outer marginal streak, following which is a more golden, faint oblique dorsal blotch; costa dotted with yellow, the dot before the apex produced into a streak and pointing to a straight similar streak from the hind margin; ocellus extremely faint; cilia yellow-brown. Hind wings and their cilia smoky-brown. Female similar.

Undersides of all the wings pale leaden-brown; costa and apex of the fore wings dotted with white.

On the wing from June till August.

LARVA similar to that of *Carpocapsa pomonella*; dull white

tinged with red and without markings; head light brown; internal dorsal vessel visible, showing a dark red spot behind the middle of the body. (Hofmann.)

September and October in the berries of hawthorn, spinning two or three together, and eating the fleshy pulp. Leaving them when full fed to spin up in bark, rotten wood, or other waste substances, or in the ground.

PUPA semi-transparent, amber-colour; abdominal segments opaque, yellow, inclining to red. In a silken cocoon.

This is a very brisk and lively little species, flying during the afternoon sunshine backwards and forwards over a tall hawthorn hedge or bush, and sometimes in numbers, buzzing in and out among the branches, and showing its pretty yellow-brown colour distinctly; to be found apparently in every English county to Norfolk in the east and to Lancashire in the west; and probably throughout Wales, though only recorded in Pembrokeshire, and not as yet noticed in Scotland. In Ireland it has been taken in Cork and Wicklow, and by Mr. J. J. F. A. King at Athlone. Abroad its range is throughout Central and Southern Europe, and Asia Minor.

7. *S. spiniana*, *Fisch.*—Expanse  $\frac{3}{8}$  inch (9 mm.). Fore wings black-brown with a small, sharply triangular, yellowish-white dorsal spot.

Antennæ black-brown; palpi, head, and thorax dull brown; abdomen the same. Fore wings narrow, costa gently arched, apex distinctly angulated, hind margin oblique; black-brown with a reddish gloss; dorsal blotch triangular, pointed above pure white, a faintly yellowish-white; costa and hind margin faintly dotted with white; cilia black-brown. Hind wings smoky black, cilia whitish. Female similar.

Underside of the fore wings conspicuously ribbed, leaden-

brown ; costa dotted with white. Hind wings also strongly ribbed, leaden-brown.

On the wing from June till August.

LARVA apparently undescribed ; said by Steudel to feed in May and June in flowers of *Prunus spinosa* (blackthorn)—which seems improbable—by Hofmann in those of hawthorn, and by A. Schmid on alder !

This little moth also flies along and over hedges of hawthorn and blackthorn in the afternoon sunshine, but is somewhat local, and, moreover, not to be found in its favoured localities in equal numbers every year. It is present with us in all the extreme southern counties from Kent to Devon, including Surrey and Wilts, also in Herts, Essex, Cambs, Norfolk, Oxfordshire, Somerset, Gloucestershire and Herefordshire, and occasionally in Cheshire and Yorkshire ; but I find no other records in these Islands ; and abroad its range seems to be limited to Central Europe.

#### Genus 2. **ASTHENIA.**

Antennæ thick ; palpi minute yet thickly tufted ; thorax smooth ; abdomen slender ; fore wings not folded, narrow and rather short ; hind wings smooth, rather pointed, not tufted.

We have twelve species :

- A. Fore wings rather short, black-brown, with shining silvery transverse lines and streaks.
- B. Silvery streaks indistinct, numerous, among them a parallel deep black bar. *A. ochsenheimeriana.*
- B<sup>2</sup>. Silvery streaks distinct, the first pair forming a narrow band. *A. scopariana.*
- B<sup>3</sup>. Silvery streaks distinct and brilliant, two pairs form narrow bands. *A. cosmophorana.*
- B<sup>4</sup>. Silvery streaks indistinct, first two pairs form a cloudy dorsal blotch, *A. strobilella.*



- B<sup>5</sup>. Silvery streaks short and diffused, preceded by a similar dorsal blotch. *A. splendidulana*.
- A<sup>2</sup>. Fore wings long and narrow, black-brown with paler markings.
- C. Hind wings yellow-white with dark border. *A. fimbriana*.
- C<sup>2</sup>. Hind wings white with a faint brown apical tinge, fore wings glistening. *A. subsequana*.
- C<sup>3</sup>. Hind wings snow-white with brown apex; fore wings with faint dorsal blotch. *A. pygmaeana*.
- C<sup>4</sup>. Hind wings smoky-brown.
- D. Fore wings mottled, without definite markings. *A. nanana*.
- D<sup>2</sup>. Fore wings with two shining white dorsal blotches. *A. vacciniæna*.
- A<sup>3</sup>. Fore wings moderately broad, hind wings smoky-brown.
- E. Fore wings mottled, black-brown, with a large oblique white dorsal blotch. *A. argyranæna*.
- E<sup>2</sup>. Fore wings brown, with a broad flattened dorsal blotch. *A. ustomaculana*.

1. **A. oxsenheimeriana**, Zell. — Expanse  $\frac{3}{8}$  inch (9-mm.). Fore wings olive-black, with silvery transverse streaks, and a narrow deep black central stripe.

Antennæ deep black finely barred with white; palpi, head, and thorax leaden-black; abdomen smoky-black. Fore wings short, somewhat ovate; costa flatly arched, apex bluntly rounded; olive-black or almost leaden-black; at one-third the length of the wing is a very faint blacker transverse stripe; at two-thirds the length an erect transverse deep black bar arising on the dorsal margin, and edged on both sides with silvery lines or dots; area of the wing otherwise faintly irrorated with golden yellow dusting and silvery lines; costa minutely dotted with steel-blue, and one or two similar streaks lie before the hind margin; cilia

blue-black, spotted with steel-blue. Hind wings smoky-black with similar cilia. Female a very little more distinctly marked.

Undersides of all the wings leaden-black; costa of the fore wings dotted with white.

On the wing at the end of May and in June.

LARVA apparently unnoticed. I reared a single specimen of the moth from among a lot of cones of spruce-fir gathered when working out the life history of *Cateremna cerebrella* in Norfolk, but the mode of feeding could not be ascertained. Mr. Warren is of opinion that it feeds in some measure on Scotch fir. Abroad it is believed to feed on silver fir.

This pretty little species was first noticed here by Lord Walsingham in May 1878, several specimens having then occurred at Merton, Norfolk, flying in the sunshine about 4 o'clock in the afternoon around *Pinus cephalonica*. A few years later it had extended itself into Suffolk, and had begun to frequent the plantations of spruce and Scotch fir. More recently it has been found in Essex, Herts, Middlesex, Berks, Surrey, Kent and Hants. So far as I know this is the extent of its present distribution with us, but having made itself at home it will probably extend much further. Abroad it has a considerable distribution through Germany, Austria, Bohemia, Brunswick, Livonia, Dalmatia, Sweden, and Asia Minor.

2. **A. cosmophorana**, *Tr.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (9–12 mm.). Fore wings black-brown, with two slender, bright silvery transverse stripes, followed by some similar costal streaks.

Antennæ, palpi, head, thorax, and abdomen leaden-black. Fore wings rather narrow, costa almost straight, apex bluntly rounded, hind margin straight and oblique; olive-black or black-brown, irrorated, except at the base, with

minute, closely clouded, yellow lines; just before the middle is a complete silvery transverse slender stripe rather bent below the costa, and beyond it another similar but still more slender; beyond these are three silvery-white costal streaks, below them another—and a small one runs out into the cilia—which are dusky white. Hind wings smoky-brown, with white cilia. Female similar.

On the wing in May and June, and a second generation in August.

LARVA varying from ochre-yellow to pale green; head and dorsal plate red-brown; spiracles not ringed. In autumn in resin-cells on fir, which are only smaller than those of *Retinia resinella*; pupating therein. (Ratzeburgh.) It seems certain, however, that it actually feeds in the resin-cells of that species. Mr. McArthur assures me that he has seen the larva of this species so feeding. Mr. Salvage says further: "I have obtained larvæ feeding in various ways, and they do not seem to be at all particular as to the method adopted. I have bred them from the excrescences of *Retinia resinella* freely, from those of *Phyeis abietella*, from galls, from small excrescences on young firs, and from resinous exudations on old fir trunks."

A very lively species, flying in the hot sunshine at mid-day and in the afternoon about the tops and branches of fir-trees, especially young Scotch firs. A local species with us and very rare in England, though it has been taken in Cumberland and North Lancashire, and Mr. E. A. Atmore has once taken a specimen at King's Lynn, Norfolk. Far more frequent in Scotland, occurring in the Edinburgh district and at Renfrew; but in far greater abundance in Perthshire, Aberdeenshire, and Moray. Abroad it is common throughout Central Europe and a large portion of Northern Europe.

3. **A. scopariana**, *H.-S.*—Expanse  $\frac{3}{8}$  inch (10 mm.).

Fore wings black-brown with a bent silvery-white slender transverse stripe, followed by one or two similar but incomplete silvery lines.

Antennæ dull brown; palpi and head brown, thickly dusted with white; thorax dark brown; abdomen black-brown, the segments edged with white. Fore wings rather narrow, costa nearly straight, apex bluntly rounded, hind margin almost straight; dark olive-brown, thickly irrorated, except at the base, with golden yellow dusting; just before the middle is a slender, bent, silvery-white transverse stripe; beyond it another, less bent, and hardly attaining the dorsal margin; outside this are three silvery-white costal streaks, and below them two more, one on each side of the ocellus, which contains a series of horizontal black lines; hind margin edged with a thick black line, which is broken by a silvery-white dash; cilia smoky white. Hind wings pale smoky brown, streaked with white; cilia white. Female similar.

Undersides of all the wings leaden-white; on the costa of the fore wings are numerous white streaks.

On the wing in April and May.

LARVA rather active and fat; dark yellow, slightly hairy, dorsal vessel dull brown; head light horn-colour. (J. B. Hodgkinson.)

July on *Genista tinctoria* on the insides of unexpanded flower buds, feeding up very rapidly.

PUPA dull yellow or chestnut-brown, short and thick, with short wing-covers, which with the limb-covers are brilliantly glossy; abdominal segments furnished with two prominent ridges, the front one thickly set with minute teeth, not glossy; cremaster short and very blunt, provided with a cluster of short hooked bristles; in a white silken cocoon attached to its food or any neighbouring object, or on the earth.

This very pretty little species was reared from the above-mentioned food-plant in the year 1880 by the late Mr. J. B. Hodgkinson, in Lancashire, and other specimens have been reared in subsequent years in the same manner, but I cannot find that the habits of the moth have been noticed, or even that it has been there taken in the imago state. The only such capture with which I am acquainted is that by Mr. A. H. Hamm in an oak wood with varied undergrowth, near Basingstoke, Hants, and our knowledge of the distribution of this species is limited to these two counties, though it seems almost certain that it will yet be found in some of the many localities in which the Dyer's green-weed flourishes. Abroad it is known to occur through the greater part of Central Europe, and in Piedmont, Livonia, and Servia,

4. **A. strobilella**, *Linn.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (9-12 mm.).—Fore wings black-brown, with numerous obscure transverse silvery lines, two of which form a faint central band.

Antennæ, palpi, and head black; thorax and abdomen brownish-black. Fore wings of moderate breadth, costa flatly arched, apex bluntly angulated, almost rounded; hind margin straight; black-brown, irrorated, except at the base and along the costa, with minute, dotted, golden-yellow lines; costa dotted with five pairs of yellow-white streaks, the first pair throwing off faint silvery-white transverse cloudy stripes, the third pair a more slender and definite silvery stripe, and the fifth another near the hind margin, which last is edged by a black line; cilia pale brown. Hind wings dark smoky brown with white cilia. Female similar but larger.

Underside of the fore wings leaden-black, shaded on the margins and dotted on the costa with white. Hind wings leaden-white, edged with a black line.

On the wing in May and June.

LARVA pale yellow and slightly shining; head pale hazel-

brown with the sutural marks black ; dorsal plate transparent and horny with two pale spots on the posterior margin ; anal plate pale brown ; spiracles brown. (Wilkinson.) Feeding through the autumn and probably the winter on the seeds in the interior of the cones of spruce fir, biting its way through the woody scales to reach a fresh seed, when necessary. Spinning up in the larval habitation.

PUPA thin-skinned, shining pale brown ; slender, abdominal segments swollen and deeply divided ; cremaster a short flat knob. In a silk-lined cavity in a large scale of the spruce cone. Very easily collected in the early spring by picking up the bright light-brown fallen cones and storing them away in a well-aired flower-pot or other vessel, soon after which the moths appear in plenty. As they sit on the cones they adapt themselves so closely to the curves of the cone-scales as to look like a mere shadow.

This moth flies in the afternoon sunshine about the spruce fir (*Pinus abies*), but as its chief attraction is the young cones its flight is usually well out of reach. So far as I can ascertain it may be found wherever its food is at all common throughout England, and in Scotland it is known to occur in Perthshire, Aberdeenshire, Renfrew, Ayr, and Arran, but I possess no records for Wales or Ireland. Abroad it is common through Central and Northern Europe.

5. **A. splendidulana**, *Gn.*—Expanse  $\frac{3}{8}$  inch (10 mm.). Fore wings glossy olive-brown with faint lustrous cloudy streaks from the costa and behind, also a paler squared dorsal blotch.

Antennæ black ; palpi and head black, finely dusted with yellow ; thorax and abdomen olive-brown. Fore wings rather narrow, costa very flatly arched, apex rounded ; dark olive-brown, thickly covered with minute yellow dots placed in fine lines ; just before the middle is a squared

silvery-white dorsal blotch faced by another, less distinct, upon the costa; beyond are two broken, pale yellow, narrow stripes or successions of streaks commencing on the costa; hind margin edged with a black line; cilia olive-brown. Hind wings faintly reddish-brown, whiter at the base; cilia dull white. Female similar.

Underside of the fore wings leaden-black, clouded with white toward the costa. Hind wings leaden-white.

On the wing from the end of April till June.

LARVA cylindrical, moderately long, and attenuated behind; clear, semi-transparent, shining white, obscured by the contents of the intestinal canal; raised dots black and conspicuous; head, dorsal, and anal plates and legs deep black.

June and July on oak-bushes, feeding between united leaves, spun flatly together by their surfaces, and having in addition a frass-lined gallery within. Here the larva resides and feeds on the inner surfaces of the leaves, never eating them quite through. When full fed it leaves this shelter and burrows into any woody substance near at hand—bark, the marble-shaped galls of *Cynips lignicola*, oak-apples (galls of *Andricus terminalis*) or decayed wood—there passing the winter in the pupa state. (Dr. J. H. Wood.)

The moth hides during the greater part of the day in oak-bushes, sometimes visibly sitting upon the lower portion of the stem of an oak sucker or of oak undergrowth; also occasionally on the trunks and branches of oak trees and may now and then be induced to fly, though much more accustomed to fall to the ground when disturbed. From 4 to 7 P.M. on a fine afternoon it flies vigorously over the branches of oak, at a good height, in the sunshine. It is said also to be attracted, at this time, by the flowers of the holly. Apparently to be found, and often commonly, in every county of England in which oak is plentiful, the records

extending from the most southern counties to Cumberland and Durham; but in Wales I have only my own notes of capture in Pembrokeshire. In Scotland it is found in the Edinburgh district, in Perthshire, and in Dumbartonshire, and elsewhere in the Clyde district. In Ireland the only record seems to be that of the late Mr. Edwin Birchall at Limerick. Abroad it is common throughout Central Europe, and in Scandinavia, and Dalmatia.

6. **A. fimbriana**, *Haw.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings long, black-brown with a triangular whitish dorsal blotch, numerous yellowish costal streaks and lustrous lines about the ocellus; hind wings yellowish-white with a clouded brown margin.

Antennæ dark brown; palpi, head, and shoulder-lappets black-brown, dusted with creamy-white; rest of thorax and abdomen black-brown. Fore wings very long, rather narrow, costa nearly straight, apex sharply angulated, hind margin oblique; olive-brown thickly dusted with dark brown and black, costa dotted throughout with white; on the middle of the dorsal margin is a dull white blotch, curved back at its apex and containing a dusky cloud; ocellus obscurely clouded with black and edged outwardly by a lustrous streak; before the hind margin is some pale dusting; cilia brown. Hind wings long, yellowish-white, shading into smoky brown along the marginal area; cilia dull white. Female similar, or with the dark marginal band of the hind wings broader.

Underside of the fore wings pale leaden-brown with large white costal dots; hind wings leaden-white with a darker border.

On the wing from the end of March till May.

LARVA sluggish, rather stout, with the segments well-marked and a distinct wrinkle across the back of each, semi-transparent pinkish-white; raised dots prominent, chocolate-red; head shining brown; dorsal plate shining, varying in



tint from the body-colour to pale grey or greenish-grey, with a blackish border behind; anal plate dark grey or blackish with a band of the same colour across the anal flap: across the back of each segment is a pair of white belts, sharply outlined and like enamel.

June till August in the fresh galls of *Andricus terminalis* (oak-apple) and *A. ramuli* (woolly gall), devouring the internal substance of the gall. When full grown it quits the young gall and spins up in bark, rotten wood, or the old galls of *Cynips lignicola*, assuming the pupa state almost immediately.

PUPA light brown, thoracic organs very glossy. In a silken cocoon in a small cavity gnawed in the woody substance to which the larva resorted.

The moth frequents oak woods, and may occasionally be beaten out of oak-trees and bushes, but ordinarily drops straight to the ground; it flies naturally, and briskly, on very still days, in the afternoon sunshine, and has been found casually to frequent willow-bloom at night. Rather local and not very common, yet found in Kent, Surrey, Sussex, Hants. Dorset. Wilts, Somerset, Berks, Herts, Essex, Suffolk, Norfolk, Cambs, Gloucestershire, Herefordshire, Cheshire, Lancashire, Yorkshire, and Cumberland; and in Scotland in the Edinburgh district, Perthshire and the Clyde Valley; but I find no record for Wales or Ireland. Abroad it inhabits the South of France, Belgium, Holland, Alsace, Germany, Lower Austria, and Scandinavia.

7. *A. argyrana*, *Hüb.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (10–13 mm.). Fore wings black-brown marbled with white, and with a broad white oblique dorsal blotch; hind wings smoky brown, the male with a broad white stripe down the front area.

Antennæ, palpi, and head dull black-brown; thorax similar but with white shoulder lappets; abdomen dull

black. Fore wings rather narrow, costa nearly straight, apex bluntly angulated, hind margin rather straight; dark brown, much dusted with golden-yellow; basal blotch blackened towards its outer margin and there roughly angulated; close to it is a broad oblique creamy-white dorsal blotch; costa dotted alternately with black and white; area beyond the middle faintly striped with blue-black lines, and variegated with short thick black streaks; at the anal angle is a small white patch, which also invades the, otherwise, smoky-brown cilia. Hind wings smoky-black, with a broad straight pearly white stripe from the base along the front area. Female similar, except that the hind wings are wholly smoky-brown.

Undersides of all the wings leaden-black, each with a leaden-white stripe down the middle; costa of fore wings broadly spotted with white; cilia all white.

Occasional specimens are found in which the dark markings are almost obliterated and the fore wings almost wholly dirty white.

On the wing from April till the beginning of June.

LARVA sluggish and stout, slightly attenuated behind, segments wrinkled, semi-transparent, pinkish-white, mottled with whiter; raised dots reddish; head shining brown; dorsal plate shining pale grey with a blackish hind border; on the back is a series of whitish bands having a faded appearance.

June, July, and the beginning of August, in the young galls of oak, as in the last species, also feeding on the leaves of apple. (Dr. J. H. Wood.) But it seems always to refuse to eat oak-leaves. When full fed it eats its way into bark, rotten wood, or the dry galls of *Cynips lignicola*, but when upon apple seems to content itself with the bark; making in the hole which it has bored, a paper-like white cocoon in which the winter is passed.

The moth sits during the day in abundance upon the

trunks of oak-trees and in some districts in equal plenty on those of apple-trees. At about 4 P.M. it begins to fly over the trees, and also over oak bushes, and continues on the wing until 7 o'clock. Abundant in oak woods and about scattered trees throughout England, and in many parts about orchards and throughout the lowlands of Scotland, extending to Perthshire, Moray, and Dumbartonshire; doubtless also in Wales, though I find no record. In Ireland it is found near Cork; and abroad is distributed throughout Central Europe, Southern France, Castile, Sweden, Livonia, and Western Russia.

8. **A. subsequana**, *Haw.*; **abiegana**, *Dup.*; **abieg-nana**, *Zell.*—Expanse  $\frac{3}{4}$  inch (9 mm.). Fore wings umbreous, with numerous bright costal streaks, and a faint angulated pale central band.

Antennæ pale brown: palpi, head, and thorax light brown; abdomen grey-brown. Fore wings narrow, pale brown thickly dusted with umbreous; outer margin of the basal blotch angulated, closely followed by the central band which is also angulated and a little paler, a mere aggregation of paler umbreous dusting; beyond are four or more pairs of shining silvery-white costal streaks, and an obscure ocellus which is bordered on both sides with white, and contains three minute black lines; hind margin edged with parallel white and black lines; cilia pale brown. Hind wings silky white edged behind with a brown line, and with a faint brown apical shade; cilia white with faint brown intersecting lines. Female similar.

Underside of the fore wings very pale leaden brown. Hind wings white.

On the wing in April and May.

LARVA apparently unknown.

This moth is rare in this country and very little known.

It was recognised and recorded by Mr. W. Warren in the year 1887, having been until then, to all appearance, confused with the next species. It flies rather high over spruce and silver firs in the sunshine, in the middle of the day and till evening; and it may occasionally be beaten out of the same trees. So far as I am aware the range of this species with us is confined to Kent, Surrey and Dorset, but there is little doubt that it will be found in other southern districts when looked for in suitable places and among its favoured trees. Abroad it is found over the greater part of Central Europe, Central Italy and Croatia.

9. **A. pygmaeana**, *Hüb., Willk.* — Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings dull pale umbreous, with a broad paler dorsal spot edging an angulated basal blotch, costal dots brown.

Antennæ, palpi, and head blackish brown; thorax dull brown; abdomen glossy brown. Fore wings narrow, costa nearly straight, apex bluntly rounded, hind margin short and but little oblique; pale umbreous; basal blotch darker, sharply angulated outside, and having a dark brown margin; this is closely followed by a pale brown or brownish white dorsal blotch, beyond which is a faintly darker oblique central shade, and one or two horizontal black streaks; costa dotted with dark brown, with intermediate whitish dots; ocellus plain but surrounded by brownish shades; cilia smoky brown. Hind wings snow-white, shaded with pale brown at the hind margin and with the apex broadly clouded with brown; cilia white. Female similar.

Underside of the fore wings leaden white, shading to leaden brown. Hind wings silky white.

On the wing in March and April.

LARVA slender, at first yellowish, afterwards green; raised dots large, black; head and dorsal plate black.

June till the autumn in the leaves of silver fir, leaving no

excrement in the mine (*Pinus picca*). (Ratzeburg.) Pupating in the earth.

This species also flies in the middle of the day, in the sunshine, around the fir trees; but has been found by Mr. I. Hartley Durrand in far greater numbers in Norfolk, frequenting the curious dense hedges of stunted fir which are common on the Breck sand of that county. He says: "When first met with they occurred only on the sunny side of the trees, and when I moved to the hedges they were still on the sunny side. The male appears to fly for little more than half an hour at midday, seeking the female, which in my experience is found only on the shady side; after this brief flight they only fly when disturbed. When roused by the beating-stick the male flies out, but the female drops to the ground like a stone." By far the most frequently obtained in Norfolk; but Canon Cruttwell has found it in Oxfordshire and Dr. Wood in Herefordshire, and it is recorded from Cambs, Surrey, and Kent. This is the limit of our present knowledge of its distribution here. Abroad it is found throughout Central Europe, and in Scandinavia and West Central Russia.

10. **A. ustomaculana**, *Curt.*—Expause  $\frac{1}{2}$  inch (12 mm.). Fore wings rather broad, black-brown, with a large whitish dorsal blotch and a greyer one at the anal angle.

Antennæ black-brown; palpi white, shaded with brown; head and thorax white above, dull dark brown at the sides; abdomen brown. Fore wings moderately broad, costa arched, apex angulated, hind margin retuse, and expanded below; black-brown; on the middle of the dorsal margin is a broad white blotch, which extends towards the base of the wing, and is flecked with faint brown lines; on the costa beyond the middle are four pairs of faint silvery white streaks, the outermost the whitest; ocellus large, dusky white to the anal angle and containing small forked brown streaks; at

the apex a short brown hook runs into the greyish white cilia. Hind wings dark brown ; cilia whiter. Female similar.

Underside of the fore wings dark leaden brown ; costa dotted with white. Hind wings pale smoky brown.

On the wing in June and July.

LARVA whitish with a very pale brown or luteous-coloured head ; dorsal plate of the same colour but darker behind ; anal plate margined with grey, raised dots brown. (Wilkinson.)

April to June on *Vaccinium vitis-idaea*, devouring the shoots, which it spins together. Assuming the pupa state in the larval habitation. Probably feeding also on *Vaccinium myrtillus*.

This is a local species and confined to northern hill districts. It flies freely in the sunshine through the afternoon in sunny hollows and sheltered spots in open woods and on hill sides among whortleberry. Its most southern known localities are in Yorkshire and Lancashire, and in Scotland it is abundant in Perthshire and Aberdeenshire, but I have no other satisfactory records in these Islands. Abroad it is common in mountain districts throughout the northern half of Europe.

11. **A. nanana**, *Tr.*—Expanse  $\frac{3}{8}$  inch (9 mm.). Fore wings almost unicolorous dark brown with one or two faintly darker transverse stripes.

Antennæ dark brown ; palpi, head and thorax dull ochreous ; abdomen light brown. Fore wings narrow, costa gently arched, apex bluntly angulated ; pale brown thickly dusted with black-brown, the markings very obscure ; costa dotted with black and faintly between with yellowish white ; basal blotch just noticeable by its blackened hinder edge ; central band not very perceptible, black-brown, rather erect but

incomplete; hinder area faintly speckled with yellowish dots; cilia brownish white. Hind wings and their cilia smoky brown. Female similar or rather more distinctly marked.

Underside leaden brown; costa of fore wings faintly dotted with white.

On the wing from the end of June till August.

LARVA slender, dark red-brown, with black head and undivided dorsal plate; when full grown, dirty yellow. (Ratzeburgh.)

April and May, mining the leaves (needles) of *Pinus abies* and *P. pecea*, hollowing out five to eight needles and spinning them together. (Sorhagen.) Assuming the pupa state in a cocoon among the fallen fir-needles or in the ground.

The moth hides during part of the day, often all day, in the branches of spruce fir (*Pinus abies*), frequently in great numbers in the lower branches or in stunted bushes, but in the afternoon sunshine will fly about the outer branches and twigs. Yet by no means so active as previous species, and often sluggish, flying back to the thick shelter of the spruce twigs at once, when beaten out. Sometimes very abundant, and probably to be found, wherever spruce fir occurs, throughout England and the Lowlands of Scotland to the hills of Perthshire, but I have no record for Wales and for Ireland only in Antrim. Abroad it seems to be common throughout Central and Northern Europe.

12. **A. vacciniana**, *Fisch.*—Expanse  $\frac{3}{8}$  inch (10 mm.). Fore wings narrow, with two large whitish transverse clouds; outer margin of dark basal blotch rounded.

Antennæ black-brown; palpi whitish brown; head dull pale ochreous; thorax black-brown dusted with white; abdomen dull black-brown. Fore wings narrow, costa flatly arched, apex bluntly angulated; basal blotch large, black-

brown, mottled inwardly with white, its outer margin erect and evenly curved; immediately following is a broad whitish transverse stripe, shaded outwardly, and expanding into a white dorsal blotch; central band oblique, black, broadest in the middle and there angulated; ocellus and also three pairs of costal dots sharply white, their intervals black dusted with yellow; cilia white, tipped with smoky black. Hind wings and their cilia pale smoky grey. Female similar.

Underside leaden black; costal dots of the fore wings white.

On the wing at the end of May and in June.

LARVA slender, greenish yellow on the sides, afterwards becoming dirty dark green; internal dorsal vessel black-grey; head honey yellow, afterwards brown; dorsal plate black, rounded, divided into three parts.

June to August, in spun-together upper leaves of *Vaccinium myrtillus*, *V. vitis-idaea* and *V. uliginosum*; pupating among fallen leaves. (Hofmann.) Von Heyden says: "I found the larva in great plenty on hedges of barberry (*Berberis vulgaris*). It spins the leaves flatly one upon another, and gnaws them much, so that they have often a brown appearance." There appears to be no mistake in this, since the moths were reared! Other food-plants are said to be *Ledum palustre* and *Cornus sanguinea*.

A very pretty and lively species, flying briskly in the sunshine, and taking advantage of the shelter of any bank or hollow covered with whortleberry for protection from the cool wind. In such spots flitting about continually or sitting upon the leaves of the plants. Usually a northern hill species, but I have taken it in Surrey, and there are records of its occurrence in Hants, Dorset, and Devon; common in Herefordshire, Cheshire, Lancashire, and Yorkshire, and becoming more abundant in Durham and Westmoreland. In Wales it is common on the Preselley Hills in Pembroke-



shire, in Merionethshire, and very probably in many other districts; in Scotland common in Perthshire and Aberdeenshire; Dumbartonshire and other parts of the Clyde district; and in Ireland on the Dublin Mountains and in Derry. Abroad it is widely distributed in the mountainous parts of Central and Northern Europe, and is found in Bithynia.

### Genus 3. **COCCYX.**

Antennæ rather thick; palpi small, tufted, drooping; thorax smooth; fore wings rather narrow, the costa folded nearly one-half its length; hind wings rather pointed, not tufted.

We have four species:

A. Fore wings narrow, grey-black.

B. Fore wings with white dorsal blotch and transverse lines.

*C. nemorivaga.*

A<sup>2</sup>. Fore wings not very narrow, black-brown.

B<sup>2</sup>. Markings several transverse white bands and lines.

*C. telella.*

B<sup>3</sup>. Markings one narrow isolated white transverse band followed by white streaks.

*C. distinctana.*

B<sup>4</sup>. No distinct markings, only faint tawny lines and mottling.

*C. nigricana.*

1. **C. nemorivaga**, *Tengs*; **finitimana**, *Gn. Willk.*—Expanse  $\frac{3}{8}$  inch (10 mm.). Fore wings narrow, grey-black, with a white dorsal blotch and following streaks.

Antennæ brown; palpi whitish-grey; head thickly tufted, umbreous; thorax black-brown, streaked with white; abdomen dull brown. Fore wings narrow, costa nearly straight, folded from the base almost half its length, and furnished with long hairs lying parallel within the fold; apex bluntly angulated; blackish-brown, thickly dusted with golden yellow; basal blotch white, flecked with brown and edged

with black-brown; dorsal blotch large, triangular, white with faint brown lines; central band of the ground colour, closely followed by a parallel cloudy white band which joins the, also white, ocellus; this last enclosing some black streaks; costa strongly dotted with twin white streaks; along the hind margin is a broken black line; cilia white with black tips. Hind wings and their cilia smoky-white. Female similar.

Underside of the fore wings pale leaden brown with obscure paler costal dots. Hind wings leaden white.

On the wing at the end of June and in July.

LARVA apparently undescribed, except that Mr. A. F. Griffiths says that it is pale yellowish, very transparent, with a dark head. In September and October, and after hibernation feeding up in the spring on *Arctostaphylos uva-ursi* (bearberry), mining in the younger leaves, eating out the whole contents of the leaf, which thus resembles an empty bladder, passing to another which, after uniting it with the original leaf with silk, it serves in the same manner, and continues the process till full fed.

PUPA compact, abdomen curved forward, thorax, limb and wing-covers shiny pale brown, abdominal segments pale yellow-brown, not glossy; cremaster short, blunt, glossy, and furnished with minute hooked bristles. In the last leaf mined out by the larva.

This species flies in the sunshine about its food plants in its mountain haunts. Mr. A. H. Jones states that he found it, in equal numbers, among *heather* in the same localities. These are in Scotland in Perthshire, Aberdeenshire, Inverness and some parts of the Edinburgh district; but it does not seem to have been found in England, Wales or Ireland. Abroad it inhabits Switzerland, Sweden, Norway, and North-west Russia.

2. *C. tedella*, *Linn*; *hyrciniana*, *Frol. Willk*; *comi-*

**tana**, *Schiff.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (10–13 mm.). Fore wings blackish brown, banded and streaked throughout with white. Antennæ dark brown, whiter in front; palpi and head brownish white; thorax brown, with white shoulder lappets; abdomen silvery-brown. Fore wings not broad; costa folded from the base and scarcely arched, apex bluntly angulated; dull brown with numerous white markings—some dots at the base, two complete erect transverse bands before the middle; and two pairs of similar stripes beyond, each broken and displaced half way across the wing; hind margin edged with a deep black line, and the cilia smoky-brown, both cut through below the apex by a white dash. Hind wings and their cilia pale smoky-brown. Female similar, or often with the white markings brighter and more distinct.

Underside leaden brown; the costal dots of the fore wings white.

Variable in the depth of ground colour and very so in the size and distinctness of the markings, which in some cases are so small and indistinct that the wings are almost uniformly black-brown. In another, very pretty, variety, almost the whole surface has become pearly white, the dark ground colour showing only in faint shadowy lines and streaks.

On the wing in May and the beginning of June.

LARVA pale pink with bright red sub-dorsal lines; head light brown, dorsal plate black; feet brown-black.

August and September and till spring in the needles of spruce-fir (*Pinus abies*), eating them out and joining them together in loose untidy bundles, with silk, in which its excrement gets entangled. Leaving these bundles when full fed to spin up on the ground.

The moth may usually be found about every spruce-fir tree in plenty. It sits in the branches and is to be disturbed, often in clouds, by the beating-stick, but flies about the twigs a little in the afternoon sunshine. Common through-

out the United Kingdom wherever its favourite tree is found ; and abroad throughout Central and Northern Europe, the South of France, Piedmont, and South-west Russia.

3. **C. distinctana**, *Bent.*; **proximana**, *Staud. Cat.*.—  
 Expanse  $7\frac{1}{2}$  inch (12 mm.). Fore wings black-brown with a narrow complete white band before the middle, and some short white streaks beyond.

Antennæ dark brown ; palpi, head, and thorax pale olive-brown ; abdomen darker. Fore wings rather narrow at the base, costa distinctly folded, then flatly arched ; apex bluntly angulated ; dark brown dusted with white and minutely with yellow ; at a short distance from the base is a complete transverse white stripe, very slightly angulated outwards in its middle ; beyond and near the apex are four distinct white costal dots or streaks ; from the first pair of these is sometimes a rather obscure similar transverse stripe ; ocellus obscure, rather narrow, white dotted with black ; cilia grey, faintly cut beneath the apex by a narrow white dash. Hind wings and their cilia smoky-brown. Female more distinctly and sharply marked, rich brown with the markings more broadly white.

Undersides of all the wings leaden-brown ; costal dots of the fore wings white.

On the wing in June.

LARVA semi-transparent pale green ; head and dorsal plate pale amber-colour ; legs green, raised dots brown ; dorsal line dark green.

August and September on silver fir (*Pinus picca*) mining out the internal substance of the leaves (needles) ; drawing these needles closely together, forming a neat and compact chamber, quite free from excrement, both inside and out, and with silk of a whitish colour ; yet it seems to reside within one of the excavated needles until full fed, then leaving to spin up elsewhere. (Dr. Wood.)

Also found upon *Pinus nordmanniana*, and *P. cephalonica*.

This species is especially attached to large trees of silver-fir, growing here and there in the woods. It loves to sit at a good height in the trees, and to fly about the outer branches in bright sunshine in the afternoon, but is best obtained when a rough wind has driven it to shelter in the lower branches. Even then if beaten out it makes strenuous efforts to return at once to the same branch, or a higher one. Very local with us, but rather common in Norfolk, and to be found in Surrey, Hants, Dorset, Herefordshire, North Lancashire, Yorkshire, Westmoreland and Northumberland; in Scotland in the Edinburgh district and in Perthshire; in Ireland taken by Colonel Partridge near Enniskillen, but I have no record for Wales. Abroad it is known through Central Europe, and also in Greece.

4. **C. nigricana**, *H.-S.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings somewhat ovate, black-brown, mottled all over with faint silver-brown transverse irregular lines and markings.

Antennæ black-brown; palpi and head drab-brown; thorax olive-brown; abdomen darker. Fore wings moderately broad, almost ovate; costa folded at the base, but well arched; apex bluntly angulated; black-brown abundantly mottled with tawny-brown; basal blotch just perceptible by its squarely angulated blacker edge; central band nearly black but very obscure and ill-defined; just before it on the dorsal margin is a faint indication of a paler dorsal blotch; on the costa beyond are four pairs of faint yellowish-white dots; outer area a little mottled with tawny streaks; apical dot and hind marginal line deep black; cilia smoky-black. Hind wings and their cilia dark smoky-brown. Female similar.

Underside smoky-black; costal dots of the fore wings faintly white.

On the wing in June and July.

. LARVA when full grown, soft, fat, and shining; of a dirty yellow colour, with just a suspicion of a greenish tinge on the thoracic segments; head and dorsal plate small, deep black. When young brown, with black head and plates.

September to April on silver fir (*Pinus picca*), feeding in the buds, usually the terminal buds of the side shoots. When full fed leaving the buds and making a cocoon in an angle of the shoots.

This species was first noticed and recorded in this country in the year 1878, having been found by Dr. J. H. Wood of Tarrington, about silver fir in Herefordshire. Some years later it turned up in Norfolk at Merton and in mixed woods near King's Lynn. Here it was to be found, just as the last species was getting known, in very small numbers, sitting on the boughs of the silver fir, and unless disturbed and kept down by wind, remaining at a good height; usually flying a little in the afternoon sunshine. It has also been taken in Essex, Herts, Hants, and Wilts, but I think never in any numbers, and may still be considered scarce as well as local with us. Abroad it is widely distributed through Central Europe, Northern Italy, Sweden, Dalmatia, Greece, and the Taurus Mountain district.

#### Genus 4. **ENDOPISA.**

Antennæ thick; palpi very short, slender, pointed; thorax smooth; fore wings short and broad, without fold; costal cell deeply channelled; apex blunt, notched beneath; hind wings broad, a very small tuft of hair scales on the base of the median nervure.

We have three species.

- A. Fore wings short olive-black, hind margin almost perpendicular, costal dots brilliant. *E. uebritana.*  
 A<sup>2</sup>. Fore wings elongated, olive-brown, hind margin oblique, costal dots dull silvery. *E. gemmiferana.*

A<sup>3</sup>. Fore wings dark brown with a leaden tint.

*E. funebrana.*

1. **E. nebritana**, *Tr.*; **pisana**, *Gn. Willk.*; **nigricana**, *Staud. Cat.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings short and broad, shining olive black or olive brown, with numerous silvery costal dots.

Antennæ black-brown; palpi, head, and thorax olive brown; abdomen whitish brown and glossy. Fore wings rather short and broad; costa without fold, very flatly arched; apex bluntly angulated; glossy olive brown or olive black rather dusted with yellow-brown; costa spotted with small dark brown and larger yellow-white dots, the latter triangular; ocellus obscure—three or four black horizontal streaks between two silvery white cloudy erect curved lines; hind margin edged with a black line; cilia olive brown, with a white dash below the apex. Hind wings pale brown shading toward the base to pearly white; cilia white. Female larger and darker, hind wings wholly dark brown.

Undersides of all the wings glossy pale lead colour; costal dots of the fore wings dull white.

Somewhat variable in size and also in the depth of the olive brown colour.

On the wing in June and July, and a very partial or casual second generation in August.

LARVA cylindrical, plump, yellowish white with a faint greenish tinge; raised dots large and distinct, grey, with short white hairs; head deeply lobed, the lobes light brown edged with black; mouth dark brown; dorsal plate narrow, divided blackish brown; anal plate yellow with a blackish tinge.

July and August in the pods of peas, eating the green peas and uniting them together with a web, in which much excrement is entangled. When full fed leaving the pod to spin up in the earth, where it passes the winter before

assuming the pupa state. Said also to feed on the seeds of *Vicia sepium*, *Colutea arborescens*, *Sarothamnus*, and *Onobrychis*.

This is a species of which the larva is far too well-known from the mischief that it does among green peas. The moth is by no means so familiar an object, yet it may be found in plenty sometimes along the hedges which bound a field which has produced a crop of peas in the preceding year. Here it loves to sit, in the bright sunshine, on oak and other bushes, flying with extraordinary swiftness away if disturbed to revel in the sunshine in another bush. Sometimes in such a field the males may be found assembling about a freshly emerged female. As it seems to be on the wing throughout the day if the sunshine is hot, there seems no reason to suppose that it flies also at dusk. Very abundant in Surrey and other parts of the South of England, and to be seen wherever peas are grown throughout the country; and in Scotland to Perthshire. In Ireland it is only recorded from Wicklow, but doubtless occurs elsewhere. Abroad it is common throughout Central and Southern Europe and Asia Minor.

2. **E. gemmiferana**, *Tr.*—Expanse  $\frac{5}{8}$  inch (16 mm.). Fore wings somewhat trigonate, pointed at the apex; olive brown with numerous faint, silvery, irregular lines, and pale yellow costal dots.

Antennæ black-brown; palpi, head, and thorax dark brown; abdomen black-brown. Fore wings somewhat trigonate, narrow at the base; costa without fold, very gently arched; apex rather sharply angulated, hind margin oblique and nearly straight; olive brown, thickly dusted behind with yellow; on the costa, commencing near the base, are numerous slender, oblique, short black lines; in their interspaces, in and beyond the middle, are seven or eight distinct yellowish white dots, and also three or four lustrous leaden lines; two of them proceeding, after a bend, to the anal



angle, and edging an ocellus which contains four or more black dots, while two more lie outside; cilia silvery grey. Hind wings and their cilia silky, smoky yellowish white. Female rather smaller, the fore wings more blunt and squared at the apex; darker and with the markings more distinct.

Undersides of all the wings dull pale lead colour; costal dots of the fore wings white.

On the wing in May and June.

LARVA apparently unknown.

The first notice of the occurrence of this insect here was in the year 1893 by Mr. W. H. B. Fletcher, who took a few specimens among *Lathyrus sylvestris* and other vetches on the coast of the Isle of Wight. So far as I know it has not been found elsewhere in these Islands. Abroad it is known to inhabit a great part of Southern Europe, Lower Austria, Hungary, Silesia, and Asia Minor.

3. **E. funebrana**, *Tr.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–18 mm.). Fore wings almost unicolorous, dark brown with a leaden tint, and a faintly paler dorsal triangular blotch.

Antennæ, palpi, head, and thorax black-brown; abdomen grey-brown. Fore wings rather narrow, costa very flatly arched, apex bluntly angulated; black-brown with a leaden tint; costa minutely spotted, almost throughout, with pairs of tiny white dots; on the dorsal margin is a trace of a paler blotch forming a sort of faint loop or triangle; ocellus obscure, silvery grey, containing cloudy black dots; cilia cloudy whitish brown. Hind wings pale brown; base a little paler; cilia dull white. Female similar.

Underside of the fore wings pale shining leaden brown; costa dotted with white. Hind wings paler leaden brown.

On the wing in June and July.

LARVA pale red; head heart-shaped, pitchy black; dorsal

plate yellow, very transparent, but mottled toward the base with pale brown clouds; usual raised dots glossy, concolorous; anal plate shining pitchy brown. (Wilkinson.)

July to September in the fruits of plum, blackthorn, and occasionally apricot, devouring the pulp or fleshy substance of the fruit, eating a passage through it, and always burrowing along by the stone. Reported abroad to have two generations in the season, one feeding in the shoots. This seems to require confirmation.

PUPA light brown, in the earth or under moss or bark on tree trunk, in a cocoon in which the larva has remained through the winter.

The moth is rarely captured here; common as the larva sometimes is with us, feeding in the plums and damsons in our gardens and orchards, I have only once captured the moth, a single specimen sitting under a blackthorn bush; and the experience of others is very similar. Probably it usually rests on the higher branches of plum trees, or perhaps drops to the ground the moment it is disturbed. Certainly occurring in the London suburbs—indeed, my next door neighbour's plums are infested—and to be found wherever its food is grown, but apparently only *recorded* in Kent, Surrey, Sussex, Middlesex, Herts, Essex, Suffolk, Norfolk, Cambs, Wilts, Gloucestershire, Herefordshire, Lancashire, and Yorkshire; and in Wales in Pembrokeshire. I have no certain record in other portions of these Islands. Abroad distributed through Central Europe, Italy, Scandinavia, and Asia Minor.

#### Genus 5. **PAMPLUSIA.**

Antennæ thick, naked; palpi rather long, densely tufted, third joint prominent; thorax smooth; fore wings narrow and pointed, having an extremely narrow costal fold; hind wings narrow, without tuft.

1. **P. mercuriana**, *Hüb.*; **monticolana**, *Wilk.*—Expanse  $\frac{1}{2}$  inch (12–14 mm.). Fore wings narrow, pointed, orange brown with bands of dark chocolate, and numerous silvery white streaks.

Antennæ black-brown, barred with white; palpi grey-brown; head and thorax red-brown with white-tipped shoulder-lappets; abdomen black, frosted with white. Fore wings narrow; costa nearly straight, and *very* narrowly folded; apex bluntly angulated and produced, hind margin oblique; basal blotch red-brown, not reaching the costa, but extending far upon the dorsal margin, its edge oblique; costal region above it pale buff, this colour extending into a transverse band outside the basal blotch, but edged by several bright white streaks; central band oblique, dark chocolate red, this colour extending round the anal angle, and up the hind margin, where it spreads and divides, forming two branches, to the apex and costa, and enclosing a white spot; two more costal white streaks edge a large cloudy orange brown space outside the central band; cilia white. Hind wings smoky brown, with white cilia.

Undersides of all the wings leaden brown; costal dots of fore wings white.

Rather variable in the depth and brightness of colour of the markings, and found rarely of an almost unicolorous red-brown, with only silvery indications of the white streaks.

On the wing in July and August.

LARVA cylindrical, of nearly uniform bulk, semi-transparent dirty greyish green with a tinge of yellow on the ventral surface; head shining, pale brown; dorsal plate grey with a black hind margin; anal plate ochreous; raised dots inconspicuous. (C. Wood.)

June in a web on *Dryas octopetala*; but reared by Dr. Wood from heather. Probably it is not very particular as to its food.

A mountain species, and local. Mr. Stainton, who saw it

commonly in Switzerland, reported that it settled constantly upon *Dryas octopetala* when flying about in the daytime. Dr. Buchanan-White found it equally fond of settling upon *Empetrum nigrum* in Scotland; others find it flying over and sitting upon heather! Its most extreme southern locality with us appears to be on the Black Mountain, Herefordshire, but it is found on moors and hills in Yorkshire, Lancashire, Durham, Cumberland, and Northumberland. It seems impossible that it can be entirely absent from Wales, though I find no record there. In Scotland it is widely distributed in Roxburghshire, Fife, and elsewhere in the Edinburgh district, the mountains of Perthshire, Inverness-shire, Aberdeenshire, Renfrew, Dumbartonshire, Argyll, the Orkneys, and in abundance on high moors in the Shetland Isles—indeed, Mr. J. A. F. X. King found it in Unst “in such multitudes that the very surface of the herbage seems moving.” In Ireland it occurs on the Dublin mountains, and on the Mourne Mountains, Co. Down. Abroad its range is northern, through Scandinavia, Finland, and Lapland, as well as in the Alpine regions of Central Europe.

#### Genus 6. CATOPTRIA.

Antennæ short and thick; palpi slightly porrected, hatchet-shaped, or densely tufted; thorax flatly crested at the back; fore wings long and rather narrow, costa folded one-third of its length; hind wings with a loose ridge of hair-scales on the median nervure.

We have five species, of larger size than in most of the allied genera.

A. Fore wings yellow brown.

B. A dark brown longitudinal shade down the middle.

*C. expallidana.*

B<sup>2</sup>. A red-brown basal blotch, and a silvery ocellus and costal streaks.

*C. fulvana.*

A<sup>2</sup>. Fore wings dull brown.

- C. Surface generally covered with ashy white, and reddish, longitudinal dashes. *C. cana.*
- B<sup>3</sup>. Basal blotch red-brown, remainder dull dark brown. *C. scopoliانا.*
- A<sup>3</sup>. Fore wings dark grey-brown, rippled and mottled with brownish white. *C. cacimaculana.*

1. **C. expallidana**, *Haw.*; **ibiceana**, *Hein.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–19 mm.).

Antennæ dull drab; palpi, head, and thorax light fulvous; abdomen pale brown. Fore wings elongated, narrow; costa folded at the base, nearly straight; apex rather bluntly angulated, hind margin oblique, rather short; light fulvous, with a deeper shade of the same colour, or of light brown, through the middle from base to apex; costal streaks hardly perceptible; ocellus large, squared, edged on either side with pale silvery brown streaks, and containing usually one short black line with fragments of others; cilia pale fulvous. Hind wings very pale smoky brown; cilia dull white. Female similar, but without the costal fold.

Underside of the fore wings leaden brown, the margins fulvous. Hind wings dusky white.

On the wing at the end of June and in July.

LARVA quick and active in all its movements; plump and fat, somewhat attenuated behind, and with deeply cut segmental divisions; a furrow crosses each segment just behind the middle; dorsal region orange yellow, whitish below the spiracles, the line of separation of colour somewhat abrupt; head small, chestnut; mouth black; dorsal plate large, pale brown; anal plate faint amber colour, variegated with pale brown. (Dr. J. H. Wood.)

August and September on corn sow-thistle (*Sonchus arvensis*) in the flower-heads, feeding upon the immature seeds. When full fed leaving the plant to spin a cocoon

just beneath the surface of the earth, and there remaining, unchanged, until the following summer.

This moth is much attached to cultivated ground, such as clover and corn-fields, and also sometimes to the more settled portions of coast sandhills, railway banks, and quarries. It seems never to fly in the daytime, but only in the dusk—often late dusk—and to continue on far into the night; occasionally it may be found at that time at a roadside gas lamp. Always apparently scarce, yet widely distributed in England; recorded from all the southern counties, from Kent to Somerset and Herts, also throughout the eastern counties; and in Gloucestershire, Herefordshire, Leicestershire, Worcestershire, Lancashire, Westmoreland, Yorkshire, and Durham, though rarely. In Wales I took it in Pembrokeshire; in Scotland Mr. J. Dunsmore informed me, long ago, of his capture of a single specimen near Paisley, but I have no record for Ireland. Abroad its range extends through Germany, Lower Austria, the Tyrol, Galicia, Livonia, Northern Spain, Piedmont, and South-east Russia.

2. *C. scopoliana*, *Haw.*; *hohenwarthiana* (?), *Schiff.*; var. *parvulana*, *Willk.*—Expanse  $\frac{3}{4}$  inch (18 mm.). Head brownish white; fore wings dull brown with a faintly paler broad dorsal blotch, richer brown basal blotch, and faint silvery costal lines.

Antennæ black-brown, pale in front; palpi and head brownish white, browner at the sides; thorax dark brown; abdomen grey-brown. Fore wings elongate, costa folded at the base and nearly straight, apex rather squared; hind margin straight; dull pale brown shaded with darker brown; basal blotch richer or darker brown or obscurely blackened, its outer margin hollowed, and followed by a broad pale brown dorsal blotch; central band a mere brown cloud; costa clouded with dark brown, in which are numerous whitish costal streaks; ocellus rather square, containing two

or three short deep black lines; cilia smoky brown. Hind wings smoky brown, rather paler at the base; cilia smoky white. Female without the costal fold, darker brown, often wholly mottled with dark umbreous, and with darker hind wings.

Undersides of all the wings leaden black with leaden white cilia; costal dots of fore wings white.

Rather variable in the depth and tone of colour, very so in size. The small form, known as *C. parculana*, seems to differ in no respect, except in size, from this type, and is indeed inseparable from the small specimens which appear *along with* the larger.

On the wing in June, July and August, in a single generation.

LARVA short and rather broad, but attenuated behind, wrinkled and hairy, upon each segment a posterior ridge; dull yellowish pink, paler beneath and between the segments; and with dorsal and subdorsal lines of a faintly redder colour; hairs very short and inconspicuous; head large, pale chestnut; dorsal plate very large and broad, pale umber; anal plate dull red.

August, on *Centaurca nigra*, in the flower-heads, eating out the immature seeds and the pith at their base; feeding up very quickly; leaving the flower or seed-head to spin a tough silken cocoon among rubbish on the ground; remaining in the larva state within the cocoon through the winter and till the following summer.

This common species remains for rather a long time upon the wing. It is always to be found where *Centaurca nigra* is plentiful, sitting upon that plant, but flying readily up when disturbed; flying in plenty of its own accord at sunset, and then to be seen in plenty buzzing at the flower-heads, its grey-white or yellow-white head becoming conspicuous in the buzzing, fearless flight. Its curious little variety

called *parvulana* abounds in the Isle of Wight about the blossoms of *Serratula tinctoria*, but elsewhere is only casual among the ordinary specimens about the *Centaurea*. Common throughout England to Northumberland; and doubtless through Wales, where it abounds in Pembrokeshire. In Scotland extending to the Orkney Isles; and in Ireland abundant on the Dublin coast, and found in Kerry, Mayo, Sligo, Tyrone and Donegal. Abroad it is plentiful throughout Central and Northern Europe, but its range does not seem to be fully recognised.

3. **A. fulvana**, *Steph. jaceana*, *Hein.*, **carduana**, *Gn.*  
—Expanse  $\frac{3}{4}$  to  $\frac{7}{8}$  inch (18–22 mm.). Soft yellow brown, or pale fawn colour, sometimes with a chestnut basal blotch; ocellus shining; costa with numerous shining oblique silvery lines.

Antennæ pale drab; palpi, head, and thorax red-drab; abdomen pale brown. Fore wings elongated but moderately broad, costa nearly straight, folded at the base, apex rather sharply angulated; hind margin not very oblique, yellowish fulvous or fawn colour, with long oblique pale buff streaks from the costa separated by silvery white oblique lines; dorsal half of the basal blotch rich fulvous; ocellus glistening silvery drab, containing a cluster of black dots; cilia pale buff. Hind wings light brown at the apex and hind margin, shading to dull white toward the base; cilia white. Female similar, without the fold, but the fore wings very slightly broader and often dusted with black or brown from the base.

Underside of the fore wings leaden brown with paler margins. Hind wings leaden white.

Not usually variable, but occasionally extremely small specimens occur, as in the last species.

On the wing from the end of June till August.

LARVA tolerably active, plump, with deeply divided



segments, and with a slightly raised ridge on the posterior portion of each ; pale pink, paler beneath ; head light chestnut ; dorsal plate rather broad, yellowish brown ; anal plate minute, brown.

August, on *Centaurea scabiosa*, in the flower or seed-head, eating out the seeds and the pith at their base. Before the involucrem withers and spreads open, the larva is full-fed and has deserted it to spin a tough cocoon under a stone or among rubbish on the ground. Here it remains unchanged until the following June or even July, a very short time being spent in the pupa state.

Rather a local species, but often common upon the sea coast and inland in chalky districts. Of rather deliberate habits, hiding among undergrowth ; easily disturbed in the daytime but keeping near its favourite *Centaurea* and often sitting upon it. Rather a handsome and attractive insect ; found in Kent, Surrey, Sussex, the Isle of Wight, Dorset, Wilts, Berks, Essex, Suffolk, Norfolk, Cambs, Oxfordshire, and Herefordshire ; but apparently not in the midland and northern counties ; in Wales common in the limestone districts of Pembrokeshire ; in Scotland in the extreme south-west, about Wigtown ; and in Ireland on the Dublin coast, at Sligo, and Armagh. Abroad it is found in most parts of Central Europe, the North of Italy, and Livonia.

4. *C. cana*, *Hav.* ; *hohenwarthiana*, *Willk.*—Expanse  $\frac{3}{4}$  inch (18 mm.). Fore wings pale olive brown or pale reddish brown, with numerous hoary longitudinal streaks over the whole surface.

Antennæ black-brown ; palpi, head, and thorax light reddish brown ; abdomen silvery brown. Fore wings elongated ; costa folded at the base, gently arched ; apex rather sharply angulated, hind margin oblique, light olive brown or pale reddish brown, almost covered with narrow, longitudinal, hoary-white streaks and shades ; basal blotch obscure, its

outer margin angulated, only noticeable toward the dorsal region; chestnut brown; ocellus large, glistening pale grey, with a few black dots; costal outer area hoary, but dusted with minute *brown* streaks; cilia pale brown. Hind wings dull white, shading to brown along the hind margin and apex; cilia dusky white. Female similar; fore wings slightly broader from absence of the fold.

Underside of fore wings smoky black, costa beyond the middle and hind margin ashy white; hind wings shining white.

On the wing in June and July.

LARVA plump, rather flattened, with swollen segments; dull pink; head and dorsal plate broad and large, chestnut brown; anal plate very small.

August and September, in the flower heads of *Carduus lanceolatus* and other thistles, eating out the immature seeds; feeding up rapidly, and at once leaving the seed-head to spin up elsewhere; also in the seed-heads of *Centaurea nigra*, usually rarely, but M. A. Thurnall has found it in them almost as commonly as *C. scopoliana*.

PUPA bright light brown; wing and limb-covers glossy; abdomen very dull, covered with fine frosting; segments with two ridges, that in front having a row of strong stout spines; the hinder ridge finer and more delicate; cremaster short, thick, and blunt, terminated by a thick cluster of hooked bristles. In June, in a tough papery cocoon among rubbish on the ground, in which the larva has spent the winter.

This moth is always to be found among thistles, hiding among them and sitting on the stems and leaves by day, but flying out quite readily on the slightest disturbance; and buzzing around the blossoms and seed-heads at sunset. A common species, generally, though apparently rather scarce in Cornwall, but extending throughout the country to

Northumberland; and in Wales plentiful in Glamorganshire and Pembrokeshire. In Scotland throughout the Lowlands to Aberdeen and Dumbartonshire, also in Perthshire and the Mull of Cantire; and in Ireland on the Dublin coast, Cork, Connemara, Sligo, Armagh, Antrim, Donegal, and Derry. Abroad it is common throughout Central and Southern Europe, Sweden, and Armenia, and in Madeira.

5. **C. cæcimaculana**, *Hüb.*—Expanse  $\frac{5}{8}$  to  $\frac{7}{8}$  inch (16–22 mm.). Wholly dull grey-brown, frosted with much silvery white perpendicular streaks, basal blotch darker; ocellus paler.

Antennæ black brown, barred with paler; palpi and head drab; thorax light brown; abdomen dark brown. Fore wings rather elongated; costa folded at the base, nearly straight; apex angulated, almost squared, hind margin slightly oblique; greyish umbreous profusely dotted with whitish brown; basal blotch darker umbreous, ill-defined, but its margin erect, closely followed by a rather paler dorsal blotch; central band shadowy and ill-defined, umbreous, but forming a dark edge near the dorsal margin; ocellus large, drab, very little spotted with black; costal region umbreous with numerous whitish brown costal dots; extreme hind margin thickly dotted with black; cilia shaded, pale brown. Hind wings smoky brown; cilia whiter. Female similar.

Underside of the fore wings blackish brown; dorsal region and cilia white. Hind wings smoky white.

Usually very constant in colour, but in rare instances the grey umbreous ground colour is replaced by reddish brown.

On the wing from the end of June till August.

LARVA possibly undescribed. Gartner gives a brief description of a larva, "Stout, naked, shining, yellowish white, second segment swollen, dorsal plate pale brown; head smaller, honey-yellow," under this name, feeding in June in the thick root of *Centaurea paniculata*, and M. Ragonot records it feeding in *C. jacca*. I have once reared it, among

*C. scopoliiana*, from *Centaurea nigra*, but the larva was overlooked and may have fed in a root—where also it is said to assume the pupa state.

The moth sits in the daytime in plants of *Centaurea nigra*, and when disturbed by the foot or the beating-stick, dashes swiftly away, rising at the same time a few feet into the air, but soon falls and hides again among herbage. Often also it will sit upon a bit of limestone on the ground—especially in its favourite haunt, a quarry—and here it cannot be discriminated with any certainty until it flies up. A very local species; to be found in the chalk districts of Kent, Sussex, Surrey, Essex, and Dorset, and on the limestone of Pembrokeshire in Wales. I know of no other haunts in the British Isles. Abroad it is to be found through Central and Southern Europe, Norway, Finland, Livonia, Armenia, and the Taurus mountain district.

#### Genus 7. **GRAPHOLITHA.**

Antennæ short, thick, notched; palpi short, slightly porrected, tufted and depressed; thorax smooth; fore wings elongated, without costal fold; hind wings with a loose tuft of hair-scales on the median nervure.

We have twelve species, not very difficult of tabulation.

- A. Fore wings drab or pale yellow-brown.  
 B. Fore wings mottled or clouded with grey-brown.  
 C. Ocellus with two black horizontal lines. *G. tripoliiana*.  
 C<sup>2</sup>. Ocellus with fragments of three horizontal lines.  
*G. amulana*.  
 B<sup>2</sup>. Fore wings not mottled; having a large pale dorsal blotch. *G. conterminana*.  
 A<sup>2</sup>. Fore wings white.  
 B<sup>3</sup>. Fore wings with two olive-grey transverse stripes. *G. pupillana*.  
 B<sup>4</sup>. Fore wings with faint grey clouds and streaks. *G. candidulana*.

- A<sup>3</sup>. Fore wings bright yellow with brown clouds.  
*G. citrana.*
- A<sup>4</sup>. Fore wings bronzy brown.
- B<sup>3</sup>. Fore wings with a darker central band, and numerous white streaks.  
*G. aspidiscana.*
- B<sup>6</sup>. Fore wings broadly tipped with pale orange.  
*G. albersana.*
- B<sup>7</sup>. Fore wings nearly unicolorous.  
*G. hypericana.*
- A<sup>5</sup>. Fore wings grey or grey-brown.
- D. Fore wings short, delicately rippled with fine white cross lines.  
*G. microgrammana.*
- D<sup>2</sup>. Fore wings narrow, shining, with light costal streaks.  
*G. cacana.*
- D<sup>3</sup>. Fore wings trigonate, variable, ocellus large.  
*G. ulictana.*

1. **G. æmulana**, *Schl.*; **modestana**, *H.-S.*; **modicana**, *Zell.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (10–12 mm.). Fore wings pale drab, with grey-brown basal blotch and central shade, and numerous costal streaks.

Antennæ pale drab; palpi and head dull white; thorax brownish white; abdomen pale brown. Fore wings rather narrow; costa without a fold, slightly arched, apex blunt, hind margin faintly oblique; pale drab or whitish brown; basal blotch fragmentary, brown-drab, its outer margin sharply angulated; costa dotted with pale brown and dull white; central band cloudy drab, the cloud extending round the ocellus, which is glistening, and encloses three partial black streaks; cilia whitish drab. Hind wings pale smoky brown; cilia white. Female similar.

Underside of fore wings pale smoky brown; cilia white; costal dots yellow white. Hind wings leaden white.

On the wing in July and August.

LARVA short and stout, but attenuated a little at each extremity, the segments ridged and sharply defined; pale

yellow with a deep purple dorsal stripe and paler purple or purple-grey subdorsal and spiracular stripes, all interrupted at the segmental divisions; head black, deeply lobed; dorsal plate whitish with a black spot on each side, and two black dots between them; anal plate light brown with the dorsal stripe visible through it.

August and September, in flower-heads of *Solidago virgaurea*, eating out the unripe seeds and passing from one flower to another, but not attaching them together by any web. When full-fed leaving the flowers to spin up among rubbish, but not assuming the pupa state till the following summer. This larva possesses the instinct of escaping from any state of confinement in perhaps a greater degree than almost any other, and when tightly tied down in a flower-pot will so thrust itself under the covering material as to become crushed *quite flat*, and thus commit suicide. This it is almost impossible to prevent!

The moth hides among its food-plant, or in neighbouring furze-bushes, or other thick shelter, but on warm still afternoons flies from 5 to 6 P.M., in the buzzing manner peculiar to the group, about the golden-red blossoms. At any other time it is by no means easy to disturb. Very local, but found in Kent, Sussex, Surrey, Essex, Suffolk, Somerset, Gloucestershire, and Herefordshire; and in Wales on the sea-coast of Pembrokeshire. In Scotland it is reported from Argyle, Dumbartonshire, Renfrew, and Arran; but I have no record from Ireland. Abroad it seems to be limited to Central Europe, and the region of the Caucasus.

2. *G. tripoliana*, *Barr.*—Expanse  $\frac{5}{8}$  inch (15 mm.). Fore wings pale yellow brown marbled and streaked with tawny brown; two black streaks in the ocellus.

Antennæ brown; palpi and head dull brownish white; thorax pale yellow brown; abdomen blackish brown. Fore wings not very broad, costa not folded, scarcely arched,

apex blunt; pale yellow-brown; basal blotch hardly darker except its outer edge, which is sharply angulated, and followed by a large paler dorsal blotch; costa pale from the base, but from the middle thickly streaked with alternate short pale drab and yellowish-brown lines; ocellus glistening white containing two black lines; cilia yellow-brown. Hind wings and cilia pale smoky brown, or smoky white. Female similar, but with darker hind wings.

Underside of the fore wings smoky brown edged toward the apex with yellow-brown. Hind wings leaden-white.

On the wing in July and August

LARVA plump, thickest in the middle, very sluggish, often remaining contracted into a mere lump; segments wrinkled and slightly ridged, pale pinkish-yellow or salmon-colour, with the dorsal line hardly darker, and under parts more yellow; raised dots of the body colour, and indistinct; head black- or chestnut-brown; dorsal plate semi-circular, divided, umber-brown, darker behind; anal plate brown; feet yellow-brown.

September and October in seed and flower-heads of *Aster tripolium*, devouring the unripe and immature seeds, spinning the florets and pappus together, and passing freely from flower to flower.

PUPA bright chestnut-brown. In a compact cocoon among rubbish or in rotten wood, spun by the larva on its leaving the seed-head in October, and inhabited by it until early in July, when the pupa state is assumed.

The moth hides among *Aster tripolium*, and other coarse plants in the salt marshes, on the banks of the Thames, where it was originally discovered by the late Mr. W. Machin; and in other similar places in the south; and towards dusk flies freely about the same plants. Its principal home with us is in Essex and Kent—near Southend, and Chatham, and in Canvey Island—but it is found in the Isle

of Wight; at Poole Harbour, Dorset; in Sussex, and in Suffolk; always on or near the sea-coast. Abroad it is recorded from Germany and Moravia, but it seems still to be in some degree confounded with the previous and other allied species.

3. *G. citrana*, *Hüb.*—Expanse  $\frac{3}{4}$  inch (18–20 mm.). Fore wings rather pointed; bright yellow with orange-brown stripes.

Antennæ notched, slender, yellowish-white; palpi, head, and thorax sulphur-yellow; abdomen whitish-brown. Fore wings rather elongated and pointed, costa very flatly arched, apex rather sharply angulated, hind margin oblique and nearly straight; sulphur-yellow with the markings orange-brown; an oblique, straight, but constricted, transverse stripe near the base; another, broader, placed as an oblique central band, but indented and scarcely attaining either margin, throwing out from its middle a similar stripe quite into the apex of the wing; above this are three or four costal spots; ocellus contracted and obscure, containing two or three minute, elongated, black dots; cilia pale yellow, dusted with yellow-brown. Hind wings very pale, smoky-brown, with a faint purplish flush; cilia white.

Underside of the fore wings smoky-brown; costa dotted with yellow; cilia yellow. Hind wings smoky-white.

On the wing at the end of May and in June, and as a second generation at the end of July and in August.

LARVA not certainly known. Rössler says that it feeds on spun-together flowers of *Achillea millefolium*. Roesel says those of *Artemisia campestris*; others suggest *Ononis*.

The moth hides during the day among low growing herbage close to the ground, but may be disturbed by the footstep on sunny afternoons, when it flies swiftly to a similar hiding place. I have myself disturbed it principally from among or near *Achillea* (milfoil), others find the thick



shelter of *Ononis* (restharrow) more appreciated. Its natural flight is at sunset. It is a local species usually confined to the coast, but rather common on the Breck-sands of Norfolk and Suffolk; occurring also on the coasts of Essex, Kent, Sussex, Dorset, and Lancashire; and found in plenty in 1877 in the Scilly Isles, by Mr. Jenkinson. In Ireland it has been taken near Cork by Capt. Donovan. I have no knowledge of its presence in other parts of these Islands. Abroad it ranges through Central Europe, Italy, Sardinia, Dalmatia, Scandinavia, Armenia and Turcomania.

4. **G. pupillana**, *Clerck*.—Expanse  $\frac{3}{4}$  inch (17–20 mm.). Fore wings silvery-white with deep brown stripes.

Antennæ dark brown; palpi and head dull white; thorax and abdomen dusky white. Fore wings rather elongated, costa nearly straight, apex sharply angulated, hind margin oblique; silvery white; basal blotch large, faintly brown, but its outer margin deep brown, oblique and faintly angulated; central band slender, deep brown, running obliquely to the anal angle; from it a more olive-brown cloud runs to near the apex, is preceded by two or three similar costal dots, and followed by an apical spot; ocellus very pretty, white, containing three clusters of minute deep black dots; cilia dull white. Hind wings pale smoky-brown with white cilia. Female similar.

Undersides of the fore wings dark leaden-brown; costal dots and cilia white. Hind wings leaden-white.

On the wing in July and August.

LARVA plump, naked, with the segments ridged in front and rather deeply divided; yellowish-white; spiracles grey; head deeply lobed, bright chestnut, going darker; dorsal plate light brown, anal plate yellowish; all the legs yellowish-white. When quite full fed pink dorsal and subdorsal lines gradually appear.

September till June or July in the solid root-stocks of

*Artemisia absinthium* (wormwood), at first mining passages under the bark, afterwards boring deeply into the solid root, eating its pith and substance.

PUPA yellow-brown, the wing and limb-covers smooth and shining; abdominal segments more dull, each with a distinct ridge of elongated points, followed by a much smaller ridge of minute points; cremaster short, broad, and blunt, finished with a round cluster of minute hooks, in a slight cocoon among rubbish, to which the full-fed larva has made its way after feeding for about ten months in the rootstock.

A singularly sluggish, quiet species, scarcely ever seen voluntarily on the wing. It sits on its food-plant, the wormwood, sometimes on the top branches and blossoms, often lower down and more concealed, and if beaten or shaken off will fly straight to the ground, or if on a warm afternoon will sometimes fly away a few feet, then either settle on the ground or fly back to the wormwood. When seen at rest, it will allow itself to be boxed, or bottled, with little trouble. Exceedingly local and apparently confined to within a short distance of the coast; there either in some quarry, or rough stony place, or even in a farmyard, where the wormwood grows freely and is never touched by cattle, it may sometimes be found in some numbers. It is recorded in Essex, Kent, Sussex, the Isle of Wight, and the Isle of Portland; also in Yorkshire in a quarry at Seamer near Scarborough; in Wales at Barmouth, and in the coast farmyards of Pembrokeshire; but I know of no other localities in these Islands. Abroad it ranges through Central Europe, Dalmatia, Finland, and Armenia.

5. *G. candidulana*, *Nalck.*, *wimmerana*, *Willk. Sta. Man.*—Expanse  $\frac{5}{8}$  inch (14–16 mm.). Fore wings white with faint grey clouds and marginal streaks.

Antennæ dull white; palpi and head snow-white; thorax and abdomen also white. Fore wings rather narrow, costa

nearly straight, apex bluntly angulated, almost rounded; white softly streaked with pale grey; basal blotch faintly indicated in grey-brown clouding, which is edged outwardly by two oblique, darker, clouded spots on the dorsal area; costa distinctly and obliquely streaked with grey-brown; ocellus containing in its white area two short grey lines, sometimes dotted with black; cilia smoky-white. Hind wings and their cilia smoky-white. Female similar.

Underside of the fore wings leaden-black; costal dots, dorsal margin, and hinder cilia white. Hind wings silky white.

On the wing in July.

LARVA plump, much wrinkled, each segment divided transversely by a fold; dull white, with the raised dots shining white; dorsal line narrow, subdorsal lines broad, dull purple, interrupted at every segmental division and fold; head shining brown; dorsal plate large, broadly dull white in front, shading off to brown behind, but with a white middle line; anal plate and legs mottled, brown and white; prolegs white. Rather sluggish.

September and October on *Artemisia maritima* (sea-wormwood) on the flowers, living in the flower spike, uniting the blossoms together by a silken tube which runs up the spike, and devouring them and the young seeds. When full fed leaving the plant and spinning up among débris, or in the mud of the salt marsh in which this plant often grows, remaining nine or ten months in cocoon as a larva.

The moth is sluggish and unwilling to fly in the daytime, though a specimen may now and then be kicked out from among its food-plant in the sunshine. It appears to frequent no other plant, and late in the afternoon crawls up it, and may then be swept off. Towards sunset it flies of its own accord, buzzing about the tops of the same plants, and looking exceedingly white while on the wing. Definitely restricted to the sea-coast, and there to the margins or dryer

portions of salt marshes, or on the sea-banks; found in some plenty in such spots on both banks of the Thames estuary; in Kent and Essex; also in Sussex, Suffolk, and Norfolk; but I have searched in vain on other parts of our coasts, where the food-plant is most abundant, and have no knowledge of its occurrence beyond these five counties, in any part of the United Kingdom. Abroad it seems only to be recorded from Northern Germany and Livonia.

6. **G. conterminana**, *H.S.*—Expanse  $\frac{5}{8}$  to  $\frac{3}{4}$  inch (15–18 mm.). Fore wings soft fawn-colour, or yellow-brown, with brownish white dorsal blotch, ocellus, and costal streaks.

Antennæ brown; palpi and head brownish white; thorax fawn-colour; abdomen dull pale brown. Fore wings elongated, costa almost straight, apex sharply angulated, hind margin straight and almost perpendicular; delicate soft fawn-colour; basal blotch of the same colour, but its lower outer margin darker, oblique, and forming also the margin of a large brownish white dorsal blotch; costa very faintly streaked with paler brownish white; ocellus squared, silvery-white, containing two deep black lines; cilia pale brown; hind wings very pale purplish-brown; cilia whiter. Female similar.

Underside of the fore wings smoky-black; costa and hind margin shaded with pale yellow. Hind wings smoky-white.

On the wing from June till August.

LARVA sluggish, rust-yellow or ochre-yellow; head dark brown with a black spot on each side; dorsal plate spotted, brownish; on the back are two pairs of raised dots. (Gartner.) Mr. A. H. Ruston described larva found by him “dull dark red with black head, and yellow underneath.”

August and September in the flower-heads of lettuce (*Lactuca sativa*) and also on those of *L. scariola*; feeding exposed, or with its head and anterior segments inside the flower; feeding singly and without a web.

PUPA cylindrical, pale yellow; in the earth. (Gartner.)

This was not recognised as a British species till about the year 1863, though taken earlier. It sometimes frequents gardens, at others is found in clover fields, or in quarries or other rough places where the wild lettuce grows, and flies about the flower-heads towards sunset. A local species with us, but to be found occasionally, though rarely, in the London suburbs, much more frequently on the chalk of Kent and Surrey, and of Cambridgeshire; also in Essex and Oxfordshire, but not, I think, elsewhere in the United Kingdom. Abroad it is well distributed over Central Europe, and in Sweden, Piedmont, Dalmatia, South-west Russia, and Turcomania.

7. *G. aspidiscana*, *Hüb.*—Expanse  $\frac{5}{8}$  inch (15–17 mm.). Fore wings squared, golden-brown, banded with red-brown and streaked with shining white.

Antennæ black-brown; palpi and head pale brown; thorax red-brown; abdomen grey-brown. Fore wings elongated and rather squared, costa nearly straight, apex squarely angulated, hind margin straight, but not quite perpendicular; golden red-brown, or chestnut-brown; costa minutely dotted throughout with black; before the middle a pair of white costal streaks is prolonged into a bent bluish-grey transverse band; beyond are pairs of bright white costal streaks, the outer pairs running together beneath; ocellus large, lustrous, edged with bright silvery-white, streaked and dotted with deep black; cilia red-brown, shaded with white. Hind wings smoky dark-brown; cilia white. Female similar.

Underside of the fore wings pale leaden-brown; costa dotted with white. Hind wings pale leaden-brown.

On the wing in May and June.

LARVA when young dirty white; when full grown flesh-colour with two rows of brown raised dots; head and dorsal

plate shining black-brown; anal plate shield-shaped, bistre-brown. (Gartner.)

August and September in an intricate web in the flower-heads of *Aster amellus* and *Solidago virgaurea*; also on *Chrysocoma linosyris* on the Continent. Dr. Wood informs me that it commences to feed in the central flower-buds, which it spins together, then passes into the main shoot, and eats it out.

PUPA robust, cylindrical, yellow-brown, with dark brown wing-cases. In a cocoon in the earth. (Gartner.)

This species was recorded as British in 1867, though it had then been repeatedly captured and disregarded; it hides by day among thick herbage in its few localities, but is said to fly in the hot sunshine, or fine days, from 8 A.M. till noon, and at that time to fly only short distances from plant to plant and is not very particular as to what plant. At sunset it flies much more swiftly and frequents open woods, rough sloping ground, and quarries. Very local with us and apparently confined to the west: recorded in Somersetshire, Gloucestershire, Herefordshire, North Lancashire, and Westmoreland, but so far as I know not in any other part of the United Kingdom. Abroad it inhabits the greater portion of Central Europe, Central Italy, Scandinavia, Asia Minor, and Siberia, and was found by Lord Walsingham in North America, in Oregon.

8. **G. hypericana**, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–18 mm.). Fore wings glistening rusty-yellow or bronzy-brown, with a brilliant upright streak on either side of the ocellus.

Antennæ black-brown, palpi pale grey; head and thorax orange-brown; abdomen whitish brown. Fore wings rather narrow, costa slightly arched, apex bluntly angulated; golden-brown or bronzy-yellow; costa faintly dotted with brown and streaked beyond the middle, obscurely, with

silvery-white; ocellus bounded on either side by an erect silvery-white line, and containing three minute black streaks; cilia orange-brown. Hind wings and their cilia pale smoky-brown. Female similar, rather smaller.

Underside of the fore wings shining lead-black; hind wings leaden-white.

Specimens from the north of Ireland have the ocellus and silvery lines very indistinct.

On the wing in June and July, and as a second generation in August and September.

LARVA when young pale yellow or pale grey with a brown-coloured tinge on the back; head and dorsal plate shining black, anal plate pale yellow, edged with black. When nearly full grown short and stout, smoky-brown or blackish-brown with the sides rather paler; head light brown; dorsal and anal plates black. When quite full-fed the colour fades a little.

April and May and a second generation in June and July, on *Hypericum perforatum*, *H. hirsutum*, and other species of St. John's wort, feeding in the young shoot, drawing it together and twisting it aside, eating the heart so completely out that it withers and turns brown, making the plant look conspicuously shabby. The second brood feeds in the blossoms and seeds. The pupa state is assumed in the earth or among rubbish on the ground.

A very plentiful species about beds of *Hypericum* in open woods, on hills, railway banks, and in dry fields, sitting among the St. John's wort, very restless and easily disturbed in the daytime, especially in the sunshine, and flying freely of its own accord after sunset and till dark; common in the southern counties of England, from Kent to Somerset and to Herts and Oxfordshire; also in the eastern counties to Norfolk and to Yorkshire and Durham, and in the west to Westmoreland; but except in Leicestershire it is scarcely

reported from the Midlands. In Wales I captured it in Pembrokeshire; but in Scotland I find no record; and in Ireland only in Cork, Wicklow, and Antrim. Abroad it occurs throughout Central Europe, Central and Northern Italy, Scandinavia, and South-west Russia.

9. *G. albersana*, *Hüb.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings rather broad, purple-brown to two-thirds of their length, the rest bronze-yellow.

Antennæ golden brown, palpi dull brown, head and thorax golden brown, abdomen silvery white. Fore wings rather broad, costa arched, apex and hind margin squared; two-thirds of the wing from the base purple-brown, its outer margin oblique and faintly curved; remaining area, to the apex and hind margin, bronzy yellow and pale golden brown, and several red-brown streaks edged with silvery white from the costa to the ocellus: this last is edged with silvery white and contains two short black lines; cilia pale yellow-brown. Hind wings smoky white, with white cilia. Female similar, but with darker hind wings.

Underside of the fore wings shining leaden black, shaded at the apex with pale yellow, which also runs along the hind margin. Hind wings leaden white.

On the wing in May and June.

LARVA slender, tapering toward the tail; dorsal region covered with small eminences of different shapes from the depth of the cross-segmental divisions; head yellow-brown, with two black dots; mouth brown; dorsal plate pale horn colour, with a deep black dot on each side; body dull green-grey; dorsal canal irregular, darker; anal plate shiny dark brown; legs and prolegs rather paler than the body.

August and September on honeysuckle in a large chamber formed by joining the edges of the leaves together, or the edge of one to a midrib, and gnawing the inner surface of



the leaf. Remaining in the chamber thus formed through the winter, and assuming the pupa state therein in the spring.

This species loves the open portions of woods, where a wide footpath passes between abundant bushes, and honeysuckle creeps about everywhere among them. Here it flies high over the bushes in the afternoon sunshine, or sits on the oak bushes; buzzing along the path or among the bushes toward sunset. As it sits on the oak leaves and shoots it looks curiously like a capsule that has fallen from some neighbouring tree. Very common in Kent, Surrey, Sussex, Hants, Dorset, Somerset, Wilts, Berks, Middlesex, Herts, and Essex, also to be found in Norfolk, Herefordshire, and even in Yorkshire occasionally. In Wales it occurs in the woods of Pembrokeshire; and in Ireland at Killarney; but I have no knowledge of its presence in any other part of the United Kingdom. Abroad its range is through Central Europe, Piedmont, Sicily, Jutland, Livonia, and South-West Russia.

10. **G. microgrammana**, *Gn.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings rather squared, pale grey-brown, covered all over with faint silvery lines and ripples.

Antennæ black-brown; palpi and head dull pale brown; thorax and abdomen silvery brown. Fore wings somewhat squared, costa very faintly curved, apex rather squarely angulated; pale grey-brown, the basal half stippled with delicate silvery grey transverse lines; costal portion of the remainder similarly streaked, and the rest also finely dusted with minute yellow dots: costa barred throughout with oblique alternate grey lines and silvery white streaks; ocellus not very distinct, but large and squared, edged on either side with silvery white, and containing a row of black lines; cilia grey-brown. Hind wings and their cilia smoky white. Female similar.

Underside of the fore wings pale leaden-brown; costa near the apex dotted with white. Hind wings smoky white.

On the wing at the end of June and in July.

LARVA yellowish white; head pale brown; dorsal plate pale, with black dots; raised dots hardly visible; anal plate of the body colour. (Herr Disqué.)

August and September in the green seed pods of *Ononis spinosa* (restharrow).

Pupa in an oval cocoon of silk and sand, lying in the sand underneath the plants of restharrow.

This delicate looking insect seems to be almost confined to the coast, but is found inland on the chalk hills about Croydon and elsewhere in Surrey. It sits during the day in and under the thick flat patches of restharrow, and may sometimes be secured by separating the tufts and looking closely where it may be sitting among the roots and dead leaves. At sunset it flies over the same plants, and from the light colour of its hind wings is easily seen. Besides the localities already mentioned, it is to be found on the coasts of Kent, Dorset, Devon, Essex, Suffolk, and Norfolk, usually on the more settled portions of coast sandhills. So far as I know, this is the extent of its range in these Islands. Abroad it is common through Central Europe, Piedmont, the north of Spain, Sweden, Armenia, and Asia Minor.

11. **G. cæcana**, *Schl.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Very slender; fore wings narrow and pointed, silvery grey tinged with olive-brown; costa with very numerous white streaks.

Antennæ brown; palpi dull white; head pale brown; thorax leaden-brown; abdomen glossy brown-black. Fore wings rather narrow and pointed, costa nearly straight, apex bluntly rounded, hind margin oblique; pale olive-brown, shaded all over with silver-grey, the outer half minutely dusted with yellow and black dots; costa barred

throughout with fine, alternate, black and glossy white streaks; ocellus imperfect, a mere series of silvery white dashes; hind margin edged by a black line; cilia greyishwhite. Hind wings smoky white, with whiter cilia. Female similar.

Underside of the fore wings glossy pale lead colour; costal dots white. Hind wings leaden white.

On the wing in July.

LARVA apparently undescribed. Mr. G. Coverdale once told me that he had found some larvæ in November feeding on the stems of *Oenobrychis sativa*, from one of which he reared a specimen of this species.

This moth seems to have first been found here by Mr. George Coverdale in the year 1883 on the cliffs near Dover. Here he took a number of specimens among the sainfoin, and afterwards found the larva as already mentioned. I cannot ascertain that it has been found with us in any other locality than the original one on the coast of Kent. Abroad it inhabits Southern Europe, Belgium, the Caucasian region, and Asia Minor.

12. **G. ulicetana**, *Huv.*; **succedana**, *Fröl.*—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–16 mm.). Fore wings dull brownish grey with a rather darker ocellus; female ground colour, whiter, and ocellus darker.

Antennæ black-brown; palpi, head, and thorax dark brown dusted with white; abdomen black-brown. Fore wings somewhat trigonate, costa nearly straight, apex angulated, hind margin oblique; dull brown mingled with slate grey, often almost unicolorous; when visible the basal blotch is large, grey-brown, its outer edge strongly angulated; closely followed by a large paler or white dorsal blotch, which extends to and touches a cluster of black dots; outside this the ocellus is slate grey, and contains several black dots; costa dotted almost throughout very faintly

with black and white; cilia grey-brown. Female similar, or very often with the marking more distinct, sometimes with white ground colour and large dark basal blotch, and the ocellus very large and velvety.

Underside of the fore wings leaden-black; costa dotted with white. Hind wings leaden white.

Variable in size, specimens from the Irish coast being sometimes very large, while those which occur where there is no furze are often very small. There is also much variation in colour; our common dark race being to all appearance a comparatively scarce form abroad. On the other hand, the pale and bright varieties, which formerly seemed to be female forms and confined principally to the north, have become much more generally distributed, and the variation seems to be extending to the other sex. Several such are recorded in Dorset by Mr. Bankes.

On the wing in multitudes in April and May, and in far smaller numbers from July to September, but whether in two generations, or in separate races, is as yet uncertain.

LARVA short and stout, heavier in front than behind, yellowish white; head small, honey brown; dorsal plate ochreous, shaded behind with grey; anal plate faintly greyish ochreous; raised dots indistinct, small and grey. (Dr. Wood.)

April and again in June in seed-pods of furze (*Ulex europæus* and *U. gallii*), clearing out one pod after another. Also occasionally in pods of *Genista anglica*, *G. tinctoria*, *Cytisus scoparius*, *C. nigricans*, and *Lotus corniculatus*, always eating the unripe seeds, and spinning up in the earth or among rubbish.

The male flies all day long in the sunshine over its food-plants, but especially furze, over which its mazy dance is almost incessant, and on which it rests for short intervals. The female is not so active, but sits in the furze bushes and flies toward sunset. Abundant throughout the United

Kingdom wherever furze is found, and in the absence of this plant usually to be found about one of its other food-plants. Abroad it has a wide range through Central and most part of Southern Europe, Livonia, Iceland, the Caucasus, Asia Minor, and North-East Africa; and Lord Walsingham found it in Oregon, North America.

#### Genus 8. **PYRODES.**

Antennæ very thick; palpi short, blunt, and thickly tufted; thorax smooth; fore wings narrow, costa not folded; hind wings with a thick ridge of scales on the median nervure.

We have only one species.

1. **P. rhediella**, *Linn.*—Expanse  $\frac{3}{8}$  inch (9 mm.). A little species; fore wings dark red-brown, shading behind to light chestnut; almost without markings.

Antennæ brown-black; palpi, head, and thorax dark red-brown; abdomen black-brown. Fore wings rather narrow, costa hardly arched, not folded, but the basal area rather depressed, apex bluntly angulated; dark red-brown, shading beyond the middle to bright chestnut; in this apical chestnut area are four, faintly paler costal dots, also two distinct streaks indicating the sides of an obscure ocellus; cilia white; hind wings pale smoky-brown, cilia white. Female similar, but a little larger.

Underside of the fore wings shining leaden-brown; hind margin paler. Hind wings leaden white.

On the wing in May and June.

LARVA apparently undescribed. At the end of June in the green berries of the hawthorn (*Crataegus oxyacantha*), or abroad in the flowers and young berries of dogwood (*Cornus sanguinea*). Said also to feed in the berries of service (*Pyrus torminalis*). Assuming the pupa state in the earth, or in rotten wood, or soft bark.

A very lively species in the spring, flying over and around tall hawthorn bushes in the sunshine, and continuing to dance about them so long as the sunshine lasts. Disappearing the moment that the sun becomes overclouded, but then sitting high up on the bushes. When at rest bearing a wonderfully close resemblance to the fallen capsule of a leaf-bud! Common in the South, and apparently to be found throughout England wherever there are tall hawthorns, but I have no record for Wales. In Scotland it is found in the Edinburgh and Clyde districts to Dumbartonshire and even to Moray; and in Ireland near Dublin, and in Armagh and Down.

Abroad its range is through Central Europe, Italy, Dalmatia, Finland, Norway, and Bithynia.

#### Genus 9. **STIGMONOTA.**

Antennæ robust; palpi small, but thickly tufted; thorax short and smooth, fore wings without fold; hind margin slightly notched just below the apex; hind wings smooth and without any ridge on the median nervure.

We have eighteen species.

- A. Fore wings shining brown-black or olive-brown with a single dorsal pale spot.
- B. The spot a slender curved streak, not clubbed, silvery white. *S. dorsana.*
- B<sup>2</sup>. The spot a broad curved streak rather clubbed, creamy white. *S. orobana.*
- B<sup>3</sup>. The spot a perpendicular broad streak, squared above, white. *S. cretana.*
- B<sup>4</sup>. The spot narrow, pointed, toothlike, silvery white. *S. leguminana.*
- B<sup>5</sup>. The spot large, broad and flattened above, yellow.
- C. Costa nearly straight, with numerous yellow dots. *S. tramiana.*
- C<sup>2</sup>. Costa rather arched, with a few yellow dots. *S. regiana.*

- A<sup>2</sup>. Fore wings olive black with a once-divided dorsal paler spot.
- D. Double dorsal streak curved, silvery white, head black-brown. *S. internana*.
- D<sup>2</sup>. Streak nearly straight, yellow, face white. *S. pallifrontana*.
- A<sup>3</sup>. Fore wings dull black, dorsal spot pointed, faintly divided.
- E. Second transverse line bent inward. *S. coniferana*.
- E<sup>2</sup>. Second line bent outward before anal angle. *S. cognatana*.
- A<sup>4</sup>. Fore wings grey-brown, much mottled, dorsal streak tooth-like. *S. leplastriana*.
- A<sup>5</sup>. Fore wings olive-brown, dorsal streak slenderly divided. *S. perlepidana*.
- A<sup>6</sup>. Fore wings brown-black; dorsal spot divided by three black streaks.
- F. Costa ornamented with numerous short silvery streaks. *S. compositella*.
- F<sup>2</sup>. Costa with few long oblique pale streaks which meet the dorsal streaks. *S. corollana*.
- A<sup>7</sup>. Fore wings glossy black-brown.
- G. An angulated faintly paler band before the middle. *S. nitidana*.
- G<sup>2</sup>. No paler band, costa very regularly dotted with yellow-white. *S. germanana*.
- G<sup>3</sup>. No paler band, costa very sparingly dotted with pale yellow. *S. ucrana*.
- A<sup>8</sup>. Fore wings spotless reddish black. *S. roscticolana*.

1. **S. dorsana**, *Fab.*; **lunulana**, *Schiff.*.—Expanse  $\frac{1}{2}$  to  $\frac{3}{4}$  inch (12–16 mm.). Fore wings pointed rather trigonate, olive-black with numerous white costal dots and a nearly erect curved, unspotted, silvery-white dorsal streak.

Antennæ rather thick, black-brown; palpi, head, and

thorax olive-brown; abdomen black-brown. Fore wings not broad, but somewhat trigonate; costa nearly straight, not folded; apex rather sharply angulated, hind margin oblique; olive-black finely dusted over its outer area with yellow-brown; on the middle of the dorsal margin is a nearly erect, but curved, slender silvery-white streak, or dorsal blotch; costa thickly dotted with rich creamy-white, from two of which dots faintly lustrous lines continue to the ocellus; this last is of the ground colour, faintly edged with silvery lines, and contains several elongated black dots; cilia olive-brown. Hind wings creamy-white at the base, shading to smoky brown behind; cilia white. Female darker; hind wings brown-black, with white cilia.

Underside of the fore wings shining lead-colour, shading to leaden-white in the middle and dorsal area. Hind wings as on the upper side.

Very rarely an aberration is found in which the dorsal blotch is partially obliterated, and represented only by a spot, or two.

On the wing in May and June.

LARVA deep yellow, head very little darker, raised dots invisible. (J. Sang.)

June and July in the pods of *Orobus tuberosus*, eating through the middle of the seeds. It leaves the pod when full-fed and spins a thick cocoon among rubbish.

Usually a northern species, but found in upland pastures where *Orobus* is common. It flies in the afternoon sunshine over the rough herbage here and on railway banks and rough hill-sides. When the sun is not shining it sits among patches or plants of vetch and is difficult to disturb; but in bright weather it is almost as lively as *Grapholitha ulicetana*. Its most southern locality with us, so far as I know, is in the Black Mountain district of Herefordshire, where Dr. Wood has found it in meadows at the mountain foot, and it does



not seem to have been noticed in Wales or in other hill districts until Yorkshire is reached, but it is not rare among the hills of Cumberland, Durham, and Northumberland; and in Scotland in Perthshire, Moray, and Aberdeenshire; hence I suspect that it will some day be found in other of our hill districts. Abroad it inhabits Central and Southern Europe, South Scandinavia, and Asia Minor.

2. **S. orobana**, *Tr.*.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings rather blunt, dark olive-brown with a thickened, white, clubbed, dorsal marking and conspicuous costal dots.

Antennæ dark brown; palpi, head, thorax, and abdomen pale olive-brown, rather robust. Fore wings rather blunt, costa very slightly arched, apex bluntly and squarely angulated, hind margin almost perpendicular; olive-brown, paler at the base, elsewhere finely dusted with yellow dots; in the middle of the dorsal margin is a partially erect, thick, creamy white curved blotch, distinctly clubbed at the apex; on the costal margin a crowded series of five pairs of creamy white dots; ocellus not large, edged with blueish silver, and containing a cluster of tiny black lines; cilia olive-brown. Hind wings pale smoky brown with the base and cilia pearly white. Female similar, but with dark hind wings.

Underside of the fore wings leaden-black with the disk and costal dots whitish. Hind wings as on the upper side.

On the wing in July.

LARVA when full-fed dark yellow with a decided brown tinge; head and dorsal plate nearly black, spots prominent.

August and September in the pods of *Vicia sylvatica*; eating the unripe seeds, and when one pod is exhausted attacking another. When full-fed forsaking the seeds to spin a tough cocoon among rubbish on the ground. Feeding

also in pods of *Vicia cracca*, *Lathyrus pratensis*, and *L. palustris*.

PUPA rather slender; wing and limb-covers very glossy; abdomen less so, each segment banded with a fine series of minute teeth, and a ridge following it; cremaster short, rounded, and furnished with a strong tuft of hooked bristles; chestnut colour.

The moth flies swiftly and wildly in the afternoon sunshine, from four o'clock onwards, over its food-plant, and is so swift as to be said to be difficult to capture. It certainly flies again at night, since it has been captured, in both sexes, at a strong light, late at night in Wicken Fen. A very local species, originally found on the coast cliffs of Yorkshire near Scarborough—where it seems to have long been known before it was published as a British species. Since found also in the fens of Cambridgeshire, and in Norfolk and Dorset; but so far as I know, not elsewhere in the British Isles. Abroad it seems to be found all over the Continent of Europe, and in Asia Minor.

3. **S. leguminana**, Zell.; **interruptana**,<sup>o</sup> H.-S.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings black-brown, with an erect, pointed, tooth-shaped, silvery white dorsal spot.

Antennæ black; palpi, head, and thorax olive-black, abdomen black-brown. Fore wings rather narrow at the base, costa gently arched, apex bluntly rounded, hind margin oblique; black-brown; on the middle of the dorsal margin is an erect, white tooth-shaped or almost hooked streak or blotch having a brown dot in the middle of its base; costa marked with very faint white dots before the middle and beyond with four pairs of more distinct dots; from the first and third of these arise paler, faintly lustrous, transverse lines; hinder area dusted with yellow, and edged by a

broken deep black line; cilia black-brown with a white dash. Hind wings smoky brown; cilia white. Female similar but larger.

Underside of the fore wings pale lead colour, with white costal dots. Hind wings leaden white.

On the wing in June.

LARVA apparently unknown.

An exceedingly rare species, of which very little is known here. The original specimen in the late Mr. H. Doubleday's collection was said to have been taken in Devon. More recently a few were taken by London collectors in the Epping Forest division of Essex. These were of small size, and their locality was kept secret. About the year 1878 Lord Walsingham took several specimens, of larger size and more striking appearance, near Wicken Fen, Cambs. I know of no more recent captures of this species in these Islands. Abroad it is known to occur in Lower Austria, Galicia, Livonia, Siberia, and in Northern Africa.

4. *S. leplastriana*, *Curt.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings grey with numerous costal brown and white streaks and a large dorsal pointed tooth-spot, preceded and followed by white marbling.

Antennæ pale brown; palpi dusky white; head, thorax and abdomen light brown. Fore wings trigonate, costa straight, apex bluntly angulated, hind margin straight and oblique; drab-grey, the base striped with white; on the middle of the dorsal margin is an erect obliquely curved and pointed, tooth-shaped blotch, containing a brown streak; preceded and followed by olive-brown patches; costa streaked throughout with olive brown and white; ocellus pale buff edged on either side with lustrous white, and containing several short black lines; all the darker spaces and also the hind margin dusted minutely with golden yellow; cilia

smoky brown. Hind wings and their cilia smoky brown. Female similar, rather larger and darker.

Underside of the fore wings leaden black with white costal dots. Hind wings leaden white.

On the wing in July and August.

LARVA cylindrical, rather plump, shining pale glaucous or almost yellowish white, with a darker dorsal vessel; head deep shining black; dorsal plate blackish brown; anal plate pale brown; feet pale green.

August to October and after hibernation from April to June, on wild cabbage (*Brassica oleracea*), in the side shoots and stems eating out the pith, forming a burrow of a few inches in length, and then moving to another shoot, thrusting out its excrement through a hole in the side of the shoot. Assuming the pupa-state in the larval burrow.

The moth flies swiftly in the sunshine, about the wild cabbage, on the cliffs and rocky slopes on which that plant grows. Exceedingly local in these Islands, and, so far as I can ascertain, confined to the coasts of Kent and Dorset. Abroad it inhabits France, Italy, South-west Germany, Hungary, Dalmatia, Bithynia, and Northern Africa.

5. *S. cognatana*, Barr.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16mm.). Fore wings dull smoky black with a curved, white, pointed, tooth-like dorsal spot, beyond which a pale transverse line bends *outward* towards the anal angle.

Antennæ black-brown; palpi, head, thorax, and abdomen dull black-brown. Fore wings moderately broad, costa gently arched, apex bluntly angulated, hind margin straight and very little oblique; dull smoky black or olive black; in the middle of the dorsal margin is an erect, curved and almost hooked, pointed white spot or blotch; opposite to it is the first of four pairs of slender white costal streaks; the second of these pairs is lengthened so as to form the usual second

transverse line, running down by the ocellus and turning outward at its lower angle, towards the anal angle; ocellus furnished with several short black lines; and from it two thin white dashes pass through the otherwise black cilia. Hind wings smoky brown with faintly white cilia. Female similar.

Underside of the fore wings glossy pale lead colour; costal dots, and two hind marginal dashes, white. Hind wings leaden white.

On the wing in June.

LARVA unknown.

This moth is taken only among fir trees—usually, I think, Scotch fir—but is obscure and not well known. It was originally taken by Richard Weaver in Scotland, probably in Perthshire, but was mixed with *S. coniferana* in collections. The late Mr. H. Doubleday, who recognised its distinctness, thought it to be *S. fissana*, Froel.—which, however, has the pale dorsal streak *double*—and Dr. Rebel, in the new edition of Staudinger's List, places it as a synonym of *S. pactolana*, Zell.—to which our insect bears no resemblance. So far as we at present know it is found only in Perthshire, Moray, and Aberdeenshire, in these Islands, and abroad it does not seem to have been recognised.

6. *S. coniferana*, Ratze.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings narrower than in *S. cognatana*, yet very similar; but the transverse slender white line is bent inward before the anal angle.

Antennæ black; palpi, head, and thorax black-brown; abdomen paler brown. Fore wings not very narrow, costa flatly arched, apex decidedly angulated, hind margin oblique and faintly curved; brownish black; in the middle of the dorsal margin is an erect double white streak, which is elongated to meet a similar extension of a faint double

white costal streak at a decided angle; beyond are three more pairs of white costal streaks, the first extending to the corner of the ocellus and thence to the dorsal margin, on its way bending decidedly *inward* from the anal angle; ocellus edged on both sides with silvery white, and filled with short black lines; cilia brown-black. Hind wings blackish brown with a reddish flush; cilia tipped with white. Female similar.

Underside of the fore wings leaden brown, with distinct white costal dots. Hind wings leaden white.

On the wing from the end of May till July.

LARVA dull yellowish white; head pale brown; spots imperceptible. (J. Sang.)

On Scotch fir (*Pinus sylvestris*), feeding in the bark—but Mr. Sang furnishes no information as to the time of feeding. Mr. W. Reid states that he has reared a number of specimens from larvæ feeding in fir *buds*.

The moth sits during the day, or at any rate the early portion thereof, in a fir tree, and if beaten or shaken out buzzes on the sheltered side of the tree and returns to its resting-place as soon as possible; on fine days flies in the afternoon about the tops of the same trees; but if there is a little breeze flies more on the sheltered side and lower down. Just before sunset it loves to fly very swiftly around *young* trees. In the north it may also often be found on the trunks of the older trees. Rather local, but to be found sparingly in fir woods in Kent, Surrey, Hants, Dorset, Norfolk, Suffolk, Gloucestershire, Herefordshire, and Leicestershire; more frequently in the northern counties from Cheshire and Yorkshire; in Scotland widely distributed and common; but I have no records for Wales or Ireland. Abroad it is common in Central Europe, and is found in Piedmont, Portugal, and Norway.

7. **S. corollana**, *Hüb.*; **heegerana**, *Wilk.*—Expanse  $\frac{3}{4}$  inch (10 mm.). Fore wings rather narrow; black-brown with a 4-divided oblique pale dorsal blotch and numerous equally oblique but opposite costal streaks.

Antennæ brown; palpi dusky white; head brown; thorax and abdomen black-brown. Fore wings rather narrow, costa hardly arched, apex bluntly angulated, hind margin oblique; blackish brown, minutely dusted with yellow; between the base and the middle are three pairs of transverse silvery white lines, so strongly angulated in the middle that they go, equally obliquely, to either margin, and especially form a broad divided dorsal blotch; immediately beyond is an oblique central black-brown line, followed by a parallel silvery white stripe; outside this is a large yellowish-white ocellus containing fine black lines; and on the costa are four pale yellow dots; hind margin edged by a deep black line, which is broken by a yellow dot under the apex; cilia smoky brown. Hind wings glossy brown with white cilia. Female similar.

Underside of the fore wings leaden brown, with white costal dots. Hind wings leaden white.

On the wing in July. Zeller, however, says in May.

LARVA bone colour, with pale yellow head and darker jaws.

In autumn and spring, in galls upon aspen, which are produced by *Saperda populnea* upon the trunk of the tree. Pupating in the same. (Zeller.)

A single specimen of this very pretty species has long been in the collections of—first the late Mr. Edwin Shepherd, since in that of the late Dr. P. B. Mason. The record attached to it is to the effect that it was taken at Whittlesea Mere, Hunts, in July (year uncertain, but at least sixty years ago) by the late Peter Bouchard. No additional specimen seems ever to have been found in that locality, or in

these Islands, but no doubt is thrown on the authenticity of the specimen. The locality has long been destroyed, but aspen is still common in that and adjoining counties, and there appears to be no sufficient reason why the moth should not be again found. Abroad it inhabits a great part of Central Europe, also Dalmatia, Finland, and South-west Russia.

8. *S. perlepidana*, *Haw.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings rather pointed; olive-brown, with a round olive-black dorsal spot, edged by a shining white curved streak. Remainder of wing much streaked with shining white.

Antennæ black; palpi and face pale brown; head and thorax dull brown; abdomen black-brown. Fore wings rather narrow, especially so at the base; costa straight, apex angulated and rather acute, hind margin oblique; olive-brown, paler toward the hinder area, but dark from the base to a shining yellowish-white, curved, double, dorsal, raised stripe which curves over an olive-black dorsal spot; immediately beyond this is the ocellus, which is large, whitish, edged with lustrous white lines, and contains two or three dotted black streaks; on the costa are four or five short oblique whitish streaks followed by a longer pair near the apex; cilia smoky white. Hind wings white with the apex smoky brown. Female similar, but the hind wings smoky brown, with whiter cilia.

Underside of the fore wings shining lead-colour; costal dots and a hind marginal dash white. Hind wings white, streaked with brown.

In Scotland and the North of Ireland specimens occur, rarely, in which the dorsal marking or all the silvery-white streaks are suffused by the ground colour.

On the wing from the end of April till June.

LARVA apparently undescribed. Kalténbach says that it feeds, in June, between two tightly spun-together leaves of *Orobis tuberosus*, gnawing the inner epidermis; pupating in



the earth. Sorhagen adds *Orobus niger*, *Lathyrus pratensis*, and *Vicia sepium*, and says that it pupates under dry leaves.

The moth frequents open woods and rough ground where the common bitter-vetch grows in plenty, and flies in a lively manner over this plant in the afternoon sunshine, but is not usually very common; and is generally somewhat local. Found, however, throughout England except the extreme south-west, and in all the Lowlands of Scotland to Perthshire and Aberdeenshire. Not recorded in Wales; and in Ireland only from near Dublin, Kerry, Enniskillen, Sligo, Antrim, and Derry. Abroad it is common through Central Europe, the northern portion of Italy, Russia, Dalmatia, Greece, and Bithynia.

9. *S. pallifrontana*, Zell.—Expanse  $\frac{3}{4}$  inch (10 mm.). Fore wings glossy olive-black, with a neat, double, yellow-white dorsal blotch and costal streaks; face white.

Antennæ black; palpi and face white; remainder of head, thorax, and abdomen brown-black. Fore wings rather short and blunt, costa nearly straight, apex rounded, and hind margin rather so; olive-black, shining; on the middle of the dorsal margin is an erect and faintly curved dorsal blotch composed of two parallel yellow-white streaks; on the costa are four pairs of similar short faintly oblique streaks; ocellus suggested by an obscure, curved, lustrous purple streak; cilia brown. Hind wings dark brown with a reddish gloss; cilia white. Female similar.

Undersides of all the wings glossy leaden-black; costal dots of fore wings white.

On the wing at the end of May and in June.

LARVA greenish; head yellow-brown with brown jaws; dorsal plate slightly orange colour with two, nearly square, dark brown spots; anal segment faintly orange colour; before its transformation, vermilion. (Hofmann.)

July and August in the seed pods *Astragalus glycyphyllos*, at first gnawing the inside of the pod, afterwards eating the seeds. Mr. Warren says that after clearing out the seed pod it moves on to another, its presence being betrayed by a slight discoloration near the base. When full-fed entering the earth for pupation.

The moth flies in the afternoon sunshine, from two o'clock onward; the male with great swiftuess, so as to be nearly invisible on the wing, the females more gently, about its food-plant, the milk vetch. It was discovered as an inhabitant of this county in the year 1887 by Mr. W. Warren, among specimens captured by Mr. Wm. Thompson, of Stony Stratford, Bucks. Since then it has been found in Sussex by Mr. W. H. B. Fletcher; in Surrey by Mr. H. J. Turner; in Herefordshire by Mr. Hutcheson; and in Cambs by Mr. Warren, but it is still one of our most local species, though not rare in these restricted localities—the only ones of which I am aware in these Islands. Abroad it is found in Germany, Lower Austria, Hungary, Livonia, and in Asia Minor.

10. **S. internana**, *Gn.*—Expanse  $\frac{3}{8}$  inch (10 mm.). Fore wings glossy black with an erect curved double dorsal streak, eight costal streaks, and the ocellus, all silvery-white.

Antennæ black; palpi black dusted with white; head, thorax, and abdomen brownish-black. Fore wings rather narrow, costa nearly straight, apex bluntly rounded; black-brown; in the middle of the dorsal margin is a divided, erect, silvery-white blotch, slightly curved outwardly; beyond it a similar silvery-white erect streak indicates the margin of a faint ocellus; costa brightly spotted with silvery yellow-white geminations; hind margin black, cut by a white dash; cilia blackish-brown. Hind wings white, with a black-brown edging at the apex, and white cilia. Female similar, except that the hind wings are black-brown.

Underside of the fore wings pale lead-colour streaked with

white; costa dotted with white. Hind wings as on the upper side.

On the wing in May or June.

LARVA apparently undescribed. There can be little doubt that it feeds on furze (*Ulex europæus*), probably on the seeds.

The male moth flies in the sunshine over and around furze-bushes, dancing merrily about much as does *Grapholitha ulicetana*, but easily distinguished from it when both are flying together by its far whiter hind wings. The female sits on the furze and is easily beaten out, but often falls to the ground, or hides at once in the thick bushes. Rather a local species, yet widely distributed and found in all the southern counties from Kent to Cornwall and to Gloucestershire, Berks and Herts, also more plentifully in the eastern counties to Norfolk; and in Herefordshire, South Yorkshire, Durham and Cumberland. In Scotland in the Edinburgh district, Roxburghshire, and Dumbartonshire; but I find no record in Wales or Ireland. Abroad it seems to be very local, being reported only from France and Andalusia.

11. **S. erectana**, *Burr.*—Expanse  $\frac{3}{8}$  inch (9 mm.). Fore wings shining brown-black, with an erect spotless silvery-white squared dorsal blotch, and four pairs of short costal streaks of the same colour.

Antennæ, palpi and head dark brown; thorax olive-brown. Fore wings rather narrow, rich dark-brown with a faint olive tinge, paler toward the base; markings silvery white; consisting of a perpendicular dorsal blotch reaching two-thirds across the wing, immaculate, sharply defined within, squared at the apex, and slightly toothed outside; there are four pairs of costal streaks, the second pair produced into a narrow angulated band beyond the dorsal blotch, and reaching the anal angle, the lower arm being nearly perpendicular to the margin, slightly dilated, and brilliantly

white; ocellus hardly visible; cilia dark-grey with a square white dash beneath the apex, and a black line along the margin. Hind wings pale smoky-grey at the base, darker on the nervures and hind margin; cilia white.

Of the size and form of *S. internana*, and similar in markings, except that the dorsal blotch is erect and contains no dark lines.

On the wing in June.

LARVA unknown.

The only known specimen of this rather striking-looking insect was taken about 1874 by the Honourable Mrs. Carpenter among broom (*Spartinus scoparium*) near Merton, Norfolk. It has remained in Lord Walsingham's collection under this name for thirty years without the acquisition of any evidence tending towards proof of its being a variety of some other species, nothing therefore remains but to continue it under the present name and hope for further information.

12. **S. compositella**, *Fab*; **composana**, *Dup.*—Expanse  $\frac{3}{8}$  inch (9 mm.). Fore wings shining black-brown with a silvery pale yellow dorsal blotch divided into four and a dense series of costal dots.

Antennæ black; palpi white; head, thorax and abdomen black-brown. Fore wings rather narrow; costa flatly arched; apex rounded; hind margin hardly oblique; glossy black-brown, rather paler at the base; in the middle of the dorsal margin is a yellow-white blotch, composed of four slightly oblique parallel streaks; above this are four pairs of short costal streaks of the same colour; ocellus small, silvery, faintly streaked with *upright* black lines; cilia brown mixed with white. Hind wings white, with white cilia except the apical area, which is smoky-brown with

dark cilia. Female similar, except the hind wings, which are smoky brown, with paler cilia.

Underside of the fore wings leaden brown, with the dorsal blotch and costal dots of the upper side repeated in dull white. Hind wings leaden white.

On the wing in May and June, and a full second generation in August.

LARVA apparently undescribed. It undoubtedly feeds on *Trifolium pratense*, but in what manner is uncertain.

The male frequents clover fields especially, but is often to be found among mixed herbage containing clover in fields and rough chalky or sandy ground, and may be seen flying in the afternoon sunshine in numbers when the weather is still, rather conspicuous from the whiteness of its hind wings, and looking like a white dot buzzing about. The female is easily swept in the daytime off the clover, but flies toward sunset. Common throughout the South of England and to Norfolk, Cambs, Oxfordshire and Herefordshire; also found in Lancashire and Yorkshire; and in Wales in Pembrokeshire and Glamorganshire. It was taken in Scotland—at Moncrieffe Hill, Perthshire, by the late Sir Thomas Moncrieffe, but I know of no other record in that country or any in Ireland. Abroad it is common over the greater portion of the Continent of Europe, and also in Asia Minor.

13. **S. flexana**, Zell.; **weirana**, Dougl.—Expanse  $\frac{3}{4}$  inch (9 mm.). Fore wings nearly ovate; velvety black-brown with white costal dots; palpi dull white.

Antennæ black-brown; palpi white or pale grey; head and thorax dark umbreous; abdomen black-brown. Fore wings somewhat ovate, costa flatly arched, apex rounded, hind margin curved and oblique; velvety black-brown, almost without markings except three or more white costal dots; sometimes there is a faint indication of a large blacker

basal blotch, which has a blunt exterior angle below the middle; ocellus very faint, suggested by obscure lustrous blue streaks; cilia smoky brown. Hind wings and their cilia smoky-black. Female similar.

Underside of the fore wings dark leaden-brown; the hind pair a little paler.

Occasional specimens have the faint markings more distinct, and this form is said to be prevalent on the Continent of Europe.

On the wing at the end of May and in June.

LARVA rather flattened, with deeply divided segments; dull white, with dark green dorsal vessel; raised dots invisible; hairs rather long; head pale brown; dorsal and anal plates faintly tinged with brown.

August and September, on beech, feeding between two leaves which are united by short silken ties; gnawing the inner surface of both leaves, and leaving frass scattered about between them; but without any silken tube.

PUPA light brown with yellowish wing covers. In a small tough egg-shaped cocoon attached within the larval habitation.

The moth frequents beech-woods, and sits during the day on the outside branches of beech-trees. On fine afternoons it flies in the sunshine about them, flying rather high, sometimes in little companies, and often being active from mid-day till sunset. Rather a local species and occurring more especially in chalk districts, found in Kent, Surrey, Sussex, the New Forest, Hants, Essex, Suffolk, Norfolk, Cambs, Herts, Oxfordshire, Somerset, Herefordshire, and even in Yorkshire, but I have no records for other parts of the United Kingdom. Abroad it is found in Central Europe, Northern Italy, Dalmatia, Livonia, Scandinavia, and in Asia Minor.

14. **S. nitidana**, *Fab.*; **redimitana**, *Gu.*—Expanse  $\frac{5}{16}$  inch (7-8 mm.). Very slender and small; fore wings rather narrowly ovate, velvety black-brown with an obscure angulated paler transverse band before the middle, and a few white costal dots.

Antennæ black; palpi dull white; head, thorax and abdomen blackish brown. Fore wings blunt, rather narrow; costa very flatly arched, apex and hind margin gently rounded; glossy black-brown; basal blotch defined only by its black edge, which is angulated above the middle; immediately following it is a cloudy whitish stripe or band similarly bent; costa dotted with pairs of yellowish white streaks which join beneath; ocellus a small lustrous blue cloud; cilia smoky white with darker tips. Hind wings smoky brown with paler cilia. Female similar.

Undersides of all the wings shining black; costa and apex of fore wings dotted with white.

On the wing in May and June.

LARVA active, slender, cylindrical with rather wrinkled segments; semi-transparent pale yellow; dorsal vessel grey, or dusky green; head and dorsal and anal plates bright yellow; anal prolegs rather extended.

July to September, on oak, living between two leaves, the surfaces of which it unites with silk, and forms a tubular habitation between them, with some loose web; gnawing the inner surfaces of both leaves and blotching them considerably.

PUPA pale olive brown, thoracic portion especially glossy; abdomen with a band of fine teeth in front on each segment, with a faint ridge behind it; cremaster hardly visible. In a small cocoon, covered with frass, in the larval habitation, but not in the larva tube. The winter is passed in this condition.

The moth is a very lively and active species, basking in little companies on oak leaves on the trees, in bright sunshine, or dancing about them like little black flies; indifferent even to a cold rough wind if a sunny sheltered corner can be found. Apparently in oak woods throughout England to Cumberland and Westmoreland, but hardly noticed in the Midlands. In Wales very local but common in Pembrokeshire; and in Scotland found in Stirlingshire: but I have no record from Ireland. Abroad it seems only to be recognised in France.

15. **S. trauniana**, *Schiff.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings brown-black with a broad, rather flattened spotless pale yellow dorsal blotch and five to seven sharply defined yellow costal dots.

Antennæ, palpi, head, thorax, and abdomen black-brown. Fore wings of rather even breadth, costa gently arched at its base, else nearly straight, apex squarely angulated, hind margin perpendicular; velvety black-brown; a large, flattened, bright pale yellow blotch occupies the middle of the dorsal margin, and reaches nearly half across the wing: on the costa are five to seven or even eight distinct and definite pale yellow dots; ocellus faintly indicated by obscure bluish shades; cilia smoky white. Hind wings brown-black with smoky white cilia. Female similar.

Underside of the fore wings leaden black with five or six white costal dots, and a yellow cloud along the costal area. Hind wings leaden brown.

On the wing in June and July.

LARVA apparently undescribed. Sorhagen says that it may be found in the spring under the bark of maple (*Acer campestris*). The inference is that it may feed on the seeds.

Mr. Wilkinson says that it is found in Kent flying around the tops of maples. It has however become now a rare



species, if not extinct here, and its habits are but little known. Formerly it was taken near Plumstead, Erith, Bexley and Darenth in Kent, and at Croydon in Surrey; Mr. C. W. Dale states that it was taken at Glanville's Wootton, Dorset, in 1888; and Mr. Purdey reports it at Folkestone, Kent, about 1899, but no certain British locality for it seems to be now known. Abroad it inhabits Belgium, Germany, Austria, Hungary, and Italy.

16. *S. regiana*, Zell.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings broad, with arched costa, rich orange black with a large, rounded-up, dorsal orange blotch, and similar costal dots.

Antennæ black; palpi dusky white; head and thorax dark umbreous; abdomen black-brown; thorax and abdomen both rather thick. Fore wings moderately broad, costa gently but decidedly arched, apex bluntly and squarely angulated, hind margin perpendicular; very glossy, and densely scaled, brown-black with a distinct golden flush; middle portion of the dorsal margin occupied by a large brilliant orange yellow blotch, which has a slight angle on its hinder edge, and is rounded above; on the costa are five or more white or yellow white dots, not sharply outlined; from two of these faint bluish streaks or lines are produced which cross the wing; ocellus indicated by some faint yellow dusting, and some bluish streaks; cilia black-brown. Hind wings glossy brown-black, with paler cilia. Female similar.

Underside of the fore wings leaden black, with whitish costal dots and dorsal region. Hind wings leaden brown.

On the wing in June and July.

LARVA dirty white; head hazel brown with chestnut sutures; dorsal plate transparent yellow, clouded with brown; raised dots oval, smoky black with whitish edging, anal plate with an oval smoky black patch. (Wilkinson.)

On sycamore, feeding in autumn in the seeds; when full fed in September going down to spin up under loose bark near the foot of the tree; assuming the pupa state in April or May.

PUPA amber colour.

The moth sits sometimes on the sycamore trunk or some other tree close by; but commonly hides in the upper part of the tree, out of reach. When visible on the trunks sheltering from a rough wind, its appearance is singularly brilliant, the dorsal orange blotch appearing strikingly glowing. Common in the parks and suburbs of London, and to be found wherever sycamore is common throughout England. Mr. G. Wilkinson, of Carlisle, tells me that in Cumberland the lesser spotted woodpecker may be seen pulling off the sycamore bark to get at the pupæ! I have no record for Wales; and in Scotland only reports by Mr. W. G. Guthrie for Roxburghshire, and by Sir Thomas Moncrieffe for Perthshire. In Ireland it is widely distributed, and has been found near Dublin, Cork, Armagh and Derry. Abroad it is common through Central Europe, and in Northern Italy, Sweden, Dalmatia, and Armenia.

17. **S. germanana**, *Hüb.*: **puncticostana**, *Wilk. Stn.*  
—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Face yellow; fore wings shining satiny black; costa furnished almost throughout with even yellow dots.

Antennæ whitish brown in front, black-brown at the back, palpi and face dull yellow; head, thorax, and abdomen olive black. Fore wings somewhat ovate, costa gently arched, apex rather suddenly rounded, and hind margin much curved; shining satiny black, or brown-black—blackest when just emerged—faintly dusted with yellow atoms; costa dotted distinctly throughout with yellow, some of these yellow dots being continued faintly into lustrous blue lines;

no other markings; cilia glossy brown-black. Hind wings and cilia glossy smoky black. Female similar.

Undersides of all the wings dark leaden brown; costa of fore wings dotted with white.

On the wing in May and June.

LARVA apparently undescribed. The Rev. G. H. Raynor recorded a single moth from oak collected as food for other larvæ. The late Mr. F. Bond stated that he had twice reared it from shoots of hawthorn; but its habits are still obscure.

The moth is found in open woods among undergrowth of oak and other bushes; over these it flies in the sunshine from midday till near sunset; also especially frequents open spots where trees are few and far apart, broad wood paths and other openings. Rarely seen away from woods, but *in* them found in Kent, Surrey, Sussex, Hants, Dorset, Berks, Bucks, Herts, Oxfordshire, Essex, Norfolk, Herefordshire, Cheshire, Yorkshire, and Westmoreland. Not recorded from Scotland nor Wales, and in Ireland only by Mr. Kane at Killarney. Abroad it is widely distributed through Central and Southern Europe, Sweden, Livonia and Eastern Siberia.

18. **S. roseticolana**, *Zell.*; **germarana**, *Willk. Stn.*—Expanse  $\frac{1}{2}$  inch (12-14 mm.). Fore wings oblong, even in width, dark purple brown or rosy black, without markings.

Antennæ purplish brown; palpi light brown; head, thorax, and abdomen blackish brown. Fore wings of rather even width, not narrow; costa flatly arched, apex bluntly angulated, hind margin very little oblique; dark purple brown without markings except some very obscure paler costal dots; cilia smoky brown. Hind wings dark brown, cilia dull white. Female similar.

Undersides of all the wings pale leaden brown, without markings.

On the wing in June and July.

LARVA plump, much wrinkled, and the segmental divisions deep; head brown with the mouth darker; dorsal plate also shining dark brown; anal plate glossy black-brown; dorsal region dull pink shading off beneath to yellowish white, and also paler on the thoracic segments; legs and prolegs of the body colour; raised dots hardly perceptible. (Furnished by Mr. A. Thurnall.) August and September in the fruit (hips) of wild rose, feeding in solid substance of the hip; when full fed spinning up in dead and rotten wood, or under bark, or in dead bramble sticks.

The moth flies high over wild rose in woods or hedges in the afternoon, and appears to be generally distributed throughout England; but seems not to be recorded from Wales or Ireland, and only from Dumbartonshire in Scotland. Abroad it is found throughout Central Europe, Central Italy, Norway, and the Caucasus.

#### Genus 10. **TRYCHERIS**

Antennæ thick; palpi very short, the third joint barely showing; thorax rather roughened; fore wings short, somewhat ovate, costa not folded; hind wings not ridged.

We have only one species.

1. **T. aurana**, *Fab. Willk.*; **mediana**, *Schiff.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (10–12 mm.). Fore wings dull brown, with two rounded orange yellow spots, one in and one beyond the middle.

Antennæ black; palpi, head, thorax, and abdomen brown-black. Fore wings somewhat narrowly ovate, costa arched especially at the base; apex bluntly rounded, hind margin curved, but hardly oblique; dull umbreous, faintly dusted with yellow; one large orange yellow spot lies near the

middle of the dorsal margin and another, rounder, before the apex; cilia dusky brown. Hind wings and their cilia smoky brown. Female similar.

Undersides of all the wings leaden brown.

On the wing from June till August.

LARVA thick, bone colour, with dark brown head and a paler, divided, dorsal plate; body tolerably compact, with delicate hairs. (Kaltenbach.)

September and October on *Heracleum sphondylium*, in the umbel, spinning two seeds together and eating out their substance. Leaving them when full fed to spin up in the ground.

This moth loves to sit upon the umbels of blossom of *Heracleum sphondylium* in the sunshine, or dances over it in the afternoon, and is said to have been seen sitting on the blossoms of southernwood in a garden. It is said even to sit sometimes upon the leaves of the *Heracleum*. Not always common, and rather partial to hill-districts, but apparently to be found throughout England, and probably Wales since it is found in Pembrokeshire. In Scotland rather common in the Clyde Valley, and is found in Dumbartonshire, Perthshire, Stirlingshire, Aberdeenshire, and the Edinburgh district. In Ireland Mr. Kane reports it as generally distributed. Abroad it is common in Central Europe, Piedmont, and Sweden.

#### Genus 11. **LOBESIA.**

Antennæ thickly notched; palpi divergent, thickly tufted, but very short; thorax smooth and slender; abdomen unusually thin; fore wings narrowly trigonate, without costal fold; hind wings semitransparent at the base, faintly ridged.

We have only one species.

1. **L. permixtana**, *Hüb.*, **reliquana**, *Willk.*, *Stn.*—Fore wings narrowly trigonate, pale tawny, or bright yellow chestnut, with two dorsal dark brown spots and a large dark costal triangle.

Antennæ black brown; palpi and head pale buff; thorax tawny; abdomen leaden black. Fore wings narrowly trigonate, costa flatly arched, apex sharply angulated, hind margin oblique; pale tawny or yellow chestnut; basal blotch deeper tawny, its outer margin squarely angulated; close to this is an erect triangular brown dorsal spot, followed by another close to the anal angle; costal area largely occupied by a roughly triangular black brown blotch; hinder area red brown, with faint tawny costal streaks; cilia yellowish white. Hind wings smoky white, with white cilia. Female similar but with the hind wings, and their cilia, dark brown.

Underside of the fore wings leaden brown; base and dorsal margin paler; costa dotted with fulvous. Hind wings smoky white.

On the wing in May and the beginning of June.

LARVA cylindrical, tapering moderately toward either extremity; segmental divisions deeply cut; segments flattened; head small, shining pale brown; dorsal plate similar with a narrow grey edging behind; anal plate not noticeable; colour dark puce, with the raised dots white and small but conspicuous; legs black. Very active, jumping about like a *Gelechia* larva. (Dr. Wood.)

July and August, on sloe (*Prunus spinosa*). There are several records from continental sources of food plants from which it is said to have been reared, but they seem to point to a polyphagous habit, and to a necessity for further observation.

PUPA uniformly pale yellow, in an oval closely woven cocoon, of pure white silk, between two united sloe-leaves. (Dr. Wood.)

The moth frequents the margins and open parts of woods, and flies in a very lively manner over small oak and other trees, and oak bushes, in the late afternoon and early evening. I have seen it also flying commonly over honeysuckle and hawthorn, but only in woods; it often sits when at rest, in birch trees or bushes. Common in suitable places throughout the South of England, with Oxfordshire, Herefordshire, and the Eastern Counties; also recorded in North Lancashire, Yorkshire, Westmoreland, and Cumberland. In Wales in Pembrokeshire; and in Scotland in the Clyde district with Arran, Perthshire, and Stirlingshire. Abroad it has a considerable range through Central and Southern Europe, Sweden, and Asia Minor.

#### Genus 12. **DICHORAMPHA.**

Antennæ short and thick; palpi rather divergent, drooping, tufted; thorax stout. Fore wings with the costa folded at the base, notched below the apex; hind wings broad, opaque, faintly ridged.

We have eleven species.

- A. Fore wings black-brown with a yellow or white dorsal blotch.
- B. Dorsal blotch pale yellow, narrow, curved back.  
*D. pectiverella.*
- B<sup>2</sup>. Dorsal blotch orange yellow, narrow, produced along dorsal margin.  
*D. alpinana.*
- B<sup>3</sup>. Dorsal blotch deep orange, broad, not produced.  
*D. flavidorsana.*
- B<sup>4</sup>. Dorsal blotch white, broad, erect and nearly squared above.  
*D. sequana.*
- B<sup>5</sup>. Dorsal blotch dull, obscure, yellow brown, behind it dusted with orange.  
*D. alpestrana.*
- A<sup>2</sup>. Fore wings purple brown, pointed, narrow.  
*D. acuminatana.*

- A<sup>3</sup>. Fore wings olive brown, dorsal blotch hardly paler.  
 C. Fore wings narrow, marbled with silvery lines.  
*D. plumbagana.*
- C<sup>2</sup>. Fore wings trigonate, dusted with yellow, unicolorous.  
*D. senectana.*
- C<sup>3</sup>. Fore wings trigonate, dorsal blotch faintly paler, its anterior edge dark.  
*D. herbosana.*
- C<sup>4</sup>. Fore wings broad, dorsal blotch paler, its edges much darkened.  
*D. simpliciana.*
- C<sup>5</sup>. Fore wings short and blunt, dorsal blotch produced at the tip.  
*D. consortana.*

1. **D. petiverella**, *Linnaeus*.—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings dark brown, with a curved, oblique, slender, pale yellow dorsal blotch.

Antennae, palpi, head, thorax, and abdomen dull brown. Fore wings somewhat narrow, costa folded at the base, flatly arched; apex bluntly angulated, hind margin oblique; dark brown thickly dusted with yellow atoms; on the middle of the dorsal margin is an oblique and curved pale yellow blotch; costa dotted with black and pale yellow; below, a lustrous stripe arising from one of these dots, reaches the anal angle, and another runs into the hind margin; below it on that margin are three or four black dots; cilia brown with a yellow gloss. Hind wings dark smoky brown; cilia dusky white. Female similar, but without the costal fold.

Undersides of all the wings leaden brown; costa of fore wings dotted with yellow.

Occasional specimens are found in which the dorsal streak is divided across, so as to form two yellow spots.

On the wing in June, July, and August, apparently in two generations.

LARVA sluggish; pinkish white; head shining yellow brown, with chestnut brown sutures; dorsal plate broad,



shining, translucent, with several small blackish clouds. (Wilkinson.)

September and October and after hybernation till the end of May in the root-stocks of *Achillea millefolium*, *Chrysanthemum leucanthemum*, and allied composite plants.

An exceedingly abundant species about hedge-banks, rough fields, and grassy spots generally, flying freely in the sunshine all day long, and having a swift buzzing flight. Common in the outskirts of London, and plentiful throughout England except perhaps Northumberland; also apparently in Wales and the Lowlands of Scotland to Perthshire and Aberdeenshire. In Ireland recorded from Howth on the Dublin coast, Cork, Waterford, and Sligo. Abroad it is found throughout Central and Northern Europe, Piedmont, Dalmatia, Southern Russia, and Bithynia.

2. **D. alpinana**, *Tr.*; **politana**, *Gn.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings narrow yellow brown, with a narrow, oblique, orange yellow dorsal blotch which is extended toward the base on the dorsal margin.

Antennæ and palpi greyish brown dusted with yellow; head and thorax bright yellow brown; abdomen dull brown. Fore wings rather narrow, costa strongly folded at the base and gently arched, apex blunt and squared; rich yellow brown or orange brown; on the dorsal margin near the middle is an oblique, rather narrow, deep yellow blotch, bending far back, and also extending itself forward along the margin; costa faintly dotted with yellowish white; before the hind margin is a row of four black dots; cilia yellowish white, darkened at the tips. Hind wings smoky brown, with white cilia. Female similar but rather larger, and with the costa plain.

Undersides of all the wings leaden brown; costa of fore wings obscurely dotted with white.

On the wing from May to August, probably in two generations.

LARVA cylindrical, moderately slender, yellowish white with a reddish internal dorsal vessel; head bright, light brown; plates both faintly brown.

October to May in the root-stocks of *Achillea millefolium*, preferring to live gregariously in an old spreading root-stock under the bark of which it burrows.

PUPA slender, red-brown; wing and limb-covers rather short, brilliantly glossy; abdomen more dull, each segment with two ridges placed far apart, the anterior set with stout spines; cremaster short and blunt, furnished with hooked bristles. In a silken cocoon in the larva burrow.

The moth is of very local habits; in its favourite places—often in an old quarry or especially rough hill-side, or railway bank where its food-plant grows in large masses, buzzing about round these masses in the sunshine, or sitting quietly on the yarrow leaves, flying again towards dusk. Found occasionally in the London suburbs; but abundantly in the southern counties from Kent to Devon and Somerset; and from Essex to Norfolk; also to Oxfordshire, Bucks, Gloucestershire, and Herefordshire; more sparingly in Cheshire and Yorkshire, and rarely Durham. In Wales I found it in Pembrokeshire; in Scotland Mr. Adam Elliot has taken it in Roxburghshire; and in Ireland Colonel Partridge has secured it near Enniskillen. Abroad it is generally distributed in Central and Southern Europe; and in Asia Minor; and in North America Lord Walsingham found it in Oregon.

3. **D. flavidorsana**, *Knaggs*, **alpinana**, *Wilk.*; **quæstionana**, *Zell.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings broad, dark brown dusted with yellow, with a broad well-defined orange dorsal blotch, which is not extended.

Antennæ black-brown; palpi whitish grey; head and thorax yellow brown; abdomen dull brown. Fore wings rather broad, costa folded at the base and flatly arched, apex bluntly angulated, hind margin rather squared; dark brown thickly dusted with golden yellow atoms, especially so toward the apex; dorsal blotch broad, very little curved back, orange-yellow, its edges well defined and not carried along the margin; costal dots inconspicuous, yellow, from them golden yellow fine lines proceed towards the hind margin, which also is preceded by three black dots; cilia smoky brown. Hind wings smoky brown with dull white cilia. Female similar, rather larger without the costal fold.

Undersides of all the wings shining leaden black.

On the wing in July and August.

LARVA very sluggish, cylindrical, but with the segments slightly swollen; shining pale yellow, with a broad, dark purple, internal dorsal vessel, visible through the whole length of the body; raised dots small, blackish, without hairs; head bright chestnut; jaws brown; dorsal plate pale yellowish brown; anal plate blackish. September and through the winter till June in the root stocks of tansy (*Tanacetum vulgare*) and at the base of the old stems, eating out the pith and gnawing the substance of the thick root-stock; assuming the pupa state in the larval-burrow. Mr. South states that he has reared it from *Chrysanthemum leucanthemum*, and *Matricaria inodora*.

The moth flies occasionally, of its own accord, in the afternoon sunshine, but far more commonly about sunset. It hides usually in tansy plants, from which it is easily disturbed, though not by any means so lively on the wing as the last two species. I once noticed it to be curiously attracted by an old plant of wormwood (*Artemisia absinthium*) in a garden where there was no tansy; the appearance was as though attracted by the scent, and a good many specimens were

thus obtained. It is a regular inhabitant of the London suburbs, and generally far more common there than elsewhere; yet tolerably frequent in the south of England from Kent and Essex to Devon and Somerset; also found in Cambs, Herefordshire, Cheshire, Lancashire, and Yorkshire, and taken by Mr. Robson in Durham. In Wales I found it in Pembrokeshire; in Scotland Sir Thos. Moncrieffe reported it from Moncrieffe Hill, Perthshire; and it is on record in Ireland from Cork and Sligo. Abroad it is recorded from Holland, Switzerland, and Germany, but probably has a wider range. It stood long under the name which has been discovered to belong to the last species, whereby it now proves that the name given to it as a supposed novelty in 1866 by Dr. H. G. Knaggs has really the priority of claim.

4. **D. sequana**, *Hüb.*—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (9-12 mm.). Fore wings short, black-brown, dusted with yellow and white, dorsal blotch white, erect and somewhat squared.

Antennæ thick, black-brown; palpi smoky-white; head and thorax glistening dark brown; abdomen black-brown. Fore wings short and rather narrow, costa folded up at the base and flatly arched, apex bluntly angulated, hind margin hardly oblique; black-brown dusted with yellow, and having some white clouding at the base; dorsal blotch very conspicuous, upright and almost squared, white; costal streaks pale yellow; from one of these a leaden lustrous line crosses to the anal angle, and another, from a different dot, attains the hind margin; below it is a marginal row of three deep black dots; cilia shining smoky brown. Hind wings and their cilia pale smoky brown. Female without the costal fold, rather larger and blacker, with the markings brighter; hind wings darker.

Undersides of all the wings shining pale lead colour; costal dots of fore wings yellowish white.

On the wing in June and July.

LARVA apparently undescribed. Mr. A. Thurnall has reared this species from the roots of yarrow (*Achillea millefolium*) dug up in April. Mr. G. Elisha reared it with other species from roots of tansy (*Tanacetum vulgare*) dug up in the winter.

The moth is specially attached to the common yarrow, sitting among it and flying about it with great constancy in those places in which it is allowed to grow and spread into large clumps, as, for instance, in some of the cemeteries in the suburbs of London, and on railway banks. In such spots it is often to be found in abundance. It is easily disturbed, flying away to another patch of the same plant in the sunshine, but late in the afternoon flies of its own accord. Rather a local species, yet to be found in all the English southern counties to Oxfordshire and Herts; also in the eastern counties to Norfolk, and in Herefordshire, Gloucestershire, and Leicestershire. In Wales I have found it in Pembrokeshire; but this is, so far as I know, the extent of its distribution in these islands. Abroad it is found in Germany, Austria, and Hungary.

5. *D. consortana*, *Will.*.—Expanse  $\frac{3}{8}$  to  $\frac{1}{2}$  inch (9-12 mm.). Fore wings short and blunt, black-brown, with a slightly paler, prolonged dorsal blotch.

Antennæ black-brown; palpi, head and thorax dull umbreous; abdomen blackish brown. Fore wings rather narrow, costa strongly folded at the base and faintly arched, apex blunt, almost squared; dark brown dusted with black; on the dorsal margin is a faintly paler blotch, rather narrow, curved back, and produced at the top towards the apex of the wing; on the costa are four or five pale yellow dots, from which obscure and faint lustrous lines pass irregularly through the hinder area, which otherwise is

dusted with yellow; cilia smoky brown, with a whitish basal line. Hind wings light smoky brown, with whiter cilia, Female similar, but the costa not folded.

Underside of the fore wings pale lead colour; hind wings leaden white.

On the wing in July and August.

LARVA short and thick, pale yellow, the internal dorsal vessel visible at the tenth segment; head and dorsal plate brown; anal plate hardly visible.

May and June on *Chrysanthemum leucanthemum* (ox-eye daisy), boring into the growing shoots just below the buds, causing the shoot to become thickened and distorted; feeding on the pith and sometimes eating out a bud.

PUPA brown; spun up within the larval burrow.

The moth seems to prefer flying about scattered plants of *Chrysanthemum leucanthemum* growing in pastures—very often hill pastures—in the afternoon sunshine. It is not very generally common, yet has a wider distribution than most of its allies; found in Kent, Surrey, Sussex, the Isle of Wight, Dorset, Wilts, Berks, Essex, Suffolk, Norfolk, Herefordshire, Lancashire, Yorkshire, Westmoreland and Durham; in Wales I found it in Pembrokeshire; and in Scotland it is known in the Edinburgh district and Perthshire, and has been found in Shetland; but I know of no record in Ireland. Abroad it seems to be but little known, but has been taken in South-west Germany and in Iceland.

6. **D. alpestrana**, *H.-S.*; **monticolana**, *Hein.?*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–15 mm.). Fore wings short and broad, black-brown dusted with deep yellow; a short thick clubbed dorsal spot, very little paler, is followed by one or two metallic, blue, transverse lines.

Antennæ, palpi, head and thorax dark brown; abdomen shining black-brown. Fore wings rather broad and short,

costa gently arched and narrowly folded; apex angulated; hind margin curved and oblique; brown thickly dusted with yellow atoms; a broad undusted transverse band just before the middle opens out into a faint similar dorsal thick blotch; beyond is a series of faint yellow costal dots, from two of which leaden-blue lines proceed in a curved and obscure manner to cross the wing through orange yellow or ferruginous spaces; cilia dusky white, tipped with brown. Hind wings black-brown, cilia a little paler. Female rather darker, with the costa not folded, and with blacker hind wings.

On the wing in May and June.

LARVA bone white with light brown head. (A. Thurnall.)

March and April on sneezewort (*Achillea ptarmica*), feeding in the underground roots or root-stocks.

This is a very recent addition to the British fauna. Specimens were taken by Mr. A. Thurnall in Epping Forest, Essex, in the year 1892 and subsequent years. They were found in an open marshy spot sitting on stems of grass and rush, up which they ran, after emergence, to dry their wings. In the sneezewort plants growing in the same place the larvæ were found "very snugly hidden away in neat little cocoons attached to the bark of the plants." It appears to have also been taken in Sussex, but these two counties seem to be its only known localities in these Islands. Abroad it is found in Germany, Switzerland, Norway, and the Caucasus.

7. **D. plumbagana**, *Tr.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings rather narrow and pointed, olive brown, marbled with shining stripes and lines, and having a distinct lustrous ocellus.

Antennæ pale brown; palpi, head, and thorax yellow-brown; abdomen shining brown. Fore wings rather narrow,

costa strongly folded at the base, nearly straight; apex rather sharply angulated; hind margin a little oblique; umbreous, or olive brown, abundantly dusted with yellow atoms; before the middle a curved transverse pale silvery brown stripe from the costa opens out into a similar erect dorsal blotch; the following silvery white costal streak is produced back into a slender horizontal line; remaining costal streaks silvery-brown but shorter; over the anal angle is a glistening ocellus enclosed by silvery lines; cilia yellowish white tipped brown. Hind wings smoky white with white cilia. Female similar, often darker, and without the costal fold.

Underside of the fore wings pale leaden brown with white costal dots. Hind wings leaden white.

On the wing from the end of May till July.

LARVA when young moderately slender, clear, semi-transparent, yellowish-white, with a distinct internal dorsal vessel; head light brown, jaws black; plates very pale brown. When full grown, more plump, and the colour dull yellowish white. February till May on yarrow (*Achillea millefolium*), feeding in a gallery at the base of an old flower-stalk, afterwards eating its way into the middle of the stem and clearing out the pith down to the root-stock. Also in the root-stocks of *Chrysanthemum leucanthemum*. Assuming the pupa state in the larval burrow.

The moth loves any fields and waste places at the edge of woods, quarries, chalk pits, railway banks and sandy spots—wherever the yarrow grows in plenty in a dry soil. It flies freely in the afternoon sunshine and suns itself sitting on the plants, continuing active quite till dusk. Very common in the South of England, including the London suburbs, and in the eastern and western counties; much less common in the North of England, and hardly recorded in the midland counties; in Wales plentiful in Pembrokeshire and Glamor-



ganshire and in Scotland in the Edinburgh district, the Clyde Valley, Dumbartonshire, Perthshire and Aberdeenshire. In Ireland apparently restricted to the coast, but found near Dublin and Galway. Abroad common throughout the temperate portions of Europe, and in Asia Minor.

8. **D. senectana**, *Gn.*—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12–16 mm.). Fore wings uniform olive brown, dusted with yellow, with faintly lustrous lines, dorsal blotch, and ocellus; hind margin shining.

Antennæ dark brown with paler rings; palpi, head, and thorax pale umbreous; abdomen grey-brown. Fore wings rather broad behind yet somewhat pointed, costa folded, gently arched, apex angulated, hind margin oblique; olive brown dusted with minute yellow dots or atoms, and singularly uniform in colour; the middle area striped very faintly with transverse shining leaden lines arising from costal streaks, two of them angulated; beyond are shorter and whiter costal streaks; along the hind margin is a row of deep black dots followed by a line of shining silver in the brown cilia. Hind wings smoky whitish brown with white cilia. Female similar, the costa not folded, the hind wings smoky brown.

Underside of the fore wings leaden brown, shading paler to the dorsal margin. Hind wings leaden white.

Very rarely variable, but a beautiful albino form taken in Dorset is recorded by Mr. Eustace Banks.

On the wing from the end of May till July.

LARVA unknown.

A species of quiet, retiring habits, to be taken flying gently in warm weather, about sunset, and seemingly not like its allies, in the sunshine. Apparently restricted to the immediate neighbourhood of the sea, especially frequenting sea-side *undercliffs*, where a little herbage grows on the fallen

rocks and stones; and in quarries when close to the sea beach. Found in the Isle of Wight; in Dorset at the Isle of Purbeck; in Devon at Plymouth and Teignmouth; and in Somerset at Brislington. In Wales near Tenby and Saunders-foot; and in Ireland near Cork. So far as I know this is the extent of its range in these Islands. Abroad it is found in France and North Germany.

9. **D. herbosana**, *Barr*; **tanaceti**, *Stu.*—Expanse  $\frac{1}{2}$  inch (12 mm.). Fore wings rather narrowly trigonate; olive brown, with a long, oblique, pointed, and rather narrow, paler dorsal blotch.

Antennæ dull brown, white in front; palpi, head and thorax brown; abdomen olive brown. Fore wings somewhat trigonate, narrow at the base; costa folded, very gently arched; apex somewhat pointed, hind margin oblique; olive brown, minutely dusted with yellow; dorsal blotch whitish brown, not very broad but extended and pointed towards the apex, and very obscurely divided; costal dots numerous, geminated, brownish white; from the middle of these a double pale lustrous line runs to the anal angle; ocellus extremely faint; before the extreme hind margin are three or four black dots; cilia shining pale olive brown. Hind wings and their cilia smoky white. Female similar, but costa not folded.

Underside of the fore wings shining leaden-brown. Hind wings leaden white.

On the wing in June, July and August, probably in two generations.

LARVA apparently unknown.

This is a northern species, in some places frequenting the slopes of hills and waste ground generally, in others abounding on sea sand hills. It has been supposed to be identical with *D. tanaceti* of Wilkinson and Stainton, but the descrip-

tion of the latter seems rather to refer to *Lipoptylcha saturnana*. In England it is found in Yorkshire, Lancashire, Durham and Cumberland; most probably throughout Scotland, since it is common in the Shetland Isles; but it has been taken in Roxburghshire, the Edinburgh district, Lanark and elsewhere in the Clyde Valley, Perthshire, Kincardineshire and Aberdeenshire. In Ireland I obtained it on the hills close to Belfast, and it has been taken in Donegal and Cork. Abroad its range is not yet ascertained.

10. **D. acuminatana**, *Zoll.* — Expanse, male  $\frac{1}{2}$  inch (12 mm.), female  $\frac{3}{8}$  inch (9 mm.). Fore wings narrowly trigonate, purple brown with a triangular yellow brown dorsal blotch.

Antennæ, palpi, and head brown; thorax purple-brown; abdomen pale brown. Fore wings trigonate and pointed, costa folded at the base and nearly straight, apex sharply angulated, hind margin straight and very oblique; purple brown rippled with dark brown; dorsal blotch long, broad at the base, but running off obliquely to a point which is directed back; yellowish brown or whitish brown; costa from above this to near the apex streaked with faint leaden lines in pairs, some of which extend across the wing or wind irregularly about; cilia shining whitish brown. Hind wings and their cilia pale smoky brown. Female smaller and stouter, costa not folded, richer purple brown and often very bright and pretty; hind wings also a little darker.

Underside of the fore wings shining leaden brown. Hind wings leaden white.

On the wing in May and June, and in a second generation in August and September.

LARVA thick and stumpy, semi-transparent white (or when young faintly tinged with green), with a distinctly visible brown dorsal vessel; head light brown, with a darker line

down the middle of the face; dorsal and anal plates very pale yellow, hardly distinguishable.

February till April, and a second generation in July, on *Chrysanthemum leucanthemum* (ox-eye daisy), feeding in the lower, thick portion of the stem, burrowing passages under the skin, and finally eating into the pith in the middle. Assuming the pupa state in the burrow.

This pretty little species is of rather quiet secluded habits, and is most noticed in the second generation, probably because so few species are then out; it seems almost restricted to chalk, limestone, and green-sand districts, and is not in these very conspicuous; the male flies a little in the late afternoon sunshine, but the female keeps much concealed among the food plant. Recorded in all the southern counties from Kent to Cornwall, Somerset and Gloucestershire; also in Essex, Cambs, Herts, Oxfordshire, Hunts, Herefordshire, North Lancashire and Durham; and in Wales very abundant in Pembrokeshire. In Scotland in East Lothian, Fife, Ayr, Renfrew, and Argyle with Arran. In Ireland at Howth, Athlone, Sligo and Connemara. Abroad in Central Europe, Italy, Sweden, Finland, Livonia, and in Asia Minor.

11. **D. simpliciana**, *Haw*; **caliginosana**, *Tr. Hein.*—  
Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12-16 mm.). Rather stout; fore wings broad; dull brown with a broad olive brown dorsal blotch, edged in front with black brown.

Antennæ dark brown; palpi pale brown, blackened at the tips; head and thorax umbreous; abdomen black-brown. Fore wings rather broad, costa folded at the base, then arched, apex squarely angulated or almost protruded, hind margin faintly retuse and perpendicular; dull brown, very minutely dusted with yellow brown; dorsal blotch broad and large, rather wide to the apex; olive brown edged in front with black brown; costal dots faint, pale brown; leaden

lines also faint and obscure; close to the hind margin are three black dots; cilia brown, shading to smoky black. Hind wings dark brown with a reddish flush; cilia dull white. Female similar, the costa not folded.

Underside of the fore wings smoky brown, shaded behind with pale yellow; dorsal margin white. Hind wings pale brown, with a yellow flush.

On the wing in July and August.

LARVA cylindrical; dirty white, with an irregular dark internal dorsal vessel; head light brown; dorsal and anal plates faintly brownish.

October to May or June; in the root-stocks of *Artemisia vulgaris* (mugwort), feeding under the bark, sometimes in little companies of five or six together.

PUPA bright brown, in a cocoon within the larval burrow.

Rather a sluggish species, sitting during the day in the plants of mugwort, from which it is easily disturbed in the warm sunshine, but merely flies about the same plants and settles again. At sunset and till dusk it moves about of its own accord, but is never very active, and rarely leaves the neighbourhood of its food-plant. Not uncommon in the London suburbs, and to be found in the southern counties from Kent to Devon and Somerset, also Berks, Oxfordshire, Herts, the eastern counties to Norfolk; and in Herefordshire, Worcestershire, Cheshire, and Lancashire; but I find no record in the north of England nor in Wales; though in Scotland it is recorded from Aberdeen and Moray, and Mr. W. Dale says in the Hebrides. In Ireland, the only capture of which I have any knowledge is that of Canon Cruttwell at Renvyle, Galway. Abroad it is found throughout Central Europe, and in Sweden and Livonia.

### Gems 13. LIPOPTYCHA.

Antennæ short and thick; palpi rather divergent, drooping, tufted; thorax stout; fore wings rather broad; costa *not*

folded, hind margin notched below the apex; hind wings broad, faintly ridged.

We have two species, of which *L. saturnana* has fore wings, decidedly broader than those of *L. plumbana*.

1. **L. plumbana**, Scop.; **ulicana**, Willk., Stn.—Expanse  $\frac{1}{2}$  to  $\frac{5}{8}$  inch (12-15 mm.). Rather stout; fore wings not folded, rather narrow, olive brown dusted with yellow scales; dorsal blotch faintly paler.

Antennæ black-brown; palpi, head, thorax and abdomen dull brown. Fore wings rather narrow, costa without fold, and very little arched; apex blunt, hind margin a little oblique; dark brown thinly dusted, especially in the hinder area, with yellow brown; dorsal blotch usually perceptible dull faint yellowish brown, rounded above and but little oblique; costal dots minute, alternately black and yellow brown; before the hind margin are two or three deep black round dots. The usual leaden lines extremely faint; cilia shining dark brown. Female similar, but often much darker, also stouter.

Undersides of all the wings shining lead colour; costal dots of the fore wings dull white.

End of May till August, possibly in two generations.

LARVA of nearly uniform bulk, opaque, yellowish white; becoming somewhat transparent just before spinning up; head amber-colour; mouth black; plates and legs ochreous; raised dots inconspicuous.

March and April on *Chrysanthemum leucanthemum*, feeding low down in the roots, grooving them deeply under cover of a web, having also eaten out the hearts of the roots and root-stocks. Also feeding, probably as a second generation, in August, in stems of *Achillea millefolium*, feeding downward toward the root-stock. (Dr. J. W. Wood.)

A tolerably lively, active species, always on the move, yet not apparently especially fond of sunshine, moving about, if

the weather is warm, at all hours, and to be found in almost every grassy place. Common in the suburbs of London, and throughout England and Wales; but less so in the northern counties; yet found in Scotland in the Edinburgh and Clyde districts including Galloway, also in Perthshire. In Ireland reported from the Dublin district, Galway, Sligo, Down, Antrim, and Fermanagh. Abroad common throughout Central Europe, Spain, Italy, Sardinia, and Dalmatia, and in North America, in California.

2. **L. saturnana**, *Gn., tanacetii*, *Willk., Stn.* (?)—Expanse  $\frac{1}{2}$  to  $\frac{3}{8}$  inch (12–16 mm.). Rather stout; fore wings moderately broad, olive brown thickly dusted with yellow dots, and with a broad, hardly perceptible paler dorsal blotch.

Antennæ, palpi, head, and thorax olive-brown dusted with yellow; abdomen shining brown. Fore wings rather broad, costa without fold, very gently arched; apex bluntly angulated, hind margin but little oblique; olive brown very thickly and minutely dusted with yellow and black scales; dorsal blotch very indistinctly paler, broad, somewhat constricted about the middle, costal streaks broad, almost triangular, but obscure, leaden white; cilia shining pale brown. Hind wings smoky brown with dull white cilia. Female similar, often darker.

Undersides of all the wings shining light leaden brown.

On the wing in June and July.

LARVA short and stout, semi-transparent, white with a distinctly visible internal brown dorsal vessel, and colourless shining raised dots; head deeply lobed, light brown; mouth darker brown; dorsal and anal plates very faintly brownish, both mottled behind with darker brown.

October till May in root-stocks of tansy (*Tanacetum vulgare*); when young mining under the bark, where it may be

found lying curved in the burrow: when older penetrating to the middle of the root-stock and feeding on the pith. Pupating in the larval habitation.

The male moth flies vigorously in the hot sunshine through the day, settling from time to time on the tansy plants—where the female remains at rest till sunset; but both are readily captured about the plants, though seldom found away from them. Rather local, yet found, and often commonly, in Surrey, Sussex, Hants, Dorset, Devon, Somerset, Wilts, Berks. Oxfordshire, Cambs, Suffolk, Norfolk, Herefordshire, Leicestershire, Staffordshire, Cheshire, and Lancashire: and in Wales in Pembrokeshire. In Scotland only recorded from Perthshire; and in Ireland from Athlone and Antrim. Abroad it is found in France, Germany, Spain, and Northern Italy.



## ADDENDA

Vol. II. p. 85. **Sesia andraeniformis (andrenaeformis)**, *Lasp.* This species has been bred by the Hon. N. Charles Rothschild, from a larva found mining in a stem of *Viburnum lauratum*. The specimen emerged on June 10, 1906.

Vol. II. p. 350. **Epichnopteryx reticella**, *Newm.* Has been observed among maram grass near the river, by the Rev. A. P. Waller, at Hemley, Suffolk, in 1903, and again in 1904.

**Pyrrharctia isabella**, *Abbot and Smith.* Two caterpillars, identified by Dr. Chapman as the larvae of this North American Arctiid, were found by Mr. Murray, of Carnforth, in the autumn of 1905, on a waste piece of ground. A similar larva had been obtained at the same place a few years previously. A figure of the larva will be found in the *Entomologists' Monthly Magazine* for 1906, p. 101.

Vol. V. p. 141. **Leucania favicolor**, *Barr.* The Rev. A. P. Waller obtained a red form of this species at Hemley, Suffolk, on September 10, 1904. The Rev. E. N. Bloomfield, who records the capture, adds: "Mr. Waller first met with it in 1893, and took several in 1901, but it was then supposed to be a red form of *L. pallens*, and was not recorded." Paymaster-in-chief Gervase F. Mathew, who gives a very full account of its life history (*Ent. Mo.*

*May.* (2) xvi.), also took specimens of this species in August and September, 1904, and he states that it has been recorded from near Southend and Rochester. Lieutenant J. J. Jacobs took six specimens in the Isle of Sheppey in July, 1906 (*Entom.* xxxix.). It would seem that this species is sometimes double-brooded, and also that it is extending its area.

Vol. IX. p. 397. **Trichoptylus paludum**, *Zoll.* To the other localities given, Esher district, Surrey, may be added. The larva feeds on sundew (*Drosera*). The early stages are figured and described by Dr. Chapman (*Trans. Ent. Soc.*, Lond. 1906, pp. 133-151, pl. vii.).

Vol. X. p. 1. **Cateremna terebrella**, *Zinck.* On July 3, 1906, a specimen of this species emerged from a small, rough-looking cone that Mr. Thurnall, on March 22 of the same year, had picked up from the ground under a spruce fir in Surrey.

Vol. XI. p. 138. **Pædisca (Epiblema) sordidana**. The early stages have been described by Mr. Eustace R. Bankes (*Ent. Mo. May.* (2) xvii. p. 101).

**Tortrix pronubana**, *Hüb.* (Plate 504, fig. 8 ♂, 8<sup>a</sup> ♀, nat. size).

“The larva is green, of a shade a little lighter than the young leaves of the euonymus, hairs whitish, and head of a somewhat paler and yellower shade than the body and glabrous. It spins together the terminal developed leaves of the euonymus, and feeds upon the tender shoot enclosed between them.

“The pupa is very dark brown, almost black, from 9 mm. to 10 mm. in length, and enclosed in a dense silken web between the leaves where the larva had fed.

“The imago is easily recognised by the bright orange colour

of its hind wings. The male measures from 15 mm. to 16 mm. in expanse. Fore wings rich greyish brown, reticulated with darker brown, with a broad deep red-brown fascia from the middle of the costa, where it is narrowest, to the inner margin, where it broadens out, extends to the anal angle, and unites with an irregular triangular patch of the same colour that occupies the apical and hind marginal areas. Hind wings bright orange bordered with black, usually with a few black scales scattered along the veins; but in one of the specimens reared, they are so dense as to almost obscure the orange colour of the wing. Cilia orange.

“The female is a larger and more sombre insect. It measures 18 mm. to 22 mm. in expanse, is slightly paler in colour than the male, and the reticulations more clearly defined. The brown fascia is of a duller and less reddish tone, and its central portion is often indicated only in outline, as is also the triangular patch of the apical region. The body in both sexes is ringed with yellow.

“The imago emerges during September and October, and its time of flight appears to be in the morning sunshine between eight and ten o'clock.”—(R. Adkin, *Entom.* xxxix. 265).

This species was added to the British List by Mr. W. H. Fletcher, who captured a fine fresh specimen in his garden at Bognor, on October 23, 1905. Another example was taken at Eastbourne by Mr. H. Cooper in the autumn of the same year. In September 1906, Mr. Robert Adkin found some larvæ and pupæ spun up in the terminal leaves of enonymus at Eastbourne, and from these imagines were obtained during the latter part of September and in October.

According to Rebel (“Catalog der Lep. Pal. Faun.” ii. p. 89), who places the species between *T. viridana*, Z. and *T. forsterana*, F., it would seem to be essentially a southern insect, occurring only in North-west Africa, Asia Minor, and Southern Europe. It has, however, been recorded as abun-

dant in September and October in Guernsey. So far, only autumnal imagines have been obtained in this country or in Guernsey, but the species is said to be double brooded in the South of France, and most likely it will be found that there is a summer emergence of moths in England also. Mr. Luff states that in Guernsey, during the summer of 1900, a number of the larva of this species were found feeding on grapes grown in a greenhouse. He also mentions that the moth had not been noticed in the island previous to the autumn of 1898.

*The Publishers hereby express their grateful acknowledgments to Mr. SOUTH for his kindness in seeing the latter portion of MR. BARRETT'S MS. through the press.*

# GENERAL INDEX

TO THE ENTIRE WORK

INCLUDING

FAMILIES, GENERA, SPECIES, AND SYNONYMS

*Synonyms are in italic*

	<i>Plate</i>	<i>Vol.</i>	<i>Page</i>		<i>Plate</i>	<i>Vol.</i>	<i>Page</i>
Ablabia . . . . .		10	252	Acidalia— <i>continued</i>			
<i>argentana</i> . . . . .	156	10	253	<i>ochrata</i> . . . . .	329	8	7
<i>gouana</i> . . . . .		10	253	<i>ornata</i> . . . . .		332	8 46
<i>osseana</i> . . . . .	156	10	252	<i>osseata</i> . . . . .		330	8 28
<i>pratana</i> . . . . .		10	252	<i>ossata</i> . . . . .			8 29
Abraxas . . . . .		7	256	<i>perochraria</i> . . . . .	329	8	9
<i>grossulariata</i> 321, 322		7	256	<i>promutata</i> . . . . .		331	8 12
<i>pantaria</i> . . . . .		7	269	" . . . . .			8 129
<i>sylcata</i> . . . . .		7	261	<i>remutaria</i> . . . . .		332	8 57
<i>ulmata</i> . . . . .	320	7	261	<i>rubiginata</i> . . . . .			8 3
Acentropus . . . . .		9	300	<i>rubricata</i> . . . . .		329	8 3
<i>niveus</i> . . . . .	109	9	300	<i>rusticata</i> . . . . .		330	8 25
Acherontia . . . . .		2	15	<i>scutulata</i> . . . . .		329	8 11
<i>Atropis</i> . . . . .	11	2	16	<i>straminata</i> . . . . .		331	8 38
Achroia . . . . .		10	150	<i>strigaria</i> . . . . .			8 63
<i>alvarilla</i> . . . . .		10	150	<i>subsericeata</i> . . . . .		332	8 51
<i>grisella</i> . . . . .	143	10	150	<i>trigeminata</i> . . . . .		330	8 17
Acidalia . . . . .		8	1	<i>virgularia</i> . . . . .			8 31
<i>aversata</i> . . . . .	333	8	63	ACIDALIIDÆ . . . . .			7 303
<i>bisetata</i> . . . . .	329	8	11	<i>Acipitilus</i> . . . . .			9 398
<i>configuraria</i> . . . . .	330	8	22	<i>baliodaetylus</i> . . . . .	118	9	403
<i>degeneraria</i> . . . . .	331	8	69	<i>galactodaetylus</i> . . . . .	118	9	399
<i>dilutaria</i> . . . . .	330	8	29	<i>pentadaetylus</i> . . . . .	119	9	406
<i>dimidiata</i> . . . . .		8	11	<i>spilodaetylus</i> . . . . .	118	9	401
<i>fumata</i> . . . . .	333	8	60	<i>tetradactylus</i> . . . . .	119	9	401
<i>herbariata</i> . . . . .	330	8	20	Acontia . . . . .			6 171
<i>holosericata</i> 331, 333		8	32	<i>catena</i> . . . . .			6 180
<i>humilata</i> . . . . .		8	28	<i>lucida</i> . . . . .			6 171
<i>immorata</i> . . . . .	332	8	49	<i>luctuosa</i> . . . . .	216	6	171
<i>immutata</i> . . . . .	332	8	51	<i>solaris</i> . . . . .	216	6	171
<i>incanaria</i> . . . . .	331	8	31	<i>venustula</i> . . . . .	216	6	177
<i>incanata</i> . . . . .		8	42	Acosmetia . . . . .			5 261
<i>inornata</i> . . . . .	333	8	66	<i>caliginosa</i> . . . . .	219	5	262
<i>intrepectaria</i> . . . . .		8	29	Acrobasis . . . . .			10 5
<i>marginipunctata</i> . . . . .		8	38	<i>consociella</i> . . . . .	125	10	6
" . . . . .		8	42	<i>rubrotibiella</i> . . . . .	426	10	42

	Plate	Vol.	Page		Plate	Vol.	Page
<i>Acrobasis—continued</i>				<i>Agrotis—continued</i>			
tumidella . . . . .	426	10	8	ripe . . . . .	128	3	319
verrucella . . . . .	125	10	10	Saucia . . . . .	135	3	369
<i>Acrolita</i>				segetum . . . . .	125	3	188
consequana . . . . .	179	11	71	sinuata . . . . .		3	176
harkerana . . . . .		11	71	spinifera . . . . .		3	318
servillana . . . . .	179	11	73	strigula . . . . .		3	162
<i>Acronycta</i>		3	219	subgothica . . . . .	132	3	351
aceris . . . . .	120	3	229	suffusa . . . . .	124	3	235
alni . . . . .	121	3	236	tritici . . . . .	131, 132	3	336
auricoma . . . . .	121	3	257	valligera . . . . .	124	3	278
cuspis . . . . .		3	253	vestigialis . . . . .		3	278
euphorbiae . . . . .	122	3	261	zpsilon . . . . .		3	283
leporina . . . . .	120	3	221	<i>Alencis</i>		6	368
ligustri . . . . .	123	3	270	pictaria . . . . .	275	6	368
megacephala . . . . .	120	3	233	<i>Alispa</i>		10	35
menyanthidis . . . . .	121	3	254	Angustella . . . . .	429	10	36
psi . . . . .	122	3	250	<i>Amblyptilus</i>		9	358
rumicis . . . . .	123	3	265	acanthodactylus . . . . .	414	9	358
strigosa . . . . .	121	3	241	cosmodactylus . . . . .		9	360
tridens . . . . .	122	3	245	punctidactylus . . . . .	414	9	360
<i>Æthia</i>		6	286	<i>Amphipyra</i>		5	248
emortualis . . . . .	261	6	286	pyramidea . . . . .	218	5	249
<i>Agdistes</i>		9	341	tragopogonis . . . . .	217	5	252
bennettii . . . . .	413	9	341	" . . . . .		6	385
<i>Aglossa</i>		9	279	<i>Amphysa</i>		10	209
cuprealis . . . . .	407	9	281	germingana . . . . .	150	10	210
pinguinis . . . . .	407	9	279	germingana . . . . .		10	210
<i>Agrophila</i>		6	188	prodromana . . . . .	450	10	211
sulphuralis . . . . .	248	6	188	walkerana . . . . .		10	211
trabealis . . . . .		6	188	<i>Anaitis</i>		8	119
<i>Agrotera</i>		9	259	plagiata . . . . .	376	8	119
memoralis . . . . .	405	9	259	<i>Anarta</i>		6	237
<i>Agrotis</i>		3	277	cordigera . . . . .	250	6	222
agathina . . . . .	133	3	357	melanopa . . . . .	250	6	238
aquilina . . . . .	132	3	347	myrtilli . . . . .	251	6	224
Ashworthii . . . . .	136	3	380	<i>Anchylopera</i>		11	108
cinerea . . . . .	126	3	298	baudiana . . . . .		11	119
corticea . . . . .	126	3	293	biarcuana . . . . .	484	11	113
crassa . . . . .		3	287	comptana . . . . .	485	11	116
cursoria . . . . .	129	3	324	derasana . . . . .	485	11	121
exclamationis . . . . .	127	3	306	diminutana . . . . .	485	11	123
" . . . . .		3	393	harpena . . . . .		11	127
fennica . . . . .		3	375	inornatana . . . . .	484	11	114
helvetina . . . . .		3	379	ketana . . . . .	486	11	127
lata . . . . .		3	287	lundana . . . . .	485	11	119
lucerna . . . . .	136	3	388	mitterbacheriana . . . . .	486	11	124
lunifera . . . . .	128	3	313	myrtiliana . . . . .	485	11	117
nigricans . . . . .	130	3	331	paludana . . . . .	485	11	120
obelisca . . . . .	133	3	353	ramella . . . . .		11	127
obscura . . . . .		3	384	siculana . . . . .	484	11	109
porphyrea . . . . .	131	3	362	subarcuana . . . . .	484	11	114
precox . . . . .	134	3	365	uncana . . . . .	484	11	112
puta . . . . .	125	3	301	uncella . . . . .		11	112
pyrophila . . . . .	135	3	376	unguicella . . . . .	484	11	111
ravida . . . . .	136	3	381	upupana . . . . .	486	11	126

	Plate	Vol.	Page		Plate	Vol.	Page
Anerastia		10	65	ARCTIIDE		2	235
lotella	431	10	65	Argynnis		1	166
ANERASTIIDE		10	65	Adippe	23	1	151
Angerona		6	344	Aglaia	24	1	167
prunaria	269, 270	6	344	Dia		1	183
Ania		8	85	Euphrosyne	25	1	174
emarginata	335	8	86	Lathonia	25	1	170
Anisopteryx		7	247	Niobe		1	165
æscularia	319	7	247	Paphia	22	1	156
Anthocharis		1	28	Selene	26	1	178
Cardamines	4	1	28	Argyrolepia		10	326
Anticlea		8	125	æneana	463	10	334
badia	340	8	132	alella		10	330
berberata	340, 344	8	138	badiana	462	10	327
cuculata		8	126	baumanniana	463	10	331
derivata	340	8	135	cnicana	462	10	328
nigrofasciaria		8	135	dabrisana		10	336
rubidata	340	8	129	hartmanniana		10	331
sinuata	339, 344	8	126	maritimana	464	10	337
Antigastra		9	253	rubigana		10	327
catalaunalis	404	9	253	schreibersiana	463	10	333
Antithesia		10	356	subbaumanniana	463	10	332
salicella	465	10	356	tesserana	463	10	330
Apamea		4	379	zephyrana	464	10	336
basilinea	181	4	380	Arsilonce		3	274
connexa	184	4	396	Albocosa		3	274
didyma		4	391	Venosa	123	3	274
gemina	182	4	383	Asphalia		3	204
oculea	183	4	391	diluta	118	3	204
ophiogramma	184	4	399	flavicornis	118	3	207
pabulatricula		4	396	ridens	119	3	211
unanimis	184	4	387	Aspilates		7	37
Apatra		1	104	citraria	288	7	41
ilia		1	110	gilvaria	287	7	44
iris	16	1	105	ochrearia		7	41
APATURIDE		1	104	strigillaria	287	7	38
Aphomia		10	138	Aspis		11	20
colonilla		10	139	uddmanniana	472	11	20
sociella	442	10	139	Astroscepus		3	158
Aplasta		9	158	nubeculosus		3	158
ononaria	394	9	158	sphinx		3	155
Aplecta		4	154	Asthena		8	196
advena	154	4	154	Blomeri	350	8	204
nebulosa	155	4	162	candidata	349	8	199
tincta	154	4	158	luteata	349	8	196
Aporia		1	18	sylvata	349	8	202
Crategi	1	1	18	testacuta		8	202
"		1	311	Asthena		11	170
"		4	403	abigana		11	181
"		4	271	abigana		11	181
Aporophyla		4	280	argyrana	493	11	179
Australis	167	4	271	cosmophorana	492	11	172
lutulenta	166	4	276	fimbriana	493	11	178
nigra	166	4	276	nanana	494	11	184
Arctia		2	265	ochsenheimeriana	492	11	171
caja	71, 72	2	265	pygmaea	493	11	182
villica	73	2	270				

	Plate	Vol.	Page		Plate	Vol.	Page
<i>Asthenia—continued</i>				<i>Botys—continued</i>			
<i>scopariana</i> . . . . .	492	11	173	<i>pandalis</i> . . . . .	397	9	187
<i>splendidulana</i> . . . . .	492	11	176	<i>prunalis</i> . . . . .	401	9	224
<i>strobilella</i> . . . . .	492	11	175	<i>repandalis</i> . . . . .	399	9	201
<i>subsequana</i> . . . . .	493	11	181	<i>sambucalis</i> . . . . .	399	9	206
<i>ustomaculana</i> . . . . .	493	11	183	<i>stachydalis</i> . . . . .	400	9	208
<i>vacciniana</i> . . . . .	494	11	185	<i>terrealis</i> . . . . .	398	9	196
<i>Aventia</i> . . . . .		6	276	<i>uliginosalis</i> . . . . .	398	9	193
<i>flexula</i> . . . . .	261	6	276	<i>verbascalis</i> . . . . .	399	9	203
<i>Axyia</i> . . . . .		4	1	<i>Brachytaenia</i> . . . . .		10	345
<i>putris</i> . . . . .	137	4	1	<i>hartmanniana</i> . . . . .	465	10	347
<i>Bactra</i> . . . . .		11	129	<i>scriptana</i> . . . . .		10	347
<i>furfurana</i> . . . . .	486	11	131	<i>semifasciana</i> . . . . .	465	10	346
<i>lanceolana</i> . . . . .	486	11	129	<i>woodiana</i> . . . . .	465	10	348
<i>Bapta</i> . . . . .		6	362	<i>Bradyepetes</i> . . . . .		8	81
<i>binaculata</i> . . . . .		6	365	<i>ovata</i> . . . . .		8	81
<i>punctata</i> . . . . .		6	362	<i>amataria</i> . . . . .	335	8	81
<i>taminata</i> . . . . .	274	6	365	<i>BREPHIDES</i> . . . . .		6	327
<i>temerata</i> . . . . .	274	6	362	<i>Brephos</i> . . . . .		6	327
<i>Batodes</i> . . . . .		10	206	<i>notha</i> . . . . .	264	6	332
<i>angustiorana</i> . . . . .	450	10	206	<i>parthenias</i> . . . . .	264	6	327
<i>Biston</i> . . . . .		7	118	<i>Bryophila</i> . . . . .		6	204
<i>betularius</i> . . . . .	301	7	127	<i>alge</i> . . . . .		6	214
<i>hirtarius</i> . . . . .	300	7	119	<i>glandifera</i> . . . . .	249	6	204
<i>prodromarius</i> . . . . .	300	7	123	<i>marialis</i> . . . . .		6	204
<i>stratarius</i> . . . . .		7	123	<i>perla</i> . . . . .	250	6	210
<i>Boarmia</i> . . . . .		7	192	<i>Cabera</i> . . . . .		6	356
<i>abietaria</i> . . . . .	312	7	207	<i>exanthemaria</i> . . . . .	274	6	359
<i>cinctaria</i> . . . . .	311, 314	7	203	<i>pusaria</i> . . . . .	273	6	356
<i>consortaria</i> . . . . .	310	7	199	<i>Cænonympha</i> . . . . .		1	255
<i>genovaria</i> . . . . .		7	217	<i>Arcania</i> . . . . .		1	262
<i>repandata</i> . . . . .	313, 314	7	212	<i>Davus</i> . . . . .	36	1	255
<i>rhomboidaria</i> . . . . .	315	7	217	<i>Pamphilus</i> . . . . .	36	1	263
<i>roboraria</i> . . . . .	310	7	193	<i>Tiphon</i> . . . . .		1	255
<i>BOARMIDE</i> . . . . .		6	339	<i>Typhon</i> . . . . .		1	255
<i>Boletobia</i> . . . . .		6	280	<i>Calamia</i> . . . . .		5	115
<i>fuliginaria</i> . . . . .	261	6	280	<i>brevilinea</i> . . . . .	200	5	119
<i>Bomolocha</i> . . . . .		6	312	<i>lutosa</i> . . . . .	199	5	116
<i>crassalis</i> . . . . .	263	6	312	<i>phragmitidis</i> . . . . .	199	5	124
<i>fontis</i> . . . . .		6	312	<i>Calamotropha</i> . . . . .		10	122
<i>BOMBYCIDÆ</i> . . . . .		3	1	<i>paludella</i> . . . . .	440	10	122
<i>BOMBYCINA</i> . . . . .		2	139	<i>Calligenia</i> . . . . .		2	200
<i>Botys</i> . . . . .		9	182	<i>miniata</i> . . . . .	66	2	209
<i>alpinalis</i> . . . . .		9	193	<i>Callimorpha</i> . . . . .		2	249
<i>asinalis</i> . . . . .	399	9	199	<i>dominula</i> . . . . .	70	2	243
<i>crocealis</i> . . . . .	400	9	210	<i>Hera</i> . . . . .	70	2	251
<i>decrepitalis</i> . . . . .	401	9	220	<i>Calocampa</i> . . . . .		6	51
<i>ferrugalis</i> . . . . .	400	9	212	<i>exoleta</i> . . . . .	237	6	51
<i>flavalis</i> . . . . .	397	9	186	<i>vetusta</i> . . . . .	237	6	59
<i>forficalis</i> . . . . .	401	9	216	<i>Calophasia</i> . . . . .		6	40
<i>fuscalis</i> . . . . .	398	9	194	<i>linariæ</i> . . . . .		6	56
<i>hyalinalis</i> . . . . .	397	9	190	<i>lunata</i> . . . . .		6	52
<i>lupulinolis</i> . . . . .		9	184	<i>platyptera</i> . . . . .		6	49
<i>lutealis</i> . . . . .	401	9	217	<i>Calymnia</i> . . . . .		5	314
<i>nubilalis</i> . . . . .	397	9	184	<i>affinis</i> . . . . .	225	5	323
<i>olivalis</i> . . . . .	401	9	222	<i>diffinis</i> . . . . .	225	5	321



	Plate	Vol.	Page		Plate	Vol.	Page
<i>Calymnia</i> —continued				<i>Celona</i> . . . . .	5		1
<i>pyralina</i> . . . . .	224	5	318	<i>Haworthi</i> . . . . .	185	5	1
" . . . . .	376	8		<i>Cerastis</i> . . . . .		6	9
<i>trapezina</i> . . . . .	224	5	314	<i>erythrocephala</i> . . . . .	233	6	9
<i>Camptogramma</i> . . . . .		8	323	<i>ligula</i> . . . . .	234	6	15
<i>bilineata</i> . . . . .	364	8	323	<i>spalvea</i> . . . . .		6	15
<i>Capua</i> . . . . .		10	250	<i>subnigra</i> . . . . .		6	15
<i>favillaceana</i> . . . . .	456	10	251	<i>vaccinii</i> . . . . .	234	6	12
<i>ochraceana</i> . . . . .		10	251	<i>Cerigo</i> . . . . .		4	340
<i>Caradrina</i> . . . . .		5	279	<i>cytherea</i> . . . . .	174	4	340
<i>alsines</i> . . . . .	221	5	286	<i>matura</i> . . . . .		4	340
<i>ambigua</i> . . . . .	221	5	283	<i>Cerura</i> . . . . .		3	82
<i>blanda</i> . . . . .	221	5	289	<i>bicuspis</i> . . . . .	100, 101	3	83
<i>cubicularis</i> . . . . .	221	5	292	<i>bifida</i> . . . . .	101	3	90
<i>morphens</i> . . . . .	220	5	280	<i>furecula</i> . . . . .	101	3	86
<i>quadripunctata</i> . . . . .		5	292	<i>vinula</i> . . . . .	102	3	93
<i>superstes</i> . . . . .		5	286	" . . . . .		3	393
<i>turacaci</i> . . . . .		5	289	" . . . . .		4	403
<i>Carpocapsa</i> . . . . .		11	153	<i>Chaerocampa</i> . . . . .		2	51
<i>grossana</i> . . . . .	490	11	157	<i>celerio</i> . . . . .	51	2	51
<i>juliana</i> . . . . .	490	11	159	<i>Elpenor</i> . . . . .	52	2	59
<i>nimbana</i> . . . . .	490	11	160	<i>nerii</i> . . . . .	53	2	62
<i>pomonella</i> . . . . .	490	11	154	<i>porcellus</i> . . . . .		2	55
<i>splendana</i> . . . . .	489	11	156	<i>Chareas</i> . . . . .		4	127
<i>Carsia</i> . . . . .		8	423	<i>graminis</i> . . . . .	151	4	127
<i>imbutata</i> . . . . .	375	8	423	<i>Chariclea</i> . . . . .		6	143
<i>paludata</i> . . . . .		8	423	<i>delphinii</i> . . . . .	244	6	143
<i>Cartella</i> . . . . .		11	101	<i>marginata</i> . . . . .	244	6	146
<i>bilunana</i> . . . . .	482	11	101	<i>umbra</i> . . . . .		6	146
<i>Cataclysta</i> . . . . .		9	284	<i>Chariptera</i> . . . . .		4	317
<i>lemnalis</i> . . . . .	407	9	284	<i>aprilina</i> . . . . .	172	4	318
<i>leucata</i> . . . . .		9	284	<i>Cheimatobia</i> . . . . .		8	385
<i>Catephia</i> . . . . .		6	229	<i>boreata</i> . . . . .	371	8	385
<i>alchymista</i> . . . . .	251	6	229	<i>brumata</i> . . . . .	372	8	388
<i>Cateremna</i> . . . . .		10	1	<i>Cheimatophila</i> . . . . .		10	273
<i>terebrella</i> . . . . .	425	10	1	<i>hyemana</i> . . . . .	458	0	273
" . . . . .		11	268	<i>tortricella</i> . . . . .	458	0	273
<i>Catocala</i> . . . . .		6	246	<i>Chesias</i> . . . . .		8	413
<i>electa</i> . . . . .	253	6	256	<i>obliquaria</i> . . . . .	375	8	416
<i>elocata</i> . . . . .		6	258	<i>rufata</i> . . . . .		8	416
<i>fraxini</i> . . . . .	252, 254	6	247	<i>spartiata</i> . . . . .	375	8	413
<i>nupta</i> . . . . .	253	6	252	<i>Chilo</i> . . . . .		10	124
<i>promissa</i> . . . . .	255	6	263	<i>cicatricellus</i> . . . . .		10	127
<i>sponsa</i> . . . . .	254	6	259	<i>phragmitellus</i> . . . . .	440, 441	10	125
<i>Catoptria</i> . . . . .		11	198	<i>CHLOEPHORIDÆ</i> . . . . .		2	174
<i>cæcimaculana</i> . . . . .	496	11	205	<i>Chrysophanus</i> . . . . .		1	55
<i>cana</i> . . . . .	496	11	203	<i>Chryseis</i> . . . . .		1	60
<i>caribana</i> . . . . .		11	202	<i>Circe</i> . . . . .		1	61
<i>expallidana</i> . . . . .	496	11	199	<i>dispar</i> . . . . .	9	1	56
<i>fulvana</i> . . . . .	496	11	202	" . . . . .		1	312
<i>hohenwerthiana</i> . . . . .		11	200	<i>dorilis</i> . . . . .		1	61
" . . . . .		11	203	<i>gordius</i> . . . . .		1	61
<i>ibiciana</i> . . . . .		11	199	<i>Phleas</i> . . . . .	9	1	62
<i>jaccana</i> . . . . .		11	202	<i>virgaureæ</i> . . . . .		1	55
<i>parvulana</i> . . . . .		11	200	<i>Cidaria</i> . . . . .		8	249
<i>scopoliana</i> . . . . .	496	11	200	<i>associata</i> . . . . .		8	287

	Plate	Fol.	Page		Plate	Fol.	Page
<i>Cidaria</i> —continued				<i>Coccyx</i> —continued			
<i>corylata</i> . . . . .	354	8	257	<i>nigricana</i> . . . . .	495	11	191
<i>dotata</i> . . . . .	360	8	287	<i>proximana</i> . . . . .	11	190	
<i>dotata</i> . . . . .		8	292	<i>tedella</i> . . . . .	494	11	188
<i>fulvata</i> . . . . .	361	8	290	COCHLIOPODIDÆ . . . . .	2	169	
<i>immanata</i> . . . . .	357, 358	8	271	<i>Cœnobia</i> . . . . .	5	93	
<i>miata</i> . . . . .	353	8	254	<i>despecta</i> . . . . .	5	93	
<i>picata</i> . . . . .	354	8	260	<i>rufa</i> . . . . .	196	5	93
<i>populata</i> . . . . .	361	8	295	<i>Colias</i> . . . . .	1	32	
<i>prunata</i> . . . . .	360	8	283	<i>Edusa</i> . . . . .	6	1	35
<i>psittacata</i> . . . . .	353	8	250	" . . . . .	1	312	
<i>pyraliata</i> . . . . .	361	8	292	<i>hyale</i> . . . . .	5	1	32
<i>russata</i> . . . . .	355, 356	8	266	" . . . . .	1	312	
<i>sagittata</i> . . . . .	354	8	263	<i>Collix</i> . . . . .	9	19	
<i>silacea</i> . . . . .	360	8	279	<i>sparsata</i> . . . . .	380	9	20
<i>siterata</i> . . . . .		8	250	<i>Conchylis</i> . . . . .	10	278	
<i>suffumata</i> . . . . .	359	8	275	<i>maculosana</i> . . . . .	459	10	278
<i>testata</i> . . . . .	362	8	299	<i>Coreyra</i> . . . . .	10	147	
<i>truncata</i> . . . . .		8	266	<i>cephalonica</i> . . . . .	443	10	147
<i>Cilix</i> . . . . .		3	79	<i>Cordiceps entomor-</i>			
<i>glauca</i> . . . . .		3	79	<i>rhiza</i> . . . . .	376	8	
<i>spinula</i> . . . . .		3	79	<i>Coremia</i> . . . . .	8	141	
<i>Cirrædia</i> . . . . .		5	355	<i>designata</i> . . . . .	8	155	
<i>Xerampelina</i> . . . . .	229	5	355	<i>didymata</i> . . . . .	346	5	175
" . . . . .		8	429	" . . . . .	8	429	
<i>Cledeobia</i> . . . . .		9	267	<i>ferrugata</i> . . . . .	344	8	158
<i>angustalis</i> . . . . .	436	9	268	<i>fluctuata</i> . . . . .	342	8	147
<i>Cleoceris</i> . . . . .		4	313	<i>miaria</i> . . . . .	8	168	
<i>viminalis</i> . . . . .	171	4	314	<i>montanata</i> . . . . .	341	8	142
<i>Cleora</i> . . . . .		7	163	<i>multistrigaria</i> . . . . .	347	8	178
<i>angularia</i> . . . . .		7	171	<i>munitata</i> . . . . .	343	8	151
<i>glabraria</i> . . . . .	306	7	167	<i>pectinitaria</i> . . . . .	345	8	168
<i>lichenaria</i> . . . . .	306	7	163	<i>propugnata</i> . . . . .	343	8	155
<i>viduaria</i> . . . . .	306	7	171	<i>quadrifasciaria</i> . . . . .	343	8	166
<i>Clepsis</i> . . . . .		10	208	<i>salicata</i> . . . . .	346	8	171
<i>rusticana</i> . . . . .	450	10	208	<i>unidentaria</i> . . . . .	345	8	161
<i>Clisiocampa</i> . . . . .		3	13	<i>viridaria</i> . . . . .	8	168	
<i>castrensis</i> . . . . .	89	3	17	<i>Cossus</i> . . . . .	2	146	
<i>neustria</i> . . . . .	88	3	13	<i>cossus</i> . . . . .	2	146	
<i>Cloantha</i> . . . . .		5	37	<i>ligniperda</i> . . . . .	61	2	146
<i>perspicillaris</i> . . . . .	189	5	38	CRAMBIDÆ . . . . .	10	68	
<i>polyodon</i> . . . . .		5	38	<i>Crambus</i> . . . . .	10	72	
<i>Clostera</i> . . . . .		3	166	<i>adipellus</i> . . . . .	10	85	
<i>anachoreta</i> . . . . .	114	3	169	<i>alpinellus</i> . . . . .	432	10	74
<i>curtula</i> . . . . .	114	3	166	<i>cassentiniellus</i> . . . . .	10	117	
<i>pyra</i> . . . . .		3	172	<i>chrysonuchellus</i> . . . . .	438	10	115
<i>reclusa</i> . . . . .	115	3	172	<i>contaminellus</i> . . . . .	438	10	110
<i>Cnemidophorus</i> . . . . .		9	343	<i>craterellus</i> . . . . .	438	10	117
<i>rhododactylus</i> . . . . .	413	9	343	<i>culmellus</i> . . . . .	439	10	118
CNEPHASIDÆ . . . . .		10	252	<i>dumetellus</i> . . . . .	433	10	81
<i>Coccyx</i> . . . . .		11	187	<i>ericellus</i> . . . . .	433	10	83
<i>comitana</i> . . . . .		11	188	<i>falsellus</i> . . . . .	432	10	76
<i>distinctana</i> . . . . .	495	11	190	<i>fascellus</i> . . . . .	437	10	105
<i>finitima</i> . . . . .		11	187	<i>furcatellus</i> . . . . .	434	10	92
<i>hyrciniana</i> . . . . .		11	188	<i>geniculeus</i> . . . . .	439	10	113
<i>netorivaga</i> . . . . .	491	11	187	<i>hamellus</i> . . . . .	434	10	86

	Plate	Fol.	Page		Plate	Fol.	Page
<i>Crambus—continued</i>				<i>Dasychira—continued</i>			
hortuellus . . . . .	439	10	120	fascelina . . . . .	82	2	320
inquinatellus . . . . .	437	10	108	puḍibunda . . . . .	81	2	316
latistrius . . . . .	434	10	91	Dasydia . . . . .		7	152
margaritellus . . . . .	435	10	94	obfuscaria . . . . .	304	7	153
myellus . . . . .	435	10	97	<i>tenebraria</i> . . . . .		7	156
pascuellus . . . . .	434	10	87	torvaria . . . . .		7	156
perellus . . . . .	436	10	98	Dasyptolia . . . . .		4	289
<i>pinellus</i> . . . . .		10	95	templi . . . . .	168	4	289
pinetellus . . . . .	435	10	95	Deilephila . . . . .		2	36
pratellus . . . . .	433	10	79	Daucus . . . . .		2	50
<i>rorellus</i> . . . . .		10	117	Euphorbie . . . . .	48	2	36
salinellus . . . . .	438	10	111	galli . . . . .	49	2	42
selasellus . . . . .	435	10	101	livornica . . . . .	50	2	46
sylvellus . . . . .	433	10	85	Deiopeia . . . . .		2	241
tristellus . . . . .	436	10	103	pulchella . . . . .	69	2	241
uliginosellus . . . . .	434	10	89	" . . . . .		2	370
Verellus . . . . .	432	10	78	DELTOIDES . . . . .		6	276
Crocallis . . . . .		7	74	Demas . . . . .		2	322
elinguaria . . . . .	293	7	74	ceryli . . . . .	82	2	323
Crymodes . . . . .		4	119	Dianthœcia . . . . .		4	223
<i>assimilis</i> . . . . .		4	119	albimacula . . . . .	163	4	243
exulis . . . . .	151	4	119	cæsia . . . . .	165	4	254
Cryptoblabes . . . . .		10	3	capsincola . . . . .	163	4	239
bistriga . . . . .	425	10	3	carpophaga . . . . .	162	4	228
Cucullia . . . . .		6	60	compta . . . . .		4	248
abrotani . . . . .	239	6	83	conspersa . . . . .	164	4	249
absynthii . . . . .	239	6	80	cucubali . . . . .	163	4	236
<i>artemesiæ</i> . . . . .		6	83	<i>chii</i> . . . . .		4	224
asteris . . . . .	239	6	73	irregularis . . . . .	161	4	224
chamomillæ . . . . .	240	6	86	luteago <i>r</i> Barretii . . . . .	165	4	259
gnaphalii . . . . .	239	6	77	<i>nana</i> . . . . .		4	249
lychnitis . . . . .	238	6	70	Diasemia . . . . .		9	255
" . . . . .		7	333	literals . . . . .	405	9	255
scrophulariæ . . . . .	238	6	66	<i>literata</i> . . . . .		9	255
umbratica . . . . .	240	6	90	Ramburialis . . . . .	405	9	257
verbasci . . . . .	238	6	62	Dichelia . . . . .		10	212
Cyclopides . . . . .		1	298	gnomana . . . . .		10	214
<i>Palæmon</i> . . . . .		1	298	grotiana . . . . .	451	10	212
Paniscus . . . . .	40	1	298	Dichrorampha . . . . .		11	249
Cymatophora . . . . .		3	193	acuminatana . . . . .	504	11	261
duplaris . . . . .	116	3	193	alpestrana . . . . .	503	11	256
fluctuosa . . . . .	117	3	196	alpinana . . . . .	503	11	251
<i>octogesima</i> . . . . .		3	201	<i>alpinana</i> . . . . .		11	252
ocularis . . . . .	117	3	201	<i>caliginosana</i> . . . . .		11	262
or . . . . .	117	3	198	consortana . . . . .	503	11	255
CYMATOPHORIDÆ . . . . .		3	186	flavidorsana . . . . .	503	11	252
DANAIDÆ . . . . .		1	111	herbosana . . . . .	504	11	260
Danais . . . . .		1	111	<i>monticolana</i> . . . . .		11	256
Archippus . . . . .	15	1	112	petiverella . . . . .	503	11	259
" . . . . .		8	428	plumbagana . . . . .	504	11	257
Dapsilia . . . . .		10	338	<i>politana</i> . . . . .		11	251
rutilana . . . . .	464	10	338	<i>questionana</i> . . . . .		11	252
Dasyampa . . . . .		6	4	senectana . . . . .	504	11	259
rubiginea . . . . .	233	6	4	sequana . . . . .	503	11	254
Dasychira . . . . .		2	316	simpliciana . . . . .	504	11	262

	Plate	Fol.	Page		Plate	Fol.	Page
Dichrorampha—con-				Emmelesia—continued			
tinued				affinitata . . .	351	8	220
tanacetii . . .		11	260	albulata . . .	351	8	226
Dictyopterix . . .		10	197	alchemillata . . .	351	8	223
<i>avidoumiana</i> . . .		10	200	blandiata . . .	352	8	240
bergmanniana . . .	449	10	199	decolorata . . .	351	8	229
bifasciana . . .	449	10	200	ericetata . . .	352	8	231
contaminana . . .	450	10	204	<i>minorata</i> . . .		8	251
conwayana . . .	449	10	201	<i>taeniata</i> . . .	352	8	237
forskaleana . . .	450	10	203	unifasciata . . .	352	8	234
holmiana . . .	450	10	202	Endopisa . . .		11	192
leflingiana . . .	449	10	197	<i>funebrana</i> . . .	495	11	195
Dicycla . . .		5	310	<i>gemmiferana</i> . . .	495	11	194
<i>oo</i> . . .	223	5	310	<i>nebritana</i> . . .	495	11	193
Diloba . . .		3	175	<i>nigricana</i> . . .		11	193
<i>caeruleocephala</i> . . .	115	3	175	<i>pisana</i> . . .		11	193
Dioryctria . . .		9	413	Endotricha . . .		9	303
<i>abactella</i> . . .		9	413	<i>flammealis</i> . . .	409	9	303
<i>decuriella</i> . . .	420	9	413	ENDOTRICHIDÆ . . .		9	303
<i>palumbella</i> . . .	420	9	418	<i>ENDROMIDÆ</i> . . .		3	50
<i>splendidella</i> . . .	420	9	415	<i>Endromis</i> . . .		3	50
<i>sylvestrella</i> . . .		9	415	<i>versicolora</i> . . .	96	3	50
Diphthera . . .		3	214	Ennomos . . .		7	55
<i>orion</i> . . .	119	3	214	<i>alniaria</i> . . .	290	7	60
Dipterygia . . .		5	30	<i>alniaria</i> . . .		7	56
<i>pinastri</i> . . .	188	5	30	<i>angularia</i> . . .	292	7	70
<i>scabriuscula</i> . . .		5	30	<i>autumnaria</i> . . .	290	7	56
Drepana . . .		3	63	<i>erosaria</i> . . .	291	7	67
<i>binaria</i> . . .		3	70	<i>fuscantaria</i> . . .	291	7	63
<i>culturaria</i> . . .		3	73	<i>quercinaria</i> . . .		7	70
<i>falcataria</i> . . .	98	3	63	<i>tiliaria</i> . . .		7	60
<i>fulcula</i> . . .		3	63	Ephestia . . .		10	49
<i>hamula</i> . . .	99	3	70	<i>cahiritella</i> . . .	430	10	56
<i>harpagula</i> . . .		3	67	<i>calidella</i> . . .	430	10	50
<i>sicula</i> . . .	99	3	67	<i>cantella</i> . . .		10	56
<i>unguicula</i> . . .	99	3	73	<i>elutella</i> . . .	431	10	58
DREPANULIDÆ . . .		3	62	<i>ficella</i> . . .		10	50
Drymonia . . .		3	130	<i>ficulella</i> . . .	430	10	52
<i>chaonia</i> . . .	108	3	130	<i>kühniella</i> . . .	430	10	54
<i>dodonea</i> . . .	109	3	133	<i>passulella</i> . . .		10	56
<i>trimacula</i> . . .		3	133	<i>semirufa</i> . . .	431	10	60
Dryobota . . .		4	309	Ephyra . . .		7	304
<i>protea</i> . . .	171	4	309	<i>annulata</i> . . .		7	316
Dyschorista . . .		5	298	<i>linearia</i> . . .		7	312
<i>fissipuncta</i> . . .		5	299	<i>omicronaria</i> . . .	327	7	316
<i>suspecta</i> . . .	222	5	302	<i>orbicularia</i> . . .	328	7	320
<i>upsilon</i> . . .	223	5	299	<i>pendularia</i> . . .	328	7	324
Earias . . .		2	181	<i>porata</i> . . .	326	7	304
<i>chlorana</i> . . .	64	2	181	<i>punctaria</i> . . .	326	7	308
Eggs, plates 256-260, 265				<i>trilineararia</i> . . .	327	7	312
-268, 277-280		6		Epichnopteryx . . .		2	344
Ellopia . . .		7	114	<i>calvella</i> . . .	84	2	344
<i>fasciaria</i> . . .	299	7	114	<i>fusca</i> . . .		2	344
<i>prosapiaria</i> . . .		7	114	<i>hirsutella</i> . . .		2	344
Emmelesia . . .		8	219	<i>pulla</i> . . .	85	2	347
<i>adequata</i> . . .		8	240	<i>radicella</i> . . .		2	347

	Plate	Vol.	Page		Plate	Vol.	Page
<b>Epichnopteryx</b> — <i>con-</i>				<b>Eudemis</b> — <i>continued</i>			
<i>tinued</i>				<i>dormogana</i> . . . . .	11	70	
reticella . . . . .	85	2	350	euphorbiana . . . . .	479	11	68
undulella . . . . .		2	353	fuligana . . . . .	478	11	63
<b>Epinephile</b> . . . . .	1	1	240	latifasciana . . . . .	479	11	70
Hyperanthus . . . . .	35	1	251	littoralis . . . . .	478	11	65
Janira . . . . .	33	1	240	<b>Eulepia</b> . . . . .	2	236	
Tithonus . . . . .	34	1	245	cribrum . . . . .	69	2	238
<b>Epione</b> . . . . .	7	7	101	grammica . . . . .	69	2	236
advenaria . . . . .	298	7	101	striata . . . . .	2	236	
apiciaria . . . . .	297	7	104	<b>Euperia</b> . . . . .	5	307	
<i>parallelaria</i> . . . . .		7	107	fulvago . . . . .	223	5	307
vespertina . . . . .	298	7	107	<i>palucca</i> . . . . .	5	307	
<b>Epischmia</b> . . . . .	9	9	441	<b>Eupisteria</b> . . . . .	8	207	
bankesiella . . . . .	424	9	442	heparata . . . . .	350	8	207
<i>boisdurwalliella</i> . . . . .		9	444	obliterata . . . . .	8	207	
farrella . . . . .	424	9	444	<b>Eupithecia</b> . . . . .	9	23	
<b>Epunda</b> . . . . .	4	4	284	abbreviata . . . . .	392	9	135
lichenea . . . . .	167	4	284	absinthiata . . . . .	391	9	117
<b>Erastria</b> . . . . .	6	6	200	albipunctata . . . . .	388	9	77
<i>fasciana</i> . . . . .		6	200	assimilata . . . . .	391	9	122
fuscula . . . . .	248	6	200	campanulata . . . . .	390	9	110
<b>Erebia</b> . . . . .	1	1	209	castigata . . . . .	388	9	71
<i>Ethiops</i> . . . . .		1	216	centanreata . . . . .	385	9	45
Blandina . . . . .	29	1	216	consignata . . . . .	381	9	33
<i>Cassiope</i> . . . . .		1	210	constrictata . . . . .	387	9	66
epiphron . . . . .	29	1	210	coronata . . . . .	393	9	146
Ligea . . . . .		1	220	debiliata . . . . .	393	9	144
<i>Medea</i> . . . . .		1	216	denotata . . . . .	9	81	
<b>Eremobia</b> . . . . .	5	5	26	<i>distinctaria</i> . . . . .	9	66	
ochroleuca . . . . .	188	5	26	dodoneata . . . . .	392	9	132
<b>Eriogaster</b> . . . . .	3	3	8	egenaria . . . . .	9	87	
lanestris . . . . .	87	3	9	exiguata . . . . .	393	9	137
<b>Eriopsela</b> . . . . .	11	11	76	expallidata . . . . .	391	9	114
fractifasciana . . . . .	479	11	76	extensaria . . . . .	383	9	35
quadrana . . . . .	479	11	78	fraxinata . . . . .	399	9	103
<b>Eromene</b> . . . . .	10	10	68	<i>harvorthiata</i> . . . . .	9	94	
ocellea . . . . .	432	10	68	helveticaria . . . . .	389	9	84
<b>ERYCINIDÆ</b> . . . . .	1	1	101	indigata . . . . .	386	9	64
<b>Eubolia</b> . . . . .	9	9	6	innotata . . . . .	390	9	106
bipunctaria . . . . .	379	9	9	<i>insignata</i> . . . . .	9	33	
Cervinata . . . . .	379	9	12	irriguata . . . . .	386	9	57
<i>limitata</i> . . . . .		9	16	isogrammata . . . . .	389	9	94
mæniata . . . . .		9	15	jasionæata . . . . .	392	9	124
mensuraria . . . . .	380	9	16	lariciata . . . . .	388	9	69
palumbaria . . . . .	378	9	6	linariata . . . . .	384	9	42
<i>plumbaria</i> . . . . .		9	6	minutata . . . . .	391	9	120
<b>Euchelia</b> . . . . .	2	2	246	nanata . . . . .	387	9	62
jacobææ . . . . .	69	2	247	<i>oblongata</i> . . . . .	9	45	
<b>Euclidia</b> . . . . .	6	6	268	<i>pimpinellata</i> . . . . .	9	74	
glyphica . . . . .	255	6	268	pimpinellata . . . . .	388	9	81
mi . . . . .	255	6	272	plumbeolata . . . . .	389	9	92
<b>Eudemis</b> . . . . .	11	11	63	pulchellata . . . . .	384	9	39
<i>abscissana</i> . . . . .		11	63	pumilata . . . . .	394	9	152
bifasciana . . . . .	478	11	67	pusillata . . . . .	386	9	60
<i>decrepitana</i> . . . . .		11	67	pygmeata . . . . .	390	9	96

	Plate	Vol.	Page		Plate	Vol.	Page
<b>Eupithecia—continued</b>				<b>Eupacilia—continued</b>			
<i>rectangulata</i>	394	9	149	<i>adana</i>		10	299
<i>rufifasciata</i>		9	152	<i>vectisana</i>	460	10	300
<i>satyrata</i>	389	9	88	<b>Eurois</b>		4	101
<i>sobrinata</i>	393	9	140	<i>adusta</i>	150	4	114
<i>subciliata</i>	392	9	130	<i>herbida</i>	149	4	102
<i>subfulvata</i>	385	9	52	<i>occulta</i>	150	4	106
<i>subnotata</i>	390	9	108	<i>porphyrea</i>		4	111
<i>subumbrata</i>	386	9	54	<i>prasinu</i>		4	102
<i>succenturiata</i>	385	9	49	<i>satura</i>	149	4	111
<i>tenuiata</i>	392	9	127	<b>Eurymene</b>		7	47
<i>togata</i>	381	9	26	<i>dolobraria</i>	288	7	47
<i>tripunctata</i>		9	77	<b>Euthemonia</b>		2	257
<i>trisinigata</i>	390	9	99	<i>russula</i>	74	2	257
<b>Valerianata</b>	390	9	101	<b>Eutricha</b>		3	49
<i>venosata</i>	382	9	29	<i>pini</i>		3	49
<i>viminata</i>		9	101	<b>Euzophera</b>		10	27
<i>virgaureata</i>	387	9	74	<i>artemesiella</i>		10	29
<i>vulgata</i>	391	9	112	<i>cinerosella</i>	428	10	29
<b>Euplexia</b>		5	48	<i>pinguis</i>	428	10	27
<i>lucipara</i>	190	5	49	<b>Fidonia</b>		7	7
<b>Eupacilia</b>		10	280	<i>atomaria</i>	283	7	8
<i>affinitata</i>	460	10	302	<i>brunneata</i>		7	17
<i>albicapitana</i>		10	283	<i>carbonaria</i>	284, 285	7	22
<i>alismana</i>	460	10	299	<i>conspicua</i>	284, 285	7	19
<i>ambigua</i>		10	287	<i>linbaria</i>		7	19
<i>ambiguella</i>	459	10	287	<i>pinetaria</i>	284	7	17
<i>angustana</i>	459	10	289	<i>piniaria</i>	282	7	12
<i>authenticana</i>		10	314	<b>Fumea</b>		2	353
<i>atricapitana</i>	459	10	281	<i>anicanella</i>		2	361
<i>cancellana</i>		10	302	<i>betulina</i>	86	2	361
<i>carduana</i>		10	285	<i>crassiorella</i>	85	2	354
<i>ciliella</i>	461	10	312	<i>intermediella</i>	85	2	357
<i>cruentana</i>		10	289	<i>roboricolella</i>	86	2	359
<i>curvistrigana</i>	459	10	291	<i>salicicolella</i>		2	363
<i>degreyana</i>	460	10	306	<i>salicolella</i>	86	2	363
<i>dubitana</i>	459	10	284	<i>sepium</i>		2	365
<i>erigerana</i>	461	10	314	<i>tabulella</i>	86	2	365
<i>flaviciliana</i>	460	10	308	<b>Galleria</b>		10	135
<i>geyeriana</i>	460	10	297	<i>cercana</i>		10	136
<i>gilvicomana</i>	459	10	292	<i>mellonella</i>	442	10	136
<i>griseana</i>		10	299	<b>GALLERIIDÆ</b>		10	135
<i>heydeniana</i>		10	310	<b>Gastropacha</b>		3	42
<i>hybridella</i>	459	10	285	<i>ilicifolia</i>	96	3	46
<i>implicitana</i>	460	10	310	"		3	393
<i>luridana</i>		10	294	<i>quercifolia</i>	95	3	42
<i>manniana</i>	459	10	294	<b>Geometra</b>		7	281
<i>mussehliana</i>	460	10	295	<i>papilionaria</i>	324	7	281
<i>nana</i>	461	10	315	<b>GEOMETRIDÆ</b>		7	277
<i>notulana</i>	459	10	293	<b>GEOMETRINA</b>		6	337
<i>pallidana</i>	459	10	283	<b>Gluphisia</b>		3	152
<i>phaleratana</i>		10	303	<i>crenata</i>	112	3	152
<i>roseana</i>	460	10	304	<b>Gnophos</b>		7	158
<i>ruficiliana</i>		10	312	<i>obscurata</i>	305	7	158
<i>rupicola</i>	460	10	303	<b>Gonepteryx</b>		1	39
<i>subroseana</i>	460	10	309	<i>rhamni</i>	7	1	40

	Plate	Vol.	Page		Plate	Vol.	Page
Gonophora . . .		3	1 86	Halenota—continued			
<i>derasa</i> . . .	116	3	186	<i>pflugiana</i> . . .	488	11	141
Gonoptera . . .		6	238	<i>scutellana</i> . . .		11	141
<i>libatrix</i> . . .	252	6	239	<i>similana</i> . . .	488	11	140
GONOPTERIDÆ . . .		6	238	<i>tetragonana</i> . . .	489	11	152
Gortyna . . .		5	73	<i>trigeminana</i> . . .	489	11	150
<i>flavago</i> . . .	193	5	73	<i>turbidana</i> . . .	489	11	148
<i>ochruca</i> . . .		5	73	Halia . . .		6	381
Grammesia . . .		5	295	<i>wauaria</i> . . .	276	6	381
<i>trigrammica</i> . . .		5	295	<i>wararia</i> . . .		6	381
<i>trilinea</i> . . .	222	5	295	Halias . . .		2	175
Grapholitha . . .		11	206	<i>bicolorana</i> . . .		2	179
<i>æmulana</i> . . .	497	11	207	<i>prasinana</i> . . .	64	2	175
<i>albersana</i> . . .	498	11	218	<i>quercana</i> . . .	64	2	179
<i>aspidiscana</i> . . .	498	11	215	Hama . . .		4	343
<i>cæcana</i> . . .	499	11	220	<i>abjecta</i> . . .	175	4	343
<i>candidulana</i> . . .	497	11	212	<i>anceps</i> . . .	175	4	347
<i>citrana</i> . . .	497	11	210	<i>furva</i> . . .	176	4	351
<i>conterminana</i> . . .	498	11	214	<i>infesta</i> . . .		4	347
<i>hypericana</i> . . .	498	11	216	<i>sordida</i> . . .		4	347
<i>microgrammana</i> . . .	498	11	219	Hecatera . . .		4	216
<i>modestana</i> . . .		11	207	<i>chrysozona</i> . . .		4	217
<i>modicana</i> . . .		11	207	<i>dysodea</i> . . .	161	4	217
<i>pupillana</i> . . .	497	11	211	<i>serena</i> . . .	161	4	220
<i>succedana</i> . . .		11	221	Hedya . . .		11	1
<i>tripoliana</i> . . .	497	11	208	<i>aceriana</i> . . .	470	11	4
<i>ulicetana</i> . . .	499	11	221	<i>dealbana</i> . . .	470	11	6
<i>vimicrana</i> . . .		11	212	<i>incarnana</i> . . .		11	6
Gymnancyla . . .		10	31	<i>lariciana</i> . . .	470	11	3
<i>canella</i> . . .	428	10	32	<i>neglectana</i> . . .	471	11	7
Habrostola . . .		6	134	<i>ocellana</i> . . .	470	11	2
<i>tripartita</i> . . .		6	135	<i>oppressana</i> . . .	471	11	11
<i>triplasia</i> . . .	244	6	139	<i>pauperana</i> . . .	471	11	10
<i>urticæ</i> . . .	244	6	135	<i>simplana</i> . . .	471	11	9
Hadena . . .		4	166	Heliodes . . .		6	167
<i>chenopodii</i> . . .	159	4	199	<i>arbuti</i> . . .	246	6	168
<i>contigua</i> . . .	156	4	167	<i>tenebrata</i> . . .		6	168
<i>dentina</i> . . .	159	4	195	Heliophobus . . .		4	133
<i>dissimilis</i> . . .		4	175	<i>cespitis</i> . . .	152	4	137
<i>genistæ</i> . . .	158	4	188	<i>popularis</i> . . .	152	4	133
<i>glauca</i> . . .	158	4	191	Heliothis . . .		6	150
" . . .		6	385	<i>armiger</i> . . .		6	150
<i>oleracea</i> . . .	158	4	185	<i>armigera</i> . . .	245	6	150
<i>peregrina</i> . . .	156	4	179	<i>dipsacea</i> . . .	245	6	160
<i>pisi</i> . . .	157	4	181	<i>peltiger</i> . . .		6	157
<i>suasa</i> . . .	157	4	175	<i>peltigera</i> . . .	245	6	157
<i>thalassina</i> . . .	156	4	171	<i>scutosa</i> . . .	245	6	164
<i>trifolii</i> . . .		4	199	Helotropha . . .		5	57
Halenota . . .		11	139	<i>fibrosa</i> . . .	191	5	57
<i>bimaeculana</i> . . .		11	140	<i>leucostigma</i> . . .		5	57
<i>brunnichiana</i> . . .	488	11	144	Hemerophila . . .		7	222
<i>cirsiana</i> . . .	488	11	143	<i>abruptaria</i> . . .	316	7	222
<i>fenella</i> . . .	489	11	149	Hemithea . . .		7	301
<i>grandævana</i> . . .	488	11	146	<i>strigata</i> . . .		7	301
<i>luctuosana</i> . . .		11	143	<i>thymiaria</i> . . .	325	7	301
" . . .		11	152	HEPIALIDÆ . . .		2	151

	Plate	Fol.	Page		Plate	Fol.	Page
Hepialus . . . . .		2	151	Hoporina— <i>continued</i>			
<i>liceta</i> . . . . .		2	152	<i>croceago</i> . . . . .	233	6	1
<i>hectus</i> . . . . .	62	2	152	Hydraecia . . . . .		5	61
<i>lumuli</i> . . . . .	63	2	165	<i>micacea</i> . . . . .	193	5	66
<i>lupulinus</i> . . . . .	62	2	155	<i>nictitans</i> . . . . .	192	5	62
" . . . . .	376	8		<i>petasitis</i> . . . . .	191	5	69
<i>sylinus</i> . . . . .	64	2	158	Hydrelia . . . . .		6	181
<i>velleda</i> . . . . .	62	2	161	<i>argentina</i> . . . . .	247	6	182
Herminia . . . . .		6	288	<i>Bankiana</i> . . . . .		6	182
<i>barbralis</i> . . . . .	262	6	291	<i>unwa</i> . . . . .		6	185
<i>cribralis</i> . . . . .	262	6	301	<i>uncana</i> . . . . .	247	6	185
<i>cribrumalis</i> . . . . .		6	301	<i>uncula</i> . . . . .		6	185
<i>derivalis</i> . . . . .	261	6	289	Hydrilla . . . . .		5	264
<i>grisealis</i> . . . . .	262	6	298	<i>arcuosa</i> . . . . .	219	5	265
<i>memoralis</i> . . . . .		6	298	<i>palustris</i> . . . . .	219	5	264
<i>tarsipennalis</i> . . . . .	262	6	294	" . . . . .		5	380
Hesperia . . . . .		1	274	Hydrocampa . . . . .		9	290
<i>Acteon</i> . . . . .	37	1	283	<i>nymphæalis</i> . . . . .	408	9	291
<i>comma</i> . . . . .	39	1	294	<i>nymphata</i> . . . . .		9	291
<i>Linea</i> . . . . .	38	1	275	<i>stagnalis</i> . . . . .	408	9	294
<i>Lineola</i> . . . . .	38	1	279	<i>stagnata</i> . . . . .		9	294
<i>Sylvanus</i> . . . . .	39	1	289	HYDROCAMPIDÆ . . . . .		9	284
<i>Thaumus</i> . . . . .		1	275	<i>Hypena</i> . . . . .		6	315
HESPERIDÆ . . . . .		1	267	<i>obsitalis</i> . . . . .		6	322
Heterogenea . . . . .		2	172	<i>proboscidalis</i> . . . . .	264	6	319
<i>asella</i> . . . . .	64	2	172	<i>rostralis</i> . . . . .	263	6	316
<i>Umacodes</i> . . . . .		2	169	Hyphenodes . . . . .		6	304
Heterogonon . . . . .		10	191	<i>abistrigalis</i> . . . . .	263	6	304
<i>adjunctana</i> . . . . .		10	192	<i>albistrigatus</i> . . . . .		6	304
<i>Acrona</i> . . . . .		10	194	<i>costæstrigalis</i> . . . . .	263	6	306
<i>forsterana</i> . . . . .	448	10	192	Hypochalcia . . . . .		9	446
<i>icterana</i> . . . . .	449	10	194	<i>ahenella</i> . . . . .	424	9	446
<i>pulex</i> . . . . .		10	194	Hypogymna . . . . .		2	303
<i>viburniana</i> . . . . .	449	10	196	<i>dispar</i> . . . . .	79	2	303
<i>viridana</i> . . . . .	449	10	193	Hyppa . . . . .		5	33
Heterographis . . . . .		10	34	<i>rectilinea</i> . . . . .	189	5	33
<i>oblitella</i> . . . . .	428	10	34	Hypsipetes . . . . .		8	364
Hibernia . . . . .		7	227	<i>elutata</i> . . . . .	368, 369	8	372
<i>aurantiaria</i> . . . . .	316	7	228	<i>impluviata</i> . . . . .	370	8	368
<i>defoliaria</i> . . . . .	317	7	231	<i>livrata</i> . . . . .		8	364
<i>leucophaæria</i> . . . . .	318	7	240	<i>ruberata</i> . . . . .	367	8	364
<i>marginaria</i> . . . . .		7	236	<i>sordidata</i> . . . . .		8	372
<i>progemmaria</i> . . . . .	317	7	236	<i>trifasciata</i> . . . . .		8	368
<i>rupicaprararia</i> . . . . .	318	7	244	Hyria . . . . .		7	328
Himera . . . . .		7	78	<i>auroraria</i> . . . . .	328	7	329
<i>pennaria</i> . . . . .	294	7	78	<i>maricata</i> . . . . .		7	329
Homæosoma . . . . .		10	38	Idiographis . . . . .		10	190
<i>binevella</i> . . . . .	429	10	43	<i>centralana</i> . . . . .		10	190
<i>cretacella</i> . . . . .	430	10	45	<i>inopiana</i> . . . . .	448	10	190
<i>etariella</i> . . . . .		10	43	<i>iodis</i> . . . . .		7	285
<i>nebulella</i> . . . . .	429	10	41	<i>lactæaria</i> . . . . .	325	7	288
<i>nimbella</i> . . . . .	430	10	47	<i>vernaria</i> . . . . .	324	7	285
<i>saxicola</i> . . . . .		10	47	Lælia . . . . .		2	313
<i>scaccionis</i> . . . . .		10	45	<i>cenosa</i> . . . . .	81	2	313
<i>sinuella</i> . . . . .	429	10	38	Laphygma . . . . .		5	271
Hoporina . . . . .		6	1	<i>exigua</i> . . . . .	220	5	271



	Plate	Vol.	Page		Plate	Vol.	Page	
<b>Larentia</b>		8	181	<b>Limacodes</b>		2	169	
<i>caesiata</i>	348	8	181	<i>testudo</i>	61	2	169	
<i>flavicinctata</i>	347	8	185	<b>Limenitis</b>		1	117	
<i>olivata</i>	347	8	188	<i>Sibylla</i>	17	1	117	
<i>ruficinctata</i>		8	185	<b>LIPARIDÆ</b>		2	292	
<b>LARENTIDÆ</b>		8	89	<b>Liparis</b>		2	299	
<b>Lasiocampa</b>		3	21	<i>salicis</i>	79	2	299	
<i>quercus</i>	91, 92	3	25	<b>Lipoptycha</b>		11	263	
<i>rubi</i>	93	3	32	<i>plumbana</i>	504	11	264	
<i>trifolii</i>	90	3	21	<i>saturnana</i>	504	11	265	
<b>Leioptilus</b>		9	387	<i>tanacetii</i>		11	265	
<i>brachydactylus</i>	417	9	394	<i>uliciana</i>		11	264	
<i>lienigianus</i>	416	9	388	<b>Lithographia</b>		11	102	
<i>microdactylus</i>	417	9	393	<i>campolitiana</i>		11	103	
<i>osteodactylus</i>	417	9	392	<i>cincera</i>		11	106	
<i>tephradactylus</i>	416	9	390	<i>cinereana</i>	483	11	106	
<b>Lemiodes</b>		9	261	<i>nisella</i>	483	11	104	
<i>pulveralis</i>	405	9	261	<i>penkleriana</i>	483	11	107	
<b>Leptogramma</b>		10	215	<i>subocellana</i>	483	11	103	
<i>boscana</i>	451	10	217	<b>Lithomia</b>		6	44	
<i>literana</i>	451	10	216	<i>solidaginis</i>	236	6	44	
<i>niveana</i>	451	10	219	<b>Lithosia</b>		2	209	
<i>parisiana</i>		10	217	<i>aureola</i>		67	2	213
<i>scabrana</i>		10	217	<i>caniola</i>		67	2	219
<i>scotana</i>		10	219	<i>complana</i>		67	2	221
<i>teveriana</i>		10	219	<i>complanula</i>		67	2	224
<b>Leucania</b>		5	131	<i>deplana</i>		2	215	
<i>albipuncta</i>	205	5	172	<i>Griseola</i>		68	2	226
<i>comma</i>	203	5	152	<i>helveola</i>		67	2	215
<i>conigera</i>	205	5	169	<i>helvula</i>		2	215	
<i>extranea</i>		5	160	<i>luridcola</i>		2	224	
<i>favicolor</i>	201	5	141	<i>muscerda</i>		66	2	210
"  "		11	267	<i>pygmæola</i>		67	2	217
<i>impudens</i>		5	132	<i>rubricollis</i>		68	2	229
<i>impura</i>	201	5	135	<i>sorocula</i>		2	213	
<i>l-album</i>		5	155	<b>LITHOSIDÆ</b>		2	196	
"  "		9	450	<b>Lithostege</b>		8	410	
<i>lithargyria</i>	205	5	175	<i>griseata</i>	375	8	410	
<i>littoralis</i>	204	5	155	<i>nivaria</i>		8	410	
<i>loreyi</i>	204	5	158	<b>Lobesia</b>		11	247	
"  "		9	450	<i>permixtana</i>	502	11	248	
<i>obsoleta</i>	203	5	146	<i>reliquana</i>		11	248	
<i>pallens</i>	202	5	139	<b>Lobophora</b>		8	391	
<i>pudorina</i>	201	5	132	<i>carpinata</i>		8	392	
<i>putrescens</i>	203	5	149	<i>halterata</i>		8	395	
<i>straminea</i>	202	5	142	<i>hexapterata</i>	373	8	395	
<i>turca</i>	206	5	178	<i>lobulata</i>	373	8	392	
<i>unipuncta</i>	204	5	160	<i>polyommata</i>	374	8	407	
"  "		6	385	<i>sexalata</i>	374	8	398	
<i>Vitellina</i>	204	5	167	<i>sczalisata</i>		8	398	
<b>Leucoma</b>		2	302	<i>viretata</i>	374	8	401	
<i>V-nigra</i>		2	302	<b>Lomasipilis</b>		7	274	
<b>Leucophasia</b>		1	30	<i>marginata</i>	323	7	274	
<i>sinapis</i>	5	1	30	<b>Lophoderus</b>		10	186	
<b>Ligdia</b>		7	270	<i>cinctana</i>	448	10	189	
<i>adustata</i>	323	7	270	<i>lepidana</i>		10	187	

	Plate	Vol.	Page		Plate	Vol.	Page
Lophoderus— <i>continued</i>				Mania— <i>continued</i>			
<i>ministrana</i> . . . . .	448	10	186	<i>maura</i> . . . . .	216	5	240
<i>politana</i> . . . . .	448	10	187	<i>Margarodes</i> . . . . .	9	9	251
<i>sylvana</i> . . . . .		10	187	<i>unionalis</i> . . . . .	404	9	252
Lophopteryx . . . . .		3	136	<i>Mecyna</i> . . . . .	9	9	249
<i>Camelina</i> . . . . .	110	3	139	<i>polygonalis</i> . . . . .	404	9	219
<i>carmelita</i> . . . . .	109	3	136	<i>Melanargia</i> . . . . .	1	1	204
<i>cuculla</i> . . . . .		3	142	<i>Galathea</i> . . . . .	28	1	204
<i>cucullina</i> . . . . .	110	3	142	<i>Melanippe</i> . . . . .	8	8	89
Lozopera . . . . .		10	316	<i>birivata</i> . . . . .	8	8	101
<i>alternana</i> . . . . .	462	10	325	<i>galiata</i> . . . . .	337	8	105
<i>beatricella</i> . . . . .	461	10	321	<i>hastata</i> . . . . .	336	8	90
<i>dilucidana</i> . . . . .	461	10	318	<i>rivata</i> . . . . .	337	8	98
<i>diplotella</i> . . . . .	461	10	317	<i>sociata</i> . . . . .	8	8	101
<i>flagellana</i> . . . . .		10	319	<i>subtristata</i> . . . . .	337	8	101
<i>francillana</i> . . . . .	461	10	319	<i>tristata</i> . . . . .	337	8	94
<i>francillonana</i> . . . . .		10	319	<i>Melanthia</i> . . . . .	8	8	109
<i>gigantana</i> . . . . .		10	325	<i>albicillata</i> . . . . .	339	8	116
<i>smeathmanniana</i> . . . . .	462	10	322	<i>bicolorata</i> . . . . .	8	8	110
<i>straminea</i> . . . . .	462	10	324	<i>ocellata</i> . . . . .	338	8	113
<i>tischerana</i> . . . . .		10	324	<i>procellata</i> . . . . .	339	8	119
LOZOPERIDÆ . . . . .		10	278	<i>rubiginata</i> . . . . .	338	8	110
Lozotænia . . . . .		10	180	<i>unangulata</i> . . . . .	339	8	122
<i>musculana</i> . . . . .	447	10	181	<i>Meliana</i> . . . . .		5	127
<i>trifasciana</i> . . . . .		10	181	<i>flammea</i> . . . . .	200	15	127
<i>unifasciana</i> . . . . .	447	10	180	<i>Melissoblaptes</i> . . . . .		0	143
Luperina . . . . .		4	332	<i>bipunctatus</i> . . . . .	442	10	143
<i>Dumerilii</i> . . . . .	174	4	337	<i>Melitæa</i> . . . . .	1	1	185
<i>testacea</i> . . . . .	173	4	332	<i>Artemis</i> . . . . .	27	1	196
<i>Athalia</i> . . . . .		1	65	<i>Athalia</i> . . . . .	26	1	185
<i>Argiades</i> . . . . .	10	1	68	<i>aurinia</i> . . . . .		1	196
<i>Betica</i> . . . . .	10	1	65	<i>Cinxia</i> . . . . .	27	1	190
LYCÆNIDÆ . . . . .		1	42	<i>Didyma</i> . . . . .		1	190
<i>Lygris</i> . . . . .		8	244	<i>Mesogona</i> . . . . .		5	236
<i>reticulata</i> . . . . .	353	8	244	<i>acetosella</i> . . . . .		5	236
<i>Lythria</i> . . . . .		8	213	<i>Mesotype</i> . . . . .		9	1
<i>pupuraria</i> . . . . .		8	213	<i>lineolata</i> . . . . .	377	9	1
<i>Macaria</i> . . . . .		6	370	<i>virgata</i> . . . . .		9	1
<i>alternata</i> . . . . .	275	6	371	<i>Metrocampa</i> . . . . .		7	111
<i>litrata</i> . . . . .	276	6	377	<i>margaritata</i> . . . . .	299	7	111
<i>notata</i> . . . . .	275	6	374	<i>Miana</i> . . . . .		5	6
<i>Macrogaster</i> . . . . .		2	140	<i>bicoloria</i> . . . . .		5	18
<i>arundinis</i> . . . . .	61	2	140	<i>captiuncula</i> . . . . .	188	5	22
<i>castaneæ</i> . . . . .		2	140	<i>expolita</i> . . . . .		5	22
<i>Macroglossa</i> . . . . .		2	66	<i>fasciuncula</i> . . . . .	186	5	13
<i>bombyliformis</i> . . . . .		2	70	<i>furuncula</i> . . . . .	187	5	18
<i>bombyliformis</i> . . . . .	54	2	73	<i>literosa</i> . . . . .	185	5	7
<i>fuciformis</i> . . . . .	54	2	70	<i>strigilis</i> . . . . .	186	5	10
<i>stellatarum</i> . . . . .	54	2	66	<i>Mimæsioptilus</i> . . . . .		9	373
<i>Madopa</i> . . . . .		6	283	<i>bipunctidactylus</i> . . . . .	415	9	375
<i>salicalis</i> . . . . .	261	6	283	<i>fuscus</i> . . . . .		9	380
<i>Mamestra</i> . . . . .		4	204	<i>locwii</i> . . . . .		9	377
<i>Albicolon</i> . . . . .	160	4	205	<i>phæodactylus</i> . . . . .	415	9	373
<i>brassicæ</i> . . . . .	160	4	208	<i>pterodactylus</i> . . . . .	416	9	380
<i>persicariæ</i> . . . . .	160	4	212	<i>serotinus</i> . . . . .		9	375
<i>Mania</i> . . . . .		5	240	<i>zophodactylus</i> . . . . .	416	9	377

	Plate	Vol.	Page		Plate	Vol.	Page
Minoa . . . . .			8 211	Noctua—continued			
<i>euphorbiata</i> . . . . .	350		8 211	<i>rubi</i> . . . . .	147	4	88
<i>marginata</i> . . . . .			8 211	<i>sobrina</i> . . . . .	144	4	78
Miselia . . . . .		4	322	<i>stigmatica</i> . . . . .		4	58
<i>bimaculosa</i> . . . . .		4	327	<i>subrosea</i> . . . . .	144	4	81
<i>oxyacantha</i> . . . . .	172	4	323	<i>triangulum</i> . . . . .	142	4	14
Mixodia . . . . .		11	46	<i>umbrosa</i> . . . . .	147	4	91
<i>palustrana</i> . . . . .	476	11	49	<i>xanthographa</i> . . . . .	148	4	94
<i>ratzeburgiana</i> . . . . .	476	11	47	NOCTUINA . . . . .		3	179
<i>schulziana</i> . . . . .	476	11	48	Nola . . . . .		2	183
<i>teocrana</i> . . . . .		11	47	<i>albula</i> . . . . .		2	193
Mniophila . . . . .		7	157	<i>albulalis</i> . . . . .	65	2	193
<i>cineraria</i> . . . . .		7	157	<i>centonalis</i> . . . . .	65	2	190
Myeloidis . . . . .		10	19	<i>confusalis</i> . . . . .	65	2	187
<i>ceratoniae</i> . . . . .	427	10	23	<i>crisulalis</i> . . . . .		2	188
<i>cirrigerella</i> . . . . .	427	10	22	<i>cucullatella</i> . . . . .	65	2	183
<i>cribrella</i> . . . . .	427	10	20	<i>strigula</i> . . . . .	65	2	186
<i>cribrum</i> . . . . .		10	20	NOLIDÆ . . . . .		2	183
Naclia . . . . .		2	138	Nomophila . . . . .		9	263
<i>ancilla</i> . . . . .		2	138	<i>hybridalis</i> . . . . .	405	9	264
Nænia . . . . .		5	244	<i>noctuella</i> . . . . .		9	264
<i>typica</i> . . . . .	217	5	244	Nonagria . . . . .		5	77
Nascia . . . . .		9	232	<i>arundinis</i> . . . . .		5	83
<i>ciliialis</i> . . . . .	402	9	232	<i>cannæ</i> . . . . .	194	5	77
Nemeobius . . . . .		1	102	<i>geminipuncta</i> . . . . .	195	5	87
<i>Lucina</i> . . . . .	15	1	102	<i>neurica</i> . . . . .	196	5	90
Nemephila . . . . .		2	260	" . . . . .		5	380
<i>plantaginis</i> . . . . .	74	2	260	<i>sparganii</i> . . . . .	194	5	80
" . . . . .		2	370	" . . . . .		8	428
Nemoria . . . . .		7	290	<i>typhæ</i> . . . . .	195	5	83
<i>viridata</i> . . . . .	325	7	290	Notodonta . . . . .		3	105
Nephoteryx . . . . .		9	420	<i>bicolora</i> . . . . .	108	3	127
<i>genistella</i> . . . . .	421	9	420	<i>bicoloria</i> . . . . .		3	127
<i>similella</i> . . . . .	421	9	423	<i>dictæa</i> . . . . .	104	3	105
Neuria . . . . .		4	151	<i>dictæoides</i> . . . . .	104	3	108
<i>reticulata</i> . . . . .		4	151	<i>dromedarius</i> . . . . .	107	3	123
<i>saponariæ</i> . . . . .	153	4	151	<i>torva</i> . . . . .	107	3	121
Nisoniades . . . . .		1	304	<i>tremula</i> . . . . .		3	105
<i>Tages</i> . . . . .	40	1	304	<i>trepida</i> . . . . .	106	3	118
Noctua . . . . .		4	28	<i>tritophus</i> . . . . .	106	3	115
<i>augur</i> . . . . .	141	4	34	<i>ziczac</i> . . . . .	105	3	111
<i>baja</i> . . . . .	147	4	85	NOTODONTIDÆ . . . . .		3	81
<i>bella</i> . . . . .		4	88	Nudaria . . . . .		2	196
<i>brunnea</i> . . . . .	143	4	61	<i>mundana</i> . . . . .	66	2	199
<i>c-nigrum</i> . . . . .	142	4	51	<i>senex</i> . . . . .	66	2	196
<i>castanea</i> . . . . .		4	98	Numeria . . . . .		7	24
<i>dahlîi</i> . . . . .	144	4	64	<i>pulveraria</i> . . . . .	286	7	24
<i>depuncta</i> . . . . .	142	4	41	Nyctegretes . . . . .		10	25
<i>ditrapezium</i> . . . . .	143	4	55	<i>achatinella</i> . . . . .	427	10	25
" . . . . .		4	403	NYMPHALIDÆ . . . . .		1	116
<i>festiva</i> . . . . .	145, 146	4	69	Nyssia . . . . .		7	139
<i>flammatra</i> . . . . .	142	4	49	<i>hispidaria</i> . . . . .	303	7	140
<i>glareosa</i> . . . . .	141	4	30	<i>lapponaria</i> . . . . .	303	7	144
<i>neglecta</i> . . . . .	148	4	98	<i>zonaria</i> . . . . .	304	7	147
<i>plecta</i> . . . . .	141	4	38	Odonestis . . . . .		3	37
<i>rhomboidea</i> . . . . .	143	4	58	<i>potatoria</i> . . . . .	94	3	37

	Plate	Vol.	Page		Plate	Vol.	Page
Odontia . . . . .		9	162	Oxyptilus— <i>continued</i>			
dentalis . . . . .	395	9	162	hieracii . . . . .	415	9	367
Odontoptera . . . . .		7	51	<i>lotus</i> . . . . .		9	365
bidentata . . . . .	289	7	51	parvidactylus . . . . .	414	9	363
Edematophorus . . . . .		9	382	pilosella . . . . .	415	9	369
lithodactylus . . . . .	416	9	382	teucarii . . . . .	415	9	370
Encetra . . . . .		10	184	Pachetra . . . . .		4	145
pilleriana . . . . .	447	10	184	leucophaea . . . . .	153	4	145
Enistis . . . . .		2	231	Pachnobia . . . . .		5	223
quadra . . . . .	68	2	232	<i>alpina</i> . . . . .		5	229
ENOCHROMIDÆ . . . . .		9	155	hyperborea . . . . .	215	5	229
Olinia . . . . .		10	275	leucographa . . . . .	214	5	223
<i>curvifasciana</i> . . . . .		10	275	rubricosa . . . . .	214	5	226
hybridana . . . . .	458	10	275	Pachycnemia . . . . .		7	250
<i>rectifasciana</i> . . . . .		10	275	hippocastanaria . . . . .	319	7	251
ulmana . . . . .	458	10	276	Pæcilocampa . . . . .		3	1
Ophiodes . . . . .		6	243	populi . . . . .	87	3	2
lunaris . . . . .	252	6	244	Pædisca . . . . .		11	132
Ophiusa stollida . . . . .		9	450	ophthalmicana . . . . .	487	11	133
Oporabia . . . . .		8	376	<i>picana</i> . . . . .		11	136
dilutata . . . . .	371	8	377	semifuscana . . . . .	487	11	136
filigrammaria . . . . .	372	8	381	solandriana . . . . .	487	11	134
Orgyia . . . . .		2	326	sordidana . . . . .	488	11	138
antiqua . . . . .	83	2	329	" . . . . .		11	268
Gonostigma . . . . .	83	2	326	<i>stabiana</i> . . . . .		11	138
Orneodes . . . . .		9	408	Pamphila acteon . . . . .		8	428
<i>hexadactyla</i> . . . . .		9	408	Pamphusia . . . . .		11	196
polydactyla . . . . .	419	9	408	mercuriana . . . . .	495	11	197
ORNEODIDÆ . . . . .		9	407	<i>monticolana</i> . . . . .		11	197
Orthosia . . . . .		5	332	Panagra . . . . .		7	1
<i>circularis</i> . . . . .		5	336	petraria . . . . .	282	7	1
ferruginea . . . . .	226	5	336	Pandemis . . . . .		10	171
<i>helvola</i> . . . . .		5	333	cinnamomeana . . . . .	446	10	175
litura . . . . .	228	5	343	corylana . . . . .	446	10	172
lota . . . . .	229	5	349	diversana . . . . .	447	10	178
lunosa . . . . .	228	5	346	dumetana . . . . .	446	10	177
macilenta . . . . .	229	5	352	heparana . . . . .	446	10	176
pistacina . . . . .	227	5	339	ribeana . . . . .	446	10	173
rufina . . . . .	226	5	333	<i>transitana</i> . . . . .		10	178
Orthotænia . . . . .		11	21	Panolis . . . . .		5	181
antiquana . . . . .	473	11	23	piniperda . . . . .	206	5	181
arbutella . . . . .	474	11	30	Papilio . . . . .		1	13
brauderiana . . . . .	473	11	22	machaon . . . . .	1	1	13
ericetana . . . . .	473	11	26	" . . . . .		1	311
<i>flammeana</i> . . . . .		11	31	Podalirius . . . . .		1	16
<i>fulvipunctana</i> . . . . .		11	31	<i>Simon</i> . . . . .		1	16
mygindana . . . . .	474	11	31	PAPILIONIDÆ . . . . .		1	13
purpurana . . . . .	473	11	27	Paraponyx . . . . .		9	287
rufana . . . . .	473	11	29	stratiotatis . . . . .	408	9	287
striana . . . . .	473	11	25	<i>stratiotata</i> . . . . .		9	287
trifoliana . . . . .		11	26	Pavarge . . . . .		1	227
Ourapteryx . . . . .		6	340	Egeria . . . . .	31	1	227
sambucata . . . . .	269	6	340	Megera . . . . .	32	1	234
Oxyptilus . . . . .		9	362	Parnassius . . . . .		1	16
distans . . . . .	414	9	365	Apollo . . . . .		1	16
<i>heterodactylus</i> . . . . .		9	370	" . . . . .		1	311

	Plate	Vol.	Page		Plate	Vol.	Page
Parnassius—continued				Peronea—continued			
delius . . . . .		1	16	lorquiniana . . . . .	455	10	244
Pelurga . . . . .		8	302	maccana . . . . .	453	10	226
comitata . . . . .	362	8	302	mixtana . . . . .	453	10	229
Pempelia . . . . .		9	437	permutana . . . . .	454	10	231
adornatella . . . . .	423	9	439	permutatana . . . . .		10	231
dilatella . . . . .	423	9	439	perplexana . . . . .	454	10	238
ornatella . . . . .	423	9	437	potentillana . . . . .		10	243
subornatella . . . . .		9	439	proteana . . . . .		10	243
Penthina . . . . .		10	357	rufana . . . . .	454	10	235
betuletana . . . . .	467	10	361	schalleriana . . . . .	455	10	239
capreana . . . . .	467	10	358	shepherdana . . . . .	456	10	247
carbonana . . . . .	469	10	377	sponsana . . . . .	454	10	236
corticana . . . . .		10	360	tristana . . . . .		10	228
cyrosbana . . . . .		10	367	uliginosana . . . . .		10	244
cyrosbatella . . . . .		10	367	umbrana . . . . .	452	10	223
dimidiata . . . . .	468	10	370	variegana . . . . .	454	10	232
fuligana . . . . .		10	377	Petasia . . . . .		3	155
fuligana . . . . .	469	10	379	cassinea . . . . .	112	3	155
gentiana . . . . .	469	10	374	" . . . . .		3	393
gentianana . . . . .	469	10	374	nubeculosa . . . . .	112	3	158
marginana . . . . .	469	10	372	Phibalapteryx . . . . .		8	328
nigricostana . . . . .	470	10	380	aquata . . . . .		8	350
oblongana . . . . .		10	372	conjunctaria . . . . .		8	334
ochroleucana . . . . .	468	10	366	fluviata . . . . .	365	8	329
ochromelana . . . . .		10	370	lapidata . . . . .	366	8	347
penhina . . . . .		10	376	lignata . . . . .	365	8	337
picana . . . . .	467	10	360	polygrammata . . . . .	365	8	331
postremana . . . . .	469	10	376	tersata . . . . .	366	8	344
pratlongana . . . . .		10	362	vilalbata . . . . .	365	8	341
pruniana . . . . .	467	10	364	vittata . . . . .		8	337
remyana . . . . .		10	380	Phigalia . . . . .		7	135
sauciana . . . . .	468	10	368	pedaria . . . . .		7	135
sellana . . . . .	469	10	373	pilosaria . . . . .	302	7	135
similana . . . . .		10	372	Phloeodes . . . . .		11	94
sororculana . . . . .	468	10	362	crenana . . . . .	482	11	99
stantoniana . . . . .	468	10	369	demarniana . . . . .	482	11	98
ustulana . . . . .		10	379	immundana . . . . .	482	11	96
variegana . . . . .	468	10	367	tetraquetrana . . . . .	482	11	95
Pericalia . . . . .		7	97	Phlogophora . . . . .		5	52
syringaria . . . . .	297	7	97	meticulosa . . . . .	190	5	52
Perinephile . . . . .		9	234	Phorodesma . . . . .		7	293
lancealis . . . . .	402	9	234	bajularia . . . . .	325	7	297
Peronea . . . . .		10	220	pubulata . . . . .		7	297
abildgaardiana . . . . .		10	232	smaragdaria . . . . .	325	7	293
aspersana . . . . .	456	10	249	Phragmatobia . . . . .		2	273
autumnana . . . . .		10	235	fuliginosa . . . . .	75	2	274
caledoniana . . . . .	455	10	242	Phtheochroa . . . . .		10	342
comariana . . . . .	455	10	243	amandana . . . . .		10	344
comparana . . . . .	455	10	240	rugosana . . . . .	465	10	342
cristana . . . . .	452	10	220	sodaliana . . . . .	465	10	344
favillaceana . . . . .		10	236	Phycita . . . . .		9	410
ferrugana . . . . .	455	10	246	roborella . . . . .		9	411
hastiana . . . . .	453	10	224	spissicella . . . . .	420	9	411
lipsiana . . . . .	454	10	234	PHYCITIDÆ . . . . .		9	410
logiana . . . . .	453	10	228	Phytometra . . . . .		6	214

	Plate	Vol.	Page		Plate	Vol.	Page
Phytometra— <i>continued</i>				Pacilochroma— <i>continued</i>			
ænea . . . . .	248	6	214	signatana . . . . .	467	10	355
viridaria . . . . .		6	214	Polla . . . . .		4	294
PIERIDÆ . . . . .		1	17	Chi . . . . .	170	4	303
Pieris . . . . .		1	21	flavicincta . . . . .	169	4	294
brassicæ . . . . .	2	1	21	nigrocincta . . . . .		4	299
Daphidice . . . . .	4	1	26	xanthomista . . . . .	168	4	299
napi . . . . .	3	1	24	Polyommatus . . . . .		1	69
" . . . . .		1	311	Acis . . . . .	14	1	94
rapæ . . . . .	2	1	23	Adonis . . . . .	13	1	81
" . . . . .		1	311	Ægon . . . . .	11	1	70
Pionea . . . . .		9	227	" . . . . .		1	313
ectimalis . . . . .		9	227	agestis . . . . .	10	1	73
margaritalis . . . . .	402	9	227	" . . . . .		1	313
stramentalis . . . . .	402	9	229	Alexis . . . . .	11	1	77
straminealis . . . . .		9	229	Alsus . . . . .	14	1	92
Platypteryx . . . . .		3	76	" . . . . .		1	313
lacertinaria . . . . .	100	3	76	Argiolus . . . . .	13	1	88
laccertula . . . . .		3	76	Arion . . . . .	14	1	96
Platyptilus . . . . .		9	346	bellargus . . . . .		1	81
bertrami . . . . .		9	346	Corydon . . . . .	12	1	85
dichrodactylus . . . . .		9	346	Dorylas . . . . .		1	84
gonodactylus . . . . .	414	9	352	" . . . . .		8	428
isodactylus . . . . .	413	9	350	Icarus . . . . .		1	77
ochrodactylus . . . . .	413	9	346	minima . . . . .		1	92
tesseradactylus . . . . .	414	9	356	semiargus . . . . .		1	94
trigonodactylus . . . . .		9	352	Porthesia . . . . .		2	292
Zetterstedtii . . . . .	414	9	355	auriflua . . . . .	78	2	296
Platytes . . . . .		10	70	Chrysorrhœa . . . . .	78	2	292
cerussellus . . . . .	432	10	70	similis . . . . .		2	296
Plodia . . . . .		10	62	Procris . . . . .		2	109
interpunctella . . . . .	431	10	62	Geryon . . . . .	58	2	115
Plusia . . . . .		6	94	globulariæ . . . . .	58	2	109
acuta . . . . .		6	122	statices . . . . .	58	2	112
aurifera . . . . .		6	101	Prodenia . . . . .		5	44
bractea . . . . .	241	6	109	littoralis . . . . .		5	44
chrysitis . . . . .	241	6	98	Pseudoterpna . . . . .		7	277
chryson . . . . .	240	6	95	cytisaria . . . . .	324	7	278
festuæ . . . . .	242	6	112	pruinata . . . . .		7	278
gamma . . . . .	243	6	123	Psilura . . . . .		2	309
illustris . . . . .	240	6	107	monacha . . . . .	80	2	309
interrogationis . . . . .	243	6	131	Psodos . . . . .		7	253
iota . . . . .	242	6	119	coracina . . . . .	319	7	253
moneta . . . . .	241	6	102	" . . . . .		7	334
ni . . . . .	243	6	128	trepidaria . . . . .		7	253
orichalca . . . . .		6	95	Psyche . . . . .		2	333
pulchrina . . . . .	242	6	116	graminella . . . . .		2	343
r-auream . . . . .		6	116	muscella . . . . .		2	344
verticellata . . . . .		6	122	nigricans . . . . .		2	334
Peciliochroma . . . . .		10	350	opacella . . . . .	84	2	339
corticana . . . . .	466	10	352	unicolor . . . . .		2	343
diniata . . . . .		10	353	villosella . . . . .	84	2	334
krosmanniana . . . . .		10	355	PSYCHIDÆ . . . . .		2	333
occultana . . . . .	467	10	353	PTEROPHORIDÆ . . . . .		9	340
pinicolana . . . . .		10	353	Pterophorus . . . . .		9	334
profundana . . . . .	466	10	350	monodactylus . . . . .	416	9	385

	Plate	Vol.	Page		Plate	Vol.	Page
<b>Pterophorus</b> — <i>continued</i>				<i>Ramia</i> . . . . .		6	318
<i>pterodactylus</i> . . . . .		9	385	<i>cratægata</i> . . . . .	271	6	318
<b>Pterostoma</b> . . . . .		3	145	<i>luteolata</i> . . . . .		6	318
<i>palpina</i> . . . . .	111	3	145	<b>Rusina</b> . . . . .		5	236
<b>Ptilophora</b> . . . . .		3	149	<i>tenebrosa</i> . . . . .	216	5	237
<i>plumigera</i> . . . . .	111	3	149	<b>Salebria</b> . . . . .		9	421
<b>Ptycholoma</b> . . . . .		10	183	<i>betulæ</i> . . . . .	121	9	427
<i>lecheana</i> . . . . .	417	10	183	<i>carbonariella</i> . . . . .		9	429
<b>Pygæra</b> . . . . .		3	161	<i>carnella</i> . . . . .	422	9	435
<i>bucephala</i> . . . . .	113	3	161	<i>formosa</i> . . . . .	422	9	432
<b>PYRALIDÆ</b> . . . . .		9	267	<i>fusca</i> . . . . .	422	9	429
<b>PYRALIDINA</b> . . . . .		9	160	<i>hostilis</i> . . . . .	421	9	425
<b>Pyralis</b> . . . . .		9	270	<i>obductella</i> . . . . .	422	9	434
<i>costalis</i> . . . . .	406	9	274	<i>semirubella</i> . . . . .		9	435
<i>farinalis</i> . . . . .	406	9	271	<b>Sarrothripa</b> . . . . .		6	233
<i>fimbrialis</i> . . . . .		9	274	<i>revayana</i> . . . . .	251	6	233
<i>glaucinalis</i> . . . . .	107	9	276	<i>undulana</i> . . . . .		6	233
<i>lienigialis</i> . . . . .	406	9	273	<b>SARROTHRIPIDÆ</b> . . . . .		6	232
<b>PYRALITES</b> . . . . .		9	161	<b>Saturnia</b> . . . . .		3	57
<b>Pyrausta</b> . . . . .		9	164	<i>carpini</i> . . . . .	97, 98	3	57
<i>anguinalis</i> . . . . .	396	9	177	<i>paronæ</i> . . . . .		3	57
<i>aurata</i> . . . . .		9	168	<b>SATURNIDÆ</b> . . . . .		3	56
<i>cespitalis</i> . . . . .	396	9	170	<b>SATYRIDÆ</b> . . . . .		1	203
<i>cingulalis</i> . . . . .	396	9	175	<b>Satyrus</b> . . . . .		1	222
<i>cingulata</i> . . . . .		9	175	<i>Semele</i> . . . . .	30	1	222
<i>nigrata</i> . . . . .		9	177	<b>Schœnobius</b> . . . . .		10	128
<i>octomaculalis</i> . . . . .	396	9	179	<i>forficellus</i> . . . . .	411	10	131
<i>otomaculata</i> . . . . .		9	179	<i>gigantellus</i> . . . . .	441	10	128
<i>ostrinalis</i> . . . . .	395	9	166	<i>mueronellus</i> . . . . .	410, 441	10	133
<i>punicealis</i> . . . . .	395	9	168	<b>Schrankia</b> . . . . .		6	310
<i>purpuralis</i> . . . . .	395	9	164	<i>turfosalis</i> . . . . .	262	6	310
<i>sanguinalis</i> . . . . .	395	9	173	<b>Sciaphila</b> . . . . .		10	256
<b>PYRAUSTIDÆ</b> . . . . .		9	161	<i>abrasana</i> . . . . .	458	10	271
<b>Pyrodes</b> . . . . .		11	223	<i>alternella</i> . . . . .		10	261
<i>rhedrella</i> . . . . .	499	11	223	<i>bellana</i> . . . . .	157	10	257
<b>Pyrrhæctia isabella</b> . . . . .		11	267	<i>chrysanthæana</i> . . . . .	157	10	264
<b>QUADRIFIDÆ</b> . . . . .		6	243	<i>colquhounana</i> . . . . .	157	10	258
<b>Retinia</b> . . . . .		11	32	<i>communana</i> . . . . .	457	10	263
<i>buoliana</i> . . . . .	474	11	33	<i>conspersana</i> . . . . .	157	10	264
<i>duplana</i> . . . . .	476	11	40	<i>incanana</i> . . . . .	157	10	267
<i>pinicolana</i> . . . . .	471	11	31	<i>incertana</i> . . . . .		10	270
<i>pinivorana</i> . . . . .	475	11	38	<i>nubilana</i> . . . . .	158	10	272
<i>posticana</i> . . . . .	474	11	37	<i>octomaculana</i> . . . . .	157	10	269
<i>resinella</i> . . . . .	475	11	41	<i>pascuana</i> . . . . .	157	10	266
<i>retiferana</i> . . . . .	475	11	44	<i>pasivana</i> . . . . .		10	266
<i>sylvestrana</i> . . . . .	475	11	43	<i>penziana</i> . . . . .		10	257
<i>turionana</i> . . . . .	471	11	35	<i>perterana</i> . . . . .		10	261
<b>Rhodophea</b> . . . . .		10	13	<i>sinuana</i> . . . . .		10	266
<i>advenella</i> . . . . .	426	10	13	<i>sinuana</i> . . . . .		10	267
<i>epelydrilla</i> . . . . .		10	15	<i>subjectana</i> . . . . .	458	10	270
<i>marmorea</i> . . . . .	426	10	15	<i>virgaureana</i> . . . . .	458	10	269
<i>suavella</i> . . . . .	427	10	17	<i>walshomiana</i> . . . . .		10	269
<b>Rivula</b> . . . . .		6	323	<b>Scodiona</b> . . . . .		7	27
<i>sericealis</i> . . . . .	261	6	323	<i>belgiaria</i> . . . . .	285	7	27
<b>Roxana</b> . . . . .		11	74	<i>farinellæaria</i> . . . . .		7	27
<i>arcuella</i> . . . . .	479	11	75	<b>Scoparia</b> . . . . .		9	306

	Plate	Vol.	Page		Plate	Vol.	Page	
Scoparia— <i>continued</i>				Senta . . . . .		5	96	
<i>alpina</i> . . . . .	412	9	336	<i>maritima</i> . . . . .		5	96	
<i>ambigua</i> . . . . .	410	9	312	<i>ulvæ</i> . . . . .	196	5	96	
<i>angustea</i> . . . . .	412	9	334	SERICORIDÆ . . . . .	10	345		
<i>atomalis</i> . . . . .	410	9	314	Sericoris . . . . .	11	51		
<i>basistrigalis</i> . . . . .	110	9	309	<i>alternana</i> . . . . .	11	54		
<i>cembra</i> . . . . .	109	9	307	<i>cespitana</i> . . . . .	478	11	60	
<i>coarctalis</i> . . . . .		9	334	<i>conchana</i> . . . . .		11	59	
<i>conspicualis</i> . . . . .		9	315	<i>daleana</i> . . . . .		11	54	
<i>cratægella</i> . . . . .	411	9	327	<i>doubledayana</i> . . . . .	478	11	62	
<i>dubitalis</i> . . . . .	410	9	318	<i>irriguana</i> . . . . .		477	11	53
<i>frequentella</i> . . . . .		9	329	<i>lacunana</i> . . . . .		477	11	55
<i>lineola</i> . . . . .	412	9	332	<i>metallicana</i> . . . . .		477	11	54
<i>mercurella</i> . . . . .	411	9	329	<i>micana</i> . . . . .		476	11	51
<i>murana</i> . . . . .	411	9	320	<i>rivulana</i> . . . . .		477	11	59
<i>pallida</i> . . . . .	412	9	339	<i>urticana</i> . . . . .		477	11	57
<i>pyradella</i> . . . . .		9	318	Sesia . . . . .		2	77	
<i>resinea</i> . . . . .	411	9	325	<i>atlantiformis</i> . . . . .		2	85	
<i>truncicolella</i> . . . . .	411	9	323	<i>andreniformis</i> . . . . .	55	2	85	
<i>ulmella</i> . . . . .	410	9	315	" . . . . .		11	267	
SCOPARIIDÆ . . . . .		9	306	<i>asiliformis</i> . . . . .	55	2	78	
Scopelosoma . . . . .		6	18	<i>asiliformis</i> . . . . .		2	88	
<i>satellitica</i> . . . . .	234	6	19	<i>chrysidiformis</i> . . . . .	57	2	101	
Scoria . . . . .		7	34	<i>conopiformis</i> . . . . .		2	370	
<i>dealbata</i> . . . . .	286	7	34	<i>culciformis</i> . . . . .	56	2	92	
<i>lineata</i> . . . . .		7	34	<i>cynipiformis</i> . . . . .	56	2	88	
Scotosia . . . . .		8	306	<i>formiciformis</i> . . . . .	57	2	94	
<i>certata</i> . . . . .	364	8	319	<i>ichneumoni-</i> <i>formis</i> . . . . .	57	2	96	
<i>dubitata</i> . . . . .	363	8	316	<i>musciformis</i> . . . . .		2	98	
<i>rhamnata</i> . . . . .	363	8	309	<i>myopiformis</i> . . . . .	56	2	90	
<i>undulata</i> . . . . .	363	8	312	<i>philanthiformis</i> . . . . .	57	2	98	
<i>vetulata</i> . . . . .	363	8	306	<i>scoliaformis</i> . . . . .	55	2	80	
Selenia . . . . .		7	81	<i>speciformis</i> . . . . .	55	2	82	
<i>bilunaria</i> . . . . .		7	92	<i>tabaniformis</i> . . . . .		2	78	
<i>illunaria</i> . . . . .	296	7	92	<i>tipuliformis</i> . . . . .	56	2	86	
" . . . . .		7	334	<i>respiriformis</i> . . . . .		2	78	
<i>illustraria</i> . . . . .	295	7	82	SESIDÆ . . . . .		2	76	
<i>lunaria</i> . . . . .	296	7	88	Setina . . . . .		2	204	
<i>tetralunaria</i> . . . . .		7	82	<i>irrorella</i> . . . . .	66	2	204	
Selidosema . . . . .		7	31	<i>mesomella</i> . . . . .	66	2	207	
<i>crictaria</i> . . . . .		7	31	Sideria . . . . .		11	45	
<i>plumaria</i> . . . . .	286	7	31	<i>achatana</i> . . . . .	476	11	45	
Senasia . . . . .		11	161	Smerinthus . . . . .		2		
<i>ephippiana</i> . . . . .		11	162	<i>ocellatus</i> . . . . .	41	2		
<i>gallicana</i> . . . . .		11	167	<i>populi</i> . . . . .	42	2	7	
<i>gallicolana</i> . . . . .	491	11	163	<i>tiliæ</i> . . . . .	43	2	11	
<i>janthinana</i> . . . . .	491	11	168	Sphacia . . . . .		2	103	
<i>obscurana</i> . . . . .		11	163	<i>apiformis</i> . . . . .	57	2	106	
<i>obscurana</i> . . . . .	491	11	165	<i>bembeciformis</i> . . . . .	57	2	103	
<i>populana</i> . . . . .	490	11	162	<i>crabroniformis</i> . . . . .		2	103	
<i>ravulana</i> . . . . .		11	165	Sphaleroptera . . . . .		10	254	
<i>rufillana</i> . . . . .	491	11	167	<i>ictericana</i> . . . . .	456	10	254	
<i>spiniana</i> . . . . .	491	11	169	<i>locviana</i> . . . . .		10	254	
<i>tomiana</i> . . . . .		11	165	<i>longana</i> . . . . .		10	254	
<i>vernana</i> . . . . .		11	163	SPHINGIDÆ . . . . .		2	1	
<i>wobnerana</i> . . . . .	91	11	166					



GENERAL INDEX.

291

	Plate	Vol.	Page		Plate	Vol.	Page
Sphinx . . . . .		2	21	Stigmonota—continued			
<i>Carolina</i> . . . . .		2	35	<i>compositella</i> . . . . .	501	11	238
<i>cingulata</i> . . . . .		2	35	<i>coniferana</i> . . . . .	500	11	231
<i>Convolvuli</i> . . . . .	15	2	22	<i>corollana</i> . . . . .		11	233
<i>Druræi</i> . . . . .		2	35	<i>dorsana</i> . . . . .	499	11	225
<i>Ligustri</i> . . . . .	47	2	31	<i>erectana</i> . . . . .		11	237
<i>Pinastri</i> . . . . .	46	2	27	<i>flexana</i> . . . . .	501	11	239
<i>quinquemacu-</i>				<i>germarana</i> . . . . .	502	11	244
<i>latus</i> . . . . .		2	35	<i>germarana</i> . . . . .		11	245
<i>Spilodes</i> . . . . .		9	237	<i>heegerana</i> . . . . .		11	233
<i>cinctalis</i> . . . . .	403	9	243	<i>internana</i> . . . . .	501	11	236
<i>palealis</i> . . . . .	403	9	240	<i>interruptana</i> . . . . .		11	228
<i>ruralis</i> . . . . .		9	245	<i>leguminana</i> . . . . .	500	11	228
<i>sticticalis</i> . . . . .	403	9	237	<i>leplastriana</i> . . . . .	500	11	229
<i>urticalis</i> . . . . .	404	9	247	<i>lunulana</i> . . . . .		11	225
<i>urticata</i> . . . . .		9	247	<i>nitidana</i> . . . . .	502	11	241
<i>verticalis</i> . . . . .	403	9	245	<i>orobana</i> . . . . .	500	11	227
<i>verticalis</i> . . . . .		3	243	<i>pallifrontana</i> . . . . .	501	11	235
<i>Spilonota</i> . . . . .		11	12	<i>perlepidana</i> . . . . .	501	11	234
<i>amenana</i> . . . . .		11	18	<i>puncticostana</i>		11	244
<i>cyuoshana</i> . . . . .		11	14	<i>redimitana</i> . . . . .		11	241
<i>incarnatana</i> 171. 472		11	18	<i>regiana</i> . . . . .	502	11	243
<i>roborana</i> . . . . .	472	11	14	<i>roseticolana</i> . . . . .	502	11	245
<i>rosæcolana</i> . . . . .	472	11	15	<i>trauniana</i> . . . . .	502	11	242
<i>suffusana</i> . . . . .	472	11	16	<i>weirana</i> . . . . .		11	239
<i>trimaculana</i> . . . . .		11	16	STIGMONETIDÆ		11	161
<i>tripunctana</i> . . . . .	171	11	13	<i>Stilbia</i> . . . . .		5	275
<i>Spilosoma</i> . . . . .		2	277	<i>anomala</i> . . . . .	220	5	276
<i>lubricepeda</i> . . . . .	76	2	281	<i>Strenia</i> . . . . .		7	4
<i>mendica</i> . . . . .	75	2	277	<i>clathrata</i> . . . . .	281	7	4
<i>menthastri</i> . . . . .	77	2	286	<i>Syntomis</i> . . . . .		2	137
<i>pappalæa</i> . . . . .		2	289	<i>Phegea</i> . . . . .		2	137
<i>urticæ</i> . . . . .	78	2	289	<i>Syrichthius</i> . . . . .		1	267
<i>Stauropus</i> . . . . .		3	98	<i>Alveolus</i> . . . . .	37	1	268
<i>fagi</i> . . . . .	103	3	99	<i>Alveus</i> . . . . .	37	1	272
<i>Steganoptycha</i>		11	79	<i>malvæ</i> . . . . .		1	268
<i>augustana</i> . . . . .	480	11	85	<i>Tæniocampa</i> . . . . .		5	185
<i>bouchardana</i> . . . . .		11	80	<i>cruda</i> . . . . .	209	5	196
<i>cruciana</i> . . . . .	480	11	83	<i>gothica</i> . . . . .	207, 208	5	186
<i>geminana</i> . . . . .	481	11	93	<i>gracilis</i> . . . . .	213	5	218
<i>minutana</i> . . . . .	480	11	82	<i>incerta</i> . . . . .		5	209
<i>nævana</i> . . . . .	481	11	91	<i>instabilis</i> . . . . .	211, 212	5	209
<i>nigromaculana</i> . . . . .	480	11	86	<i>miniosa</i> . . . . .	208	5	192
<i>obtusana</i> . . . . .	480	11	81	<i>munda</i> . . . . .	212	5	214
<i>paykulliana</i> . . . . .		11	88	<i>opima</i> . . . . .	210	5	206
<i>ramella</i> . . . . .	480	11	88	<i>populeti</i> . . . . .	210	5	203
<i>rubiginosana</i> . . . . .	480	11	80	<i>pubescenta</i> . . . . .		5	196
<i>rufimitrana</i> . . . . .	481	11	90	<i>stabilis</i> . . . . .	209	5	200
<i>trimaculana</i> . . . . .	481	11	89	<i>Tanagra</i> . . . . .		9	155
<i>Stenia</i> . . . . .		9	297	<i>atrata</i> . . . . .		9	155
<i>punctalis</i> . . . . .	409	9	297	<i>cherophyllata</i> . . . . .	394	9	155
<i>Sterria</i> . . . . .		8	214	<i>Tapinostola</i> . . . . .		5	99
<i>sacraræa</i> . . . . .	350	8	214	<i>Bondii</i> . . . . .	198, 204	5	110
<i>Stigmonota</i> . . . . .		11	224	<i>concolor</i> . . . . .	197	5	105
<i>cognatana</i> . . . . .	500	11	230	<i>elymi</i> . . . . .	198	5	112
<i>composana</i> . . . . .		11	238	<i>extrema</i> . . . . .		5	105

	Plate	Vol.	Page		Plate	Vol.	Page
Tapinostola— <i>continued</i>				Tortrix— <i>continued</i>			
fulva . . . . .	197	5	102	piceana . . . . .	444	10	155
Helmanni . . . . .	198	5	107	podana . . . . .	443	10	157
<i>Morrisi</i> ? . . . . .		5	110	pronubana . . . . .	501	11	268
musculosa . . . . .	197	5	100	<i>pyrastrana</i> . . . . .		10	157
Tephrosia . . . . .		7	171	<i>roborana</i> . . . . .		10	160
bidunularia . . . . .	307, 308	7	178	rosana . . . . .	445	10	163
consonaria . . . . .	307	7	171	semialbana . . . . .	445	10	168
<i>crepuscularia</i> . . . . .		7	178	sorbiana . . . . .	445	10	165
extersaria . . . . .	309, 311	7	186	<i>spectrana</i> . . . . .		10	169
<i>loricaria</i> . . . . .		7	178	xylosteanana . . . . .	441	10	162
<i>luridata</i> . . . . .		7	186	Toxocampa . . . . .		5	255
punctularia . . . . .	309, 311	7	189	cracca . . . . .	219	5	258
Teras . . . . .		10	214	" . . . . .		5	380
caudana . . . . .	151	10	214	pastinum . . . . .	218	5	255
Tethea . . . . .		5	326	Trachea . . . . .		5	40
retusa . . . . .	226	5	329	atriplicis . . . . .	189	5	41
subtusa . . . . .	225	5	327	Trichiura . . . . .		3	5
Thais ruzina . . . . .		1	17	crategi . . . . .	87	3	5
Thalera . . . . .		9	451	Trichoptylus . . . . .		9	396
fimbriatis . . . . .		9	451	paludum . . . . .	417	9	397
Thalpochares . . . . .		6	192	" . . . . .		11	268
ostrea . . . . .	217	6	192	TRIFIDÆ . . . . .		3	214
parva . . . . .	217	6	195	Trigonophora . . . . .		5	45
paula . . . . .	217	6	197	empyrea . . . . .	190	5	45
Thecla . . . . .		1	42	<i>flammea</i> . . . . .		5	45
betule . . . . .	7	1	43	Triphena . . . . .		4	4
ilicis . . . . .		1	48	comes . . . . .		4	14
rubi . . . . .	8	1	48	fimbria . . . . .	137	4	5
quercus . . . . .	8	1	51	interjecta . . . . .	138	4	12
rubi . . . . .	8	1	53	janthina . . . . .	138	1	9
" . . . . .		1	312	orbana . . . . .	139	4	11
spini . . . . .		1	48	orbana . . . . .		4	19
w-album . . . . .	8	1	45	pronuba . . . . .	140	4	23
Thera . . . . .		8	351	subsequa . . . . .	138	4	19
coniferata . . . . .		8	357	Trycheris . . . . .		11	246
firmata . . . . .	367	8	351	aurana . . . . .	502	11	246
juniperata . . . . .	367	8	360	<i>mediana</i> . . . . .		11	246
simulata . . . . .	367	8	357	Ulochlena . . . . .		4	266
variata . . . . .	366	8	354	hispidana . . . . .	165	4	266
Thyatira . . . . .		3	189	Valeria . . . . .		4	328
batis . . . . .	116	3	190	oleagina . . . . .	174	4	328
Timandra . . . . .		8	72	Vanessa . . . . .		1	121
emutaria . . . . .	331	8	75	Antiope . . . . .	20	1	140
imitaria . . . . .	335	8	78	Atalanta . . . . .	20	1	145
strigilata . . . . .	331	8	73	c-album . . . . .	18	1	121
TORTRICIDÆ . . . . .		10	154	" . . . . .		1	313
TORTRICINÆ . . . . .		10	152	Cardui . . . . .	21	1	149
Tortrix . . . . .		10	154	Huntera . . . . .		1	155
costana . . . . .	115	10	169	" . . . . .		9	449
cratægana . . . . .	444	10	160	Io . . . . .	19	1	136
decretana . . . . .	444	10	159	polychloro . . . . .	18	1	127
fulvæna . . . . .		10	157	urticæ . . . . .	19	1	131
<i>lavignana</i> . . . . .		10	163	Venilia . . . . .		6	352
latauriana . . . . .	445	10	166	maculata . . . . .	272	6	352
latiorana . . . . .		10	169	Venusia . . . . .		8	192

	Plate	Vol.	Page		Plate	Vol.	Page
<i>Venusia—continued</i>				<i>Xylomiges—continued</i>			
<i>cambrica</i> . . . . .	349	8	192	<i>conspicillaris</i> . . . . .	152	1	141
<i>cambricaria</i> . . . . .		8	192	<i>Xylophasia</i> . . . . .		1	355
<i>Xanthia</i> . . . . .		5	359	<i>hepatica</i> . . . . .	180	1	372
<i>aurago</i> . . . . .	232	5	369	<i>lateritia</i> . . . . .		7	333
<i>cerago</i> . . . . .	230	5	363	<i>lithoxylea</i> . . . . .	176	1	356
<i>citrago</i> . . . . .	230	5	360	<i>monoglyphæ</i> . . . . .		1	362
<i>flavago</i> . . . . .		5	366	<i>polyodon</i> . . . . .	177, 178	1	362
<i>fulvago</i> . . . . .		5	363	<i>rurea</i> . . . . .	179, 180	4	368
<i>gilvago</i> . . . . .	231	5	373	<i>scolopacina</i> . . . . .	181	4	376
<i>ocellaris</i> . . . . .	231	5	376	<i>sublustris</i> . . . . .	176	1	359
<i>silago</i> . . . . .	231	5	366	<i>Zollikoferi</i> . . . . .		1	367
<i>Xanthosetia</i> . . . . .		10	339	" . . . . .	421	9	419
<i>hamana</i> . . . . .	464	10	341	<i>Zeuzera</i> . . . . .		2	143
<i>zœgana</i> . . . . .	464	10	340	<i>æsculi</i> . . . . .	61	2	143
<i>Xylina</i> . . . . .		6	22	" . . . . .		2	370
<i>conformis</i> . . . . .	235	6	30	" . . . . .		8	428
<i>furcifera</i> . . . . .		6	30	<i>pyrina</i> . . . . .		2	143
<i>lambda</i> . . . . .	235	6	34	<b>ZEUZERIDÆ</b> . . . . .		2	139
<i>ornithopus</i> . . . . .		6	37	<i>Zygæna</i> . . . . .		2	117
<i>petrificata</i> . . . . .	235	6	26	<i>exulans</i> . . . . .	58	2	121
<i>rhizolitha</i> . . . . .	236	6	37	<i>filipendula</i> . . . . .	60	2	133
<i>semibrumæa</i> . . . . .	235	6	23	<i>lonicere</i> . . . . .	59	2	130
<i>socia</i> . . . . .		6	26	<i>meliloti</i> . . . . .	59	2	124
<i>Zinckenii</i> . . . . .		6	34	<i>Minos</i> . . . . .	58	2	117
<i>Xylocampa</i> . . . . .		6	41	<i>uobigena</i> . . . . .		2	117
<i>arcola</i> . . . . .		6	41	<i>pilosella</i> . . . . .		2	117
<i>lithoriza</i> . . . . .	236	6	41	<i>trifolii</i> . . . . .	59	2	127
<i>Xylomiges</i> . . . . .		1	141	<b>ZYGÆNIDÆ</b> . . . . .		2	108

## ERRATUM

Vol. xi, page 1, for Group 5, Pyralidina, read Group 6, Tortricina





PLATE CCCCLXX.

- FIG. 1. *Penthina nigricostana*, male.  
1*a.* „ „ female.  
2. *Hedya ocellana*, male.  
2*a.* „ „ female.  
2*b.* „ „ var. male.  
2*c.* „ „ var. female.  
3. „ *laricana*, male.  
3*a.* „ „ female.  
4. „ *aceriana*, male.  
5. „ *dealbana*, male.  
5*a.* „ „ female.  
5*b.* „ „ var. *alnetana*.



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PLATE CCCCLXXI.

- FIG. 1. *Hedya neglectana*, male.  
1*a*. „ „ female.  
2. „ *simplana*.  
2*a*. „ „  
3. „ *pauperana*, male.  
4. „ *oppressana*, male.  
4*a*. „ „ female.  
5. *Spilonota tripunctana*, male.  
5*a*. „ „ female.  
6. „ *incarnatana*, var. (Malahide).

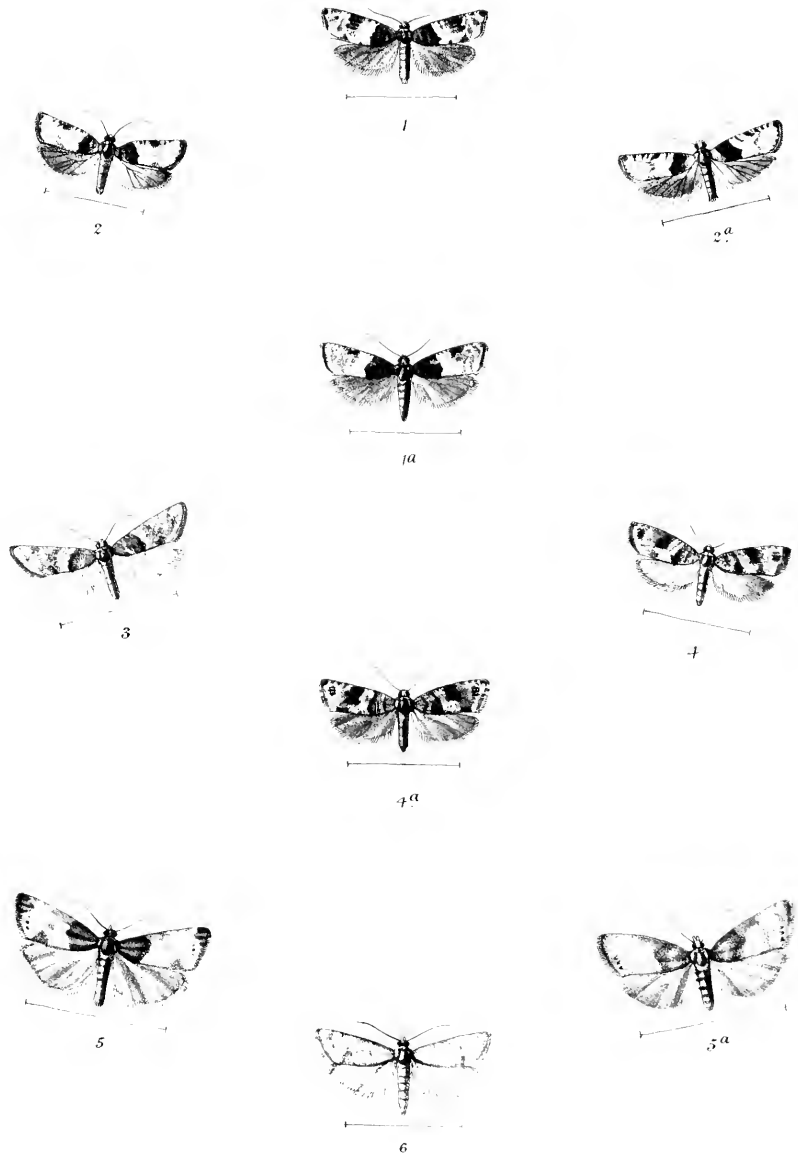






PLATE CCCCLXXII.

- FIG. 1. *Spilonota roborana*, male.  
1*a.*     ,,           ,,       female.  
2.       ,,       *rosæcolana*, male.  
2*a.*     ,,           ,,       female.  
3.       ,,       *suffusana*, male.  
3*a.*     ,,           ,,       female.  
4.       ,,       *incarnatana*, male.  
4*a.*     ,,           ,,       female.  
5. *Aspis uddmanniana*, male.  
5*a.*     ,,           ,,       female.

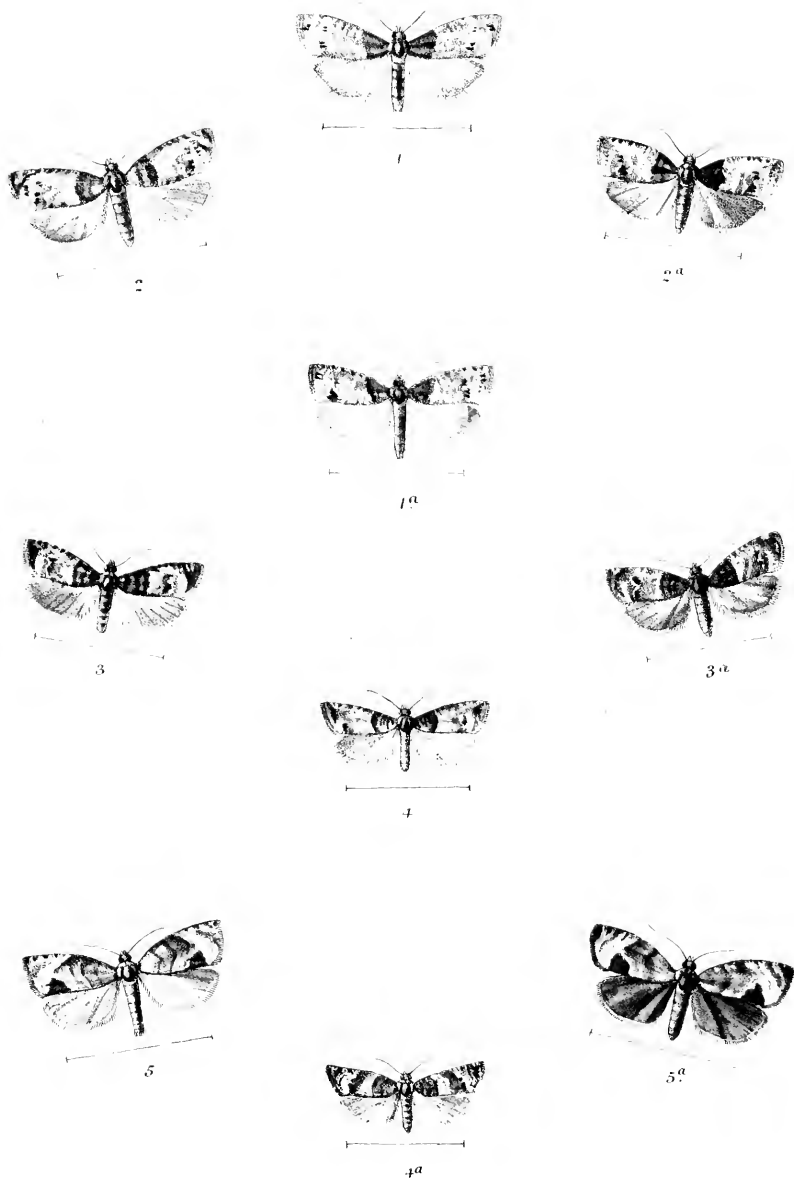








PLATE CCCCLXXIII.

FIG. 1. *Orthotænia branderiana*.

1 <i>a</i> .	„	„	female.
1 <i>b</i> .	„	„	var.
2.	„	antiquana.	
2 <i>a</i> .	„	„	
2 <i>b</i> .	„	„	var.
3.	„	ericetana.	
4.	„	striana.	
4 <i>a</i> .	„	„	female.
5.	„	purpurana.	
5 <i>a</i> .	„	„	female.
6.	„	rufana.	



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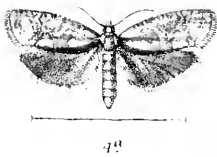
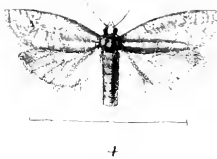
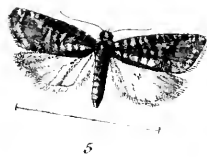
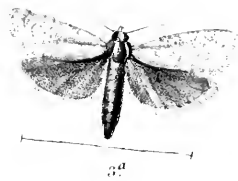
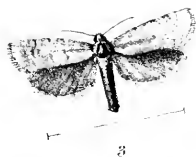




PLATE CCCCLXXIV.

FIG. 1. *Orthotænia arbutella*.

- 1*a.*        ,,                ,,        female.
- 2.         ,,                *mygindana*.
- 2*a.*        ,,                ,,        female.
- 3.         *Retinia buoliana*.
- 3*a.*        ,,                ,,        female.
- 4.         ,,                *pinicolana*.
- 4*a.*        ,,                ,,        female.
- 5.         ,,                *turionana*.
- 5*a.*        ,,                ,,        female.
- 6.         ,,                *posticana* (Dumbarton. Atmore.)
- 6*a.*        ,,                ,,        (King's Lynn. Atmore.)



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PLATE CCCCLXXV.

FIG. 1. *Retinia pinivorana*.

- |             |   |                    |         |
|-------------|---|--------------------|---------|
| 1 <i>a.</i> | „ | „                  | female. |
| 1 <i>b.</i> | „ | „                  | var.    |
| 1 <i>c.</i> | „ | „                  | var.    |
| 2.          | „ | resinella.         |         |
| 2 <i>a.</i> | „ | „                  | female. |
| 2 <i>b.</i> | „ | „                  | „       |
| 3.          | „ | sylvestrana.       |         |
| 3 <i>a.</i> | „ | „                  | female. |
| 4.          | „ | retiferana (Webb). |         |



1.



2



1a



2a



1b



1c



2b



3



4



3a

*Agrotis*

*Agrotis*

*Agrotis*





PLATE CCCCLXXVI.

FIG. 1. *Sideria achatana*.

1*a.* „ „ female.

2. *Retinia duplana*.

3. *Mixodia ratzeburgiana*.

3*a.* „ „ female.

4. „ *schulziana*.

4*a.* „ „ female.

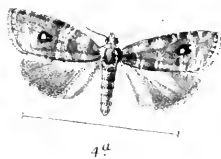
4*b.* „ „ var.

5. „ *palustrana*.

5*a.* „ „ female.

6. *Sericoris micana*.

6*a.* „ „ female.



E. W. Knight, del. et lith.

Vanocote, Fris. Co. Mass. & Co. Lith. Del.







PLATE CCCCLXXVII.

FIG. 1. *Sericoris irrignana*.

- 1*a.*    ,,       ,,       female.
- 1*b.*    ,,       ,,       var.
- 2.     ,,       *metallicana*.
- 2*a.*    ,,       ,,       female.
- 3.     ,,       *lacunana*, male.
- 3*a.*    ,,       ,,       (Fen form).
- 3*b.*    ,,       ,,       (Hill form).
- 4.     ,,       *urticana*, male.
- 4*a.*    ,,       ,,       var.
- 4*b.*    ,,       ,,       var.
- 5.     ,,       *rivulana*.
- 5*a.*    ,,       ,,       female.



E. C. C. Smith del. et lith.

Vincent Lee & Co. Dayr. Soc. Lond. Sc.

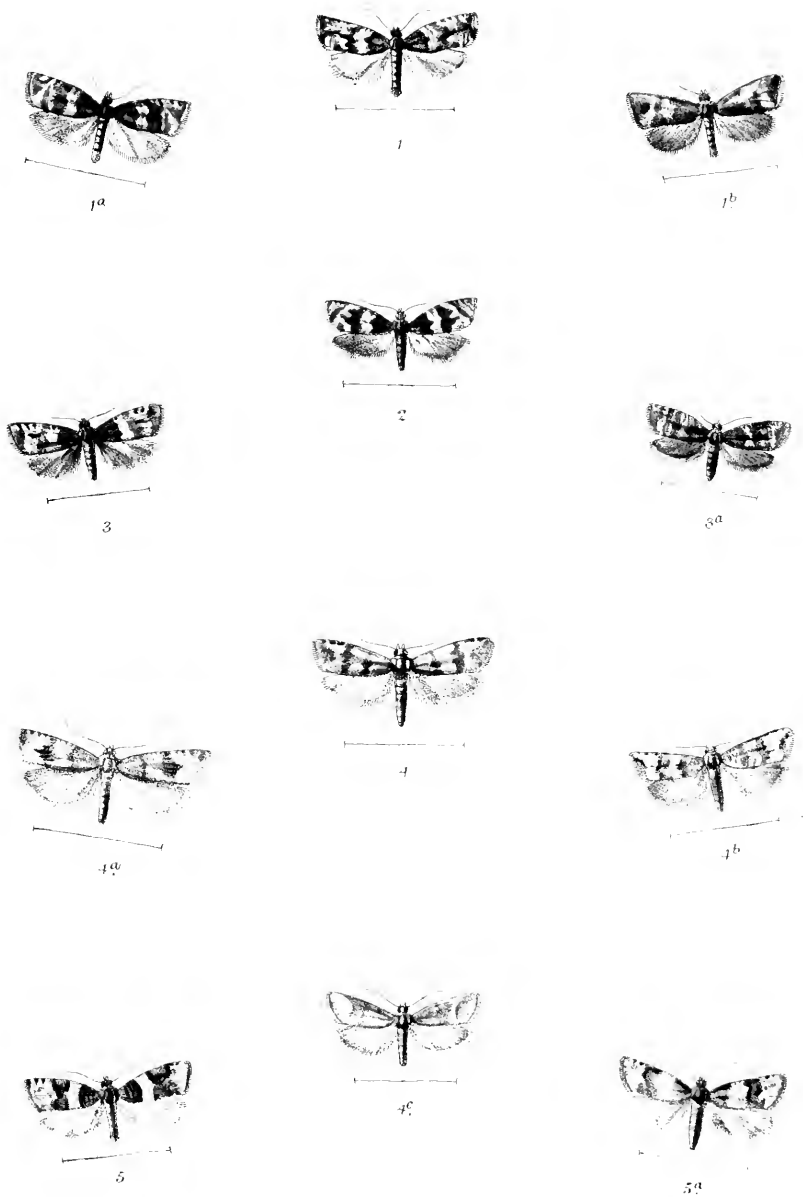




PLATE CCCCLXXVIII.

FIG. 1. *Sericoris cespitana*, male.

- 1*a.*     ,,     ,,     var. (Sand hills).
- 1*b.*     ,,     ,,     var. (Limestone hills).
- 2.     ,,     *doubledayana*, male.
- 3.     *Eudemis fuligana*.
- 3*a.*     ,,     ,,     female.
- 4.     ,,     *littoralis*, male (Pembroke).
- 4*a.*     ,,     ,,     (Kincardine).
- 4*b.*     ,,     ,,     (Dublin).
- 4*c.*     ,,     ,,     (Devonshire).
- 5.     ,,     *bifasciana*.
- 5*a.*     ,,     ,,     female.



E. C. Knight, del. et lith.

Wm. H. Burmeister, sculp.







PLATE CCCCLXXIX.

FIG. 1. *Eudemis euphorbiana*.

1 $\alpha$ . „ „ female.

2. „ *latifasciana*, male.

3. *Acrolita consequana*.

3 $\alpha$ . „ „ female.

4. „ *Servillana*.

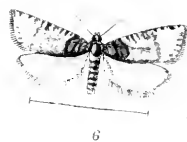
4 $\alpha$ . „ „ female.

5. *Roxana arcuella*, male.

6. *Eriopsala fractifasciana*.

6 $\alpha$ . „ „ female.

7. „ *quadrana*, male.



E. J. Knap & Co. Lith.

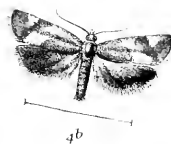
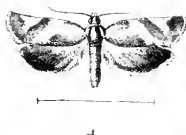
W. H. & J. W. & Co. Lith.





PLATE CCCCLXXX.

- FIG. 1. *Steganoptycha rubiginosa*, male.  
2. „ *obtusana*, male.  
3. „ *minutana*, female.  
4. „ *cruciana*.  
4*a*. „ „ female.  
4*b*. „ „ var.  
5. „ *angustana*.  
5*a*. „ „ var.  
5*b*. „ „ var.  
6. „ *nigromaculana*, male.  
7. „ *ramella*, male.  
7*a*. „ „ var.



E. C. Knight del et lith.

Proc. Entom. Soc. Lond. 1892, p. 12

1. *Fraxinella* *Fraxinella*







PLATE CCCCLXXXI.

FIG. 1. *Steganoptycha trimaculana*.

1 <i>a</i> .	..	.,	female.
1 <i>b</i> .	..	.,	var.
1 <i>c</i> .	..	.,	var.
2.	..	<i>rufimitrana</i> .	
2 <i>a</i> .	..	..	female.
3.	.,	<i>nævana</i> .	
3 <i>a</i> .	..	..	female.
3 <i>b</i> .	..	.,	var.
3 <i>c</i> .	.,	.,	var.
4.	..	<i>geminana</i> .	
4 <i>a</i> .	..	.,	female.
4 <i>b</i> .	.,	..	var.

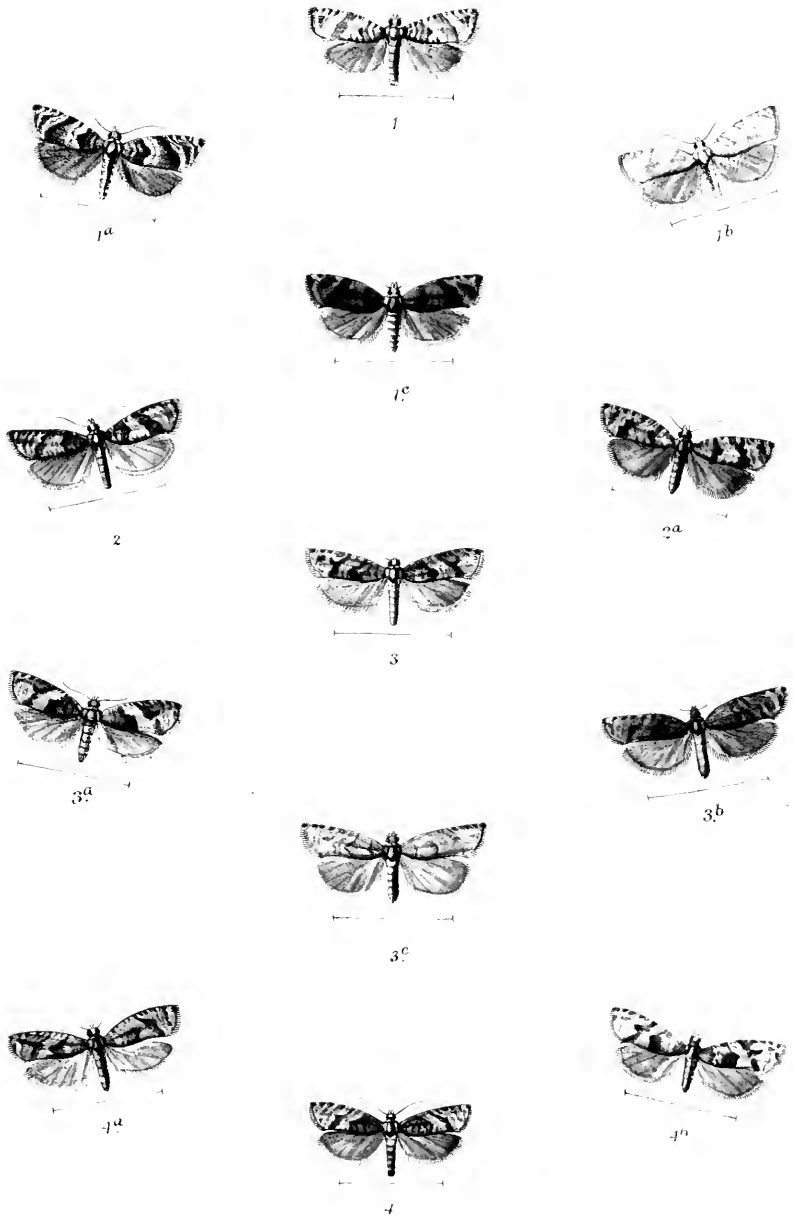


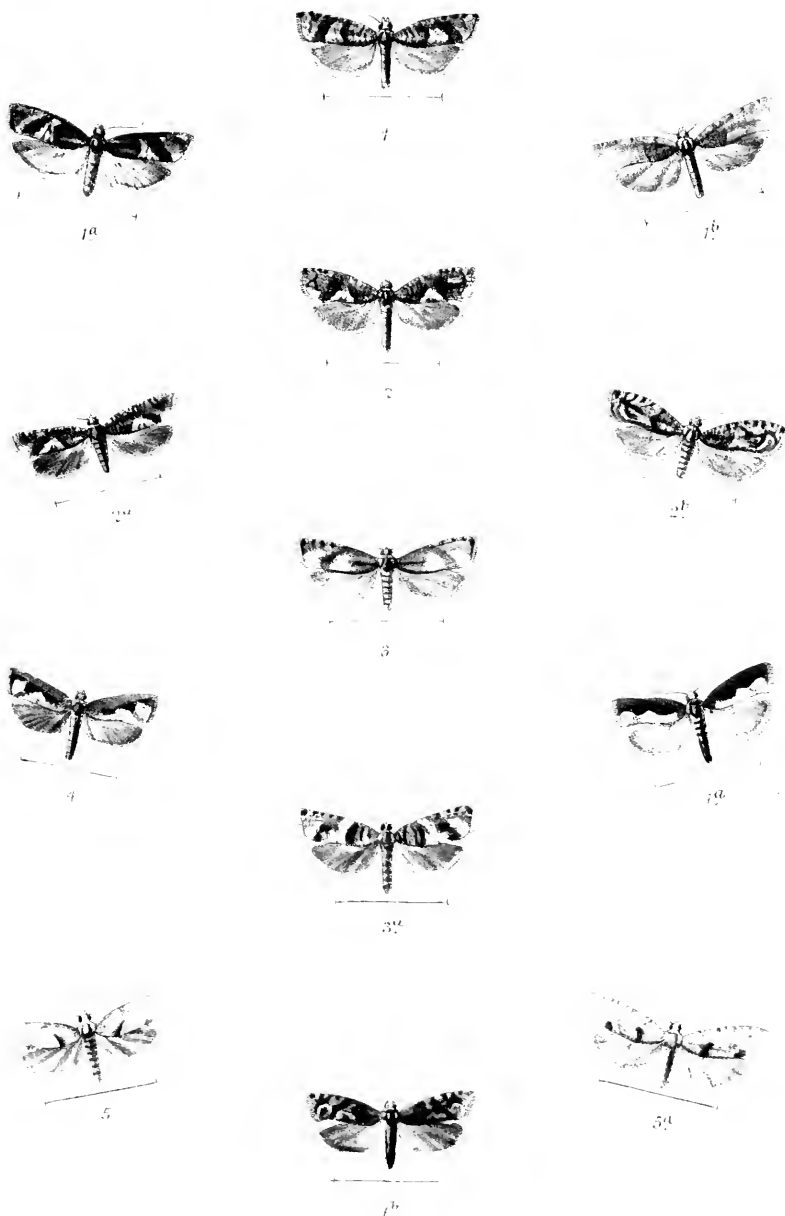




PLATE CCCCLXXXII.

FIG. 1. *Phlœdes tetraquetra*na.

- |              |   |                            |         |
|--------------|---|----------------------------|---------|
| 1 <i>a</i> . | „ | „                          | female. |
| 1 <i>b</i> . | „ | „                          | var.    |
| 2.           | „ | <i>immundana</i> .         |         |
| 2 <i>a</i> . | „ | „                          | female. |
| 2 <i>b</i> . | „ | „                          | var.    |
| 3.           | „ | <i>demarniana</i> .        |         |
| 3 <i>a</i> . | „ | „                          | female. |
| 4.           | „ | <i>crenana</i> .           |         |
| 4 <i>a</i> . | „ | „                          | female. |
| 4 <i>b</i> . | „ | „                          | var.    |
| 5.           |   | <i>Cartella bilunana</i> . |         |
| 5 <i>a</i> . | „ | „                          | female. |



E. C. Knight del. et lith.

Robert Brooks Layton Sculp. imp.

L. Moore & Co. Lith.







PLATE CCCCLXXXIII.

FIG. 1. *Lithographia subocellana*.

1 <i>a</i> .	..	..	female.
2.	..	nisella.	
2 <i>a</i> .	..	..	female.
2 <i>b</i> .	..	..	var. pavonana.
2 <i>c</i> .	..	..	var. decorana.
2 <i>d</i> .	..	..	var. rhombifasciana.
2 <i>e</i> .	..	..	var. (Wisley, Surrey).
3.	..	cinereana.	
3 <i>a</i> .	..	..	female.
4.	..	penkeleriana.	
4 <i>a</i> .	..	..	female.
4 <i>b</i> .	..	..	var.
4 <i>c</i> .	..	..	var.



*Yuglia decaurata*

*Yuglia discipaloides* (Gimp)





PLATE CCCCLXXXIV.

FIG. 1. *Anchylopera siculana*.

- |             |    |   |              |
|-------------|----|---|--------------|
| 1 <i>a.</i> | .  | „ | female.      |
| 2.          | .. |   | unguicella.  |
| 2 <i>a.</i> | „  | „ | female.      |
| 2 <i>b.</i> | „  | „ | var.         |
| 3.          | .. |   | uncana.      |
| 3 <i>a.</i> | „  | „ | female.      |
| 4.          | „  |   | biarcuana.   |
| 4 <i>a.</i> | „  | „ | female.      |
| 5.          | „  |   | inornatana.  |
| 5 <i>a.</i> | „  | „ | female.      |
| 5 <i>b.</i> | „  | „ | (pale form). |



1



2



1a



2a



3



3b



4



4a



4b



5



5b



5a

H. C. Knight del, et lith

Vincent Brooks, Day & Son, Lit<sup>d</sup> Imp



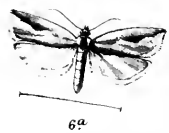
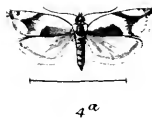
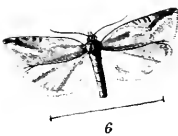
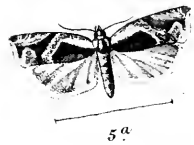
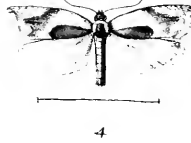
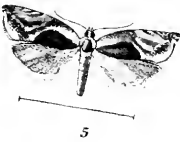
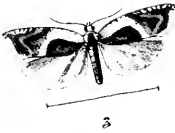
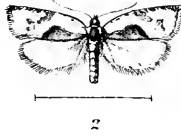
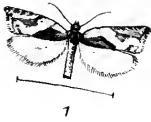




PLATE CCCCLXXXV.

FIG. 1. *Anchylopera comptana*.

- |             |    |                     |         |
|-------------|----|---------------------|---------|
| 1 <i>a.</i> | ,, | ,,                  | female. |
| 2.          | ,, | <i>myrtillana</i> . |         |
| 2 <i>a.</i> | ,, | ,,                  | female. |
| 3.          | ,, | <i>lundana</i> .    |         |
| 3 <i>a.</i> | ,, | ,,                  | female. |
| 4.          | ,, | <i>paludana</i> .   |         |
| 4 <i>a.</i> | ,, | ,,                  | female. |
| 5.          | ,, | <i>derasana</i> .   |         |
| 5 <i>a.</i> | ,, | ,,                  | female. |
| 6.          | ,, | <i>diminutana</i> . |         |
| 6 <i>a.</i> | ,, | ,,                  | female. |



E.C. Krught, del et lith.

Vincent Brookes, Day & Son, Lith. Imp.





PLATE CCCCLXXXVI.

FIG. 1. *Anchylopera mitterbacheriana*.

1*a.* ,, ,, female.

2. ,, upupana.

3. ,, letana.

3*a.* ,, ,, female.

4. *Bactra lanceolana*.

4*a.* ,, ,, female.

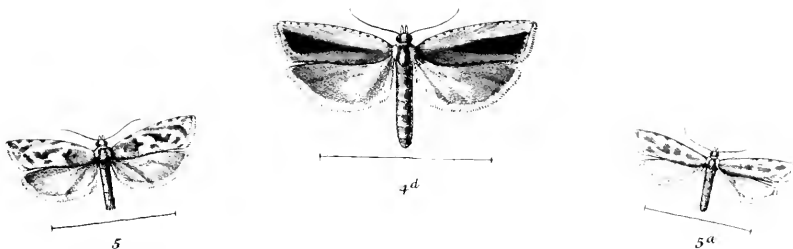
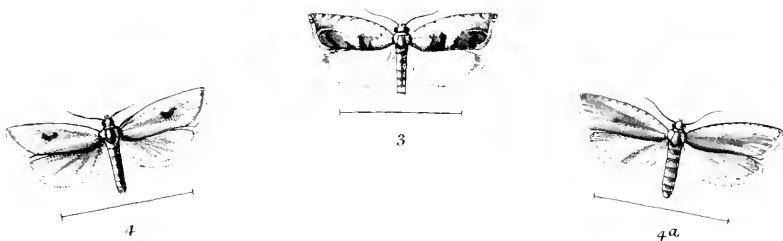
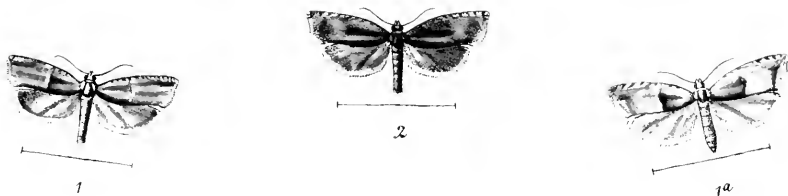
4*b.* ,, ,, var. (Pembroke).

4*c.* ,, ,, var.

4*d.* ,, ,, var. (Pembroke).

5. ,, furfurana.

5*a.* ,, ,, female.



E. C. Knight, del et lith.

Vincent Brooks, Day & Son, Lith.



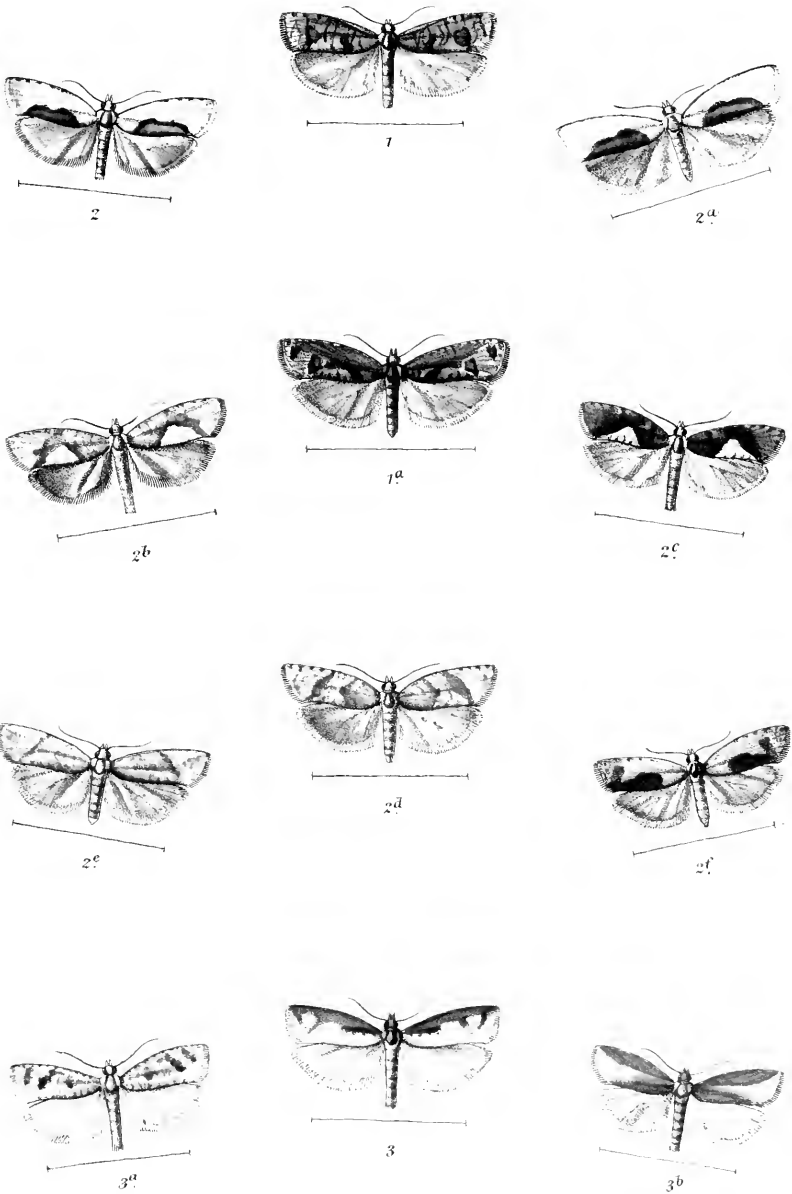




PLATE CCCCLXXXVII.

FIG. 1. *Paedisca ophthalmicana*.

- |             |   |              |                 |
|-------------|---|--------------|-----------------|
| 1 <i>a.</i> | „ | „            | female.         |
| 2.          | „ | solandriana. |                 |
| 2 <i>a.</i> | „ | „            | female.         |
| 2 <i>b.</i> | „ | „            | var. parmatana. |
| 2 <i>c.</i> | „ | „            | var. sinuana.   |
| 2 <i>d.</i> | „ | „            | var. trapezana. |
| 2 <i>e.</i> | „ | „            | var. sylvana.   |
| 2 <i>f.</i> | „ | „            | var.            |
| 3.          | „ | semifusca.   |                 |
| 3 <i>a.</i> | „ | „            | var.            |
| 3 <i>b.</i> | „ | „            | var.            |



E. C. Knight del. et lith.

Vincent Brookes, Day & Son Lith'rs





PLATE CCCCLXXXVIII.

FIG. 1. *Paedisca sordidana*.

1*a.* „ „ female.

2. *Halonota similana*.

2*a.* „ „ female.

3. „ *pflugiana*.

3*a.* „ „ female.

4. „ *cirsiana*.

4*a.* „ „ female.

5. „ *brunnichiana*.

5*a.* „ „ female.

6. „ *grandaevana*.

6*a.* „ „ female.



2



1



2a



3



1a



3a



5



4



5a



6



4a



6a

F.C. Knight del. lith.

Ancora Brown, Pl. & Col. Lit. Imp.



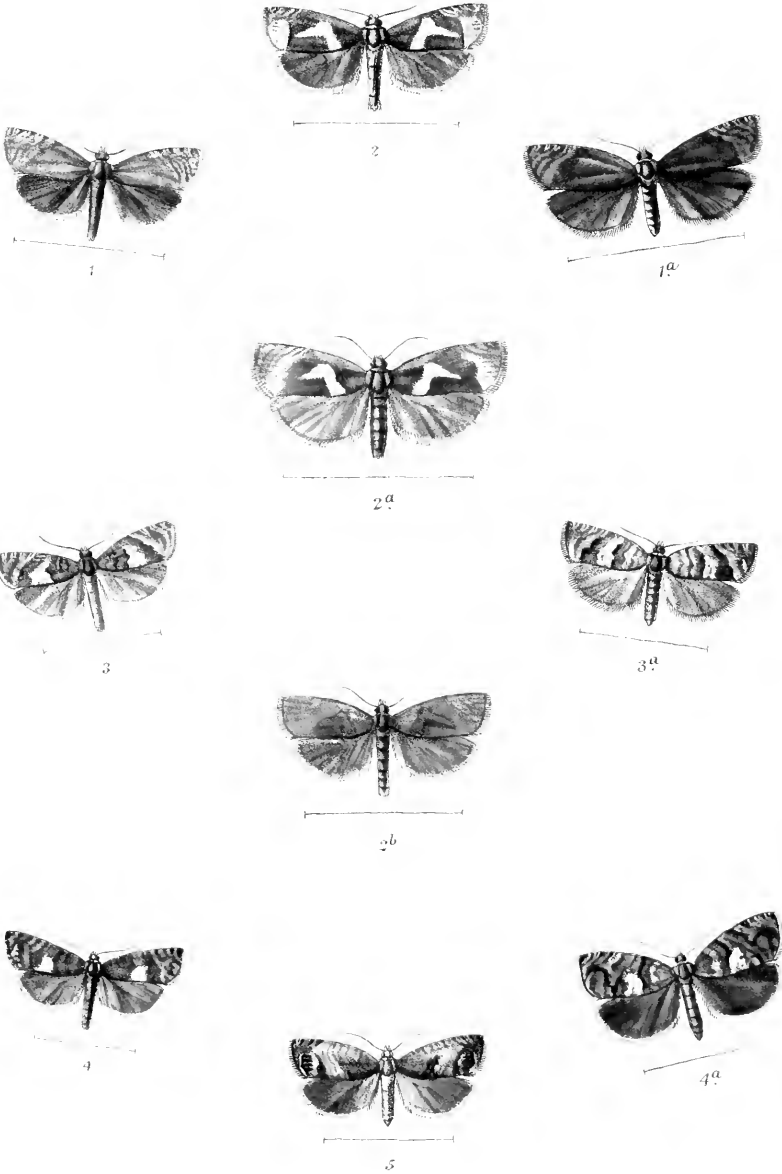




PLATE CCCCLXXXIX.

FIG. 1. Halonota turbidana.

- 1*a.* „ „ female.
- 2. „ fœnella.
- 2*a.* „ „ female.
- 2*b.* „ „ var.
- 3. „ trigeminana.
- 3*a.* „ „ female.
- 4. „ tetragonana.
- 4*a.* „ „ female.
- 5. Carpocapsa splendana.



E. C. Knight del et lith

Vincent Brooks, Del. & Lith. Lond.

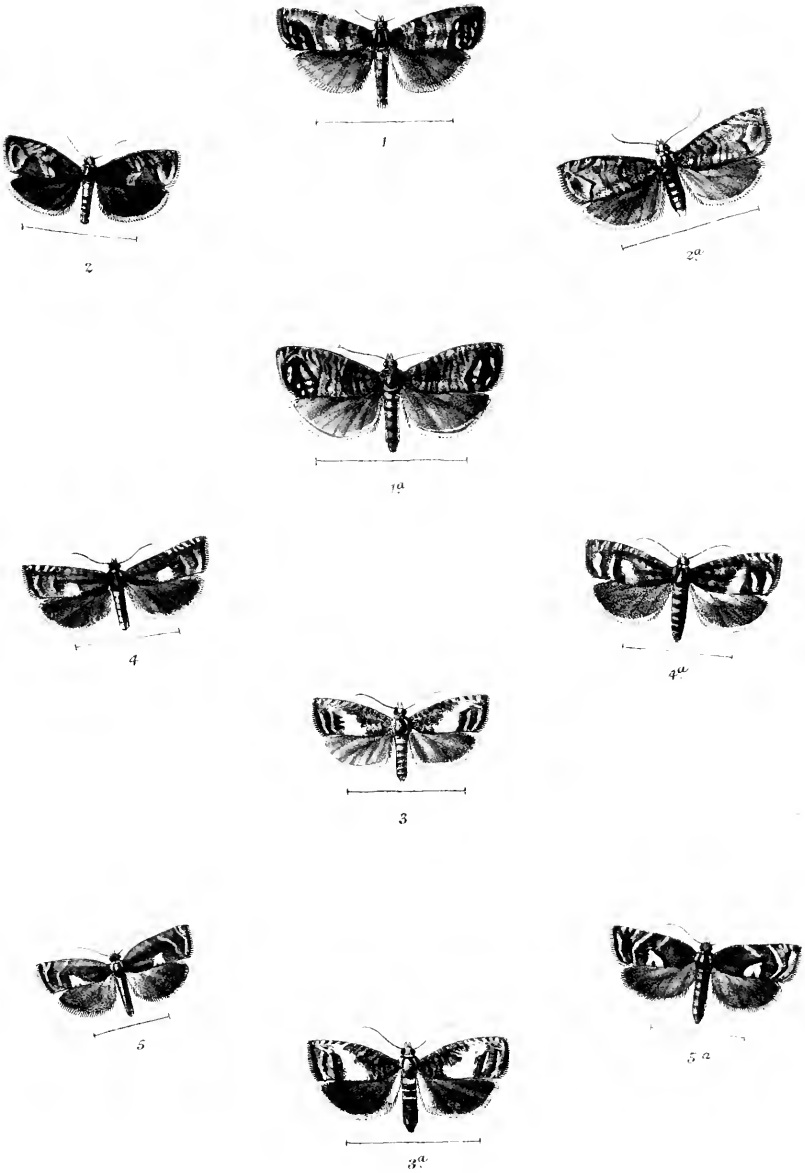
L. Peavey & Co. London





PLATE CCCCXC.

- FIG. 1. *Carpocapsa pomonella*.  
1*a.*       ,,       ,,       female.  
2.       ,,       *grossana*.  
2*a.*       ,,       ,,       female.  
3.       ,,       *juliana*.  
3*a.*       ,,       ,,       female.  
4.       ,,       *nimbana*.  
4*a.*       ,,       ,,       female.  
5.       *Semasia populana*.  
5*a.*       ,,       ,,       female.



E. C. Knight del et lith.

L. Reeve & Co. London.

Vincent Brooks Day & Co. Lith. Imp.



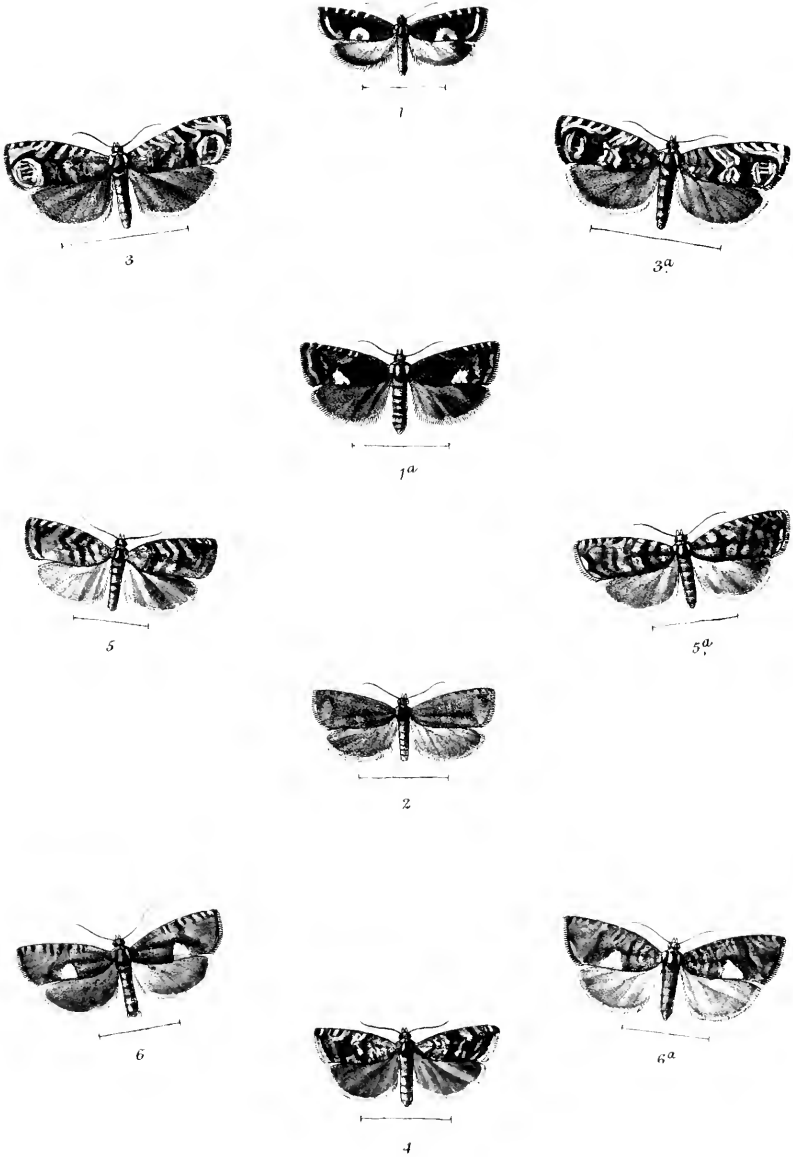




PLATE CCCCXCI.

FIG. 1. *Semasia gallicolana*.

- 1*a.*    ,,        ,,        female.
- 2.     ,,        *obscurana*.
- 3.     ,,        *weberiana*.
- 3*a.*    ,,        ,,        female.
- 4.     ,,        *rufillana*.
- 5.     ,,        *janthinana*.
- 5*a.*    ,,        ,,        female.
- 6.     ,,        *spiniana*.
- 6*a.*    ,,        ,,        female.



E. C. Knight del et lith.

Vincent Brooks Day & Son Del Imp

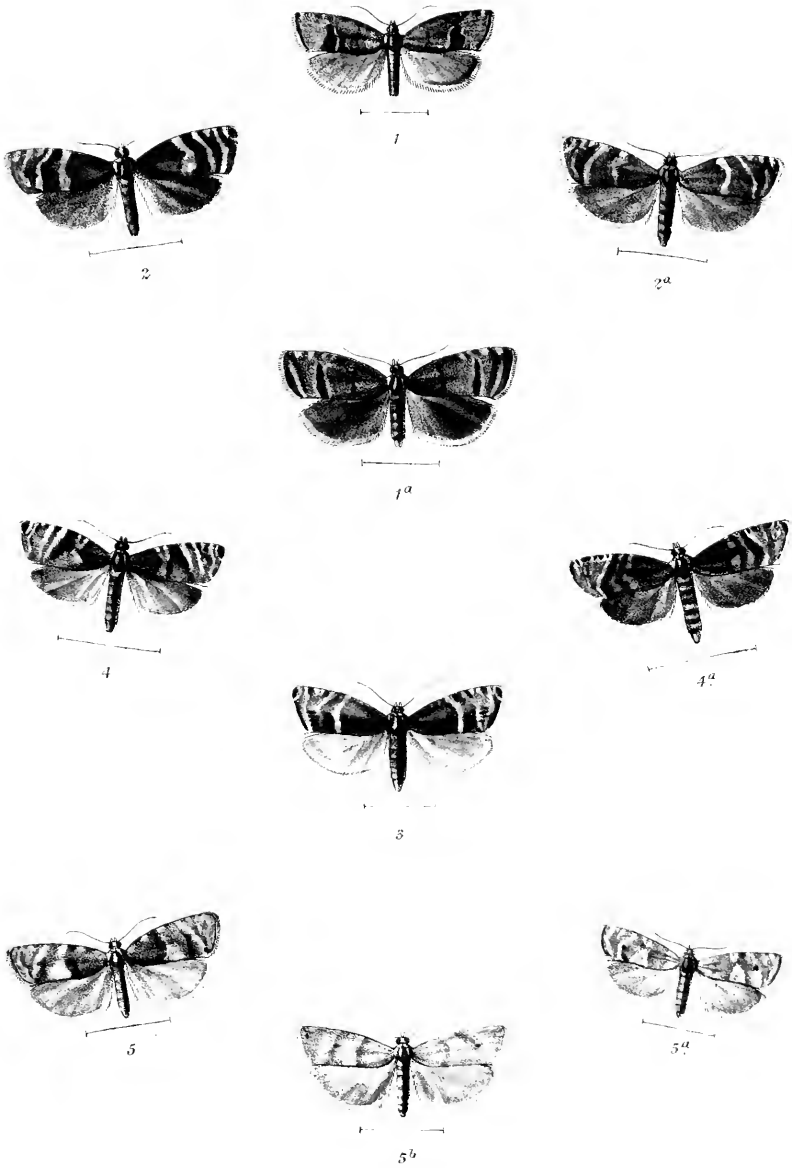




PLATE CCCCXCII.

FIG. 1. *Asthenia ochsenheimeriana*.

- |              |   |                |         |
|--------------|---|----------------|---------|
| 1 <i>a</i> . | „ | „              | female. |
| 2.           | „ | cosmophorana.  |         |
| 2 <i>a</i> . | „ | „              | female. |
| 3.           | „ | scopariana.    |         |
| 4.           | „ | strobilella.   |         |
| 4 <i>a</i> . | „ | „              | female. |
| 5.           | „ | splendidulana. |         |
| 5 <i>a</i> . | „ | „              | female. |
| 5 <i>b</i> . | „ | „              | var.    |



E.C. Knight del et lith.

Amoyan Fauna, vol. 1, p. 127, fig. 1-10.

Revised by G. S. Davis.



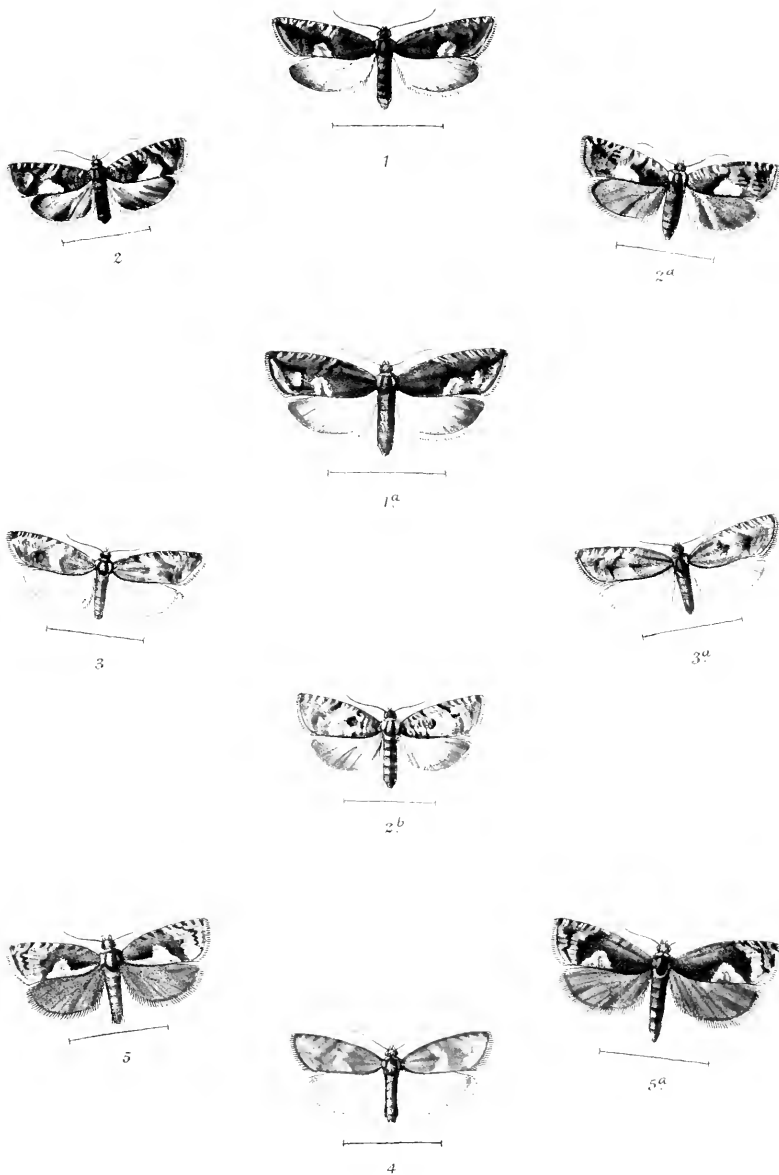




PLATE CCCCXCIII.

FIG. 1. *Asthenia fimbriana*.

- 1*a.*     ,,         ,,         female.
- 2.       ,,         *argyrana*.
- 2*a.*     ,,         ,,         female.
- 2*b.*     ,,         ,,         var.
- 3.       ,,         *subsequana*.
- 3*a.*     ,,         ,,         female.
- 4.       ,,         *pygmæana*.
- 5.       ,,         *ustomaculana*.
- 5*a.*     ,,         ,,         female.



E. C. Knight del et lith

Vincent Brooks Day & Son, Lith.

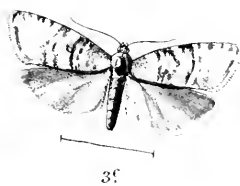
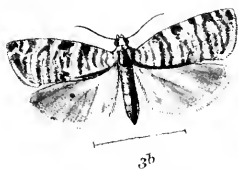
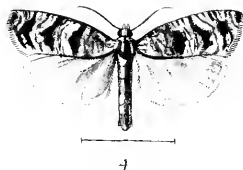
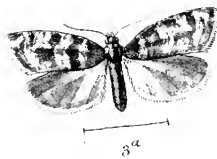
L. Reeve & Co. London





PLATE CCCCXCIV.

- FIG. 1. *Asthenia nanana*.  
1*a.*     ,,     ,,     female.  
2.       ,,     *vacciniana*.  
2*a.*     ,,     ,,     female.  
3.     *Coccyx tedella*  
3*a.*     ,,     ,,     female.  
3*b.*     ,,     ,,     var.  
3*c.*     ,,     ,,     var.  
4.       ,,     *nemorivaga*  
4*a.*     ,,     ,,     female.



E. C. Knight del et lith

Vincent Brooks, Day & Son, Ltd. Imp.

L. Reeve & Co. London



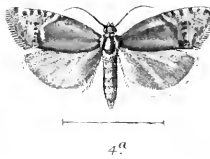
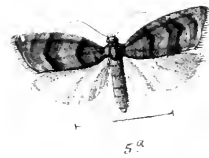
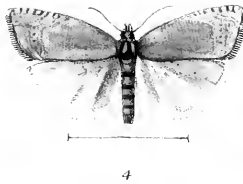
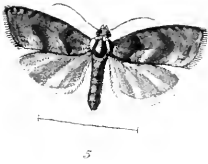
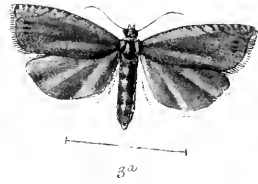
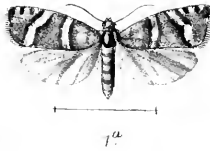
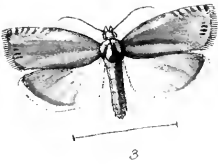
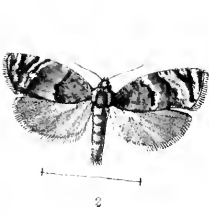




PLATE CCCCXCV.

FIG. 1. *Coccyx distinctana*.

- 1*a.*    ,,       ,,       female.
- 2.     ,,     *nigricana*.
- 2*a.*    ,,       ,,       female.
- 3.    *Endopisa nebritana*.
- 3*a.*    ,,       ,,       female.
- 4.     ,,     *gemmiferana*.
- 4*a.*    ,,       ,,       female.
- 5.     ,,     *funebrana*.
- 5*a.*    ,,       ,,       female.
- 6.    *Pampluria mercuriana*
- 6*a.*    ,,       ,,       female.



E.C. Knight del, et lith

Vincent Broderick, Day & Son, Lith'rs

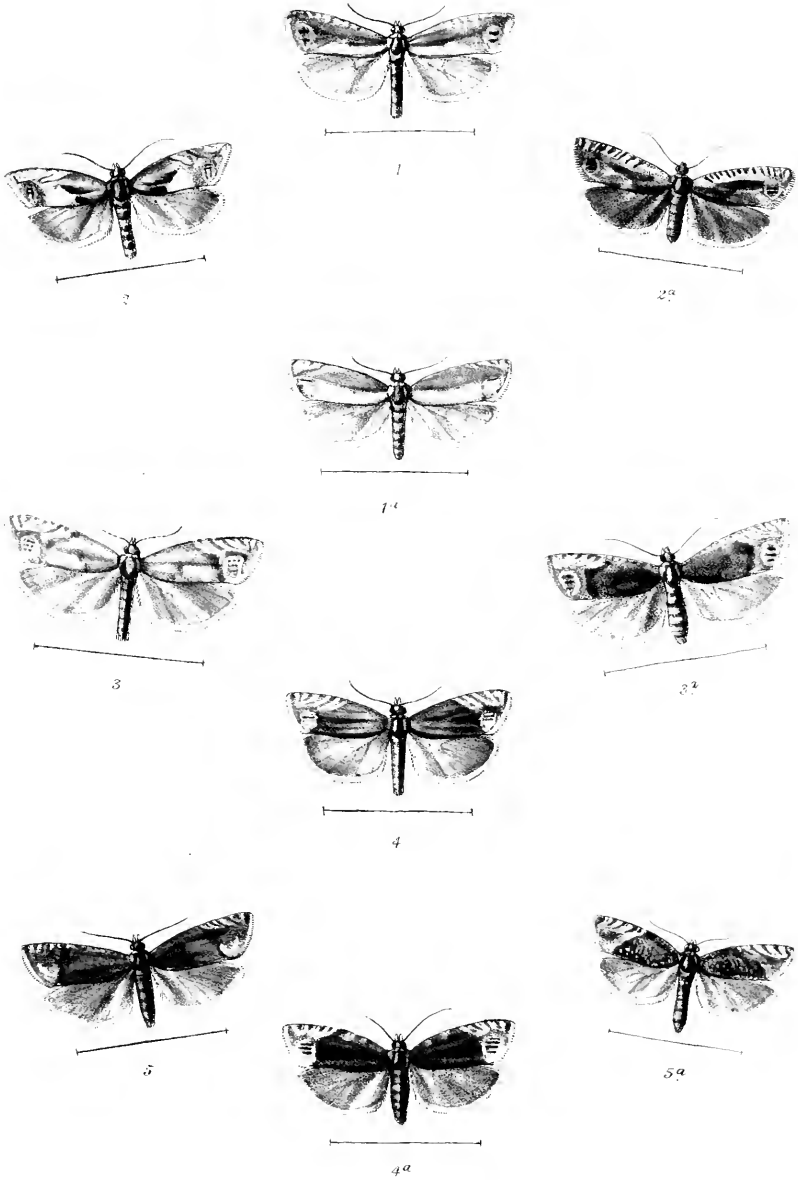




PLATE CCCCXCVI.

FIG. 1. *Catoptria expallidana*.

- |              |   |               |         |
|--------------|---|---------------|---------|
| 1 <i>a</i> . | „ | „             | female. |
| 2.           | „ | scopoliana.   |         |
| 2 <i>a</i> . | „ | „             | female. |
| 3.           | „ | fulvana.      |         |
| 3 <i>a</i> . | „ | „             | female. |
| 4.           | „ | cana.         |         |
| 4 <i>a</i> . | „ | „             | female. |
| 5.           | „ | cæcimaculana. |         |
| 5 <i>a</i> . | „ | „             | female. |



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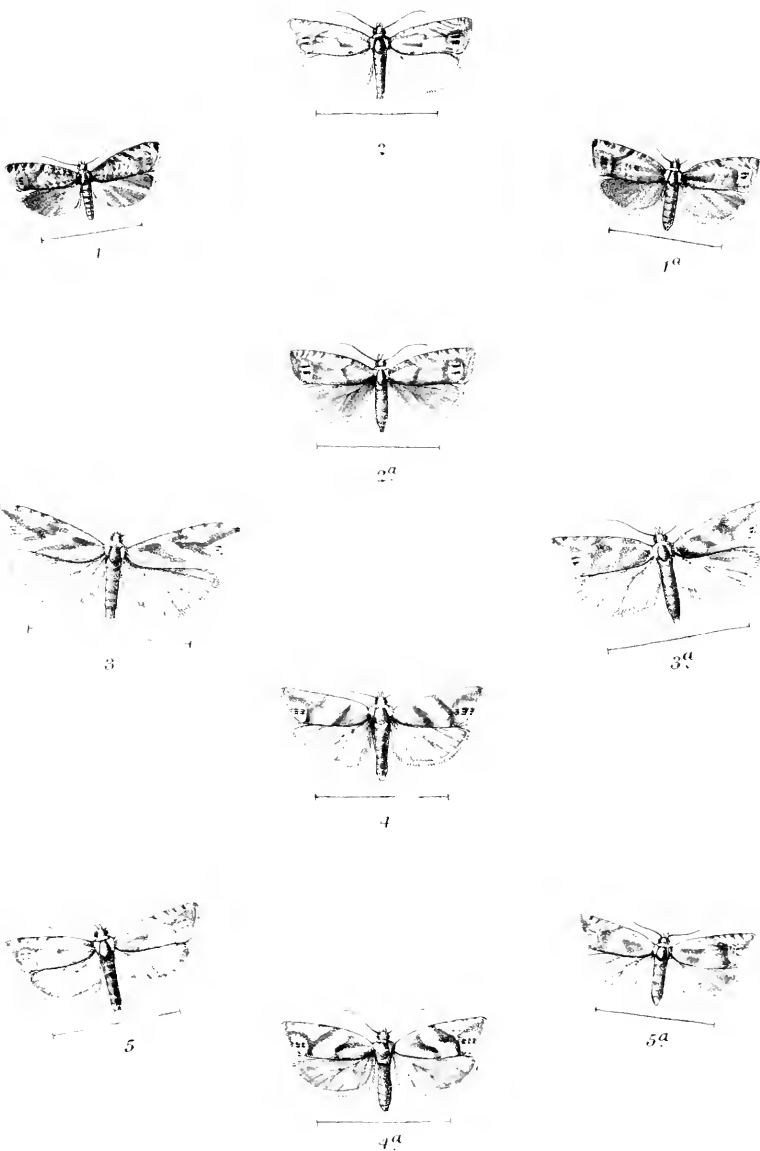




PLATE CCCCXCVII.

FIG. 1. *Grapholitha æmulana*.

- 1*a.*    "                "       female.
- 2.       "       tripoliana.
- 2*a.*    "                "       female.
- 3.       "       citrana.
- 3*a.*    "                "       female.
- 4.       "       pupillana.
- 4*a.*    "                "       female.
- 5.       "       candidulana.
- 5*a.*    "                "       female.



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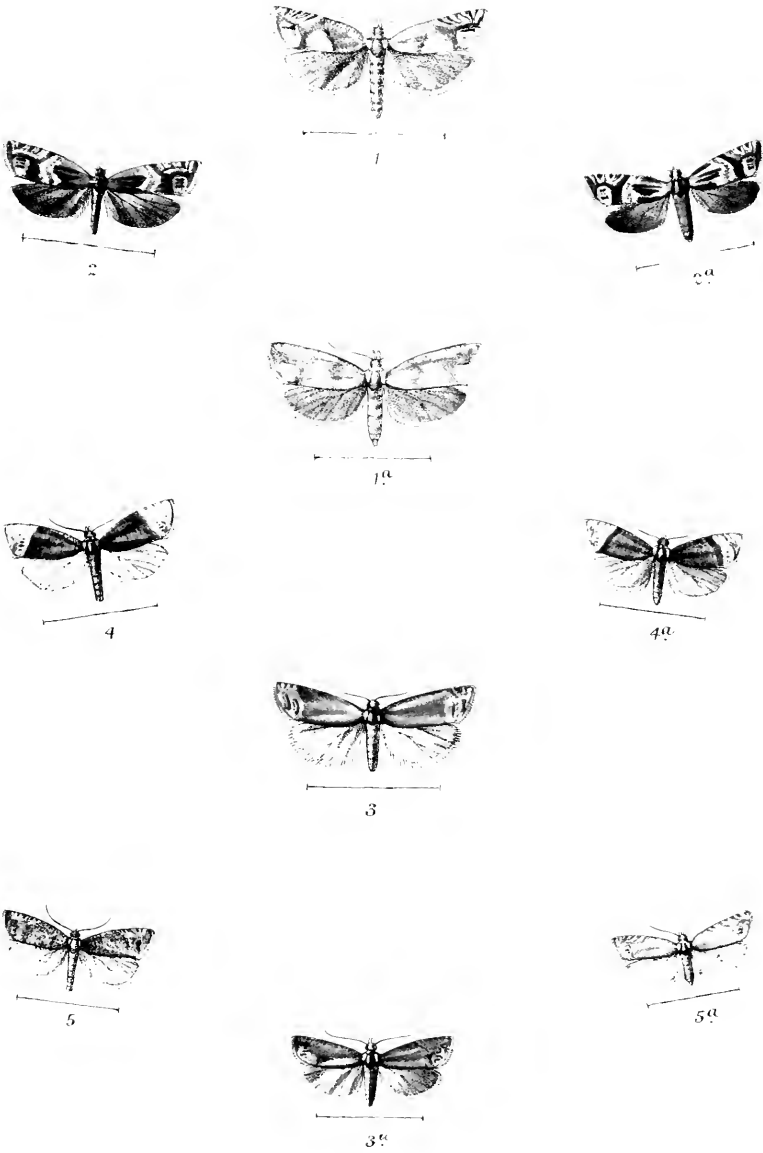


PLATE CCCCXCVIII.

FIG. 1. *Grapholitha conterminana*.

- |              |    |                        |         |
|--------------|----|------------------------|---------|
| 1 <i>a</i> . | .. | „                      | female. |
| 2.           | .. | <i>aspidiscana</i> .   |         |
| 2 <i>a</i> . | .. | „                      | female. |
| 3.           | .. | <i>hypericana</i> .    |         |
| 3 <i>a</i> . | .. | „                      | female. |
| 4.           | .. | <i>albersana</i> .     |         |
| 4 <i>a</i> . | .. | „                      | female. |
| 5.           | .. | <i>microgrammana</i> . |         |
| 5 <i>a</i> . | .. | „                      | female. |

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PLATE CCCCXCIX.

- FIG. 1. *Grapholitha cæcana*.  
2.            ..            ulicetana.  
2*a.*         ..            ..        female.  
2*b.*         ..            ..        ab.  
2*c.*         ..            ..        ab. (Ireland).  
2*d.*         ..            ..        small form.  
3. *Pyrodes rhediella*.  
3*a.*         ..            ..        female.  
4. *Stigmonota dorsana*.  
4*a.*         ..            ..        female.



E. T. Knight del et lit.

Am. Entom. Soc. Trans. 1896, p. 107, figs. 1-10.





PLATE CCCCC.

FIG. 1. *Stigmonota orobana*.

- |              |   |               |         |
|--------------|---|---------------|---------|
| 1 <i>a</i> . | „ | „             | female. |
| 2.           | „ | leguminana.   |         |
| 2 <i>a</i> . | „ | „             | female. |
| 3.           | „ | leplastriana. |         |
| 3 <i>a</i> . | „ | „             | female. |
| 4.           | „ | cognatana.    |         |
| 4 <i>a</i> . | „ | „             | female. |
| 5.           | „ | coniferana.   |         |
| 5 <i>a</i> . | „ | „             | female. |



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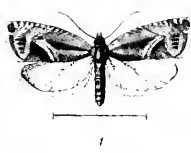




PLATE CCCCXI.

FIG. 1. *Stigmonota perlepidana*.

- |              |   |                        |         |
|--------------|---|------------------------|---------|
| 1 <i>a</i> . | „ | „                      | female. |
| 2.           | „ | <i>pallifrontana</i> . |         |
| 2 <i>a</i> . | „ | „                      | female. |
| 3.           | „ | <i>internana</i> .     |         |
| 3 <i>a</i> . | „ | „                      | female. |
| 4.           | „ | <i>compositella</i> .  |         |
| 4 <i>a</i> . | „ | „                      | female. |
| 5.           | „ | <i>hexana</i>          |         |
| 5 <i>a</i> . | „ | „                      | female. |



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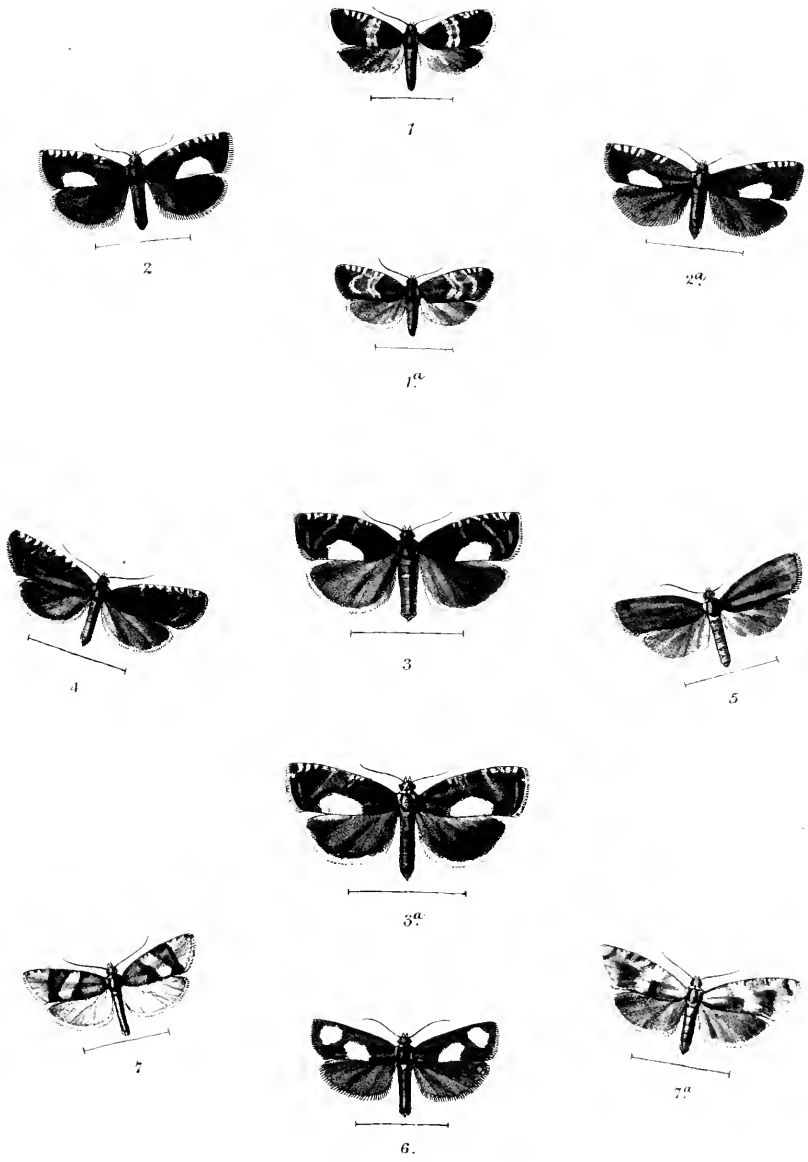




PLATE CCCCCII.

FIG. 1. *Stigmonota nitidana*.

- 1*a*.        "        "        female.
- 2.         "        trauniana.
- 2*a*.        "        "        female.
- 3.         "        regiana.
- 3*a*.        "        "        female.
- 4.         "        germarana.
- 5.         "        roseticolana.
- 6. *Trycheris aurana*.
- 7. *Lobesia permixtana*.
- 7*a*.        "        "        female.



E C Knight del et lith.

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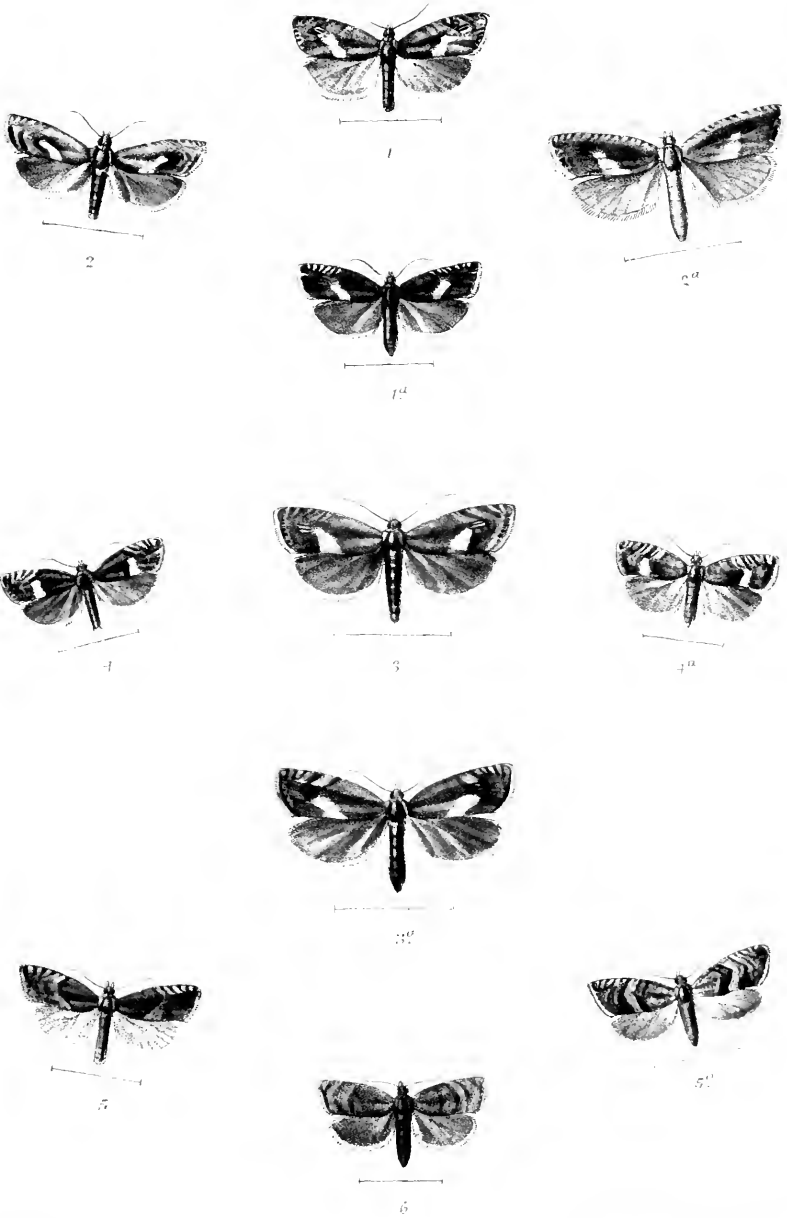




PLATE CCCCCIII.

FIG. 1. *Dichrorampha petiverella*.

- |              |   |               |         |
|--------------|---|---------------|---------|
| 1 <i>a</i> . | „ | „             | female. |
| 2.           | „ | alpinana.     |         |
| 2 <i>a</i> . | „ | „             | female. |
| 3.           | „ | flavidorsana. |         |
| 3 <i>a</i> . | „ | „             | female. |
| 4.           | „ | sequana.      |         |
| 4 <i>a</i> . | „ | „             | female. |
| 5.           | „ | consortana.   |         |
| 5 <i>a</i> . | „ | „             | female. |
| 6.           | „ | alpestrana.   |         |



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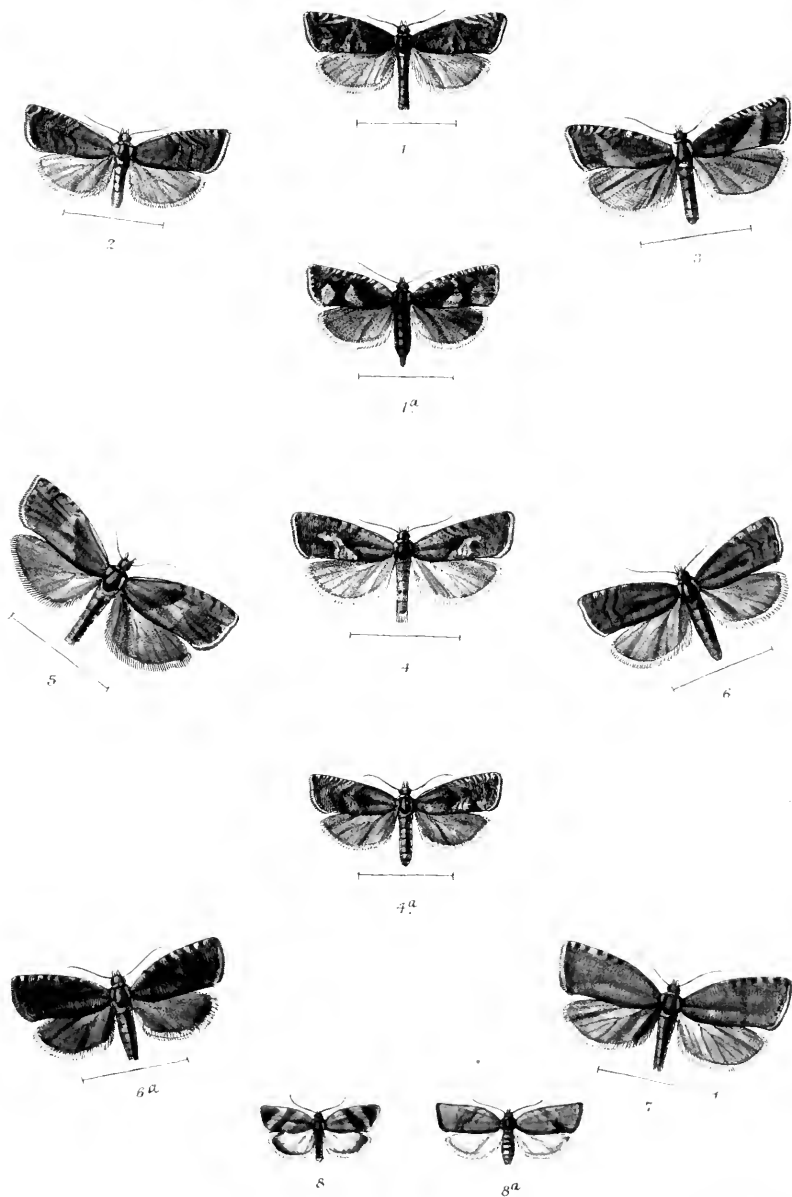




PLATE CCCCCIV.

FIG. 1. *Dichrorampha plumbagana*.

- 1*a.*        „                „        female.
- 2.         „                *senectana*.
- 3.         „                *herbosana*.
- 4.         „                *acuminatana*.
- 4*a.*        „                „        female.
- 5.         „                *simpliciana*.
- 6.   *Lipoptycha plumbana*.
- 6*a.*        „                „        female.
- 7.         „                *saturnana*.
- 8.   *Tortrix pronubana*.       (nat. size).
- 8*a.*        „                „        female (nat. size).



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Vincent Brooks Delin. sculp. lith.













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Golding, 1836-1904.

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