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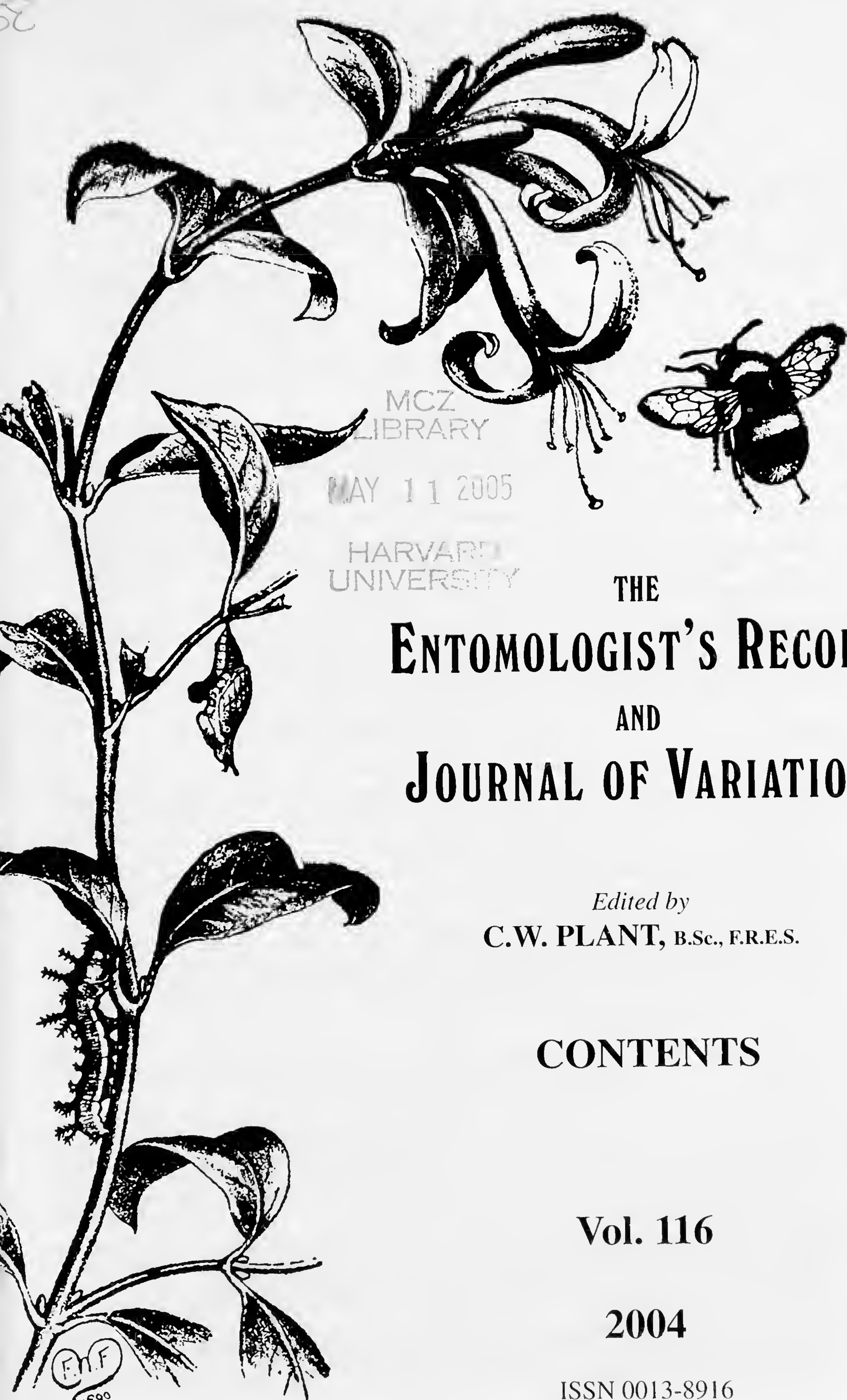

THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

Edited by
C.W. PLANT, B.Sc., F.R.E.S.

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- The journal is concerned with **British Lepidoptera** (moths and butterflies). We also accept contributions on **British Coleoptera** (beetles), **British Diptera** (flies) and **other groups** at the Editor's discretion. We also print **Subscriber Notices** at no cost on behalf of current subscribers; non-subscribers pay a fee for this service. We also publish **Reviews of entomological books** and other publications relating to all aspects of world entomology if these are sent to the Editor at no cost to him. It is our policy not to accept unsolicited book reviews from third parties.
- We may also accept contributions on **European insects** if these are likely to be of interest to British readers, such as species likely to colonise Britain (especially where these contributions include identification keys or photographs), or accounts of entomological trips to places that may be of interest to other readers.
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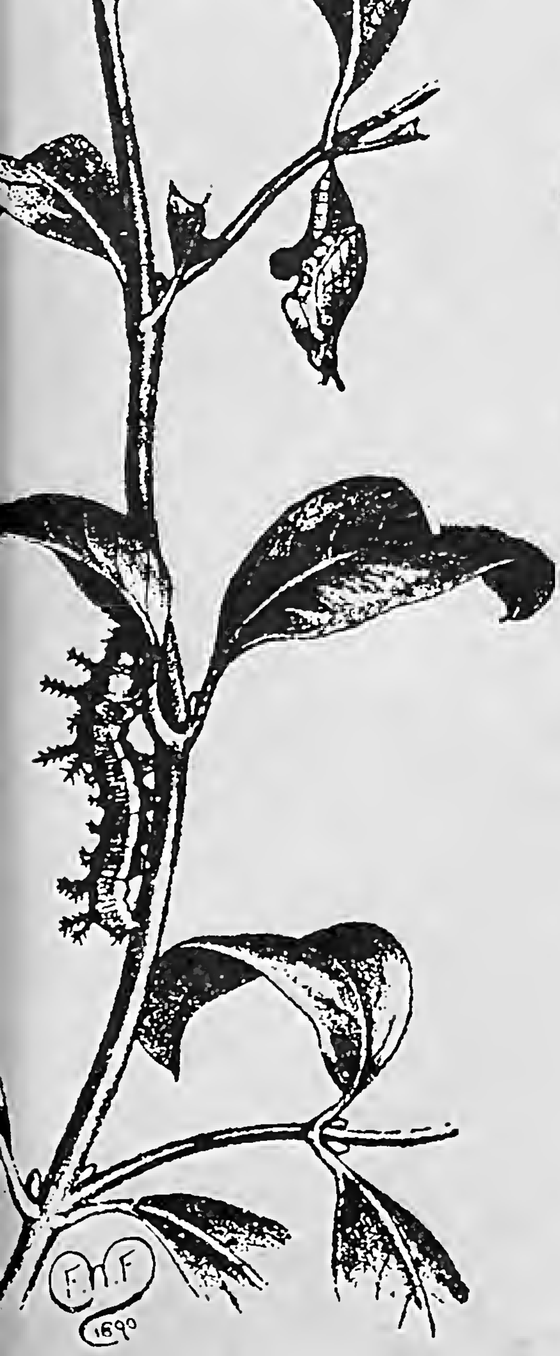

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THE IMMIGRATION OF LEPIDOPTERA TO THE BRITISH ISLES IN 2000

Bernard Skinner[1] and Graham A. Collins[2]

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[2] *15 Hurst Way, South Croydon, Surrey CR2 7AP.*

Abstract

Formally accepted records of immigrant Lepidoptera occurring in the British Isles and the Channel Islands during the year 2000 are listed and discussed. For less frequently encountered species full information is given; for common immigrants a selection of the more noteworthy records is presented.

Introduction

In a year reported as the wettest on record the migrant activity in 2000 was best described as average with most of the regular migrant butterflies and moths appearing in neither high nor low numbers. One exception was the Clouded Yellow *Colias croceus* (Geoff.), which first appeared in June and was then seen in increasing numbers for the rest of the season. Many of these were probably the result of local breeding. The White Point *Mythimna albipuncta* (D. & S.) also fared well in southern and western England in September and October, but distinguishing the primary immigrants from the resident populations is not possible.

Highlights of the year included the fourth British record of Porter's Rustic *Proxenus hospes* (Frey.) from the Isles of Scilly and the eighth, ninth and tenth English records of Radford's Flame Shoulder *Ochropleura leucogaster* (Frey.). However, the most noteworthy immigrants to the British mainland were the capture of three examples of the Many-lined *Costaconvexa polygrammata* (Borkh.). The first two specimens were taken in Somerset and Dorset in June and the last in South Devon in September. In view of the three-month gap between the first two records and the last it is possible the September specimen was the offspring of the earlier migration, albeit undetected in Devon.

The Many-lined was formerly resident in the Cambridgeshire fens where it occurred not uncommonly until its decline around the middle of the nineteenth century and the last documented specimen is dated 1879. Therefore in 2000 these captures were hailed as the first English records for over 100 years. However in 1993 a specimen was taken at West Bexington, Dorset, but had remained unidentified until

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Author's note: Due to other commitments, this will be the last review that I will be co-authoring. I would like to take this opportunity to thank all the recorders for their support over the last few years. With effect from the 2001 review Steve Nash has agreed to take over as co-author, and records can be submitted electronically to him at steve@migrantmoth.com. Steve runs the immigrant moth website (www.migrantmoth.com) where current migrant news can be posted; the definitive published review will, as usual, follow a few years behind to allow it to be as complete as possible. Postal records may continue to be sent to Bernard Skinner at the address above – Graham A. Collins.

2001 when the record was published in the *Moths of Dorset Newsletter* No. 8 dated 31 March 2001. In 2000 a fourth example for the year was reported on Jersey, where previously single specimens had been noted in 1973 and 1999.

Abbreviations

E	Exotic introduction/escape
I	Primary immigrant
In	Introduction (including importations)
R	Resident
R(t)	Temporary resident
V	Vagrant/wanderer

ANNEX 1: RECORDS OF SCARCER SPECIES

YPONOMEUTIDAE

***Yponomeuta evonymella* (L.) [I]**
S. HANTS [**11**] Southsea, 30.6, 2.7 (JRL).

***Yponomeuta rorrella* (Hb.) [I]**
S. HANTS [**11**] Southsea, 19.7 (JRL).

ETHMIIDAE

***Ethmia terminella* Fletch.**
S. ESSEX [**18**] Thundersley, 29.6 (DGD).

TORTRICIDAE

***Cydia amplana* (Hb.) [I]**
DORSET [**9**] Walditch, 25.8 (MSP); Portland Bird Observatory, 25.8 (5) (MC).
CHANNEL ISLANDS Guernsey: Icart, 7.8 (TNDP *in* Austin, 2001); Petit Bot, 16.8 (Austin, 2001).

PYRALIDAE

***Haimbachia cicatricella* (Hb.) [I]**
E. KENT [**15**] Dungeness, 20.7, 27.7, 5.8 (DF[1]/SB[5]); Lydd, 30.7 (KR[1]).

***Crambus pratella* (L.)**
N. HANTS [**12**] Selborne, 31.7 (AA).

***Platytes alpinella* (Hb.) [?I/?R]**
S. DEVON [**3**] Starcross, 13.7 (AHD).

***Evergestis limbata* (L.) [?I/?R]**
S. HANTS [**11**] Hayling Island, 2.7 (Phillips & Durnell, 2001); Lymington, 8.8 (Pickles *in* Anon, 2001b).
CHANNEL ISLANDS Guernsey: La Broderie, 3.7 (Costen *in* Austin, 2001).

***Hellula undalis* (Fab.) [I]**
W. CORNWALL [**1**] Church Cove, Lizard, 15.9, 25.9 (MT[2]). E. SUSSEX [**14**] Peacehaven, 28.10 (CRP).

Loxostege sticticalis **(L.) [I]**
W. CORNWALL [**1**] St Agnes, Scilly, 2.9 (Hicks, 2001).

Sitochroa palealis **(D. & S.) [?I/?R]**
DORSET [**9**] Portland Bird Observatory, 29.6, 8.8 (MC). W. SUSSEX [**13**] Kingsham, 27.7 (SP). E. SUSSEX [**14**] Icklesham, 12.8, 14.8 (IH[1]); Winchelsea Beach, 26.8 (DCGB). E. KENT [**15**] Lydd, 4.8, 5.8, 13.8 (KR[1]). HERTS [**20**] Radlett, 20.7 (CME).

Sitochroa verticalis **(L.) [?I/?V]**
CHANNEL ISLANDS Jersey: Grouville Common, 9.8 (DJW[1]).

Sclerocona acutellus **(Evers.) [I/In]**
W. SUSSEX [**13**] West Wittering, 13.6 (ML). S. ESSEX [**18**] Bradwell-on-Sea, 15.6 (Dewick, 2001).

Ostrinia nubilalis **(Hb.) [?I/?R]**
S. DEVON [**3**] Starcross, 3.7 (AHD). DORSET [**9**] Portland Bird Observatory, 18.6, 6.8 (MC). IOW [**10**] Freshwater, 22.9 (SAK-J). S. HANTS [**11**] Hayling Island, 24.6, 3-4.7, 14.7, 19.7, 16.8 (Phillips & Durnell, 2001). N. HANTS [**12**] Bramley Frith Wood, 29.6, 12.7 (AHD). W. SUSSEX [**13**] Ferring, 19.7 (TF). E. SUSSEX [**14**] Icklesham, 6.7-22.9 (5) (IH[1]). BERKS [**22**] Fernham, 6.7 (2), 24.7 (SN). E. NORFOLK [**27**] Martham, 4.7 (CK). E. GLOUCESTER [**33**] Hempsted, 3.7 (GRA).
CHANNEL ISLANDS Guernsey: La Broderie, 29.6 (Costen *in* Austin, 2001).

Nascia cilialis **(Hb.) [?R]**
W. SUSSEX [**13**] Woods Mill, c. 13.6, 21.6 (SC).

Antigastra catalaunalis **(Dup.) [I]**
DORSET [**9**] Portland Bird Observatory, 25.9 (MC). S. HANTS [**11**] Portswood, 2.9 (Norris *in* Anon, 2001b).

Maruca vitrata **(Fab.) [?I/?In]**
CHESTER [**58**] Congleton, 17.8 (Kimber, 2001).

Diasemiopsis ramburialis **(Dup.) [I]**
W. CORNWALL [**1**] St Agnes, Scilly, 23.9 (Hicks, 2001).

Duponchelia fovealis **Zeller [In]**
DORSET [**9**] Milton-on-Stour, 17.5 (J. Burge *in* Langmaid & Young, 2001). IOW [**10**] Ventnor, found indoors 23.6 (PJC). N. ESSEX [**19**] Kirby-le-Soken, found indoors 17.3 (PB[1]).

Palpita vitrealis **(Rossi) [I]**
W. CORNWALL [**1**] St Agnes, Scilly, 29.6, 15.9 (Hicks, 2001); Church Cove, Lizard, 15.9-7.10 (7) (MT[2]); Kynance Cove, 23.9 (PB[3]); Coverack, 25.9, 27.9 (DCGB), 26.9 (SN); St Just, 26.9 (SN); Mullion, 2.10 (AW[1]). S. DEVON [**3**] Lydford, 23.9 (PB[2]); Abbotskerswell, 29.9 (BPH); Berry Head, Brixham, 30.9 (BPH). DORSET [**9**] Portland Bird Observatory, 29.8, 19.9 (MC); Durlston Head, 8.9 (SN). IOW [**10**] Freshwater, 12.7 (SAK-J); Binstead, 22.9 (BW); Sconce Point, Yarmouth, 18.10 (DCGB). S. HANTS [**11**] Southsea, 1.7 (JRL); Fareham, 18.9 (RD). W. SUSSEX [**13**] Lyminster, 15.6 (REP); Walberton, 30.6 (JTR); Ferring, 29.8, 18.9 (TF). E. SUSSEX [**14**] Peacehaven, 26.8 (CRP); East Grinstead, 2.10 (JHC). E. KENT [**15**] Kingsgate, 21.9 (Solly, 2001); Greatstone, 24.9 (BB[3]); Lydd, 29.9 (KR[1]); Orlestone Forest, 29.9 (RRC); Dungeness, 30.9 (NVG). S. ESSEX [**18**] Bradwell-on-Sea, 26.8, 23.9 (Dewick, 2001). S.W. YORK [**63**] Wakefield, 2.10 (Smith *in* Anon, 2001b). IOM [**71**] Dhoon Maughold, 20.6 (LK); Claughbane Ramsey, 23.6, 2.7 (CW).

Conobathra tumidana **(D. & S.) [?R]**
E. KENT [**15**] Dungeness, 20.8 (KR[1]).

***Conobathra tumidana* (D. & S.) [?R]**
E. KENT [**15**] Dungeness, 20.8 (KR[1]).

***Sciota adelphella* (F.v.R.) [?R]**
E. SUSSEX [**14**] Rye Harbour, 28.6 (2) (PT[1]).

***Dioryctria abietella* (D. & S.) [?I/?R]**
S. HANTS [**11**] Southsea 29.6 (JRL). N. HANTS [**12**] Selborne, 3.7 (AA). W. SUSSEX [**13**] Ferring, 19.6 (TF). SURREY [**17**] Banstead, 30.6 (SWG).
CHANNEL ISLANDS Guernsey: La Broderie, 28.6 (Costen *in* Austin, 2001).

***Vitula biviella* (Zell.) [R(t)]**
E. KENT [**15**] Lydd, 13.7-15.8 (12) (KR[1]); Greatstone, 11.8 (KR[1]).

PAPILIONIDAE

***Papilio machaon* (L.) - Swallowtail [I/V/E]**
HERTS [**20**] Rothamsted, 5.5 (J. Chapman) – subspecies not stated.
CHANNEL ISLANDS Jersey: St Martin, 11.6, 26.8 (2) (Perchard *in* Long, 2001); Le Ouaisné, 8.10, a larva on parsley (Williams *in* Long, *loc. cit.*).

PIERIDAE

***Colias hyale* (L.)/*alfacariensis* Berger - "Pale" Clouded Yellow**
Three examples from Sussex are accepted as being of this species pair by the county recorder (CRP), but without voucher specimens the identity cannot be confirmed.

***Colias croceus* (Geoff.) - Clouded Yellow [I]**
2000 was remarkable for the large immigration, and subsequent local breeding, of the Clouded Yellow. For example, at Portland it was described as "the best year since 1983" (MC). The first large influx arrived in the second week of June with a second peak, probably comprising fresh immigrants and locally bred insects from the middle of August onwards, throughout September and with a few stragglers surviving until October. There was also evidence of attempted overwintering. In Dorset, the first individual was seen on 23.4, far earlier than anywhere else. In October and even late November numbers of larvae were found at a couple of coastal sites and freshly emerged adults observed from 17-20.11 (MG).
Because of the number of records involved, a vice-county summary only is given. Numbers involved must be regarded as approximate.
W. CORNWALL [**1**] 18.6-13.10 (185+). E. CORNWALL [**2**] 25.6-16.9 (6). S. DEVON [**3**] 25.6-22.10 (13). N. DEVON [**4**] 21.8 (1). S. SOMERSET [**5**] 16.8 (1). N. SOMERSET [**6**] 13-15.7 (2). N. WILTS [**7**] 10.6 (1). DORSET [**9**] 23.4-20.11 (350+); 20.10-24.11, 280+ larvae at two localities. IOW [**10**] 18.6-3.9 (200+). S. HANTS [**11**] 10.6-29.9 (200+). N. HANTS [**12**] 10.6-17.9 (50+). W. SUSSEX [**13**] 1.6-15.10 (2000+). E. SUSSEX [**14**] 9.6-26.10 (750+). E. KENT [**15**] June-October (200+). W. KENT [**16**] 1-23.8 (2). SURREY [**17**] 19.6-10.9 (19). S. ESSEX [**18**] 10.6-31.8 (48). N. ESSEX [**19**] 22.8 (2). HERTS [**20**] 19.6-23.9 (26). MIDDLESEX [**21**] 10.6-20.9 (31). BERKS [**22**] 19.6-28.8 (4). OXON [**23**] 11.6-30.8 (6). BUCKS [**24**] 25.6-24.8 (47). E. SUFFOLK [**25**] 27.8-10.9 (200+). W. SUFFOLK [**26**] 18.6-25.9 (3). E. NORFOLK [**27**] 17.6-19.8 (6). W. NORFOLK [**28**] 18.6-15.8 (2). CAMBRIDGE [**29**] 2.7-1.10 (7). HUNTS [**31**] 19.6-3.11 (4). NORTHAMPTON [**32**] 30.6-28.8 (5). W. GLOUCESTER [**34**] 11-23.8 (3). WORCESTER [**37**] 20.8 (1). WARWICK [**38**] 17.7-30.8 (30+). SALOP [**40**] 19-20.8 (4). MERIONETH [**48**] 24-25.8 (5). DENBIGH [**50**] 4.9 (1). S. LINCOLN [**53**] 26.8-30.9 (6). N. LINCOLN [**54**] 25.8-1.10 (11). NOTTS [**56**] 29.8-1.9 (2). W. LANCASTER [**60**] 22.8-14.9 (3). S.E. YORK [**61**] 18.6-19.10 (100+). N.E. YORK [**62**] 13.9 (1). MID-WEST YORK [**64**] 25.6-23.9 (4). DURHAM [**66**] 25.6-16.9 (4). WESTMORLAND [**69**] 17.6-13.9 (30+). CUMBERLAND [**70**] 18.6 (2).

IOM [**71**] 8.5-13.10 (50+). E. LOTHIAN [**82**] 25.6 (1). STIRLING [**86**] 10.9 (2). MID PERTH [**88**] 25.6 (1). S. ABERDEEN [**92**] 2.7 (1). MAIN ARGYLL [**98**] 25.6-14.10 (15). WEXFORD [**H12**] 18-30.6 (2). DUBLIN [**H21**] 17.6 (1). SLIGO [**H28**] 30.9 (1). FERMANAGH [**H33**] 18.6-29.9 (3). ARMAGH [**H37**] 15.10 (1). DOWN [**H38**] 17.6-21.10 (20+). ANTRIM [**H39**] 18.6 (1).

Pontia daplidice **(L.) - Bath White [I]**
W. SUSSEX [**13**] Levin Down, 27.9 (RW[2]).

LYCAENIDAE

Lampides boeticus **(L.) - Long-tailed Blue [I]**
N. LINCOLN [**54**] Wildmore Fen, 22.9 (Parsons *in* Anon, 2001b).
CHANNEL ISLANDS La Pulente, Jersey, 10.8 (DJW[1]).

NYMPHALIDAE

Aglais polychloros **(L.) - Large Tortoiseshell [I]**
DORSET [**9**] Throop, 11.3 (M. Forster). E. SUSSEX [**14**] Lewes, 4.6 (JP[1]).

Aglais antiopa **(L.) - Camberwell Beauty [?E]**
W. CORNWALL [**1**] Madron, 6.8 (PJ[2]).

Danaus plexippus **(L.) - Milkweed [I/E]**
W. CORNWALL [**1**] Nanquidno, 24.9 (per VS); "seen from the ferry from Penzance to Scilly", 30.9 (per VS); St Marys, Scilly, 5.10 (DT). E. CORNWALL [**2**] Bude, 10.10 (TD). DORSET [**9**] Portland, 7.10, 8.10 (per MC). W. SUSSEX [**13**] Bracklesham, 8.10 (Anon., 2001a). WARWICK [**38**] Bidford-on-Avon, 8.6 (R. Cox per DCGB). [IOM [**71**] Braddan, 18.9 "probable" (GW[1])].

LASIOCAMPIDAE

Dendrolimus pini **(L.) - Pine-tree Lappet [?I]**
CHANNEL ISLANDS Guernsey: La Broderie, 17.8 (Costen *in* Austin, 2001).

DREPANIDAE

Sabra harpagula **(Esp.) - Scarce Hook-tip [I/V]**
E. SUSSEX [**14**] Winchelsea Beach, 26.8 (DCGB).

GEOMETRIDAE

Cyclophora puppillaria **(Hb.) - Blair's Mocha [I]**
E. SUSSEX [**14**] Crowborough, n.d (MJS). E. KENT [**15**] New Romney, 21.6 (SPC); Kingsgate, 7.10 (Solly, 2001).
CHANNEL ISLANDS Jersey: Grouville, 23.9 (RL[2]).

Rhodometra sacraria **(L.) – Vestal [I]**
W. CORNWALL [**1**] Penzance, 3.9 (JW[3]); Church Cove, Lizard, 12-25.9 (11) (MT); Coverack, 24.9 (3), 26.9 (6), 27.9 (DCGB), 24.9-5.10 (10) (SN); Newlyn, 27.10 (JHC). E. CORNWALL [**2**] Minster Wood, Boscastle, 23.9 (AS). S. DEVON [**3**] Starcross, 8.8-3.9 (8), 12.10 (AHD); Abbotskerswell, 2.9, 4.9, 29.9 (BPH); Lydford, 23.9 (4) (PB[2]). N. DEVON [**4**] Saunton Sands, 25.8 (JM[1]); Bideford, 23.9 (ASH). N. SOMERSET [**6**] Catsgore, 5.9, 9.9 (GEH). DORSET [**9**] Portland Bird Observatory, 19-26.6 (3), 5.8-19.10 (115) including 29.8 (36) (MC); Dorchester, 20.6 (JD[2]); Walditch, 5.8-29.9 (47); Lower Walditch, 12.8 (MSP); Wyke Regis, 26.8 (10), 29.8 (3), 9.9 (DF[2]); Ferndown, 26.8, 27.8 (3), 9.9 (3) (RRC); Durlston, 27.8 (8) (RAB); Parley Common, 28.8 (2) (RRC). IOW [**10**] Freshwater, 6.8, 29.8 (5) (DBW), 26-29.8 (6) (SAK-J); Binstead, 26.8 (5) (BW). S. HANTS

[**11**] Thorney Island, 27.6, 28.8 (3) (BC[3]); Portsmouth, 7.8, 11.8, 27.8 (12) (IT); Hayling Island, 26.8-4.10 (27) (Phillips & Durnell, 2001); Southsea, 26.8 (2), 28.8 (3) (JRL); Fareham, 26.8, 27.8 (3), 28.8; Wickham Common, 27.8 (RD); Selborne, 29.8-5.9 (5) (AA); Broughton Down, 29.8 (2) (AHD); Hook Spit, 30.8 (RD); Titchfield Haven, 8.9 (BD[2]). N. HANTS [**12**] Northwood Park, 16.8-13.9 (14) (RAB); Fleet, 27.8, 11.9, 21.9 (MAS); Basingstoke, 1.9 (GH[1]). W. SUSSEX [**13**] West Wittering, 19.6, 26.8 (7), 28.8, (7), 4.9 (2) (ML); Kingsham, 21.6, 21.8, 26.8 (8), 27.8 (31), 28.8 (21), 29.8 (4), 30.8 (2), 31.8 (2), 4.9, 5.9, 10.9, 12.9, 19.9, 6.10 (SP); Walberton, 22.6, 7.8, 13.8, 26.8 (5), 27.8 (10), 28.8 (17), 29.8 (7), 30.8 (6), 31.8 (3), 3.9, 5.9 (3), 8.9, 9.9 (3), 10.9, 16.9, 19.9, 25-29.9 (4), 3.10, 4.10, 20.10 (JTR); Church Norton, 19.8 (CD[1]); Chichester, 19.8, 26.8, 27.8, 28.8 (3), 29.8 (4), 2.9 (2), 7.9, 9.9 (MCP); Warnham, 26.8 (DB); Barlavington, 29.8 (MCP); Ferring, 29.8, 5.9, 18.9 (2) (TF); Littlehampton, 1-3.10 (2) (REP). E. SUSSEX [**14**] Old Heathfield, 28.6, 27-30.8 (3), 13.9 (DRML); Rye Harbour, 1.7, 26.8 (5), 27.8, 31.8, 22.9 (PT[1]); Peacehaven, 12.8, 26.8 (6), 27.8 (6), 28.8 (12), 29.8 (8), 30.8 (3), 31.8, 4.9 (2), 13.9 (2), 18.9, 23.9 (CRP); Crawley Down, 24.8, 26.8, 29.8 (JHC); Winchelsea Beach, 26.8 (DCGB); Icklesham, 26.8 (2), 27.8, 29.8, 26.9, 3.10, 6.10 (IH[1]); Laughton, 9.9 (JS[2]); Little Horsted, 22.9 (GP). E. KENT [**15**] New Romney, 22.6, 29.8 (SPC); Greatstone, 28.6, 20.8, 26.8 (2) (BB[3]); Lydden, 25.8 (REL); Dungeness, 26.8-13.9 (15) (DW/KR[1]); Littlestone, 26.8 (2) (KR[1]); Lydd, 26.8-4.9 (11), 25.9, 29.9 (KR[1]); Densole, 17.9, 18.9, 29.9 (TR[1]); Rolvenden Layne, 29.9, 4.10 (AB). W. KENT [**16**] Barnehurst, 22.6, 5.9 (TS). SURREY [**17**] Ash Ranges, 29.8 (GAC); Limpsfield Chart, 30.9 (PJO). S. ESSEX [**18**] Plaistow, 27.6 (GM); Theydon Bois, 26.8 (JGG); Bradwell-on-Sea, 28.8, 28.9, 3.10 (Dewick, 2001). N. ESSEX [**19**] Magdelen Laver, 5.9 (TG[2]); Felsted, 29.9, 6.10 (GG[1]). HERTS [**20**] Bengeo, 23.9 (AW[2]). BERKS [**22**] Fernham, 24.6 (2), 17.8-4.9 (21), 22.9, 14.10 (SN); Pucketty Farm, 26.6 (MFVC). BUCKS [**24**] Willen, 2.7 (GEH). E. SUFFOLK [**25**] Felixstowe, 21.6 (JN); Staverton Thicks, 25.8 (SMG). E. NORFOLK [**27**] Eccles-on-Sea, 17.8 (NB *in* Hipperson, 2000); Stoke Holy Cross, 29.9 (AM[1], ibid.). E. GLOUCESTER [**33**] Longney, 6.8 et seq. (11) (AS[2]); Hempsted, 30.8 (GRA); Long Pool Meadow, Tewkesbury, 3.9 (RGG); Cheltenham, 2.10 (JSB per RGG). W. GLOUCESTER [**34**] St Briavels, 20.8 (RGG); Rodborough Common, 22.8 (DR[2]). MONMOUTH [**35**] Dingestow, 26.8 (7) (SB[2]). WARWICK [**38**] Charlecote, 24.6 (DCGB). GLAMORGAN [**41**] Gower, 26.8 (7) (BS[1]); Pilton Green, 28.8 (2), 10.9 (SW[2]); Reynoldston, 29.8 (2) (DP); Sandylane, 4.9 (BS[1]); Swansea, 16.9 (BS[1]). ANGLESEY [**52**] Alaw Estuary, 30.8 (NL). N. LINCOLN [**54**] Caistor, 16.8 (ATM); Old Bolingbroke, 24.8 (PP[2]); Roughton, 27.8 (KR[2]). LEICESTER [**55**] Markfield, 31.8-4.9 (3) (AM[2]); Oadby, 4.9 (RPF). NOTTS [**56**] Newstead Abbey Park, 31.8 (KVC). CHESTER [**58**] Birkenhead, 26.8 (4); Hoylake, 27.8 (12) (GJ); Coppull Moor, Chorley, 29.8 (SMW). S. LANCASTER [**59**] Formby, 19.6 (HB); Hough Green, 26.8 (JC[2]); Urmston, 26.8 (MD); Meresands Wood, 28.8 (DR[1]); Chorley, 30.8 (HB); St Helens, 30.8 (DO); Worsthorne, 30.8 (GG[2]); Pennington, 2.9 (PCP). W. LANCASTER [**60**] Cockersands, 30.6 (BC[2]/PM); Bispham, 26.8 (BB[2]); Lightfoot Green, 26.8 (SMP); Heysham, 29.8, 13.9 (BC[2]/PM); Burrow Heights, 29.8 (2), 31.8, 26.9, 29.9, 6.10 (BC[1]). S.E. YORK [**61**] Eastrington Ponds, 22.8 (DC). S.W. YORK [**63**] Rossington, 21.6 and 30.8 (RIH); Calderdale, 26.8, 7.9 (PT[3]). WESTMORLAND [**69**] New Hutton, 26.8 (2) (RPJ); Witherslack, 26.8 (SB[1]); Walney Island, 28-29.8 (3) (Littlewood, 2001). IOM [**71**] Ballacriy Colby, 28.6, 27.8 (I&DS); Ravensdale Ballaugh, 30.6 (PK); Andreas, 27.8, 23.9 (TC); Minorca Laxey, 27.8 (RC); Jurby East, 28.8 (GDC); Dhoor Ramsey, 29.8 (GW[1]); Dhoon Maughold, 5.9 (LK). BANFF [**94**] Ordiquhill, 2.9 (RL[1]). ZETLAND [**112**] Eswick, 27.8 (Pennington & Rogers, 2001).

CHANNEL ISLANDS Guernsey: 12-31.8 (c100), occuring in small numbers until 4.10 (Austin, 2001).

Orthonama obstipata **(Fab.) – Gem [I]**
W. CORNWALL [**1**] Land's End, 17.6 (RH[2]); Lizard, 5.8 (SPC), 21.9, 15.10 (MT); St Agnes, Scilly, 23.9 (4) (MH[1]); Coverack, 27.9 (SN); Lamorna Cove, 25.10 (JHC). S. DEVON [**3**] Abbotskerswell, 18.6, 23.8 (BPH); Beer, 23.9 (RFM). DORSET [**9**] Portland Bird Observatory, 2-19.6 (3), 29.8-6.10 (4) (MC); Durlston Head, 18.6 (SN); Ferndown, 9.8 (RRC). IOW [**10**] Binstead, 17.6 (BW); Freshwater, 2.10, 23.10 (SAK-J). S. HANTS [**11**] Portsmouth, 10.8 (IT); Southsea, 10.8, 24.9 (JRL); Fareham, 26.9, 14.10 (RD). N. HANTS [**12**] Selborne, 12.6 (AA); Northwood Park, 13.6, 26.7 (RAB); Basingstoke, 1.9 (GH[1]). W. SUSSEX [**13**] Kingsham, 21.6, 7-9.8 (3), 14.8, 17.8, 3.9 (SP); Walberton, 5-22.8 (6), 25-28.9 (7), 23-27.10 (5) (JTR). E. SUSSEX [**14**] Rye Harbour, 3.6, 25.6, 13.7, 30.7, 1.8, 4.8 (4), 5.8 (PT[1]), 13.8 (DCGB), 23.8, 8.9, 23-24.9, 28.9, 20-22.10 (3) (PT[1]); Peacehaven, 25.6, 30.9 (CRP); Icklesham, 31.7, 10.8, 30.8, 23.10 (5), 26.10 (2) (IH[1]); Winchelsea Beach, 26.8 (DCGB); Ringmer, 22.10 (AKB). E. KENT [**15**] New Romney, 20.6-26.10 (12) (SPC); Greatstone, 29.7, 7.8, 11.9 (BB[3]); Lydd, 8.8-23.10 (9) (KR[1]); Dungeness, 18.8 (TR[1]), 11.9-22.10 (10) (DW/KR[1]); Littlestone, 24.8 (KR[1]); Densole, 29.9 (TR[1]); Rolvenden Layne, 6.10 (AB); Cheriton, 22.10 (TR[1]). S. ESSEX [**18**] Theydon Bois, 19.6 (JGG); Bradwell-on-Sea, 18.8, 1.10, 4.10 (Dewick, 2001). N. ESSEX [**19**] Felsted, 30.7 (GG[1]); Dovercourt, 22.9, 23.9, 1.10 (CG); Frinton-on-Sea, 28.9 (BL). E. SUFFOLK [**25**] Minsmere, 30.9 (TP). E. NORFOLK [**27**] Eccles-on-Sea, 22.5, 30.9 (NB *in* Hipperson, 2000), 19.10 (Bowman, 2001); Cawston, 20.10 (JS[3] *in* Hipperson, 2001). E. GLOUCESTER [**33**] Hempsted, 7.8 (GRA); Longney, 8.8 (AS[2]). GLAMORGAN [**41**] The Gower, 18.6 (DP). ANGLESEY [**52**] South Stack, 31.8 (NL). N. LINCOLN [**54**] Old Bolingbroke, 29.9 (PP[2]); Skidbrooke, 30.9 (JJ); Muckton, 1.10 (GW[2]). S. LANCASTER [**59**] Parr, 28.6 (RB). W. LANCASTER [**60**] Burrow Heights, 6.10 (BC[1]). IOM [**71**] Dhoon Maughold, 21.5, 14.10 (LK); Claughbane Ramsey, 29.8 (CW); St Johns, 29.9 (PK); Dhoor Ramsey, 30.9 (GW[1]).
S.E. GALWAY [**H15**] Kinvarra, 10.8 (IR[1]). ROSCOMMON [**H25**] Lough Ree, 7.8 (IR[1]).
CHANNEL ISLANDS Guernsey: Clos des Pecqueries, 25.7, 14.9 (Lawlor *in* Austin, 2001); L'Ancresse, 23.9, 7.10, 15.10 (Austin, 2001).

Costaconvexa polygrammata **(Borkh.) - Many-lined [I]**
S. DEVON [**3**] West Hill, 23.9 (Baker, 2001). S. SOMERSET [**5**] Closworth, 29.6 (JA). DORSET [**9**] Portland Bird Observatory, 18.6 (MC).
CHANNEL ISLANDS Jersey: St Catherine, 25.8 (Long, 2001).

Thera cupressata **(Geyer) - Cypress Carpet [?R/?V]**
W. SUSSEX [**13**] Ferring, 7.6, 19.6, 27.6 (5), 1.7 (2), 5.7 (5), 19.10 (2) (TF). E.. SUSSEX [**14**] Rye Harbour, 28.11 (BY).

Eupithecia abietaria **(Goeze) - Cloaked Pug [?R/?I]**
WARWICK [**38**] Charlecote, 17.6 (DCGB).

Hylaea fasciaria **(L.) - Barred Red [I]**
E. KENT [**15**] Densole, 20.7 ab. *prasinaria* (TR[1]).

SPHINGIDAE

Agrius convolvuli **(L.) - Convolvulus Hawk [I]**
W. CORNWALL [**1**] St Agnes, Scilly, 1.7, 24-25.8, 2.9 (4), 5.9 (Hicks, 2001); Church Cove, Lizard, 11.9-2.10 (39) (MT); Coverack, 24.9 (3), 25.9, 27.9 (DCGB), 25.9 (2) (SN). S. DEVON [**3**] Buckfastleigh, 2.9 (BB[1]); Newton Abbot, 28.9 (per RFM); Teignmouth, 29.9 (RFM); Abbotskerswell, 30.9 (BPH); Lustleigh, 2.10 (PH[2]). N. SOMERSET [**6**] Catsgore, 10.9 (GEH). S. WILTS [**8**] Tollard Royal, 10.9 (SS). DORSET [**9**] Child Okeford, 8.8 (JH[6]); Portland Bird Observatory, 19.8-7.10 (12) (MC); Durlston Head, 27.8 (RAB), 8.9 (6) (SN), 14.9 (5) (DCGB), 22.9 (2) (SN); Walditch, 5.9 "squirted meconium", 20-30.9

(6) (MSP); East Lulworth, pupa, 7.9 (per MSP); Wyke Regis, 8.9 (DF[2]); Coombe Keynes, 11.9; Sutton Waldron, 13.9 (per MSP). IOW [**10**] Newtown, 20.9 (SY); Binstead, 23.9 (BW); Freshwater, 30.9 (TR[2]); Yarmouth, 3.10 (JW[2]). S. HANTS [**11**] Lee-on-Solent, 5.9 (Wilson *in* Phillips & Durnell, 2001); Havant, 21.9 (BC[3]); Southsea, 1.10 (JRL). N. HANTS [**12**] Basingstoke, 24.8 (BS[2]), 22.9 (AHD), 28.9 (PW[2]); Selborne, 30.9 (per AA). W. SUSSEX [**13**] Walberton, 9.9, 23.9, 27.9 (4), 28.9, 1.10, 3.10, 4.10 (JTR); Ferring, 9.9, 28.9, 2.10 (TF); Atherington, 22.9 (3) (DCGB); West Wittering, 23-30.9 (4) (ML); Lyminster, 27.9 (REP); Runcton, 1.10 (GS[2]). E. SUSSEX [**14**] Rye Harbour, 1.7, 24.9, 28.9 (PT[1]), 28.10 larva (anon. per PT[1]); Beachy Head, 18.8 (AKB); Winchelsea Beach, 7.9 larva (JS[3]); Peacehaven, 8.9, 25.9, 22.10 (CRP); Chiddingly, 23.9 (RS); Icklesham, 30.9-6.10 (4) (IH[1]); Little Horsted, 5.10 (GP); Ringmer, 22.10 (AKB). E. KENT [**15**] Dungeness, 7.7 (DF[1]), 29.9, 1.10 (KR[1]); Lydd, 24.8, 26.8, 1.10 (KR[1]); Dover, 20.9; Densole, 22.9, 1.10 (TR[1]); Tunbridge Wells, 28.9 (JM[2]); Rolvenden Layne, 29.9, 2.10, 5.10, 8.10 (AB). S. ESSEX [**18**] Bradwell-on-Sea, 6.7, 10.8, 31.8, 6.9, 19.9, 23.9, 25.9 (Dewick, 2001); Bicknacre, 2.8 (JD[1]); Burnham-on-Crouch, 28.9 (DH[1]); Epping, 29.9 (TG[1]); Theydon Bois, 2.10 (JGG). N. ESSEX [**19**] Mersea Island, 25.9 (JH[1]); St Osyth, 28.9 (RWA). E. SUFFOLK [**25**] Tunstall, Sept/Oct (3) (DAY). E. NORFOLK [**27**] Winterton-on-Sea, 31.7 (RAB); Weybourne, 5.9, 18.9 (MP[1] *in* Hipperson, 2000); Hindolveston, 10.9 (JC[1], ibid.); Honing, 28.9 (PH[1], ibid.); Eccles-on-Sea, 28.9, 29.9 (NB, ibid.), 4.10 (Bowman, 2001). W. NORFOLK [**28**] Titchwell, 23.9 (MS[1] *in* Hipperson, 2001). CAMBRIDGE [**29**] Harston, 30.9 (CME). HUNTS [**31**] Great Gransden, 24.8 larva, 11.9 (SB[3]). MONMOUTH [**35**] Abergavenny, 19.9 (per SB[4]). WORCESTER [**37**] Pershore, no date (LB[2], det MSP). GLAMORGAN [**41**] Pilton Green, 19.8, 28.8, 8.9 (SW[2]); Whiteford Burrows, 6.9 (DP); Swansea, 10.9 (MJW); Sandylane, 11.9 (BS[1]); Reynoldston, 12.9 (DP); Llanmadoc, 17.9 (MRF); Port Eynon Point, 23.9 (BS[1]). PEMBROKE [**45**] Milford Haven, 8.10 (MP[2]). S. LINCOLN [**53**] Nocton Top, 6.9 (per RG[2]). N. LINCOLN [**54**] Gibralter Point, 2.7 (KMSW), 3.9 (AD); Muckton, 25.8, 15.9, 30.9-2.10 (GW[2]); Immingham, 1.9 (ATM); Skidbrooke, 8.9 (JJ); Gainsborough, 9.9 pupa (per RG[2]); Goxhill, 11.9 (CP), 16.9 (ATM); Rigsby, 28.9 (per RG[2]). W. LANCASTER [**60**] Martin Mere, 5.9 larva (JFW); Burrow Heights, 10.9 (BC[1]); Heysham, 30.9 (per PM). S.E. YORK [**61**] Spurn, 26.6, 27.6, 18.8-30.9 (13); Easington, 10.10 (BRS). WESTMORLAND [**69**] Walney Island, 5.9, 7.9 (Littlewood, 2001). IOM [**71**] Ballacaley Sulby Glen, 16.8 (LK); Claughbane Ramsey, 1.9 (CW); Dhoon Maughold, 1.9 (LK); Kirk Michael, 7.9, 20.9 (per GDC); Glen Auldyn, 1.10 (PK). N. EBUDES [**104**] Holoman Bay, Raasay, 2.9 (SB[1]). ZETLAND [**112**] Shetland, 18.8-5.9 (7) (Pennington & Rogers, 2001).

CHANNEL ISLANDS Guernsey: La Broderie, 25.8; Icart, 21.9; St Peters Church, 22.9; Castle Cornet, 29.9 (Austin, 2001).

Acherontia atropos **(L.) - Death's-head Hawk [I]**

S. DEVON [**3**] Hittisleigh Barton, August (J. Milverton per RFM); Ashburton, dead in church, 10.9 (per MSP). DORSET [**9**] West Bexington, "summer" (per MSP). IOW [**10**] Bonchurch, 26.9 (JL[2]). E. SUSSEX [**14**] Icklesham, 21.8 (IH[1]). N. ESSEX [**19**] Great Braxted, larva, 25.8 (JT); Marks Tey, 1.9 (AC[2]). E. SUFFOLK [**25**] Hadleigh, 14.7 (Rudman *in* Anon, 2001b). W. NORFOLK [**28**] Titchwell, 20.9 (*in* Hipperson, 2000). MONMOUTH [**35**] Newport, 26.4 (Dupe *in* Anon, 2001b). GLAMORGAN [**41**] North Cornelly, 4.9 (Anon, 2001b). S. LINCOLN [**53**] Morkery Wood, 28.8 (KS[2]). N. LINCOLN [**54**] Ashby cum Fenby, 7.10 (ATM). S.E. YORK [**61**] Filey, 29.9 (Anon, 2001b). IOM [**71**] Glen Auldyn, 21.7 (LK).

ANTRIM [**H39**] Jordanstown, c.4.7 (per IR[1]).

Hyloicus pinastri **(L.) - Pine Hawk [/I/?V]**

S.E. YORK [**61**] Spurn, 12.7 (BRS).

***Macroglossum stellatarum* (L.) - Humming-bird Hawk [1]**

W. CORNWALL [**1**] Feock, 17.6 (RDP); St Marys, Scilly, 18.6; St Agnes, Scilly, 18.6 (per SN); Mullion, 18.6 (GAC); Constantine, 28.6-5.7 (HJ); Truro, 30.6, 18.9 (RDP); Lizard, 2.7 (2), 21.9, 23.9 (MT), 29.9 (SN), 3.10 (2) (AW[1]); Perranporth, 10.7 (V. Allsop per RDP); Mousehole, 20.7 (per SN); Lamorna Cove, 1.9 (JHC); Illogan, 10.9 (per SN); St Ives, 24.9 (JH[3]); Coverack, 24.9 (DCGB), 27.9, 28.9, 5.10 (SN), 2.10 (2), 5.10 (3) (AW[1]); Nanquidno, 6.10 (GF); St Martins, Scilly, 6.10 (RDP); St Marys, Scilly, 13.10 (GF). E. CORNWALL [**2**] Port Gaverne, 13.6 (per SN); Ladock, 13-22.6, 16.9 (JR); Boscastle, 16.6 (GAC); Gerrans, 18.6 (RDP); Mevagissey, 11.7 (RDP); Polperro, 14.9; St Austell, 15.9; Looe, 15.9 (per SN). S. DEVON [**3**] Kinsgwear, 28.2 (ME); Dawlish, "mid-June", 17.9, October (PF); 20.9, 22.9 (PH[2]); Lydford, 17.6 (ME); Abbotskerswell, 25.6, 22.9 (BPH); Bovey Tracey, 26.6 (2) (PH[2]); Exeter, 27.6 (PB[2]); Berry Head, Brixham, 28.6 (3), 17.7 (ME); Prawle Point, 28.6 (c.20) (RAB); Haytor, Dartmoor, 2.7 (PH[2]); Torquay, 8.7 (BD[1]), 29.7 a larva (ME); Combe Pafford, 17.7 (2) (ME); Chudleigh, 27.7, 10.9 (PH[2]); Holcombe, 3.9 (RFM); Slapton Sands, 17.9 a pupa (TR[1]); Lustleigh, 2.10 (2) (PH[2]); Newton Abbot, 23.11 (BPH). N. DEVON [**4**] Bucks Mills, 16.6 (GAC); Lower Washfield, 20.6 (FS). N. SOMERSET [**6**] Brean Down, 3.9 (2) (per SN); Long Sutton, 7.9 (GEH). N. WILTS [**7**] Corsham, 17.6 (per SN); Avebury, 13.7 (JHC); Bishopstone, 25.9 (per SN). S. WILTS [**8**] Salisbury, 2.10 (per SN). DORSET [**9**] Portland Bird Observatory, 9.4-23.11 "average numbers" (MC); Upwey, 2.6 (PH[3]); Dorchester, 18.6, 24.6, 22.11 (JD[2]); Maiden Newton, 25.6 (JD[2]); Portland, 4-11.8 (5 larvae) (RAB); Litton Cheney, 2.9; Longburton, 3.9 (per SN); Gillingham, 18.9 (per MSP); Walditch, 20.9, 23.9 (MSP); Wyke Regis, 23.9 (DF[2]); Ferndown, 25.9 (per SN); East Lulworth, 9.10 (RH[3]); Wareham, 15.10 (CR); Blandford Forum, 15.10 (per SN). IOW [**10**] Binstead, 5.3 (BW); Carisbrooke, 18.6 (per SN); Freshwater, 18-19.6 (DBW); Newtown, 23.9 (SY). S. HANTS [**11**] Martin Down, 26.6 (MCH); New Milton, 28.6 (per SN); Southampton, 5.7 (per SN); Oliver's Battery, 26.8; Havant, 11.9, 13.9 (per SN); Hayling Island, 29.9, 23.10 (Phillips & Durnell, 2001); Southsea, 30.9 (JRL); Bishops Waltham, 4.11 (per SN). N. HANTS [**12**] Northwood Park, 20.6, 23.6, 25.6, 26.6, 7.7, 29.10 (RAB); Winchfield, 19.6, 17.7; Alton, 2.7 (per SN); Basingstoke, 16-17.9, 22-23.9, 30.9, 2.10 (AHD); Bramley Frith Wood, 28.9 (AC[1]). W. SUSSEX [**13**] Hove, 14.6 (RMC); Pagham Harbour, 15.6, 30.6, 3.7, 29.7 (SP); Ferring, 26.6, 5.7 (TF); Littlehampton, 27.6, 29.6, 19.8 (RK); Chichester, 27-28.6 (MCP); Upper Beeding, 1.7 (per SN); Kingsham, 5.7 (SP); Levin Down, 21.7 (AG[3]); Horsham, 29.7 (per SN); Walberton, 4.9, 9.9 (JTR); South Lancing, 11.9 (per SN); West Wittering, 29.9 (ML). E. SUSSEX [**14**] Peacehaven, 10.6-23.10 (45) (CRP); Ringmer, 11.6, 1.10 (AKB); Eastbourne, 20.6 (Mrs Clarke per CRP); St Leonards, 21.6 (DD); Rye Harbour, 21.6, 30.6, 5.7, 9.9 (2), 21.10 (PT[1]); Lewes, 25.6 (3), 17.9 (OJ), 22.9 (AKB); Piltdown, 26.6 (2) (GP); Brighton, 30.6 (BF); Norman's Bay, Pevensey, 5.7 (MSP); Icklesham, 10.7, 25.9 (IH[1]); Beachy Head, 3.9 (2) (JC[4]), 28.9 (2) (PW[3]); Seaford, 9-11.9 (3), 25.9 (PW[3]), 27.9 (AKB). E. KENT [**15**] Dungeness, 24.3, 9.6-21.10 (26) (DW/DF[1]); New Romney, 23.6, 19.9, 3.10, 5.10 (SPC); Densole, 3.7, 24.8, 11.9, 15.10 (TR[1]); Walmer, 30.8 (per SN); Lydd, 30.9 (KR[1]). W. KENT [**16**] Farnborough, 23.6 (per SN). SURREY [**17**] East Dulwich, 1.4 (RAJ); Ashtead, 24.9, 19.10 (per SN). S. ESSEX [**18**] Bradwell-on-Sea, 3.3 in a moth trap (JS[1]), 17.6-10.10 adults, 21.7-23.8 larvae (Dewick, 2001); Walthamstow, 2.7 (per SN); Leigh-on-Sea, 11.8; Thundersley, 29.9 (DGD). N. ESSEX [**19**] Jaywick, 24.6 to 7.7 (20+) (JY); Frinton-on-Sea, 6.7 (BL); Rayne, 19.7 (AG); Langenhoe, 28.7 (HO); Hempstead, 24.9 (DH[3]). HERTS [**20**] Bishops Stortford, 25.6; Shenley, 25.6; Walkern, 26.6; Ware, 21.7 (per SN). MIDDX [**21**] South Kensington, 2.7 (per SN). BERKS [**22**] Newbury, 14.5 (per SN); Cookham Rise, 18.6 (BDC); Maidenhead, 21.6, 12.9, 17.9 (DF[3]); Upper Basildon, 24.6, 30.6, 11.9, 3.10, 18.10 (NS/MCH); Fernham, 25.6, 28.6, 2.7, 5.7, 8.7, 10.7, 30.7, 4.10 (SN); Pucketty Farm, 26.6 (MFVC); Cox Green, 30.9 (DJW[2]). OXON [**23**] Wheatley, 30.6 (PB[4]); Wyfold Grange, 27.7, 1.10 (PT[2]). BUCKS [**24**] Willen, 27.6, 29.6, 2.7, 17.9 (GEH). E. SUFFOLK [**25**] Boyton, 26.9 (JH[3]). W. SUFFOLK [**26**] Brandon, 25.6 (per SN). E.

NORFOLK [**27**] Horsey, 25.5 (per SN); East Ruston, 13.6 (RA *in* Hipperson, 2000); Filby, 18.6 (2) (JG[2], ibid.); Sheringham, 21.6, 27.7 (CF[2] *in* Hipperson, 2001); Felbrigg, 21.6, Edgefield, 22.6, 1.7, 18.7 (AS[3] *in* Hipperson, 2000); Martham, 26.6 (per SN); Filby, 27.6 (KS[1], ibid.); Great Yarmouth, 30.6 (PC[2], ibid.); Wolterton, 30.6 (JP[2] *in* Hipperson, 2001); Weybourne, 8.7 (MP[1] *in* Hipperson, 2000); Barnham Broom, 10.7 (JG[1], ibid.); Hemsptead, 13.7 (JH[5], ibid.); Norwich, 14.7 (RR, ibid.); Stoke Holy Cross, 12.8 (DJ, ibid.), 30.9 (AM[1], ibid.); Worstead, 30.9 (PH[1], ibid.); Thorpe Hamlet, 30.9 (DH[4], ibid.); Thorpe St Andrew, 9.10 (JI, ibid.). W. NORFOLK [**28**] Wells, 2.10 (PH[1] *in* Hipperson, 2001). CAMBRIDGE [**29**] Reach, August (CM). HUNTS [**31**] Bluntisham, 26.6 (per SN). NORTHAMPTON [**32**] Boughton, 9.7; Sywell, 26.9 (per SN). E. GLOUCESTER [**33**] Gloucester, 11.6 (RP); Churchdown, 17.6 (CT); Siccardige Wood, 29.6 (MSP); Marle Hill, 11.7 (per RGG); Cheltenham, 17.7 (DH[2]); Stroud, 22.9 (SH); Cirencester, 2.10 (P. Attaway per RGG); Longney, 24.10 (AS[2]). W. GLOUCESTER [**34**] Wotton-under-Edge, 24.6 (BC[4]); Avon Gorge, 18.7 (DCG); Longhope, 7.9 (DR[2]); Newnham, 15.9 (LB[1] per RGG); St Briavels, 26.9 (RGG); Two Bridges, 10.10 (SG). MONMOUTH [**35**] Trellech, 24.9 (per SN). SALOP [**40**] Bridgnorth, 25.6; Wem, 25.6 (per SN). GLAMORGAN [**41**] Pilton Green, 5.2 (SW[2]); Rhoose, 30.3; Bridgend, 17-18.6; Barry Docks, 26.6; Nash Point, 25.7 (per SN). PEMBROKE [**45**] St Davids, 16.6 (SB[2]); Skomer, 16.6 (7), 17.6 (8) (Field, 2001). DENBIGH [**50**] near Wrexham, 18.6 (2) (SL). FLINT [**51**] Nercwysy Mountain, 18.6 (per SN). S. LINCOLN [**53**] Barholm, 22.6; Ancaster, 25.9; Wyberton, 8.10; Ruskington, 15.10 (per SN). N. LINCOLN [**54**] Muckton, June, 17.7 (GW[2]); Barton upon Humber, 19.6 (ATM); Haxey, 26.6, Glentham, 28.6 (CS[2]); Gibralter Point, 3-4.7 (KMSW); Goxhill, 26.6 (CP), 11.7 (ATM); Rigsby, 28.9; Winterton, 8.10 (per SN). NOTTS [**56**] Worksop, 19.6 (per JE); Keyworth, 25.6 (per SN); Ruddington, 26.6 (3) (per JE); Gedling, 27.6, 29.9 (per SW[1]); Newstead Abbey Park, 28.6 (KVC); Eakring, 2.7; East Leake, 4.7 (per SN); Clifton, 6.7 (per JE); Market Warsop, 16.9 (per SN); Brackenhurst, 22.9 (per SW[1]); Southwell, 13.10 (per JE); Ravenshead, 13.10 (per JE). CHESTER [**58**] Cheadle, 16.7 (per SN). S. LANCASTER [**59**] Earby, 17.6, 17.7; Prestwich, 18.6; Burnley, 18.6, 27.10 (per SMP); Colne, 19.6, 22.6 (GG[2]); Chorley, 21.6, 26.6, 1.7 (per SMP); Meresands Wood, 23.6 (IK); Orrel Park, 26-27.6; Briercliffe, 27.6; Barrowford, 1-2.7; Blacko, 1.7; Martin Mere, 1.7; Barrowford, 2.7 (per SMP); Liverpool, 3.7, 30.9 (per SN); Nelson, 6.7; Trawden, 16.7; Hoghton, 17.7, 22.7; Billinge, 18.7; Horwich, 19.7 (per SMP). W. LANCASTER [**60**] Low Gill, 20.6 (per SMP); Claughton, 25.6 (MB[1]); Warton Crag, 26.6 (SMP); Lancaster, 30.6; Silverdale, 3.7; Heysham, 3.7, 27.7, 11.10; Warton Bank, 26.7; Scotforth, 11.9 (per SMP). S.E. YORK [**61**] Spurn, 1-3 almost daily 18.6-7.7, 14.7, 18.7, 11.9, 24.9 (BRS); Cottingham, 22.6; Kingston upon Hull, 4.7 (per SN). N.E. YORK [**62**] Guisborough, 27.9 (per SN). S.W. YORK [**63**] Adlingfleet, 24.6 (per SN); Bingley, 28.6 (AH). MID-WEST YORK [**64**] Ilkley, 23.6; Leeds, 27.6; Burley in Wharfdale, 27.6, 10.7; Low Bentham, 1.7; Ingleton, 15.7 (per SN). DURHAM [**66**] Darlington, 25.6; Sunderland, 28.6, 1.8; Hutton-Le-Hole, 12-13.7 (per SN). S NORTHUMBERLAND [**67**] Newcastle, 17.6 (per SN). CHEVIOTLAND [**68**] Low Newton-by-the-Sea, 7.7 (PS[1]); Alnwick, 7.7 (PS[1]), "July/August" (Mr Swan per MSP). WESTMORLAND [**69**] Witherslack, 27.6 (per SN); Walney Island, 9.7, 18.7, 22.7 (Littlewood, 2001). IOM [**71**] Dhoor Ramsey, 15.6 (GW[1]); Peel, 17-18.6 (IH[2]); Ballamoda Malew, 17.6, 23.6 (IH[2]); Minorca Laxey, 18.6 (RC); Ballaghennie Ayres, 18.6 (BJ); Dhoon Maughold, 19.6 (LK); Ramsey, 19.6 (FH); Braddan Church, 22.6 (JC[3]); Maughold, 22.6 (JB[2] per GDC); Claughbane Ramsey, 26.6 (CW); Laxey, 26.6 (CS[1]); Ballahot Malew, 21.7 (KJ); Sandygate Jurby, 6.8 (LK); Howe Rushen, 18.9 (JC[3]); Glen Auldyn, 1.10 (PK). EDINBURGH [**83**] Temple, 25.6 (per SN). EASTERNESS [**96**] Inverness, 1-3.7 (per SN). ZETLAND [**112**] Cunningsburgh, 20.6; Burra, 21.6; Fair Isle, 22.6, 25.6, 4.7, 26.7; Foula, 23.6; Baltasound, 24.6, 1.7; Muckle Roe, 28.9 (Pennington & Rogers, 2001).

N.E. GALWAY [**H17**] Ballinasloe, 2.7 (GM). WICKLOW [**H20**] Ballinaclash, 18.6 (per SN). E. DONEGAL [**H34**] Lough Eske, 18.6 (per SN). TYRONE [**H36**] Omagh, 3.7 (per IR[1]). ARMAGH [**H37**] Loughgall, 17.6, 1-5.7 (per SN); Portadown, 15.10 (IR[1]). DOWN [**H38**] Monlough, 16.6 (per SN); Killard Point, 17.6; Bleary, 3.7 (per IR[1]).
CHANNEL ISLANDS Guernsey: Regular between 4.6 and 19.10 (Austin, 2001).

Daphnis nerii **(L.) - Oleander Hawk [?I/?E]**
MIDDLESEX [**21**] Tottenham, 13.9 (Cottridge *in* Anon, 2001b).

Hyles gallii **(Rott.) - Bedstraw Hawk [I]**
W. CORNWALL [**1**] Breage, 18.7 (Tunmore, 2001). E. SUSSEX [**14**] Rye Harbour, 5.7 (PT[1]). E. KENT [**15**] Kingsgate, 9.7 (Solly, 2001); Dymchurch, 5.8 (JO). N. ESSEX [**19**] Felsted, 19.7 (GG[1]). E. SUFFOLK [**25**] Rushmere St Andrew, 5.7 (Higgott *in* Anon, 2001b); Thorpeness, 30.7 (RAB). E. NORFOLK [**27**] Eccles-on-Sea, 22.7 (Bowman, 2001). W. NORFOLK [**28**] Wells-next-the-Sea, 6.9 a larva (CP). N. LINCOLN [**54**] Muckton, 5.7 (GW[2]). S. LANCASTER [**59**] Flixton, 28.7 (B. Hilton per SMP). S.W. YORK [**63**] Mirfield, 6.7 (Tordoff *in* Anon, 2001b). WESTMORLAND [**69**] Grange-over-Sands, 17.7 (Birkett, 2000); Walney Island, 27.7 (Littlewood, 2001). IOM [**71**] Claughbane Ramsey, 13.7 (CW); Dhoon Maughold, 13.7 (LK). S. ABERDEEN [**92**] Kittybrewster, 11.7 (Banks *in* Anon, 2001b). BANFF [**94**] Ordiquhill, 4.7 (RL[1]). ZETLAND [**112**] Eswick, 22.6 (Pennington & Rogers, 2001).

Hyles livornica **(Esp.) - Striped Hawk [I]**
W. CORNWALL [**1**] Breage, 17.6 (Tunmore, 2001). DORSET [**9**] Puddletown, 20.6 (HWH). E. KENT [**15**] Dymchurch, 26.7 (JO). E. GLOUCESTER [**33**] Hilcot End, 28.6 (MSP). MONMOUTH [**35**] Abergavenny, 17.6 (Brown *in* Anon, 2001b).

NOTODONTIDAE

Clostera anachoreta **([D. & S.]) - Scarce Chocolate-tip [?I/?R]**
CHANNEL ISLANDS Jersey, 8.8 (DJW[1]).

LYMANTRIIDAE

Lymantria dispar **(L.) - Gypsy Moth [I]**
E. SUSSEX [**14**] Pebsham, Hastings, 26.8 (SR).
CHANNEL ISLANDS Guernsey: St Peter Port, one in a pheromone trap some time between August and October (Angell *in* Austin, 2001).

ARCTIIDAE

Atolmis rubricollis **(L.) - Red-necked Footman [?I/?R]**
N. ESSEX [**19**] Colchester, 17.6 (RWA). BERKS [**22**] Fernham, 28.6 – with *Eublemma ostrina* and *E. parva* (SN). S. LANCASTER [**59**] Formby, 20.6 (HB). W. LANCASTER [**60**] Gait Barrows, 10.6 (RPJ).

Pelosia muscerda **(Hufn.) - Dotted Footman [I]**
E. KENT [**15**] Hamstreet, 26.8 (Tickner *in* Ferguson, 2002).

Eilema sororcula **(Hufn.) - Orange Footman [I]**
E. KENT [**15**] New Romney, 12.5 (SPC); Greatstone, 12.5 (BB[3]).

Lithosia quadra **(L.) - Four-spotted Footman [I+R]**
W. CORNWALL [**1**] St Agnes, Scilly, 17.6 (Hicks, 2001); Mousehole, 23.9 (JH[3]). S. DEVON [**3**] Teignmouth, 3.7 (RFM); Starcross, 31.7 (AHD). DORSET [**9**] Walditch, 29.7, 8.8, 9.8 (MSP). IOW [**10**] Binstead, 27.6 (BW); Freshwater, 18.9 (SAK-J). W. SUSSEX

[**13**] Walberton, 20.6, 27.6, 28.6, 23.9, 28.9 (JTR); West Wittering, 30.7 (ML). E. SUSSEX [**14**] Beckley, 12.6 (Burrows & Bradshaw per CRP); Winchelsea, 19.6, (DCGB); Rye Harbour, 20.6 (2) (PT[1]); Icklesham, 14.9, 18.9 (2), 22.9, 25.9 (IH[1]); Laughton, 23.9 (JS[2]). E. KENT [**15**] Littlestone, 15.6, 20.6, 18.9 (KR[1]); Orlestone Forest, 1.7 (RRC); Cheriton, 22.9 (TR[1]). GLAMORGAN [**41**] Gower, 18.6 (DP). CAERNARVON [**49**] Rowen, 20.6 (DE). IOM [**71**] Claughbane Ramsey, 12.8 (CW).
CHANNEL ISLANDS Guernsey: Mont D'Aval, 27.7, 7.8; La Broderie, 30.7; Le Chêne, 9.8, 12..8 (Austin, 2001).

Utetheisa pulchella **(L.) - Crimson Speckled [I]**
W. CORNWALL [**1**] Breage, 17.6 (Tunmore, 2001).

Euplagia quadripunctaria **(Poda) - Jersey Tiger [R+V]**
DORSET [**9**] Portland Bird Observatory, 21.8 (MC); Southwell, 26.8 (per MC). IOW [**10**] Freshwater, 5.8 (DBW), 20.8 (SAK-J), 24.8 (2), 25.8 (2), 29.8 (DBW). E. SUSSEX [**14**] Winchelsea Beach, 14.8, 26.8 (2) (DCGB).

CTENUCHIDAE

Amata phegea **L. - Nine-spotted [?E/?In]**
N. ESSEX [**19**] Clacton-on-Sea area, 24.7 (RG[1]/PS[2]).

NOLIDAE

Meganola albula **(D. & S.) - Kent Black Arches [?I/?R]**
E. NORFOLK [**27**] Calthorpe, 22.7 (PH[1] *in* Hipperson, 2000). N. LINCOLN [**54**] Gibralter Point, 2.7 (SE).

NOCTUIDAE

Ochropleura plecta **(L.) - Flame Shoulder [V]**
ZETLAND [**112**] Quendale, 22.6 (Pennington & Rogers, 2001).

Ochropleura leucogaster **(Frey.) - Radford's Flame Shoulder [I]**
DORSET [**9**] Walditch, 29.11 (MSP). W. SUSSEX [**13**] Walberton, 29.9 (JTR). E. SUSSEX [**14**] Icklesham, 26.10 (IH[1]).

Eurois occulta **(L.) - Great Brocade [I]**
W. SUSSEX [**13**] Kingsham, 7.8 (SP). W. KENT [**16**] Dartford, 23.7 (BKW). S. ESSEX Bradwell-on-Sea, 27.7 (Dewick, 2001). N. ESSEX [**19**] Dovercourt, 4.9 (CG). E. NORFOLK [**27**] Cawston, 17.7 (JS[3] *in* Hipperson, 2000); Hindoleveston, 5.9 (JC[1], ibid.); Weybourne, 8.9 (MP[1], ibid.); Eccles-on-Sea, 9.9 (NB, ibid.). S.E. YORK [**61**] Spurn, 18.7, 19.7 (BRS). ZETLAND [**112**] Shetland, 26-31.7 (c.6) (Pennington & Rogers, 2001)

Hecatera dysodea **(D. & S.) - Small Ranunculus [?I/?V]**
E. SUFFOLK [**25**] Landguard Bird Observatory, 6.7 (Odin, 2001).

Mythimna albipuncta **([D. & S.]) - White-point [I+R(t)]**
W. CORNWALL [**1**] St Agnes, Scilly, 29.8 (Hicks, 2001). S. DEVON [**3**] Holcombe, 8.9 (RFM); Dawlish, 30.10 (PF). DORSET [**9**] Portland Bird Observatory, 9.5-1.7 (12), 8.8-19.9 (107) (MC); Upwey, 2.6 (PH[3]); Dorchester, 14.6, 3.7 (JD[2]); Durlston Head, 29.6 (2) (SN); 27.8 (2) (RAB), 8.9 (55) (SN), 23.9 (RRC); Walditch, 21.8-10.9 (16) (MSP); Wyke Regis, 29.8 (DF[2]). IOW [**10**] Binstead, 24.8, 29.9 (BW); Freshwater, 29.8, 30.8, 2.9 (2) (DBW). S. HANTS [**11**] Hayling Island, 2.6-23.9 (16) (Phillips & Durnell, 2001); Thorney Island, 27.6 (BC[3]); Southsea, 17.8 (2), 25.8, 26.8 (2), 27.8 (JRL); Pennington Marshes, 23.8 (2) (RRC); Titchfield Haven, 29.8-8.9 (5) (BD[2]); Hayling Island, 8.9 (4) (RAB); Southleigh Forest, 23.9 (JRL). N. HANTS [**12**] Northwood Park, 13.9 (RAB). W. SUSSEX

[**13**] Walberton, 15.5-29.6 (10), 10.8-19.9 (45) (JTR); West Wittering, 20.5-24.6 (3), 11.8-26.9 (10) (ML); Kingsham, 19-26.6 (2), 7.8-18.9 (35) (SP); Ferring, 5.9 (TF); Atherington, 22.9 (2) (DCGB). E. SUSSEX [**14**] Peacehaven, 2-18.6 (3), 23.8-25.9 (47) (CRP); Rye Harbour, 2-24.6 (13), 8.8-20.9 (30) (PT[1]); Crawley Down, 4.8, 23.8 (JHC); Icklesham, 13.8-4.10 (40) (IH[1]); Old Heathfield, 17-20.8 (DRML); Winchelsea Beach, 26.8 (20) (DCGB); Eastbourne, 30.8 (4) (CWP), 9.9 (AKB); Ringmer, 6-11.9 (4) (AKB); Laughton, 7.9 (JS[2]); Playden, 9.9 (3), 17.9 (RAB); Lewes, 22.9 (2) (JS[2]). E. KENT [**15**] Densole, 24.8, 27.8, 30.8, 28.9 (TR[1]); Newington, 14.9 (REL); Dungeness, 30.9 (NVG). S. ESSEX [**18**] Bradwell-on-Sea, 23.5-22.6 (9), 13.8-28.9 (50) (Dewick, 2001). N. ESSEX [**19**] Brightlingsea, 15.8 (DS[1]); Mistley, 19.8 (ICR); Dovercourt, 24.8, 26.8, 30.8, 2.9, 3.9, 4.9 (CG); Takeley, 6.9 (GS[1]); Jaywick, 11.9 (JY); St Osyth, 13.9 (RWA); Lawford, 23.9 (ICR). E. SUFFOLK [**25**] Rushmere St Andrew, 1.6, 10.8-3.10 (19) (JH[3]); Staverton Thicks, 25.8 (2) (SMG); Tunstall, over 100 from July to October (DAY). E. NORFOLK [**27**] Stoke Holy Cross, 13.8 (AM[1] *in* Hipperson, 2000); Eccles-on-Sea, 22.8, 8.9, 11.9 (NB, ibid.).

Mythimna vitellina **(Hb.) – Delicate [I+R(t)]**

W. CORNWALL [1] Praze-an-Beeble, 15.6 (GAC/AS[1]); Land's End, 17.6, 19.6 (RH[2]); St Agnes, Scilly, 17.6, 5.9 (Hicks, 2001); Church Cove, Lizard, 12.9-31.10 (39) (MT); Coverack, 24.9 (3), 25.9, 26.9 (11), 27.9 (12) (DCGB), 24.9-7.10 (82) (SN); Mullion, 30.9-6.10 (33) (AW[1]); Lamorna Cove, 22-27.10 (16) (JHC). S. DEVON [3] Plymstock, 13.7 (JHC); Dawlish, 14.7, 23.9 (PF); Berry Head, Brixham, 16.9, 30.9 (BPH); Exeter, 26.9 (2) (PB[2]). S. SOMERSET [5] Churchinford, 7.10 (HP). DORSET [9] Portland Bird Observatory, 23-29.6 (4), 23.9-22.10 (42) (MC); Wyke Regis, 20.9, 29.9 (DF[2]); Durlston Head, 23.9 (RRC), 14.10 (TR[1]); Walditch, 25.9, 2.10 (MSP). IOW [**10**] Freshwater, 7.7 (DBW), 23.9-19.10 (8) (SAK-J); Newtown, 23.9 (2) (SY); Binstead, 23.9, 28.9 (BW); Totland Bay, 17.10 (DCGB). S. HANTS [**11**] Hayling Island, 3.7, 14.7, 30.9, 2.10 (2), 4.10, 7.10, 21.10 (Phillips & Durnell, 2001); Southsea, 29.9, 1.10, 2.10 (2), 5.10 (JRL). N. HANTS [**12**] Northwood Park, 26.9, 4.10, 14.10 (RAB). W. SUSSEX [**13**] Walberton, 15-21.6 (2), 19.9, 25.9-30.10 (23) (JTR); Kingsham, 25.6 (SP); Atherington, 22.9 (8) (DCGB); Ferring, 22.9 (3), 23.9 (3), 28.9 (3); West Wittering, 24.9-4.10 (9) (ML). E. SUSSEX [**14**] Winchelsea Beach, 26.8 (DCGB); Rye Harbour, 26.8, 20.9-4.10 (13) (PT[1]); Peacehaven, 20.9-15.10 (11) (CRP); Icklesham, 20.9-21.10 (25) (IH[1]); Crawley Down, 25.9 (JHC); Lewes, 26.9 (JS[2]); Old Heathfield, 29.9 (DRML). E. KENT [**15**] Lydd, 7-20.7 (4), 22.9-18.10 (15) (KR[1]); Dungeness, 7.7, 17.7 (DW), 6.9-7.10 (77) (DW/KR[1]/DF[1]); Greatstone, 14-15.7, 19.9-8.10 (BB[3]); Cheriton, 21.9 (TR[1]); New Romney, 28.9 (2), 3.11 (SPC); Rolvenden Layne, 28.9-5.10 (5) (AB); Littlestone, 29.9-3.10 (3) (KR[1]); Folkestone Warren, 30.9 (2) (TR[1]); Dungeness, 30.9, 1.10 (RRC). SURREY [**17**] Oxted, 29.9 (PJ[1]). S. ESSEX [**18**] Bradwell-on-Sea, 1-7.10 (7) (Dewick, 2001). N. ESSEX [**19**] Landermere, 23.9 (JBF); Kirby-le-Soken, 30.9 (PB[1]); St Osyth, 7.10, 9.10 (RWA). MIDDLESEX [**21**] Hampstead, 24.9, 29.9 (RAS). E. NORFOLK [**27**] Eccles-on-Sea, 22.9, 29.9 (NB *in* Hipperson, 2000), 2-3.10 (Bowman, 2001); Weybourne, 29.9, 30.9 (MP[1], ibid.), 4.10 (MP[1] *in* Hipperson, 2001); Stoke Holy Cross, 2.10, 3.10 (AM[1] *in* Hipperson, 2000); Hainford, 4.10 (Hipperson, 2000). GLAMORGAN [**41**] The Gower, 18.6 (DP); Hareslade, 11.9 (BS[1]). S.E. YORK [**61**] Spurn, 28-30.9 (4) (BRS). IOM [**71**] Ballacriy Colby, 28.6 (I&DS); St Johns, 7-12.7 (2) (PK).

CHANNEL ISLANDS Guernsey: small numbers regularly recorded 9.6-9.10 (Austin, 2001).

Mythimna l-album **(L.) - L-album Wainscot [?R]**

IOW [**10**] Freshwater, 7.7 (DBW). S. ESSEX [**18**] Bradwell-on-Sea, 26.6, 22.9, 28.9, 2.10 (Dewick, 2001). N. ESSEX [**19**] Jaywick, 2.7, 29.7 (JY); Kirby-le-Soken, 17.7 (PB[1]); St Osyth, 13.9 (RWA); Dovercourt, 23.9 (CG). E. SUFFOLK [**25**] Landguard Bird Observatory, 15.9 (Odin, 2001).

CHANNEL ISLANDS Guernsey: small numbers regularly recorded 19.6-16.10 (Austin, 2001).

***Mythimna unipuncta* (Haw.) - White-speck [I+R(t)]**

W. CORNWALL [**1**] Praze-an-Beeble, 18.6 (GAC/AS[1]); Land's End, 19.6 (17) (RH[2]); Breage, 31.8 (5) (RAB); St Agnes, Scilly, 2.9 (14), 5.9 (6) (Hicks, 2001); Kynance Cove, 5.9 (20+) (DGD); Lizard, 9.9-6.11 (229) (MT), 18.10, 25.10 (PS[3]); Penwith Moors, 23.9 (JH[4]); Coverack, 24.9 (15), 25.9 (26), 26.9 (20), 27.9 (24) (DCGB), 24.9-7.10 (282) (SN); St Just, 26.9 (3), 6.10 (4) (SN); Mullion, 30.9-6.10 (173) (AW[1]); St Marys, Scilly, 4.10 (JB[1]); Lamorna Cove, 21-27.10 (112) (JHC). E. CORNWALL [**2**] Bodmin, 23.9 (PW[3]). S. DEVON [**3**] Exeter, 13.8 (PB[2]); Abbotskerswell, 8.9, 19.9 (BPH); Modbury, 8.9 (7), 9.9 (2) (JCL); Teignmouth, 10.9, 5.10, 14.10 (RFM); Buckfastleigh, 15.9, 23.9 (2) (BB[1]); Berry Head, Brixham, 16.9 (3), 30.9 (BPH); Holcombe, 22.9, 29.9, 20.10 (2), 26.10 (RFM); Lydford, 23.9 (PB[2]); Beer, 23.9 (RFM). N. DEVON [**4**] Bideford, 23.9 (ASH); Hatherleigh, 1.10 (RW[1]). N. SOMERSET [**6**] Timsbury, 7.9 (MB[2]); Catsgore, 10.9 (GEH). DORSET [**9**] Portland Bird Observatory, 4-18.6 (3), 22.8-27.10 (235) (MC); Walditch, 29.8-15.10 (31) (MSP); Wyke Regis, 2-29.9 (31) (DF[2]); Durlston Head, 8.9 (14) (SN), 14.9 (2) (DCGB), 22.9 (SN), 24.9 (2) (RAB), 14.10 (5) (TR[1]); Langton Matravers, 16.9 (DCGB); Burton Bradstock, 11.10, 25.10 (2); Portland, 12.10 (5 at ivy) (MSP). IOW [**10**] Freshwater, 6.9-23.10 (18) (SAK-J); Binstead, 16.9-1.11 (7) (BW); Totland Bay, 19.10 (DCGB). S. HANTS [**11**] Hayling Island, 16.9 (Phillips & Durnell, 2001); Southsea, 25.9, 29.9, 6.10, 19.10, 21.10 (JRL). W. SUSSEX [**13**] Kingsham, 7-23.9 (8) (SP); Walberton, 7-9.9 (2), 25.9-9.10 (9), 23.10-6.11 (3) (JTR); Ferring, 9.9, 22.9, 23.9, 6.10, 19.10 (TF); Atherington, 22.9 (3) (DCGB); West Wittering, 23.9 (ML). E. SUSSEX [**14**] Rye Harbour, 29.9, 19-21.10 (2) (PT[1]); Peacehaven, 6.10, 15.10 (CRP). E. KENT [**15**] Dungeness, 11.9, 25.9 (KR[1]), 16.10 (DF[1]); Lydd, 24.9, 25.10, 3.12 (KR[1]); Greatstone, 28.9-21.10 (6) (BB[3]); Rolvenden Layne, 30.9 (AB); Littlestone, 1.10, 2.10, 7.10 (KR[1]); New Romney, 5.10, 14.10, 17.10 (SPC). S. ESSEX [**18**] Bradwell-on-Sea, 16.9-26.11 (11) (Dewick, 2001). N. ESSEX [**19**] St Osyth, 27.7, 20.10 (RWA); Kirby-le-Soken, 25.8 (PB[1]). BERKS [**22**] Fernham, 15.10, 22.10 (SN). E. SUFFOLK [**25**] Landguard Bird Observatory, 15.10 (Odin, 2001). E. NORFOLK [**27**] Alby Hill, 8.7 (MT[1] *in* Hipperson, 2000); Weybourne, 27.10 (MP[1] *in* Hipperson, 2001). E. GLOUCESTER [**33**] Gloucester, 30.9 (RP). WARWICK [**38**] Rugby, 29.9, 6.10 (IR[2]); Charlecote, 15.10 (AG[1]). GLAMORGAN [**41**] The Gower, 18.6 (DP); Pilton Green, 28.8-18.9 (130) (SW[2]); Reynoldston, 3-16.9 (21) (DP); Sandylane, 4-22.9 (12) (BS[1]), 23.9 (6) (SM); Whiteford Burrows, 6.9 (DP); Swansea, 9-23.9 (38) (BS[1]); Hareslade, 8-11.9 (11) (BS[1]); Horton, 9.9 (54) (BS[1]); Port Eynon Point, 23.9 (114) (BS[1]). PEMBROKE [**45**] Skomer, 21.6, 29.6, 13.9, 20.9, 23.9 (Field, 2001). FLINT [**51**] Shotton, 18.10 (2) (CJ). S. LANCASTER [**59**] Parr, 21.9, 26.9 (RB); Flixton, 22.9 (KM). W. LANCASTER [**60**] St Annes, 24.9 (JS[4]); Claughton, 30.9, 12.10 (MB[1]); Burrow Heights, 1.10 (2), 8.10, 11.10, 5.10, 16.10, 27.10 (BC[1]); Heysham, 7.10, 30.10. 1.11 (BC[2]/PM). S.E. YORK [**61**] Spurn, 5-21.10 (7) (BRS). WESTMORLAND [**69**] Walney Island, 8.9-15.10 (19) (Littlewood, 2001); Witherslack, 2.10, 3.10, 10.10 (SB[1]). IOM [**71**] Calf of Man, 17.6 (2), 18.6, 22.6 (2), 30.9 (10), 6.10, 11.10 (2), 14.10 (TB[1]); Dhoor Ramsey, 25.6 (GW[1]); Dhoon Maughold, 27.6-31.10 (75) (LK); Jurby East, 28.6 (GDC); Ballacriy Colby, 28.6-15.9 (3) (I&DS); Andreas, 3.9 (TC); Claughbane Ramsey, 10-30.9 (15) (CW); St Johns, 15.9-27.10 (7) (PK); Minorca Laxey, 19-30.9 (13) (RC); Ballaugh, 20.9 (GDC); Kentraugh Rushen, 22.9 (GDC). ZETLAND [**112**] Shetland, 18-30.6 (c.6) (Pennington & Rogers, 2001).

ARMAGH [**H37**] Aghinlig, 1.10 (per IR[1]). DOWN [**H38**] Murlough, 30.9, 6.10 (4) (per IR[1]).

CHANNEL ISLANDS Guernsey: 16.3, 8.8-4.11 (Austin, 2001).

***Mythimna loreyi* (Dup.) – Cosmopolitan [I]**

W. CORNWALL [**1**] Church Cove, Lizard, 1.7, 24.9 (2), 13.10 (MT); Lizard Village, 22.9 (PS[3]); Coverack, 24.9-6.10 (6) (SN). S. DEVON [**3**] Abbotskerswell, 29.9 (BPH). DORSET [**9**] Portland Bird Observatory, 19.6 (2), 29-9-10.10 (3) (MC); Durlston Head, 14.10 (TR[1]). W. SUSSEX [**13**] Walberton, 24.10 (JTR). E. SUSSEX [**14**] Peacehaven, 30.9

(CRP); Rye Harbour, 4.10 (PT[1]); Crawley Down, 14.10 (JHC). E. KENT [**15**] Dymchurch, 14.9, 29.9, 6.10 (JO); Dungeness, 25.9 (KR[1]), 13.10 (DW); Greatstone, 26.9 (BB[3]); Lydd, 15.10 (KR[1]). E. SUFFOLK [**25**] Landguard Bird Observatory, 5.10 (2) (Odin, 2001). E. NORFOLK [**27**] Hainford, 4.10 (Hipperson, 2000). WARWICK [**38**] Charlecote, 23.10 (AG[1]). GLAMORGAN [**41**] Pilton Green, 3.9, 16.9, 23.9, 31.9 (Walmsley *in* Anon, 2001b). PEMBROKE [**45**] Broomhill Burrows, 17.6 (SB[2]).
CHANNEL ISLANDS Guernsey: Mont D'Aval, 8.9 (Simmons *in* Austin, 2001).

***Cucullia absinthii* (L.) - Wormwood Shark**
CHANNEL ISLANDS Jersey: Grouville Common, 6.8 (DJW[1]).

***Calophasia lunula* (Hufn.) - Toadflax Brocade [?V]**
N. ESSEX [**19**] Dovercourt, 30.5 (CG).

***Aporophyla nigra* (Haw.) - Black Rustic**
ZETLAND [**112**] Eswick, 15.9 (Pennington & Rogers, 2001).

***Lithophane hepatice* (Cl.) - Pale Pinion**
ZETLAND [**112**] Eswick, 15.9 (Pennington & Rogers, 2001).

***Xylena vetusta* (Hb.) - Red Sword-grass [I]**
HERTS [**20**] Bengeo, 2.11 (AW[2]). E. NORFOLK [**27**] Weybourne, 22.9 (MP[1] *in* Hipperson, 2000).

***Trigonophora flammea* (Esp.) - Flame Brocade [I]**
E. SUSSEX [**14**] Rye Harbour, 18.10, 19.10, 22.10 (PT[1]). E. KENT [**15**] Dungeness, 29.9 (KR[1]).

***Agrochola circellaris* (Hufn.) - Brick**
ZETLAND [**112**] Eswick, 16.9 (c.200) (Pennington & Rogers, 2001).

***Cryphia algae* (Fab.) - Tree-lichen Beauty [I]**
S. HANTS [**11**] Warsash Common, 9.8 (P. Boswell *in* Goater & Norris, 2001). W. SUSSEX [**13**] Ferring, 30.7 (2) (TF). E. KENT [**15**] Greatstone, 12.8 (BB[3]); Kingsgate, 13.8 (Solly, 2001). W. KENT [**16**] Dartford, 9.8 (BKW).
CHANNEL ISLANDS Jersey: Grouville Common, 7.8, 9.8 (DJW[1]).

***Parastichtis suspecta* (Hb.) - Suspected**
ZETLAND [**112**] Shetland, 27.7-early August (c.12) (Pennington & Rogers, 2001).

***Apamea lateritia* (Hufn.) - Scarce Brindle [I]**
E. SUFFOLK [**25**] Landguard Bird Observatory, 4.7 (Odin, 2001).

***Celaena leucostigma* (Hb.) - Crescent**
ZETLAND [**112**] Eswick, 1.9 (Pennington & Rogers, 2001).

***Spodoptera exigua* (Hb.) - Small Mottled Willow [I]**
W. CORNWALL [**1**] Breage, 1-5.2 (11) (Tunmore, 2001); Land's End, 17.6 (RH[2]); St Agnes, Scilly, 17.6, 1.7 (10), 7.8 (15), 5.9 (2) (Hicks, 2001); Praze-an-Beeble, 18.6 (GAC/AS[1]); Lizard, 4.7 (2), 7.7 (MT), 7-11.8 (4) (SPC), 11.9 (2) (MT); Coverack, 25-26.9 (DCGB). S. DEVON [**3**] Berry Head, Brixham, 30.6 (BPH); Starcross, 8-9.8 (2) (AHD); Prawle Point, 21.8 (11) (AGJB); Kingskerswell, 3.9 (BD[1]); Holcombe, 8-9.9 (RFM); Abbotskerswell, 9.9 (BPH); Dawlish, 23.9 (PF). N. SOMERSET [**6**] Catsgore, 9.9 (GEH). S. WILTS [**8**] Horse Down, Tilshead, 28.6 (GAC). DORSET [**9**] Puddletown, 14.6 (HWH); Dorchester, 14.6-3.7 (11) (JD[2]); Portland Bird Observatory, 18.6-7.7 (222) including 19.6 (127), 4.8-13.9 (112) (MC); Upwey, 19.6 (5) (PH[3]); Durlston Head, 29.6 (SN), 27.8 (5) (RAB), 8.9 (SN); Walditch, 30.7-9.9 (22) (MSP); Portland, 24.8 (RAB); Wyke Regis, 30.8,

9.9 (DF[2]). IOW [**10**] Freshwater, 19.6, 20.6, 28.6, 5.7, 19-27.8 (5) (SAK-J); Binstead, 20.6 (BW). S. HANTS [**11**] Portsmouth, 20.6, 17.8 (IT); Hayling Island, 7.9 (Phillips & Durnell, 2001); Southsea, 23.9 (JRL). N. HANTS [**12**] Northwood Park, 21.6, 29.6-5.7 (3), 16.8-9.9 (16), 19.9 (RAB); Bramley Frith Wood, 29.6 (2) (AHD); Selborne, 10.9 (AA). W. SUSSEX [**13**] Ferring, 19.6, 5.9 (TF); Walberton, 20.6-3.7 (7), 13.8, 23.8-9.9 (4), 26.9, 22.10 (JTR); Kingsham, 20.6-3.7 (12), 7.8-7.9 (22) (SP); Church Norton, 19.8 (3) (CD[1]); West Wittering, 20.8, 10.9 (ML); Lyminster, 10.9 (REP). E. SUSSEX [**14**] Rye Harbour, 15.6 (PT[1]), 19.6 (2) (DCGB), 20.6 (2), 12.8, 17.8 (2), 25.8, 28.8, 9.9, 23.9 (PT[1]); Peacehaven, 19.6 (2), 25.6, 28.6, 19.8, 23.8, 29.8, 10.9, 12.9, 29.9 (CRP); Winchelsea Beach, 20.6 (3), 13.8 (DCGB); Crawley Down, 28.6 (JHC); Old Heathfield, 28.6, 16.8 (DRML); Icklesham, 13.7, 24-27.8 (6) (IH[1]); Falmer, 28.8 (JS[2]). E. KENT [**15**] Dungeness, 19.6 (2) (KR[1]), 20.8 (DW); Densole, 2.7 (2), 1.8 (TR[1]); New Romney, 3.7, 8.7, 26.8 (SPC); Lydd, 7-22.8 (5) (KR[1]); Greatstone, 19.8 (BB[3]), 25.8 (DCGB); Rolvenden Layne, 6.10 (AB). W. KENT [**16**] Barnehurst, 5.9 (2), 21.9 (TS). SURREY [**17**] Limpsfield Chart, 11.9 (PJO). S. ESSEX [**18**] 29.6 (2), 2.7, 6.8, 18-29.8 (6), 10.9 (2) (Dewick, 2001). N. ESSEX [**19**] Jaywick, 1.9 (JY). BERKS [**22**] Fernham, 19.6-4.7 (9), 23-24.8 (2), 4.9 (SN); Pucketty Farm, 20.6 (MFVC); Silwood Park, Ascot, 4.7 (GT). E. GLOUCESTER [**33**] Hilcot End, 18.6; Siccardige Wood, 28.6 (MSP). WORCESTER [**37**] Hollywood, 8.7 (GF). WARWICK [**38**] Charlecote, 27.6, 30.8, 12.9 (DCGB); Oversley Wood, 27.6 (DCGB). GLAMORGAN [**41**] Reynoldsron, 29.8 (DP); Sandylane, 4.9 (BS[1]); Hareslade, 9.9 (BS[1]). PEMBROKE [**45**] Skomer, 29.6 (Field, 2001). MERIONETH [**48**] Maentwrog, 1.7 (DCGB). S. LANCASTER [**59**] St Helens, 24.6 (DO); Hutton, 7.7 (ER); N.W. YORK [**65**] Hutton Conyers, 17.6 CF[1]). Worsthorne, 29.8 (GG[2]). W. LANCASTER [**60**] Heysham, 19.6 (BC[2]/PM); St Annes, 19.6, 28.6, 29.6 (2), 25.8, 2.9 (JS[4]); Lightfoot Green, 27.6 (SMP); Lane Ends, 1.7 (BC[2]/PM); Burrow Heights, 17.8, 30.8 (BC[1]); Potts Corner, 29.8 (BC[2]/PM). WESTMORLAND [**69**] Walney Island, 16.6-1.7 (15), 25.8-12.9 (11) (Littlewood, 2001). IOM [**71**] Calf of Man, 18.6 (2), 12.9 (TB[1]); Dhoon Maughold, 18-29.6 (5) (LK); Cranstal Bride, 19.6 (2) (LK); Claughbane Ramsey, 21.6-30.9 (8) (CW); Dhoor Ramsey, 28.6 (GW[1]); Jurby East, 28.6 (3), 22.8 (GDC); Minorca Laxey, 29-30.6 (RC).

CHANNEL ISLANDS Guernsey: 20-29.6 (3), 31.7-11.9 (15) (Austin, 2001).

***Proxenus hospes* (Frey) - Porter's Rustic [I]**

W. CORNWALL [**1**] St Agnes, Scilly, 5.9 (Hicks,.2001).

***Helicoverpa armigera* (Hb.) - Scarce Bordered Straw [I/In]**

W. CORNWALL [**1**] St Agnes, Scilly, 25.8 (2), 22.9 (Hicks, 2001); Mullion, 2.9, 30.9 (2), 6.10 (2) (AW[1]); Mousehole, 23.9 (JH[3]); Church Cove, Lizard, 23.9, 25.9, 6.10 (MT); Coverack, 26.9 (DCGB), 29.9-7.10 (5) (SN). S. DEVON [**3**] Teignmouth, 27.8, 10.9 (RFM); Holcombe, 3.9, 8.9, 29.9 (RFM); Paignton, 14.9 (KB per RFM); Berry Head, Brixham, 16.9 (BPH). N. SOMERSET [**6**] Catsgore, 8.9 (GEH). [N. WILTS [**7**] Swindon, 5.1, larva on supermarket flowers (SN).] DORSET [**9**] Upwey, 30.6 (PH[3]); Walditch, 6.7, 23.9 (MSP); Ferndown, 21.8, 27.8 (RRC); Portland Bird Observatory, 25.8-8.9 (5) (MC); Durlston Head, 8.9 (SN), 15-16.9 (DCGB); Cheyne Weare, 13.9 (2) (per MC); Wyke Regis, 16.9 (DF[2]). IOW [**10**] Binstead, 25.8, 21-28.9 (3) (BW); Newtown, 23.9 (SY); Freshwater, 26.9 (SAK-J); Totland Bay, 18.10 (DCGB). S. HANTS [**11**] Hayling Island, 23.9, 30.9 (Phillips & Durnell, 2001); Southsea, 30.9, 1.10 (JRL), N. HANTS [**12**] Northwood Park, 11.8, 21.9 (RAB). W. SUSSEX [**13**] Kingsham, 19.9, 20.9, 6.10 (SP); Atherington, 22.9 (DCGB); Walberton, 22.9, 23.9 (JTR); Chichester, 23.9 (MCP); West Wittering, 30.9 (ML). E. SUSSEX [**14**] Peacehaven, 23.9 (CRP); Rye Harbour, 25.9, 29.9, 3.10, 4.10 (PT[1]). E. KENT [**15**] Dungeness, 1-2.7 (DF[1]), 23.9-22.10 (6) (DF[1]/DW/KR[1]); Lydd, 6.91.10, 6.10, 22.10 (KR[1]); Littlestone, 23.9 (KR[1]); Densole, 23.9, 29.9 (TR[1]); Greatstone, 26.9 (BB[3]). SURREY [**17**] Banstead, 8.9 (SWG). S. ESSEX [**18**] Bradwell-on-Sea, 6.7, 7.7, 7.9, 18.9-4.10 (10) (Dewick, 2001). N. ESSEX [**19**] Dovercourt, 11.6, 21.9 (CG); Jaywick, 30.9, 1.10

(JY); St Osyth, 2.10 (RWA). HERTS [**20**] Garston, 25.9 (CME). E. SUFFOLK [**25**] Tunstall, 30.9 (DAY); Landguard Bird Observatory, 30.9 (2) (Odin, 2001); Minsmere, 30.9 (2) (TP). E. NORFOLK [**27**] Weybourne, 14.9, 30.9 (MP[1] *in* Hipperson, 2000); Stoke Holy Cross, 17.9, 28.9 (AM[1], ibid.); Eccles-on-Sea, 18.9, 26.9, 29.9, (NB, ibid.); Martham, 23.9 (CK *in* Hipperson, 2001). W. NORFOLK [**28**] Holme Dunes, 10.9 (GH[2] *in* Hipperson, 2000). WORCESTER [**37**] Norchard, 4.10 (MS[2]). SALOP [**40**] Bridgenorth, 29.9 (AJP). GLAMORGAN [**41**] Swansea, 16.9, 23.9 (BS[1]); Port Eynon Point, 23.9 (3) (BS[1]). S. LANCASTER [**59**] Burnley, 26.9 (GG[2]). W. LANCASTER [**60**] Morecambe, 29.9 (CD[2]). WESTMORLAND [**69**] Witherslack, 29.9 (SB[1]).

CHANNEL ISLANDS Guernsey: 24.8-12.9 (7) (Austin, 2001).

Heliothis peltigera **([D. & S.]) - Bordered Straw [I]**

W. CORNWALL [**1**] Praze-an-Beeble, 17.6 (GAC/AS[1]); Land's End, 17.6 (3), 19.6 (2) (RH[2]); St Agnes, Scilly, 29.6, 1.7, 7.8 (Hicks, 2001); Church Cove, Lizard, 2.7 (MT). S. DEVON [**3**] Kingskerswell, 18.6 (BD[1]); Modbury, 22.6 (JCL); Slapton, 15.7 (1 larva) (JHC); Dawlish, 17.9, 30.10 (PF). S. SOMERSET [**5**] Broadway, 28.6 (BU). N. SOMERSET [**6**] Timsbury, 24.6 (MB[2]). DORSET [**9**] Upwey, 2.6, 30.6 (PH[3]); The Grove, Portland, 17.6 (per MC); Portland Bird Observatory, 24.6-10.9 (6) (MC); Dorchester, 27.6 (JD[2]); Durlston, 23.9 (A. Page per RRC). IOW [**10**] Freshwater, 27.6 (SAK-J). S. HANTS [**11**] Portsmouth, 19.6 (IT); Southsea 29.8 (JRL). N. HANTS [**12**] Northwood Park, 21.6 (RAB). W. SUSSEX [**13**] Walberton, 22.6 (JTR); West Wittering, 24.6 (ML); Ferring, 27.6, 16.9 (TF); Kingsham, 28.6, 29.6, 1.7, 3.7 (SP); Pagham Harbour, 27.7, "dozens" of larvae (SP). E. SUSSEX [**14**] Eastbourne, 18.6 (RM); Peacehaven, 19.6, 9.9, 24.9 (CRP); Winchelsea Beach, 19.6, 20.6 (DCGB); Rye Harbour, 19.6 (2), 20.6 (2), 21.6, 24.6 (2), 30.6 (2), 31.7, 25.8, 26.8 (2) (PT[1]); 10.9 (JHC); Icklesham, 26.8 (IH[1]); Cuckmere Haven, 28.8 (1 larva) (JHC). E. KENT [**15**] Sandwich, 18.6 (RAB), 24.6 (GAC); Lydd, 19.6, 29.6, 29-30.8 (KR[1]); Littlestone, 20.6, 27.8 (KR[1]); New Romney, 27-29.6 (2), 26.9 (SPC); Greatstone, 30.6, 27.8 (BB[3]); Dungeness, 1-3.7 (4), 18.8-22.9 (DW); Densole, 29.9 (TR[1]). W. KENT [**16**] Orpington, 29.8 (MJ). S. ESSEX [**18**] North Chingford, 28.6 (BP); Bradwell-on-Sea, 25.8 (Dewick, 2001). N. ESSEX [**19**] Dovercourt, 24.6 (CG); Frinton-on-Sea, 29.9 (BL). HERTS [**20**] Bengeo, 14.6 (AW[2]). MIDDLESEX [**21**] Uxbridge, 23.9 (MH[2]). BERKS [**22**] Fernham, 19.6-8.7 (6) 10-11.9 (4) (SN). E. NORFOLK [**27**] Eccles-on-Sea, 18.6, 20.6 (2), 28.6, 7.9 (NB *in* Hipperson, 2000); Weybourne, 24.6, 26.9 (MP[1], ibid.); Winterton-on-Sea, 13.8 (MT *in* Hipperson, 2001); Brundall, 1.10 (NG *in* Hipperson, 2000). W. GLOUCESTER [**34**] St Briavels, 20.6 (RGG). MONMOUTH [**35**] Abergavenny, 19.6 (TB[2]). WARWICK [**38**] Charlecote, 23.6 (2), 22.9 (DCGB). GLAMORGAN [**41**] Swansea, 9.6 (BS[1]). PEMBROKE [**45**] Skomer, 29.6, 1.7, 25.8 (Field, 2001). CAERNARVON [**49**] Rowen, 19.6, 21.6 (DE). S. LINCOLN [**53**] Morton Fen, 20.6 (JL[1]). N. LINCOLN [**54**] Goxhill, 20.6 (CP); Spilsby, 5.7 (CS[2]); Muckton, 9.9 (GW[2]). S. LANCASTER [**59**] Pennington, 3.5 (PCP); Formby, 19.6 (HB); Littleborough, 28.6 (IK). W. LANCASTER [**60**] Heysham, 22.6 (JH[2]), 16.8 (BC[2]/PM); St Annes, 29.6 (JS[4]). S.E. YORK [**61**] Spurn, 24-27.6 (3) (BRS). WESTMORLAND [**69**] Walney Island, 18.6, 24.6, 27.6, 7.9 (Littlewood, 2001). IOM [**71**] Dhoor Ramsey, 18.6 (GW[1]); Jurby East, 19.6 (LK); Ballaghennie Ayres, 23.7 (BJ).

CHANNEL ISLANDS Guernsey: Clos des Pecqueries, 20.6; L'Ancresse, 26.8; Le Chêne, 26.8 (Austin, 2001).

Eublemma ostrina **(Hb.) - Purple Marbled [I]**

DORSET [**9**] Upwey, 19.6 (Harris *in* Anon, 2001b). BERKS [**22**] Fernham, 28.6 (SN).

Eublemma parva **(Hb.) - Small Marbled [I]**

W. CORNWALL [**1**] St Agnes, Scilly, 29.6 (Hicks, 2001). E. SUSSEX [**14**] Winchelsea, 29.6 (PP[1]). BERKS [**22**] Fernham, 28.6 (SN).

Chrysodeixis chalcites **(Esp.) - Golden Twin-spot [I/In]**
[S. DEVON [**3**] Exeter, 12.12 imported with tomatoes (BB[1]).] E. NORFOLK [**27**] Hickling, 23.9 (TNDP *in* Hipperson, 2001). [MERIONETH [**48**] Llanuwchllyn, 9.8 "found indoors" (Graham *in* Anon, 2001b).]

Trichoplusia ni **(Hb.) - Ni Moth [I]**
S. DEVON [**3**] Prawle Point, 21.8 (AGJB). DORSET [**9**] Portland Bird Observatory, 19.6 (MC). N. HANTS [**12**] Northwood Park, 6.9 (RAB). W. SUSSEX [**13**] Ferring, 27.6 (TF); West Wittering, 4.9 (ML). E. KENT [**15**] Dungeness, 7.9 (DW); Lydd, 11.9 (KR[1]). E. NORFOLK [**27**] Stoke Holy Cross, 10.9 (AM[1] *in* Hipperson, 2000). MERIONETH [**48**] Maentwrog, 30.6 (DCGB). CAERNARVON [**49**] Rowen, 21.6 (DE). WESTMORLAND [**69**] Grange-over-Sands, 7.6 (Birkett, 2000).
CHANNEL ISLANDS Guernsey: Le Chêne, 21.8 (TNDP); Icart, 23.8 (Austin, 2001).

Thysanoplusia orichalcia **(Fab.) - Slender Burnished Brass [?I/?In]**
[HERTS [**20**] Hitchin, 18.11 "in a kitchen" (Hudson *in* Anon, 2001b).]

Macdunnoughia confusa **(Steph.) - Dewick's Plusia [I]**
W. CORNWALL [**1**] St Marys, Scilly, 4.10 (JB[1]). DORSET [**9**] Winterbourne Stickland, 12.9 (de Whalley *in* Anon, 2001b). W. SUSSEX [**13**] Kingsham, 8.10 (SP). E. KENT [**15**] Rolvenden Layne, 23.9 (AB); Dymchurch, 29.9 (JO). N. ESSEX [**19**] Jaywick, 12.9 (JW[1]).
CHANNEL ISLANDS Guernsey: L'Ancresse, 29.9 (Austin, 2001).

Autographa bractea **(D. & S.) - Gold Spangle [I]**
N. ESSEX [**19**] Felsted, 17.7 (GG[1]).

Hypena obsitalis **(Hb.) - Bloxworth Snout [?I/?R]**
W. CORNWALL [**1**] Church Cove, Lizard, 23.9 (MT[2]). E. SUSSEX [**14**] Peacehaven, 22.12 (CRP).

Herminia tarsicrinalis **(Knoch) - Shaded Fan-foot [I]**
E. KENT [**15**] Dungeness, 18.6 (DW).

ANNEX 2: SELECTED RECORDS OF COMMONER SPECIES

YPONOMEUTIDAE

Plutella xylostella **(L.)**
Annual counts from fixed traps include: S. DEVON [**3**] Starcross (114) (AHD); DORSET [**9**] Portland Bird Observatory (1017) (MC); S. HANTS [**11**] Southsea (346) (JRL).
Earliest dates: S. DEVON [**3**] Starcross, 25.4 (AHD); S.E. YORK [**61**] Spurn, 30.4 (BRS); DORSET [**9**] Portland Bird Observatory, 1.5 (MC); SURREY [**17**] Raynes Park, 6.5 (MSP); BERKS [**22**] Pucketty Farm, 7.5 (MFVC); S. HANTS [**11**] Southsea, 8.5 (JRL).
Latest dates: DORSET [**9**] Walditch, 28.11 (MSP).
Significant records: S.E. YORK [**61**] Spurn, 3.6 (104) (BRS); DORSET [**9**] Portland Bird Observatory, 9.6 (91) (MC); EASTERNESS [**96**] Tullochgrue, 31.7 (BPH).

PYRALIDAE

Udea ferrugalis **(Hb.)**
Annual counts from fixed traps include: S. DEVON [**3**] Starcross (130) (AHD); DORSET [**9**] Portland Bird Observatory (1099) (MC); S. HANTS [**11**] Southsea (78) (JRL); BERKS [**22**] Fernham (105) (SN); S.E. YORK [**61**] Spurn (68) (BRS).
Earliest dates: DORSET [**9**] Portland Bird Observatory, 8.5 (MC); E. KENT [**15**] Densole, 6.6 (TR[1]); S.E. YORK [**61**] Spurn, 7.6 (BRS).

Latest dates: E. KENT [15] Densole, 2.12 (TR[1]); W. CORNWALL [1] Church Cove, Lizard, 6.12 (MT[2]); N. HANTS [12] Selborne, 12.12 (AA).
Significant records: DORSET [9] Portland Bird Observatory, 30.8 (106) (MC); BANFF [94] Ordiquhill, 25.9-13.10 (7) (RL[1]).

***Nomophila noctuella* ([D. & S.])**
Annual counts from fixed traps include: S. DEVON [3] Starcross (60) (AHD); DORSET [9] Portland Bird Observatory (21253) (MC); IOW [10] Freshwater (1238) (SAK-J); S. HANTS [11] Southsea (794) (JRL); BERKS [22] Fernham (2260) (SN); S.E. YORK [61] Spurn (366) (BRS).
Earliest dates: IOW [10] Freshwater, 2.2 (SAK-J), Binstead, 4.2 (BW); W. CORNWALL [1] Church Cove, Lizard, 7.3 (MT[2]); DORSET [9] Portland Bird Observatory, 8.5 (MC); E. KENT [15] Densole, 15.5 (TR[1]); S.E. YORK [61] Spurn, 26.5 (BRS).
Latest dates: DORSET [9] Walditch, 11.12 (MSP).
Significant records: W. CORNWALL [1] St Agnes, Scilly, 29.6 (c.1000), 2.9 (1500+) (Hicks 2001); Church Cove, Lizard, 11.9 (961) (MT[2]); DORSET [9] Portland Bird Observatory, 20.8 (4650) (MC); E. KENT [15] Densole, 29.9 (350+) (TR[1]).

NYMPHALIDAE

***Vanessa atalanta* (L.) - Red Admiral**
Earliest dates: W. SUSSEX [13] Hove, 8.1 (DD); N. ESSEX [19] Ardleigh, 8.1 (BG); S. ESSEX [18] Foulness Island, 13.1 (DGD).
Latest dates: MAIN ARGYLL [98] Loch Creran, 1.10 (JCAC); DORSET [9] Walditch, 3.10 at mvl (MSP); W. CORNWALL [1] Penzance, 24.10 (JHC); S. ESSEX [18] Plaistow, 2.12 (GM); E. SUSSEX [14] Scaynes Hill, 14.12 (A. McCulloch per CRP).
Significant records: S.E. YORK [61] Spurn, 500 flying south on 22.9 (BRS).

***Vanessa cardui* (L.) - Painted Lady**
Earliest dates: DORSET [9] Portland Bird Observatory, 7-9.5 (4) (MC); S.E. YORK [61] Spurn, 11.5 (BRS); NORTHAMPTON [32] Werrington, 12.5 (PW[1]).
Latest dates: DORSET [9] Portland Bird Observatory, 22.10 (MC); S.E. YORK [61] Spurn, 23.10 (BRS).
Significant records: BANFF [94] Ordiquhill, 21.6 (8) (RL[1]); MAIN ARGYLL [98] Loch Melfort, 6.7 (JCAC); DORSET [9] Portland Bird Observatory, 4 and 5.9 (100+) (MC).

NOCTUIDAE

***Agrotis ipsilon* (Hufn.) - Dark Swordgrass**
Annual counts from fixed traps include: DORSET [9] Portland Bird Observatory (915) (MC); S. HANTS [11] Southsea (30) (JRL); BERKS [22] Fernham (39) (SN); S.E. YORK [61] Spurn (225) (BRS).
Earliest dates: IOW [10] Freshwater, 2.2 (SAK-J); W. CORNWALL [1] Church Cove, Lizard, 10.3 (2) (MT[2]); ZETLAND [112] Shetland, 28.3-6.4 (Pennington & Rogers, 2001); DORSET [9] Portland Bird Observatory, 1.4 (MC).
Latest dates: W. CORNWALL [1] Lamorna Cove, 27.10 (JHC); DORSET [9] Portland Bird Observatory, 28.10 (MC); W. CORNWALL [1] Church Cove, Lizard, 6.11 (MT[2]).
Significant reocrds: DORSET [9] Portland Bird Observatory, 3.9 (120) (MC).

***Peridroma saucia* (Hb.) - Pearly Underwing**
Annual counts from fixed traps include: DORSET [9] Portland Bird Observatory (504) (MC); S. HANTS [11] Southsea (21) (JRL); BERKS [22] Fernham (30) (SN); S.E. YORK [61] Spurn (55) (BRS).
Earliest dates: W. CORNWALL [1] Church Cove, Lizard, 13.3 (MT[2]); DORSET [9] Portland Bird Observatory, 6.6 (MC); E. KENT [15] Densole, 7.6 (TR[1]); S. HANTS [11] Southsea, 12.6 (JRL); IOW [10] Freshwater, 13.6 (SAK-J).

Latest dates: E. SUSSEX [**14**] Crawley Down, 27.11 (JHC).
Significant records: DORSET [**9**] Portland Bird Observatory,.16.10 (124) (MC).

Autographa gamma **(L.) - Silver Y**

Annual counts from fixed traps include: DORSET [**9**] Portland Bird Observatory (1645) (MC); S. HANTS [**11**] Southsea (183) (JRL); BERKS [**22**] Fernham (455) (SN).
Earliest dates: IOW [**10**] Freshwater, 1.1 (SAK-J); E. SUSSEX [**14**] Peacehaven, 1.1 (CRP).
Latest dates: DORSET [**9**] Walditch, 10.12 (MSP); IOW [**10**] Binstead, 20.12 (BW).
Significant records: N. DEVON [**4**] Lundy, 24.8 "thousands" (JM[1]); S.E. YORK [**61**] Spurn, 27.8 (1000), 9.9 (2000) (BRS); DORSET [**9**] Portland Bird Observatory, 30.8 (380) (MC).

Initials of recorders

AA	A. Aston
AB	A. Bradshaw
AC[1]	A. Cleave (per AHD)
AC[2]	A. Cook (per BG)
AD	A. Dowse (per PP[2])
AG[1]	A. Gardner
AG[2]	A. Goodey (per BG)
AG[3]	A. Griffiths (per CRP)
AGJB	A.G.J. Butcher
AH	A. Harkiss (per RAJ)
AHD	A.H. Dobson
AJP	A.J. Pickles
AKB	A.K. Batten (pe CRP)
AM[1]	A. Musgrove
AM[2]	A. Mackay
AS[1]	A. Spalding
AS[2]	A. Stevens (per RGG)
AS[3]	A. Starling
ASH	A.S. Henderson (per RFM)
ATM	A.T. McGowan (per PP[2])
AW[1]	A. Wander (and J. Clifton)
AW[2]	A. Woods
BB[1]	B. and L. Bewsher (per RFM)
BB[2]	B. Brigden
BB[3]	B. Banson
BC[1]	B. Cockburn (per SMP)
BC[2]	B. Cross (per SMP)
BC[3]	B. Collins
BC[4]	B. Cleal (per RGG)
BD[1]	B. Deakins (per RFM)
BD[2]	B. Duffin
BDC	B.D. Clews (per MCH)
BF	B. Fordham (per CRP)
BG	B. Goodey
BJ	B. Jones (per GDC)
BKW	B.K. West
BL	B. Lock (per BG)
BP	B. Pateman (per BG)
BPH	B.P. Henwood (per RFM)
BR	B. Richards (per RDP)
BRS	B.R. Spence
BS[1]	B. Stewart
BS[2]	B. Silver (per AHD)
BU	B. Urwin
BW	B. Warne
BY	B. Yates
CD[1]	C. Dewhurst (per CRP)
CD[2]	C. Darbyshire (per SMP)
CF[1]	C. Fletcher
CF[2]	C. Farrow
CG	C. Gibson (per BG)
CJ	C. Jones
CK	C. Kirby
CM	C. Moseley (per CME)
CME	C.M. Everett
CP	C. Potts (per PP[2])
CR	C. Rugeroni (per MSP)
CRP	C.R. Pratt
CS[1]	C. Sharpe (per GDC)
CS[2]	C. Smith (per PP[2])
CT	C. Twissell (per RGG)
CW	C. Wormwell (per GDC)
CWP	C.W. Plant
DAY	D.A. Young
DB	D. Bridges (per CRP)
DBW	D.B. Wooldridge
DC	D. Chesmore
DCGB	D.C.G. Brown
DD	D. Dey (per CRP)
DE	D. Evans

DF^1	D. Fry (per SPC)
DF^2	D. Foot
DF^3	D. Fuller (per MCH)
DGD	D.G. Down (per BG)
DH^1	D. Hutcheon (per BG)
DH^2	D. Haigh (per RGG)
DH^3	D. Haylock (per BG)
DH^4	D. Holman
DJ	D. Jones
DJG	D.J. Gibbs
DJW^1	D.J. Wedd
DJW^2	D.J. White (per MCH)
DO	D. Owen (per SMP)
DP	D. Painter
DR^1	D. Rigby (per SMP)
DR^2	D. Rey (per RGG)
DRML	D.R.M. Long (per CRP)
DS^1	D. Scott (per BG)
DS^2	D. Slade
DT	D. Taylor (per MT)
DW	D. Walker
ER	E. Roskell (per SMP)
FH	F. Hopson (per GDC)
FS	F. Smith (per RFM)
GAC	G.A. Collins
GDC	G.D. Craine
GEH	G.E. Higgs
GF	G. Fellows
GG^1	G. Geen (per BG)
GG^2	G. Gavaghan (per SMP)
GH^1	G. Henwood (per AHD)
GH^2	G. Hibberd
GJ	G. Jones
GM	G. Mallin (per RAJ)
GP	G. Parris (per CRP)
GRA	G.R. Avery (per RGG)
GS^1	G. Sell (per BG)
GS^2	G. Smith (per CRP)
GT	G. Tordoff
GW^1	G. Wilson (per GDC)
GW^2	G. Wright (per PP^2)
HB	H. Barlow (per SMP)
HJ	H. Jonas (per RDP)
HO	H. Owen (per BG)
HP	H. Papworth
HWH	H. Wood-Homer
I&DS	I. & D. Scott (per GDC)
ICR	I.C. Rose (per BG)
IH^1	I. Hunter (per CRP)
IH^2	I. Heard (per GDC)
IK	I. Kippax (per SMP)
IR^1	I. Rippey
IR^2	I. Reid (per DCGB)
IT	I. Thirlwell
JA	J. Astley
JB^1	J. Baker (per DT)
JB^2	J. Barrett
JBF	J.B. Fisher (per BG)
JC^1	J. Clifton
JC^2	J. Clarke (per SMP)
JC^3	J. Callister (per GDC)
JC^4	J. Cooper (per CRP)
JCAC	J.C.A. Craik
JCL	J.C. Lidgate (per RFM)
JD^1	J. Dobson (per BG)
JD^2	J. Down
JE	J. Ellis
JFW	J.F. Walsh (per SMP)
JG^1	J. Geeson
JG^2	J. Goodrum
JGG	J.G. Green (per BG)
JH^1	J. Hoy (per BG)
JH^2	J. Holding (per SMP)
JH^3	J. Higgott
JH^4	J. Herbert
JH^5	J. Hampshire
JH^6	J. Howell
JHC	J.H. Clarke
JI	J. Ingham
JJ	J. Jaines (per PP^2)
JL^1	J. Lamin (per PP^2)
JL^2	J. Langton (per SAK-J)
JM^1	J. Martin
JM^2	J. Morris (per SPC)
JN	J. Nicholls
JO	J. Owen (per SPC)
JP^1	J. Poland (per CRP)
JP^2	J. Pooler
JP^3	J. Pooley (per GDC)
JR	J. Rule (per RDP)
JRL	J.R. Langmaid
JS^1	J. Sutherby (per BG)
JS^2	J. Shaughnessy (per CRP)
JS^3	J. Sutton
JS^4	J. Steeden (per SMP)
JSB	J.S. Brock

JT	J. Torino (per BG)
JTR	J.T. Radford (per CRP)
JW^{1}	J. Wilde (per BG)
JW^{2}	J. Walton (per SAK-J)
JW^{3}	J. Worth
JY	J. Young (per BG)
KB	K. Brown
KJ	K. Johnson (per GDC)
KM	K. McCabe (per SMP)
KMSW	K.M.S. Wilson (per PP^{2})
KR^{1}	K. Redshaw (per SPC)
KR^{2}	K. Robertson (per PP^{2})
KS^{1}	K. Saul
KS^{2}	K. Skelton (per PP^{2})
KVC	K.V. Cooper (per SW^{1})
LB^{1}	L. Bellamy
LB^{2}	L. Blore
LK	L. Kneale (per GDC)
MAS	M.A. and W.J. Scott
MB^{1}	M. Broomfield (per SMP)
MB^{2}	M. Bailey
MC	M. Cade
MCH	M.C. Harvey
MCP	M.C. Perry (per CRP)
MD	M. Dockery (per SMP)
ME	M. Edmonds (per RFM)
MFVC	M.F.V. Corley
MG	M. Gibbons
MH^{1}	M. Hicks (per BG)
MH^{2}	M. Hough
MJ	M. Jordan
MJS	M.J. Simmons (per CRP)
MJW	M.J. White
ML	M. Love (per CRP)
MP^{1}	M. Preston
MP^{2}	M. Pritchard
MRF	M.R. Fordy
MS^{1}	M. Shardlow
MS^{2}	M. Southall
MSP	M.S. Parsons
MT^{1}	M. Thain
MT^{2}	M. Tunmore
NB	N. Bowman
NG	N. Greef
NL	N. Littlewood
NS	N. Sweet
NVG	N.V. Gill (per RRC)
OJ	O. Jarvis (per CRP)
PB^{1}	P. Bergdahl (per BG)
PB^{2}	P. Butter
PB^{3}	P. Boggis (per BG)
PB^{4}	P. Butcher (per MCH)
PC^{1}	P. Costen
PC^{2}	P. Cawley
PCP	P. Cleary-Pugh
PF	P. Franghiadi (per RFM)
PH^{1}	P. Heath
PH^{2}	P. Hurst (per RFM)
PH^{3}	P. Harris
PJ^{1}	P. Jones
PJ^{2}	P. Johnstone
PJC	P.J. Cramp (per SAK-J)
PJO	P.J. Oliver
PK	P. Keenan (per GDC)
PM	P. Marsh
PP^{1}	P. Philpot (per CRP)
PP^{2}	P. Porter
PS^{1}	P. Scroop
PS^{2}	P. Smith (per BG)
PS^{3}	P. Stubbs (per MT)
PT^{1}	P. Troake (per CRP)
PT^{2}	P. Thompson (per MCH)
PT^{3}	P. Talbot
PW^{1}	P. Waring
PW^{2}	P. Welland
PW^{3}	P. Wilson (per CRP)
PW^{4}	P. Wakelin
RA	R. Andrews
RAB	R.A. Bell
RAJ	R.A. Jones
RAS	R.A. Softly
RB	R. Banks (per SMP)
RC	R. Cripps (per GDC)
RD	R. Dickson
RDP	R.D. Penhallurick
REL	R.E. Lane
REP	R.E. Pratt (per CRP)
RFM	R.F. McCormick
RG^{1}	R. Goodson (per BG)
RG^{2}	R. Goy
RGG	R.G. Gaunt
RH^{1}	R. Hope (per BG)
RH^{2}	R. Howard
RH^{3}	R. Hobson (per MSP)
RIH	R.I. Heppenstall
RK	R. Kemp (per CRP)
RL^{1}	R. Leverton
RL^{2}	R. Long (per BG)

RM	R. Meller (per CRP)
RMC	R.M. Craske (per CRP)
RP	R. Pearce (per RGG)
RPF	R.P. Fray
RPJ	R. Petley-Jones (per SMP)
RR	R. Rogers
RRC	R.R. Cook
RS	R. Symington (per CRP)
RW[1]	R. Wolton (per RFM)
RW[2]	R. Wildman (per CRP)
RWA	R.W. Arthur (per BG)
SAK-J	S.A. Knill-Jones
SB[1]	S. Bradley (per PC[1])
SB[2]	S. Bosanquet
SB[3]	S. Barlow
SB[4]	S. Brown
SB[5]	S. Busuttil (per SPC)
SC	S. Curson (per CRP)
SE	S. Ely (per PP[2])
SG	S. Glover (per RGG)
SH	S. Harris (per MSP)
SL	S. Loftus
SM	S. Musgrave (per BS[1])
SMG	Suffolk Moth Group
SMP	S.M. Palmer
SMW	S. McWilliam
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SP	S. Patton (per CRP)
SPC	S.P. Clancy
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SS	S. Shimeld (per MSP)
SW[1]	S. Wright
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TB[1]	T. Bagworth
TB[2]	T. Brown
TC	T. Callister (per GDC)
TD	T. Dingle
TE	T. Edmondson (per S. Hind)
TF	T. Freed (per CRP)
TG[1]	T. Gray (per BG)
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SUBSCRIBER NOTICE

Readers of this journal will be pleased to learn that Essex lepidopterists have recently honoured Bob Dewick, the 92 years old operator of what is, probably, Britain's largest moth trap, with the presentation of a copy of *The Aurelian Legacy* – donated by Basil Harley, of Harley Books. The presentation, which was made by Joe Firmin on behalf of the Essex Moth Group and the Essex Lepidoptera Panel, is in recognition of Bob's outstanding contribution to moth recording and in particular of his considerable input to the study of moth migration over the past fifty years. Bob's trap measures 11 feet square and stands six feet high, with rounded corners. It sports a 400 watt roof lamp and an extractor fan that draws air into the trap to help minimise moths escaping. Sited out on the Essex coastal marshes, the trap catches literally thousands of moths, which are counted and released. In October 1951, the trap caught the first British example of *Macdunnoughia confusa* (Stephens), which was named "Dewick's Plusia" in his honour (see *Entomologist* **63**: 253). — Editor.

UNUSUAL PARTIAL SECOND BROODS OF LEPIDOPTERA IN NORTH-EAST SCOTLAND DURING 2003

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Abstract

Many moths that are normally univoltine in north-east Scotland produced partial second generations during the hot summer and autumn of 2003. Details are provided for 34 species. For some of these, records of second brood individuals in the region are unprecedented; in several cases they would be unusual even in the south of England. The possible influence of global warming is discussed. The data also provides evidence that the normally univoltine Scottish *Diarsia* species is *D. rubi* and not *D. florida*.

Introduction

There is increasing evidence that global warming (however caused) is already having demonstrable effects on Britain's Lepidoptera. These effects fall into three categories. First, species that are on the wing in spring and early summer are emerging earlier, at least when judged on the date of the first sighting (Alston, 2001). Secondly, the range of many species is gradually extending northwards. This has been particularly well-studied in butterflies (Parmesan *et al*, 1999) but it also applies to moths (Parsons, 2003). North-east Scotland itself is regularly gaining new species from the south (Palmer *et al*, 2002). A third effect has so far received less attention. It involves the production of partial second broods by species which are normally univoltine in a particular region.

In summer 2003, the latter phenomenon was particularly noticeable in North-east Scotland (here defined as Watsonian Vice-Counties 91-94: respectively Kincardineshire, South Aberdeenshire, North Aberdeenshire and Banffshire). Very few moths are regularly bivoltine here. Detailed records have been kept since 1990 at my home site at Ordiquhill in Banffshire, with particular interest in flight periods. They show that, of the resident macros, only Garden Carpet *Xanthorhoe fluctuata* and Grey Pine Carpet *Thera obeliscata* normally produce a second brood equally as numerous as the first. A few other species that are regularly bivoltine in southern Britain occasionally produce second brood individuals here in particularly good summers.

Because partial second broods are so rare in North-east Scotland, the events of summer 2003 aroused much interest, causing detailed records to be kept. For the purposes of this paper, all observers known to operate in the region were contacted and asked for data. In total, unusual or unprecedented second brood individuals were recorded from 34 moth species. Only four of these were micros, perhaps because their habits are less well-known. Also, most records were from light traps.

Flight periods in North-east Scotland often differ from those in southern Britain. This caused occasional problems in deciding whether a moth was genuinely from a second brood, not just a very late individual from a prolonged single brood. In the following list, I have gone by the balance of probabilities but erred on the side of caution. One criterion used was a sizeable gap (often a month or more) with no sightings before fresh individuals of the presumed second generation appeared. A further strong indication came from the size of the moths. In many species, the presumed second brood individuals were far smaller than average, some being described as tiny. Even so, a few of the records that follow might conceivably represent delayed development or emergence in an unusually hot and dry year, though the observers considered this unlikely. Finally, there is the question of whether the second brood individuals were produced locally, or whether they could have been migrants from further south. During the main period in question, late August to early October, surprisingly little immigration was noted in North-east Scotland. Even expected migrants like *Nomophila noctuella* and Dark Sword-grass *Agrotis ipsilon* were scarce or absent. Furthermore, most of the species that produced second broods have no reputation as migrants or strays.

List of species involved

Tineidae

Monopsis laevigella (Denis & Schiffermüller.)

Ordiquhill: several from 3.ix.2003, after gap since late July. No previous Gen.II records.
Oldmeldrum: several in September 2003 (MRY).
Heath & Emmet (1985) state "perhaps bivoltine in the south".

M. weaverella (Scott)

Ordiquhill: several from 3.ix.2003, after long gap. No previous Gen.II records.
Oldmeldrum: seen in September 2003 (MRY).
Emmet in Emmet & Heath (1992) charts life history as incompletely known, but univoltine.

Tortricidae

Celypha lacunana (Denis & Schiffermüller)

Ordiquhill: singles (very small) on 5.ix and 16.ix.03 after long gap. No previous Gen.II records.
Cluny: one on 7.ix and four on 14.ix.03 (HG).
Oldmeldrum: many more small specimens than usual in September 2003 (MRY).

Apotomis semifasciana (Haworth)

Ordiquhill: singles on 12.ix and 18.ix.03 after gap since July. Previous latest was on 7.viii.98.
Bradley, Tremewan & Smith (1979) give as univoltine, in July.

Geometridae

Small Dusty Wave *Idaea seriata* (Schrank)

Oldmeldrum: several in late September 2003 – unprecedented: normally July/early August (MRY).
Single-brooded in northern Britain (Skinner, 1998).

Flame Carpet *Xanthorhoe designata* (Hufnagel)

Ordiquhill: 20.v – 22.vii, then 6.viii – 3.ix.2003, equally numerous but smaller specimens.
1990 – 2002: Gen.II examples in 5 out of 13 years, most being three in 2002.
Alford: one on 22.viii.03; Cluny: one on 21.viii.03 (HG).
Monymusk: 21.v – 16.vii (total = 16), then 27.vii – 9.ix.2003 (total = 97) (RMP).
Oldmeldrum: one on 2.ix.2003 (MRY).
In Scotland, second brood only occurs in favourable years (Skinner, 1998)

Purple Bar *Cosmorhoe ocellatus* (Linnaeus)
Oldmeldrum: one on 3.ix.2003 (MRY). Normally one brood here, late June to mid August. Partial second generation in the south, one generation in the north (Waring & Townsend, 2003).

Small Phoenix *Ecliptopera silaceata* (Denis & Schiffermüller)
Ordiquhill: 20.v – 27.vi (up to 8 per night), then 11.viii – 14.ix.2003 (total = 9), smaller moths. 1990 – 2002: only one Gen.II example, on 2.ix.1999.
Auchnagatt: 28.v – 20.vi, then 6.viii – 2.ix.2003 (total = 8) (CJH).
Cluny: one on 7.ix.2003 (HG).
Inchmarlo: one on 20.viii.03 (CWNH).
Monymusk: six between 15.viii – 20.ix.2003 (RMP).
Oldmeldrum: one on 2.ix.03 (MRY).
A second generation occurs in southern England, late July and August (Skinner, 1998).

Common Marbled Carpet *Chloroclysta truncata* (Hufnagel)
Ordiquhill: 16.vi – 31.vii.2003; then singles on 15.ix and 17.ix.2003, both small specimens.
1990 – 2002: one brood, mid June to early August; no suspected Gen.II examples seen.
Both univoltine and bivoltine races occur in Scotland (Skinner, 1998, Waring & Townsend, 2003).

Green Carpet *Colostygia pectinataria* (Knoch)
Auchnagatt: last of main brood on 21.vii.2003, then two small individuals on 9.x.2003 (CJH).
Inchmarlo: fresh specimen on 14.x.2003 (CWNH).
Unprecedented: normally one extended brood here, end of June until late August. Skinner (1998) notes an occasional and partial second generation in southern England.

Golden-rod Pug *Eupithecia virgaureata* Doubleday
Ordiquhill: 20.v – 24.vi, then small individual on 6.viii.2003 - unprecedented.
1990 – 2002: strictly one brood, mid May to late June.
Cluny: one on 4.viii.2003 (HG).
Oldmeldrum: singles on 10.viii and 17.viii.2003 (MRY).

Double-striped Pug *Gymnoscelis rufifasciata* (Haworth)
Ordiquhill: small individuals on 1.ix. and 6.ix.2003 – unprecedented at this site.
1990 – 2002: strictly one brood, late May through June.
Waring & Townsend (2003): one generation in parts of northern Britain.

Tawny-barred Angle *Macaria liturata* (Clerck)
Inchmarlo: one on 23.viii.2003 (CWNH).
Skinner (1998): single-brooded except in southern England.

Barred Umber *Plagodis pulveraria* (Linnaeus)
Monymusk: a small male on 9.ix.2003; genitalia checked to confirm species (RMP).
South (1907-09) is the only British author to describe this species as anything other than univoltine.

Brimstone Moth *Opisthograptis luteolata* (Linnaeus)
Ordiquhill: 18.v – 30.vi, then 23.viii – 20.ix.2003, with two in August and 12 sightings in September.
1990-2002: no September records; total of 8 individuals in August over seven different years.
Alford: one on 22.viii.2003. Cluny: singles on 7.ix and 14.ix.2003 (HG).
Auchnagatt: 2.ix – 25.ix.2003 (total = 14) (CJH).
Inchmarlo: 13.ix – 23.ix.2003 (CWNH).
Monymusk: 19.viii – 26.ix (total = 80+) then singles on 13.x and 14.x.2003 (RMP).
Oldmeldrum: late September 2003 (MRY).
Normally univoltine in northern Britain, overwintering as a pupa (Porter, 1997).

Common White Wave *Cabera pusaria* (Linnaeus)
Monymusk: one small example. 1.ix.2003 (RMP).
Bivoltine in southern Britain (Skinner, 1998), but no previous Gen.II records known from our area.

Light Emerald *Campaea margaritata* (Linnaeus)
Inchmarlo: one on 19.ix.2003 (CWNH).
Monymusk: singles on 9.x and 11.x.2003 (RMP).
Partial second generation in southern England (Skinner, 1998), but no previous autumn records here.

Barred Red *Hylaea fasciaria* (Linnacus)
Inchmarlo: one on 1.x.2003 (CWNH).
Normally late June to mid August here. Only South (1907-09) suggests a partial second brood.

Sphingidae

Poplar Hawk *Laothoe populi* (Linnaeus)
Ordiquhill: 22.v – 12.vii, then singles on 24.viii and 2.ix.2003.
1990 – 2002: latest-ever was 22.vii.1998, with no suspicions of a second brood.
Aberchirder: one on 24.viii.2003 (RS).
Sometimes a partial second generation in the south (Waring & Townsend, 2003).

Notodontidae

Iron Prominent *Notodonta dromedarius* (Linnaeus)
Ordiquhill: 14.vi – 4.viii, then singles on 18.viii, 21.viii, 3.ix and 15.ix.2003.
1990 – 2002: long flight periods, but only one convincing Gen.II example, on 1.ix.1999.
Alford: one on 22.viii.2003 (HG).
Oldmeldrum: one on 27.viii.2003 (MRY).
Usually single-brooded in the north (Skinner, 1998).

Pebble Prominent *N. ziczac* (Linnaeus)
Ordiquhill: 18.v – 29.vii, then small specimen on 16.viii.2003.
1990 – 2002: long first broods; the only probable Gen.II examples on 11.viii and 16.viii.1998.
Oldmeldrum: one on 17.viii.2003 (MRY).
Single-brooded in the north (Skinner, 1998).

Lesser Swallow Prominent *Pheosia gnoma* (Fabricius)
Ordiquhill: 30.v – 16.vii, then one on 24.viii.2003.
1990 – 2002: long broods, sometimes into August, but no convincing Gen.II examples.
Alford: one on 22.viii.2003. Cluny: one on 21.viii.2003 (HG).
Oldmeldrum: one on 27.viii.2003 (MRY).
One generation in northern Scotland (Waring & Townsend, 2003).

Swallow Prominent *P. tremula* (Clerck)
Ordiquhill: one on 24.viii.2003.
1990 – 2002: single brood, late June to early August, with no convincing Gen.II examples.
Oldmeldrum: one on 23.viii.2003 (MRY)
Single-brooded in the north (Skinner, 1998).

Coxcomb Prominent *Ptilodon capucina* (Linnaeus)
Ordiquhill: 5.vi – 19.vii, then singles on 23.viii and 5.ix.2003.
1990 – 2002: from late May into early August, but only one Gen.II example, on 13.ix.1999.
Aberchirder: one on 24.viii.2003 (RS).
Auchnagatt: singles on 24.viii, 30.viii & 4.ix.2003 (CJH).
Generally considered bivoltine, but not so in this region

.Buff-tip *Phalera bucephala* (Linnaeus)

Inchmarlo: at least one from 26.viii to 4.ix.2003, perhaps same moth retrapped (CWNH). Given as univoltine by all British authors.

Noctuidae

Flame Shoulder *Ochropleura plecta* (Linnaeus)

Ordiquhill: 20.v – 17.vii, then 6.viii – 16.ix.2003 (Gen.II total = 15).
1990 – 2002: late May sometimes into August, but Gen.II examples in four years only (total = 5).
Alford: one on 22.viii.2003; Cluny: two on 21.viii.2003 (HG).
Auchnagatt: 7.vi – 23.vii, then singles on 24.viii, 2.ix & 4.ix.2003 (CJH).
Oldmeldrum: late September 2003 (MRY).
Generally considered bivoltine, but not so in this region.

Small Square-spot *Diarsia rubi* (Linnaeus)

Ordiquhill: 11.vi – 6.viii, then 31.viii – 18.x.2003 (Gen.II total = 78).
1990 – 2002: Gen.II individuals in 8 years only (total = 11), some possibly migrants.
Auchnagatt: Gen.II 4.ix – 14.x.2003 (total = 19) (CJH).
Cluny: two on 7.ix and one on 1.x.2003 (HG).
Inchmarlo: 14.ix – 21.ix.2003 (CWNH).
Monymusk: 4.ix – 2.x.2003 (total = 13) (RMP).
Oldmeldrum: late September 2003 (MRY).
Univoltine in Scotland (Heath & Emmet, 1979).

Bright-line Brown-eye *Lacanobia oleracea* (Linnaeus)

Ordiquhill: 10.vi – 22.vii, then small specimen on 1.ix.2003.
1990 – 2002: from June well into August in late years, but never any suspicion of Gen.II.
Cluny: one on 1.x.2003 (HG).
With a small second brood in southern England (Heath & Emmet, 1979).

Smoky Wainscot *Mythimna impura* (Hübner)

Cluny: one on 1.x.2003 (HG). Unprecedented here, though lingers into September in cool summers.
With occasional and partial second brood in southern England (Skinner, 1998).

Small Angle Shades *Euplexia lucipara* (Linnaeus)

Auchnagatt: one on 24.ix.2003 (CJH). Unprecedented in NE Scotland.
With very occasional and partial second generation (Skinner, 1998).

Burnished Brass *Diachrysia chrysitis* (Linnaeus)

Ordiquhill: 24.vi – 9.viii, then small specimens on 14.ix & 18.ix.2003.
1990 – 2002: from late June or July into late August in poor summers, but no Gen.II suspected.
Auchnagatt: 28.vi – 6.viii, then singles on 14.ix, 16.ix, 17.ix & 24.ix.2003 (CJH).
Cluny: one on 14.ix.2003 (HG).
Univoltine from the Midlands northwards (Heath & Emmet, 1983).

Gold Spot *Plusia festucae* (Linnaeus)

Auchnagatt: 24.vi – 25.vii, then one on 14.ix.2003 (CJH).
Oldmeldrum: one on 6.ix.2003 MRY).
In much of Scotland always single-brooded (Skinner, 1998).

The Spectacle *Abrostola tripartita* (Hufnagel)

Ordiquhill: 21.v – 20.vii, then very fresh specimen on 8.viii.2003.
1990 – 2002: prolonged single emergence, but only one Gen.II record, on 17.viii.1995.
Occasional and usually partial second generation in southern Britain (Skinner, 1998).

The Snout *Hypena proboscidalis* (Linnaeus)
Cluny: small specimen on 1.x.2003 (HG).
Inchmarlo: one on 18.ix.2003 (CHo).
Monymusk: two tiny specimens on 25.ix.2003 (RMP).
Bivoltine in southern England (Heath & Emmet, 1983) but no previous Gen.II records here.

Discussion

The weather in 2003 was unusually dry and sunny throughout Britain, continuing the recent trend towards warmer summers. The most noteworthy feature, however, was an exceptionally hot spell in the first ten days of August when a new UK temperature record of 38.1°C was set at Gravesend. Even my garden thermometer registered over 32°C on 9 August.

Arguably it was this hot spell that triggered the unprecedented partial second broods of so many moths that hitherto have been strictly univoltine in North-east Scotland. For most species, the timing seems to fit: second brood individuals appeared roughly a month to six weeks after the early August hot spell. This would provide the time-scale needed for caterpillars to feed up and pupate instead of overwintering, or for pupae to form up instead of diapausing until spring. Ironically, when the second broods did emerge, the weather was no longer exceptional.

A relatively early spring was no doubt part of the equation. Springs tend to be particularly cold and late in North-east Scotland, but by the end of May 2003 I had already recorded adults of 61 species of macro-moth at Ordiquhill. This compares with an average of 46 species by that date (range 21 – 60) in the 12 previous years. Thus many of the potentially double-brooded species had got off to a good start.

Time alone will tell if the events of 2003 part of a definite trend, or this was simply a year when the life cycles of some moths were confounded by unusual weather. Certainly it is doubtful whether most of the species concerned actually benefited by producing partial second broods. At their low density, some of the individuals concerned may not have been able to find mates. Even if fertile eggs were laid, autumn comes quickly up here. It seems unlikely that caterpillars hatching in September or later would have time to reach the appropriate overwintering stage. For example, willow-herb *Epilobium* was already in a sorry state when the second brood of Small Phoenix appeared. Far from promoting the ability to produce a second brood, 2003 might have ensured that the genes concerned were removed from the population.

Fewer than 1% of the macro-moths in North-east Scotland are fully bivoltine in an average year. Instead, a common strategy seems to be the extended single brood, often lasting 10 weeks or more. For example, many of the prominents (Notodontidae) have a protracted single flight from late May to early August in some years. Other species show a similar pattern. Especially in a cool summer, our single brood can almost span the period occupied by two more discrete generations in the south. Its timing is variable, depending on the weather, being a month or more later in cool summers than in good ones. In the uncertain Scottish climate, presumably this flexibility is valuable.

Factors other than temperature may also favour a single brood. Even if the climate of Scotland warms in the future, day length will stay the same. Many caterpillars feed nocturnally, presumably to avoid predation, yet summer nights here are considerably shorter than those in southern England, especially for a month either side of the midsummer solstice. Thus reduced nocturnal feeding time could work against bivoltinism in northern Britain, irrespective of temperature.

It is also interesting to consider the species that (as far as we know) failed to produce a partial second generation in North-east Scotland 2003, even though they are bivoltine further south. They included Early Thorn *Selenia dentaria*, Sallow Kitten *Furcula furcula*, Ruby Tiger *Phragmatobia fuliginosa* and Nut-tree Tussock *Colocasia coryli*. All were out by May in 2003, but no second brood resulted. This strongly suggests their univoltinism here is genetically controlled rather than determined by temperature.

Finally, the strong partial second brood of Small Square-spot was convincing evidence that the normally univoltine Scottish moths are *Diarsia rubi* and not *D. florida* (whatever the true status of that taxon), answering the query of Palmer & Gould (2003).

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The Straw Dot moth *Rivula sericealis* (Scop.) (Lep.: Noctuidae): how many broods?

The observation by Brian West (*Ent. Rec.* **115**: 286-287) that the Straw Dot *Rivula sericealis* is regularly double-brooded, and occasionally triple-brooded, in his garden on the outskirts of south-east London, prompted me to look more closely at my own data on this species. Though there were similarities between our two gardens, there were also differences. The opportunity was taken, therefore, to examine the situation in closer detail.

A preliminary examination of the literature suggests that existing data on voltinism in this species is sparse and inconclusive and does not allow any real decision to be made concerning whether there are two broods of adults or one protracted brood. For Britain, Barrett (1900. *The Lepidoptera of the British Islands*) states simply that the moth is on the wing from the end of June to the end of August. More recently, Bretherton, Goater & Lorimer, writing in volume 10 of *Moths and Butterflies of Great Britain and Ireland* (Harley Books, 1983) observed that "*It is not possible to state the number of generations with any certainty, as the moth may be seen in any month from late May to early October; much probably depends on the early summer rainfall and consequent succulence of the foodplant after midsummer, so that hibernated larvae complete their growth at varying speeds in different years. The resulting emergence is spread throughout June and July and there is at least one more complete generation, possibly even a partial third in southern England.*" The possibility exists that both the phenology (the period when it is an adult) and the voltinism (number of generations per year) may be affected by latitude and so a quick examination of the European literature is also of interest and relevance.

For Northern Europe, Skou (1991. *Nordens Ugler*) writes "*In Denmark and southern Sweden from mid June to mid September, probably in two continuous generations. Further to the north only one generation from late June to mid August.* I am most grateful to Peder Skou for e-mailing me a translation of his text for this species. It may be worth bearing in mind that in terms of latitude, Denmark and southern Sweden extend approximately from Newcastle-upon-Tyne to Orkney. For France, Culot (1915. *Noctuelles et Géomètres d'Europe*, volume 2) notes the adult from May to September, making no comment on voltinism; later French texts do not appear to give flight periods. For Central Europe, Nowacki (1998. *The Noctuids of Central Europe*) reports positively "*May to September in two generations*". For the

Czech and Slovak Republics, Bělín (2003. *Noční motýli České a Slovenské republiky*) records adults from May to July and August to October, implying two broods but not specifying. Further south, in Romania, Rákosy (1996. *Die Noctuiden Rumäniens*) notes adults from May to July and August to mid-September with, if I have translated the German correctly, a peak ("*Flugmaximum*") from mid August to mid September. Further south still into Bulgaria, and my good friend Dr Stoyan Beshkov tells me that all of his records fall in the period from the 23 May to 23 September. He states that "*For Bulgaria* R. sericealis *is not an interesting species, it is widely distributed everywhere in low altitude. I have continuously collected it, as freshly emerged specimens of both males and females, from May, June, July, August and September. In the old literature (Buresch & Tuleschkow, 1935) it is reported in two generation – May-June and August-September. My opinion now is, that it has probably at least three generations, but I can not prove this.*" I should add that I have not, myself, examined the work by Buresch & Tuleschkow which is, in any case, printed in Cyrillic text which I do not understand. Finally, in Greece, Hacker (1989. *Die Noctuiden Griechenlands*) states that the moth apparently flies from April to September in two or three generations; it is not clear if he means the number varies or if he is not certain which number applies.

Data sets obtained from a single site are probably too small to permit a proper analysis, even if the trap was run on every night. Far better to look at records from a larger number of sites, though constraining the overall area studied to eliminate significant variation in geography, climate, altitude or other factors. Accordingly, I asked selected members of the Hertfordshire Moth Group for their data, which they willingly provided. Collective records for a number of moth traps in Hertfordshire and Middlesex were summarised in graphical form.

A total of 17 people contributed to the data set. This number excludes that from the Rothamsted Insect Survey light traps which operate in the county; because these traps kill all the moths entering them, the numbers obtained are more a measure of recruitment than of total numbers available on a particular night (which must include recaptured individuals). The two types of data should not be combined. The sites contributing data all lie in Hertfordshire and northern Middlesex – the latter away from the maritime influence of the River Thames and untouched by the "heat island effect" that is focused on central London; it is judged that they are all within a sufficiently confined geographical area to be regarded as a single data source. However, only ten of these data sets related to near-nightly trapping at a fixed location; the other seven related to more casual recording. The difference between the two data sets is significant – fixed position traps that are run on a nightly basis also record negatives (nights when none were captured); casual reports do not. Accordingly, only the ten continuous data sets were used in the analysis.

However, it is still necessary to correct the data. For example, if five of the ten were away for the same two school holiday weeks, a dip in the graph line for that period would be evident even though moth numbers were probably high. So, is a graph of the actual results a true reflection of reality or should the graph be corrected in some way? Hertfordshire Moth Group member Emil De Maria, a statistician at the

University of Hertfordshire, willingly took on the task of ascertaining the validity of my analysis. He examined the year 2003 data set and reported as follows:

Records run from 28 May to 8 October – the flight period; during this period there was a high incidence of missing values. Of the 1360 observer-nights (number of observers × nights) during the flight period a total of 361, or 26.7%, lack records because, for whatever reason, one or more traps were not operated on that date. This is likely to have an artificial effect on the line of the flight graph that is not relevant to the real situation. This potential error was dealt with in two ways.

First, the nightly total counts, for all observers, were recalculated (when missing values occurred) on the basis that the missing value was the same as the mean per observer for that night.

Second, it was noted that two observers had high missing values counts 114 and 121 whilst also having low total moth counts 44 and 49 from a grand total of 1081. When the records of these observers are eliminated the missing value percentage drops to 14.6 % but the total moth count is only reduced by 8.6%. The records of these observers were, therefore, withdrawn and imputed missing values were calculated as follows: for nights with missing values a mean value was calculated using the first method above. This mean value was then adjusted for the observer on the basis of that observer's annual total (i.e., for observers with high total the value was inflated and for those with low counts it was deflated). These imputed values were then rounded to the nearest whole number and inserted in place of the missing value. This process yields two time-series of nightly counts:

- a series which uses all the data from ten observers, but has a high missing value percentage
- a series with a lower missing value percentage but has fewer (8) observers.

In order to make a meaningful comparison of these two series the second was scaled up to ten-observer equivalent by multiplying by 1.125.

Next a seven-day moving average was calculated for each series. A moving average will 'smooth out' the day-to-day count fluctuations. Seven was chosen as the length of the moving average because this eliminated any weekly effect due to the observers.

The two series yield very similar results. When correlated the series have a correlation coefficient of .998. The conclusions from this exercise are that there is no statistically significant difference, for this purpose, between the actual plot of data and the corrected data. Therefore, for the data set under discussion the plot of actual data is valid.

The graph of the raw data from the reduced number of 8 traps (all in Hertfordshire) is now presented in Figure 1, with the years 2002 and 2003 shown separately. It is immediately apparent that the graph shows is a clear bimodal pattern characteristic of a double-brooded species. There is also some evidence of a third brood, but the relatively small sample size means that precise interpretation is not possible; a much larger data set is desirable.

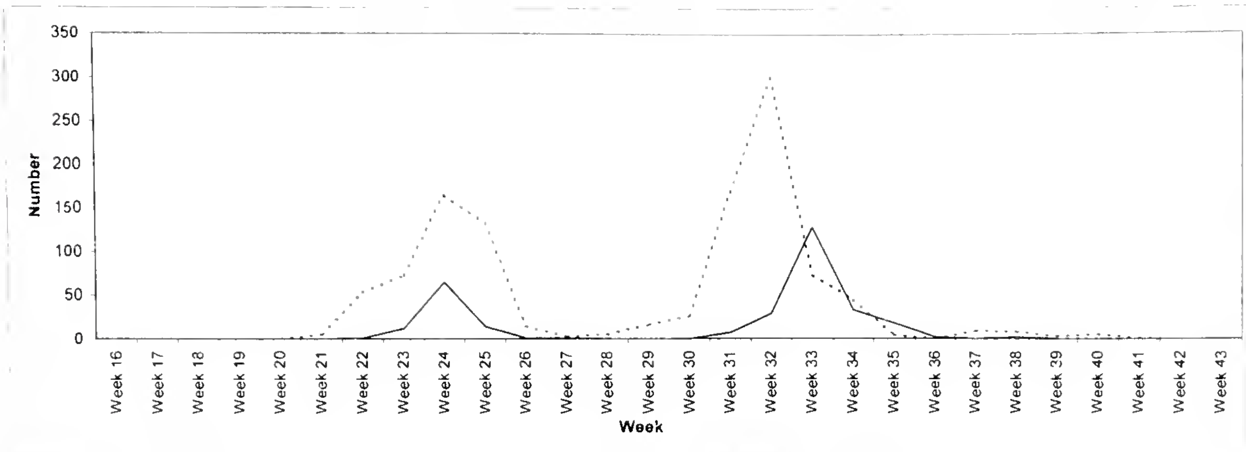


Fig. 1. Numbers of Straw Dot *Rivula sericealis* (Scop.) per standard week, from light traps operated at eight sites in Hertfordshire during the years 2002 (solid line: n=313) and 2003 (dashed line: n=1110). Standard weeks are seven-day units commencing on 1 January; 29 February is included in week 9 and 31 December is included in week 52 (see, e.g., Plant, 1994. *Provisional atlas of lacewings and allied insects of Britain and Ireland*, Biological Records Centre, page 28).

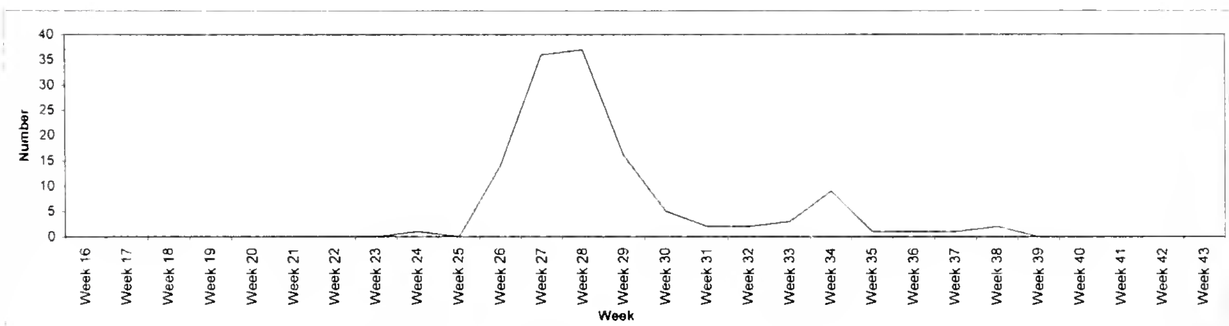


Fig. 2. Actual numbers of Straw Dot *Rivula sericealis* (Scop.) per standard week, from light traps operated at seven sites in Lancashire during the year 2003 (n=136). Information kindly provided by Steve Palmer, Lancashire Moth Recorder. The main population peak falls exactly in the trough between the two Hertfordshire population peaks (week 28).

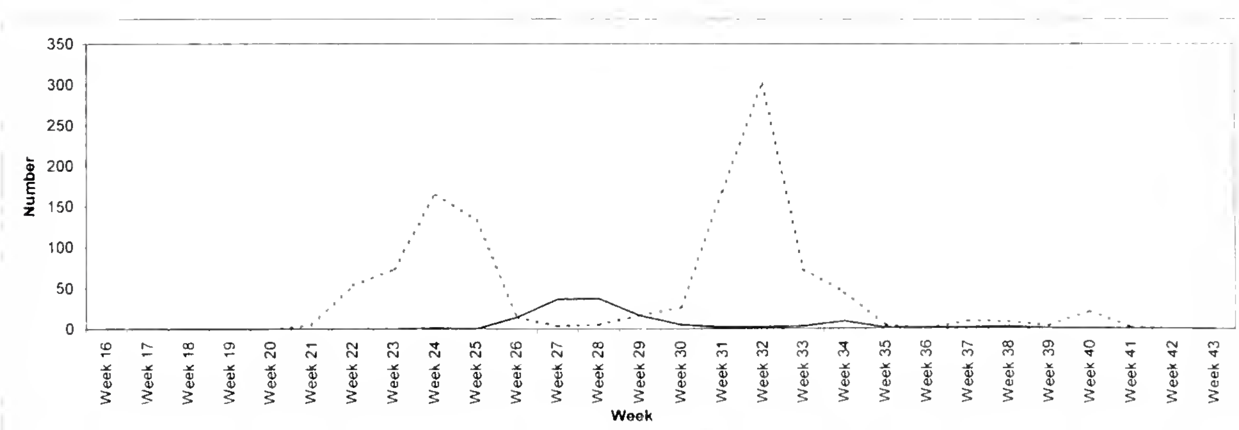


Fig. 3. Actual numbers of Straw Dot *Rivula sericealis* (Scop.) per standard week, from light traps operated at seven sites in Lancashire (solid line) and eight sites in Hertfordshire (dashed line) during the year 2003. There are moths on the wing continuously from week 21 to week 41.

Data for the entire of the British Isles would be sufficient in volume to determine if there is a third brood, but regional variations in voltinism would be masked. In order to demonstrate this, Figure 2 shows year 2003 data kindly provided for the two Lancashire vice-counties by Steve Palmer. There are clearly two main peaks of adults, suggesting a bivoltine habit. However, overlaying this on the 2003 Hertfordshire data (Figure 3) shows that the first peak, which is considerably larger than the second, is a full month later (weeks 27 and 28) than in Hertfordshire and falls precisely in the middle of the trough between the two southern population peaks. The smaller second peak is two weeks behind the southern counties peak for the same year. The Lancashire sample is much smaller (136 in Lancashire, compared to 1110 in Hertfordshire, although it derives from a similar number of traps (seven in Lancashire, eight in Hertfordshire). Nevertheless, combining the year 2003 graph lines for these two areas would produce a line showing a species that is present without a break throughout the summer and which is apparently continuously brooded; analysis of the data on a regional basis shows clearly that this national generalisation is false.

Returning to the Hertfordshire data set, it is evident that Straw Dot adults started to appear two weeks earlier in 2003 (week 20) compared with 2002 (week 22) and continued slightly later (week 40 compared with week 38). In spite of this earlier start, however, the numbers of first brood adults peaked in the same standard week number in both years (Week 24: 11 – 17 June)). However, after the unusually warm and dry summer period, the second brood of adults peaked one full week earlier in 2003 (week 32: 6 – 12 August) than in 2002 (week 33: 13 – 19 August). The reasons for this are unclear, but the shift is real.

My thanks are due to the following Herts Moth Group members who sent me their numerical data for inclusion in this small study: Marcel Ashby, Barnaby Briggs, John Chainey, Jim Fish, Liz Goodyear, Phil Gould, Wendy Hatton, Vincent & Betty Judd, Andrew Middleton, Dave Murray, Bill & Pearl Page, Julian Reeves, Jenny Spence, Rachel Terry and Andrew Wood. I am also gratefully to Steve Palmer (Lancashire Moth Recorder) for the Lancashire data and for his kind permission for me to use it in the comparison. My son Edward set up the computer side of things (apparently something called a macro – I thought they were moths!) to update automatically the graph line as new data was added to the Microsoft Excel spreadsheet. Herts Moth Group member Emil de Maria (University of Hertfordshire) contributed the statistical examination of the data. Peder Skou (Apollo Books, Copenhagen) kindly provided a translation of his published text and Stoyan Beshkov (National Museum of Natural History, Sofia) provided first-hand field data from Bulgaria as well as translation of Cyrillic texts.— COLIN W. PLANT, 14 West Road, Bishop's Stortford, Hertfordshire CM23 3QP (E-mail: colinwplant@ntlworld.com).

Is the Chequered Skipper butterfly *Carterocephalus palaemon* (Pallas) (Lep.: Hesperiidae) becoming bivoltine?

Whilst on holiday in the Italian Dolomites during September 2003 I observed a perfectly fresh specimen of *Carterocephalus palaemon*, and this was quickly followed by the sighting of another two, slightly worn, examples. The observations took place in a sheltered valley near the mountain hut Sangon, approximately 2 kilometres to the north of Selva, on 16 September 2003, at an altitude of 1,850 metres (6,069 feet). The weather was sunny and warm and the time about 14.30 hours.

The Collins Field Guide (*Butterflies of Britain & Europe*, 1997), cites this butterfly as being univoltine, with the flight period mid May to June at lower altitudes, and July at 1600 metres. I also consulted several European butterfly books in my library and the findings were the same and I have not been able to locate any references to this species flying in September. I can only conclude that, with global warming, this species could be moving towards being bivoltine in southern Europe.— TONY STEELE, 57 Westfield Road, Barnehurst, Kent DA7 6LR.

***Rivula sericealis* (Scop.) (Lep.: Noctuidae): Apparent substantial third generation in the Isle of Wight during 2003**

With reference to the note by B. K. West (*Ent. Rec.* **115:** 236 – 237) on an apparent substantial third generation of *Rivula sericealis* in north-west Kent, I can also report a third generation in late September and early October at Totland, Isle of Wight, in 2003. This species is very common here and I was taking them in ones & twos right up to 12 October. I made a special note of the lateness of this insect as I cannot remember taking it so late in the year in the past. It will be interesting to see whether this late generation continues in future years, in which case it could then be accounted for by global warming.– SAM KNILL-JONES, 1 Moorside, Moons Hill, Totland, Isle of Wight P039 OKU.

A sign of the times, or just an unusual year? Some records of extended flight periods or partial additional broods of moths in 2003 at Walditch, Dorset

Apart from the regular appearance of immigrant Lepidoptera throughout much of the autumn and into early December, a feature of 2003 at Walditch, Dorset, was the late or extended appearance of several species, some of these undoubtedly representing partial additional broods. On a very few occasions, species considered typical of late summer/autumn were seen alongside species perhaps more typical of winter, for example on 9 November when a Mottled Umber *Erranis defoliaria* was seen alongside a Large Yellow Underwing *Noctua pronuba*. It is perhaps also worth highlighting that the 125 watt m.v. Robinson trap, which was the source of the majority of the records below, is not run in an ideal situation, against a wall in a north-facing garden, the house being at the bottom of a north-facing slope.

The following table lists species with dates on which they appeared compared to published flight periods in recent standard works.

Species	Date in 2003 of record* at Walditch	Flight period given in the work quoted				
		A	B	C	D**	E**
Carcina quercana	19.ix: 1.x	July - August				
Archips podana	7.ix: 10.ix: 19.ix: 20.ix (2): 1.x: 2.x		End June - July			
Clepsis consimilana	2.x: 8.x: 13.x: 4.xi		June – August: September			
Crocidosema plebejana	5.xi: 1.xii		July - October			
Eudonia pallida	19.ix			June - July		
Eudonia angustea	18.xi: 1.xii: 5.xii			July - October		
Hypsopygia costalis	11.ix (2): 19.ix (3): 20.ix: 30.ix (3): 1.x: 2.x (3): 8.x: 10.x: 13.x: 14.x			July - August		
Buff Arches *Habrosyne pyritoides*	3.ix: 16. ix: 17. ix: 18. ix (2): 19. ix: 20. ix				Late June - early August	Late June - early August: autumn (occasional)
Common Marbled Carpet *Chloroclysta truncata*	28.x: 17.xi				May - June: late August - early November	May - June: late August - early October
Swallow-tailed Moth *Ourapteryx sambucaria*	21. ix				Late June – July	Late 6 – mid August: early October (partial)
Brussels Lace *Cleorodes lichenaria*	8.x				June – early August	June -mid August: September – October (partial)
Light Emerald *Campaea margaritata*	16. ix: 29. ix: 1.x				Late May - early August: late August - September	Late May - early August: late July – September (partial) (late October in Scotland)
Ruby Tiger *Phragmatobia fuliginosa*	17. ix				April - June: mid July – early September	April - June: mid July – early September

Species	Date in 2003 of record* at Walditch	Flight period given in the work quoted A	B	C	D**	E**
Heart & Dart *Agrotis exclamationis*	2.x				mid May - July (mainly)	mid May – late August; from September
Large Yellow Underwing *Noctua pronuba*	17.xi				July - September	June - November
Broad-bordered Yellow Underwing *Noctua fimbriata*	2.x				July - September	July - September
Setaceous Hebrew Character *Xestia c-nigrum*	5.xi				May - July; late August - October	May - July; early August - October
Black Rustic *Aporophyla nigra*	18.xi; 20. xi				September – October	September – October
Feathered Ranunculus *Polymixis lichenea*	4. xi				Late August - mid October	Late August – early October
Red-line Quaker *Agrochola lota*	29. xi; 1.xii; 2.xii (2)				September - October	September – mid November
Beaded Chestnut *Agrochola lychnidis*	28. xi				September - October	September – early November
Barred Sallow *Xanthia aurago*	19. xi				September - October	September – early November
Marbled Beauty *Cryphia domestica*	11.ix (2); 16. ix				July - August	July - August
Vine's Rustic *Hoplodrina ambigua*	18. xi; 20. xi				May - October	May - July; August - September
Straw Dot *Rivula sericealis*	7.x				mid June – late July; August - September (sometimes later)	June – July; August - September

A – Harper, Langmaid & Emmet, 2002. *Oecophoridae*, pp. 43-177. In: *The moths and butterflies of Great Britain and Ireland*, Volume 4(1). Harley Books.

B – Bradley, Tremewan & Smith, 1973 & 1979. *British tortricoid moths*. Ray Society

C – Goater, 1986. *British pyralid moths*. Harley Books.

D – Skinner, 1998. *The colour identification guide to moths of the British Isles*. Viking.

E – Waring, Townsend & Lewington, 2003. *Field guide to the moths of Great Britain and Ireland*. British Wildlife Publishing.

* denotes single examples unless otherwise stated.
** denotes southern Britain where stipulated.

Records from one site in one year are obviously not enough to answer the question posed in the title. Knill-Jones (1999. *Ent. Gaz.* **50**: 85-89) noted several late (and early) records from the Isle of Wight since 1989, including several of the species listed above, and suggested that this favoured global warming as a possible explanation. It is clear from the records above that many species are capable of producing a partial second or even third brood and others will have an extended flight period during favourable weather conditions. 2003 was clearly a year that produced conditions for this to happen, although it is worth mentioning the possibility that some of these individuals may have had their origin beyond these shores. Only the compilation and examination of further data from a wider range of sites and years will answer the bigger question.— MARK PARSONS, Butterfly Conservation, Manor Yard, East Lulworth, Dorset BH20 5QP.

Late season adult Grey Birch *Aethalura punctulata* (D. & S.) (Lep.: Geometridae) in a light-trap on 17 August 2002 in Nottinghamshire

The continuing interest in the occurrence of second and even third generations of some of our moths which have seldom previously produced more than one generation, prompts me to report the above record. A single fresh adult of the Grey Birch *Aethalura punctulata* was captured in one of seven light-traps operated during the BENHS field meeting at Misson Carr, Nottinghamshire, on 17 August 2002. The species normally flies in May and June. The moth was not noticeably smaller, or otherwise different from individuals seen at another BENHS meeting on 17 May 2003 on the same site. In such cases, it is never certain whether the late moth is a delayed individual of the first generation, or the progeny of a female that flew earlier the same year. That there were seven traps operating and only one individual recorded suggests either there were not many others about, or that it was perhaps one of the first of any August adults. Further details of the field meeting will be published in *Br. J. ent. Nat. Hist.* **17**. I do not recall seeing this species so late in the summer before, but late individuals have been reported occasionally by others, e.g. at Westerham, Kent, on 24 September 1924 (*Ent. Rec.* **36**: 143).— PAUL WARING, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS.

Hazards of butterfly collecting. Rape on Corregidor Island, the Philippines, November 2000

Given the grisly recent history of Corregidor Island, which strategically blocks the entry to Manila Bay in the Philippines, it is perhaps fitting that this was where I personally witnessed wholesale rape – by the Common Lacewing Butterfly *Cethosia biblis insularis* Felder & Felder. Corregidor Island began to be fortified when the Spanish colonised the Philippines back in the 16th century. This was intensified by the Americans when they threw out the Spanish during the Spanish-American War of 1898. By the time the Second World War was beginning it must have been one of the most heavily fortified pieces of real estate in the world, with huge cannons and howitzers that could lob shells weighing a ton 20 km or more out to sea. It was here that general McArthur left the Philippines in 1942, the Japanese at his heels, with the famous words: "I shall return" ... and, wags often add in appreciation of the national lager: "for the San Miguel beer!" And it was here that the US Forces finally surrendered after the terrible Bata'an Death March in 1942. At that time, not so many people died on Corregidor. When the US Forces retook the island in 1945 more than 20,000 died on this tiny island, many of them when the honeycomb of connected underground shelters were blown up.

After the war the island was overrun by poor Filipinos making a living from all the left-over paraphernalia of war, and what little natural vegetation remained was completely destroyed by humans and their goats. Eventually the government declared the island a war memorial and a national park. All the illegal residents were evacuated, the vegetation was allowed to re-grow, even seeded with forest litter from Bata'an. Deer and monkeys were imported and have been doing well. Birds had little difficulty in finding their own way there.

By 2000, when we lived in Manila, it was a quiet natural haven just an hour by boat from the Manila Yacht Club. There was a splendid little hotel (mock Swiss chalet style) and a well developed military historical tourist circuit. Many of the visitors are still war veterans from the Philippines, the United States, and Japan. Most were day-trippers; apparently neither Japanese nor Filipinos wanted to spend the night among the thousands of "ghosts" from the war (or so we were told).

Away from the narrow tourist trail there were lovely nature trails – where you saw hardly any other people, a rare luxury in the Philippines. Butterflies had not yet reached their maximum level of natural diversity; indeed they may never do so since most of the forests have gone from neighbouring Bata'an, but a good selection were on the wing. On one of these trails, male Lacewings were common and whenever a female came into view I was able to watch their courtship rituals

Most butterflies go through some sort of mating ritual, sometimes most intricate and most time-consuming. The way *Cethosia biblis* went about it hardly qualifies as a ritual, except in the most technical sense. The first female I saw was immediately grabbed in full flight, forced to the ground, where the male sat on top of her and gradually aligned himself during much scuffling in the grass, finally to curl his abdomen to establish *copula*. It took just ten or fifteen seconds from the aerial intercept to *copula*. It looked like rape of the most brutal kind. I hardly believed my eyes the first time, but then I saw it again and again and again all morning. In fact, I never saw a female that was not immediately thrown to the ground. After lunch I went out to continue the observations and to get some photos, but I saw no females, so afternoons are probably reserved for other activities than being raped.

Males and females must live in different habitats so the females come into male territory only when they 'want' to get impregnated. When going about the important business of laying eggs they cannot afford to be continuously waylaid by males intent on sex; this would be very time-consuming, not to mention the real risk of physical damage when the female is thrown to the ground.

According to Graham and Stephen Henning in South Africa, exactly this kind of rape is also a common procedure among the *Acraea*. This is interesting. Though the *Cethosia* have traditionally been considered members of the Nymphalinae, recent findings – genetic as well as morphological – indicate that they are very closely related to the *Acraea*, and that both should be placed in the tribe Acraeini within the Heliconiinae. So maybe we have to include the propensity to rape in future cladistic and systematic studies?— TORBEN B. LARSEN, UNDP Vietnam, c/o Palais des Nations, 1211 Geneva 10, Switzerland. (E-mail: torbenlarsen@compuserve.com).

Recorded, collected or worked? A plea for verbal accuracy

It is almost commonplace, these days, to read that such and such a district or locality is well (or poorly) recorded when what is meant is that it has been well (or little) worked, for some insect of group thereof. I have even read that some locality or area has been "well collected" – which, as soon as we apply logic, is seen to be nonsense. To plead that it is clear what is meant is just not good enough. In the above sense, "worked" is always the right word.— A. A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

EDITORIAL COMMENT: Mr Allen is perfectly correct and I have given my wrists a good slapping for this heinous editorial *lapsus*. My excuse is that I am already pre-occupied with eliminating the many references to 'specimens' that evidently fly around light traps. The day my specimens take to flight I shall have to give up the red wine!

Wild larva of Nutmeg moth *Discestra trifolii* (Hufn.) (Lep.: Noctuidae) feeding on Field Bindweed *Convolvulus arvensis* L.

A scan through the standard works on the British Lepidoptera indicates that the larva of the Nutmeg moth *Discestra trifolii* (Hufn.) is considered mainly to feed on goosefoots *Chenopodium* spp. and related species, although it has been reported on a few unrelated plants such as onions and seedling conifers. I found a wild larva of this moth feeding on Field Bindweed *Convolvulus arvensis* at 23.26 hrs on 2 August 2003 at Bingham Linear Park, Bingham, Nottinghamshire, during an unsuccessful nocturnal search for larvae of the Four-spotted moth *Tyta luctuosa* (D. & S.). Bingham Linear Park is a stretch of cuttings and embankments along the line of a disused railway through rather flat, intensively farmed, open land.

The larva measured 2 cm in length when found and was green with a cream lateral stripe. It was found on the tip of a shoot of Field Bindweed growing in the centre of an area of approximately 25 × 4 m, in which all vegetation had been scraped off on 8 April 2003. The Field Bindweed had recolonised in abundance, with no other plants near the larva. It was collected and reared solely on leaves of Field Bindweed until full-grown. The larva was identified by Gerry Haggett from colour photographs sent to him. The final instar was of the green form with a distinctive orange lateral stripe.

The ability of the Nutmeg to feed on Field Bindweed may help to explain its often considerable abundance in gardens and other disturbed places, including my own garden, where Field Bindweed is often more frequent than members of the unrelated Chenopodiaceae.

These results were obtained during a field meeting of the British Entomological and Natural History Society organised as part of a national study of the Four-spotted moth underway at Writtle College, Essex, with part-funding from English Nature and assistance from Butterfly Conservation's Cambridgeshire & Essex Branch. The author would like to thank these organisations for their support in conducting this work and preparing this report, Gerry Haggett for identifying the larva, and those that joined the author for a most enjoyable field meeting.— PAUL WARING, Reader, Writtle College. Correspondence address: Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS (E-mail: paul_waring@btinternet.com).

Geranium Bronze *Cacyreus marshalli* Butler (Lep.: Lycaenidae) on the Riviera

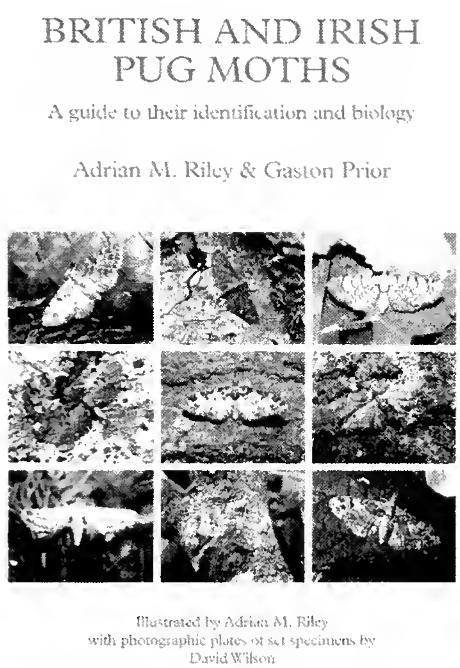
The range expansion of the Geranium Bronze *Cacyreus marshalli* in Europe has been a recurrent theme in this journal in recent years, but what struck the author of this note on a visit to the Riviera in late July 2003, was the sheer abundance of this species. I discovered that even in the most built-up parts of Nice, *C. marshalli* could be seen flying at tree-top height along the streets, defying the traffic, where no other butterfly species was present. While it was possible in suburbs such as Cimiez, with its mansions and large gardens, to see Swallowtail *Papilio machaon*, Small White *Pieris rapae*, Long-tailed Blue *Lampides boeticus* and Painted Lady *Cynthia cardui* during the last week in July, *C. marshalli* was more numerous than all of these species added together. A day-trip across the Italian border to visit the Hanbury Gardens, at Cape Mortola near Ventimiglia, revealed that here too, *marshalli* was the most abundant species by far. By contrast, a few days later, *marshalli* proved to be present at around 1000 metres altitude in the Alpes Maritimes, in the valley of the Vesubie river, but here only one female individual was seen, in the grounds of the Hotel Le Boreon. The butterfly appeared to be investigating the cultivated geraniums with which the Hotel was festooned.— MARTIN J. WHITE, 58 Victoria Quay, Maritime Quarter, Swansea SA1 3XG.

The origin of the name *Ludius* (Col.: Elateridae): a correction

In a recent contribution to the generic names of the British click beetles, I over-hastily treated the name *Ludius* as an 'invented' name. In fact, as I have since ascertained, *Ludius* was the term used for a player in the public games in ancient Rome (Latin *Ludo* = I play). Berthold, the author of the name, doubtless had in mind the leaping powers of click beetles though in this case, owing to the insect's size, rarity and retiring (largely nocturnal) habits, they are normally very little in evidence.— A. A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

BOOK REVIEWS

British and Irish pug moths. A guide to their identification and biology by **Adrian M. Riley and Gaston Prior**. Photographie plates by **David Wilson**. Harley Books , 2003. 264 pp., including 12 colour plates, over 300 figures and 49 distribution maps. 215×150 mm hardback, ISBN 0 946589 51 8. £29.50 from the publishers at Great Horkesley, Colchester CO6 4AH.



Pugs are a difficult group of moths to identify, particularly since most are met with in moth traps and are, consequently, worn. The group has been treated with varying degrees of clarity and aeeuracy by a number of publications over the years, but there was no truly definitive guide until the publication by Apollo Books of the fourth volume of *The geometrid moths of Europe* (review in *Ent. Rec.* **115**: 199-200). The inclusion in that work of all the European species not (yet?) found in Britain makes it a rather unwieldy publication, not least for the beginner. So, a eomprehensive guide to British species alone is to be weleomed. Now, eharacteristically overdue, we have the long-promised British pug book from Harley.

The work aims to provide a comprehensive aeeount of the British and Irish pug moths (Eupitheeiini). After the Acknowledgements and Introduction, and How to use this book, we are given a synonymic eheeklist, an historieal review of the speeies, a chapter on breeding and rearing followed by a large seetion of speeies aeeounts, whieh ends with notes on erroneously recorded species and a list of species that might be found in Britain. There are then sections dealing with genitalia, distribution and then eolour plates. The latter are done at life size and exhibit a very high standard of presentation. Plates 1 to 3 depict set examples of the British and Irish species in checklist order, whilst plates 4 to 8 group the set specimens according to their appearance so that identification begins by narrowing down to one of these groups. Another four pages of colour plates show live moths at rest in the wild. The work is completed with a Glossary, a Table of Phenology, a comprehensive list of larval foodplants and a Bibliography.

The second author died in 1994 and the book is really the work of Adrian Riley – a friend of this reviewer and, therefore, fair game for whatever just criticism I can find to level at him! Overall, it is an excellent book and Adrian is to be heartily congratulated, though there are one or two niggles, some missed opportunities and very few errors. The pictures are technically excellent and cannot be criticised, but there is a debate over whether it is best to depict set specimens of small moths at life size to get a feel for their "jizz" or larger for clarity of features. I prefer the latter; perhaps beginners would have liked both?

The species accounts are full, providing information on the life history, flight period, habitat, distribution, collecting and rearing, as well as on identifieation. The identification sections are of varying length, reflecting the degree of difficulty in separating similar speeies, and where neeessary they are illustrated with clear line drawings. Around nine out of every ten pugs in my garden seem to be Common Pug *Eupithecia vulgata* so it is inevitable that I turned to this text first. No less than fifteen other pugs are listed under "similar species"; though this list includes some that I would not have eonfused at all, it is most refreshing to learn that this book is clearly aimed at people who cannot identify pugs – not at people who already can! The accounts include some minor errors. For example on page 139 the original description of ab. *mediopalleus* of *Gymnoscelis rufifasciata* in incorrectly attributed to this reviewer whereas it was in fact ab. *albofasciata* that I described from the Wyre Forest. The text relates to *albofasciata* and the reference cited is correct.

Many wild caught pugs are worn, which makes the genitalia even more important as the final arbiter. Riley's drawings of the genitalia are well-executed and faithfully represent the detail on the slide. However I have a number of criticisms, the main one being that he does not draw the entire male genital apparatus. Instead, there are a few sketches of the valvae that are said to be of a distinctive shape and we are told that remaining species all look the same. He does draw the genital plates of the males, though only as they appear before removal, and the aedeagus, but I regret that I do not find this a satisfactory arrangement. By way of example, I have long been mystified by the presentation of the aedeagus of Sloe Pug and Green Pug in existing literature and was seriously hoping to have the confusion swept away by this new tome. The new drawings of the aedeagus of Sloe, Green and Bilberry Pugs show slight differences, but when a real example of any is compressed under a cover slip on a microscope slide it can be made to assume the form of the others at will. By presenting these aedeagus drawings Riley implies that features are available on this organ for separation of the species but, quite frankly, I cannot find any. If the rather marked difference in the shape of the valva of Sloe and Green Pugs had been shown separation may have been improved. This difference is presented, though not drawn specifically to the reader's attention, in the BENHS Pug Guide and is even more clearly seen in the excellent drawings by Mironov in the recently published European work. Remaining with Sloe Pug, the genital plates (sclerotised parts of the eighth ventral abdominal segment of males) differ significantly from both the BENHS Pug Guide and the European book (in which two works there is close agreement). It is a pity that the grouping of colour photographs in plates 4 to 8 was not extended to the genital plate drawings – there is surely mileage in grouping together the plates of, for example, *satyrata, absinthiata, assimilata, vulgata* and *fraxinata*, all of which are similar but which here are spread over turned pages. On a more positive note, the presentation of the aedeagus of the Bleached Pug *E. expallidata* and the Wormwood Pug *E. absinthiata* finally clears up the confusion caused by some potentially incorrect illustrations in an earlier work.

For the females, only the *bursa copulatrix*, the anterior portion of the *ductus bursae* and the origin of the *ductus seminalis* are drawn. The details of the ostium are not shown – a pity as in some species they show additional characters. The drawings are evidently done from prepared slides and so are viewed in two dimensions only. This gives me a problem with, in particular, the Brindled Pug *E. abbreviata* and the Oak-tree Pug *E. dodoneata* as I have a number of specimens that do not truly conform to either species (these two also appears to have been viewed from the dorsal rather than ventral side). When I dissect worn pugs that I do not intend to keep I look at them in their natural three-dimensional state in water or alcohol and, in this situation, these two species take on a quite different appearance to that depicted in the new book. I have no intention of making hundreds of permanent slides of moths that are to be discarded. I think that an opportunity has been missed here. This work has enjoyed a very long gestation period and it is a pity that modern digital camera technology was not used to let us have three-dimensional photos down the microscope!

The distribution maps are a little disappointing as they only show a presence by vice-county. Surely we could have seen ten-kilometre dots for pugs? There is only one map for *E. intricata* in spite of the fact that the subspecies are geographically distinct; other geographically distinct subspecies are similarly lumped. The map for the V Pug *Chloroclystis v-ata* uses larger dots to suggest that it is widespread and common in the county indicated whilst that for the Green Pug uses smaller-sized dots indicating that it is scarcer; this is a nonsense, at least in the south-east.

The larvae are shown on four pages of black on white drawings. These are extremely clear and appear to allow positive identification of the species. Once again, given the period over which this book has been produced, it is a pity that photographs in colour of live larvae on their foodplants are not included to complement the excellent plates of the adult moths at rest in the wild. On the plus side there is an extremely useful table of foodplants as well as a phenological table that includes all four life cycle stages and updates much in existing publications.

Beginners will certainly find this book invaluable and it is certainly cheaper than the European guide as well as restricting itself to British species. However, whilst I have no hesitation in commending it to the masses, and expect it to sell well, I suspect that the more dedicated taxonomist who has already spent a sizeable sum on the text by Mironov is unlikely to find that this additional purchase provides him with an excess of additional information.

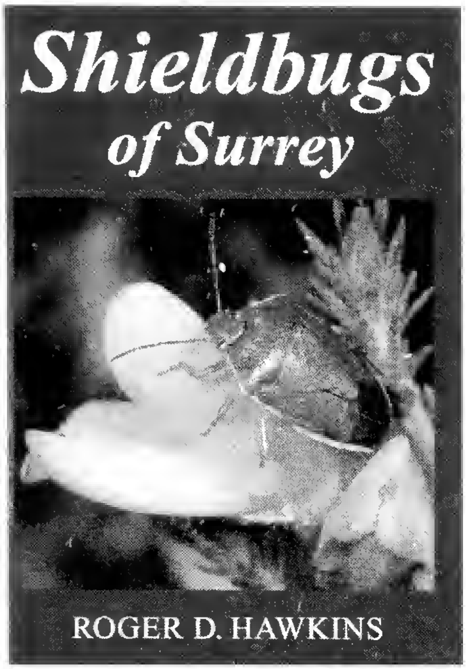
Maria Sibylla Merian – The St Petersburg Watercolours edited by **Eckhard Hollmann** with natural history commentaries by **Wolf-Dieter Beer**. Prestel Publishing Ltd, 2003. 176 pp., copiously illustrated, 345 × 250 mm, hardbound with slipcase, ISBN 3-7913-2927-8. £55 from Prestel Publishing Ltd, 4 Bloomsbury Place, London WC1A 2QA.

Maria Sibylla Merian was born in Frankfurt in 1647, died in 1717, and was probably the first famous German woman artist. She became deeply interested in natural history at an early age and was already breeding Lepidoptera and making notes on their larvae at the tender age of 13 years. Her passion eventually became an obsession, causing her to divorce her husband and leave the security of family life behind her as she undertook numerous expeditions, including one to Surinam where she studied and painted the flora and fauna of the tropical rainforest for two years. This was surely something of an unusual achievement at a period in history when women were denied access to academic institutions such as universities and art academies. As a result of all this, she created a large number of watercolour paintings of natural history objects, including many insects and other invertebrates. This book is a celebration of these artistic works, which are now housed in the St Petersburg Academy. The illustrations are accompanied by biographical notes on the artist and natural history commentaries on the art works.

It is perceived amongst those who know me at all, not entirely without some element of accuracy, that I am something of a traditionalist when it comes to things arty: Constable – yes, Warhol – no! With that in mind I am impressed by the accuracy of the paintings presented – especially as they were created in an era that pre-dates the time when taxonomy became an important issue. With very few exceptions, the insects depicted can be identified at least to genus and often to species and overall the works indicate that the artist had a keen and accurate power of observation. Her observational powers also extended beyond the singular subject; thus, for example, the painting that depicts an adult Garden Tiger Moth *Arctia caja* L. is also accompanied by pictures of two separate larval instars, a pupa, a vacated pupal case and, remarkably, the ichneumonid parasites that emerged from another pupa. Maria Sibylla also made notes and these include many behavioural observations, such as the fact that *caja* larvae curl up when disturbed and remain curled for some while afterwards. Primitive stuff by modern standards, but that particular work was executed in 1679.

This book will bring considerable pleasure to those whose interest combines their entomological pursuits with a love of art and is highly commended. If I make it to St Petersburg one day I will probably make a trip to look at the originals – and coming from me that is compliment indeed.

Shieldbugs of Surrey by **Roger D. Hawkins**. 192 pp., 24 pages of colour plates, numerous text illustrations and distributions maps. 218 × 153 mm., hardbound, ISBN 0 9526065 7 7. Surrey Wildlife Trust, 2003. £15 plus £2.40 Postage and packaging from Atlas Sales, School Lane, Pirbright, Surrey GU24 0JN.

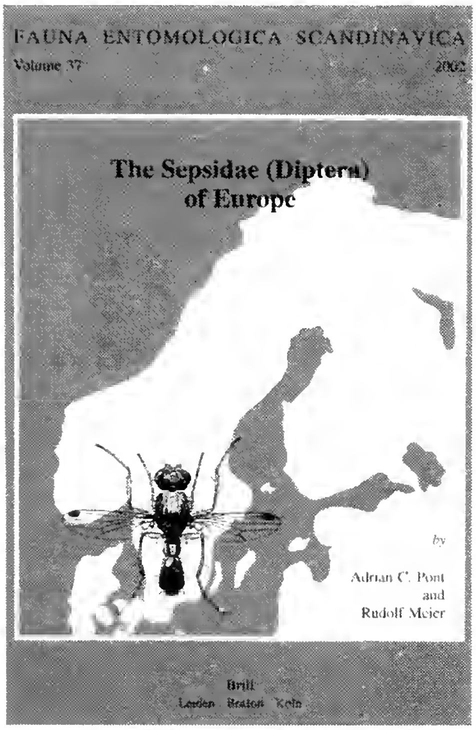


This is the second title in this highly commended series of, now, eight publications on the wildlife of Surrey to be authored by Roger Hawkins; his first was on the subject of ladybirds, published in 2000. The term "shieldbug" is interpreted *sensu lato* and includes the species in families Coreidae, Alydidae, Rhopalidae, Pyrrhocoridae and Stenocephalidae as well as "traditional" shield bugs in Acanthosomatidae, Cydnidae, Scutelleridae and Pentatomidae. The twenty-nine species recorded in Surrey are keyed and discussed; a further seven that are not yet recorded in the county are included in a second key to allied insects that may be confused with shieldbugs. These keys are clearly illustrated with drawings that are placed adjacent to the key couplet. The colour plates are superb and depict live insects – not a pin in sight. However, whilst pointing out that much can be learned from watching and studying live shield bugs in the field, Roger Hawkins quite rightly emphasises that not all species can be named from pictures and stresses that in some cases collecting is necessary. Instructions are presented, and illustrated, for the dissection of the genitalia in genus *Eurygaster*. The species accounts are thorough and, whilst emphasising Surrey, contain ecological and other information that is relevant to a much wider area. They are accompanied by distribution maps for Surrey.

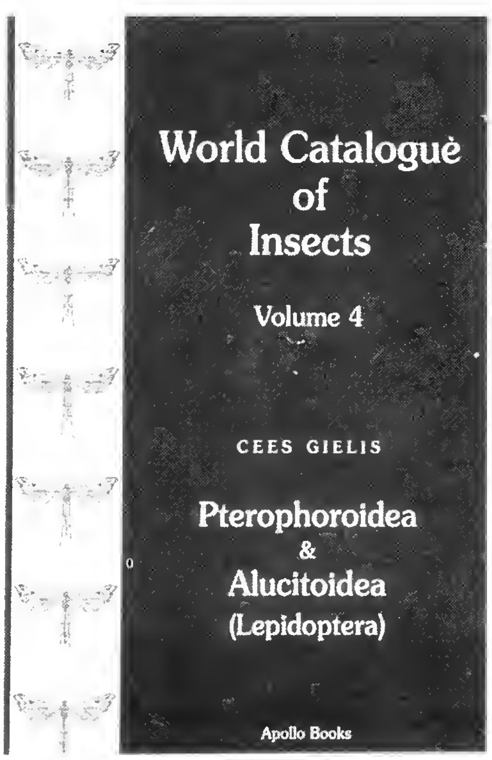
This is a difficult book to criticise. Written essentially for the amateur, it will also have an appeal to the more experienced entomologist. I appreciate that the funding sources relate to the county of Surrey, but to my mind it is a shame that the undoubted wider appeal of the series (and sales potential) has not been enhanced by the inclusion next to the Surrey distribution maps of small size national distribution maps. Even if these were only vice county maps they would at least allow the reader in Scotland to know if the species depicted could be found in his own area as well. However, given the near complete absence in the British literature of accessible works on the Heteroptera this new book has already become a critical work for anyone who wishes to identify shield bugs in Britain; in spite of my comments concerning the maps the ecological and other content do make this book of considerable importance to readers outside the south-east of England.

The Sepsidae (Diptera) of Europe by **Adrian C. Pont and Rudolf Meier**. Fauna Entomologica Scandinavica, volume 37. Brill Academic Publishers, 2002. 224 pp., numerous line drawings, 2 black and white plates. 250 × 174 m, hardbound, ISBN 90-04-12477-2. €70 or US$82 from the publishers at PO Box 9000, 2300 Leiden, The Netherlands. Add postage at rate of €8 for one copy and €4 for each subsequent copy in the same package.

The Sepsidae are a familiar yet often ignored family of flies in Britain. In most species the larvae feed within animal faeces, though others are found in decaying vegetation on the shoreline and elsewhere, and consequently they are generally widespread. Adrian Pont's key in



the Royal Entomological Society's *Handbooks* series appeared as long ago as 1979 and reported 25 British species from 41 in all of Europe. The figures rise to 27 and 44 in this new work, which is a full taxonomic revision of the family, and incorporates all the known European species. The two additional British species are also absent from Peter Chandler's 1998 Diptera checklist (*Checklists of Insects of the British Isles (New Series). Part 1: Diptera*): they are *Sepsis luteipes* Melander & Spuler, 1917 and *Meroplius fukuharae* (Iwase, 1984). The comprehensive identification keys are clear and accurate and both these and the species texts are accompanied by precisely executed drawings depicting the features under discussion. The adults present a number of features of clear use in identification and this new work should do much to popularise the group amongst British dipterists and will surely assist the British Isles recording scheme that is organised by Adrian Pont. Unfortunately, the high price of a key for a family that is represented in Britain by relatively few species is likely to put off some people; after all the majority of British dipterists are amateurs. Perhaps Brill might produce a softback version; meanwhile, this is probably the only book on the family that you will need for a good many years to be able to tackle the entire European fauna.



World catalogue of insects. Volume 4: Pterophoroidea and Alucitoidea (Lepidoptera) by **Cees Gielis**. 198 pp., hardbound, 170 x 240 mm., ISBN 87 88757 68 4. Apollo Books, 2003. DKK 320 (approx. £30) plus postage, and as usual, Apollo offer a ten percent discount on the whole series if ordered direct from them at Kirkeby Sand 19, DK-5771 Stenstrup, Denmark. Apollo are usually able to accept payment in UK currency.

This is the latest in the series which has included Hydraenidae, Hydrophiloidea and Dytiscidae in the Coleoptera and in which the next volume will be the Coleophoridae (Lepidoptera). A review of the Hydraenidae volume appeared in volume 111, page 200 and we expect that a review of the Dytiscidae will be submitted in time for publication soon. The present volume is authored by the undisputed authority on the two families covered and it would surely be a brave man that challenged anything within its pages!

INDEX 2003

We regret that it has not been possible to produce the Index to Volume 115 in time for distribution with this issue of the journal; it will be enclosed with the March issue. The Editor apologises for any inconvenience to subscribers caused by this delay.

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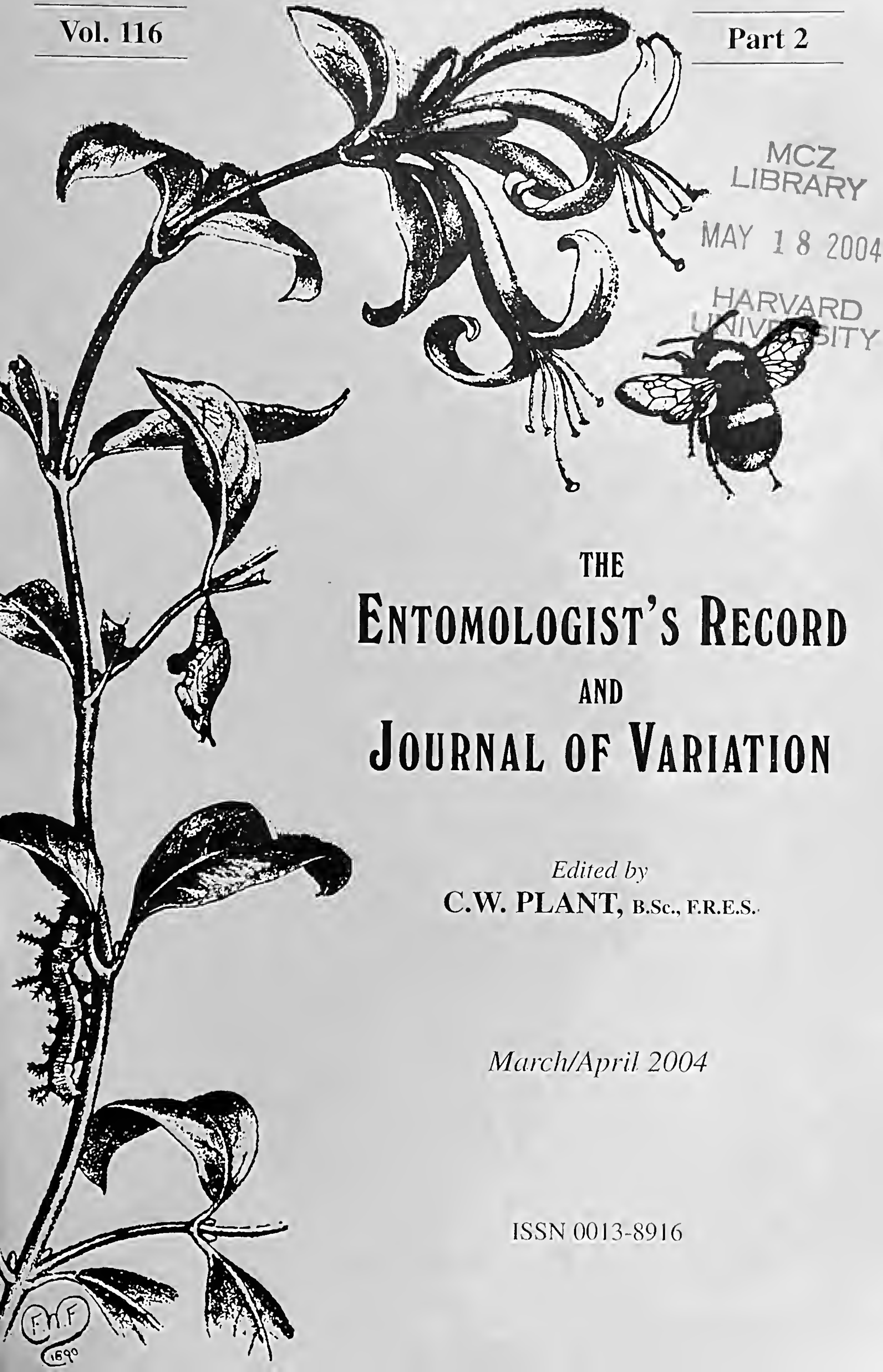

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- The journal is concerned with **British Lepidoptera** (moths and butterflies). We also accept contributions on **British Coleoptera** (beetles), **British Diptera** (flies) and **other groups** at the Editor's discretion. We also print **Subscriber Notices** at no cost on behalf of current subscribers; non-subscribers pay a fee for this service. We also publish **Reviews of entomological books** and other publications relating to all aspects of world entomology if these are sent to the Editor at no cost to him. It is our policy not to accept unsolicited book reviews from third parties.
- We may also accept contributions on **European insects** if these are likely to be of interest to British readers, such as species likely to colonise Britain (especially where these contributions include identification keys or photographs), or accounts of entomological trips to places that may be of interest to other readers.
- **Papers** should be at least 2000 words in length. Acceptance is not automatic. They will be peer-reviewed by two referees. Authors must be prepared to make modifications suggested by the referees. Papers must cover their subject matter to a far greater depth than Notes and should present original material or a broad-based review of existing knowledge. Descriptions of new species may be submitted. Authors of papers are expected to follow the house style and conventions as closely as possible. The Editor reserves the right to convert papers into Notes.
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- We accept all formats from hand-written notes upwards. However, we prefer submissions via e-mail, or on floppy diskette. Files must be in a PC-compatible format that is readable by Microsoft Word 2000. Originals are required for all photographs, drawings, diagrams, graphs, histograms and similar, though Tables may be incorporated into word processor files. For details, visit the web site or contact the Editor direct.

ON THE EARLY STAGES OF THE REED LEOPARD MOTH *PHRAGMATAECIA CASTANEAE* HB. (LEP.: COSSIDAE)

David Wilson
Lark Rise, Dunwich Road, Blythburgh, Suffolk IP19 9LT.

Abstract

Observations on the larval and pupal stages of *Phragmataecia castaneae* (Hb.) are presented.

Introduction

The early stages of *Phragmataecia castaneae* are well described and illustrated in the Victorian literature on the Cossidae. There are a number of references in the 19th century journals and main Lepidoptera works that followed the discovery of the insect new to Britain by Henry Doubleday at Holme Fen in 1841. James Baldwin (1878), suggested that "the discovery of the larva and pupa led to it being taken in abundance", and it seems that Doubleday followed up his discovery with energetic and successful field work. Little new information or details on the insect's habits in the early stages seems to have been added to the record for many years, and what was known of the methods used by the Victorian and Edwardian collectors seems to have been lost.

P. castaneae is a well known and common moth at Wicken Fen in Cambridgeshire. Males come readily to light sometimes in good numbers. On some nights I have seen 30 to 40 at a single light and it appears that the moth is strongly and widely spread over the reserve. Thanks to the assistance of a former Property Manager of the fen, Tim Bennett, on a couple of occasions in the 1980s I was able to take several generators and associated light trapping gear into the heart of the fen far beyond the range that equipment can be readily hand-carried to. Using an all-terrain vehicle for transport, records were obtained showing that this species was amongst the commonest flying to light on some nights by Drainer's Dyke, which separates Verrall's Fen from Sedge Fen. Females of the species were far scarcer. Out of some four hundred examples of this species seen over the years, I have only taken five females at light. Of bred insects collected in the early stages and bred through, the proportion of male to female is much closer. Pruscha (1972) suggests a ratio of trapped adult insects between 10:1 and 20:1, and a bred ratio of 5:4, the former figures relating to males. My own observations are rather different but also suggest that the females are far more common than light trapping would indicate. It seemed a little unusual that my captive stock has produced most females before the males emerge and this would be an interesting trend to confirm in wild caught specimens. For instance, the first specimen taken in my garden trap in 2003, was a female at light on the night of 8 June. The first male of the season arrived at light on 11 June in the same trap. It is worth noting also the mobility of the species, as my trap was at least 250 metres outside the fen reserve and the nearest reed stands.

Random searches for larvae at Wicken in the 1970s and 1980s by the writer were fruitless apart from an empty pupal case in a reed stem near the wind pump on the northern end of the fen. The discovery of the article by Dr E. A. Cockayne (1931) [the cover and title page is mis-dated, 1931-32]) on this insect, was very illuminating. On 29 September 1930, in the company of the Cambridge lepidopterist H. Worsley Wood, 14 larvae were collected on Wicken Fen, by cutting reed stems between 12 to 18 inches [30 – 48cm] below water level. With this note in mind, I visited the fen on 26 September 1996 and worked the area to the west of the wind pump. Armed with a pair of long handled lawn edging shears, I was able to reach reeds out in the pools of the old brick clay pits and by sliding the shears down interesting looking stems, could cut as far down as 24 inches or more below water level. In the space of an hour or so I obtained some 17 larvae, ranging in size from half an inch to one and a quarter inches (Plate A).

Plate A.
Final instar larva of *Phragmataecia castaneae* (Hb.)

These larvae were taken home and introduced into the lower stems of reeds planted in anticipation in my garden pond. The stems were slit vertically low down, the opening wedged apart with match sticks until the larva had been encouraged to enter, one to a stem, and the stem closed and bound with plastic tape, and the reed marked for future recognition. Reeds cut in this way loose some of their structural strength and break more readily in winter wind than uncut ones. They were therefore supported to stop wind breakage. The following spring, the stems were harvested at ground level and kept in moist sand. Moths emerged at the expected time. Some were lost due to fungal attack, some vanished but most were reared successfully. Larvae not fully grown were inserted into reeds growing in tubs and taken to Wicken when I moved there. Coals to Newcastle.

Having made the move to Wicken in 1997, it was much easier to spend time studying the early stages and with similar success. A main interest was to establish if there were external signs indicating which reeds were infested. Some of the internal reed feeders like *Archanara geminipuncta*, and *A. dissoluta* are quite easily located by the discolouring of reed leaves as they wither amongst the surrounding green foliage. I spent considerable time while looking for larvae of *P. castaneae* studying reed stands, selecting stems that caught my eye for a variety of reasons before I noticed that in late September and into October most reeds are in full flower. Some otherwise healthy plants, of similar height, colour and stature lacked flower heads. These almost always produced a larva when cut at maximum reach even to a depth of two feet. Any less and the cut stem would show the distinctive blackish brown internal damage left by a feeding larva though the larva was left still in the lower section. Or more unpleasantly the cut stem would show the cross section of a larva sliced in two. I can see no other obvious sign of larval activity. These affected reeds are just as robust as those in the surrounding growth.

Plate B. Pupa of *P. castaneae* (Hb.)

The use of long handled shears is a great asset though caution has to be exercised when working the edges of the pits. I do not know how deep they are, but when working over the edge of water of this type, the possibility of doing a header into the water has to be considered, whereafter access to lots of otherwise inaccessible reeds may be facilitated!

The pupae (Plate B) are best obtained in mid to late May in an average season, again the lack of any flower head remnants help the search though many have been blown away during the winter. Earlier in the month larvae are encountered and much later, empty pupae or stems frustrate

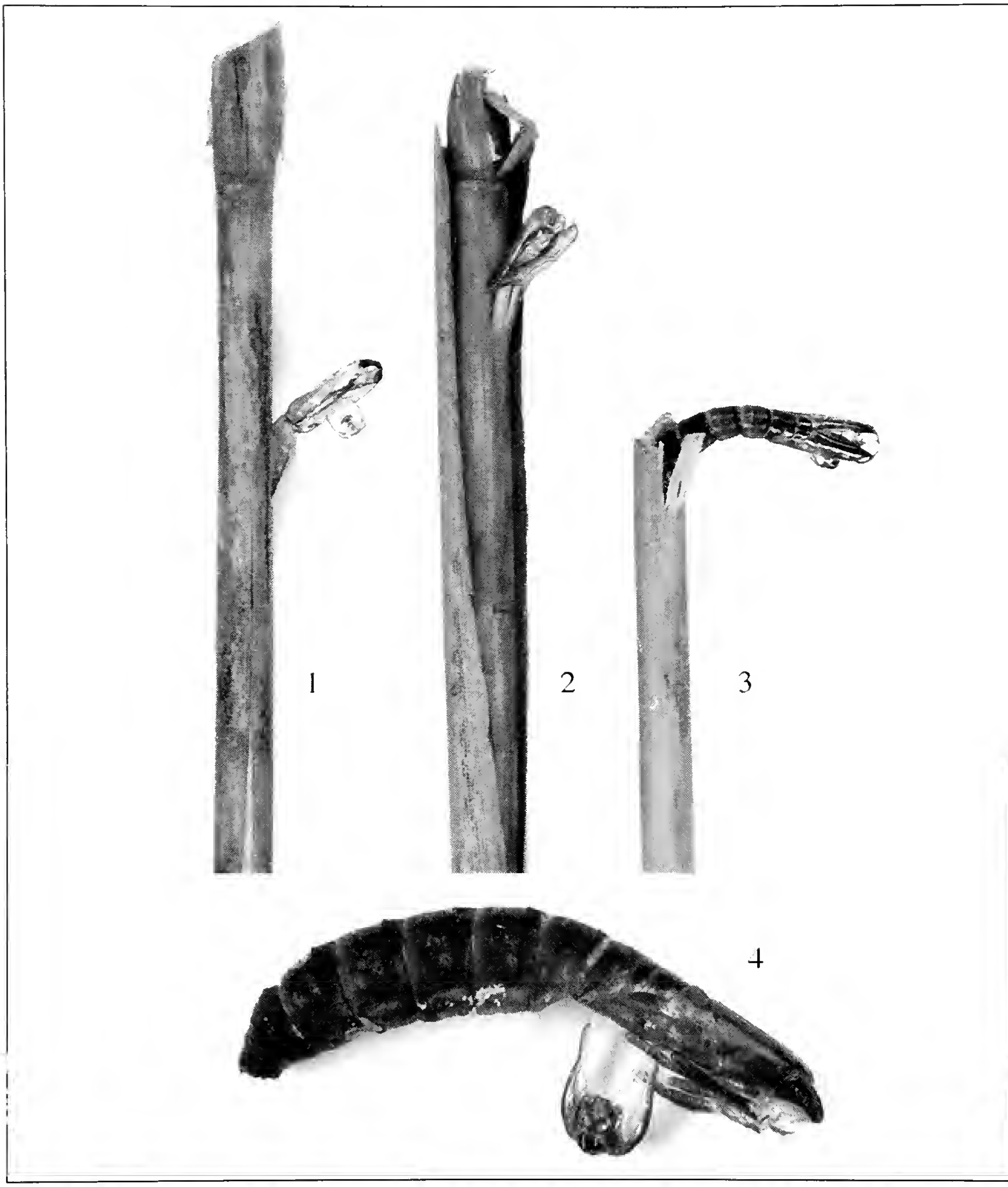

Plate C. Pupal cases of *P. castaneae* (Hb.). 1. Typical emergence position; 2. Pupa and exit window just below wind fracture; 3. Showing exit from broken stem; 4. Empty case.

the searcher. At this time the larva has moved up the stem to a point six to nine inches above the surface of the water, usually just below a node (Plate C, Fig. 1). At about that height, a plug of pale stem fragments caps the larval workings and the larva pupates not far below it, head up. After a strong spell of wind, particularly in April, reed stems that have broken at about six to 12 inches above water level are very likely to be occupied and the larva may even have re-plugged the point of breakage (Plate C, Fig. 2.)

Regarding the old observations that the pupa is capable of rapid movement up or down the stem, I have not been able to confirm this. Mr. Doubleday writing in July 1850 in the Zoologist, p. 2884, "This insect has occurred in great profusion in the neighbourhood of Whittlesea-Mere this season. The larvae feed within the stems of the common reed, and the pupa, which is remarkably elongated, is exceedingly active, moving up and down the stems of the reed with great rapidity". I have watched movement down the stem of pupae but I would not like to create a picture of anything other than a slow steady wriggling progression. Exceedingly active would not be suitable for my observations.

The emergence "window" is virtually invisible and I do not think it practical to look for this external sign at this time. The pupa extrudes from the reed stem to about one third of its length prior to emergence. My notes suggest that emergence takes place in the evening, often about 10pm.

Acknowledgements

I would like to thank the Property Manager of Wicken Fen NNR, Adrian Coleston and the National Trust for permission to study Lepidoptera on Wicken Fen and Mr B.O.C. Gardiner for help locating references to Henry Doubleday's early articles published in the *The Zoologist.*

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The decline in incidence of ab. *ruficosta* Lempke of the Brimstone Moth *Opisthograptis luteolata* (L.) (Lep. Geometridae) in north-west Kent

The aberration *ruficosta* is the form of *O. luteolata* possessing a complete, or near complete, reddish forewing costal streak. Examples with this streak complete and well-marked are rare, but those with an incomplete one of a somewhat tenuous nature are relatively common. The variety seems to be virtually confined to generation 2 of the bivoltine race. In north-west Kent examples of generation 1a (from winter pupae) have a fairly clear yellow costa broken by a small mid-costal spot, the dark anterior end of the ill-defined postmedian line and its attendant reddish apical triangle. Until recently examples of generation 1a have been readily differentiated from those of generation 2 by the slightly darker appearance of the latter by virtue of their exaggerated costal markings, slightly less obscure transverse lines and a greater tendency to possess marginal dots at vein ends.

Throughout the 1970s and 1980s, ab. *ruficosta* was extremely common among gen.2 moths attending my garden m.v. light, probably to the extent of 20% and almost all having some additional sullying of the forewing costa. In the early 1990s, it became apparent that this was no longer the case, and in 1996 no *ruficosta* appeared out of 86 examples caught; subsequently the aberration has been rarely seen. Thus, in 2001 one was observed out of 56 moths, and in 2002 none out of 57. The reduction of costal markings, a less developed series of marginal dots and weaker transverse lines, have combined to produce a lighter appearance in present day gen. 2 *luteolata* here. Elsewhere in southern Britain, in rural areas away from large industrial conurbations, I have met with *ruficosta* only very rarely, and only in gen. 2. Thus, it seems plausible that the high incidence of *ruficosta* at Dartford in the 1970s and 1980s was a response to the environmental effects of atmospheric pollution.

A decade or so ago, the reddish brown costal markings and an increased tendency for other markings such as the dots at vein ends and the faint transverse lines to be slightly more prominent presented the specimens with a somewhat darker appearance.

This would seem to be an example of industrial melanism and now, with a cleaner environment as a result of the implementation of Clean Air legislation, these darker moths are no longer at a relative advantage. Because the literature on industrial melanism has focused almost entirely on the more spectacular aspects of the less spectacular subject a number of less spectacular examples may disappear without recognition.

A consequence of the decline of *ruficosta* is that there is here no longer a perceptible difference between generations la and 2 of *O. luteolata*. However, two aberrations associated with gen. 1a – ab. *apicolutea* Cockayne (forewing apical triangle absent) and ab. *delineata* Lempke (transverse lines absent) have not yet appeared here in second generation moths.— B. K. West, 36 Briar Road, Dartford, Kent DA5 2HN.

THE GREEN VEGETABLE BUG *NEZARA VIRIDULA* (L., 1758) (HEM.: PENTATOMIDAE) NEW TO BRITAIN

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Abstract

Nymphs of the exotic shield bug *Nezara viridula* (L.) (Pentatomidae) were collected outdoors in London in August 2003. This cosmopolitan pest is regularly imported to the Britain with produce, but it was assumed in the past that it was unable to establish here. As 2003 had an exceptionally hot summer, it is not clear whether this species will continue to breed in the British Isles. Identification notes and a figure of adult *N. viridula* are provided.

Introduction

Nezara viridula (L.), variously known as the Green Vegetable Bug, Southern Green Stink Bug or Southern Green Shield Bug, is a very widespread pest species in Southern Europe north to Germany, North and South America, Africa, Oceania, much of Asia and Australasia (CABI, 2003). It is a pest of a wide range of commercial crops. Southwood & Leston (1959) include the bug in their list of '*Foreign species in Britain*', stating that it is '*sometimes found on lettuce, grapes and other produce in vegetable shops and elsewhere*' but '*unlikely to become established*'. They suggest that examples found in Britain were most likely imports from Italy or the Canary Islands. The species is still regularly imported with produce and Italy is still a major source of imported specimens (see Table 1).

On the 24 August 2003 I was presenting an 'Insect Road show' at the Natural History Museum's Darwin Centre at which members of the public were encouraged to bring specimens from their gardens for identification. One visitor, Mrs D. E. Maggs, produced a jar containing an adult and a final-instar nymph of *N. viridula*, collected the previous day on tomato plants in her garden at Kingswood Avenue, Queens Park, London (TQ 243833: VC 21), where they had been observed feeding on unripe tomatoes. At the time of collection, both specimens were nymphs, but one had moulted the previous night (the other moulted two nights later). Mrs Maggs mentioned that she had noticed other specimens on the tomatoes. When I explained that it was a species not known to occur in Britain, she stated that she had not brought anything to the garden from abroad or from garden centres.

On 18 August 2003, further nymphs of *N. viridula* were sent to the Natural History Museum for identification by Mrs Judith Rose, a Museum volunteer. It transpired that these specimens had also come from Mrs Maggs but, on examination of her own tomatoes, Mrs Rose confirmed that the species was also present in her garden at Summerfield Avenue (TQ 244833), only a few hundred metres from Mrs Maggs' garden. The presence of nymphs indicates breeding, and as the nymphs are not particularly mobile, their presence in two gardens suggests that they are not the first generation.

Table 1 contains a list of some of the specimens intercepted in Britain, from the databases of the Natural History Museum, the Central Science Laboratory, Sandhutton and the Royal Horticultural Society, Wisley. The species is evidently a very frequent import, and its failure to establish breeding colonies in the U.K. in the past is most likely due to unsuitable climatic conditions and not due to lack of potential colonists. In North America it is prevalent in the south and absent from Canada (CABI, 2003). Southwood & Leston (1959) predicted that *Nezara* would probably not establish itself in the British Isles, but it is possible that the climate has since ameliorated (so called 'global warming') sufficiently to allow it a foothold. These records show that it is now capable of producing at least one generation in southern England during the summer months, although it may be significant that 2003 was an exceptionally hot summer. It remains to be seen whether the species will survive the winter and future cooler summers.

Date	Institute	Origin	where intercepted	Product
i.1930	CSL	?	?	on Mimosa
23.ix.1967	CSL	Italy	Liverpool	on aircraft
13.ii.1970	CSL	?	Liverpool	At greengrocer
28.iv.1975	CSL	S. Africa	Bristol	Grapes
3.ix.1975	CSL	France	Lincolnshire	Grapes
21.x.1975	CSL	France	Kent	Potatoes
vi.1978	CSL	?	Goff's Oak, Herts	?
29.i. 1976	CSL	India	?	in curry powder
7.iv.1977	CSL	Brazil	Surrey	Cacti
ii.1980	CSL	Canaries	Herts	Chrysanthemums
xi.1980	CSL	?	Blackheath	?
iv.1982	CSL	Italy	Spalding, Lincs	Leafy veg
1984	CSL	Malawi	Kew, Surrey	Orchids
1986	CSL	?	?	in shopping
2.iv.1991	RHS	?	London	Watercress (in shop)
7.xi.1991	CSL	Italy	Boston, Lincs.	Broccoli
9.i.1992	BMH	?	?	Can; fruit cocktail
30.ix.1992	CSL	Italy	Luton airport	Aircraft
6.iii.1998	CSL	?	?	Thyme
20.x.1998	CSL	Italy	?	Grapes
23.xi.1999	CSL	Italy	Herts.	Grapes
30.x.1992	BMNH	?	Kent	'Intercargo survey'
29.ix.1998	BMNH	?	Cornwall	Fragments of 3 from crop of 'red necked nightjar' allegedly collected dead in Cornwall.
16.ii.2001	BMNH	Italy	Hants.	?
4.vi.2003	BMNH	?	Kent	Grapes
30.vi.2003	BMNH	?	?	Eggs on supermarket green beans.

Table 1. A selection of records of intercepted *Nezara viridula*. Abbreviations as follows: BMNH- The Natural History Museum Enquiries Service; RHS Royal Horticultural Society, CSL; Central Science Laboratory.

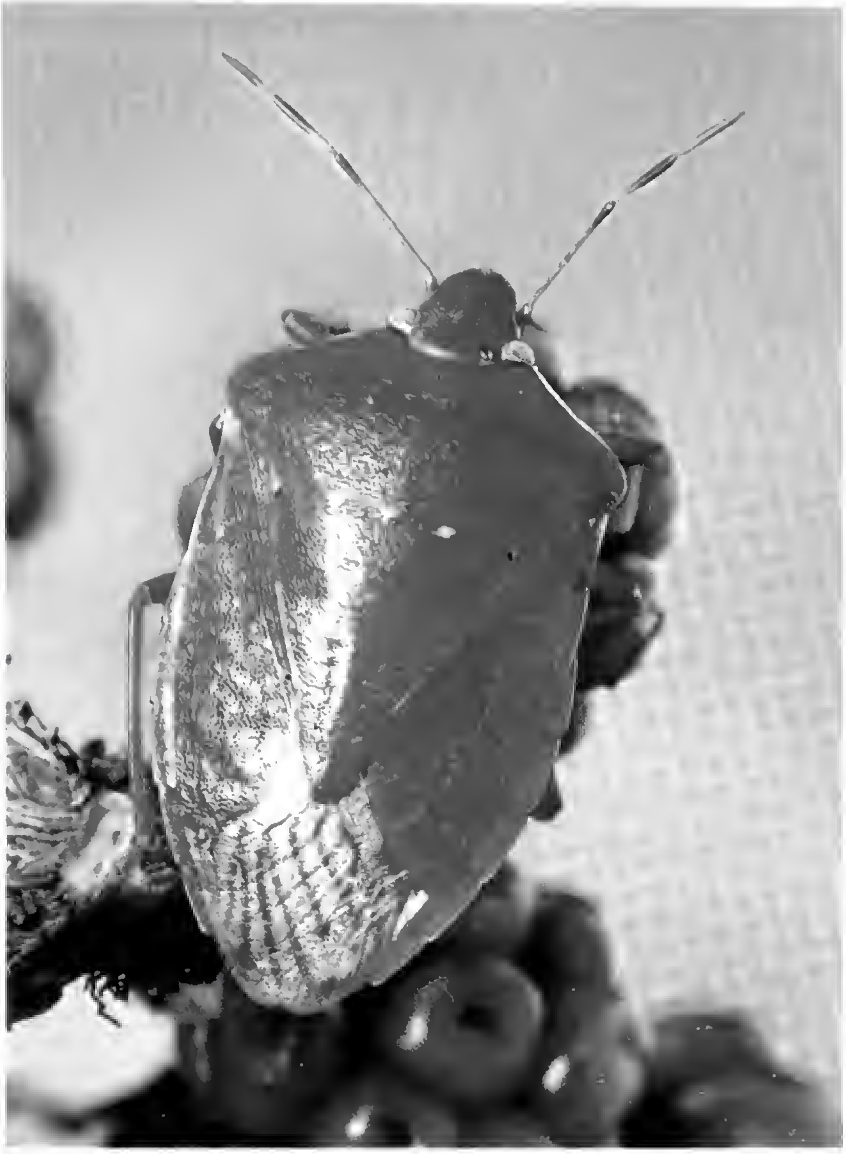

Plate D. British-collected example of the Southern Green Shield Bug *Nezara viridula* (L.) on blackberries (Photo Harry Taylor, NHM).

Several southern European species have apparently established themselves in Britain in the past few years; these include the curculionids *Otiorhynchus armadillo* (Rossi) and *O. salicicola* Heyden (Barclay, 2003), the coccinellids *Epilachna argus* (Geoff.) (Menzies & Spooner, 2000) and *Rhyzobius chrysomeloides* (Herbst) (Hawkins, 2001), the chrysomelid *Chrysolina americana* (L.) (Salisbury, 2002), the southern oak bush cricket *Meconema meridionale* Costa (Orthoptera: Tettigoniidae) (Hawkins, 2002) and the tamarisk bugs *Tuponia brevirostris* Reuter and *T. mixticolor* (Costa) (Hemiptera: Miridae) (Barclay & Nau, 2003).

Identification

Nezara viridula is a distinctive species, and at 11-15mm is larger than any native British pentatomid. It most closely resembles the Green Shield Bug *Palomena prasina* (L.), but is generally paler and narrower. Adults (Fig. 1) are uniform green, including the apex of the forewing, which is brown in *Palomena*. Some individuals of *Nezara* (though none so far noted from Britain) have the head and front margin of the pronotum creamy white. Adults also have a row of 3-5 distinctive small white spots at the base of the scutellum (see Plate D). Larger nymphs of *Nezara* are very conspicuous, with a pattern of white and red on the dorsal surface, and red margins to the abdomen (while nymphs of *Palomena* are uniform green and brown). Chinery (1986) provides colour illustrations of the nymphs of both species (though he only shows the adult of *Palomena*). *Nezara* will not run through the key to Pentatominae in Southwood & Leston (1959: p.35). At couplet '4' the very small tubercle on the underside of abdominal segment II of *Nezara* will lead to *Piezodorus* and *Pentatoma* ('*tubercle present*'). The '*tubercle absent*' route will fail at couplet '8', '*connexivum spotted with black markings OR without black markings*'. The connexivum of adult *Nezara* has a single black marking at the apical angle of each segment, so is neither 'spotted' nor 'without'. Given the small number of very distinct species of Pentatomidae occurring in Britain, a key to the genera hardly seems necessary; *Nezara* is easily recognised by comparison with illustrations, and is only likely to be confused with *Palomena*, from which it is readily identified by the colour of the overlapping apices of the forewings (see above).

The specimens, one male and one female, are now placed in the collection of British Heteroptera at the Natural History Museum (BMNH), London.

Acknowledgements

Especial thanks to Mrs D. E. Maggs and Mrs J. Rose for drawing my attention to the populations here discussed. Also to J. Ostoja-Starzewski (CSL) and Andrew Halstead (RHS) for sharing their records, to the Darwin Centre staff for organising the road shows and to H. Mendel, D. J. Mann and M. Wilson for helpful comments, and to Harry Taylor for his consistently excellent photography.

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The season is not over until . . .

During the spring of 2003 I was struck by the incredible amount of damage caused, apparently, by the larvae of Winter Moth *Operophtera brumata* (L.) in Balls Wood and elsewhere in east Hertfordshire. The leaves of several trees, but of hornbeam *Carpinus betulus* in particular, were riddled with holes and larvae were easily beaten. Of course, this is not unusual, but the degree of defoliation seemed excessive. At the end of the year, on the extremely mild night on 12 December 2003, I was proven correct. I took two mv traps to Thunderfield Grove, another woodland not far from Balls Wood and within five hours I had caught 524 winter moths (my use of lower case is intentional – some were certainly Winter Moth *O. brumata*, but several were Northern Winter *O. fagata* (Scharf.). This was a very small proportion of what was around; there were thousands and thousands of them. At rest on the trunk of every hornbeam and every oak *Quercus* in the wood were from 10 to 50 males as well as several females. Interestingly, there were none on the birch *Betula* trunks. Being slightly mad we tried to count how many winter moths there were on the trees beside the path between the car and the traps. We were distracted and lost count either at 4232 or 4322! About a quarter to one third appeared to be Northern Winter Moth (*O. fagata*). A few other species managed to fight their way in to the trap including the Mottled umber *Erannis defoliaria* (Cl.) the Chestnut *Conistra vaccinii* (L.) and the oecophorid *Agonopterix arenella* (D.& S.). I would like to thank Neil Chamberlain for arranging access to Thunderfield Grove, a Woodland Trust property.— MARK COOPER, 37 Hobbs Close, Cheshunt, Hertfordshire EN8 0EB (E-mail: badmotsco@ntlworld.com).

***Miltochrista miniata* Forst. ab. *flava* de Graaf (Lep.: Arctiidae) in north-west Kent**

Barrett (1895. *The Lepidoptera of the British Islands*) mentions two specimens of ab. *flava* of *M. miniata*, the Rosy Footman – one from the New Forest in the collection of Mr. Sydney Webb and one other, along with some intermediate forms, in that of Mr. Bond, suggesting that *flava* is a very rare aberration. Chalmers-Hunt (1962. *Butterflies and Moths of Kent. Supl. Ent. Rec.* **74**) considered it rare in Kent and that he knew of only two Kent specimens. He does not mention ab. *intermedia* Lempke.

On 7 July 2003 I noted an example of ab. *flava* at my garden m.v. light at Dartford, while earlier, on 23 June, ab. *intermedia* was attracted to it – these in a season total of 46 examples. The appearance of the latter, with only the basal and central areas of the wings yellow, suggest they might be genetically the heterozygote form of ab. *flava* and they are more often encountered.

My previous acquaintance with ab. *flava* has been In Orlestone Forest in East Kent, on 19 July 1968 (2), 23 July 1979 (1), 10 August 1982 (1) and 29 July 1983 (1), all at m.v. light.— B. K. WEST, 36 Briar Road, Dartford, Kent DA5 2HN.

Papilio dardanus Brown ab. *obscura* ab. nov. (Lep.: Papilionidae)

A fine melanic example of a male Mimic Swallowtail, *Papilio dardanus* Brown, emerged in the breeding room of Butterfly World, Klapmuts, Cape, Republic of South Africa, in March 1997 (Plate E).

Plate E. *Papilio dardanus* Brown ab. *obscura* ab. nov. ♂ left: upperside; right: underside.

The uppersides of the wings are almost, completely black. The areas that are normally yellow are heavily suffused with black/brown scales allowing only a faint trace of the normal wing markings to remain apparent beneath the dark veil. Those areas of the wings that are typically black remain darker than the remainder. On the underside, the original markings are still predominant and the suffusion of black/brown scales is much less evident than on the upperside. On the hindwing undersides, the discal band is less pronounced and dark scaling is generally reduced. The forewing undersides again show a suffusion of black/brown scales, which completely obliterates those areas which are normally yellow, including the apical spot.

It is believed that the pupae, which were purchased from the Stratford-upon-Avon Butterfly Farm, originated from the Arabuko-Sokoke Forest (Kipepo Project), Kenya. The lack of certainty as to the origin of the pupae makes it preferable not to state the race, but it is most likely to be *tibullus* Kirby.

This species is undoubtedly the most extreme example known to science of Batesian mimicry in butterflies. This fact, together with the importance of the species in genetic studies, makes this unique insect worthy of note.— LEONARD MCLEOD, 22 Maris Green, Great Shelford, Cambs CB2 5EE and GABRIELLE MCLEOD, 47 Upper Lewes Road, Brighton, Sussex BN2 3FH.

THE UTILISATION OF TWO METRE COUNTRYSIDE STEWARDSHIP FIELD SCHEME GRASS MARGINS BY MEADOW BROWN *MANIOLA JURTINA* (L.) (LEP.: NYMPHALIDAE)

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Abstract

The utilisation of two-metre grass margins around arable fields by the Meadow Brown butterfly *Maniola jurtina* (L.) was investigated at three farms in Essex between 1997 and 2000. There was a significantly greater abundance of *M. jurtina* on the two metre grass margins than on the control sections (field edges without grass margins) but this abundance varied depending on the position of the margin and the initial seed mixture used. Two-metre grass margins could be improved as habitats for *M. jurtina* if they were established using a mixture containing a diverse range of grasses and nectar sources.

Introduction

There is an impoverished butterfly fauna on arable farmland in lowland England (Thomas, 1984) because it consists of a fragmented mosaic of habitats prone to seasonal change and under the annual trauma of the farming cycle (Macdonald and Smith, 1991). The result is an unpredictable and scarce supply of resources suitable for butterflies (Smith *et al.*, 1993).

Maniola jurtina (L) do not travel far (Brakefield, 1982; Feber *et al.*, 1994). As a consequence, in order to survive on grass margins they need mating, oviposition and foraging habitat (Wikland, 1977) all within a short distance. Hedgerows once helped to fulfil these roles, but with their wholesale removal in the 1960s and 1970s, the ability of farmland to support butterflies was substantially reduced (Dover, 1996). Hedges also provided shelter in open countryside. Sparks *et al.* (2000) pointed out that south-facing aspects against a dense hedge were amongst the most important of butterfly habitats, supporting work of Dover (1999), who showed a positive association between field corners, other sheltered areas, flower rich areas and concentrations of butterflies. Dover's (1999) association between butterfly concentration and flower rich areas agrees with the findings of Ehrlich (1984), who observed that the distribution of adult and larval nutritional resources was probably the major factor controlling the structure of non-migratory butterfly populations in temperate areas. Dover (1999) suggested that sub-optimal adult resources were the main limiting factor on butterfly abundance, with nectar from perennial sources in field boundaries being the most important (Dover, 1996).

The introduction of schemes such as the Countryside Stewardship Scheme (CSS) was to help enhance and provide important landscapes, wildlife habitats and public enjoyment of them (Rebane & Tucker, 1997). Dover (1999) suggested that butterflies were an important indicator of farmland biodiversity, an increase in butterfly abundance under CSS management possibly implying suitable conditions for a wide range of other invertebrate species.

One part of the CSS was the creation of two metre grass margins around arable fields. These margins were to be sown with a tussocky type of grass seed mix containing 50% *Phleum pratense* and/or *Dactylis glomerata*, and/or *Holcus lanatus*. The margins had to be cut three times in the first year and then cut no more than one year in three and then only to stop encroachment of scrub species (MAFF, 1997).

The aim of this study was to investigate the effects of such two-metre grass margins on abundance of the Meadow Brown butterfly *M. jurtina*.

Method

Three farms at Writtle (O. S. grid reference TL 670070), Highwood (TL 630036) and Greenstead Green (TL 810288), all in Essex joined the CSS in 1996 and monitoring work was undertaken at these three sites during the period 1997-2000. The main attributes of these margins are highlighted in Table 1, while the composition of the mixtures sown is given in Table 2. *M. jurtina* abundance was monitored between late June and early August each year using the transect method (Pollard, 1977). Thirteen two-metre grass margins and at least three control sections (field edges without grass margins) were monitored once a week when weather conditions were suitable (Pollard and Yates, 1993). The total observations were added together and a figure for *M. jurtina* per km per visit was calculated.

Results

At all three sites the abundance of *M. jurtina* increased from the first year of monitoring (Table 3). At two of those sites, Writtle and Greenstead Green, substantially more were observed on the two metre grass margins than on the control sections. At Highwood even though *M. jurtina* were more abundant on the two-metre grass margins the difference was small.

There were marked differences in *M. jurtina* abundance on the two-metre grass margins at Greenstead Green with G2.5 having the greatest abundance in three of the four years. This was surprising as this section had no hedge or ditch and was dividing one large field into two (Table 2). At Writtle the best two sections W2.2 and W2.3 were once again dividing a field into two, but this time a newly planted hedge was alongside the margins.

Overall *M. jurtina* abundance was significantly greater (Sign test, P=0.001) on the two metre grass margins than on the control sections (Table 3). The two metre grass margins were established using different grass mixtures and for each year the mean abundance of *M. jurtina* was greater on the grass margins established using mixture one (Table 4).

Discussion

Establishing two-metre grass margins around arable fields will increase abundance of *M. jurtina*, compared to fields without margins. All three sites showed an increase, with a significant increase being found overall. Increases could be far greater had the CSS grass margins been set up differently (Kirkham *et al.* 1999). None of the two-metre grass margins at any of the sites came up to the suggested minimum habitat-size requirement of *M. jurtina* of between half and one hectare (Thomas, 1984).

One reason why two-metre grass margins were unsuitable for *M. jurtina* may be because there were not enough nectar sources, which are vital for the female when first emerging to mature the eggs. Feber *et al.* (1996) suggested that the best predictor for *M. jurtina* abundance in July was the abundance of *Leucanthemum vulgare* and in August the abundance of *Centaurea* species. Neither of these was included in any seed mixtures. As only grasses were sown, there was an almost complete lack of nectar sources available for butterflies. Several authors (Watt *et al.*, 1974; Murphy *et al.*, 1993; Dover, 1994; 1999; Feber *et al.*, 1996) have identified that the availability of nectar sources is the limiting factor to butterfly abundance. Cost was the most likely reason for not including wildflower seed in the statutory mixtures.

Table 1: Attributes of the margins at the three sites.

	Size margin (m)	Section length (m)	Aspect	Hedgerow length (m)	Sown with mix
Writtle					
W2.1	2	274	NE/SW	150	3
W2.2	2	274	NW/SE	274	3
W2.3	2	270	NW/SE	270	3
WN2.4	No margin	133	NE/SW	100	
Greenstead Green					
G2.1	2	450	E/W	390	1
G2.2	2	141	E/W	141	2
G2.3	2	250	E/W	150	1
G2.4	2	320	NE/SW	320	1
G2.5	2	285	NE/SW	0	2
GN2.6	No margin	180	E/W	160	
Highwood					
H2.1	2	200	N/S	200	2
H2.2	2	762	E/W-N/S	450	2
H2.3	2	467	N/S-E/W	467	2
H2.4	2	500	NE/SW	400	2
H2.5	2	285	ENE/WSW	0	2
HN2.6	No margin	343	ENE/WSW	300	

The vegetation on the two-metre grass margins was far taller than that identified as being critical (1-20 cm) for *M. jurtina* (Goldsmith, 1991). The taller vegetation results in less warm spots for the female to bask in, and an unsuitable egg laying habitat. Smith *et al* (1993) suggested that more *M. jurtina* were found on cut sections, showing the profound effect of a warmer micro climate on resting butterflies. This research did not investigate the suitability of the egg and larval habitats, but the length of vegetation may have caused a reduction in warmth to both of these stages, so affecting development. The effect of using grass seed from agriculturally improved sources also cannot be judged, but the selection of grass species in some of the mixtures was not beneficial to the *M. jurtina*.

Table 2: Seed mixtures used on the two metre margins at the three sites.

	Writtle	Greenstead Green		Highwood
Date established	Oct 1997	Oct 1996	Oct 1997	Oct 97-Oct 00
Length in research transect	818 m	1020 m	426 m	2214 m
Seed mix	Mix 3	Mix 1	Mix 2	Mix 2
Dactylis glomerata	50%		50%	50%
Festuca pratensis	10%		25%	25%
Festuca arundinacea			10%	10%
Poa pratensis		7.5%	15%	15%
Festuca ovina	20%	25%		
Cynosurus cristatus	15%	7.5%		
Trisetum flavescens	5%			
Festuca rubra subsp. *commutata*		30%		
Agrostis tenuis		5%		
Festuca rubra		25%		

The CSS agreements with farmers identify a range of grasses to be used within the grass margins but these were not associated with native grass mixtures growing in areas of the country. The farmers at all three farms in this study bought the grasses on price and availability only. Each farmer had establishment failures due to selecting species not suitable for their soil type. Why simple tables of suitable grasses, as produced by Marshall (1998), could not be included in the agreements, is surprising. Even using the list supplied by Marshall (1998) might not ensure that suitable larval food plants would be sown, but if the mandatory number of species in the mixture was increased, there would be more chance that some larval sources would be included.

There is also a lack of native seed for grasses, resulting in grasslands sown with seed from agriculturally improved sources. Kirkham *et al.* (1999) suggested that a tussocky mix, as used in the CSS, was the most inappropriate grass mixture out of a range of grass margins sown at the ADAS experimental farm at Boxworth. It is therefore difficult to understand why it was chosen for the CSS.

The hedgerow management of trimming once every three years in January and February, as specified by the CSS agreement, may also not benefit butterflies. In a recent study Maudsley *et al.* (2000) suggested that at five out of six sites hedgerows cut in September had greater number of Lepidoptera larvae in May, than those cut in February. This difference was significant at two of the sites.

In conclusion, the two-metre grass margins as set up under the CSS in October 1996 were better than not having no grass margin at all. However, it is suggested that a major opportunity has been missed because what has been created is a

Table 3: Abundance of *Maniola jurtina* (mean number/km/visit) on two metre margins at three farms

	Number of 2m margins	Mean *M. jurtina*	Range	Control
Writtle	**3**			
July 1998		3.4	0-8.8	1.5
July 1999		19.7	7.9-37.1	1.3
July 2000			7.3-20.9	0
Greenstead Green	**5**			
July 1997		15.2	3.3-35.1	3.2
July 1998		11.3	2.8-21.1	2.2
July 1999		33.4	23.3-49.9	4.6
July 2000		24.2	5.1-33.9	6.9
Highwood	**5**			
July 1998		4.7	2.4-8.1	4.1
July 1999		10.4	5.9-14.2	3.9
July 2000		12.8	3.1-29.4	9.5
		15.5		**3.6**

'monoculture' of improved grassland, which Thomas (1984) rates as supporting at best only one to three butterfly species. With a little thought and reference to previous research such as that of Smith *et al.* (1993), an unimproved type patchy pasture/tall grassland which supports 23 to 28 butterfly species (Thomas, 1984) could have been created.

Table 4 : *Maniola jurtina* abundance (mean number/km/visit) by seed mixture sown.

	Mixture 1	**Mixture 2**	**Mixture 3**
July 1998	10.9	4.8	3.4
July 1999	33.5	16.9	19.7
July 2000	23.1	16.6	18.4

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Mythimna albipuncta (D. & S.) in north-west Kent

B. K. West (*Ent. Rec.* **115**: 292) described *Mythimna albipuncta* as an unusual migrant to north-west Kent. My home, also in north-west Kent, lies about 13 km to the east of West's, just 400 metres from the River Thames. A trap is also operated regularly by Roger Kiddie about 1.5 km south-east from here. Prior to 1998, Roger reeorded *M. albipuncta* on 29.vi.1996 and I had one on 6.x.1996.

After my return from Kenya at the end of 2000 the situation was rather different and the figures are given per generation (numbers taken by R. Kiddie in parentheses):

	1st generation	2nd generation	3rd generation
2001	–	4 (1)	
2002	9	4 (1)	
2003	>2* (1)	6 (1)	(1)

*exaet numbers not reeorded.

This speeies is well known to be resident near the Channel eoast and is frequently taken in East Kent. These figures show clearly that the speeies is locally resident in the Gravesend area, espeeially sinee the eaptures were not associated with migration of other speeies. In view of this specimens reaching B. K. West near Dartford are just as likely to be vagrants from a nearby population as to be primary migrants. — David Agassiz, 23 St James's Road, Gravesend, Kent DA11 0HF.

Hazards of butterfly collecting – Rendezvous in Algeciras – Morocco/Spain, 1968

Following substantial overwork as UNICEF Director in Nigeria during the so-called 'Biafra War' my father had a full four months of home-leave due for the summer of 1968. He decided to take our car by boat from Lagos to Casablanca and to drive to Denmark from there. We had heard of no-one else doing this, but it went very smoothly; the international car 'Carnet des passages' issued by the Nigerian Automobile Association was accepted in Casablanca without a murmur, nobody holding out even for a small bribe.

I was at university in Denmark at the time, and the thought of a visit to Morocco followed by a leisurely trip back through Spain and France with my parents was most appealing.

The cheapest way for me to get to Morocco was on a charter flight to Spain, so a few weeks before my parents left Lagos, we agreed to meet in 'the closest thing to a French 'Cafe de Gare' at the main Algeciras station in southern Spain on 6 July between 12.00 and 15.00'. I would also be there the two following days. To meet somewhere in Morocco seemed too ambitious. If we did not team up, I would make my own way back to Denmark. This – reasonably secure – arrangement was one of those that really got my mother into overdrive with worry; she was, as so often, convinced she would never see me again.

So off I went to Malaga on 'Spies Rejser', with a week's vouchers for a crummy hotel in Torremolinos (one of the most awful places I have ever visited, just surpassed by Benidorm further north). I would abandon the return flight, which was technically illegal, but against which no sanctions could be imposed. On arrival I was supposed to receive breakfast and dinner vouchers (half-board was obligatory for charters at the time), but there had been some mix-up. I had to visit the Spies office in town several times to get them, and each time they would try to peddle me various excursions and extras. I was just interested in getting up the neighbouring hills for butterflies. On the third visit, when my vouchers finally arrived, I think I convinced them I did not want any of their excursions: 'But surely you are coming to our information briefing ... there is a free glass of wine'. I did not have the heart to say no, but did not go.

After having exhausted my week of extremely modest luxury that my vouchers procured, I set off for Morocco. On cheap buses I found my way to Chefchauenne in the lower Rif Mountains, a delightful small township surrounded by mountains. In those days one of the most popular travel books – before 'Lonely Planet' – was Erich Frommer's 'Europe on five dollars a day'. In those days in Chefchauenne five dollars a day stretched far – more than needed for a dirty mattress in a small, dingy private room (with key) and to excellent food in small local restaurants. My favourite place seemed to slaughter a sheep on Fridays, boil it in a huge cauldron, and then add more water, vegetables, and spices and keep the sheep going till next Friday (it was at its best about Tuesday, after which the meat began losing flavour). Butterfly house-keeping and note-taking were done on the terrace of a small café over glasses of delicious mint tea.

There were many interesting butterflies along the surrounding mountain tracks. The greatest impression on me was made by the delicate beauty of the western marbled white *Melanargia occitana pelagia* Oberthür. The rich chestnut underlining of the hindwing veins and the special prominence of the eye-spots make the common European one look positively dowdy. I later found that I would have had an even better time in the High Atlas further south, but there was this rendezvous with my parents.

I stopped a few days in Tetouan on the way back to Spain and collected on the conical hills in the neighborhood. On one I saw the two-tailed pasha *Charaxes jasius* L. flying for the first time, a battered male hilltopping with its exuberant power and grace. This is the first butterfly that I remember; one came into our house in Athens in 1950, when I was six, and my father declared it was the first swallowtail he had ever seen with two tails. A little later a Provençal brimstone *Gonepteryx cleopatra* L. flew by. It looked very light. I netted it absent-mindedly. In the net it seemed to be a female. A moment later it flashed through my mind: gynandromorph?! It was ... not a perfect bilateral, but still the finest I have. And if you must have just one gynandromorph, you can hardly do better than the Provençal brimstone.

But it was time to think about that rendezvous in Algeciras. I arrived at the Spanish enclave, inside Morocco, at Ceuta, from where the ferry for Algeciras departs, with two days to spare. Having out-Frommered Frommer, I was flush (well perhaps not exactly flush) with cash, so I lodged at a real hotel, checked out the ferry-schedules, and repaired to a lovely restaurant on the near-by high street. At one stage I looked out of the window ... and saw the profiles of my parents as their car drove off as the traffic lights turned green! I finished my leisurely meal – the last ferry had already gone and my parents were bound to be at the only luxury hotel in town. I walked up to the hotel and, sure enough, our Nigerian registered Mercedes was in the parking lot. I sneaked in on my parents in the dining room: 'What are you doing here already? We aren't meeting for another two days!'

The two-tailed pasha (*Charaxes jasius*) on a Tetouan hilltop.

My mother shed copious tears of relief into her deep-fried squid rings. She always did worry too much. We had a lovely three-week drive up through Spain, France, and Germany. Lots of butterflies were on hand in the western Pyrenees where we dallied for several days. We reached Denmark safely and my parents had a super home-leave, much deserved after the rigours of Lagos.

But we never did find out whether there actually was a 'closest thing to a French 'Cafe de Gare' at the main Algeciras station'.

— Torben B. Larsen, UNDP Vietnam, c/o Palais des Nations, 1211 Geneva 10, Switzerland. (E-mail: torbenlarsen@compuserve.com).

Cosmopterix zieglerella (Hb.) (Lep: Cosmopterigidae) new to Hampshire

It was an e-mail from Willem Ellis in Holland, saying that this leaf miner, found on Hop *Humulus lupulus*, was common in Holland this year (2003), which prompted me to search for it locally. I soon found two mines by a gateway at the entrance to a field at Dogmersfield, near Fleet (VC 12), on 3 September 2003. Thorough searching of the locality, over the next three weeks, lead to the discovery of a further 20 mines at four other sites in the Fleet area. These records constitute the first for Hampshire.

The initial mines were found in a semi-shaded location and mines were subsequently found in habitats ranging from full sun to shade. The most mines (12) were found in a semi-derelict area, in shade, on the edge of a residential area of Fleet. Further searching of hedgerows on the edge of farmland, where the first mines were found, was curtailed due to my encounter with a person in camouflage (presumably the farmer), armed with a rifle with telescopic sight, telling me to get back onto the footpath. It did not seem a particularly opportune moment to share one's enthusiasm for members of the Cosmopterigidae!

I am grateful to Willem Ellis for his initial observations and to John Langmaid for confirming the Hampshire record. — ROB EDMUNDS, 32 Woodcote Green, Fleet, Hampshire GU51 4EY (E-mail: r.edmunds@ntlworld.com).

Editorial Comment: The characteristic mines of *Cosmopterix zieglerella* (Hb.) were noted in many places in Hertfordshire and in a few sites in South Essex by myself during 2003. In most cases the sites are ones at which there has been no previous evidence of the species. It is not clear, however, if this species has suddenly appeared in many new sites or if it has suddenly undergone a numerical increase such that normally very rare mines are now common and easily spotted; further observations in note form are welcomed by this journal. There is an excellent illustration in volume 4, part 1, of the Harley Books series *Moths and Butterflies of Great Britain and Ireland*, whilst a web search for images of this species produces a number of good quality colour pictures likely to be of value in identification/recognition.

Coleophora hemerobiella (Scop.) (Lep.: Coleophoridae) – the second Hampshire record

Whilst walking the dog across some fallow fields on the outskirts of Fleet, North Hampshire, on 11 May 2003 I noticed some isolated hawthorn bushes with very visible feeding damage to the leaves. I searched the bushes and found several large, dark *Coleophora* cases, which seemed to be *Coleophora hemerobiella*. John Langmaid confirmed the identity when photographs were posted on the UKMoths YahooGroup.

This is the second Hampshire record for this species – the first being of a moth trapped in Shroner Wood in 1965 (Goater 1974. *The Moths and Butterflies of*

Hampshire and the Isle of Wight). At the same time as discovering this colony I found a case, which was 7 to 8 mm long (in comparison to the other cases, which were 9 to 11mm long), and had similarities to the case of *C. hemerobiella*, but with a curved top. The feeding damage to the leaf was extensive and was similar to that for *C. hemerobiella*. This case could not be identified and so I decided to breed it through. The moth emerged on 2 July and it proved to be another *C. hemerobiella*. Whether this case represents an atypical form or accidental construction is hard to say, but I did find one more similar example. Over the next week I found a further four localities, all within one kilometre of the initial sighting, where the hawthorn bushes contained *C. hemerobiella*. The characteristic feeding damage made their presence very visible. Most bushes containing this coleophorid were at the edge of once cultivated farmland.

It was interesting to observe the larva, which seemed to spend some time constructing a very fine web (invisible to the naked eye), at the top of the container. It would often seem to hang from this, a couple of centimetres from the lid. I assume that it was constructing a platform for pupation. In fact, when the lid was opened, on emergence of the moth, the case was seen to be still attached to this web.

I am grateful to John Langmaid for confirming the identity of this coleophorid.— ROB EDMUNDS, 32 Woodcote Green, Calthorpe Park, Fleet, Hampshire GU51 4EY (E-mail: r.edmunds@ntlworld.com).

Scrobipalpa costella (Humph. & West.) (Lep: Gelechiidae) adult in winter

On 25 December 2003, my Christmas celebrations were graced with the presence of an adult *Scrobipalpa costella*, found on the wall inside my bathroom (in Colden Common, South Hampshire – VC 11). Parsons and Sattler (2002), in their account of *Scrobipalpa* in vol. 4 part 2 of *The Moths and Butterflies of Great Britain and Ireland* (Harley Books), state that *S. costella* was "formerly considered to hibernate as an adult", and that records range from mid-February to mid-November.

The most wintry date for *S. costella* on the Berkshire moth database (held by the author) is for 22 November (in 2002), and on the Hampshire database (other than the record described above) it is 26 November (in 2003).

The foodplant (Bittersweet *Solanum dulcamara*) does not grow in my garden, but it is frequent in the hedgerows nearby. The adult moth's presence in late December suggests that it does sometimes overwinter in this stage, or could it be that in a relatively mild winter the moth is effectively continuous-brooded?

My thanks to Tim Norriss for checking the Butterfly Conservation (Hampshire Branch) moth database, and to John Langmaid for additional information on *Scrobipalpa costella*.— MARTIN C. HARVEY, Hampshire and Isle of Wight Wildlife Trust, Woodside House, Woodside Road, Eastleigh SO50 4ET. (E-mail: MartinH@hwt.org.uk).

Cochylidia implicitana (Wocke) (Lep.: Tortricidae) in south-west Scotland

The first report of *Cochylidia implicitana* (Wocke) from Scotland was from Kilstay Bay (O. S. grid reference NX 1238), Wigtownshire (VC 74) on 7.viii.1997 by S. H. Hind and I. F. Smith (*J. Brit. Ent. & N. H. Soc.* **12** (1999), 158; *Ent. Rec.* **111** (1999), 114). Unfortunately, the report was supported solely by photographs of the imagines; no specimens were retained. Although the photographs were of good quality and the identification seems sound, there is always an element of doubt with this difficult group unless a specimen is preserved for checking. It is therefore pleasing to vindicate the correctness of that record, as the species has now turned up further along the coast in Kirkcudbrightshire. Three specimens were taken at actinic light at Barlocco Bay (NX 794471), Kirkcudbrightshire (VC 73) on the night of 6/7.viii.2003 by Richard and Barbara Mearns. Identity was confirmed by examination of the male genitalia. In spite of the above Scottish records, the most northerly reported locality for this species is still Kyloe, Northumberland (VC 68) where George Bolam (*Hist. Berwick Nat. Club* **27** (1929), 125) recorded it flying about sallows on 28 June 1887 - an extremely early date!— K. P. Bland, National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF.

Argyresthia cupressella Walsingham, 1890 (Lep.: Yponomeutidae) a possible means of range extension by road

This North American species was first found in the British Isles at Ufford, Suffolk in 1997 (Agassiz & Tuck, 1999 *Entomologist's Gaz.* **50**: 11-16). The source of introduction was not proved but it is most likely that it was the garden centre trade, larval damage being found on garden cultivars of various members of the Cupressaceae family. It has since been slowly expanding its range here and is now known from vice-counties 19, 21, 22 and 27.

I stayed at Colchester, Essex (V.C. 19) during the weekend of 22-23 June 2002. In the early evening of 22 June I parked my car in a residential area near some unidentified conifers in the Cupressaceae family and also near, but not under, a street light. At about 23.00 hours I drove the five miles back to where I was staying. By chance I then parked directly under a light. When I got out of the car I immediately noticed some small moths on the roof and rear. Close examination showed these comprised at least 50 *Argyresthia cupressella*, all sitting perfectly still; no specimens were flying, nor was there any other species on the car. What attracted them is a mystery.

Although I did not notice them when I started the short journey I am quite certain that they must have been there because they would not have time to alight, in such number, between stopping my car, getting out and seeing them. Had they been attracted to the car because of reflected light I would have expected to have seen some still flying, or at the very least moving about on the car. The fact that I did not observe them when I started off is because the place where the car was parked was comparatively dark. We had just left a family celebration and I was paying more attention to people than recording moths.

If, however, there were any doubt whether the species could successfully "hitch-hike" they were dispelled the next day. It was sunny and warm when I left Colchester for the 295 mile journey back to Plymouth, with no sign of any of the *A. cupressella* on my car. Except for a few miles at the beginning and end, the route I took was motorway or main roads and so most of the journey was undertaken at speeds of between 60-70 mph. On arrival home, and very shortly after turning the engine off, I noticed a small moth crawl out from under where the rear edge of the bonnet meets the windscreen. It was a female *A. cupressella*, which was not given the opportunity to extend its range into Devon.

The journey involved two stops, one at Fleet Service Station on the M3, in Hampshire and another at a roadside café near West Knoyle in Wiltshire. Should the species turn up in either of these areas it is possible that my car was the source of introduction. Indeed had I not noticed the specimen on my car when I arrived home it is quite likely that it might have founded a local population here.– R. J. HECKFORD, 67 Newnham Road, Plympton, Plymouth, Devon PL7 4AW.

The doubtful Moray record of *Lepyrus capucinus* (Schaller) (Col.: Curculionidae)

I am grateful to Mr. A. A. Allen for detailing the circumstances leading to his recording this extremely rare weevil from Morayshire on the basis of a letter from Philip Harwood (*Ent. Rec.* **115**: 126). However, I fear that his suggestion that the specimen is in either Harwood's collection or the general British collection in the Hope Collections of the Oxford University Museum of Natural History has not been borne out. Both Mr Darren Mann, who curates the collections, and Mr Max Barclay, of The Natural History Museum, London, have searched for the weevil in both of the collections without locating it. I am grateful to both of them for their efforts.

It is possible, though I suggest very unlikely considering the rarity and distinctness of the weevil, that Harwood passed the specimen on to some other entomologist; until it is found I believe that the record is best disregarded. This belief is strengthened by a discrepancy in Hyman & Parsons (1992, *A review of the scarce and threatened Coleoptera of Great Britain*, Part I., JNCC, Peterborough). The authors categorised *L. capucinus* as 'Extinct', meaning that there have been no records after 1900. They cited the last British record (referred to by Mr Allen) as Bucknill's from Wellington College in 1897. But Mr Allen states that the date of Harwood's letter to him is 1947, fifty years after this 'last record'. This suggests that the Moray record was regarded as problematical by Hyman & Parsons; it does not seem to refer to an occurrence earlier than 1897, and the species was regarded as being extinct in Britain. Until the Harwood specimen (if it exists) is located I suggest that 'Extinct' continues to be the appropriate designation for *L. capucinus*.— M. G. MORRIS, Orchard House, 7 Clarence Road, Dorchester, Dorset DT1 2HF (E-mail: mgmorris.ent@virgin.net).

The generic names of the British Phytophaga (Coleoptera) explained

Macroplea	long swimmer. The simple *Plea* is found among the water bugs (Heteroptera)
Donacia	from *donax*, 'a reed', with which several of the species are associated
Plateumaris	an Asiatic shoe or slipper (*eumaris*), compounded with *platys* 'broad', from the somewhat dilated tarsi.
Orsodacne	'with bitten rump' (excised pygidium), but no such feature seems visible
Zeugophora	yoke-bearing, from impression on pronotum (plus a vivid imagination)
Lema	a difficult name, the few possibilities having no clear- entomological bearing
Oulema	'not Lema', to emphasise distinction from last
Crioceris	ram's horn, though the resemblance is problematic
Lilioceris	literally 'lily horn' (showing the absurdity of names formed by incautious analogy)
Labidostomis	pincer*-mouth (.cf. *Labidura* 'pincer-tails', an earwig genus)
Clytra	nothing satisfactory suggests itself
Gynandrophthalma	'female-male eye', whatever that may mean
Cryptocephalus	hidden head (a far more apt name)
Lamprosoma	shining or bright body
Adoxus	inglorious, from its sombre appearance
Timarcha	a timarch or honorable ruler as opposed to a tyrant
Chrysolina	golden *Lina* (see next)
Chrysomela	golden apple (its restriction to the old genus *Lina* is recent)
Plagiodera	having the 'neck', i. e., pronotum, oblique or sloping
Gastrophysa	with inflated abdomen (gaster), a feature often found in this genus
Phaedon	From a root meaning bright, shining
Hydrothassa	sitting (beside) water; i. e., living on waterside plants
Prasocuris	a grub that destroys leeks (*prasa*) mentioned by Aristotle
Phytodecta	'plant biter'
Phyllodecta	leaf biter
Galerucella	diminutive of next
Galeruca	Greek *galeros* 'cheerful' and Latin *eruca* 'caterpillar' (!)
Pyrrhalta	red or reddish leaper (cf. *Altica*) but there is no power of leaping
Phyllobrotica	feeding on leaves or foliage
Lochmaea	frequenting woods or copses
Luperus	painful, distressing, from the generally sombre colouring
Calomicrus	beautiful (but) small
Agelastica	not laughing, grave or perhaps sullen, with reference to dark colour
Sermylassa	arbitrary extension of *Sermyla*, an invented name
Phyllotreta	boring through or perforating leaves
Aphthona	without envy or malice – application fanciful
Longitarsus	long foot, from the elongate hind basitarsus
Altica	properly *Haltica* 'able, or tending, to leap'(though these relatively large species in fact exhibit the power only weakly)
Hermaeophaga	'eating the plant mercury' (Hermes corresponds to Mercury)
Batophila	berry-loving. (*B. rubi* lives on blackberry)
Lythraria	from *Lythrum salicaria*, the foodplant
Ochrosis	'a yellowing': our species, *O. ventralis*, is a yellowish beetle
Crepidodera	'shoe neck', from the shape of the pronotal impression
Derocrepis	the same, with the two elements reversed
Hippuriphila	'loving horse-tail', the foodplant
Chalcoides	appearing like bronze
Epitrix	best rendered 'hairy surface'. Pubescence is unusual in a halticine
Podagrica	afflicted with gout
Mantura	obscure, but second element *ags(-ura)* is 'tail'
Chaetocnema	'bristle shin' from the tibial seta
Sphaeroderma	'spherical form' (though derma is properly 'skin')
Apteropeda	'wingless foot'; Redtenbacher's intention here is hardly clear
Mniophila	moss-loving (c.f., the species-name *muscorum*; *mnion* = moss)
Dibolia	first element 'two'; second hardly clear
Psylliodes	flea-like
Pilemostoma	'felt mouth'; application hardly clear
Cassida	a helmet, from the peculiar form

— A. A. Allen, 49 Montcalm Road, Charlton, London SE7 8QG.

STURMIA BELLA (MEIGEN) (DIPT.: TACHINIDAE). NEW TO WALES

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Abstract

Of 15 *Aglais urticae* (L.) (Lep.: Nymphalidae) pupae collected from garden sites, 12 (80%) were parasitised. One of these was taken by a predator before the identity of the parasitoid could be confirmed, three were parasitised by *Pteromalus puparum* (L.) (Hym.: Pteromalidae) and eight by *Sturmia bella* (Dipt.: Tachinidae), a species new to Wales.

Introduction

The acquisition, earlier this year, of an adjacent plot of land on which Common Nettle (*Urtica dioica*) formed drifts along several metres of the original boundary, provided an opportunity to encourage nymphalid activity. The nettles were cut back in early June in order to promote the tender, fresh growth preferred by the Small Tortoiseshell *Aglais urticae* (L.) for egg-laying (Thomas & Lewington, 1991) and within weeks many egg batches were observed. The warm summer of 2003 provided ideal breeding conditions, leading to a sustained period of ovipositing by *A. urticae* into mid-August. Very large clusters of eggs were commonly found, with eggs typically laid one on top of the other forming low mounds. Although there was no close monitoring of the site, casual checks indicated that larval development was unremarkable. The first pre-pupation larva was observed during the first week of September, suspended in an exposed position on an east-facing house wall, approximately 19 metres from the nettle-bed. This emerged successfully on 14 September, leaving quite heavy meconium staining on the cream-coloured, freshly painted house wall. Although the various stages of *A. urticae* had been given every encouragement in their development, the time had come for action to be taken if further wall cleaning was to be avoided!

Between 16 and 19 September, 15 *A. urticae* pupae were 'harvested' from the house or garage walls during which operation it became clear, from their darkening appearance and lack of rigidity, that many were no longer viable. Pupae were carefully teased from the wall, leaving as much of the silk pad as possible still attached to the cremaster. Four, apparently healthy pupae were suspended from a twig by means of quick-drying adhesive and the twig attached to a partially-shaded trellis outdoors. One of these pupae was subsequently found to be parasitised. Unfortunately, within days, all fell victim to predation. Eleven non-viable pupae, which were presumed to be parasitised, were placed loosely within a small plastic box and kept indoors, in a heated room.

Results

Over the period 21-24 September, eight tachinid fly larvae emerged from the *A. urticae* pupal cases and formed unattached puparia on the base of the box. Their confinement within the plastic box denied the tachinid larvae the opportunity to use an "escape line" (Baumgart *et al.* 2003) when emerging from the *A. urticae* pupae, though there *is* some evidence of a proteinaceous strand, measuring 2.5 cm in length, in the box and attached to one of the host pupae. Four parasitoid puparia were sent to Mark Shaw at the National Museums of Scotland, who provided a provisional identification (on the basis of puparial characteristics alone) of *Sturmia bella* (Meigen). Rather than allowing these to develop prematurely indoors, they were placed in the cooler conditions of a garden shed for over-wintering. Confirmation of identity is therefore awaited for these, although there is little doubt. At the same time, two, parasitised *A. urticae* pupae were also sent to Mark Shaw, as the appearance of an exit hole within the wing area of the host pupa pointed to the presence of a second parasitoid. This was identified as the common, gregarious *Pteromalus puparum* (L.), a species that oviposits into the pupal stage of its hosts (Mark Shaw, *pers. comm.*). Between 7 and 11 October four tachinid flies emerged from the remaining puparia stored at room temperature at the author's address. All were again sent to the National Museums of Scotland where David Robertson confirmed the identity as *Sturmia bella*.

Discussion

Sturmia bella, a widespread and often common tachinid in continental Europe (Chandler *et al.* 2001, Baumgart *et al.* 2003), was added to the British list in 2000 (Ford *et al.* 2000). It has subsequently been recorded from many counties in southern England, with the closest known record to the Welsh border located at Severnside in south Gloucestershire (Matthew Smith, *pers. comm.*: Tachinid Recording Scheme website at http://tachinidae.org.uk). Unlike parasitoids such as *Pteromalus puparum*, the larva of *S. bella* appears to be solitary, killing its host in the final stages of development after the host has pupated, though the host is initially parasitised as a larva. Eggs of *S. bella* are deposited on the undersides of the target larval host-plant (in this case *U. dioica*), where they are unintentionally ingested by the host larvae (Herting, 1960). Butterfly larvae of the families Nymphalidae and Satyridae are stated as the usual hosts and this experience supports that observation. The high parasitism rate (80%) of *A. urticae* larvae, compounded by bird predation at the pupal stage, accounted for a complete loss of all 15 harvested larvae. However, my interference may have contributed to the downfall of the remaining three viable larvae, as I had seemingly increased their vulnerability by grouping them together, even though collectively they appeared less obvious (to the human eye) than as individuals at their original pupation sites on a cream-coloured wall. Interestingly, there are many similarities to an earlier published report (Rowell, 2001) on the parasitism of *A. urticae* larvae, where seven pupae out of 20 were found to be parasitised by *Sturmia bella*, a further seven by *Phryxe vulgaris* and two by *Pteromalus puparum*, though larger samples are surely required to establish if the observed parasitism rates are real.

Acknowledgements

I am grateful to Mark Shaw and David Robertson for identifying the parasitoids, and to Matthew Smith for providing distribution details of *S. bella* within the United

Kingdom and also for confirming *S. bella* as new to Wales. I am also grateful to Mark Shaw for his helpful comments on an earlier draft of this paper.

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Dewick's Plusia, *Macdunnoughia confusa* (Steph.) (Lep.: Noctuidae) in Hampshire

I was pleased to find a lovely fresh male Dewick's Plusia, *Macdunnoughia confusa* in my Lymington garden moth trap on the morning of 6 September 2003. As far as I am aware, this is only the fifth record for Hampshire.

This scarce migrant was first taken in Britain by A. J. Dewick in October 1951. By 1983, sixteen had been recorded (Skinner, B., 1984. *Colour Identification Guide to the Moths of the British Isles.* Viking). The present total now stands around fifty (Waring, P., & Townsend, M., 2003. *Field Guide to the Moths of Great Britain and Ireland.* British Wildlife Publishing). It is found commonly in the autumn on the north-west coast of Spain, and it could be that this is the origin of many British specimens. The spread of the species from the Eastern Palaearctic into Western Europe has been noted in the past.— ALEC S. HARMER, Covertside, Sway Road, Lymington, Hampshire SO41 8NN.

Lepidoptera on Hop *Humulus lupulus* at Etton, Northamptonshire (VC 32), in 2003

During 2003 I undertook searches for the Buttoned Snout *Hypena rostralis* (L.) and its larval foodplant Hop *Humulus lupulus* L. in the area immediately to the north of Peterborough. This work was part of the survey of this UK Biodiversity Action Plan moth by the Cambridgeshire & Essex Branch of Butterfly Conservation, co-ordinated by Robin Field, with financial support from an English Nature Biodiversity Action Grant. Waring (2003. *British Wildlife* **14**: 285-288) provides the context for this project. While both plant and moth have been found to be well distributed in Essex, and to a lesser extent in south Cambridgeshire (Field *et al.*, 2003. *Atropos* **20**: 11-14), botanical records indicate that the plant has seldom been reported in the area between Peterborough and the county boundary to the north at Market Deeping. However, a search of this area by bicycle in 2002 resulted in the discovery on 26 August of a stretch of Hop some 100m in extent along a hedgerow by a farm track which runs from Etton east towards Glinton (between O.S. grid refs. TF 141071 and TF 150070, in VC 32 Northamptonshire (now modern Cambridgeshire). This was beaten for larvae on the hot sunny afternoon of 19 July 2003, at which time many of the Hop leaves were full of holes produced by larval feeding which resembled that of the Buttoned Snout. A high density of larvae of the Currant Pug *Eupithecia assimilata* Doubleday was found. At almost every spot one or two larvae of this species fell onto the beating tray. These ranged from first to final instar. A single, half-grown larva of the Comma butterfly *Polygonia c-album* (L.) was found at the Glinton end while simultaneously adults of this butterfly were seen on the wing. A nearly fully-grown larva of the Angle Shades *Phlogophora meticulosa* (L.), some 4 cm in length, was also beaten from the Hop. It subsequently fed on Hop leaves in captivity until pupation, an adult later emerging to confirm the identification. No larvae of the Buttoned Snout were found although they were being seen at other sites on this date.

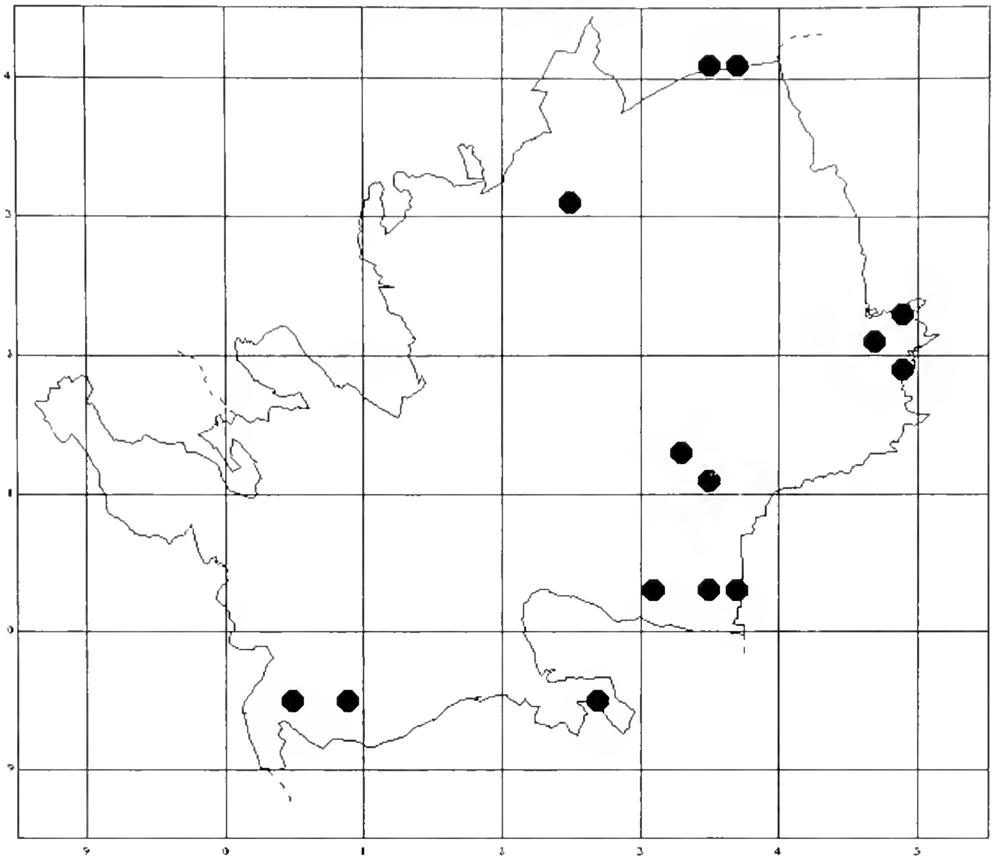
Plant (1987. *Ent. Rec.* **99**: 276-277) and others have drawn attention to the similarity of feeding damage produced by the Buttoned Snout and Currant Pug and in view of the large number of holes produced when rearing a few of the latter, the numbers seen at the Etton site were easily sufficient to account for all the damage observed. A return visit to the site was made on the evening of 1 August 2003 in the company of Mick Beeson, and larvae of the Currant Pug were still abundant, with a greater proportion in the later instars. A parasitic wasp was reared from one of these and was found dead in the rearing box in September 2003, having been kept in an unheated garage. Dr Mark Shaw at the National Museums of Scotland, Edinburgh, identified it as a member of an unresolved aggregate of species within the genus *Aleiodes*. Adult Currant Pug had also been reared successfully from larvae by this time. Dr Shaw informs me that these wasps have been recorded from the larvae of various geometrid moths but would be most unlikely to attack those of the Buttoned Snout (Noctuidae).

Experience suggests that Buttoned Snout larvae are not difficult to find at occupied sites on appropriate dates, so perhaps the species is absent from the Etton-Glinton farm track. Searches will be made in 2004 to double-check. A much smaller colony of Hop was found growing in a hedge and up a post supporting an overhead cable at the Marholm end of the Werrington-Marholm road (TF 150021). This was also beaten on 1 August 2003, but no larvae of any Lepidoptera were found on it. — PAUL WARING, Reader, Writtle College, Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS (E-mail: paul_waring@btinternet.com).

Comments on the Buttoned Snout *Hypena rostralis* (L.) (Lep.: Noctuidae) in Hertfordshire

Paul Waring's failure to find larvae of the Buttoned Snout *Hypena rostralis* at an apparently suitable site in Northamptonshire (*antea*. 77-78) is something of a comfort to me, having failed dismally to find it myself during a Butterfly Conservation funded project search of sites in Hertfordshire. In spite of the apparent abundance of the

2480 Hypena rostralis (L.) Buttoned Snout



species in neighbouring Essex and its prevalence in the suburban zone of north London (Middlesex, VC 21) it does appear absent from much of Hertfordshire, as the map above, compiled from post 1995 records received by me as the county recorder, indicates. The reports are clustered along the Essex and Middlesex borders in the south and east, with just three sightings away from this area, and the moth scarcely ventures into the centre of the county. There are no records at all against the Buckinghamshire and Bedfordshire borders in the west. This is of interest, particularly, in view of the results obtained by Martin Townsend (2002. *A survey of the Buttoned Snout Hypena rostralis (L., 1758) in the Oxford, Reading and Buckinghamshire Chiltern area in 2001.* Butterfly Conservation report number SO2 – 12). Although his search was centred away from the Buckinghamshire – Hertfordshire border area, five ten-kilometre squares searched in this region yielded negative results.

The foodplant (*Humulus lupulus*) appears to be absent from much of central and western Hertfordshire and where it does grow it is physically isolated from other areas where it is found; this must surely make it hard for the moth to find it and account for the absence of the latter is some places where hops do grow? As an aside, the three most easterly dots on the map relate to the Bishop's Stortford area and include larval records relating to 'Golden Hop' – a garden variety of the native foodplant.

The sooner a proposed national recording scheme for macro-moths gets off the ground the better – isolated county results such as mine for Hertfordshire will surely take on new meaning if they can be easily set in a regional or national context.— COLIN W. PLANT, 14 West Road, Bishops Stortford, Hertfordshire CM23 3QP (E-mail: colinwplant@ntlworld.com).

The spread of *Cnephasia genitalana* Pierce & Metcalfe (Lep.: Tortricidae) in Huntingdonshire (VC 31)

Cnephasia genitalana, a proposed Red Data Book species, was first discovered in Huntingdonshire in Raveley Wood on 5 August 1995, while trapping with a 125watt mercury vapour light place approximately 60 cm above a white sheet. As usual all moths not readily identifiable while trapping were collected and taken home. Those not identified the following morning were then put into storage until the winter months when they would be dissected. It was during one of these dissection sessions that *C. genitalana* was discovered. The only other *Cnephasia* taken on the 5 August in Raveley Wood was *C. incertana.*

I returned to Raveley Wood the following year to see if further specimens could be taken. The 125 watt mercury vapour light was run on the 4 August 1996, but only *C. incertana* and *C. longana* were taken, so I returned to the wood on the 15 August and was rewarded with another *C. genitalana.* The following year, having successfully trapped Raveley Wood on 14 August, I discovered while dissecting the years catch of 'difficult' micros that *C. genitalana* had also been taken in Little Paxton Wood on the 25 July and in Gransden Wood on the 7 August. The equipment used in Little Paxton Wood was the same as that used in Raveley Wood, but a 6 watt actinic light trap similar to a 'Heath' trap was used in Gransden Wood. These two woods are close to the southern edge of the vice county of Huntingdonshire, while Raveley Wood is close to the centre of the county, eleven miles from Little Paxton Wood and eighteen miles from Gransden Wood, as the moth flies.

During 1998, a further three sites were added to the list. These were Little Paxton Gravel Pits and Hail Lane Spinney, Abbotsley, both in the southern part of the county and Hilton, which is towards the mid west of the county. At Little Paxton Gravel Pits the 125 watt mercury vapour was used, Hail Lane Spinney, a 6watt actinic and at Hilton a 100 watt mercury vapour place above a box trap. *C. genitalana* was seen on seven sites in 1999 and during 2000 and 2001 on a total of thirteen sites in each year, including Yaxley in the north of the county. During 2002 a total of nineteen sites produced examples of *C. genitalana*, while in 2003 twenty-six sites produced this moth.

Cnephasia genitalana has now been recorded from 40 sites in Huntingdonshire, vice county 31. All have been identified by dissection of the genitalia. This moth appears to have no preference for the type of light or method used to attract it. I have had equally large numbers at 6 watt actinics and 125 watt mercury vapour. When large numbers of *Cnephasia* species are present I do not collect them all, a random selection is made when empting over night traps and when trapping with a sheet random selections are made at intervals during the trapping period, so that those flying at different times have equal chances of being selected for identification.

The earliest date *C. genitalana* has been taken is the 26 June and the latest 29 August, however the flight period in 2003 was exceptionally early starting on the 26 June with no further examples being taken after 8 August. The 'normal' flight period appears to be from the middle of July until the end of August with the peak being during the first and second weeks of August.

I am grateful to Andrew Frost and Steve Dudley for collecting the micros that came to their traps for identification. — BARRY DICKERSON, 27 Andrew Road, Eynesbury, St Neots, Cambs PE19 2QE (E-mail: Barry@eynesbury27.freeserve.co.uk).

Recent large outbreaks of Magpie Moth *Abraxas grossulariata* L. (Lep.: Geometridae) on heather *Calluna vulgaris* (L.) Hull on the mainland of north-west Scotland

The earliest record of the Magpie Moth *Abraxas grossulariata* occurring in large numbers on heather is given by Barrett (1901. *The Lepidoptera of the British Islands* **7**: 262) who reported that Mr. A. F. Griffiths had observed that, in the Hebrides, the larvae of this species feed, in multitudes, upon heather (*Calluna vulgaris*), and that the moths, of ordinary colour and markings, may be seen sitting, side by side, in hundreds on the rocks nearby. In June 1910, Grimshaw (*Scottish Naturalist* **1920**: 86) found hundreds, perhaps thousands, of pupae of the Magpie Moth lying in crevices of rocks on South Uist from which he drew a parallel with the report by Barrett. Sheldon (1922. *Entomologist* **55**: 34) found adult Magpie Moths swarming on the small island of Soyea near Lochinver where he had no doubt but that the larvae fed upon *Calluna vulgaris*, the usual food plants not existing on the island. Heslop-Harrison (1947. *Entomologist* **86**: 55) noted that Magpie Moths were abundant in sheltered places on the moorlands of Lewis and Harris where its larvae fed on *Calluna* and *Erica*. The first record of a colony of Magpie Moth on heather on the mainland was noted by Harper (1958. *Ent. Rec.* **70**: 91), who found a small colony near Arisaig on the west coast of Inverness-shire. Interestingly Harper noted that this species is exceedingly local and limited in numbers in northern Scotland. Harper and Langmaid (1975. *Ent. Rec.* **87**: 139-140) found Magpie Moth larvae on bog myrtle *Myrica gale* and heather on Skye. More recently Hulme (1991. *Ent. Rec.* **103**: 188) reported Magpie Moth to be common and widespread, associated with heather and bog myrtle, in coastal regions and inshore islands of NW Sutherland and Wester Ross from the Applecross Peninsula to the Kyle of Tongue. Hulme (*op. cit.*) also records a mass emergence near Loch Drumbeg (O.S. grid reference NC 1132) where many hundreds were flying or at rest on heather.

We have found larval Magpie Moth to be abundant on heather from Skye in the south to Loch Eriboll in the north and along the north coast to Dunnet Head in the east. Larval Magpie Moth cause partial damage to, and stripping of leaves from the shoots of heather. This causes a characteristic browning of the heather to occur within heathland dominated by heather. Over a number of years we have observed the characteristic browned patches of heather, variable in size, and mostly confirmed by observations of larvae, from the following localities, with dates and grid references (clockwise from Skye):

Glen Arroch in south-east Skye (28.vii.1998, NG 7321, NG 7520), Glen Torridon (27.v.1991, NG 9356);

Inverpolly (13.v.2003, NC 1015, NC 1115, NC 1116, NC 1016; 14.v.2003, NC1510; 16.v.2003, NC 1109, NC 1110; 15.vi.1997, NC 1110; 16.v.2003, NC 1111, NC 1011, NC 0910, NC 0909);

Beinn Spionnaidh and Cranstackie (29.v.2003, many localities, NC35);

Creag na Faolinn (29.v.2003, NC 3953);

Eriboll (29.v.2003, many localities, NC 45);

Strathmore and Loch Hope (4.vi.2003, NC 4647, NC 4497);

A'Mhoine (29.v.2003, many localities, NC 56);

Tongue (4.vi.1992, NC 6359, NC 6159; 20.v. 1997, NC 6159; ll.vi.1999, NC 6155);

Ben Loyal (30.v.2003, NC 6052, NC6051, NC6250);

Strathnaver (ll.v.1999, NC 7056; 28.v.2003, NC 7353, NC 7352);

Dunnet Head (6.vi.2003, ND 2174, ND 2074, ND 2075).

Based on observations going back to 1991 (by AM) heather browning due to Magpie Moth larvae has been much more widespread in 2003 than in previous years. Prior to 2003 all the patches of browning observed were smaller than 3 hectares. In 2003, patches in the range 5-10 hectares were seen on Cul Mor (14 May), on the upper slopes of Stac Pollaidh (16 May), in Strathnaver (28 May), in Strath Beag (29 May), on Ben Hope (4 June) and in Strathmore (4 June). On the lower slopes of Stac Pollaidh (16 May) a browned patch of around 25 hectares was seen, the largest to date.

Magpie Moth outbreaks were observed to be largely restricted to ground below about 300 metres altitude and most were within about seven kilometres of the coast. Outbreaks were observed as far as 15 kilometres from the sea in Strathmore, in Strathnaver and on Ben Loyal.

The earliest date of browning by Magpie Moth larvae was 13.v.2003, on Inverpolly. The browning was distinct at this date and larvae had attained a length of up to 20mm. The latest outbreak observed was on 28.vii.1998 on Skye, where no larvae were seen though adults were abundant, flying and resting in heather, at densities of up to around 10-20 per square metre. Surprisingly, there was no immediately obvious area of browned heather. However, on close inspection it became obvious that the leaves on the heather shoots had been 'chewed' earlier in the growing season and browned, but that this had become masked by new shoot growth.

In the outbreaks we have observed, the size of patches of browning ranged from a few square metres up to about 25 hectares. The patches were widespread on some hill slopes. They were particularly widespread this year (2003) on the hill slopes below 300 meetres on the east side of Loch Eriboll, where about a third to a half of the taller heather (more than about 10-15cm tall) had been severely browned. The patches of browned heather covered about 20-25% or 3 square kilometres of the hill slopes. There was widespread, though patchy, browning of taller heather on lower slopes of Cranstackie and Beinn Spionnaidh, up to about 300 metres altitude. Any heather which was short, due to recent burning or heavy browsing, was less affected. By the road across A'Mhoine and on the hills looking over Loch Hope the browning was more like a diffusion pattern, rather than discreet patches.

Attack by Magpie Moth larvae tended to affect the taller, older heather on steep slopes in dry heath in which heather was mixed with bell heather *Erica cinerea*. Most larvae were found on heather over 30cm tall while short heather (<15cm) was left untouched. Bell heather was untouched by the larvae, even when intimately mixed with severely affected heather. This is contrary to the observations of Heslop-Harrison (1957. *Ent. Rec.* **69**: 48-49) who reported colonies restricted to *Erica cinerea* in the Inner and Outer Hebrides. Magpie Moth larvae were also seen on heather in wet heaths, where the heather was mixed with deer grass, *Trichophorum cespitosum* and cross-leaved heath, *Erica tetralix*, but the larvae were not common in such heath and the browned patches of heather affected only clumps of a few plants.

In a few places we observed a large brown patch of heather with one or more smaller grey patches or strips of dead heather from which the larger, more recently browned patch appears to have spread. From this we deduced that local outbreaks may develop over a couple of years with a small outbreak in one year followed by a larger one in the next year, centred on the previous outbreak. Presumably the outbreak then collapses due to parasitism or disease. In any outbreak there often appears to be a range of larval sizes present by the end of May with pupation occurring from around late May to early June.

Observations of browned areas made later in the year suggest that recovery of heather from an attack can be quite good. Feeding may stop sufficiently soon to permit any shoots which have not actually died to make some new growth in the season in which the feeding occurs. In Glen Torridon, one of us (AM) photographed two discrete patches of browned heather of a few hundred square metres each on 27.v.1991 and revisited them on 9.ix.1995. Very little loss of heather cover was apparent after four years and, without the photographs, it would have been virtually impossible to distinguish affected heather from unaffected heather. Rough counts of larvae in 1991 indicated densities of about 10-20 per square metre, with occasional patches of at least twice this density. Larvae were mostly late instars but some very small larvae were also present.

In Strath Beag at the head of Loch Eriboll on 29.V.2003, there appeared to have been a high mortality of larvae with large numbers of blackened and shrivelled caterpillar skins. The bodies of the larvae had more or less liquefied, then blackened and dried out, possibly indicating an outbreak of some bacterial or viral disease. However, not all larvae had been affected and some healthy looking pupae were also found.

West (1991. *Ent. Rec.* **103**: 89-92) gave evidence for a steady decline in the Magpie Moth during the first half of the twentieth century in many parts of the British Isles and more recently especially in urban areas. However, he concluded that the distribution and life-history in Scotland was imperfectly known, though there was evidence for decline in one urban population. On the contrary the information presented here and that of Hulme (*op. cit.*) suggest that in Scotland the Magpie Moth still occurs widely and in large colonies on heather on the mainland of the seaboard of north-west Scotland and that the heather feeding populations are not restricted to the Hebrides as historical records might suggest.

We are grateful to Keith Bland of the National Museums of Scotland for help with the literature and for helpful comments on an earlier draft of the note.– David Horsfield and Angus J. MacDonald, Scottish Natural Heritage, 2 Anderson Place, Edinburgh, EH6 5NP.

Least Yellow Underwing *Noctua interjecta* Hb. ssp. *caliginosa* (Schawerda) (Lep.: Noctuidae) in Dumfries and Galloway

The Least Yellow Underwing is widespread and local over much of England and Wales, with fewer records in the north of England (Heath, J. and Emmet, A.M. 1979. *The Moths and Butterflies of Great Britain and Ireland*, vol 9, p. 163), and only widely scattered singletons, probably vagrants, recorded in Scotland. The Scottish Insect Record Index gives the following in chronological order:

VC 89	*Perth Soc. Nat. Sci.* **5:** 1914: 121
Aviemore	*Ent. Rec.* **63**: 12 (1951)
Invernessshire	*Ent. Rec.* **66**: 63 (1954)
Badenoch	*Ent. Rec.* **80**: 37 (1968)
Shetland	*Ent. Rec.* **109**: 274 (1997)
St Cyrus	*Ent. Rec.* **114**: 145 (2002)

While light trapping along the Galloway coast (on our own or as part of the Dumfries and Galloway Group of Entomological Recorders) we have found this species at a few locations only, indicating that it is probably a widespread resident but rather local and uncommon. In Wigtownshire: Barsalloch Point, at O. S. grid reference NX 346412 (1 on 25 July 1999). In Kirkcudbrightshire: Brock's Hole, Rascarrel, NX 800475 (1 on 12 August 2000); Mersehead RSPB Reserve, NX 934552 (1 on 20 July 2003); Castle Muir Point, NX 797472 (2 on 6 August 2003); Barlocco Bay, NX 794471 (2 on 6 August 2003); Dundrennan MOD Range, NX 709439 (1 on 22 August 2003). It has also been recorded in Dumfriesshire: a single near the Brow Well, at NY 081674, on 11 August 1996 (D. Patterson and J. Randell, *pers. com.*). All the above sites are coastal, and the habitats mainly consist of low lying open grassland with some scrub, and most often adjacent to shingle or vegetated dune systems.

With thanks to Keith Bland for supplying records from the Scottish Insect Record Index and for comments on an earlier draft of this note. Peter Norman brought the single Dumfriesshire record to our attention.— RICHARD & BARBARA MEARNS, Connansknowe, Kirkton, Dumfries DG1 1SX.

MORE ABERRATIONS OF *COLIAS ELECTO ELECTO* L. (LEP.: PIERIDAE) FROM THE CAPE, SOUTH AFRICA

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22 Maris Green, Great Shelford, Cambridge CB2 SEE.

Abstract

Three new aberrations of the African Clouded Yellow, *Colias electo electo* L. are described from the South-Western Cape Province of South Africa. Ab. *inconstantis* ab. nov., ab. *pallidula* ab. nov. and ab. *memorabilis* ab. nov. all involve scale deformation and/or pigment deficiency. Speciation of butterflies in The Cape is briefly discussed.

Introduction

During the ten year investigation of *Colias electo electo* L. ab. *capensis* in the foothills of the Riviersonderend Mountains of the South-Western Cape (McLeod & MacLeod, 2002) several other aberrations were found in the population. Some of these were single individuals and can be considered as extremely rare, while others were more numerous with several examples being obtained during a single day. Numbers were, however, so low as to make it likely that each aberration was the offspring of a single female.

Descriptions of the new aberrations

***Colias electo electo* L. ab. *inconstantis* ab.nov. (Plate F, Figs. 1 – 4)**

Holotype ♂ Riviersonderend, Cape, South Africa, 10. xi. 1998, L. McLeod

Allotype ♀ Riviersonderend, Cape, South Africa, 15.xi.1998, L. McLeod

Paratypes 5♀♀ from the type locality, 16. xi. 1998, L. McLeod

All specimens are in the collection of L. McLeod. The phenotype is characterised by the presence of patches of transparent scales, totally lacking in pigment, randomly distributed and variable in size, thus causing each individual to be unique. This character is particularly evident on the undersides of both fore and hind wings. To the naked eye these patches appear to be grey in colour, resulting from the wing membrane showing through the transparent scales. The upper sides of both fore and hind wings exhibit normal patterns but the colours are less brilliant and somewhat faded, even in fresh specimens. Unlike ab. *capensis*, the scale shape and orientation is normal and the fringes are pink in those areas of the wings that remain pigmented. In extreme examples, the undersides tend to be devoid of markings or with markings greatly reduced. Occasionally the underside ground colour appears to be almost entirely white. Sometimes the extremities of the wings tend to be bleached.

***Colias electo electo* L. ab. *pallidula* ab. nov.**

Holotype ♀ Riviersonderend, Cape, South Africa, 20.x.1993, L. McLeod

Paratypes 6 ♂♂ from the type locality, 20.x.1993, L. McLeod.

All specimens are in the collection of L. McLeod. In the field, the initial impression is that these are worn individuals, but on examination this assumption is seen to be incorrect. This aberration is characterised by an overall reduction in pigmentation resulting in a phenotype which has "normal" markings and colours, but which is pale and relatively dull and drab. Scale shape and orientation are normal but transparent scales totally lacking pigment granules, and scales with fewer pigment granules, are scattered over both upper sides and undersides of all wing surfaces.

In males, the UV flash is reduced thus making it unlikely that ab. *pallidula* males will be accepted by a female during courtship.

***Colias electo electo* L. ab. *memorabilis* ab. nov. (Plate F, Figs. 5 & 6)**

Holotype ♀ Riviersonderend, Cape, South Africa, 21.xi.1987, L. McLeod.

The single female specimen of this unusual phenotype, which is in the collection of L. McLeod, was one of the first aberrations of this species taken by the author in the foothills of the Riviersonderend Mountains in 1987 and is mentioned in McLeod & MacLeod (2002). A second example of this aberration was observed at close range by the writer on 27 October 2003 at the same location, but unfortunately was not captured. The first noticeable difference is its small size, which is probably a distinguishing character. The measurement from wing tip to wingtip is only 30mm. At the time of capture of the first individual there were no other examples of butterflies of this size, likewise at the time of observing the second individual. This suggests that its size is genetically controlled, unlike most examples of ab. *minor* which result from food shortages in late larval life.

The main characters which distinguish this aberration from the typical form are a total lack of yellow and red pigmentation in the non-melanin-containing scales, accompanied by extreme deformation/malorientation of scales of both upper side and underside wing surfaces. This indicates a possible close relationship to ab. *capensis*. However, this aberration is far more extreme and the longitudinal rolling deformities of the scales are extensive, giving the dorsal forewing (DFW) a furry appearance. The melanin-containing scales are normal, thus the discoidal spot and marginal borders of the DFW are black. The spots enclosed by the DFW borders, and the non-melanin-containing scales of both DFW and dorsal hindwing (DHW) are white. The DHW is heavily dusted with black scales thus giving the ground colour a grey appearance, as in a typical f. *aurivilliusi* (Plate F, Figs. 7 & 8). The yellow ground colour of the ventral forewing (VFW) of the typical form is here replaced by transparent scales, which results in a "mother-of-pearl" effect when viewed from a certain angle. To the naked eye the ventral hindwing (VHW) ground colour and the VFW apex and border appear silvery blue-grey because of the wing membrane showing through the transparent scales. Pigment granules are totally lacking in these scales (cf. *Colias croceus* ab. *russwormi* Harmer, 1999). The costal spot and marginal spots are pale and indistinct while the pupils of the post discal spots of the VHW are silvery white. Fringes are also transparent.

The whiteness of the upper side ground colour does suggest that this phenotype might be an aberration of the white female f. *aurivilliusi*. It is certainly vastly different to f. *aurivilliusi* ab. *capensis*, which retains yellow pigmentation and which is illustrated in McLeod & MacLeod (2002).

Discussion

It would appear that in the South-Western Cape, the current surge of genetic changes in *C. electo* mainly affects the scale formation of the wings, including not only their malorientation and distortion, but also their pigmentation. Ab. *capensis* and the three aberrations here described are all concerned with these characters. Obviously any changes which affect the phenotype in this way will readily be seen by lepidopterists, by the butterflies themselves and perhaps by their predators. The possible effect of such changes on butterfly courtship has already been discussed in a previous paper. Scale deformation accompanied by pigment changes have also been recorded in other butterfly families (Birkett, 1976, 1978) and it may be that these characters are amongst the first to be damaged from any increases in radiation. On the other hand it may be that these changes, because they are non-lethal, allow such individuals to survive. As in all animal populations, there will undoubtedly be other changes which remain hidden, or which are lethal.

Notes on the Speciation of Butterflies in the Cape

In the South-Western Cape of South Africa butterflies are not common because most of the vegetation is sclerophyllous and its low nitrogen content is unsuitable for phytophagous larvae. Suitable larval foodplants for butterflies are relatively scarce. Despite this, the region is unusual for the high level of speciation that has taken place there, not only in the fauna but also in the flora, the ecologics of both being inter-related. Sub-speciation and eventual speciation must be preceded by segregation of populations and consequent interruption of gene flow. In the Cape Province each mountain range has a distinct climate and a distinct flora and it is these contemporary conditions of dissected landscape, soil diversity and moisture gradients which aid in the reproductive isolation of butterfly species and also appear to be conducive to speciation and endemics. Fluctuations of other inhibiting factors such as diseases, predators and parasites, scarcity of foodplants etc. may from time to time, reduce the population of a species by contracting its range to favourable areas. In this way several populations will arise which may remain isolated from each other long enough

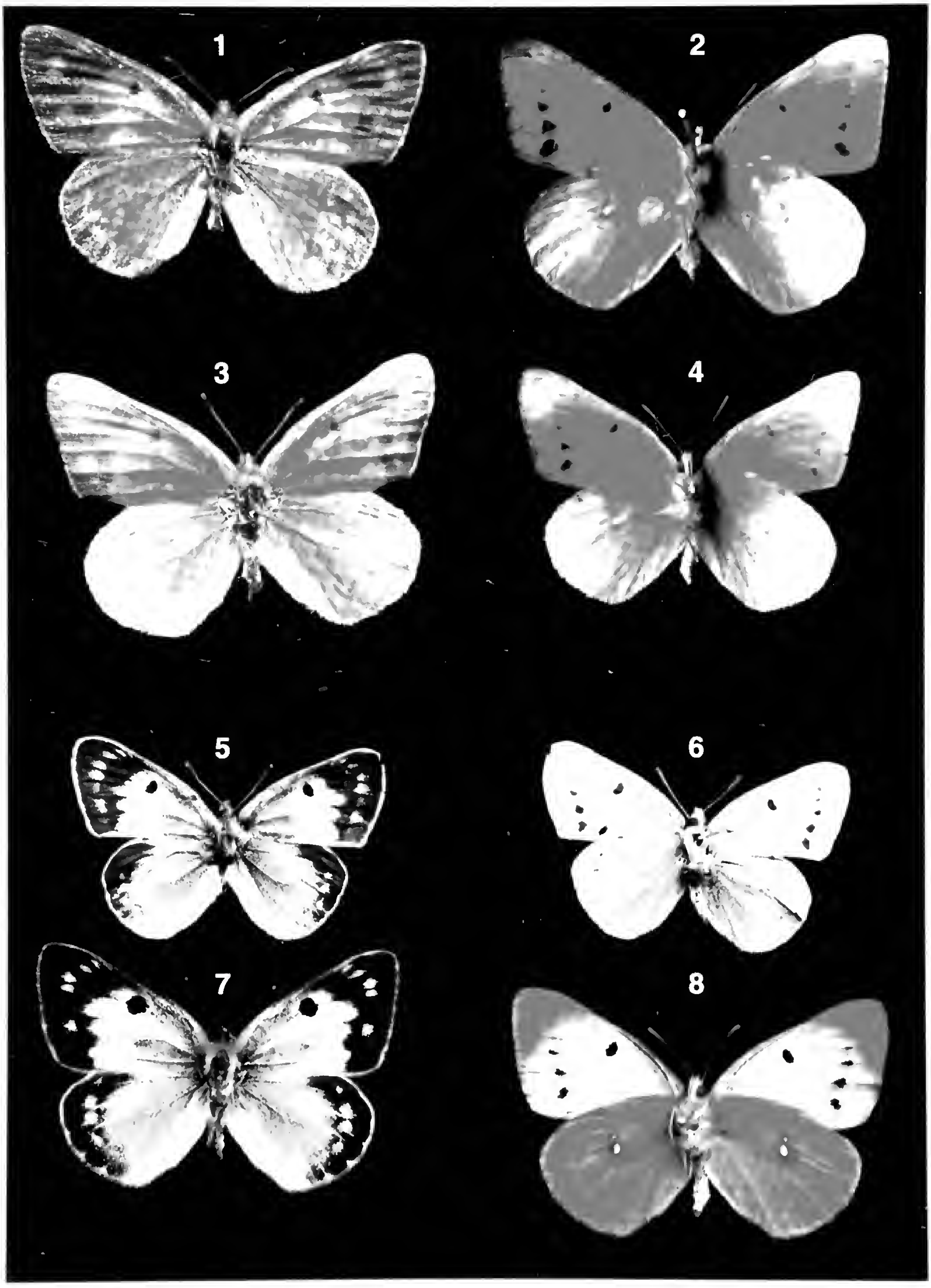

Plate F. Aberrations and forms of *Colias erate erate* L. Figs. 1 & 3. ab. *inconstantis* ab.nov. ♂ Uppersides; Figs. 2 & 4. ab.*inconstantis* ab.nov. ♀ Undersides; Fig. 5. ab. *memorabilis* ab.nov. ♂ Upperside; Fig. 6. ab *memorabilis* ab.nov. ♀ Underside; Fig. 7. f. *aurivillinsi* Upperside; Fig. 8. f. *aurivillinsi* Underside.

for sub-speciation or speciation to take place. Frequently several closely related species can be found within relatively small areas. The remarkable levels to which the situation has evolved in the Cape can best be seen in the Lycaenidae. Almost every mountain range, of which there are many, has produced its own species or subspecies. (Some authorities in South Africa are of the opinion that in past years there has been an over-enthusiasm for describing new subspecies. It is now considered that many of the so-called subspecies previously described are merely based upon characters which are not genetically constant.) Fires may have aided in the process of speciation by creating barriers of "inhospitable" land between the mountain ranges and even by the elimination of intermediates. Fires are such a common event, although irregular in occurrence, that certain plant groups have evolved to require the presence of smoke and/or burning of the seed coat to stimulate seed germination. Fires have thus become an integral and important part of the ecology of the region (Pringle 1994) and are essential for the continuation of the *fynbos* flora. The recent very high levels of UV-B radiation, which result from South Africa's close proximity to holes in the ozone layer, might also be responsible for chromosome/DNA damage in insects and resulting genetic aberrations. Studies of the genetic aberrations and range of variation within a species population may help us comprehend more fully the processes of speciation and evolution within the genus.

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Red-headed Chestnut *Conistra erythrocephala* (D.& S.) (Lep. Noctuidae): The first Devon specimen since 1906

A male Red-headed Chestnut was taken at light by Andy Trout at Shaugh Prior, Dartmoor on 12 February 2004. The identification was confirmed by myself and the specimen has been retained in my collection.

Parfitt (1878. *The Fauna of Devon Lepidoptera*, Vol. 10. Devonshire Association) says that one example was taken at sugar on 5 November 1856 at Ivybridge, and that this was the second specimen taken in England. Barrett (1906. *Victoria County History of Devon*) repeats this record, and adds "Honiton" with no date. Stidston (1952. *A List of the Lepidoptera of Devon*, Part 1 and introduction) repeats the claim that the 1856 record was the second in England and adds that the captor of this specimen was J. J. Reading.— ROY MCCORMICK, 36 Paradise Road, Teignmouth, Devon TQ14 8NR.

Convolvulus Hawk-moth *Agrius convolvuli* (L.) (Lep.: Sphingidae) in Hampshire

Whilst setting up a Heath Trap in my garden at around 10 pm on 8 August 2003, I noticed a large moth "dive-bombing" smaller moths along the flower border. A short while later I saw the moth again, apparently nectaring at some pink hollyhocks *Alcea rosea*. Later still, I found the moth resting on a glass door panel and was at last able to recognise it as a Convolvulus Hawk-moth – in fresh condition.

Given that this is the first time I have recorded this species in my garden it is incredible to note that between 8 August and 23 September 2003 another eleven examples were recorded at light here. In addition to the example on 8 August, a male, there were also: 14 August – 1 male, 1 female, 17 August – 1 female, 19 August – 1 male, 22 August – 1 male, 6 September – 1 female, 14 September – 1 female, 17 September – 1 male, 22 September – 1 female and 23 September – 1 female. This new species of hawk-moth for my garden list ended a magnificent summer in which no less that eight species of Sphingidae were recorded: Convolvulus, Privet, Lime, Poplar, Eyed, Large Elephant, Pine and several Humming-bird Hawks, the latter persisting throughout the summer and early autumn.— K. J. COKER, Porch House, Wickham Common, Fareham, Hampshire PO17 5DN.

EDITORIAL NOTE: Readers are reminded that this journal has, for a great many years, carried the definitive summary of immigrant Lepidoptera records for the British Isles. Indeed, that for the year 2001 appears in this issue. All records of immigrant moths, especially those that have not been published in a mainstream entomological journal, should be sent to the authors listed at the head of the paper on page 1 of this volume of *Entomologist's Record*.

Bloxworth Snout *Hypena obsitalis* (Hb.) (Lep.: Noctuidae) overwintering in Devon

On 4 August 2003, J. McGill, a Devon Moth Group Member, recorded an example of *H. obsitalis* at Prawle Point, South Devon, at light; this is a new locality for the species and the furthest west in Devon thus far.

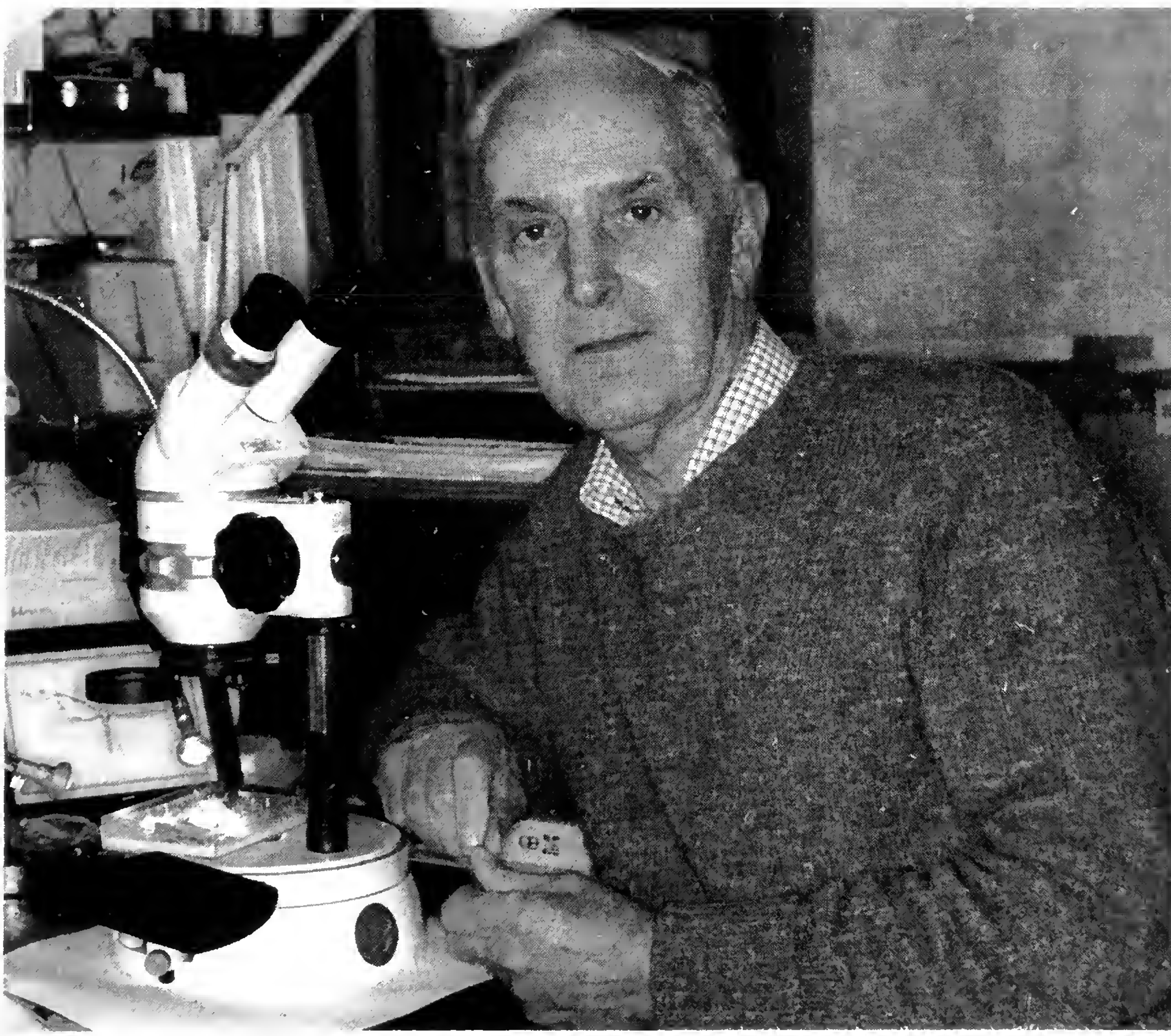
On 1 February 2004, a visit to Prawle Point was made to look for overwintering butterflies and moths in the former army bunker on the cliff top. Several Small Tortoiseshell *Aglais urticae* and Peacock *Inachis io* butterflies were seen along with the Herald *Scoliopteryx libatrix* and three Bloxworth Snout *Hypena obsitalis*. This appears to be the first positive record of the latter species over-wintering in mainland Britain. Perhaps as consequence of the high temperature in the bunker, around 10°C, these insects were easily disturbed when illuminated by torch light.

The Bloxworth Snout can now be found from Watcombe, near Torquay, all along the coastal locations past Dartford and now at Prawle Point. The larval foodplant Pellitory-of-the-Wall *Parietaria judaica* is abundant along the walls and gullies in the cliffs at Prawle and this, together with over-wintering adults, is surely evidence that this species is breeding in the area? It has not, as far as I know, spread further north from Watcombe into Teignmouth, although the foodplant is very common there too. — ROY MCCORMICK, 36 Paradise Road, Teignmouth, Devon TQ14 8NR.

OBITUARY

John David Bradley, 1920 – 2004

Like many lepidopterists John Bradley began his interest in insects during his childhood. Born in the Wimbledon area of south-west London on 24 January 1920, he left school at 16 to become a laboratory assistant in bacteriology at the London School of Hygiene and Tropical Medicine. He then joined the British Museum (Natural History) as a Preparator in 1938, but the war interrupted and he spent six years in the armed forces serving in North Africa, Italy and Austria.



He returned to the BM(NH) after the war and began work on the curation of Meyrick's collection and from then on his emphasis was on microlepidoptera, in due time specialising in the Tortricidae. Together with E. L. Martin he produced an illustrated checklist of British Tortricidae in 1956-59. In 1964, he joined the Commonwealth Institute of Entomology, still based in the British Museum (Natural History). His main task was identifying microlepidoptera sent in from many parts of the world, and so he became familiar with many pest species. He published some 120 papers between 1950 and 2000 of which many were on tropical pests, but best known are his works with Gerry Tremewan and Arthur Smith in *British Tortricoid Moths*, published by the Ray Society, on whose council he served. He was editor of the *Entomologist's Gazette* from 1960 until late 1964.

John worked on a revision of Kloet & Hincks' *Checklist of British Lepidoptera*, taking care of the microlepidoptera whilst Steve Fletcher did the macros and the new list was published in 1972. His interest in the British fauna was shown by continued work on checklists producing "The Log Book" in 1979 (*A Recorder's Log Book or label list of British Butterflies and Moths*. Harley Books) and then a privately published Indexed list in 1986 which was rather spoilt by many errors in the process of publication. Subsequent checklists in 1998 and 2000 have proved very useful and his numbers introduced with the *Log Book* have proved invaluable in an increasingly computerised world. On his desk was a list entitled "2004", even though he was admitted to hospital for the last time on 2 January; he died two days later on 4 January 2004.

For amateur microlepidopterists John was a fountain of knowledge, with resources of the BM(NH) at his disposal. He took trouble to keep us informed of changes in the nomenclature and was always ready to help – even if he appeared a little shy at first. In addition he was often keen to get involved with fieldwork, joining expeditions to the Burren with Robin Mere and Teddy Pelham-Clinton; as if to reinforce this a picture of the Burren Green *Calamia tridens occidentalis* Cockayne was painted over his garage at Osterley! A survey of Buckingham Palace gardens began in 1960 and he identified the microlepidoptera trapped there until the time when he left London after his retirement from the Museum in about 1980. As a full time employee at the Natural History Museum he was not permitted to keep a personal collection, but within the Museum he built up a collection of micros from Buckingham Palace, as well as from the Burren. He also developed a collection of microlepidoptera of economic importance. After he left London and settled in Somerset he became involved with the Somerset Moth Group and made his experience and expertise available to them, although poor health prevented him from getting out into the field in recent years.

As a scientist in the BM(NH) John had dealings with entomologists all over the world. He appears in the "Acknowledgements" section of almost every work on microlepidoptera in recent decades and was warmly regarded by many colleagues; his friend Prof Dalibor Povolný in the Czech Republic enabled his studies to be submitted to the Charles University, Prague where he was awarded a Ph.D. degree.

As well as being a knowledgeable entomologist John was a very likeable person with a dry sense of humour. He will be missed by many as a friend as well as a colleague. Our sympathy is extended to his family: Jane, Michael and David.

David Agassiz

Two records of the Snow Flea *Boreus hyemalis* (Mec.: Boreidae) from west Wales

On 14 December 2003, while recording mosses and liverworts in Cwm Berwyn, Cardiganshire (VC 46) with Arthur Chater, I noticed a female Snow Flea sitting on a tuft of the moss *Amphidium mougeotii* in a crevice on a sandstone rock face. After a few minutes of being watched and photographed, the insect jumped off the moss and was not relocated. The rock face is part of Craig Clogan (O.S. grid reference SN 726582), a south-facing outcrop of Silurian rocks at 550m above sea level.

A few weeks later, on 25 January 2004, I saw another female Snow Flea during a bryophyte recording trip in Carmarthenshire (VC 44). This one was on mosses on a block of Old Red Sandstone in a gully on the Carmarthen Fan. It was sitting on *Anoectangium aestivum* and growing nearby were the mosses *Schistidium apocarpum sensu stricto* and *S. crassipilum* and the liverwort *Frullania tamarisci*. The Carmarthen Fan (SN 816218) is the imposing crag above Llyn y Fan Fach; the Snow Flea was noted at 640m above sea level.

This elusive relative of the common scorpion flies (*Panorpa* spp.) is almost certainly under-recorded in south Wales. There are a few previous records for Cardiganshire, but neither the National Recorder Colin Plant nor Ian Morgan knows of others from Carmarthenshire. Bryologists, who tend to peer closely at tufts of moss, seem likely people to spot more Snow Fleas. I have alerted a few other members of the British Bryological Society to the existence of these beautiful metallic insects.— SAM BOSANQUET, Cyngor Cefn Gwlad Cymru (Countryside Council for Wales), Winchway House, Winch Lane, Haverfordwest, Pembrokeshire SA61 1RP) (E-mail: S.Bosanquet@ccw.gov.uk).

Lasius brunneus (Latreille) (Hym.: Formicidae) and Yellow-legged Clearwing *Synanthedon vespiformis* (L.) (Lep.: Sesiidae) in Kensington Gardens, Inner London

Richard Jones (*Ent. Rec.* **115**: 28) records the ant *Lasius brunneus* at Nunhead Cemetery and several other localities in urban London south of the Thames, including Battersea Park. On 19 July 2002, a few workers of this species were in evidence on the exposed lower trunk of an old Sweet Chestnut *Castanea sativa* near the Round Pond (O. S. grid reference TQ 2680) in Kensington Gardens, Middlesex (VC 21). The record falls just inside a 10km square without records on the distribution map published by Alexander & Taylor (1998, *Br. J. ent. Nat. Hist.* **10**: 217-219) and reproduced in Edwards (1998, *Provisional Atlas of the Aculeate Hymenoptera of Britain & Ireland Part 2*, ITE).

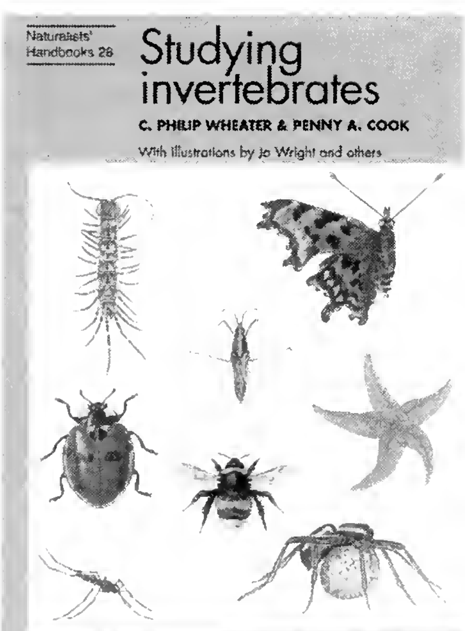
I have also recently recorded *L. brunneus* at Stanmore Country Park (TQ 1793), Bushy Park (TQ 1669) and near Kempton Park Racecourse (TQ 1170), all during 2001, and near Harrow Weald (TQ 1492) in 2003 – all Middlesex sites. It seems likely that further fieldwork would show this increasing species to be as widespread north of the river, as Jones demonstrates that it is few miles further to the south and as it is known to be in southern Hertfordshire, for which county a tetrad distribution map has recently been published (Attewell, *Trans. Herts. Nat. Hist. Soc.* **35**: 23).

A male Yellow-legged Clearwing *Synanthedon vespiformis* attracted to a pheromone lure elsewhere in Kensington Gardens on the same date as the above record confirms the continuing presence of this species on site. The clearwing, too, occurred in a section of the park containing mature *Castanea sativa*, with which A. A. Allen (*Ent. Rec.* **112**: 83) suggests a possible association in the Greenwich district. The opportunity exists for London-based users of clearwing pheromone lures to carry out a co-ordinated search for this long-known inhabitant of the Inner London zone, to establish clearly the current extent of the species' distribution in the central area.

I would like to express my gratitude to R. W. J. Uffen, the Recorder for Aculeate Hymenoptera in Middlesex, for his very helpful correspondence and for drawing my attention to the lacuna on the published maps for *L. brunneus*.— C. M. EVERETT, The Lodge, Kytes Drive, Watford, Herts WD25 9NZ (E-mail: cm.everett@ntlworld.com).

BOOK REVIEWS

Studying invertebrates by **C. Philip Wheater & Penny A. Cook.** *Naturalists' Handbooks* number 28. 120 pp, paperback, A5: ISBN 0 85546 313 9. The Richmond Publishing Co. Ltd. Price: £9.95.



This useful, and indeed necessary, little book on studying invertebrates covers the investigative process from its inception to the presentation of results. Its hundred or so pages of text are divided into six chapters – three on data gathering and three on analysis and presentation. The first, rather brief chapter is concerned with designing an investigation. Basic data types are described and the rudiments of (statistical) experimental design given. Chapter two is mainly concerned with the practicalities of sampling the various types of invertebrates from different habitats. Methods for measuring the properties of a habitat, such as microclimate, monitoring soil and water as well as surveying the vegetation are given in some detail. There follow descriptions of the standard techniques for sampling invertebrates from water (marine and fresh), land and air.

Identification is the topic of the third chapter. Seven pages take the reader from marine invertebrates via freshwater species to Terrestrial types. There are numerous references to standard and specialist texts. As the authors say "Some species-rich groups of small invertebrates can be parcicularly challenging to identify." Having collected the data there now follows the analysis. This is dealt with in three chapters, totalling 60 pages. A rather superior 'cook book' approach is used for the statistical methods given. The great advantage of this is that almost no statistical prior knowledge is assumed. The format used is that of a 'box' for each technique – from frequency tables to Chi square tests. Each box lays out clearly the sequence of steps in the calculation, with numerical values given for a particular example.

Chapter Four 'Describing data' deals not only with the standard statistical descriptors of frequency, mean, standard deviation etc., but also with what might otherwise be called cluster analysis, here under the heading of diversity and evenness indices. The Lincoln Index for the capture-recapture problem is presented and other method are mentioned and referenced. No mention, however, is made of how to deal with the 'missing data' situation. On to Chapter Five – 'Statistical testing' and the statistical 'core' of the book. Here, in 30 pages, ten standard statistical tests, both parametric and non-parametric, are covered. Following biological practice, three keys are used, each leading to a subset of tests. Key A is Statistical tests for differences, Key B is Statistical tests for relationships and Key C is Statistical tests for analysing frequencies. And so to the final chapter – three pages on 'Presenting your results'. Bar charts, pie charts, Box and whisker plots and scatter plot come thick and fast.

There follows a list of 'useful addresses' and two appendices – one on calculating statistics with a mathematical glossary and the second of Statistical Tables. The 'References and further reading' section stretches to 179 items, of which a mere dozen (about 7%) refer to statistical or quantitative sources. This book takes the student a long way along the statistical and other components of studying invertebrates.

Emil De Maria

Of moths and men, Intrigue, tragedy and the peppered moth by Judith **Hooper**. Fourth Estate, 2003. xx plus 377 pp., soft cover. £8.99. ISBN 1 84115 393 1.

If any review of this book has appeared in our most popular journals then I have missed it: such an omission would be remarkable, indeed an oversight, for it is the most erudite commentary on the prominence given to melanic *Biston betularia* experiments of H. B. D. Kettlewell and the wide presence of that significance in books on evolution over the past thirty years.

The author has, in a most compelling feat of journalism, mastered the intricacies and nuances of the arguments that have accumulated about evolution ever since Darwin, Larmarck and the ancients through the famous names of world geneticists and mathematicians like Huxley, Fisher and Haldane to the savants of the present day. This impressive achievement is made all the more readable, and indeed exciting, by the choice prose and pace of this distinguished writer who never misses with powerful one-liners, or with her delivery of short, punchy but devastatingly gripping, descriptive phrases. Her no-nonsense pen-portraits of these figures of lepidopteran history are "warts and all" so that heroes of our early days follow that all-too familiar political parallel of fallen idols.

There are many supporting roles and well-written walk-on parts by such as Demuth, Heslop Harrison, P. B. M. Allan, Sir Cyril Clarke and Cockayne in this star-studded cast who pop in and out of Kettlewell's own personal story, of high-life at Oxford, of enmity and jealousy amongst learned alumni, while more innocently there are deliciously sharp commentaries on lepidopterists in general. Thus page nine "moth people are a breed apart, weirder and crazier than butterfly people. They have this male bonding thing; they have a language all their own, a latinized vocabulary, since the moths and the food plants have Latin names. Like other rapt hobbyists lepidopterists can be crushing bores if you are not one of them". "Some moth men have the stunted social skills of the more monomaniacal hackers, going about with mis-buttoned shirts and uncombed hair, spouting taxonomic Latin". Or on page 11 "A typical breeding handbook, this one translated from the German, throws the reader into a realm more demanding in its way than neurosurgery or nuclear physics. The sense of secret lore, the painstaking (and numbingly boring) instructions, the solitary, never-ending toil, is reminiscent of early alchemical treatises." And again, page 71 "Non-entomologists picture 'butterfly hunting' as the most serene and uncompetitive of sports, somewhere between crocheting and backgammon, but nothing could be less true. The drive to be the first to 'take' a particularly variety (the vaguely sexual overtones are no accident) or to find its breeding ground rivals the cut-throat avidity of prospectors in California in 1849"; while much of this may be rather over the top and certainly outdated, it is in line with current popular demand for spicy text, but there is always more than just a little grain of truth.

Those of us who have taken E. B. Ford's 'Butterflies' and 'Moths' as seismic shifts in the understanding of Lepidoptera will be shocked to read of the character of this learned don. Page 78 "In general Henry behaved as if he were auditioning for the Great Book of Eccentric Oxford Dons. People who knew him find the temptation to mimic his mannerisms irresistible. The eyes close halfway, as if world-weary. A sort of asthmatic throat-clearing precedes the first word. Then the unmistakable voice: high-pitched, mannered, smooth as oil, every syllable articulated, each vowel elongated. It has the effect of a High-Church sermon, with a tinge of something more louche." Having first met K in 1937, Ford recruited him to his School of Ecological Genetics in 1951 and the first *betularia* experiments soon followed. It may still come as a surprise to many of us that the Kettlewell's 1953-55 experiments of marked-released-recaptured bred stock of melanic, intermediate and typical *betularia* were found at an early date to be suspect and the ensuing fall-out brought famed protagonists into battle on both sides of the Atlantic. There is an underlying implication that Ford contributed to Kettlewell's scientific embarrassment. Disillusionment quickly set in for K in spite of enhanced reputation within his circle of amateur moth-ers. Kettlewell's burning ambition, it seems, was to transform a medical MA into an Oxford D.Sc. and then to FRS. The tragedy was that such a tireless, gifted, field-worker could be so ensnared by the lure of scientific fame that his reputation outside of Oxford grew tarnished and his standing within the Oxford School increasingly belittled. This, in the grip of declining health and family disappointment, resulted in his death in 1979 "apparently from an accidental overdose of the painkiller". His epitaph might be – in the words of a quoted contemporary "He was the best naturalist I have ever met and almost the worst professional scientist."

This story has an unexpected late final twist where it emerges that while K's experiments are now agreed to have been badly planned and flawed, nonetheless his basic belief that *betularia* melanism was indeed to be explained by evolution remains alive and sustainable; and the reason for the rapid increase in melanic moths in the latter part of the 19th century from Europe to the USA has never been fully agreed.

The whole book is an encapsulation of one story of evolution as evinced by the peppered moth and, as a student's introduction to that subject, hard to beat. As a readable yarn it must earn a place at the top of popular science; it is investigative journalism at its best, supported by an overwhelmingly convincing list of revealing Notes that combines literary references with quotes from personal letters and papers of the principal characters. Details of academic achievements are listed along with choice, stunning quotes and above all sources of material obtained at interview. Add to this a wide-ranging Bibliography, a selective but highly useful Glossary and a thorough and well-organized Index and one simply marvels at the author's industry and energy.

Those of us who knew the principals will read this with nostalgia and sadness. Yet I urge all moth-ers young and old to buy their copy, but to warn them that it will not be easy to put down until the last page. And then to read it again.

Gerry Haggett

Continued from back cover

Obituary

Book Reviews

THE ENTOMOLOGIST'S RECORD
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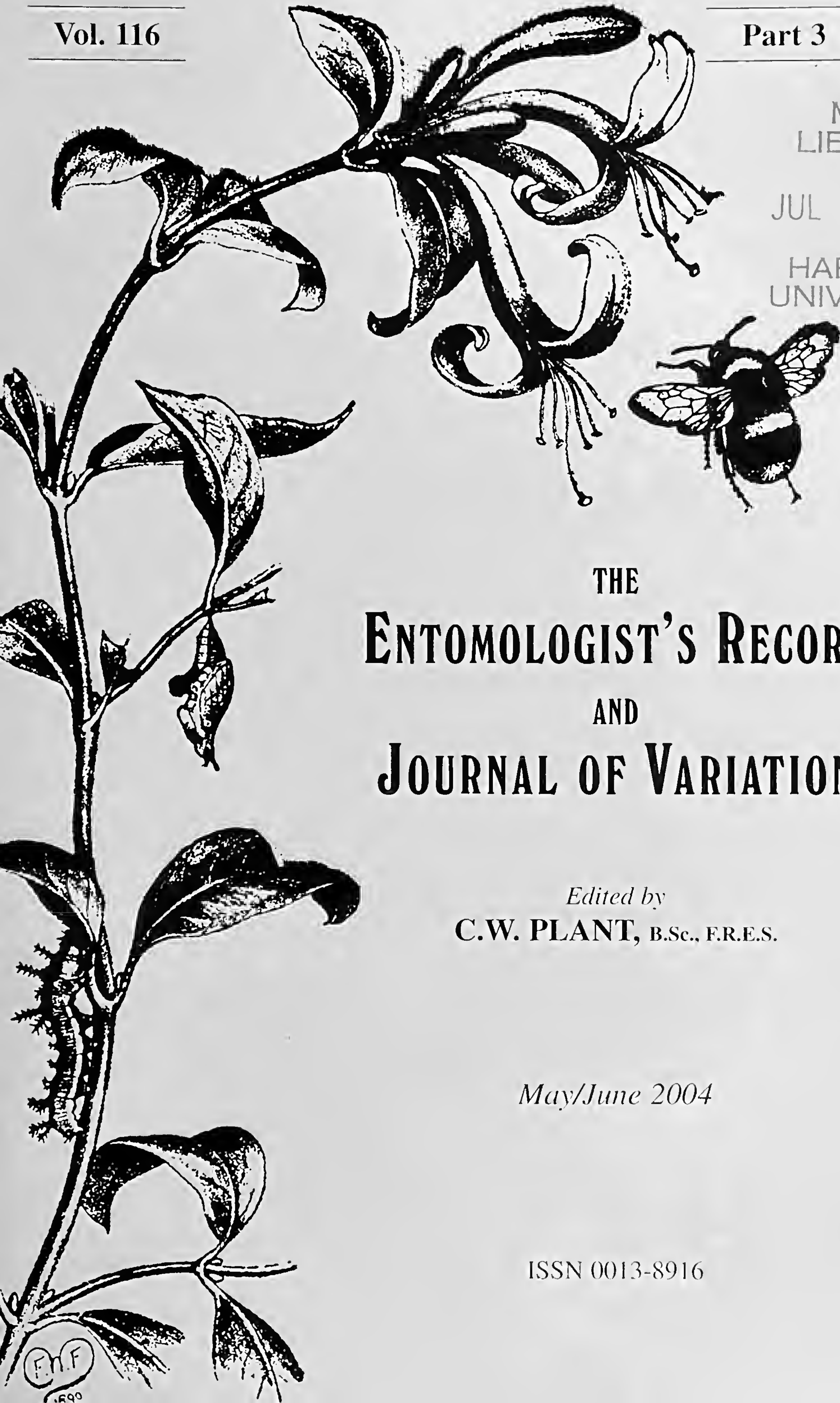

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RESIDENT AND REGULAR MIGRANT BUTTERFLIES ON THE ISLES OF SCILLY

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Abstract

The butterfly fauna of the Isles of Scilly is reviewed on the basis of regular recording since 1975 and with reference to earlier published lists. The history and current status of the species are discussed.

Introduction

In 1976, I published an account of the butterflies recorded on the Isles of Scilly during August 1975; this has been cited in a number of subsequent descriptions of the islands' butterfly fauna (Agassiz, 1981; Smith, 1997; Dennis & Shreeve, 1996). I visited the islands again in August 1976, but did not return until August 1988. Since then I have visited almost annually (August 1989, June 1990, June 1991, June 1992, August 1995, June 1996, April/May 1997, April 1998, August 1999, July 2001, July 2002, July 2003). Although several local lists have been published over the last three decades, these still do not always distinguish clearly between long-standing residents, recent colonists, and casual introductions or vagrants. Doubt is often expressed as to which category certain species fall into, but records and observations compiled over the course of regular visits at different times of year can shed light on their history and status.

Although it may once have been believed that the butterfly fauna of the Isles of Scilly has been more or less static since recolonisation at the end of the last glaciation, it has by now become clear that the fauna of offshore islands is subject to a constant but unpredictable succession of colonisation and extinction events (Dennis & Shreeve, 1996). Dennis and Shreeve comment on the difficulties of documenting the history of such events, despite their undoubted occurrence and inherent interest, but sufficient data is now available to begin to draw some conclusions about the butterfly fauna of the Isles of Scilly. It is evident that the islands' species list is constantly changing, with species unpredictably appearing and disappearing, along with considerable evidence for what Dennis and Shreeve characterise as 'potential colonisation' (records of isolated individuals with no evidence of permanent establishment).

In view of the absence of its foodplants, the three twentieth century records of *Gonepteryx rhamni* (L.) (Penhallurick, 1996; Smith, 1997) are obvious examples of 'potential colonisation'. Because of the paucity of recorders at that time, it is impossible to know whether *Nymphalis polychloros* (L.) was ever established on Tresco in the 1930s (Richardson & Mere, 1958), but it is obviously long gone. *Lasiommata megera* (L.), listed as a resident in two recent lists (Spalding & Sargeant, 2000; Wacher, Worth & Spalding, 2003), may once have been temporarily established, as a cluster of records from 1962-1963 (Smith, 1997) might suggest, but was not seen by Richardson and Mere in the 1950s (or by any earlier observers) and has certainly not been resident in the period since 1975. On the other hand, local naturalists report that *Pararge aegeria insula* is still regularly mistaken for *L. megera* by inexperienced observers, so some records of the latter may be misidentifications. Penhallurick (1996) cites evidence that *L. megera* is a migrant to Scilly. Published records (Smith, 1997) of *Coenonympha pamphilus* (Linnaeus), definitely not a resident today, have also, and more unanimously, been attributed to migration (Penhallurick, 1996; Spalding & Sargeant, 2000; Wacher, Worth & Spalding, 2003).

As for the more recent isolated records (documented by Smith, 1997 & 2002) of *Anthocharis cardamines* (Linnaeus), *Ladoga camilla* (L.) and *Polygonia c-album* (L.), there is no evidence that any of these have ever established a breeding population on the islands. *P. c-album* is listed as a definite or possible resident in recent lists (Spalding & Sargeant, 2000; Wacher, Worth & Spalding, 2003) but should be regarded, as it is by Penhallurick (1996), at present as an occasional migrant. The record of *Plebejus argus* (L.) mentioned in Emmet & Heath (1989) cannot be substantiated, and is undoubtedly the result of a misidentification (Smith, 1997 and personal communication). The unconfirmed record of *Pyronia tithonus* (L.) mentioned by Smith (1997) is also most likely to be an error.

Excepting the above and such well-known rare migrants as *Danaus plexippus* (L.), the islands' current butterfly fauna consists of three long established sedentary residents (*Lycaena phlaeas*, *Polyommatus icarus* and *Maniola jurtina*); three current residents with curiously intermittent histories (*Pieris napi*, *Inachis io* and *Pararge aegeria*); six regular migrants or residents supported by migration; and two modern colonists (*Celastrina argiolus* and *Aphantopus hyperantus*) whose abrupt appearance in recent times is well documented. The islands' Hymenoptera fauna shows a similar pattern, with conspicuous species like *Andrena flavipes* Panzer being well established by the 1990s, but unrecorded by extensive surveys in the 1960s (Beavis, 2000), and others like *Bombus pratorum* (Linnaeus) appearing since 2000 (Beavis, 2003).

Although many records have been published from the smaller uninhabited islands, the following account is mainly concerned with the five inhabited islands of St Mary's, Tresco, St Martin's, St Agnes and Bryher. Gugh, with two houses and linked to St Agnes by a tidal sand-bar, is sometimes included as a sixth inhabited island; here the phrase 'all the inhabited islands' should be taken as excluding Gugh unless otherwise stated. For present purposes, butterfly habitats may be conveniently divided into coastal and inland categories. Coastal habitats consist mainly of sand dunes, heathland and grassland; since the 1950s there has been considerable encroachment of bracken following the decline of grazing. Tall bracken stands and windbreak trees and shrubs create sheltered areas along a coastline that would otherwise be entirely open. Inland habitats include, along with lanes and farmland, a number of areas of woodland planted as windbreaks. There are also wetland areas including the fringes of the large bodies of fresh water that occur on all the inhabited islands except St Martin's; the two major 'pools' on St Mary's are surrounded by extensive areas of reed beds, damp meadows and secondary woodland, which are known as Lower and Higher Moors.

Systematic list

Pieridae

Colias croceus (Geoffroy)

Since 1975, I have recorded the Clouded Yellow on only a few occasions. Although 'common in some years' (Agassiz, 1981) such as the summer of 1998 when breeding occurred (Hicks & Hale, 1998), and recorded from all the inhabited islands (Dennis & Shreeve, 1996), it is clearly very irregular in its occurrence. Hicks and Hale (1998) report that currently on St Agnes 'sightings vary annually from nil to six' (apart from the exceptional year of 1998).

Pieris brassicae (Linnaeus)

In 1975 I found the Large White to be 'fairly common', as it was in 1976. Since 1988 I have recorded the Large White regularly, but not commonly, from a variety of inland and coastal sites on all the inhabited islands. It is probably a largely migratory species in Scilly, lacking a strong permanently resident population, especially in wild habitats.

Pieris rapae (Linnaeus)

Since 1988 I have recorded the Small White regularly from inland and coastal sites on all the inhabited islands, but (apart from an occasional migrant influx) have not found it to be particularly common or numerous. As with the Large White, it is presumably a largely migratory and synanthropic species in Scilly, but unlike that species there is some evidence for continuity in wild habitats such as Lower Moors on St Mary's.

Pieris napi (Linnaeus)

The Green-veined White has an ambiguous history in Scilly, as it was said to be common by Blair in 1925, but was not reported by Richardson and Mere in the 1950s. It seems not to have been recorded again until 1961 (Smith, 1997). Although some recent authors cast doubt on its resident status (Wacher, Worth & Spalding, 2003), it is undoubtedly resident at the present time, and has been since at least the 1970s. Currently it appears to have its strongest populations on St Mary's. I have recorded it regularly from the wetland areas of Lower Moors, Higher Moors and Holy Vale, with a scattering of records from other sheltered inland and coastal sites. The only other islands on which I have found it are Tresco (occasionally from 1995, mostly around Great Pool and Abbey Pool) and St Martin's (once in 1976). There are records from the other inhabited islands (Penhallurick, 1996), but it is clearly not permanently established on St Agnes (Hicks & Hale, 1998) or Bryher.

Lycaenidae

Lycaena phlaeas (Linnaeus)

Since 1975 the Small Copper, an old established resident, has proved to be common on all the inhabited islands (including Gugh), although (in contrast to the Common Blue, with which it shares its habitat) it never occurs in numbers. It occurs mostly in open grassland and heathland on the coast, with relatively few inland records.

Polyommatus icarus (Rottemburg)

The Common Blue is currently one of the three commonest resident butterflies, widespread and often numerous in coastal heathland and grassland on all the inhabited islands (including Gugh). Like the Small Copper, it is less common at inland sites such as the Moors of St Mary's. Ford's (1945) description of an alleged local race on the uninhabited island of Tean, characterised by females with silvery blue scales and a high proportion of certain underside aberrations, has inspired great interest, and a number of unsuccessful attempts have been made to rediscover it (Barrington, 1996; Smith, 1997). Unfortunately, as Barrington describes in some detail, that island's habitat has deteriorated greatly since Ford's day, with encroachment of bracken and bramble over most of the open ground which this species formerly inhabited. This had already happened by the time of my first visit in 1975, when the population of *P. icarus* was found to have become extremely sparse. However, as Dennis (1977) and Barrington point out, the underside characters supposed to be a distinctive feature of the Tean butterflies are in fact not uncommon among those of the islands in general. It is also the case that striking female forms with extensive light blue coloration do occur, in some years not uncommonly, on St Mary's and other inhabited islands. It would seem that through long isolation the Scillonian population of *P. icarus* as a whole has come to exhibit distinctive features; namely, a tendency to produce unusual female colour forms and certain underside aberrations at a higher frequency than in mainland Britain.

Celastrina argiolus (Linnaeus)

The Holly Blue is undoubtedly a recent colonist, first recorded in the 1970s. Previous authors (such as Smith, 1997) have given the earliest record as being from St Mary's in 1977, although Penhallurick (1996) comments on the fact that a post-1961 record (for which he could not locate the source) from Scilly features on the Biological Record Centre's distribution maps as published by Howarth in 1973. There are in fact three specimens on display in the Isles of Scilly Museum with data labels indicating that they were taken on St Mary's in April 1973. Although these represent the earliest records so far known, they do not necessarily explain Penhallurick's puzzle, since the maps in Howarth are said to include only records up to June 1972. Records from Tresco seem to begin in October 1978 (Penhallurick, 1996; Smith, 1997). I saw no sign of this species in 1975 and 1976, but it was in evidence on my return in 1988. Agassiz (1981) describes it as 'fairly common', the same status as he gives for *Polyommatus icarus*, but I have found it to be much more localised and less numerous than the latter. It is seen most frequently at inland sites like the Abbey Gardens on Tresco or the Moors of St Mary's, but it also occurs in sheltered spots near the coast. Although the strongest populations appear to be on St Mary's and Tresco, it is also resident on St Agnes (Hicks & Hale, 1998). Although it has been recorded from St Martin's and Bryher (Dennis & Shreeve, 1996), it is probably not currently resident on these two islands.

Nymphalidae

Vanessa atalanta (Linnaeus)

Generally the commonest nymphalid on all the inhabited islands (including Gugh), the Red Admiral is more frequent in some years than in others, but with a population that displays considerably more stability than the next species. It appears in a wide variety of inland and coastal habitats. On St Mary's inland records are in the majority, and here a marked tendency from the 1990s towards yearly recurrence at sites such as the Moors may suggest a more or less permanent resident population. Hicks and Hale (1998) report evidence suggesting overwintering on St Agnes in the 1990s.

Cynthia cardui (Linnaeus)

The Painted Lady is common in favoured years (such as 1996) on all the inhabited islands (including Gugh), but at other times apparently absent. This pattern of records, combined with a strong bias towards open ground on the coast, presents a marked contrast with the preceding, confirming the impression of a species dependent on migration for its continued occurrence on the islands. Breeding takes place in some years, and there was evidence of overwintering in 1994-5 (Hicks & Hale, 1998).

Aglais urticae (Linnaeus)

Since 1975 I have recorded the Small Tortoiseshell regularly on all the inhabited islands (including Gugh), although it has not been a particularly numerous species. The population appears to be stable, with no evidence of the marked population crash that occurred in recent years in mainland Britain. It is found in a variety of inland and coastal sites.

Inachis io (Linnaeus)

Although records of the Peacock exist from all the inhabited islands (Dennis & Shreeve, 1996), and it is generally accepted as a resident, I have found this to be a surprisingly scarce species. Since 1975 (when only three were noted), I have only seven records from St Mary's, four from Tresco and one from St Martin's. Six of these records were in 2003, and the rest between 1995 and 1998. Its history on Scilly is difficult to interpret, as Blair (1925) spoke of it as fairly common, Richardson and Mere (1958) failed to record it, while Agassiz (1981) described it as common. Bletcher (1978) suggests it is only common in some years (local naturalists have told me similarly that it has 'good and bad years'), and Hicks & Hale (1998), speaking of St Agnes in the 1990s, describe it as rare. It could be mainly migratory, with an intermittent resident population.

Pararge aegeria insula Howarth.

Apart from two old records (from 1903 and the 1920s), the Speckled Wood was not definitely recorded from Scilly until 1967 (Smith, 1997), although it has subsequently become one of the islands' commonest species. Even as early as 1971 it is described as being 'abundant' (Summers, 1975). Since the island subspecies is so clearly distinct from *P. aegeria tircis* (Godart) of mainland Britain, it would be natural to assume that this butterfly must have existed continuously on the islands for thousands of years. On the other hand, it is difficult to believe that such a conspicuous insect (whose habit of resting on sunlit foliage beside footpaths brings it naturally to the attention of any passing observer) could have remained unseen for so many decades, even escaping the surveys of Richardson and Mere in the 1950s. Some authors (such as Penhallurick, 1996) therefore regard its current status as that of a recent colonist. In that case, the two old records would represent either 'potential colonisation' that came to nothing, or a former period of temporary establishment that ended in extinction. Another curious fact is the existence of a remarkably similar form on the Channel Islands (comparing specimens from Guernsey and Scilly, I find that collectively they are indistinguishable); but this could support either theory regarding the Speckled Wood's status on Scilly. There is certainly some biogeographic link between the Isles of Scilly and the Channel Islands, since some undoubtedly endemic Scillonian forms among the Hymenoptera have corresponding races on the latter. Richardson (1978) described *Andrena thoracica sarnia* from specimens taken on both groups of islands, and attributed Alderney specimens of *Bombus muscorum* (Linnaeus) to his subspecies *scyllonius*. It could, however, be argued that the current population of the Speckled Wood in Scilly results from a colonisation event that took place in the late 1960s, but that the source of colonisation was the Channel Islands rather than mainland Britain.

Since 1975 I have found this butterfly to be one of the three commonest species. It occurs, often in numbers, in shady spots on all the inhabited islands (including Gugh). Its core populations seem to be associated with inland habitats such as tree-fringed lanes, wooded areas, and sheltered wetlands like the Moors of St Mary's, but it is often to be found on the coast too, wherever the cliff paths are shaded by tall foliage such as bracken and brambles.

Maniola jurtina cassiteridum Graves

The Meadow Brown, an old established resident, is one of the three commonest butterflies and probably the most ubiquitous on all the inhabited islands (including Gugh). Most characteristic of open ground, whether on the coast or inland, where it is often numerous, it also shares some of the more sheltered spots (such as the Moors of St Mary's and Abbey Wood on Tresco) with the preceding. Although the status of the islands' population as an endemic subspecies has been disputed, it undoubtedly has a strong tendency to produce more brightly coloured upperside forms (with extended light patches in both sexes) and more contrasting undersides than is usual in mainland Britain.

Aphantopus hyperantus (Linnaeus)

The Ringlet is the islands' most recent colonist (Smith, 2002), and at present its establishment seems to have been highly successful. It was first recorded from St Martin's in July 1995 (Wagstaff, 2002), and in the following year it was found also on St Mary's and Tresco. There have, however, been few subsequent records from Tresco (Wagstaff, 2002). In July 2001-2003 I found this species to be well established and widespread on St Mary's and St Martin's. As well as isolated singles, there was a distinct pattern of localised pockets of activity, with up to twelve individuals flying within a small area. Its habitat consisted of shady inland tracks and footpaths, wooded areas, and sheltered spots on coastal paths.

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Northern Arches *Apamea zeta assimilis* (Doubleday) (Lep.: Noctuidae) discovered in Dumfriesshire

Seven examples of Northern Arches were trapped at light near Wanlockhead, Dumfriesshire, in an extensive area of open grassland and heather moor. One was found at 725m on 2 August 2003 on the summit of Lowther Hill (O. S. grid reference NS 890106) and we found six more on the lower slopes at 530m the following night (NS 883117).

Heath and Emmet 1979 (*Moths and Butterflies of Great Britain and Ireland* **10**: 186-188) describe this species as widespread in the Scottish Highlands, with Arran and Midlothian shown as the most southerly sites. The latter refers to records at Edinburgh in 1954 and 1978 (*Entomologist* **88**: 40 and *Ent. Rec.* **90**: 338). When reporting on its first discovery at Edinburgh, Pelham-Clinton suggested that "it may well be widely distributed in high moorland bogs in the border counties, not many of which have even been well worked with sugar and probably none with the mercury-vapour lamp". Fifty years later, the high ground in southern Scotland is still relatively un-worked, but the nature of these new records indicates that the species is resident and breeding in Dumfriesshire. It is likely to be much more widespread, as indicated by Waring and Townsend, 2003 (*Field Guide to the Moths of Great Britain and Ireland*, p. 348) who mention a single record from Northumberland on 13 July 1992. Evidently, much more work is required to establish the southern range of Northern Arches.

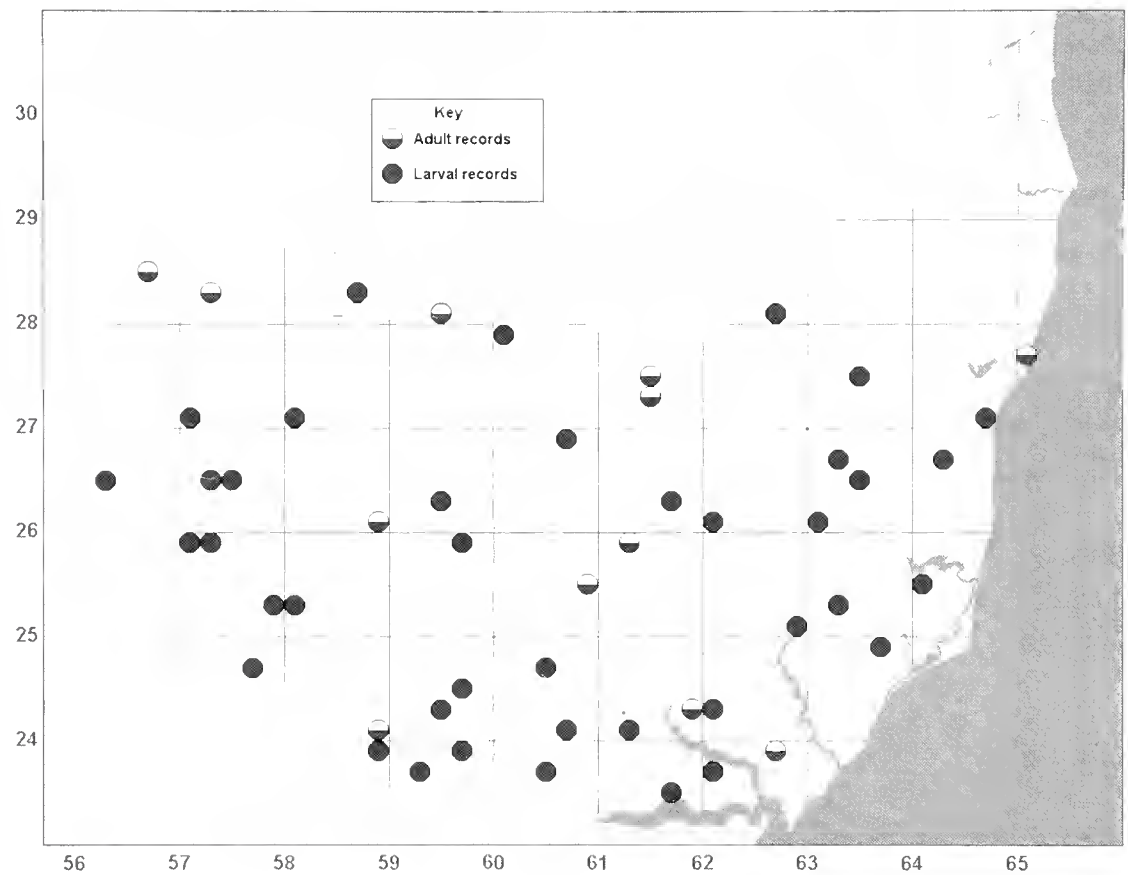
We would like to thank Keith Bland for confirming the identity of two specimens and for bringing the two Edinburgh records to our attention.— RICHARD AND BARBARA MEARNS, Connansknowe, Kirkton, Dumfries DG1 1SX.

Search for larvae of Buttoned Snout *Hypena rostralis* (L.) (Lep: Noctuidae) in Suffolk, 2003

Having heard and read reports of successful searches for the larva of this species in other south-eastern counties I thought it would be useful to carry out a similar search in Suffolk in 2003. Recent records of the moth in Suffolk prior to 2003 have consisted of occasional scattered reports of the adult at light with no records of larvae. As the foodplant, Hop *Humulus lupulus*, is widespread and reasonably common throughout most of the county chances of success seemed reasonable. The plan was to attempt to find the larva in as many 10 km squares as possible in the county rather than try to assess population levels or density within a more limited area.

I spent several days through July and early August driving around the lanes of Suffolk looking for Hop growing in roadside hedgerows. Having located the foodplant rustling the leaves over a butterfly net with the net stretched flat over the rim usually produced larvae in a short period of time, no more than ten minutes. I opted for the smaller butterfly net 'beating tray' as the normal beating tray I found was more awkward to get under the leaves of the foodplant when growing in a hedgerow and it seemed to work effectively enough. Hops in hedgerows, growing over trees and metal wire fences all proved productive and the amount of hop at a site did not need to be particularly great to hold larvae.

Over the period Hop was beaten at forty-seven different locations and produced larvae at thirty-three of these. This represented a presence of the larva in thirty-two 10 km squares out of the fifty-six that cover Suffolk, or fifty-seven percent of the 10km squares. The species has now been recently recorded (post-1980) from seventy-three percent of 10km squares in Suffolk as either an adult or a larva (Map 1).



Map 1. Post-1980 distribution (by 10Km squares) of Buttoned Snout in Suffolk.

I am grateful to Sharon Hearle, Neil Sherman and Andy Musgrove for additional larval records from within the county during 2003.

The following list indicates the dates and localities where larvae were found in 2003.

6th July	Chelmondiston (TM 206376), Holbrook (TM 172358)
9th July	Thetford (TM 172358)
10th July	Raydon (TM 046376 & TM 062408), Elmsett (TM 045467), Lindsey (TL 978457), Edwardstone (TL 946430), Boxford (TL 964399), Assington (TL 923368), Little Cornard (TL 886389), Stansfield (TL 784523), Hawkedon (TL 805524)

12th July	West Stow (TL 801711)
13th July	Thelnetham (TM 016786), Finningham (TM 078695), Dunwich Forest (TM 464702)
16th July	Bromeswell (TM 296503), Rendlesham (TM 326534), Iken (TM 415556), Butley (TM 378486)
18th July	Barrow (TL 755644), Herringswell (TL 717703)
19th July	Cretingham (TM 215606)
23rd July	Rattlesden (TL 978593), Drinkstone (TL 958620)
24th July	Ousden (TL 718584), Lidgate (TL 718584)
27th July	Parham (TM 307605), Bruisyard (TM 343647 & TM 321662), Mendham (TM 273819), Huntingfield (TM 341741), Middleton (TM 436679)
30th July -	Debenham (TM 175642), Gazeley (TL 737642)
31st July	Wherstead (TM 132406)
1st August	Newmarket (TL 633653)

In the north-western and north-eastern areas of the county it proved rather difficult to locate the larvae or the foodplant. However, as not much time was spent searching these particular areas it may not be significant. Based on my experiences I did not find the field tip to look for leaves with central holes as an indicator of the presence of the larvae particularly useful.

From the results it would appear that Buttoned Snout is well distributed throughout most of Suffolk. It would also seem that numbers are relatively healthy as no more than ten minutes was spent searching for the larvae at each site and with sites where the larva was present producing up to seven larvae.— TONY PRICHARD, 3 Powling Road, Ipswich, Suffolk (e-mail: tony.prichard@btinternet.com).

Recent additions of Moths to the Isle of Wight

The following species of moths are new to the Isle of Wight:

Eriocrania salopiella (Stt.).
5 July 2003 at Sandown airport by Dr David Biggs; confirmed by Dr John Langmaid.

Epinotia trigonella (L.)
10 August 1995 at Freshwater by Sam Knill-Jones.

Epinotia bilunana (Haw.)
27 June 1996 at Freshwater by Sam Knill-Jones; determined by Keith Bland and Brian Elliott.

Assara terebrella (Zinck.).
11 July 2003 & 26 August 2003 at Totland by Sam Knill-Jones.

Conobathra tumidana (D. & S.).
26 July 2003 at Totland by Sam Knill-Jones.

Nascia cilialis (Hb.)
7 August 2003 at Totland by Sam Knill-Jones.

Dioryctria sylvestrella (Ratz.)
4 August 2003 and 7 August 2003 at Bonchurch by James Halsey.

Ennomos autumnaria (Werneburg)
29 August 2003 at the Dinosaur Park, Sandown, observed and photographed by G. A. Henwood.

Macaria signaria (L.) Dusky Peacock
23 June 2003 at Bonchurch by James Halsey. This is the thirteenth British record.

Lacanobia splendens (Hb.) Splendid Brocade
5 July 2003 at Totland by Sam Knill-Jones.

Heliothis nubigera (H.-S.) Eastern Bordered Straw
23 July 2003 at electric light at the coast guard cottages at Alum Bay near the The Needles, by Martin Harvey & Dan Hoare. This is the sixth British record of this species.

Finally, records for four Jersey Mocha *Cyclophora ruficiliaria* (D. & S.) on 16 August 2003 Gompton Bay and a further one on 18 August 2003, by Alec Kolaj, Diane and Peter Sharp await confirmation that they are this species.– SAM KNILL-JONES, 1 Moorside, Moons Hill, Totland, Isle of Wight P039 OHU.

Pandemis heparana* (D. & S.) (Lep.: Tortricidae) feeding on Hop *Humulus lupulus

Further to my note on Lepidoptera found on Hop *Humulus lupulus* L. while searching for larvae of the Buttoned Snout *Hypena rostralis* L. (*antea*: 77-78), I also collected a small green tortricoid larva from the hedgerow at Etton, Northamptonshire, on 19 July 2003. This larva was subsequently reared on Hop, duly producing an adult moth on 2 August 2003 which has since been identified as *Pandemis heparana* (D.&S.) – the Dark Fruit-tree Tortrix The identification was provided by Barry Dickerson, County Moth Recorder for Huntingdonshire, to whom I am most grateful. *Pandemis heparana* has been reported from various trees and shrubs, especially *Malus, Prunus, Pyrus, Tilia, Salix, Lonicera, Betula, Ribes, Vaccinium* and *Myrica* (Bradley, Tremewan & Smith, 1973. *British Tortricoid Moths.* Ray Society), but neither this work, nor Emmet (1979. *A field guide to the smaller British Lepidoptera*, BENHS) report this species as feeding on Hop. The larval foodplant data-base (HOSTS) at the website of the Natural History Museum does record *Humulus* as a food-plant, possibly on the basis of records from North America. As hops are grown commercially, this foodplant record may be of particular interest. — PAUL WARING, Reader, Centre for Environment & Rural Affairs, Writtle College, Essex. Address for correspondence: Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS (e-mail: paul_waring@btinternet.com).

THE UTILISATION OF SIX METRE COUNTRYSIDE STEWARDSHIP SCHEME GRASS MARGINS BY THE GATEKEEPER *PYRONIA TITHONUS* (L.)(LEP.: NYMPHALIDAE)

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Abstract

The utilisation of six metre Countryside Stewardship Scheme (CSS) grass margins by *Pyronia tithonus* (L.) (Lep.: Nymphalidae) was investigated at two farms in Essex between 1997 and 2000. At Writtle, significantly more *P. tithonus* were seen on the control section than on the six metre grass margins, while at Greenstead Green *P. tithonus* abundance was greater on the six metre grass margins. Overall *P. tithonus* abundance significantly increased between 1997 and 2000, but there was no significant difference in *P. tithonus* abundance between establishment methods. It is suggested that to produce six metre grass margins suitable for *P. tithonus* they should be sown with a range of wildflowers and fine leaved grasses, managed by cutting the outer four metre width (adjacent to the crop) in autumn and leaving the inner two metres (adjacent to the hedge) uncut. They should be connected to other semi-natural habitats to allow for *P tithonus* minimum habitat requirement of one to two hectares.

Introduction

Due to the dramatic transformation of arable systems since the 1940s (Dover, 1997) large areas of semi-natural grasslands have been lost (Asher *et al.*, 2001) or agriculturally improved. This has resulted in a marked reduction in the number of butterfly species that can be supported. Thomas (1984) observed that improved grassland can only support one to three species while semi-natural grassland can support 19 to 28 species. Asher *et al.* (2001) suggested that there has been a decline in butterfly distribution and abundance over the last 150 years, but this is not entirely due to changes in farming practices as climate change, urbanisation, pollution and land drainage have all played a major role.

In an attempt to reduce food surpluses and restore grassland to arable areas, grass margins around arable fields were introduced in the Countryside Stewardship Scheme (CSS). In the scheme, two types of grass margins, 2 m and 6 m, can be established. The aims for both types of margin are to buffer field boundaries, streams and rivers and provide wildlife habitats. However the establishment and management are different.

The six metre grass margins are established using a range of at least four grasses from a list provided by MAFF, with no more than 40% from one grass. The seeding rate is 20 kg/ha and where possible the seed should be native and of British origin. The six metre grass margins must be cut four times in the first year and then cut each year after 15 July with all the cuttings removed. In 1997, the farmers were paid £35 per 100 m per year for the six metre grass margins but this was reduced in 2000 to £32 per 100 m per year (MAFF, 1997).

The preferred habitat of *Pyronia tithonus* is tall grassland next to hedgerows, trees and scrub (Asher *et al.*, 2001). Thus CSS six metre grass margins could be beneficial to *Pyronia tithonus* provided that a range of larval foodplants such as *Agrostis* spp., *Festuca* spp., *Poa* spp., and *Elytrigia repens* are available, together with suitable nectar sources.

This study investigates the utilisation of six metre grass margins as set up and managed under the CSS, by *Pyronia tithonus* at two farms in Essex during the period 1997 to 2000.

Method

This study was undertaken at two farms in Essex who joined the CSS in 1996. Butterfly and plant monitoring work was undertaken at Writtle (NGR: TL 670070) and Greenstead Green (NGR: TL810288) during the period 1997-2000. Four six metre grass margins and one control section (non margin) were established at each site (Table 1), using two different seed mixtures (Table 2). At Writtle different methods were used to established the six metre grass margins. One was sown, two were developed by natural regeneration while one was established from a grass ley. All the margins at Greenstead Green were sown.

Pyronia tithonus abundance was monitored between July and August each year using the transect method (Pollard, 1977). Monitoring was undertaken once a week, when weather conditions were suitable (Pollard and Yates, 1993), on eight six metre grass margins and at two control sections (field edges without grass margins). The total observations were summed and the number of *Pyronia tithonus* per km per visit was calculated.

The analysis of the data was completed using Mann-Whitney for comparing unmatched samples and Friedman's test for comparison of multiple samples.

Results

At Writtle there were significantly more *Pyronia tithonus* observed ($U=6$, $P<0.05$) on the control sections than on the six metre grass margins. At Greenstead Green a greater number of *Pyronia tithonus* were seen on the six metre grass margins than on the control sections, but this difference was not significant (Table 3). The abundance of *Pyronia tithonus* on the six metre grass margins was significantly greater ($U=4$, $P<0.05$) in 2000 than in 1997 (Table 4).

The six metre grass margins were established using various techniques but there was no significant difference in *Pyronia tithonus* abundance on them (Table 5). The abundance was greatest on the six metre grass margin established next to a field in permanent set-aside (G6.4), significantly more than on a nearby six metre grass margin (G6.1) which was next to arable crops ($H=10.87$, $P<0.05$) (Table 6). Both of these had been established at the same time and using the same seed mixture.

There was no significant relationship between *Pyronia tithonus* abundance and area of grass margin, length of hedgerow next to margins or abundance of larval foodplants.

Discussion

Various authors have identified that *Pyronia tithonus* abundance is associated with hedges (Dover *et al.*, 1997), tall grassland (Asher *et al.*, 2001) and field boundaries and ditches (Feber *et al.*, 1996), so one might expect CSS six metre grass margins would be beneficial to *Pyronia tithonus*. However the only really successful six metre grass margin was the one established next to the permanent set-aside. *Pyronia tithonus* abundance increased dramatically on that margin between 1998 and 2000, while only increasing slowly on the other six metre grass margins. At Writtle, *Pyronia tithonus* abundance was significantly greater on the control section than the six metre grass margin. That control section had a good range of suitable nectar and larval plants and was uncut over the research period.

Table 1. Attributes of the margins at the two farms.

	Section length (m)	Comments	Date set up
Writtle			
W6.1	631	Natural regeneration	Oct 96
W6.2	701	Natural regeneration	Oct 96
W6.3	720	From ley	Oct 96
W6.4	190	Sown mixture 1	Oct 97
WN6.5	450	No margin	
Greenstead Green			
G2.1	417	Sown mixture 2	Oct 96
G2.2	322	Sown mixture 2	Oct 96
G2.3	166	Sown mixture 2	Oct 96
G2.4	345	Sown mixture 2	Oct 96
GN2.5	250	No margin	

It is suggested that there are three main reasons why *Pyronia tithonus* abundance was not greater on the six metre grass margins. The management of the six metre grass margins did not suit *Pyronia tithonus*. The six metre grass margins were cut when *Pyronia tithonus* were just at their peak and as all the material had to be removed under CSS regulations, most of the eggs, which take 11 to 30 days to produce larvae (Porter, 1992) would have been removed with the cut material (Field, 2002). Smith *et al.* (1993) observed that for *Pyronia tithonus* summer cutting was the worst option for both sown and unsown margins in a range of trials. The best options for both sown and unsown margins were firstly uncut and then a cut in spring and autumn.

Table 2. Seed mixtures used on the six m margins at the two farms.

Seed mix	Writtle Mixture 1	Greenstead Green Mixture 2
Cynosurus cristatus	25%	7.5%
Festuca ovina	15%	25%
Agrostis tenuis	15%	5%
Festuca arundinacea	12.5%	
Dactylis glomerata	12.5%	
Alopecurus pratensis	5%	
Agrostis tenuis	5%	
Festuca pratensis	5%	
Festuca rubra ssp. *commutata*	5%	55%
Poa pratensis		7.5%

Table 3. Abundance of Pyronia tithonus (mean number/km/visit) on the six m margins at two farms.

	Number of 6 m margins	Margin mean	Range	Control
Writtle	4			
July 1997		1.5	0-4.3	9.5
July 1998		1.5	1.1-5.4	5.8
July 1999		2.3	0-18.2	21.1
July 2000		2.9	0.7-5.9	10.6
Mean		**3.6**[a]		**11.8**[b]
Greenstead Green	4			
July 1997		0		
July 1998		1.2	0.5-2.2	0
July 1999		4.9	1.6-8.2	0.7
July 2000		19.3	1.8-58.7	1
Mean		**6.4**		**0.6**

Means followed by a different superscript are significantly different at $P<0.05$, Mann-Whitney U test

There was also a lack of nectar sources for *Pyronia tithonus* on the six metre grass margins. Feber *et al.* (1996) could predict the abundance of *Pyronia tithonus* in their trials by abundance of plants such as *Knautia arvensis*, *Leucanthemum vulgare* and *Centaurea* spp., all of which were absent from all the six metre grass margins in this trial (Field, 2002). The range of grasses available as larval foodplants in all the six metre grass margins should have benefited *Pyronia tithonus* but Dover (1999) suggested that the limiting factor for butterflies in today's arable landscape is the lack of nectar sources.

Table 4. Abundance of *Pyronia tithonus* (mean number/km/visit) on the six m margins by year

	Mean abundance	**Range**
July 1997	1.1^{a}	0-4.3
July 1998	2.2	0.5-8.2
July 1999	5.5	0-18.2
July 2000	11.2^{b}	0.7-58.7

Means followed by different superscripts are significantly different at P<0.05, Mann-Whitney U test

Table 5. Mean abundance (range) of *Pyronia tithonus* (mean number/km/visit) by establishment method

From ley	**Sown**	**Natural regeneration**	**Sown next to set-aside**
3.3	2.9	4.4	23.02
(0.7-4.7)	(0-9.1)	(0-18.2)	(2.2-58.7)

Table 6. Mean abundance (range) of *Pyronia tithonus* (mean number/km/visit) on sown six metre grass margin

W6.4	**G6.1**	**G6.2**	**G6.3**	**G6.4**
1.7^{ab}	1.3^{a}	5.2^{ab}	4.5^{ab}	23.02^{b}
(0-3.9)	(0.5-1.8)	(0.6-7.9)	(1.5-9.1)	(2.2-58.7)

Means followed by different superscripts are significantly different at P<0.05, Friedman's test

One other possible problem is the minimum habitat requirement of *Pyronia tithonus*. Thomas (1984) identified that *Pyronia tithonus* needed 1 to 2 ha of suitable habitat and none of the six metre grass margins were anywhere near that required size. The best six metre grass margin for *Pyronia tithonus* was linked to an area of permanent set-aside which then meant an area of suitable habitat of over 2 ha, plus an area where all the cuttings were not removed.

To benefit *Pyronia tithonus*, six metre grass margins should be sown with a range of fine leaved grasses and wildflowers, the inner two metre (next to the hedge) should be left uncut and the other four metres should not be cut until autumn. The six metre grass margins need to be alongside hedgerows and ditches and, where possible, linked to other areas of semi-natural habitat to create large enough areas of suitable habitat.

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THE LARVAL HABITS OF SNAKEFLIES (RAPHIDIOPTERA: RAPHIDIIDAE)

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Abstract

Field observations and laboratory rearing have revealed that existing data on tree associations within the British Raphidioptera are incorrect. Some valid associations are presented.

Anyone who has worked deadwood for insects will be aware that snakefly larvae are to be found in the deadwood of virtually all species of tree and shrub. They are most often found beneath loose bark on branches within the first few years following death. It is therefore surprising that Fraser (1959) linked each species so closely to one or two particular tree species: *Atlantoraphidia maculicollis* (Stephens) and *Subilla confinis* (Stephens) with pine and larch, *Phaeostigma notata* (Fabricius) with oak and *Xanthostigma xanthostigma* (Schummel) with willows. Plant (1994) has already pointed out that there seems to be no evidence to support the willow association.

Atlantoraphidia maculicollis has now been reared from pupae twice and in both cases in association with native broad-leaved trees within ancient semi-natural woodlands in Gloucestershire:

- Hailey Wood (SO90), Cirencester Park, reared from pupa in the bracket fungus *Inonotus dryadeus* on a mature ride-side oak, collected 3.xii.1989;
- Folly Wood, Dursley (ST79), reared from pupa collected from beneath loose bark on fallen dead trunk of wych elm *Ulmus glabra*, 4.iii.1984.

The species has also been encountered as an adult in the field on many occasions, and most often by beating oak branches, both of woodland trees and open-grown parkland, wood pasture and hedgerow trees. The species has been found right across south-western England – Cornwall, Devon, Dorset, Somerset, and Gloucestershire – as well as in Surrey, and so this is not just a localised feature of the species' ecology. This association with oak and other native broad-leaved tree species contrasts with Fraser's (*loc. cit.*) experience. Thus the record for *A. maculicollis* from Selborne well away from pines (Aston, 1997) is not at all surprising and does not imply a long dispersive flight.

One further rearing record supports Fraser's association of *Phaeostigma notata* with oak:

- Sherborne Park, Dorset (ST61), reared from pupa in the bracket fungus *Inonotus dryadeus* on a mature open-grown parkland oak, collected in April 1996.

My records of adult *P. notata* are from exactly the same situations as described above for *A. maculicollis*: by beating oak branches, both of woodland trees and open-grown parkland, wood pasture and hedgerow trees. Sites were in Surrey, Worcestershire, Warwickshire, Shropshire, and Montgomeryshire

Subilla confinis is a little known snakefly, and Plant (1994, 1997) identifies the need for information on the species of trees on which this species is found. As noted above, Fraser (1959) indicates that it is confined to pine and larch, but this is not the experience in Gloucestershire. One was beaten from elder blossom underneath an ancient pear tree and another from a dead branch of an ancient plum tree in a large area of mixed orchards in Westbury-on-Severn (SO71), Gloucestershire, 25.v.2003. Snakefly larvae were also found beneath bark on the old fruit trees, although none were reared successfully – no other snakefly species was found as adult in these orchards so there is a strong suspicion that these were *Subilla* larvae. I am aware of only one previous record of this snake fly in Gloucestershire and that was from oak in the north Cotswolds, 15.vi.1998, P.F. Whitehead. Whitehead (pers. comm.) comments that he has nearly always found it on oak (also from ash) and has confirmed *Quercus robur* as the larval habitat.

In my experience the fourth British species, *X. xanthostigma* occurs in similar situations to those described for *A. maculicollis* and *P. notata*. Records are from Gloucestershire, Wiltshire, Worcestershire, Warwickshire, Norfolk, and Cumberland. Collins (2000), interestingly, reports rearing *X. xanthostigma* from spruce cones in Warwickshire.

It is clearly time to place the information about those early exclusive associations with conifers on the compost heap where they belong. All four species may be found on oak although only three have definitely been reared from deadwood of this tree species. It seems probable that all four species are capable of developing in the dead wood of a wide range of tree and shrub species.

Interestingly only one of the areas mentioned has generated more than one species of snakefly – Great Wood, Virginia Water and Alderhurst, Englefield Green are two areas close to each other in north Surrey (SU96) and both have *A. maculicollis* and *P. notata* recorded. *P. notata* adults were found in early June (6th and 8th) and *A. maculicollis* adults in late June (17th and 25th), which might indicate that the adults of the two species are not active at precisely the same time of year on any one site. All of my *P. notata* records come from a very short period of the year June 6-14 (seven records) whereas *A. maculicollis* records are from a longer period May 29-July 21 (10 records). *X. xanthostigma* are also from a longer period May 15-June 26 (nine records). The comparative phenology of these species might reward some close study.

Acknowledgement

Thanks to Paul Whitehead for permission to refer to his unpublished records.

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Some moths in north Pembrokeshire, Wales, during 2003

In 2002, several of us living in north Pembrokeshire (VC 45) renewed our interest in Lepidoptera, something we had all enjoyed during our youth. Early in 2003, we decided to record on a more formal basis as a group and, for convenience, the Pembrokeshire Lepidoptera Recorder gave us our name North Pembrokeshire Moth Group (NPMG). This is a brief summary of our group and individual activities throughout the season which we hope will be of interest to other lepidopterists. When viewing our records, it should be borne in mind that Pembrokeshire has been little worked, especially in the rural north. Regular NPMG trapping between April and November, using a generator to power 4 × MV traps and a vertical white sheet, produced a number of useful records (CR = County record). Nationally Notable category B species are indicated by the abbreviation "Nb".

Tycanol NNR SN094376. 17.04.2003.		
Furcula bicuspis (Borkh.)	Alder Kitten	4th CR. Early record
Drymonia ruficornis (Hufn.)	Lunar Marbled Brown	Large numbers
Pengelli NNR SN124394. 28.06.2003		
Archips xylosteana (L.)		2nd CR
Perinephela lancealis ([D. & S])		5th CR
Cilgwyn SN076367. 03.07.2003		
Archips xylosteana (L.)		3rd CR
Phlyctaenia coronata (Hufn.)		4th CR
Euphyia biangulata (Haw.)	Cloaked Carpet	Nb
Bena bicolorana (Fuessly)	Scarce Silver-lines	3rd CR
Riverslea SN058399. 07.07.2003		
Ditula angustiorana (Haw.)		4th CR
Catoptria pinella (L.)		8th CR
Amblyptilia acanthadactyla (Hb.)		2nd CR
Euphyia biangulata (Haw.)	Cloaked Carpet	Nb
Brynberian SN113353. 25.07.2003		
Euphyia biangulata (Haw.)	Cloaked Carpet	Nb
Ty Rhos SN085376. 09.08.2003		
Acleris hastiana (L.)		6th CR
Cydia splendana (Hb.)		8th CR
Pandemis corylana		6th CR
Nymphula stagnata (Donovan)	Beautiful China-mark	8th CR
Furcula bicupsis (Borkh.)	Alder Kitten	10th CR. Late record
Euphyia biangulata (Haw.)	Cloaked Carpet	Nb
Watsonalla cultraria (Fabr.)	Barred Hook-tip	4th CR
Sychbant, Cwm Gwaun SN045350. 23.08.2003		
Euphyia biangulata (Haw.)	Cloaked Carpet	Nb
Eilema caniola (Hb.)	Hoary Footman	Nb
Stilbia anomala (Haw.)	Anomalous	

Minwear Woods SN054138. 06.09.2003

Ypsolopha parenthesella (L.)		4th CR
Pandemis cinnamomeana (Treitschke)	(Male with white head)	4th CR. Late record
Trichiura crataegi (L.)	Pale Eggar	7th CR

Regular trapping by each individual on their own land is now reviewed.

Werngwyddel (O. S. grid reference SN 091392)

Liz and Philip Rapley's land lies along the bank of Afon Nyfer with an acre of informal and wild garden and an additional acre of unimproved hay meadow. On the opposite bank of the river is Llwyngoras, a mature deciduous wood dominated by oak. They recorded almost 300 species during 2003 and those of particular interest are listed below.

Yponomeuta evonymella (L.)		3rd CR, 5.07
Pandemis corylana (Fabr.)		5th CR, 4.07
Acleris forsskaleana (L.)		4th CR, 5.08
Acleris comariana (L. & Z.)		6/7th CR, 7.08;13.09
Acleris literana (L.)		3rd CR, 13.04
Acentria ephemerella ([D. & S])	Water Veneer	3rd CR, 8.08
Amblyptilia acanthadactyla (Hb.)		3rd CR, 6.11
Catoptria pinella (L.)		22,.07;16.08;22.08
Palpita vitrealis (Rossi)		2/3rd CR, 22.06;17.09
Watsonalia cultraria (Fabr.)	Barred Hook-tip	3rd CR, 5.08
Xanthorhoe biriviata (Borkh.)	Balsam Carpet	17.07;5.08;8.08
Lampropteryx otregiata (Metc.)	Devon Carpet	Nb, 27.05(2);8.08
Euphyia biangulata	Cloaked Carpet	Nb, 18.06
Hydrelia sylvata ([D. & S.])	Waved Carpet	Nb, 30.06;4.07
Furcula bicuspis (Borkh.)	Alder Kitten	6.05 - 2.06 (5)
Lacanobia contigua ([D. & S.])	Beautiful Brocade	9th CR, 21.06
Lacanobia w-latinum (Hufn.)	Light Brocade	5th CR, 31.05
Xylena vetusta (Hb.)	Red Swordgrass	7th CR, 20.04
Mormo maura (L.)	Old Lady	8/16th CR, 15.07 - 16.08 (9)
Bena bicolorana (Fuess.)	Scarce Silver-lines	4/5th CR, 10.07;4.08
Pseudoips prasinana britannica (Warr.)	Green Silver-lines	5/6th CR, 28.05;15.06
Deltote uncula (Cl.)	Silver Hook	13.07

Pencastell (O. S. grid reference SN 110460)

Peter Byles' house, together with some 50 acres of grassland, sits immediately above the cliffs at Ceibwr. He is probably the only lepidopterist in Wales to have his own colony of Black-banded! Strong winds often interfered with his trapping activities but he nevertheless recorded 140 species in 2003, including the following:

Agapeta zoegana (L.)		20.07 - 16.08 (10)
Scopula marginepunctata (Goeze)	Mullein Wave	26.08 - 4.09 (5)
Eupithecia venosata (Fabr.)	Netted Pug	13.05
Deilphila porcellus (L.)	Small Elephant Hawk	2.06 & 30.06
Polymixis xanthomista statices (Gregs.)	Black-banded	Na, 24.08 - 24.09 (20)
Stilbia anomala (Haw.)	Anomalous	3.09 - 27.09 (13)
Pyrrhia umbra (Hufn.)	Bordered Sallow	8th CR, 2.09. Late record
Hadena confusa (Hufn.)	Marbled Coronet	15.04 (2) ;30.05 – 30.06 (10)

Penybryn (O. S. grid reference SN 180430)

Roland Gill has several acres, comprising scrub woodland, wetland and unimproved grassland, which is close to the Teifi Marshes SSSI. He joined the group later in the season but still recorded 80 species, including the following:

Diurnia lipsiella ([D. & S.])		1st CR, 10.11
Acleris ferrugana ([D. & S.])		2/4th CR, 9.11;16.11;19.11
Acleris cristana ([D. & S.])		1st CR, 15.10
Watsonalla cultraria (Fabr.)	Barred Hook-tip	5th CR, 17.09
Lithophane leautieri hesperica (Boisd.)	Blair's Shoulder Knot	19.10; 20.10;1.11
Dryobotodes eremita (Fabr.)	Brindled Green	6/13th CR, 15.09 -15.10 (13)
Peridroma saucia (Hb.)	Pearly Underwing	19.11
Helicoverpa armigera (Hb.)	Scarce Bordered Straw	15.09

Maes yr Haf (O. S. grid reference SN 057389)

Tony Lewis' property, at the edge of a coastal village, has a quarter acre garden which lies against extensive castle grounds with maritime heathland beyond. During 2003 he recorded 300 species, including the following:

Tinea trinotella (Thunberg)		1st CR, 26.05
Phyllonorycter geniculella (Rag.)		3rd CR, 12.09
Carcina quercana (Fabr.)		4/5th CR, 27.07;6.08
Agonopterix arenella ([D. & S.])		4/5th CR, 1.10;20.10
Syndemis musculana musculana (Hb.)		31.05
Acleris forsskaleana (L.)		3rd CR, 4.08
Acleris comariana (L. & Z.)		8th CR, 9.11
Acleris hyemana (Haw.)		2nd CR, 12.11
Acleris literana (L.)		2nd CR, 3.04
Dichrorampha petiverella (L.)		29.07(3);6.08;18.08
Pyla fusca (Haw.)		2nd CR, 6.08
Euchoeca nebulata (Scop.)	Dingy Shell	5th CR, 4.06
Eilema caniola (Hb.)	Hoary Footman	Nb, 6.08
Lithophane leautieri hesperica (Boisd.)	Blair's Shoulder Knot	5.10 - 19.11 (5)
Stilbia anomala (Haw.)	Anomalous	3.09
Pseudoips prasinana britannica (L.)	Green Silver-lines	7th CR, 9.07

Bryn Siriol (O. S. grid reference SM 942367)

Mel Ouseley's house sits in two acres in a narrow rural valley surrounded by deciduous woodland and damp unimproved grassland. With limited trapping opportunities he recorded 136 species during 2003, including:

Blastobasis decolorella (Woll.)		1st CR, 17.09
Euphyia biangulata (Haw.)	Cloaked Carpet	Nb, 2.07;15.07;5.08
Cybosia mesomella (L.)	Four-dotted Footman	24.06
Xestia agathina (Dup.)	Heath Rustic	16.09

We are particularly grateful to our County Recorder, Ron Elliott, for his help and advice and for invariably joining the NPMG outings. He has built up a comprehensive collection of records dating from 1875 and it is on the basis of these that we highlight some of the above species. Ron would particularly welcome any records, historical, old and new which anyone can provide. Our thanks also to David Slade for identifying some difficult micros. Finally, any lepidopterist visiting Pembrokeshire is more than welcome to join one of our regular field trips.– TONY LEWIS, Maes yr Haf, Feidr Castell, Newport, Pembrokeshire SA42 0PJ.

Ectoedemia amani Svensson (Lep.: Nepticulidae) second British site

On 12 July 1994, I discovered a small colony of *Ectoedemia amani* in Waresley Wood, in the south-eastern corner of Huntingdonshire (VC 31). A paper announcing this discovery of the species in Britain was published in this journal (Dickerson, 1995. *Ent. Rec.* **107**: 163-164). A further note was published in 1996, (*Ent. Rec.* **108**: 95) giving details of an indecisive search for mines and a light trapping session, which took place on 10 July 1995 during which nine *E. amani* were recorded. Since then, annual trapping at the known site has been carried out and *E. amani* has been recorded in most years. All the moths have been taken at 125 watt mercury vapour light placed approximately 60 cm above a white sheet. All records have been of males and all have occurred between 7 and 24 July, although Johansson *et al.*(1989. The Nepticulidae and Opostegidae (Lepidoptera) of North West Europe. *Fauna ent. scand.* **23**: 1-739), gives July and August as the flight period. A further search for mines was held on 2 March 1996, when four mines were found in small branches (about the thickness of a finger) of elm *Ulmus* ssp.

On 9 July 2003, I ran the mercury vapour light in Waresley Wood, as I now do annually, to check if *E. amani* is still present. One male came to the light and as is the norm it was collected and dissected for confirmation. On 15 July 2003, I ran the mercury vapour light in Brampton Wood, where I have been recording moths since 1986. As usual all moths not readily identifiable were collected. Most were then identified the following morning and released that evening, However, any that required dissection were kept for genitalia examination during the winter months. While working through the moths taken during the 15 July session I came across the very familiar genitalia of *E. amani.*

Brampton Wood lies approximately eleven miles to the north north-west of Waresley Wood, as the moth flies. It covers an area of 327 acres (132 hectares) and like Waresley Wood is owned by the local Wildlife Trust. The area where *E. amani* was taken has along the eastern side of the ride a number of small elm suckers of about the right size. A search for mines was conducted by Tony Lawrence and myself in December, but none were found. However, this is not surprising, because subsequent searches in Waresley Wood, including one for two hours during March 2003 have failed to relocate mines, even though the moth still continues to be recorded.

Translocation has been considered and ruled out as an explanation for the presence in the new site. After each moth trapping session the ground sheet and white sheet are hung out to dry, and the equipment box is left open to air. This would give any moth that was in amongst the equipment or on a sheet adequate time to fly away. Also between 9 and 15 July the equipment was used on 10 July in Gamsey Wood and on 12 July in Pingle Wood. No *E. amani* were seen at either of these sites.

It is welcome news that the moth now appears to have colonized a new site, but further work will need to be done to confirm this. If *E. amani* has spread within Huntingdonshire it must also be possible, considering the position of Waresley Wood, that other colonises may exist in adjoining counties to the south and east of Huntingdonshire.— BARRY DICKERSON, 27 Andrew Road, Eynesbury, St Neots, Cambridgeshire PE19 2QE (E-mail: Barry@eynesbury27.freeserve.co.uk).

New Lepidoptera records from a Bedfordshire site including *Ectoedemia sericopeza* (Zeller) (Lep. Nepticulidae) and *Coleophora lassella* Staudinger (Lep.: Coleophoridae)

The Rothamsted Insect Survey trap at Cockayne Hatley, Bedfordshire (O.S. grid reference TL 2549), has now been in daily operation for 28 years. Only macrolepidoptera have been identified for the whole period, but for the last ten years one of us (IW) has extracted all microlepidoptera in weekly batches to be identified and counted by the other (DM). This provides a valuable 10-year daily dataset covering all the Lepidoptera. Despite a current species list of 476 microlepidoptera, new county records still occur regularly and 2003 was no exception with four new records for Bedfordshire (Vice County 30). Two of these, *Parectopa ononidis* (Zeller), and *Coleophora prunifoliae* Doets were not particularly noteworthy but the other two species were more interesting.

Ectoedemia sericopeza (Zell.) was present in the week commencing 6 August 2003, confirmed by dissection (one male). There are few published records for this species in Britain. Heath and Emmet (1976. *The Moths and Butterflies of Great Britain and Ireland*, Volume 1) give records for VC 12 (North Hampshire) and 19 (North Essex). The Microlepidoptera Review for 1996 in this journal, adds VC 13 (West Sussex). The foodplant (Norway maple *Acer platanoides*), is present in the vicinity of the trap.

Two *Coleophora lassella* Stdgr. were identified, both by dissection of males – one in the week commencing 28 May, and one in the week from 4 June. Emmet (1996. *The Moths and Butterflies of Great Britain and Ireland*, Volume 3) shows most records of this species to be sub-maritime, in Ireland and the south-west and south of England. The Microlepidoptera Review for 1999 adds VC 21 (Middlesex). The recorded foodplant for this species is toad rush *Juncus bufonius*, which occurs in the area.— DAVID MANNING, 27 Glebe Rise, Sharnbrook, Bedford MK44 1JB and IAN WOIWOD, Rothamsted Research, Harpenden, Hertfordshire SG19 2EA.

Magpie Moth *Abraxas grossulariata* (L.) (Lep.: Geometridae) in North-east Scotland

On 4 July 2003, a Robinson trap at my home address in Banffshire (VC 94) attracted a male Magpie Moth *Abraxas grossulariata*. It was a new species for this intensively worked site. Even so, I thought little of it until two more were caught on 6 July 2003, with a further individual on 8 July 2003. This was too much for coincidence, especially when other local recorders reported the first sightings in their area of North-east Scotland (VCs 91 – 94) for many years, as follows:

VC 91 Kincardineshire: Kincorth, Aberdeen, 17.vii.2003, adult in garden by day (B. Stewart).

VC 92 South Aberdeenshire: Blackdog Links, 10.vii.2003, adult by day (N. Littlewood).

VC 93 North Aberdeenshire: Auchnagatt, 5.vii.2003, adult to light trap (C. J. Harlow).
Loch of Strathbeg, summer 2003, many adults (S. Paterson, RSPB).
New Deer, summer 2003, adult (per R. M. Palmer).

Formerly an abundant pest, Magpie Moth has become scarcer over most of Britain (West, B. K., 1991. *Ent. Rec.* **103**: 89-92). It is one of a group of species with aposematic larvae, but otherwise unrelated, for which Rothamsted light trap records show a serious long-term decline in numbers caught (Woiwod, I., 2003. *Butterfly Conservation News* **82**: 9-11).

This decline is reflected in North-east Scotland. In and around the Aberdeen urban area (VCs 91 & 92) R. M. Palmer (pers. comm.) recorded adults and larvae commonly on *Ribes* (including flowering currant) from his arrival in 1968 until 1974, with particular abundance in 1972. Numbers then dwindled, the last larval records being in 1978, though adults continued to be recorded sparingly until 1991. In North Aberdeenshire, the moth was recorded at Oldmeldrum in 1979 but has not been seen since at a continuously worked site (M. R. Young). Yet this vice-county holds the only known surviving colony of Magpie Moth in North-east Scotland, on the coast at Buchanhaven near Peterhead. Here, the moth is still recorded, sometimes in abundance as in 1996. Flowering currant is its main foodplant, though caterpillars have been found on osier *Salix viminalis*, and one on *Euonymus japonicus* in 2003 (M. Innes). In Banffshire, caterpillars were annually a pest on garden gooseberry at Aberchirder up to 1986, since when no moths or larvae have been seen (Rosemary Smith). The last VC 94 record before mine was of two caterpillars on black currant in Banff in 1990.

Remarkably, the evidence suggests that, except at Peterhead, Magpie Moth has not been a permanent resident of North-east Scotland for perhaps fifteen years. Such a conspicuous species could hardly be overlooked. Nor is there any obvious reason for its plight, as many of the gardens where the species was previously found seem unchanged and retain their *Ribes* bushes, the main foodplant in this region. Even when the species flourished in urban areas it was rarely encountered in the wider countryside.

In north-western Scotland, including the Hebrides, it is a different story. Here, Magpie Moth has remained abundant, but apparently the population undergoes great fluctuations both locally and from year to year. Also, the main foodplant is heather *Calluna vulgaris*, though other plants such as sallow *Salix* are also used. Surprisingly, even Sitka spruce *Picea sitchensis* and lodgepole pine *Pinus contorta* can be attacked, as during an outbreak in a Forest Research experimental block during June 2000 at Loch Borrolan, West Sutherland VC 108 (D. Williams).

In summer 2003, Magpie Moth had a population explosion in north-west and northern Scotland. Horsfield, D. & Macdonald, A. J. (*Ent. Rec.* **116**: 81-83) recorded browning of the heather due to larval feeding damage in numerous localities from Skye to Loch Eriboll, then along the north coast to Dunnet Head in Caithness. Many of the browned patches ranged from 5-10 ha in extent, some even up to 25 ha. Resultant imagines occurred at densities of up to 10-20 individuals per square metre.

The species was also abundant on Orkney in 2003, where it is apparently a recent colonist, the first larval record being in May 2000. (T. Prescott, S. Gauld).

Might these outbreaks explain the North-east Scotland records for 2003? With such huge numbers present only 80 miles or so to the north-west, a few such strays would hardly be surprising. Significantly, my specimens at Ordiquhill were caught after a four-day period of sustained north-westerly winds that were initially strong then gradually moderated.

Will these strays enable Magpie Moth to re-colonise North-east Scotland? All my examples were males, but doubtless females can be windblown too. If so, would their progeny feed on heather? The caterpillar has never been recorded on that foodplant in our area, possibly because most heather moorland here is at a higher altitude and further from the coast than that used in the north-west.

I thank the observers named in the text for so helpfully providing me with information.– ROY LEVERTON, Whitewells, Ordiquhill, Cornhill, Banffshire AB45 2HS.

Some further examples of late broods of Lepidoptera

A great deal has been written about late broods of some of our Lepidoptera, which may be caused by global warming. I now note further examples of late broods which I have not mentioned before that have occurred on the Isle of Wight.

Donacaula forficella (Thunb.) 23 August 2003, at Totland. Single-brooded in June and July according to Goater (1986. *British Pyralid Moths.* Harley Books).

Microstega hyalinalis (Hb.) 5 & 9 September 2003, at Totland. There has only been one previous record of this species, on the Island and it is single-brooded in June and July according to Goater (*op. cit.*).

Idaea dimidiata (Hufn.) Single-dotted Wave, 11 October 2002 at Bonchurch.

Idaea trigeminata (Haw.) Treble Brown Spot 11 October 2003 at Bonchurch.

Idaea aversata (L.) Riband Wave, 30 September 2003 at Totland.

Drepana binaria (Hufn.) Oak Hook-tip, 10 September 2003 at Totland.

Agrotis clavis (Hufn.) Heart & Club, 27 September 2003 at Totland.

Hadena rivularis (Fabr.) Campion., 27 August 2003 at Totland.

Euplexia lucipara (L.) Small Angle Shades 30 August 2003 at Totland.

Acronicta rumicis (L.) Knot Grass, 12, 17, 20 & 21 September 2003 at Totland.

— SAM KNILL-JONES, 1 Moorside, Moons Hill, Totland, Isle of Wight P039 OHU.

Entomologists – born or made?

This note was prompted by my recent discovery, amongst family papers, of a letter from my late mother to my late father which reads "Paul is now examining a caterpillar, a green furry one with black bands and pink tufts". The significance is that the letter and the envelope are dated and postmarked respectively 4 August 1960, at which time I was a month short of my third birthday. Like many of us, I have been aware that my interest in insects extends back as far as I can remember. I well recall drawing ladybirds at nursery school in a classroom I attended when I was between three and four years old, and keeping caterpillars in jars at about the same time, but the letter provides confirmation that I was actively involved with moth larvae before I was three years old.

From the description and date, the caterpillar was clearly a form of the Pale Tussock *Calliteara pudibunda*. For the record, as it constitutes my first formal record ever, the letter was addressed from St Anne's, Station Road, Sway, Hampshire (SZ 279980), where the caterpillar had been found that day. This was the house of my maternal grandparents, to which I returned repeatedly and spent much time annually until it was sold in 1976. I continue to pass through Sway most years and to this day there are various native trees and shrubs along the road by the house which are suitable larval foodplants for the Pale Tussock, which is frequent in the area. I have a vague memory that I picked up the caterpillar from the path by the road but, as I recall finding some other caterpillars this way, including a very fine Buff-tip *Phalera bucephala* when I was several years older, I may be confusing these memories.

That my mother described the caterpillar to the extent she did, in a much more general letter, is a reflection of her keen interest in natural history. While not specifically an amateur lepidopterist, she could name some of the British butterflies at this time when most of the villagers of Sway could not. We first learned the other species together courtesy of the picture cards which were distributed in packets of Brooke Bond tea in 1963 and we collected them into an album which I still have. While possibly I may have been interested in insects from my first encounter with them after birth, it is certain that my mother, who was a primary school teacher all her working life, made a point of spotting and encouraging my interests.

Dad was not such an accomplished naturalist but he loved walking in the Lake District and passed to me as a child his well-worn copy of "The rambler's pocket guide to life and growth by the wayside" by S.C. Johnson (Foulsham, London, "Wartime Print" edition, undated). This little hardback has a Red Admiral butterfly *Vanessa atalanta* on the wrapper and an illustrated section on butterflies and moths within. Even more interesting in this context, I have my Dad's copy of "Out with Romany once more" by G. Bramwell Evens ("Romany of the BBC") into which is inserted a hand-written postcard addressed to my father, postmarked 25 August 1938 and signed Romany. The message on the card advises my father on the care of snails in captivity and is in response to a query Dad had written to the BBC on the subject, probably following one of Romany's popular radio broadcasts. My father would have been ten years old at the time.

Such evidence demonstrates that I was born into a family where both parents had an interest in wildlife to some degree, including Lepidoptera and rearing snails! As my own interests developed, my parents acquired more books for me and took me to zoos, museums and other places where I could learn about Lepidoptera to compliment our rambles and family holidays. We also did many other activities together, ranging from brass-rubbing and gardening to scramble-biking and hot-rodding! Among many wonderful entomological memories is a visit I made with my parents to Watkins & Doncaster when the company was at 110 Park View Road, Welling, Kent. After showing me a drawer full of Death's-head Hawk-moths *Acherontia atropos* and many other wonders, Richard Ford signed a copy of his *Practical Entomology* for me, and fortunately dated it – 30 October 1967. I was ten at the time. I had discovered Watkins & Doncaster via a catalogue given to me by a friend of my father's who attended the same church in Oxford. Those catalogues were really the door to the world of entomology for me and my interest developed much deeper and faster from then on. *Practical Entomology* joined *The Young Specialist looks at Butterflies* by Georg Warnecke (1964, Burke) and the surprisingly extensive information in the Brooke Bond card album as my guides on techniques. Then there was the annual exhibition of the Amateur Entomologists' Society, which I joined in 1968, and my first moth-trap, which I made to a design provided by Dickson from a back number of the *AES Bulletin* (**25**: 58-60), but that is another story (see *Bull. AES* **51**: 257-263).

Some forty years on from the early 1960s, I now have a three year old daughter attending a local nursery school. In October 2003 I took to the nursery some live eggs, caterpillars, pupae and moths of readily available native species and gave twenty minute presentations to two of the classes of three year olds, with about twenty children per class. There is a cartoon book called *The very hungry caterpillar* by Eric Carle (1994, Hamish Hamilton, but originally published in 1969), which has been very popular amongst this age group for many years and continues to be so. All the children knew it and my aim was to take them through the life-cycle and the story but showing them what the real thing looks like. The children sat in a semi-circle around me on the floor and my exhibits were passed around in order, with the children invited to handle them – gently. I had scattered the previous night's catch from my garden light-trap into a large box of fallen leaves and the children had to find the moths amongst them, which caused great entertainment. Both classes paid rapt attention for the full twenty minutes, which was a pleasant surprise for the teachers because this sort of session is not a normal event for the children. Amongst the feedback from the children, only one little boy and two little girls did not want to handle the insects, and they were not forced. The majority were really keen. When I asked if anyone had found caterpillars in their gardens or elsewhere, quite a number of the children said yes. Two boys in particular responded and behaved as if finding caterpillars was quite familiar and that they had found several, if they are to be believed and were not simply exaggerating to impress. Perhaps the great majority, if not all of us, are born potential entomologists. Clearly other interests may compete for our attention, but whether we develop our entomological interest may well depend on the level of encouragement, or discouragement, we receive, at home and elsewhere. One of the little girls said her mother had told her not to touch! Perversely, I suspect such an instruction, dependent on source and frequency, might also have served as encouragement rather than discouragement to some of us!— PAUL WARING, Reader, Writtle College. Address for correspondence: Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS (e-mail: paul_waring@btinternet.com).

Psectra diptera (Burmeister) (Neur.: Hemerobiidae) in Gloucestershire

Two examples of *Psectra diptera* – both micropterous females - were found in the ancient limestone grassland of Swift's Hill (O.S. grid reference SO 80) in the Slad Valley of the Cotswold Hills, East Gloucestershire. The first was taken by sweep-netting along the south-facing slopes where there is an open but tall grassland sward dominated by tor grass *Brachypodium pinnatum*, on 4 August 2003, and one was found in the same area again by suction sampling on 6 September 2003. The species is known to favour rank tussocky vegetation and is known from a wide variety of long-established semi-natural situations, both wet and dry (Plant, 1994, *Provisional atlas of the lacewings and allied insects of Britain and Ireland*). Although known from other calcareous grasslands – notably the Chalk of the Chilterns, North and South Downs, and Cambridgeshire, but also Jurassic Limestone in Northamptonshire (Kirby & Welch, 1990, *Neuro News* **No 7**: 4-10) - it has not previously been reported from the Cotswolds or any other downlands this far west.

Thanks to Colin Plant for confirming my determination.— KEITH N. A. ALEXANDER, 59 Sweetbrier Lane, Heavitree, Exeter EX1 3AQ.

The Burren – a brief summary of its butterflies in 2003

I can vividly recall my first visit to the Burren in March 1977 when, on a cold and wet morning, as a secondary school student, my classmates and I were loaded onto a bus and transported to north Co. Clare on one of those dreaded school tours. Little did I realise, at that time, the hold this unique area would take on me. My entomological interest developed with several other events that same year, namely my first sighting of a Green hairstreak *Callophrys rubi L.*, a single Painted lady *Cynthia cardui* L. on privet blossom *Ligustrum vulgare* in my parents back garden and, most spectacular of all, the sight of a Deaths Head Hawk-moth *Acherontia Atropos* L., which flew through our kitchen window in late September.

Living in Co. Kerry has its advantages, an area of natural beauty in Killarney only half an hours drive away and, even more importantly, ease of access to the Burren, which entails a drive of several hours and a short ferry crossing of the Shannon. Since 1984, I had been fortunate enough to visit the area about thirty times and this number could be much higher except for the vicissitudes of the Irish weather. However, during 2003, I did manage to make five visits and in this short note, have attempted to briefly outline what was recorded where, when and in what abundance.

Species	Area	Date	Abundance	Notes
Erynnis tages baynesi Huggins	Clooncoose	30/05/2003	Very common	1
Leptidea sinapis juvernica Williams	Ballyvaughan	30/05/2003	2 only	2
	Clooncoose	21/06/2003	1 only	
Gonepteryx rhamni gravesi Huggins	Dromore	30/05/2003	Abundant	3
	Lough Bunny	21/06/2003	1 only	
	Clooncoose	06/07/2003	Few	
Pieris brassicae Linnaeus	Clooncoose	30/05/2003	Abundant	
Anthocaris cardamines hibernica Williams	Clooncoose	30/05/2003	Abundant	
Pieris rapae Linnaeus	Dromore	21/06/2003	Few only	
Pieris napi britannica Verity	Clooncoose	30/05/2003	Abundant	
	Clooncoose	06/07/2003	Abundant	
	Clooncoose	09/08/2003	1 only	
Thecla betulae Linnaeus	Clooncoose	28/05/2003	1 larva beaten	
	Clooncoose	09/08/2003	1 _ seen	
Lycaena phlaeas hibernica Goodson	Clooncoose	30/05/2003	1 only	
	Clooncoose	09/08/2003	Few only	
Polyommatus icarus mariscolore Kane	Lough Bunny	21/06/2003	Few only	
	Clooncoose	21/06/2003	Abundant	
	Clooncoose	06/07/2003	Abundant	
	Clooncoose	09/08/2003	Few only	
Cynthia cardui Linnaeus	Corofin	30/05/2003	1 only	5
	Clooncoose	09/08/2003	1 only	
Aglais urticae Linnaeus	Lough Bunny	21/06/2003	Few only	
	Clooncoose	21/06/2003	Few only	
Inachis io Linnaeus	Clooncoose	30/05/2003	Several	6
	Clooncoose	09/08/2003	Common	
Boloria euphrosyne Linnaeus	Clooncoose	30/05/2003	Common	7
Argynnis aglaja Linnaeus	Clooncoose	21/06/2003	Few only	
	Clooncoose	06/07/2003	Abundant	
	Clooncoose	09/08/2003	2 only	8
Argynnis paphia Linnaeus	Clooncoose	09/08/2003	Several	9
Pararge aegeria Linnaeus	Clooncoose	21/06/2003	Few	
	Lough Bunny	21/06/2003	Few	
	Dromore	21/06/2003	Common	
	Clooncoose	06/07/2003	Common	
	Clooncoose	09/08/2003	Abundant	
Lasiommata megera Linnaeus	Clooncoose	09/08/2003	Few only	
Hipparchia semele clarensis de Lattin	Clooncoose	09/08/2003	Abundant	
Coenonympha pamphilus Linnaeus	Clooncoose	30/05/2003	Few	
	Clooncoose	21/06/2003	Common	
	Lough Bunny	21/06/2003	Common	
	Clooncoose	06/07/2003	Common	
	Clooncoose	09/08/2003	Abundant	
Maniola jurtina iernes Graves	Clooncoose	21/06/2003	Few	
	Clooncoose	06/07/2003	Abundant	
	Clooncoose	09/08/2003	Few, worn	
Aphantopus hyperantus Linnaeus	Dromore	21/06/2003	Few	
	Clooncoose	06/07/2003	Abundant	
	Clooncoose	09/08/2003	Few, worn	

Notes to the table.

1 Locally common in various location throughout the Burren, but always in abundance at Clooncoose.

2 Very scarce in 2003. Normally, this species if found in good numbers and, as with *E. tages*, commonly at Clooncoose.

3 Found sporadically, especially around Lough Bunny, Lough Geálain and Clooncoose. However, I have found that the food plant, Buckthorn *Rhamnus cathartica* grows in profusion at Dromore Nature Reserve and the butterflies occur in large numbers hereabouts.

4 *T. betulae* larvae can be beaten from Blackthorn *Prunus spinosa* around Clooncoose, Lough Geálain, Boston, etc. August 1984 was the only previous occasion on which I have seen the adult insect, a gap of some nineteen years.

5 This was the first time that I had encountered this species in the Burren.

6 *Inachis io* has not been common for the past number of years and it was gratifying, therefore, to be able to report the butterflies in some numbers, during 2003.

7 The Pearl-bordered Fritillary *Boloria euphrosyne* was first recorded from Clooncoose by R. A. Phillips (1922. *Irish Naturalist*, **32** , 91-92) thus: "on a bright day in June last Mr. H. Fogarty and I, while passing along a rocky roadway in the limestone crag land at Clooncoose near Kilfenora, Co. Clare, noticed large numbers of a pretty butterfly flitting about in the sunshine. We captured one but were at the time unable to identify it. The specimen was subsequently sent to Mr. A. W. Stelfox of the National Museum, Dublin who reported that it was the Pearl-bordered Fritillary *Argynnis Euphrosyne, L.* a species not known to previously inhabit Ireland". The species has not been recorded from anywhere else in this country, notwithstanding an unconfirmed record from Borrigone, Co. Limerick.

8 On 6 July, John Lavery and I encountered *A. aglaja* in good numbers at Clooncoose. Indeed, it is no exaggeration to state that it was the most common species on this particular day. The earlier part of the day had been cloudy with an accompanying light drizzle which later cleared to good sunshine and, under these conditions, we were amazed to find several butterflies emerge from grass tussocks, all in good condition and quite obviously freshly emerged. It was in July 1985 that we had last seen *aglaja* in such profusion hereabouts.

9 *Argynnis paphia* has only been observed by me on a few occasions in the Burren region, namely during 2001 and again in 2003 and never in double figures. Several were seen in 2003, including a C, which we observed in close quarters, depositing her ova on the lichen and moss covered stem of a stunted Hawthorn bush *Crataegus monogyna*, at Clooncoose, on 9 August.

The earliest visit occurred on 28 May when John Lavery and I were caught out on an appalling day of rain, the worst I have encountered in the district. Visits on 30 May, 21 June and 6 July were on good days, with 6 July beginning cloudy and turning very warm later. On 9 August, we experienced heavy rainfall travelling up through Co. Clare, which, thankfully abated to occasional spells of light drizzle during the afternoon. Good fortune accompanied me through the year and I can recall reading that H. C. Huggins, that most eminent of lepidopterists, once only enjoyed about ten minutes of sunshine during a two-week stay in the region.

From my own experience, I have recorded a total of 22 butterfly species from Clooncoose. It is not unreasonable to expect to include the Holly Blue *Celastrina argiolus* L., Green Hairstreak *Callophrys rubi* L. and Little Blue *Cupido minimus* Feussly with visits to specifically seek out these species. In addition, the Marsh Fritillary *Eurodryas aurinia hibernica* Birchall has not been noted here since the late 1980s. The total number of Burren species would total 27, including the Red Admiral

Vanessa atalanta L., which I have seen in other parts of Co. Clare, but not the Burren itself. This would make Clooncoose the most species rich habitat on this island, a fact that is borne out by the distribution maps in Asher, J. et al. 2001. *The Millennium Atlas of Butterflies in Britain & Ireland.*

Some other insects encountered during 2003 are as follows: a single Humming-bird Hawk moth *Macroglossum stellatarum* L., feeding on Knapweed *Centauea* on 9 August Clooncoose, Dew Moth *Setina irrorella L.* on 6 July Clooncoose, Chimney Sweeper *Odezia atrata L.* in large numbers, but all rather ragged, on 21 June Clooncoose, Yellow Shell *Pseudopanthera macularia* L., Latticed Heath *Semiothisa clathrata hugginsi* Baynes and Transparent Burnet *Zygaena purpuralis sabulosa* Tremewan on 21 June Lough Bunny. Six-spot Burnet *Zygaena filipendulae stephensi* Dupont was much in evidence at both Clooncoose and Lough Bunny on this date also. On 21 June, also at Lough Bunny, two large webs of larvae of Small Eggar *Eriogaster lanestris* L. were located on Blackthorn *Prunus spinosa.*

Amongst the coleoptera, a single specimen of Rose Chafer *Cetonia aurata* L. and two of *Dascillus cervinus* L. were noted at Clooncoose on 21 June as was a single *Silpha atrata* L. at Dromore. On 6 July, at a small turloughnorth-west of Lough Bunny, a number of beetles were taken under stones and scattered logs and these are still awaiting identification. During our search for coleoptera in this area, we had the unwelcome company of a number of military aircraft, which flew in low and fast over the surrounding limestone hills. We subsequently discovered that these aircraft were attending the Air Show at Salthill, across Galway Bay.

On 21 June, I planned to visit Dromore Nature Reserve with the intention of observing the Pine Marten *Martes Martes* on the basis of a report by David Wedd (*Atropos*, **11**, 3-8) to the effect that this is the most likely area to see the Marten in these islands outside of Scotland. To our astonishment, between Lough Bunny and Corofin, a Marten crossed the road in front of our car and was plainly identified, as it was only yards from us. On 6 July, John Lavery and I had the pleasure of a close encounter with an enormous herd of some 200 plus Feral Goats *Capra hircus* that we literally stumbled into on a sojourn over the clints at Clooncoose. It is to be hoped that these animals are left to graze here peacefully as the encroachment of scrub, especially Hazel *Corylus avellana* over the past decade or so has been most pronounced.

In the early 1990s, a great deal of controversy was generated by the proposed construction of an Interpretative Centre at Mullaghmore, close to Lough Geálain. In this writer's opinion, the eventual failure of this venture was vital to ensure the survival of this unique area. Mullaghmore and it's surrounds are an area of outstanding natural beauty, and nationally important both botanically and entomologically. The crass short-sightedness and arrogance of the Office of Public Works now Dúchas in proceeding with excavating the site, without planning permission, defies belief. Thankfully, common sense eventually prevailed and the concrete abomination, which was taking shape, has now become consigned to history. On 21 June 2003, I am pleased to report that the site was the scene of acres of Ox-eye Daisy *Leucanthemum vulgare*. A case of Mother Nature reclaiming her own, and so it should be.– MICHAEL O'SULLIVAN, 20 St. James Gardens, Killorglin, Co. Kerry, Ireland (E-mail: mikeosullivan2@eircom.net).

Hazards of butterfly collecting – Good for a rainy day – Sa Pa, Vietnam, September 2003

Just over a month after moving to Vietnam, before winter would extinguish high-level butterflies, I took the train to Lao Cai right on the Chinese border, some 350km WNW of Hanoi. From here an hour's drive gets you to Sa Pa, and old French hill-resort in what was quaintly called the Tonkinese Alps (the Hoang Lien Mountains). Sa Pa is at 1,650m and very much cooler than the muggy end of the monsoon in Hanoi. Above Sa Pa towers Mount Fan Si Pan, the highest peak in the country at just over 3,100m.

After the French were forced to abandon much of northern Vietnam in the 1940s, and even more decisively so after their defeat at Dien Bien Phu in 1954, hill-resorts were not part of the vocabulary of the new and austere nationalist government of Ho Chi Minh, which on his death became increasingly dogmatically communist. The old French hotels, guest houses, and villas fell into terminal disrepair, and Sa Pa reverted to being a small market town for the several hill-tribes that live in the area (red, black, and flower H'Mong; several Zao; Thais and others). To this day these 'minority' women dress in colourful traditional clothes that immediately identify the tribe to which they belong, and the market remains the only contact point between the various tribes.

But with the 1980s, spurred on by the dramatic changes in the former Soviet Union and the drastic economic reforms in neighbouring China, Vietnam began its own, initially tentative, policy of 'doi moi', getting rid of much state ownership, granting land rights to individual farmers, and opening up to the outside world. Vietnam went from near famine to becoming one of the world's largest exporters of rice. Tourism became a key growth sector, and Vietnam is a safe and friendly country that has much to offer visitors, not least its wonderful cuisine. I went up in luxury in the special train carriages of the luxury Victoria Hotel – not quite the Orient Express, but working on it.

The flora and fauna of the area is of great interest. Down at the bottom at Lao Cai it is still largely tropical, at 1,300m it is essentially subtropical Sino-Himalayan, a fauna that straddles the Oriental and the Palaearctic Regions; above 1,800m begins the temperate area where several of the same species that are found in Europe occur, and which predominate at the highest levels (*Papilio machaon* Linné, *Pieris brassicae* Linné, and *Artogeia rapae* Linné, to mention just some.

I set out for a pass at 2,000m on a hired motorcycle with driver. The sun was not generous, but butterflies began accumulating. Among them were the hill jezebel (*Delias belladonna* Fabricius), the chestnut tiger (*Tirumala melaneus* Cramer), the tabby (*Pseudergolis wedah* Kollar), and the large silverstripe (*Argynnis childreni* Gray). These were butterflies I had not seen in nature since 1960 or so during summer excursions to the Himalayan hill-stations. When the total had reached some 35 species, the weather closed in and the final weak shafts of sunshine shut down.

It started raining and we had to take shelter. The only available place was a tiny shack where we were well received by a young H'Mong tribal, his wife, and an infant daughter. They cooked a pot of tea and I tried to make conversation by the use of a small pocket dictionary. I congratulated them on their beautiful daughter, usually as safe gambit in any culture. I was rewarded by their surprise that I could draw out even such a low level conversation from a book. I also had some training in

My tattooed host with his precious pipe.

the Vietnamese vowels; the **a** comes in six different pronunciations with their own diacritical marks, each being a distinct letter of the alphabet. On top of that there are four accents on pronunciation. There are thus 24 different forms of the letter **a**, and if you don't get them right, you are probably not saying what you want to say – quite possibly even saying something embarrassing or offensive!

Our host asked to see my pipe tobacco, rolled it with his fingers, and asked if he could have some. He brought out a large bamboo pipe, smeared something on the small head of the pipe, and pressed in a plug of tobacco. He lit it, took a couple of draws, and then passed it to me. I suddenly realized that I was inadvertently taking my very first puffs of opium. But as President Clinton said in another context, I did not inhale. How my host was able to afford this, I do not know. The few belongings of the family could be procured for a tenner or two in an average UK department store. But the rain stopped and we took our leave. A few more butterflies were caught on the 20km ride back to Sa Pa, not least two of those wonderful coppers of the genus *Heliophorus* which must be among the most beautiful of all lycaenids. It then started raining again for the last eight kilometres and I learnt how much rain can sting in the face when you are on a motorbike and not wearing a helmet.

With just over 40 species in the bag it was not a splendid day. But at least one of them was of real interest. I sent DNA-samples of *Pseudergolis wedah* to Niklas Wahlberg in Stockholm. He tells me that once they have been sequenced, they should finally clear up the exact systematic placement of *P. wedah* and related species that have been difficult to fit into the traditional arrangement of the Nymphalidae.— TORBEN B. LARSEN, UNDP Vietnam, c/o Palais des Nations, 1211 Geneva 10, Switzerland. (E-mail: torbenlarsen@compuserve.com).

Grass Eggar *Lasiocampa trifolii* (D. & S.) (Lep.: Lasiocampidae) intersex female

Nostalgia is a powerful emotion, so I was delighted when Graham Jones sent me a few eggs from a female Grass Eggar *Lasiocampa trifolii* trapped on 10.viii.2001 at one of my boyhood hunting grounds, the Formby sandhills in Lancashire.

I reared the resulting caterpillars with some difficulty. A full account is given in *Lancashire Moths newsletter* 7: 4-6. Five moths were bred, but one of the three females was an intersex. This was most noticeable in the antennae. The right antenna was bipectinated almost as strongly as in a male, while the left antenna was structurally intermediate between the sexes. The moth otherwise resembled a female, and indeed produced an egg. The specimen is now deposited in the collection of Mark Young.

Ford, E. B., (1955) *The New Naturalist: Moths* mentions intersex females in this species resulting from crosses between the Kent subspecies *flava* and typical form from Devon, due to genetic incompatibility between these races. Clearly this was not the cause here. Although too much importance should not be given to a single instance of this developmental abnormality, further examples might suggest that the isolated Formby population is suffering from inbreeding.

I am grateful to Graham Jones for sending me the eggs.– ROY LEVERTON, Whitewells, Ordiquhill, Cornhill, Banffshire AB45 2HS.

Migrant moths recorded on the Isle of Wight during February 2004

This year, 2004, saw the best February on record for immigrant Lepidoptera. Early in the month moderate South-westerly winds caused the first wave of migrant butterflies and moths. On 3 February a Painted Lady *Cynthia cardui* (L.) was seen on Headon Warren and St. Helens. Many more were reported up to the middle of the month. A record temperature of 18°C was recorded at Gravesend on 4th. On 5 and 6 February several Small Mottled Willow *Spodoptera exigua* (Hb.), Dark Sword-grass *Agrotis ipsilon* (Hufn.) and Rush Veneer *Nomophila noctuella* (D. & S.) were recorded at Freshwater, Totland and Binstead.

On 10 February the winds dropped and a very gentle breeze from the south & south-west caused the second more notable wave of migrants which ended on 14 February. I recorded The Ni Moth *Trichoplusia ni* (Hb.), three Bordered Straw *Heliothis peltigera*, (D. & S.), *Spodoptera exigua*, two *Nomophila noctuella* and one Diamond-backed Moth *Plutella xylostella* (L.) at Totland on 10 February, with *Euchromius ocellea* (Haw.) on 11 February and two Scarce Bordered Straw *Helicoverpa armigera* (Hb.) on 12th. A female Red-headed Chestnut *Conistra erythrocephala* (D.& S.) was taken by James Halsey at Bonchurch and a single male Cosmopolitan *Mythimna loreyi* (Dup.) was noted by Dave Wooldridge at Freshwater on 13 February. *Spodoptera exigua* (Hb.) *Heliothis peltigera*, *Agrotis ipsilon* and *Nomophila noctuella* were also recorded in numbers at Freshwater, Binstead and

Bonchurch. A single Silver Y *Autographa gamma* (L.) was observed at Freshwater during the day on 18 February, after which colder weather set in and the migration finished. Dry cold weather with northerly winds and night frosts were a feature of the second half of the month and on the evening of 26 February about an inch (2.5 cms) of snow fell on the Island.

There were about a dozen records of the very rare immigrant Levant Blackneck *Tathorhynchus exsiccata* (Lederer) from Puddleton and Portland, Dorset from 11 to 13 February. Other migrants not mentioned so far which were recorded from Southern England were Udea ferrugalis (Hb.), the Vestal *Rhodometra sacraria* (Linn.), the Gem *Orthonama obstipata* (Fabr.), Striped Hawk-moth *Hyles livornica* (Esper), Pearly Underwing *Peridroma saucia* (Hb.), Nutmeg *Discestra trifolii* (Hufn.) and White-speck *Mythimna unipuncta* (Haw.).— SAM KNILL-JONES, 1 Moorside, MoonsHill, Totland, Isle of Wight P039 OHU.

Searches for the Bordered Gothic *Heliophobus reticulata* around Peterborough, 2001-2003

The Bordered Gothic is a moth that has recently declined to the point of virtual extinction in Great Britain (see Waring, 2002. *Atropos* **16**: 76-77, Dudley, 2003. *Atropos* **20**: 59 and Waring, Townsend & Lewington, 2003. *Field guide to the moths of Great Britain and Ireland*. British Wildlife Publishing). Up to the 1970s it was recorded from a wide scatter of sites in southern and eastern England, but after 1980 it was seldom reported away from Dorset and East Anglia (Waring, 2002. *Atropos* **16**: 76-77). It used to be found in the vicinity of Peterborough. For example it is on the moth list in Cook & Pilcher (1982. *The history of Borough Fen Decoy*. Providence, Ely) for the Borough Fen Duck Decoy (O.S. grid reference TF 200080) just 6 km north-east of Werrington, where I live. The larval foodplant and other ecological requirements of the moth are poorly understood, but most former localities are hot dry, open, well-drained sites, such as the breckland of East Anglia and the Isle of Portland, Dorset. Soapwort *Saponaria officinalis* appears to be the only reported foodplant, after which the moth was once named by Borkhausen (*saponariae* Borkhausen, 1792). I personally doubt the species feeds exclusively on Soapwort but Julian Clarke (pers. comm.) has said that a captive female he once had would only lay eggs on this plant, of those offered. Soapwort is large and conspicuous when in flower. It favours open, sunny places with thin soil. I saw it growing widely in southern France in August 2003, but around Peterborough I only know of one wild population, along a stretch of about 50m of grassy roadside verge near Helpston (TF 113027 to TF 113028), and two colonies of the double-flowered form which is a garden escape. I could not find any of the plant at Borough Fen Duck Decoy when I visited on 25 May 2002 but I must return in August when the plant is in flower and much more obvious before I can say there is none there. My impression of the Decoy is that it is now heavily overgrown with woody plants and that there are no really open, hot sites there. According to Cook and Pilcher (1982. *The history of Borough*

Fen Decoy), there was a major felling of trees at the Decoy in 1958, after which the area was fenced off, so there may well have been more open ground at that time and into the 1960s. Pilcher's records for the Bordered Gothic from the Decoy date from some when between 1961-1975 (BRC record card).

There are lots of other open sites to the east of Peterborough however, most obviously the many scattered brick-pits, many of which are now disused. I have found no Soapwort on visits to the disused and partially flooded Dogsthorpe Star Brick-pit on the outskirts of Eye nor at Eye Green Local Nature Reserve, which is also a disused brick-pit, but following my hunch that other food-plants are likely, I would not write off these sites as possible breeding areas.

I have never had the Bordered Gothic in my garden trap in Werrington where I have been light-trapping each year since 1991, nor have I ever seen it along the nearby railway line and associated rough ground which I have been surveying weekly by day from May to August since 2000 and with occasional visits previously since 1987.

I began searching specially for the Bordered Gothic around Peterborough in 2001. The first year I light-trapped all night beside Dogsthorpe brick-pit on 18 May and 28 June, which fall within the reported flight period. No Bordered Gothic were seen but the records of other species pleased our County Moth Recorder, John Ward. The site falls in the 10 km square TF 20 which includes the extreme eastern tip of vice county Northamptonshire, for which John has received virtually no moth records for 30 years. By contrast, over 400 species of macro-moths have been recorded in the adjacent 10 km square, in which I live (TF 10), as do at least three other moth recorders. In view of John's interest, I found a baby-sitter for a pair of Robinson light-traps, Bob Shirtcliffe, who lives in a rural location in TF 20 by the Carr Dyke and the brick-pit, at Hodney Road, Eye (TF 216030). I dropped the traps off with Bob who ran them all night. I rolled up early the following morning and recorded the catches. I was also successful in attracting the day-flying Currant Clearwing *Synanthedon tipuliformis* to a pheromone lure placed in Bob's patch of Blackcurrant bushes on 28 June 2001 and I beat a few moth larvae from local hedgerows. John has now been able to add spots to the county distribution maps for all these species but any Bordered Gothic have alluded me if they are there!

In 2002 I found a large amount of a double-flowered cultivar of Soapwort growing wild along the railway line by the level crossing on Foxcovert Road, Werrington (TF 163051), only 4.5 km from Borough Fen Decoy and I suspect this might be as suitable a foodplant as the native form. This colony is flagged up for a search in 2004. I have seen this same cultivar growing wild several times before, including by a telephone box in the village of Etton in 2003, and wonder if it is more widespread in the area, as a garden escape.

On 5 August 2003, with Mick Beeson, I tried searching Soapwort for Bordered Gothic larvae by night, at the colony on the roadside verge near Helpston, soon after dark, having set up an actinic trap at dusk in Oxey Wood. Neither of us have ever found the larva before. We just had the photograph in "Porter" to go on. Several adult Silver Y *Autographa gamma* were noted visiting the pinkish white Soapwort flowers for nectar and some photographs were taken to record the site. We found no larvae of any species feeding on the Soapwort, though a few of the leaves did show some feeding damage.

These few special efforts have so far failed to locate the Bordered Gothic but I shall keep trying, as spare time allows, meanwhile hoping that one day I shall capture the moth incidentally during light-trapping for other purposes. Hopefully, a special BENHS field meeting that I am proposing for 2004, at Barnham Cross Common, in Norfolk, where Dudley (2003) reports finding the moth during the 1990s, will be more productive. Meanwhile, I wish others who are searching for this moth better luck than I have had so far, but I have enjoyed the hunt!

I would like to thank Bob Shirtcliffe and Mick Beeson for their help with the fieldwork and Writtle College, Essex, for their support in preparing this report.— PAUL WARING, Reader, Writtle College. Address for correspondence: Windmill View, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS (e-mail: paul_waring@btinternet.com).

Records of *Ceutorhynchus syrites* Germar (Col.: Curculionidae): a suggestion and a plea for information

Mr. A. A. Allen (2000, *Ent. Rec.* **112**: 211-3) has drawn attention to the account of Coleoptera in the *Victoria History of the County of Cornwall* (1906, Clark, J. in Page, W.) (*VCH*) as a source of records from the county, including *C. syrites*, which, as he states, is a 'very rare species with us'. He goes on to opine that the record in *A review of the scarce and threatened Coleoptera of Great Britain, part1* (Hyman, P. S. & Parsons, M. S., 1992) 'can hardly refer to Lamb's find' (at Padstow, in the *VCH* account). Could this not be a case of confusion between the use of a term in its general and specialised sense, similar to that of 'notable', on which the Editor has ruled (2001, *Ent. Rec. 113*: 83)? The Cornish town of Padstow, though hardly to be thought of as in 'West Cornwall', is actually situated within the vice-county of that name (Dandy, J. E. 1969, *Watsonian Vice-Counties of Great Britain*). Vice-counties (Allen's 'county divisions') were used in the Review to summarise distributions. Hyman & Parsons (*op. cit.*) state of *C. syrites* in Britain 'Last recorded in 1966 from Aston Rowant, Oxfordshire'. The source of this record is quite unknown to me and enquiries of individuals and organisations likely to have information about it have failed to locate it. As all other published records of the weevil are nineteenth century ones this putative Aston Rowant occurrence is of considerable interest and importance. Can any reader of the *Record* help?– M. G. MORRIS, Orchard House, 7 Clarence Road, Dorchester, Dorset DT1 2HF (E-mail: mgmorris.ent@virgin.net).

The Pale Pinion: *Lithophane hepatica* Clerk (Lep.: Noctuidae) in Norfolk

A singleton of this species was taken in a Rothamsted Insect Survey light-trap at Wells-next-the-Sea (trap number 274, O.S.grid reference TF 917434) on the night of 5/6 October 2002. This species is most often found in wooded areas of the south-west of the country, Wales and western Ireland, so its occurrence in East Anglia is most unusual. I am informed by Gerry Haggett of the Norfolk Moth Group that this is the first record of this species in the county since 1980. Although there is no evidence from the same trap of any amount of migrant activity at the time, this specimen was most probably an immigrant.

My thanks to Gerry Haggett for letting me know the unusual nature of this record; and to Christine Marshall of Wells Field Centre for her efficient operation of our light-trap.— PHILIP J. L. GOULD, Rothamsted Insect Survey, Plant & Invertebrate Ecology Division, Rothamsted Research, Harpenden, Hertfordshire, AL5 2JQ (E-mail: phil.gould@bbsrc.ac.uk).

EDITORIAL COMMENT:

It may be that the Pale Pinion is on the increase in East Anglia. It has become tolerably frequent in my garden on the east edge of Hertfordshire in the last few years, with both pre- and post-hibernation adults in the trap. For Hertfordshire as a whole, there are 12 records since 1 January 2000, but only four records before that date. For Essex, county recorder Brian Goodey tells me that Dave Perry captured an adult at Great Dunmow in April 2004; the third Essex record, but only the first since publication of a list in the *Victoria County History of Essex* in 1903. Since then, Phil Jenner has taken more examples at light in his garden at Chrishall in north-west Essex.

News on the conservation of some UK Biodiversity Action Plan moths in 2003

Barberry Carpet *Pareulype berberata* (D. & S.)

There was no funding available from English Nature for survey and monitoring of the Barberry Carpet moth *Pareulype berberata* in 2003, for the first time since 1987. The limited funds available were used to maintain the captive stock of the moth and support and encourage propagation and planting of Common Barberry *Berberis vulgaris*, the larval foodplant, to increase the size of some remaining stands. Captive breeding of the moth was very successful, almost certainly due to the prolonged warm dry summer, as in previous years with such weather. Between 3,000 and 4,000 pupae are now (January 2004) hibernating in care of Whipsnade Wild Animal Park and the Zoo Federation. However, no livestock was released into establishment sites during the year, pending the results of a scan for exotic pathogens, expected to take place at London Zoo this winter. Concerns over this issue were raised following the detection of exotic gregorine parasites in the culture of Field Crickets *Gryllus campestris* L. being reared at London Zoo for release in Britain

In order to prevent a complete break in the continuity of the survey and monitoring, I spent 2 September 2003 visiting and assessing the populations and habitat condition of most of the occupied sites in Wiltshire and Gloucestershire, and meeting land-owners and other interested parties, supported by Writtle College, University of Essex. Good numbers of Barberry Carpet larvae were seen at most of the nine native sites, but over-zealous, almost brutal, trimming of foodplants while the second generation of larvae was feeding was a problem at two sites. No larvae were seen at one of the native sites, nor nearby where occupied host plants had been translocated in February 2001.

Populations at single establishment sites in Wiltshire and Northamptonshire did well, and a population established in Suffolk, appears to have done likewise, with a dispersing individual light-trapped in the nearby village on 23 July 2003. An establishment site in Lincolnshire was not monitored, for the first time in many years. A growing number of site owners are expressing a desire to plant Common Barberry to benefit the moth, and some have done so during the year, with over 100 plants newly established at one occupied site. Some of the plantings having taken place as part of Countryside Stewardship and forestry grant schemes. Additional nurserymen are being encouraged to propagate new plants to meet the demand, including staff at Writtle College, in some cases using seed or cuttings collected this summer from occupied sites.

Four-spotted Moth *Tyta luctuosa* (D. & S.)

In 2003, the Four-spotted moth *Tyta luctuosa* emerged earlier than ever recorded before, with the first adult seen at its main Northamptonshire colony on 27 April, followed by others on every weekly visit thereafter until mid June. Nearly fully grown larvae were found during nocturnal searches of single sites in Northamptonshire on 25 June (one larva) and Lincolnshire on 26 June (seven larvae). As a consequence of these observations and the continuing hot, dry summer, a more numerous than usual second generation of adults was predicted. However, although slightly larger numbers of second generation adults were seen at the Northamptonshire site, the moth was only noted in ones and twos, while transect counts of 11-21 individuals were recorded during the first generation. Light-trapping by derelict allotments over one kilometre from this breeding site produced two moths on 6 August, but a return visit four days later produced none. It is not yet clear whether this is a discovery of an unknown population or dispersal from the known one, but suitable breeding habitat is present. In contrast, at Portland, Dorset, the moth was not seen in April and did not reach substantial numbers until weeks later, a pattern consistent with previous years at this site. Eventual numbers at the light-trap at Portland Bill Bird Observatory were some of the highest ever.

A number of unsuccessful searches for the moth took place both in Essex and Somerset, where adults are occasionally reported, usually as singletons, and where undiscovered populations are suspected. There are concerns that the moth may now have been lost from the second of its two remaining known sites in Nottinghamshire, where the last confirmed record was of several on 14 July 1997, with a probable sighting on 19 July 1999. Six scrapes, each 25m × 4m, were made on south-facing banks on this site on 8 April, in an effort to greatly increase the extent of prime habitat on site. This has been spectacularly successful, with an abundance of Field Bindweed (the larval foodplant) now growing on the scrapes. Despite this, no Four-spotted were seen anywhere on the site during 2003, although Small Copper *Lycaena phlaeas* (L.) and Wall Brown *Lasiommata megera* (L.) appear to have benefited from creation of the scrapes. Illustrations of these scrapes will shortly be published *British Journal of Entomology and Natural History* together with an account of the work and of a BENHS field meeting to monitor the results. Populations on at least two sites in Oxfordshire will be one of the subjects of study in 2004, and a record of a singleton from one of these in 2003 has been received. Records of singletons near Durlston, Dorset, suggest there may be a colony in this area. If readers know of any other sites where the moth can be seen reliably, these can be included in the national survey, which is being conducted by Writtle College, with funding from English Nature and help from Butterfly Conservation, to advance the UK Biodiversity Action Plan.

Marsh Moth *Athetis pallustris* (Hb.)

There now appears to be only one known breeding site for the Marsh Moth *Athetis pallustris* in the British Isles. This is on the Lincolnshire coast, where three adult males were seen by the author on 30 May 2003 during a routine light-trapping visit to monitor the population as part of the Butterfly Conservation Action for Threatened Moths Project, part-funded by English Nature. The males ranged from very fresh to rather worn. The following night the author led a BENHS nocturnal field meeting to explore Red Farm Flash, near North Somercotes, further north on the Lincolnshire coast. The habitat is very similar to the occupied site. This was the second time a BENHS meeting has been held on this site in the hope of detecting the Marsh Moth and was a week earlier than in 2002 (see *Ent. Rec.* **115**: 216 and *Br. J. ent. Nat. Hist.* **17**, in press). Despite good weather, again no Marsh Moth were seen. The same night Adrian Russell and friends light-trapped without finding the moth at Wicken Fen, Cambridgeshire, a former site from which the Marsh Moth has not been recorded for over 40 years. There was no specific searches or litter-piling at Gibraltar Point, Lincolnshire, in 2003, where both types of search in the last three years have produced negative results (*Ent. Rec.* **115**: 217). If the moth survives here, it is clearly very much rarer than in the past, when it was possible to obtain it from many parts of the reserve using actinic traps left out all night. 24 litter-piles were constructed by English Nature staff on the occupied site and sifted by the author on 10 October. One larva which is very probably of the Marsh Moth was obtained. The identification is subject to confirmation from photographs taken and from rearing the larva. Every year several other species of noctuid larvae are found and some are notoriously difficult to distinguish from the Marsh Moth, hence the need for great care over identification. Issues of site management are being investigated to see if there is anything which can be done to raise the population density of this species on the site to the levels of the late 1980s and early 1990s, when over a hundred larvae were sometimes reported during examination of litter-piles.

White-spotted Pinion *Cosmia diffinis* (L.)

Record numbers of the White-spotted Pinion *Cosmia diffinis* were light-trapped at sites in Huntingdonshire and Cambridgeshire during 2003, coincident with the hot nights experienced during August when the adults were on the wing. A gravid female was captured at last, after four years of trapping and recording well over 100 males (see *British Wildlife* **15**: 61). The moth was discovered in several more woods near the known ones. However, it was also noted that there is a resurgence of Dutch

Elm Disease at present and a number of elms which looked healthy at the start of the Butterfly Conservation Action for Threatened Moths Project, are now dead or dying. One result of the BC/EN funded surveys of the White-spotted Pinion and follow-up work is that forestry management underway to replace elms with planted Ash in an occupied shelterbelt at Madingley, Cambridgeshire, has been reversed by the University of Cambridge to safeguard the larval foodplant of this rare moth.

Although the moth appears to be quite well distributed in woods with tall elms on and near the Huntingdonshire/Cambridgeshire border, further searches of elm woods nearer to Peterborough failed to find it. Essex and Bedfordshire are the only other counties from which the moth has been recorded since the start of the project, so it is good to be able to report that the moth was seen in both in 2003. In Essex it was seen again at Langenhoe, on 31 July – one was captured in a light-trap there on 18 August 2002 (Hugh Owen). I undertook a search for larvae there with Hugh Owen, Joe Firmin and Phil Smith on 22 May 2003. No larvae were seen, but one empty leaf shelter with all the characteristics for this moth was found. This suggests any resident population is at low density, at least in the parts of the trees within reach from the ground. A second Essex site which produced an adult moth in 2002 was searched for larvae the same day, without success. A singleton was captured in August 2003 in the garden of John Day (the younger of two John Days working for RSPB) at Potton, near Sandy in Bedfordshire. This is the second White-spotted Pinion trapped by John, who had one at the same site on 2 August 2002. There are elms nearby which we hope to investigate for larvae in 2004. Access permission has also been obtained at last for light-trapping in Coppice Wood, which is the site which produced the last previous records from Bedfordshire, in 1985. The site has been visited by day and there is much healthy elm of more than one species and age class.

Some eggs were laid by the gravid female, from which it is hoped to rear some larvae during 2004, to study their feeding behaviour and any preferences, sleeving some outside on growing foodplant.

The Butterfly Conservation project on this moth, co-ordinated by the author, has involved a large number of people, but in addition to the above, we would particularly like to thank Barry Dickerson and John Dawson (County Moth Recorders for Huntingdonshire and Cambridgeshire respectively), Ruth Edwards (site owner and moth enthusiast), Will Kirby (RSPB), John Comont (Bedfordshire County Ecologist), Charles Baker and everyone else who helped with searches. In addition to all the above-mentioned, the author also thanks Mark Parsons, Head of Moth Conservation at Butterfly Conservation, for his efforts to ensure continuation of funding for the above projects.— PAUL WARING, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS (e-mail: paul_waring@btinternet.com).

Bright Wave *Idaea ochrata* (Scop.) (Lep.: Geometridae) captive-reared for five generations solely on Hare's-foot Clover *Trifolium arvense* L. and Common Chickweed *Stellaria media*, with minimal intervention

My first experiments rearing the Bright Wave moth *Idaea ochrata* from the egg took place during 1997 and the results were published in *British Wildlife* **9**: 54-55. My main aims were to determine which of the plants growing where I had seen adult moths would be eaten by the larvae and to familiarise myself with the habits and appearance of the larvae to increase my chances of finding them in the wild. I discovered that they chose to feed on Lesser Stitchwort *Stellaria graminea* and legumes, particularly Hare's-foot Clover *Trifolium arvense* and Tufted Vetch *Vicia cracca* eating both flowers, seed pods and leaves of all three, even when these were wilting or mouldy. Larvae were successfully over-wintered and reared to adult.

In the spring of 1998, I searched for wild larvae of the Bright Wave, and some were found near Sandwich, Kent, on 19 May 1998. This work was reported in *British Wildlife* **9**: 326 and **9**: 393. I found one larva by day, within 1 centimetre of the ground in a short sward of fine grasses, of which the tallest stems were 5 cm in length. The larva was 12 mm in length and was resting among the leaves of a tare, which I identified as Smooth Tare *Vicia tetrasperma*, on which the larva was reared indoors to adult. This larva ate the flowers, leaves and pods until 29 May, pupating shortly thereafter and the adult emerged on 19 June, thereby confirming its identity. Three more Bright Wave larvae were found in further searches between 19.30hrs and midnight on 19 May 1998, all resting on grass stems near tare plants. Some of these plants were wilting in the sand.

In 1998, I established a small breeding population in captivity in a flower pot in which Hare's-foot Clover and Common Chickweed *Stellaria media* were the only plants growing. The main purpose of this note is to report that this population has persisted to the time of writing (summer 2003) in this one flower-pot, without intervention, and the pot probably contains larvae at this moment. These results are of interest in demonstrating how a small geometrid moth has survived for five years in a tiny habitat. They are also relevant should any captive-rearing programme be required for this Red Data Book species which has been lost from Suffolk and Essex and is currently known to be resident only in Kent, in a 6 km strip of sandy coastal grassland and shore between Sandwich and Deal, with small out-lying populations at Pegwell Bay and Kingsdown. For the record, the flower pot is 25 cm in diameter, 23 cm tall and made of brown-coloured plastic. The pot is covered with black netting of a mesh fine enough to exclude parasitoids but small predators could gain access by climbing up inside the pot from drainage holes in the base. The netting is supported on a wire frame 30 cm tall. The Hare's-foot Clover was planted into a potting mix of light soil, from which germinated the Common Chickweed. In the first year a plant of Couch Grass *Elytrigia repens* also appeared, but this was removed before it could crowd out the other plants. In some years the two plant species fill all the space within the net. The Hare's-foot Clover is dry and brown by late summer but some of the Chickweed remains green to the end of the year and by autumn fresh young plants are often coming up. Sometimes the vegetation has been largely brown for part of the winter. The pot stands at the base of the south-facing brick wall of my house, on a paved patio, under the overhang of the house roof. In summer the pot stands in a plastic washing bowl which retains some of the rain-water which falls on it, but in the winter the bowl has often been removed to prevent the pot standing for long periods in accumulated rain-water and becoming water-logged. The pot is in full sun all day except the early morning. Most of the summer the soil in the pot looks dry. Occasionally I water it, just frequently enough to keep the plants alive. In the first years I removed some of the dead plant material in the winter, and found larvae at their base, but in the last two years I have left the plant material *in situ*. Apart from withdrawing a few corpses of the adults, this Bright Wave population has been left alone. Each year in late June or early July I see a few adults at rest on the netting or on the plants, but I have not had the time to count them throughout the season. I doubt the adult population numbers much more than a dozen adults and in 2003 I saw no more than three on any one occasion when I was around to look. In 2001, I noted eight adults on one occasion. In 2002, I noticed the first two of the year on 28 June and four were seen on 4 July. If the population persists into 2004, I intend to keep a closer watch to assess numbers. The culture was not set up with the deliberate intention of maintaining it all these years, but its fortuitous persistence has become something of a fascination and it will be left in place until two years pass with no adults seen.

This note was prepared in my post as part-time Reader at Writtle College, University of Essex, to whom I am most grateful for this opportunity and for financial support. My research work on the Bright Wave between 1997 and 2002 was conducted and financed as part of the English Nature Species Recovery Programme.— PAUL WARING, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS (E-mail: paul_waring@btinternet.com).

Rivulet *Perizoma affinitata* (Stephens) (Lep.: Geometridae) flying by day

Red Campion *Silene dioica* flourishes in patches of deep fertile soil on the sloping coastal cliffs of Banffshire. The Rivulet *Perizoma affinitata*, a species normally associated with woodland edge and scrub, accompanies its foodplant despite the treeless habitat. Elsewhere in Britain I have only seen this moth sparingly, but here it can be plentiful. Also, as the following observations show, it is partly diurnal. I have not noticed this behaviour elsewhere, nor is it mentioned in the literature, so it may be a purely local habit. Alternatively, it might be more evident here because the moths are so numerous and easily visible. Diurnal flight is well-known in other members of this genus such as Pretty Pinion *P. blandiata* and Heath Rivulet *P. minorata*.

On 12 May 2000 (a very early date so far north), at Tarlair, O.S. Grid Ref. NJ 7264, near Macduff, about a dozen Rivulets were seen flying actively in the mid-morning sunshine in a gully on the coastal cliffs. The largely white hindwings made the moths very conspicuous. All those netted were males.

On 4 June 2003, again at Tarlair, over a dozen moths were seen flying naturally and vigorously in hot and sunny weather at about 11.00 hours BST. They were mostly worn and faded, and again looked conspicuously pale. Apart from one female nectaring at Red Campion, all appeared to be males.

On 5 June 2003, a visit to Tarlair at 20.00 hours BST revealed at least ten Rivulets fluttering gently amongst the foodplant in the evening sunshine. This time, all were females. Their flight was very different from the rapid, active males in the morning. They flew slowly, almost hovering in front of a Red Campion flower before settling on it. Then they probed the throat of the flower with their abdomen. Actual egg-laying was not observed, but on a later visit (15 June 2003) numerous off-white eggs of this species were found on the developing green seedpods, normally only one egg per pod. No eggs were found on the remains of male flowers.

The grub-like caterpillar of this species lives wholly concealed within the pod, feeding on the seeds. Since Red Campion is dioecious, it must be important for Rivulets to lay only on female plants. The behaviour of the female moths suggested that they were indeed determining the sex of a flower before laying on it.

Many larvae were reared from collected eggs, their numbers inadvertently augmented each time fresh foodplant was added. Virtually all pupated inside a tough cocoon of dry frass and chewed remains of seeds, spun up within an empty seedpod. So consistent was this method of pupation that I assumed it would also apply in the wild. Later that summer, however, I examined many hundreds of old seedpods at the Tarlair site without finding a single Rivulet cocoon, though numerous pods showed signs of past occupation by larvae. A salutary lesson, of course: behaviour in captivity is not always the same as in the wild.– ROY LEVERTON, Whitewells, Ordiquhill, Cornhill, Banffshire AB45 2HS.

SUBSCRIBER NOTICE

Wanted: specimens of British Tortricidae for DNA analysis

I am trying to solve some systematic problems concerning the arrangement of genera and their synonymy within the Tortricidae. This is especially important in the Tribe Olethreutini, where differences are slight and often doubtful. Current research focuses on DNA analysis and I am keen to obtain material from a wide geographical area. I would welcome British material that is no older than year 2000 (ideally, fresh material collected in this current season). **All British species are required;** both males and females are needed for each. Ideally, specimens will have been killed by freezing; if ethyl acetate, cyanide or other killing agents have been used it would help to have a note of this. Material preserved in alcohol (e.g., from Malaise traps) is **not** suitable. **Specimens do not need to be set**, but should simply be pinned with a micro pin and the wings roughly spread away from the abdomen (e.g., micro pin onto a flat sheet of plastozote and spread wings by gently blowing, removing from this board after just a couple of days). Specimens need only to be identifiable – not necessarily in good condition. The DNA sampling will damage the specimens in any case and I just need to be able to identify the species without the need to relax the specimen (which may itself adversely affect the DNA). **It is not necessary for the specimens to be identified by the sender**.

I would like to examine around ten of every British species. Specimens from elsewhere in Europe are also welcomed. Material can either be sent direct to my address below or via The Editor, Colin Plant. (see note below – Ed.). All persons helping will be fully acknowledged.– JOZEF RAZÓWSKI, Polska Academia Nauk, Instytut Systematyki I Ewolucji Zwierząt, ul. Sławkowska 17, PL – 31-016 Kraków, Poland (E-mail: RAZOWSKI@isez.pan.krakow.pl).

EDITOR'S COMMENT

I do hope that people will be able to support Dr Razowski by sending British material. Remember – he wants common species as well as rarities, so just about anyone with a light trap can contribute something. Microlepidoptera specialists will doubtless wish to correspond direct with him. However, for the benefit of those who do not normally collect tortrix moths, I am happy to act as a collecting point for smaller quantities of specimens if this makes life easier. Please ensure that data labels include a locality and a date, as well as your name, and are applied to the specimens. I cannot enter into correspondence with the senders, however.– Editor, 14 West Road, Bishops Stortford, Hertfordshire CM23 3QP.

BOOK REVIEWS

Die Schmetterlinge Baden-Württembergs. Band 9, Nachtfalter (moths) VII edited by **Günter Ebert**. 609pp., 658 colour and 17 monochrome photographs, 652 diagrams and drawings, 180 distribution maps. 240 x 170 mm. Hardback, ISBN 3-8001-3279-6. Text in German. Verlag Eugen Ulmer, 2003. 49.90 Euros (approximately £33.50), plus postage & packing, available from Koch, Neff & Oetinger & Co. Verlagsauslieferung GmbH, Schockenriedstr. 39, D-70565 Stuttgart, Germany.

This is the penultimate volume of this magnificent work dealing with the Lepidoptera of the large south-western German state of Baden-Württemberg; the preparation of the tenth and final volume is well advanced. The present volume completes the coverage of the Geometridae: dealing with the remainder of the Larentiinae and concluding with the Ennominae. As with the previous volumes which were reviewed in this journal (1992, 104: 87; 1995, 107: 203-204; 1998, 110: 146-147; 1999, 111: 46; 2002, 114: 183-184), it is superbly illustrated with colour photographs, the vast majority of living insects in their various stages, plus colour photographs, where appropriate, of their typical habitats; all taken within Baden-Württemberg. As previously pointed out, a high proportion of the species included also occur in the British Isles, either as residents or as immigrants. Under the enthusiastic leadership of the editor, Günter Ebert of the State Natural History Museum at Karlsruhe, twelve other eminent entomologists have contributed sections of this volume.

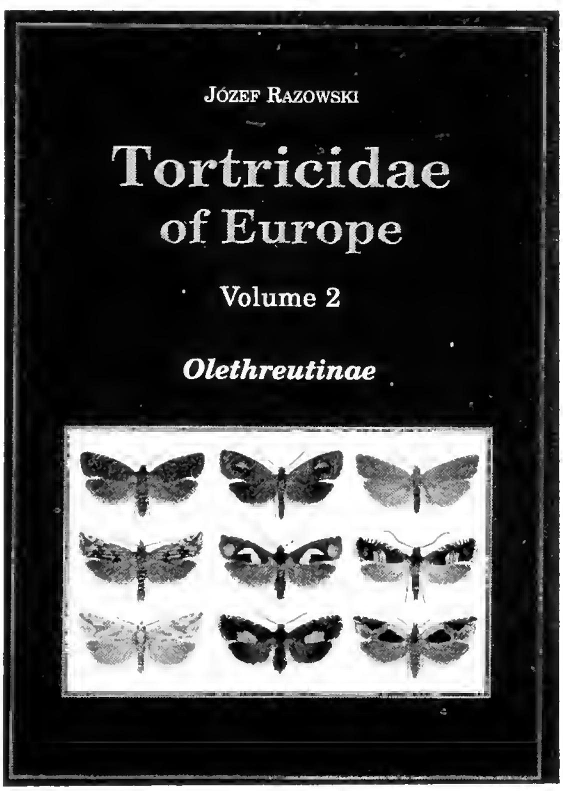
A particularly welcome and useful feature of volume 9 is its excellent coverage of the pugs (Eupitheciini), which can be compared and used in conjunction with Riley and Prior's *British and Irish Pug Moths* (Harley Books, 2003). It contains, in addition to photographs of the living imagines and larvae, life-size colour photographs of set specimens of all species, clear drawings of their genitalia and enlarged diagrammatic drawings of the wing-patterns, high-lighting the distinctive features of certain species which are easily confused with each other.

As with the earlier volumes, the German text is highly informative with regard to the distribution (computer spot maps), habitat selection, larval foodplants, phenology, ecology and conservation status of each species. The final volume (10), in preparation, will contain, among other things, a history of lepidopterological research in Baden-Württemberg, brief biographical details of contributors to these splendid books, and a table of the nectar sources used by imagines.

This volume, like the others, is of great value to European lepidopterists, including those of the United Kingdom. I can thoroughly recommend it to readers of the *Entomologist's Record*. At 49.50 Euros (about £33.50 at the time of writing), plus postage & packing, it is very good value. Even non-German speakers should find that they are able to make good use of these straight-forward, lucidly written books with judicious help from a dictionary.

John F. Burton

Tortricidae of Europe. Volume 1: Tortricinae and Chlidanotinae; Volume 2: Olethreutinae by **Józef Razowski**. Volume 1: 2002. 248 pp., 16 colour plates, 780 genitalia drawings,. Hardback, ISBN 80 967540 9 2. Volume 2: 2003. 302 pp., 18 colour plates, 1084 genitalia drawings,. Hardback, ISBN 80 969052 0 1. Both 214 x 303 mm. Approx. £60 per volume, exclusive of postage – Available directly from the publisher, Dr František Slamka, Račianska 61, SK-831 02 Bratislava, Slovakia or most UK mail order moth book suppliers.



This two volume *magnum opus* updates and completely replaces the single-volume smaller work *Die Tortriciden Mitteleuropas* that was reviewed in this journal earlier (*Ent. Rec.* **114**: 185 – 186). It also embraces a far wider geographical area that includes all of Britain, so that the book is of direct interest to British microlepidopterists.

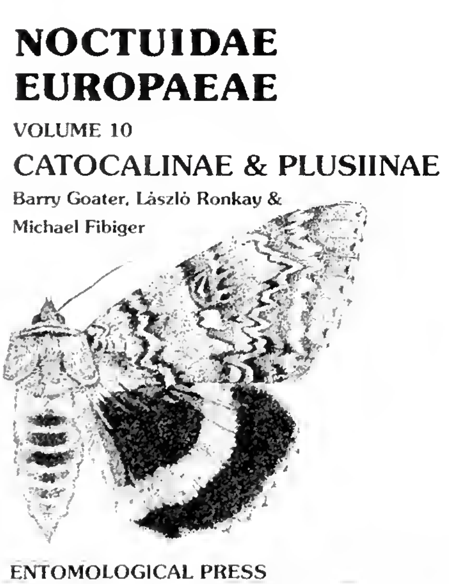
The earlier work was blighted by a number of transposition and other errors; these have all apparently been eliminated in the present two-volume work, which incorporates the same drawings and photographs, along with others, but which seems remarkably error free. The wider geographical coverage has allowed Professor Razowski to incorporate the species that were missing from the smaller volume and all European species appear to be included. In addition, there is descriptive text for each species.

The colour plates depict set specimens and are photographic – not paintings. All species are reproduced at the same size, however, which makes size distinction difficult, and I have heard several people criticise this fact. However, after careful consideration, and an earnest attempt to form an impartial opinion rather than one based on the "tradition has it that …" approach, I think I actually prefer it this way. The size of each picture is about right – not so small that features cannot be seen and not so large that they no longer represent the small moth before you. An isolated specimen may easily be compared to the plates and there is, in any case, a degree of foolishness in the traditional method of comparison with another species if that other species is not known to you (in which case you probably also know the species before you). Such works may be of more use to people who do not need such works!

Genitalia drawings are presented for both sexes of all species; as far as I can tell this is the only work in which the females are portrayed, so that alone renders it invaluable. The text is English and the few linguistic errors do not in any way detract from the value of the work. The work stops short of being a taxonomic review, however, so that problems such as the true nature of *Cydia succedana* and *C. ulicetana* are not resolved.

In Britain the Tortricidae are a problem group for all but those who can already "do" them. The first volume of the standard work by Bradley et al (*British Tortricoid Moths*. Ray Society) is available, but now quite out of date. The second volume is scarcer than the proverbial hen's teeth – a second hand copy was sold on an Internet site in January 2004 for over £400! Neither volume has anything other than a few selected genitalia drawings and both are afflicted by a number of utterly nonsensical statements that affect identification. Of course, we are all waiting for the tortrix volume from Harley Books, but that is not yet available. There is a book depicting the male genitalia of French species, but this does not cover the rest of Europe (a few British species are missing) and is devoid of drawings of females. Razowski's two-volume work is, on this basis, an absolute must for anyone wanting to identify British tortricoids and for two hardbound volumes I think the price is very reasonable by today's standards.

Noctuidae Europaeae, Volume 10, Catocalinae and Plusiinae by **Barry Goater, László Ronkay, & Michael Fibiger**. Entomological Press, 2003. 452 pp., 16 colour plates, 332 genitalia photographs, 166 distribution maps. Hardback, 215 x 292mm, ISBN 87 89430 08 5. 1090 DKK exclusive of postage (approx. £99 – Apollo have a facility to accept payment in British pounds). Available directly from Apollo Books, Kirkeby Sand 19, DK-5771 Stenstrup, Denmark.

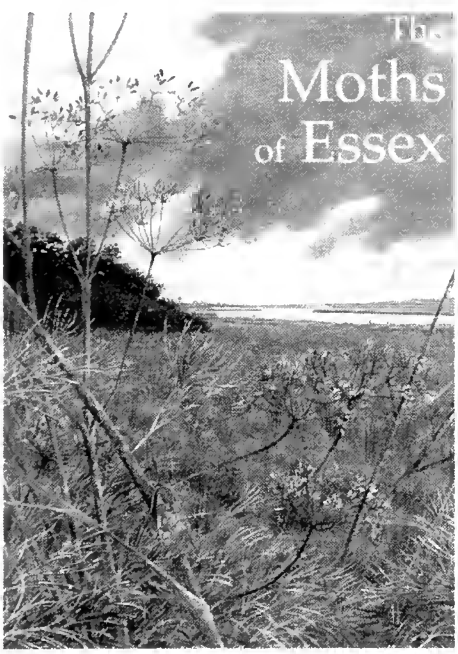


This volume is the eighth to be published in the proposed twelve-volume series. It deals with the two subfamilies Catocalinae and the Plusiinae in their entirety and, apart from representing the most important identification guide for European Noctuidae in the last hundred years is also a taxonomic review; consequently there are some (fully justified) changes to get used to. One new species is described – *Armada barrygoateri* Fibiger, L.& G. Ronkay – a western sibling species of *A. clio* (Stdgr.), though this does not affect Britain.

A characteristic of the series is an extremely high standard of both accuracy and presentation and this volume is, overall, no exception to that rule. Minor errors are evident in places, however, perhaps inevitably. One that I did notice concerns the distribution of *Chrysodeixis acuta* (Walker), on page 185. The source of the records given (Skinner, 1998) does not in reality include the Essex and Sussex records that the work claims it did; these are given in the first edition and are edited out of the 1998 version. I have no knowledge of the Sussex record, but that from Essex, at least, was certainly *C. chalcites*; I have an F2 series bred from its offspring and named by dissection. Further, in claiming that *C. acuta* is recorded in Europe only from Britain the authors have perhaps overlooked a record from Brittany, France on 24 September 1991 which is, in fact, given in Skinner (1998). Curiously, Skinner (1998. *Moths of the British Isles*. Viking) seems to be absent from the list of quoted references (surely it ought to be on page 416?) This all suggests to me some sort of editorial slip up rather than any mistake on the part of the author of this particular text. I cannot imagine such a basic error emanating from the pen of such a wise and experienced man — especially as he was almost certainly aware that it would be me reviewing his work!

This is nit-picking in any case. The last three volumes of this series have appeared in the same number of years and it is hoped by the publishers that this can be maintained. I look forward with great enthusiasm to the remaining four volumes and commend both this volume and the series, without hesitation, to all who study British macro-moths.

The moths of Essex by **Brian Goodey**. Lopinga Books, 2004. 362 pp., distribution maps for all species. Softback, 147 x 210 mm, ISBN 0 9350362 5 1. £19.75 exclusive of postage. Available directly from Lopinga Books, Tye Green House, Wimbish, Essex CB10 2XE.



Essex been blessed with a more than fair share of extremely competent lepidopterists and it is no surprise that there have been a number of books concerning that county' s fauna. A *Guide to the Butterflies and larger moths of Essex* was produced by Joe Firmin, Geoff Pyman and several others in 1975. Then, in 1981, Maitland Emmet produced a work containing ten-kilometre distribution maps of the micros, closely followed, in 1985, by a similar work involving the macros. Now, Brian Goodey continues the splendid efforts of these earlier recorders with an excellent update of all the county's moths – both macros and micros.

There is only so much information that can be imparted by means of a dot distribution map, and in recognition of this fact, Brian Goodey has endeavoured to present a far greater amount of data than is normally encountered in county faunas. Ten-kilometre squares are entirely shaded, light for pre-1960 records and dark for 1960 – 1989 data. Against this background, three types of dots are employed on a 5 x 5 kilometre square basis for single adult records, multiple records of adults and for breeding records. Thus, the breeding range of any given species can be identified easily – something that cannot be done in most other works of this nature.

The book has, unfortunately, been very long delayed in its appearance – the blame for which does not lie with the author. I might have preferred a larger page size to ease the text a little, and I find the binding a little tight, since the book springs closed when released. Thus, referring to its pages whilst writing this review means that I need to lay another, heavy book across it to keep it open. Personally, I would have preferred larger maps and a little more text on each species, but the book does cover **all** the moths and also contains a number of introductory chapters of interest (by Robin Field, Tim Gardiner, Basil Harley, Chris Gibson and Zoë Ringwood) and it is actually difficult to draw any conclusion other than that the best balance between text length and purchase price has been reached. If there had been any available space, some more pictures like that which adorns the front cover (painted by Alan Harris) would have been very nice indeed. It is an affordable book that should be of interest and value to all lepidopterists interested in moths in the south-east corner of England.

Continued from back cover

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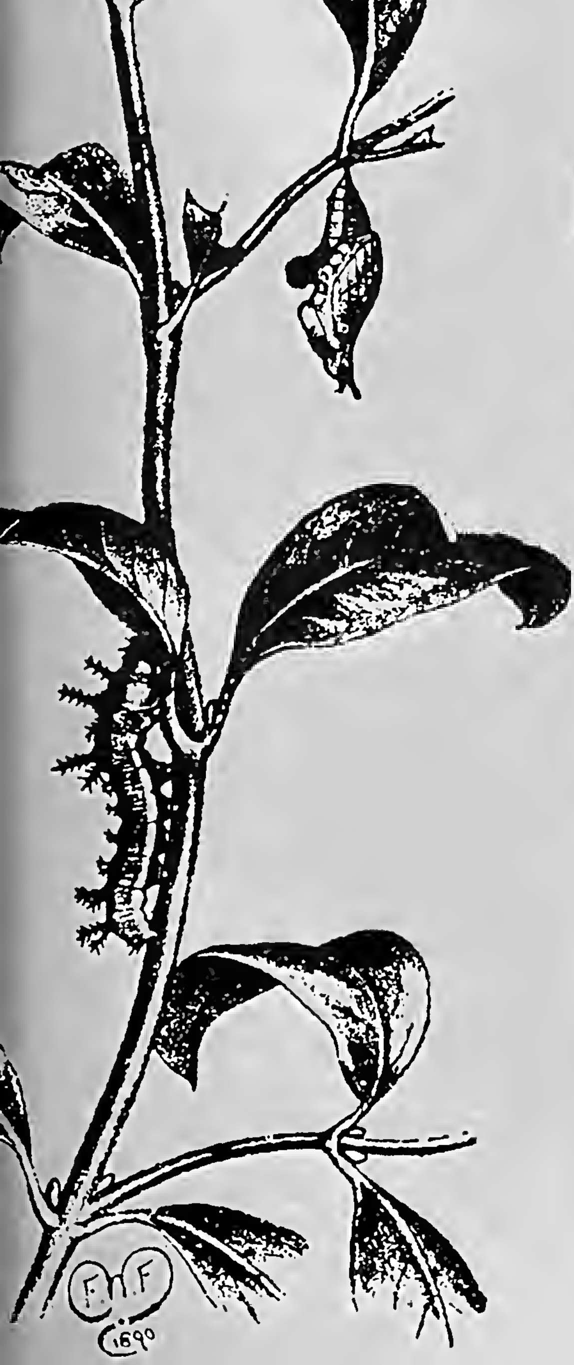

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Scleroconus acutellus (Eversmann) (Lep.: Pyralidae) new to Middlesex, as a probable primary immigrant

A single example of a pyralid moth that I did not recognise came to my garden light in Barnet on the night of 9 June 2004. The moth was retained and a digital photograph of the live insect was duly made and e-mailed to the county recorder, Colin Plant, for an opinion. Although photographs are far from ideal for naming unusual species, they do allow for a rapid response and, as a result of the combined efforts of Colin, Brian Goodey and Barry Goater, the moth was unanimously named as *Scleroconus acutellus* (Evers.) almost by return. This species is not featured in Goater (1986. *British pyralid* moths) but illustrations can be viewed in Palm (1986. *Nordeuropas Pyralider*) and Slamka (1997. *Die Zünslerartigen (Pyraloidea) Mitteleuropas*) – though neither work figures the genitalia of either sex. The Barnet specimen is preserved in Colin Plant's collection. Although my postal address is Hertfordshire, my garden is some 100 metres across the boundary into the Middlesex vice-county in the northern part of London.

Previous records of this species in Britain are few. Those published, appear to be:

Leckford, Hampshire, 8 August 1988 (P. H. Sterling. *Ent. Rec.* **101**: 153, 226);

Virginia Water, Surrey, 13 June 1989 (P. J. Baker. *Br. J. ent. Nat. Hist.* **7**: 35);

Henley-on-Thames, Oxfordshire, 20 June 1995 (D. Wedd. *Br. J. ent. Nat. Hist.* **9**: 225);

Exeter, Devon, 13 June 1999,14 June 1999 and 5 July 1999 (P. Butter. *Atropos* **8**: 11-12);

West Wittering, West Sussex, [2000 - no specific date noted] (M. Love *vide* T. Davis. *Atropos* **11**:56).

I am informed that another example was taken by Mark Parsons during 2003, and so the Barnet example appears to be the seventh occurrence in Britain. The moth is found, naturally, in the Danube Basin of central Europe where it is associated with reed *Phragmites*. Both Paul Butter (*Atropos* **8**: 11-12) and Tony Davis (*Atropos* **11**: 56) have suggested that British records of this species may relate to accidental importations with reeds for thatching and indeed, in introducing the Devon records noted above, Butter was quick to point out that his cottage had recently been re-thatched with reed imported from Hungary. There seems no doubt that this was the source of his records. Similarly, the West Wittering record was made not too far from a newly thatched building (Tony Davis, pers. comm.).

There do not appear to be any thatched cottages or other sources of imported reed in this part of north London – and another explanation is required for the moth's sudden appearance in Barnet. There are two possibilities. First, it may be relevant that the moth appeared on a night of immigrant insect activity, which had been preceded by several weeks without such activity. During the daytime of 9 June 2004 large numbers of Painted Lady butterflies *Cynthia cardui* L. and Silver Y moths *Autographa gamma* (L.) suddenly appeared at several localities in London, with several hundreds of each noted by Colin Plant on the northern bank of the Thames at Barking Level. In my own garden trap on the same night I recorded both Silver Y and the Diamond-backed Moth *Plutella xylostella* (L.); the latter was also noted in Bishops Stortford by Colin Plant whilst in Takeley, North Essex, Geoffrey Sell captured a Small Mottled Willow *Spodoptera exigua* (Hb.). The following night, a Striped Hawk-moth was noted in Sussex by Tim Freed (Colin Plant – personal communication); doubtless there were other immigrants that I am not aware of. The main area of residency of *acutellus* is central Europe and this does not fit too well with the expected source of other immigrants noted at the time. However, Karsholt & Razowski (1996. *The Lepidoptera of Europe: A distributional checklist*) note *acutellus* in most European countries, including France and Spain. It is, therefore, possible that the Barnet specimen was a primary immigrant.

The second explanation is rather more daring. It is based upon the fact that on some warm, humid nights, garden moth traps situated miles from the nearest marshland habitat suddenly start catching marshland moths. On the night before there are none and the next night there are none either! For some reason, these wetland moths all take to the air on the same evening and some are caught in traps. Much documentary evidence exists, but space prohibits its full presentation here. Evidence for such an occurrence on the night of 9 June 2004 is slender, but Colin Plant informs me that Geoffrey Sell captured *Schoenobius gigantella* (D. & S.) in his garden in Takeley, North Essex – a most unexpected occurrence of another moth that is also associated with reed. Could it be that *Scleroconus acutellus* is in fact already established as a resident moth in some of the southern wetland sites of England – perhaps overlooked as the now increasingly common *Nascia cilialis* (Hb.). This is not totally beyond the bounds of possibility as the example of the Toadflax Brocade *Calophasia lunula* (Hufn.) illustrates. This noctuid is normally confined to the shingle beaches of the south-east of England, but several examples taken in moth traps in London during 2003 were thought to relate to primary immigrants. Larvae certainly resulted from some of these arrivals, including at Tower Hamlets in eastern London (also Middlesex) where several were found by Terry Lyle, and Colin Plant tells me that during May and June 2004 freshly emerged adults have been turning up in one or two places across northern London, suggesting that it is, at least temporarily, resident here.— RACHEL TERRY, 92 Woodville Road, Barnet, Herts EN5 5NJ.

Many-plumed Moth *Alucita hexadactyla* Linnaeus, 1758 (Lep.: Alucitidae) — extended copulation period

That moths may spend many hours in copulation is well known, but documented records apparently relate only to larger species (Young, M., *The Natural History of Moths*, London, 1997). At 2100 hrs GMT on 2 April 2004 I found a pair of Many-plumed moths copulating on my garage window frame. They were still in the same position at 0700 hrs the next morning and remained so until 1800 hrs when they moved half a metre up the mullion. They remained there, still in copulation, until at least 2200 hrs, but had gone by the following morning. They were thus in copulation for a minimum period of 25 hours. Young (*op. cit.*) suggests that prolonged mating may only be possible for large well protected or very cryptic species, but neither of those characteristics applies to the Many-plumed Moth.– P. J. OLIVER, The Briar Patch, Limpsfield Chart, Oxted, Surrey RH8 0TL.

On the Aston Rowant record of *Ceutorhynchus syrites* Germar (Col.: Curculionidae) and another from Devon

With reference to the appeal for information made by Professor Morris concerning the Aston Rowant (Oxfordshire) record of *Ceutorhynchus syrites* I can give a very few details. The captor was the late G. E. Woodroffe, primarily a student of Heteroptera, but also a very competent coleopterist. The site was Aston Hill and a note I made at the time indicates that he swept one example only, from chalk grassland, on 17 May 1966.

The other record is of an example from Totnes, South Devon, captured on 13 October 1925 by T. H. Edmonds, according to a note I have from the late H. Donisthorpe who, with good reason, suggested that it ought to be confirmed. As far as I know that was never done, nor do I know the present whereabouts of Edmonds' collection.— A. A. ALLEN, 49 Montcalm Road, Charlton, London SE7 8QG.

***Meteorus rubens* (Nees) (Hym.: Braconidae) reared from Large Yellow Underwing *Noctua pronuba* (L.) (Lep.: Noctuidae) in Peterborough (VC 32, Northamptonshire)**

On 19 January and 23 January 2004 I found two larvae of the Large Yellow Underwing *Noctua pronuba* in their penultimate instar in my garden at my Peterborough address by day when collecting heads of Chicory for the table. Both larvae were 2.5 cm in length, green with black dashes, and feeding quite deep within the Chicory heads. The first one soon moulted into its final instar (brown), then the drama started. On 25 January seven wasp grubs emerged from the caterpillar and spun their brownish-white cocoons beside the caterpillar. The exit holes they made in the sides of the caterpillar were clearly visible at the hind end. The caterpillar lived for a further three days, moving about quite actively, but did not feed. It died on 28 January. The black adult wasps all emerged on 4 February, having been kept indoors. They have been identified as *Meteorus rubens* (Nees) by Dr Mark Shaw, Natural Museums of Scotland, Edinburgh, with whom the specimens have been deposited. Dr Shaw reports that *M. rubens* is a widely distributed and frequent braconid wasp which mainly parasitises noctuid hosts which feed near the earth. It has been recorded previously from the Large Yellow Underwing. The second Large Yellow Underwing larva became fully grown and burrowed into the soil on 31 January and pupated successfully. I thank Dr Shaw for the identification and information on *M. rubens*. — PAUL WARING, Reader, Centre for Environment & Rural Affairs (CERA), Writtle College, Essex. Address for correspondence: Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS (e-mail: paul_waring@btinternet.com)

Hazards of butterfly collecting. Margrethe – chameleon extraordinary, Botswana 1991

I had a chameleon in Africa – to paraphrase the opening line of my compatriot Karen Blixen in her famous book, *Out of Africa*. We were living in Botswana at the time and I found it sitting at the very top of a flowering *Maerua*-bush near Gaborone Airport. The bush was humming with insects. I saw it catch several *Colotis* butterflies and the occasional *Junonia*, as well as various beetles and a large fly. I took it home.

After a bit of research we identified it as a fully-grown female flap-necked chameleon (*Chameleo dilepis*). We named her Margrethe, after the Queen of Denmark - and she was never referred to as IT again. She was quite hefty, fully 30cm from the tip of the tail till the front of her head and then, of course, with the tongue reaching a further 10cm when fully extended. Chameleons vary a lot in temperament. After a few days of acclimatization in a large packing crate, Margrethe proved to have the sweetest possible disposition. We transferred her to a large laundry basket which we kept in our study and began the process of getting better acquainted. Pretty soon she accepted little handheld snacks, such as a juicy cockroach caught by one of the cats or even a bit of minced meat – but we had to hold the gift at a distance since she had to 'catch' it with her long, yellow, sticky tongue.

Initially we fed her mainly nice grasshoppers, apparently innocuous beetles, botflies, and such. We then turned to live butterflies and finally to dead, thawed frozen butterflies, all of which she ate with pleasure. She also liked flying termites; whenever they came to light on our terrace Margrethe would happily let herself be grasped round the abdomen and held near the light where she would zap the termites as if she were a machine-gun!

After a while we also offered her insects known to be toxic or unpalatable (aposematic), such as blister beetles (*Mylabris* sp. (Meloidae)), warning-coloured bugs, and Chrysomelid beetles. Some of the latter were occasionally eaten; the others could remain unharmed in her laundry basket for days. Formal feeding experiments now seemed possible. So over breakfast every other day, Nancy and I would alternate in offering her a selection of fifteen thawed butterflies. They would be held by the antennae at a suitable distance for ten seconds, and then removed if they were not taken. In each case the species of butterfly and the time elapsing before it was 'caught' was noted, and pretty soon we had a fine set of data. In between the formal feeding sessions we threw all sorts of insects and their caterpillars into the basket, without strict observation of the outcome; however, it was clear that those that looked aposematic to me usually survived. No grey or green grasshoppers (especially various *Truxalis*, with their horse-like heads) survived; no blister beetle ever went missing.

The hand-held feeding results were so amazing that you might think the figures were cooked. Out of 155 Pieridae offered, 87% were eaten within an average of 2.7 seconds; this is about as fast as Margrethe could fix the prey with one eye, swivel the other, and 'shoot' with the tongue. On the other hand, not one *Acraea* nor one African Tiger *Danaus chrysippus* L. out of 96 was even touched; these are generally thought to be the most aposematic butterflies in Africa and are models in mimicry complexes.

Also ignored were 14 Jokers *Byblia ilithyia* Drury, which have all the elements of the aposematic species though with a different mix; this species feeds on Euphorbiaceae and might actually be aposematic. Somewhat ambiguous butterflies were treated with caution; only 58% of other Nymphalidae were taken within the ten seconds, at that with an average delay of 6.5 seconds.

Out of 26 female Diadems *Hypolimnas misippus* L., a wonderful mimic of *D. chrysippus*, only one was taken - with a delay of nine seconds; so mimicry seemed to work. However, the crowning element of the tests should have been the non-mimetic males of *H. misippus*; none of 26 males was even touched. The male underside and the abdomen do have some aposematic features, but half were offered only with the upperside showing, and they are just black with big white oval spots. I have no idea why they were refused.

Clearly Margrethe showed great powers of discrimination and full consistency in her choices, and there were certainly also learning processes. She once sampled a very toxic *Phymaeus* grasshopper, to her evident disgust, and never touched one again. She completely rejected *Acraea* species brought down from north that were not found in Gaborone, so she must have generalized as well (the full story can be found in Larsen, T.B. 1992. *Tropical Lepidoptera*, 3:101-104).

I had hoped to continue the experiments with models rather than real butterflies, but that was not to be. Both Nancy and I went on long business trips (Bangladesh and Belize respectively, I think) and when we got back there were bad news. Margrethe died from overexertion after laying more than 30 unfertilized eggs while in care with friends.

The only other large chameleon we found before leaving Botswana was an irascible male that hissed and scratched and never ate anything at all in captivity. Nancy and I both missed the morning feeding ritual and not least Margrethe's reaction when we offered her yet an *Acraea*; she would throw a quick glance at the offer with one eye, then swivel the other towards us with a look that clearly said: 'Come on guys ... not again!'.— TORBEN B. LARSEN, UNDP Vietnam, c/o Palais des Nations, 1211 Geneva 10, Switzerland. (E-mail: torbenlarsen@compuserve.com).

Further observations and comment on the flight times of the Straw Dot moth *Rivula sericealis* (Scop.) (Lep.: Noctuidae) from a rural garden on the Norfolk/Suffolk border

Although Colin Plant suggests that "data sets obtained from a single site are probably too small to permit a proper analysis, even if the trap was run on every night" (*antea*. 33), I think some detail taken from the last 20 years of almost daily records from my south Norfolk garden can add to the current discussion on the voltinism and time of flight for the Straw Dot *Rivula sericealis*.

The species first appeared as a singleton in my trap on the 13 October 1984 and, with hindsight, I believe that late date is significant in indicating cyclical population fluctuations for the species, but not necessarily at this site at that time. There is a suggestion from Bretherton and Chalmers-Hunt (1983, *Ent. Rec.* **95:** 92 & 151) that at times the Straw Dot may migrate some distance, although not necessarily from abroad. With no sighting in 1985 the Straw Dot was next seen in 1986 and from then the length of the recorded flight time(s) has generally increased to 2003, but with a noticeably lean period from 1996 to 1998 (or perhaps a year or so longer), as shown in table 1 below. It is not certain when the lean period ended, since there are gaps for 1988/1989 and 1999/2000. The traps were not run after the start of each of these periods as I was unable to find any way of combating the problem caused by birds entering the traps at around dawn and decimating the catch, other than turning off the traps. After two years the culprits had either "forgotten" or, more likely, had died and recording was resumed.

The dates in the Table are shown as day/month, the days are the duration of each flight period and are inclusive and the gap shows days between flight periods, where appropriate. Whilst there is just over a month difference (32 days) between the first record in 1987 and that in 2003 there are only four days between first sightings in 1992 and 2003. Similarly the first appearance of the second flight period in 2003 is 44 days earlier than it was in 1987 but only three days earlier than in 1995 and I would suggest that no conclusion as to change in flight time can be drawn from these figures except to say it probably varies with population levels, weather conditions etc.

However the progression from the sighting of a singleton in October in 1984 to an obviously distinct third flight period in both 2002 and 2003 does seem to have some significance. The record from 1984 together with the singleton seen in October 1996 may indicate the propensity for more "broods" with this species, when conditions are suitable and numbers are comparatively high, a propensity which has become more obvious at Scole in 2002 and 2003. But the question must be asked as to whether these sightings represent distinct broods of just separate flight periods. Buckler (1901. *The Larvae of the British Butterflies and Moths*, Vol. 9, p. 8) noted that "on the 21st February 1882, the air became suddenly warm, and many of the larvae awoke from their long sleep" but adds they soon became torpid when colder weather returned and many then died. Such early breaking of the diapause followed by conditions that caused significant numbers of larvae to die may well explain the total lack of records for the first (June) flight period in 1990 and 1991 and only singletons being recorded in 1996 and 1997. The numbers of adult moths seen in the traps in the last couple of years (see 2003 flight chart below) would indicate a locally breeding population with three broods, but until a survey for larvae is carried out no firm conclusions can be drawn.

Until wild larvae, in various instars, are found at appropriate times of year, it can only be assumed there are currently three broods. With wood false-brome, *Brachypodium sylvaticum*, apparently the preferred larval foodplant as indicated in most current British literature, not found in particularly close proximity to the trapping site other grasses are probably utilised by the Straw Dot here. Skou (1991. *Nordens Ugler*) lists *Agropyron repens*, *Bromus* spp. and *Festuca* spp. as additional foodplants, which do all grow around the trapping site and Gerry Haggett (pers. comm.) has reared this species on *Holcus* spp., which again is well represented, so it should be possible to find and identify wild larvae at this site.

Table 1. Flight periods for the Straw Dot Moth from 1984 to 2003 at Scole in Norfolk.

Year	First Period			Gap	Second Period			Gap	Third Period		
	from	to	days	days	from	to	days	days	from	to	days
1984										13/10	1
1985	-	-			-	-			-	-	
1986		16/7	1	-		23/9	1		-	-	
1987	29/6	27/7	29	32	29/8	20/9	23		-	-	
1990	-	-	-		8/8	24/8	17		-	-	
1991	-	-	-		26/7	27/8	33		-	-	
1992	1/6	9/6	9	28	8/8	14/8	7		-	-	
1993	4/6	26/6	23	37	3/8	4/9	33		-	-	
1994	6/6	1/7	26	19	21/7	1/9	42		-	-	
1995	3/6	29/6	27	19	19/7	18/8	31		-	-	
1996		27/6	1	?	20/8	3/9	15	?		14/10	1
1997	10/6		1	?	10/8	18/8	9		-	-	
1998	15/6	19/6	5	55	14/8	16/8	3		-	-	
2001	5/6	5/7	31	36	11/8	2/9	23		-	-	
2002	2/6	28/6	27	29	28/7	31/8	35	19	20/9	30/9	11
2003	27/5	28/6	33	17	16/7	24/8	40	15	9/9	12/10	34

Dates when larvae are found, and at what instar(s), are required to confirm that the Straw Dot is triple brooded – at least at Scole at the moment. Ideally finding mature larvae from mid June to early July and again from late August to early September, as well as the usual late April early May period, is what is wanted. These dates are somewhat tentative as there must be differential growth rates and emergence times, but significant variation either in when mature larvae are found or the number of different instars found together would still leave questions to be answered.

I am grateful to Gerry Haggett for information on rearing the larvae of the Straw Dot and for helpful comment and criticism on an earlier draft of this note.— MIKE HALL, Hopefield, Norwich Road, Scole, Diss, Norfolk IP21 4DY.

Trichiusa immigrata Lohse (Col.: Staphylinidae) in numbers from straw in East Suffolk

This aleocharine rove beetle has spread rapidly following its discovery in Kent in 1992 (Heal, N. F. 1993. *Coleopterist* **2**: 218). It has chiefly been found in very small numbers in old dung heaps although there are two records of it being found in numbers; once in a Surrey grass-compost heap (Owen, J. A. *et al.* 1997. *Entomologist's Gaz.* **48**: 111–124) and once from composted household and garden waste (Welch, R. C. & Sadler, J. P. 2000. *Coleopterist* **9**: 54).

Since April 1998, I have found it in ones or twos in four old dung heaps in East Suffolk (see Nash, D. R. 2002. *Trans. Suffolk Nat. Soc.* **38**: 101–123). On 4 July 2002, however, I discovered the beetle in absolute profusion in the loose, damp straw on the open ground outside the base of some stacked and covered straw bales at White House Farm, Great Glemham (O.S. grid ref. TM 3562).There was an almost total absence of other aleocharines as well as of the larger carabids and staphylinids (the absence of these last-named predators may well have contributed to the abundance of *Trichiusa*).

These three finds of the beetle in numbers perhaps indicates that optimum breeding sites are those with more-or-less "pure" decomposing plant material rather than dung heaps with their partially digested plant remains and straw contaminated by herbivore dung and urine. I thank my friend Alex Williams for identifying my first examples of *T. immigrata* and Lord Cranbrook for permission to record on his estate at Great Glemham.— DAVID R. NASH, 3 Church Lane, Brantham, Suffolk CO11 1PU.

Further records of the Lead-coloured Drab *Orthosia populeti* Fabr. (Lep.: Noctuidae) in Devon

The presence of this species in Devon has only been confirmed recently (*Ent. Rec.* **115**: 192- 193). Further survey work was carried out on 2 and 14 April 2004 with traps set at four different sites in the Hatherleigh area. The Hannaborough Moor site was not surveyed this time. The moth was found at all sites surveyed by myself and Rob Wolton. Our first attempt, on 2 April, failed almost certainly because we packed up too early; this action was based on my experiences of the moth in the south-east, which suggested that it flies early on in the night. The session on 14 April proved more successful, and on this occasion we left traps running all night. It seems reasonable to assume that the moth in Devon flies a lot later than it does in the south-east, probably after 01.30 hours. The Halsinger Down, near Ilfracombe site mentioned in *Ent. Rec.* **115**: 192 – 193 has yet to be investigated.— ROY MCCORMICK, 36 Paradise Road, Teignmouth, Devon TQ14 8NR.

ECTOEDEMIA HANNOVERELLA (GLITZ, 1872) (LEP.: NEPTICULIDAE) NEW TO THE BRITISH ISLES

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Abstract

The first occurrence in Britain of *Ectoedemia hannoverella* (Glitz, 1872) (Lep.: Nepticulidae) is documented.

Introduction

On 25 September 2002, while recording leaf-mining Lepidoptera in the Mildenhall area of Suffolk (O. S. grid reference TL 7276, VC 26) some fallen poplar leaves on the ground attracted our attention and were noticed to contain mines in the basal area of the leaf; the mines were accompanied by some thickening and discoloration of the petiole. On consulting the key to nepticulid leaf-mines in Emmet (1983), we came across only one species that mined in this manner on poplar - *Ectoedemia turbidella*, and the mines were recorded as such. The fact that the key specified that *E. turbidella* occurred on *Populus canescens*, grey poplar, rather than just *Populus* was rather rashly overlooked at the time. Our discovery was mentioned to Neil Sherman who subsequently found similar mines on *Populus* × *canadensis*, Italian poplar, on 1 October 2002 in the Ipswich area (TM 2043, VC 25) and again these were recorded as *E. turbidella*. As *E. turbidella* had not been recorded previously from either West or East Suffolk vice-counties, AWP forwarded the details of these records to John Langmaid for inclusion in the Microlepidoptera Review for 2002. Dr Langmaid noticed the lack of specificity about the type of poplar that these mines had been found in and informed us that *E. turbidella* had only been recorded mining *P. canescens* in this country. Referring back to the leaf mines taken from the Mildenhall site we came to the conclusion that these were not within in the leaves of *P. canescens*, but most likely a hybrid of *Populus nigra* was involved; a subsequent visit to the site confirmed them as *P.* × *canadensis*.

Because the mines found appeared to have very close similarities with other petiole-mining *Ectoedemia* this lead us to consider that they were either mines of *E. turbidella* on a new foodplant or else a new species of *Ectoedemia* not covered by the existing key. In 2003, Neil Sherman and AWP collected mines from the two known sites to rear through for confirmation of their identity, as the mines taken in 2002 had not been reared through. JC also took some mines from the Ipswich site to rear through.

Examples of the mines were shown at a Norfolk Moth Survey meeting in November 2003 and subsequently Andy Musgrove found similar mines on hybrid black poplar at Thetford (TL 8782, VC 28) on 13 November 2003. Further sites with mines on *P.* × *canadensis* were found by AWP at Brandon (TL 7886, VC 26) on 3 October 2003 and Melton (TM 2850, VC 25) on 9 November 2003.

In April and early May 2004, adults from mines from the Ipswich site raised by JC and NS started to emerge. As *E. turbidella* and *E. hannoverella* are indistinguishable externally the genitalia were examined. These confirmed the identity to be *Ectoedemia hannoverella.* Mines raised by AWP from the Mildenhall site were brought inside later and these emerged in May 2004 and were also confirmed by genitalia examination to be *E. hannoverella*.

Recognition

Ectoedemia hannoverella (Glitz, 1872)
Nepticula hannoverella Glitz, 1872, Stett. ent. Ztg. **33**: 23-26

Adult ♂♀. (Plate H, Fig. 1).
Descriptions are based on British material from Mildenhall and Ipswich. Wingspan 6 – 7 mm. Head with yellow-orange frontal tuft, eye scapes off-white, antennae uniform dark-brown. Thorax dark blue-black, sometimes with off-white scales along anterior edge. Abdomen dark blue-black. Forewing, dark blue-black with white basal spot, a white costal spot and white dorsal spot just beyond the mid-point, in some specimens the dorsal spot extends to join costal spot to form a white fascia, a short oblique white spot arising from the costa in the basal area extending distally, scattered white scales in the basal area, cilia off-white. Hindwing pale grey.

Genitalia (♂). (Plate G, Figs. 1 and 2)
The inner margin of the valva is fairly straight along its length, the outer margin being strongly curved, the apex not being separated or with tips. The aedeagus having two pairs of similar pointed spines at the tip, the lower pair slightly more curved than the upper pair. The most distinctive area of the process was the fairly long and pointed gnathos with a series of spines positioned centrally rather like a 'flower arrangement' (just visible in the photo). This can be become rather obscured when under the microscope cover slip if it becomes twisted.

Genitalia (♂). (Plate G, Fig. 3)
Ovipositor having a distinctive blunt tip. Relatively long corpus bursae. Anterior apophyses fairly broad throughout the length, posterior apophyses broad and curving inwards at their tips. Signa long.

Larval mine. (Plate H, Figs. 2 and 3)
Based on the mined leaves examined the egg is laid at approximately one-third the distance along the petiole from the base. This differs from the description in Johansson *et al* (1989), which states that the egg is laid 1 cm from the lamina. The mine starts in the petiole, extending to the leaf base, causing thickening and often discolouration of the petiole. On reaching the leaf base the mine expands into a blotch in the lamina between the first lateral vein and the leaf margin. Johansson *et al* (*op. cit.*) mention that the blotch mine may be formed between the mid-rib and the first lateral vein, although this behaviour has not been observed in mines examined so far. As the larva continues to feed and extend the blotch its black frass is laid down in two

parallel lines extending from the petiole into the blotch. This forms a passage from the area of the leaf where the larva is feeding down to the petiole that the larva may use to retreat back into the petiole. The mines often form 'green islands' in fallen leaves, the leaf retaining its green colour in the area around the mine while the rest of the leaf loses its green colour turning brown.

Biology and distribution

The following description of the biology is from Johansson *et al* (1989), except were explicitly stated to refer to findings in this country. Host plants include *Populus nigra* and its hybrids (*P.* × *canadensis*) although so far in this country mines have only been found in *P.* × *canadensis*. The species is single brooded with adults being found in May and June. The larvae start feeding in July and appear to start blotch mining earlier than *E. turbidella* with tenanted mines having been found in this country from late September through to early November. Pupation occurs outside the mine.

In Europe it is widespread and often abundant in Netherlands, Belgium, Germany, Poland, Switzerland, Austria, Hungary and northern Italy with the species also being present in east France, Czechoslovakia, northern Yugoslavia, Denmark and Sweden.

Remarks

In the European Checklist, Karsholt and Razowski (1996) position *E. hannoverella* as species number 269, after 268 *E. intimella* (Zell.) and before 270 *E. turbidella* (Zell.). In the British checklist (Bradley, 2000) the positions of *E. turbidella* and *E. intimella* are reversed, with the latter preceding the former. In consideration of this, we suggest that *E. hannoverella* should be placed in the British list immediately after *E. turbidella* (Zeller, 1848) and be given the checklist number 24a.

Specimens of the adult have been retained in the collections of the authors. Slides of the genitalia are held in J. Clifton's collection.

Acknowledgements

We would like to thank the following people for their assistance: Neil Sherman for providing a ready source of tenanted leaf mines, for taking part in the rearing through of adults and the photograph of the adult, John Langmaid for catching our initial misidentifications and for additional advice, Brian Goodey for taking the photographs of the genitalia and Rob Edmunds for photographs of the leaf-mine.

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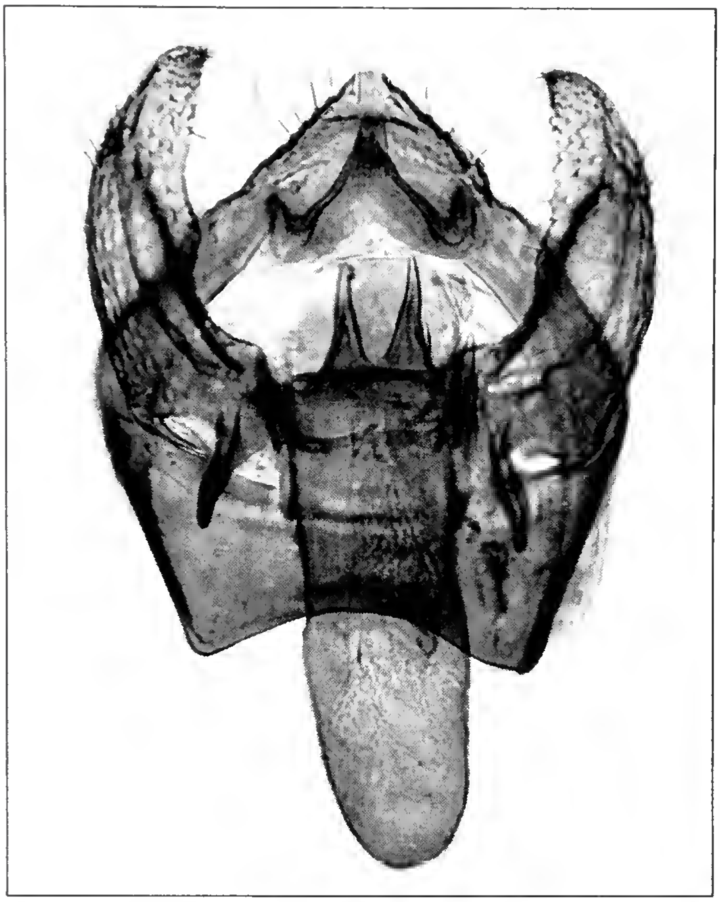

Fig. 1. Male genitalia of *E. hannoverella* (J. Clifton coll., slide number 164).

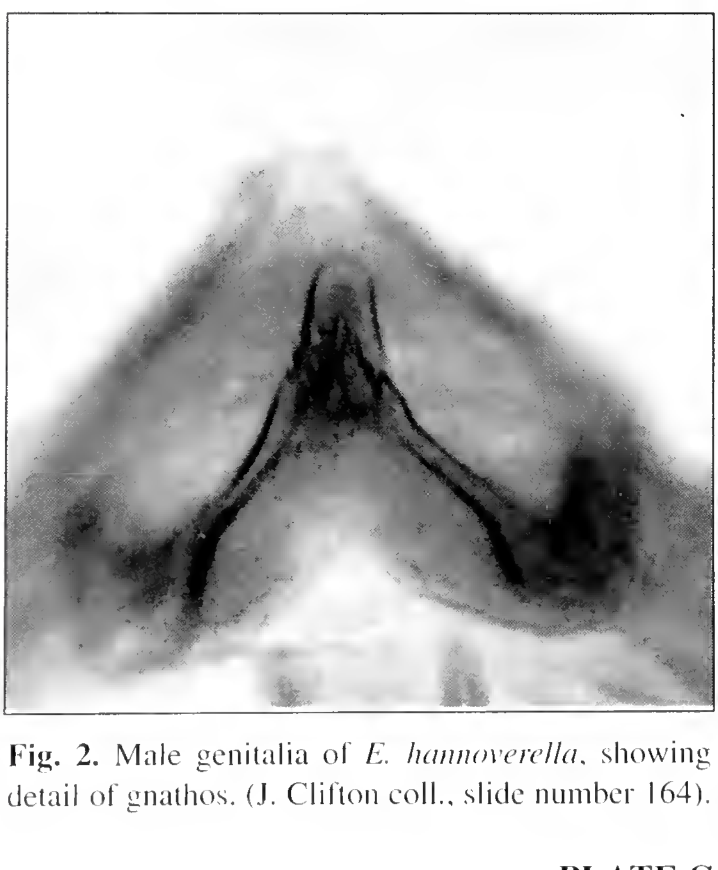

Fig. 2. Male genitalia of *E. hannoverella*, showing detail of gnathos. (J. Clifton coll., slide number 164).

Fig. 3. Female genitalia of *E. hannoverella* (J. Clifton coll., slide number 165)

PLATE G

Fig. 1 *Ectoedemia hannoverella* (Glitz, 1872). Ipswich, 28 April 2004.

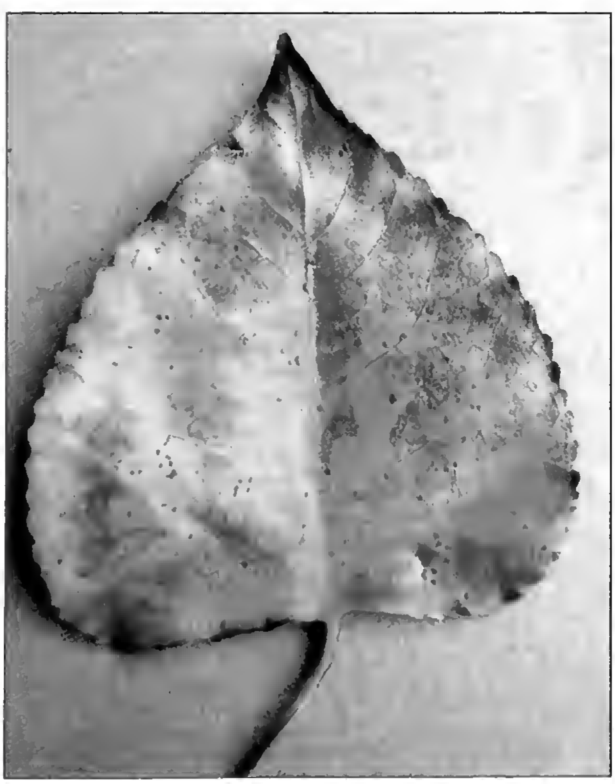

Fig. 2. Leaf-mine of *E. hannoverella* in *P.* × *canadensis*. Ipswich, 7 November 2003.

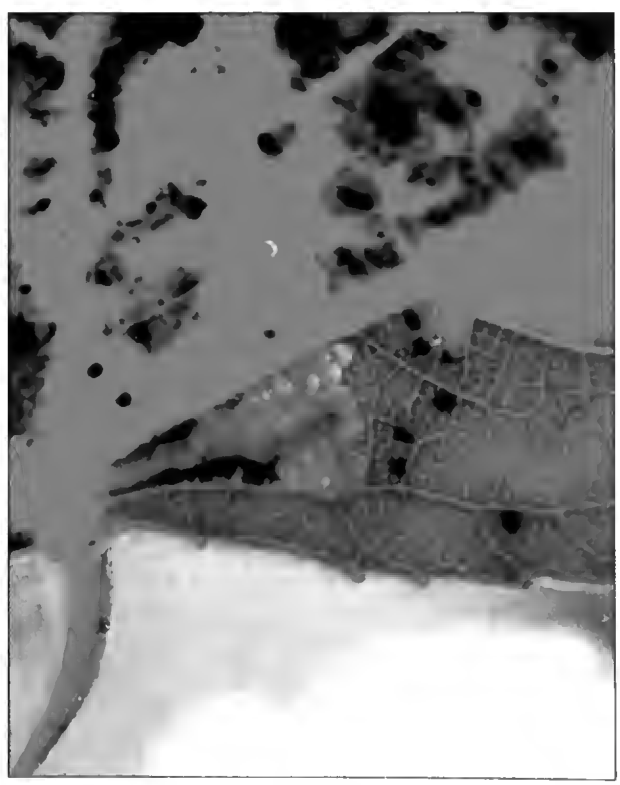

Fig. 3. Leaf-mine of *E. hannoverella*, showing detail of larva and parallel tracks of frass in blotch. Ipswich, 7 November 2003.

PLATE H

Satin Lutestring *Tetheella fluctuosa* (Hb.) (Lep.: Thyatiridae) oviposition

As shown by the map in Emmet & Heath (1992) *The Moths and Butterflies of Great Britain and Ireland* vol. 7(2), Satin Lutestring *Tetheella fluctuosa* has a disjunct distribution in Britain. In Scotland it is so scarce and local that even many resident lepidopterists (including myself) have never seen it there in the wild. So I was pleased when David Barbour kindly gave me a live female caught in Glen Affric, East Inverness-shire, on 29.v.2003.

The moth was a large example (maximum wingspan 42mm), strikingly patterned in sooty black and silvery white. Hoping to obtain eggs, I placed her in a roomy container with freshly cut sprigs of birch *Betula* from several different trees. A pad of cotton wool soaked in honey and water was also provided. Laying began on the night of 30 May, and the female appeared spent by 6 June. The eggs were then counted, totalling 185.

The precision with which the eggs had been placed was most remarkable, so the exact site of each egg was documented. In all, 175 eggs were placed near the tip of a serration around the edge of a birch leaf, usually singly but sometimes two together. Virtually all were on the upper surface of the leaf. The remaining ten were on leaf stalks. No eggs were laid elsewhere on the leaves, or on the birch twigs. No eggs were laid on the plastic container, its kitchen towel lining, or on the clingfilm cover.

Of the several morphologically different strains of birch provided, the female clearly preferred one with large, thick, rounded, dark green leaves that were slightly cupped, ignoring sprigs from trees with smaller, more papery, kite-shaped leaves. The ovoid eggs were pearly white (not yellow, as given in Emmet & Heath (*loc. cit.*), and surprisingly inconspicuous on the leaf. They resembled bulbous tips to the leaf's serrated teeth that were catching the light, being unrecognisable as eggs from most angles.

While it is not always safe to assume that behaviour in captivity reflects that in the wild, I would be surprised if the egg-laying precision shown by this female were not the normal habit. It is possible, however, that fewer eggs would have been laid per leaf if she had been unrestricted.

When the larvae hatched they were given birch sprigs from the female's preferred tree. There were heavy losses initially, as warned by Porter (1997. *The Colour Identification Guide to Caterpillars of the British Isles*). Most hatchlings climb, but these descended to the bottom of their container, even beneath the kitchen towel lining, where many starved to death before the problem was noticed. Once persuaded to begin feeding, rearing was straightforward. In the early instars, they fenestrated the birch leaves; later, they ate irregular holes into the leaves.

Porter (*op. cit.*) illustrates the caterpillar in its final instar, when the whitish lateral markings and dorsal freckling are distinctive. In the earlier instars these are absent, and it could easily be mistaken for the larva of Common Lutestring *Ochropacha duplaris*, except that the thoracic plate is pale in Satin Lutestring rather than black.

I am grateful to David Barbour for providing me with the parent moth.– ROY LEVERTON, Whitewells, Ordiquhill, Cornhill, Banffshire AB45 2HS.

DIASEMIA ACCALIS (WALKER, 1859) (LEP.: PYRALIDAE) AN ADVENTIVE SPECIES NEW TO BRITAIN

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Abstract

The first occurrence of *Diasemia accalis* (Walker, 1859) (Lep.: Pyraloidea: Spilomeninae) in Britain is documented and the moth is illustrated in colour.

Discussion

After the night of 24 – 25 May 2004, I found an unfamiliar spilomenine pyralid in the moth trap in my garden in Gravesend. It was immediately recognisable as a *Diasemia* Hübner species, since I had come to know *D. monostigma* Hampson in Africa where this is a common garden species. Goater (1986) gives characters for separating *D. reticularis* (Linnaeus) from *Diasemiopsis ramburialis* (Duponchel); according to these characters my species was *reticularis*, but the forewings did not match the illustrations in Goater (*op. cit.*) or Palm (1986). *D. reticularis* is a rare migrant and there was no other evidence of a migration at that time – the wind had been a light south easterly, and the date was early in the year.

The next week I happened to be browsing through Robinson et al. (1994) when I noticed an illustration of *Diasemia accalis* (Walker), which matched my specimen. I consulted the series of *reticularis* and *accalis* in the Natural History Museum and was able to confirm that my specimen was *accalis*. The distinguishing characters given by Shaffer (in Robinson *et al*) left no doubt.

Diasemia accalis is slightly smaller than *D. reticularis*. The forewings are more clearly and contrastingly marked, but it does not have the chequered fringes of both wings which are characteristic of *reticularis*. These characters are easily seen in the illustration (Plate I).

Diasemia accalis occurs in South East Asia from India to Japan. How it came to be in Gravesend is a matter of speculation. There is a large Asian population and consequently a considerable amount of travel and trade, especially with India. The life history is not known.

Diasemia accalis is not included in either the most recent British Isles moth list (Bradley, 2000) or the recent list of European Lepidoptera species (Karsholt & Razowski, 1996). In terms of its position in the British checklist, I suggest that it should follow *D. reticularis* as species number 1402a, although the inclusion of adventives in the main British list can be regarded as a nuisance.

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Plate I: *Diasemia* species. **1:** *D. accalis* (Walker), Gravesend, West Kent, 24.v.2004; **2:** *D. reticularis* (L.), Zeller collection, BMNH.

SUBSCRIBER NOTICE

The North West Wales Moth Report for year 2002 is now available at the knockdown price of £5, inclusive of postage. This second annual report lists 788 moth species noted during 2002 in Merionethshire (VC 48), Caernarvonshire (VC 49) and Anglesey (VC 52). There are 142 pages, A4, comb bound. May be purchased from John Harold, Hen Ardd, Carreg y Garth, Rhiwlas, Bangor, Gwynedd LL57 4HD. Records may also be sent to the same address, although each county does in fact have a separate Recorder. Out of courtesy, please enclose an sae if you want a reply. — EDITOR.

LUNULATION AND GENETIC ANALYSIS IN *ARICIA* BUTTERFLIES

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Abstract

Lunulation in *Aricia* species (Lep.: Lycaenidae) was studied in Durham and Hampshire during 2003. Data from this fieldwork, as well as existing data from sites in the Peak District and Yorkshire, are discussed. Comparisons are drawn with European data. Previous conclusions drawn from Peak District data are confirmed. The status of a Yorkshire population and the nomenclatural aspects of all the studied populations is discussed with reference to the overall *Aricia* picture. A history for the genus is reiterated.

Introduction

The first paper giving details of genetic analysis on butterflies from several *Aricia* colonies in Britain and Scandinavia appeared recently (Aagaard *et al.*, 2002). Its findings were discussed with Andrew Pullin, one of the joint authors, and he mentioned that 'there is considerable agreement between lunulation and geographic variation in allele frequency as shown by allozyme analysis.' The analysis confirmed that the Scottish race *Aricia artaxeres artaxerxes* was very similar to European *A artaxerxes allous*, so that the Scottish race has been formed from *allous* and is not peculiar to Scotland. Also the presence of *artaxerxes* in the north of England was confirmed – again there is no special endemic race *salmacis*, but the analysis was unable to clarify whether hybrids were or were not present. A subsequent more sophisticated analysis, as yet unpublished, was able to confirm hybrids in the north of England (Wynne, pers. comm., 2002). For the above areas genetic analysis and conclusions via male upper forewing lunulation (mufl) are in agreement. The grey areas remaining in the east of England are the status of colonies near Pickering, north Yorkshire, and in the Peak District, where in the Aagaard *et al.* paper there were contradictory results from allozyme analysis (*artaxerxes*) and mitochondrial data (*agestis*).

A poster and information sheet at Butterfly Conservation's fourth International Symposium in Lancaster, during 2002, gave examples of phased emergence in *Aricia* colonies. During any flight period the mufl drifts downwards. Therefore, genetic analysis from samples taken early and late in the same flight period from any site might show up differences as indicated by differences in lunulation. This had already been noted in a Peak District colony, which has *agestis* lunulation (Smyllie, 1992a). As far as is known, specimens for genetic analysis have been taken from any site on one day, a perfectly normal approach. The possibility of carrying out small-scale genetic analysis experiments from males early and late in a flight period at suitable localities was discussed, but found not to be feasible. It was therefore decided to visit a colony in Durham, and another in the south of England, at intervals during 2003 to collect more lunulation data.

Durham

The Durham visits to Thrislington National Nature Reserve (TH) and Bishop Middleham quarry (BM) are summarised below and compared with 1990 figures via Sam Ellis. Visits, with numbers of males in brackets, were made on 4 June (TH-11), 23 June (TH-3, BM-7), 9 July (BM-5, TH-0) and 15 July (BM-0). The situation was disappointing in that numbers had dropped to a total of only five males counted on 9 July and none were seen on 15 July. Normally the flight period continues right through July. Since the butterfly is univoltine there was no second chance. There was little difference between the two sites, and not enough data to check phased emergence. Results show that 2003 was less well lunulated than 1990, and in both 1990 and 2003 all 5th or 6th lunules were only traces. This is important since the overall lunulation is poorer than the actual numbers of 5&6 mufl specimens might indicate. Table 1 summarises the position in 1990 and 2003.

Table 1. Male lunulation at sites in Durham.

YEAR	PERIOD	MC	MP	MT	MC/MT
1990	17-28.6	8	14	22	0.364
2003	4.6-9.7	4	22	26	0.154

MC=well lunulated (5 or 6mufl): MP=poorly lunulated (0-4mufl): MT=total.

Although the results are disappointing it can be seen that there is a distinct difference between the two sets of figures. This is not unusual regarding variations encountered in the north of England. The shortened flight period in 2003 may well have altered the genetic bank by removing at least part of the less well lunulated portion, thereby causing the overall lunulation to increase next year.

Winchester

Magdalen Hill Down (MHD) is a Butterfly Conservation nature reserve to the east of Winchester with a south-facing slope approximately 1 mile long. The first brood was again disappointingly short, but some data was obtained. The second brood behaved more normally, and Table 2 gives details of all visits with male lunulation, time spent on site and weather.

Examination of the data shows that Nos. 1 and 6, the first days for both broods, have distinctly higher MC/MT figures than the rest. In all but one case the P males had 4ufl, the remaining male on 10.9 had 3ufl. Some of the 4ufl had small or trace lunules. Counting was (in order of preference) basking, placing in a bottle and waiting for the butterfly to settle down and open its wings – this could take up to 20 mins. or longer - catching in a net and trapping with open wings. In order to avoid duplication the lunules were split into large, medium, small and trace. Also comments like fresh, worn, chip out of wing, some white discal spots etc. were made. In practice only one potential duplicate was noted. The numbers of butterflies on site were not large and were spread out, so it was hard work finding them and then counting where possible.

Table 2. Male lunulation at MHD

No.	Date	MC	MP	MT	Time	Weather
1	19.5.03	16	2	18	10.30-12.20	Dull then rain then sun
2	6.6.03	-	-	-	18.00-19.00	Heavy rain
3	8.6.03	2	2	4	13.25-15.10	Some sun: cold wind
4	17.6.03	-	-	-	17.45-19.20	Some sun
5	19.7.03	-	-	-	14.00-15.30	Sunny
6	5.8.03	7	1	8	2-3pm:17.45-19.20	Sun: very hot
7	20.8.03	5	4	9	17.00-19.30	Grey: sun after 19.00
8	30.8.03	8	6	14	14.20-16.50	Mainly grey: some sun
9	10.9.03	5	3	8	14.25-17.30	Sun early and late

Conversely both Marbled Whites and Chalk-hill Blues were abundant over flight periods of four weeks or longer. Details are summarised below.

A	MHD '03 Nos.1 and 6:	MC 23	MP 3	MT 26
B	MHD '03 Nos. 3,7,8,9:	MC 20	MP15	MT 35 14.259 25.741
C	Watlington Hill 20.5.89	MC 8	MP 0	MT 8
D	Watlington Hill 29.5.89	MC 7	MP 2	MT 9
Totals	A+C+D	MC 38	MP 5	MT 43 27.217 34.643

The statistical formula to check whether variation is due to chance or some other factor is $np \pm k\sqrt{(npq)}$ where n is the total number = MT, p = MC/MT, q = MP/MT = p-1 and k is a constant. Five percent "significance limits" are employed as a standard. When k=1.96 and numbers are outside the limits there is a less than 5% likelihood that the difference is due merely to chance, so a more than 95% likelihood that some other factor is involved.

The first records for both broods at MHD, nos 1 and 6, have been added together to give A. All other counts later in the broods are somewhat lower in MC and are added together to give B. In order to increase the early totals, C and D from Watlington Hill, Oxon. have been added to A. Without these additions the figures are not large enough to provide adequate separation. The two right hand columns above give the calculated 5% significance limits for the B total of 35. The corresponding figures for A+C+D have been reduced from 43 to 35 for comparison. There is a gap between the two close limits of 27.217 – 25.741 = 1.476. Not large, but one which will increase if further data were to be accumulated. This indicates that the earlier and later portions of one brood at an *agestis* site in south England vary by an amount which is greater than that which can be attributed to chance. The same situation will apply for males at any *agestis* site.

A. agestis and the Peak District

The initial impetus to examine lunulation came from a comment (Jarvis, 1969) that all *agestis* colonies were well lunulated whereas north of England colonies were variable and lunulation decreased further through Scotland. The standard for well lunulated males was set at 5 or 6 upper forewing lunules (mufl) whereas better lunulated females required 6fufl. Table 3 shows 5&6 mufl (MC) but also 6 mufl for field counts at Coombs Dale (CD) in 1992 and other years excluding 1992 in order to provide a comparison with MHD. Neither set of CD figures gives a 5% significance separation, but the main point is that both CD and MHD show reductions in lunulation when the first and second halves of the broods are compared. Early on in the flight period the well lunulated portion can be up to 100%. For example, the weekly checks at CD in 1992 for just one week shorter than in Table 3, i.e from 18.5 to 21.6 (four visits) showed that 18 out of 18 males had 5 or 6ufl. On this showing, admittedly from a relatively small number, it might be claimed that CD was a *cramera* colony. It might even be claimed that the figure of p=0.958 up to 28.6 from 23/24 males was still high enough to indicate *cramera*. This is not a serious claim because of the later reduction, but it does indicate the type of difficulty which phased emergence can cause. Study of the figures shows a fair amount of variation. Also the CD 6mufl figures could be on the whole lower than MHD. This might indicate a greater *artaxerxes* content than MHD without the general lunulation pattern being altered.

Table 3. Coombs Dale and Magdalen Hill Down lunulation.

LOCALITY	**MC/MT**	**P**	**6mufl/MT**	**P**
Coombs Dale 31.5-28.6.92	23/24	0.958	14/24	0.583
Coombs Dale 5.7-2.8.92	20/27	0.741	7/27	0.259
Total	43/51	0.843	21/51	0.412
Coombs Dale up to 30.6.89-95	19/23	0.826	9/23	0.391
Coombs Dale after 2.7.89-95&02	23/36	0.639	8/36	0.222
Total	42/59	0.712	17/59	0.288
Magdalen Hill Down 19.5 & 5.8.03	23/26	0.885	15/26	0.577
Magdalen Hill Down 8.6 &20.8-10.9.03	20/35	0.571	15/35	0.428
Total	**43/61**	**0.705**	**30/61**	**0.492**

It is very important to indicate, if possible, the main reasons for variation at any site presuming no migrating butterflies reach the colony. The Meteorology Office 30 year statistics give the average hours of sunshine, also maximum and minimum temperatures on a monthly basis for stations around the UK and Europe. There is a considerable difference in the hours of bright sunshine between say Bournemouth, Buxton and Braemar which for May, June and July total 661, 487 and 474 hours respectively On average Bournemouth is between 3° and 3.5° warmer than the other two each month. These differences are large enough to indicate that the effect on lunulation is likely to be extremely small, otherwise there would be much larger and more random variations due to this factor in some of the *agestis* sites. The main other candidates are predation, unfavourable weather at critical times in the larval or other state, and phased emergence. Taking one year at a time, it is quite possible that either separately or in combination all could play their part. As is the case in Durham, a partial first brood this year has been a disappointment, but indicates the probable major source of subsequent variation. There will be much less lunulation change later on at MHD compared with Durham, so any effect on *agestis* will be much smaller.

Restricting comments to *agestis*, the data banks contain approximately 850 males and 550 females. When males are split into single or small groups of counties, all are within the 5% significance limits of the average (Smyllie, 2001). The Peak District is included in this list. So, in spite of the annual variations noted, the bulk figures have smoothed these out. Nearly all of the specimens providing the data have come from museum collections, and there is probably a tendency to collect early in a brood in the expectation of greater numbers of fresh specimens. The 2003 figures for males at MHD are a little outside the statistical limits, but this merely covers variation during one single season with multiple visits. Even then the MC/MT figure of just over 70% is considerably higher than the next group of relatively well lunulated colonies at c55% max. These will be considered with Pickering.

Each year is likely to be different as far as numbers of butterflies, completeness of brood, and random predation goes. At the female level of consistency it is not possible to separate different colonies via female lunulation from the south coast up to and including the Pickering district (Smyllie, 1992b). It follows that it is not possible to get meaningful variation in female lunulation through the flight period. The female lunulation is not only higher than the male, it is also less prone to produce the odd specimen with trace lunules in southern colonies. So possible operator judgement as a variable factor in deciding whether a trace is or is not present is low in males and rare in females.

Therefore, presuming that there is a link between DNA and lunulation, a difference between male and female DNA at ag*estis* sites is to be expected, provided samples are not taken very early on in the flight period. This aspect might provide an explanation for the difference noted for the Peak colonies in the Aagaard paper. This does not appear to be the case however for other *agestis* material analysed. At this point an unfortunate aspect in the paper has to be mentioned. Fig. 3 plots lunulation characteristics and indicates via symbols whether the haplotype involved is *agestis* or *artaxerxes*. Fordon Bank (Yorkshire Wolds) lunulation is MC 90%(11), FC100% (10). Figures in brackets denote sample size. These figures are exactly as expected from accumulated lunulation data. The Peak District colonies are Coombs Dale MC 64% (28), FC 67% (9), and for Cressbrook Dale MC 25% (39), FC 40% (8). It is the female figures for both colonies and the male from Cressbrook Dale which give the most cause for concern – all 60 Peak District females in the author's data bank have 6 ufl. There must therefore be a question mark against the validity of these samples. Possibilities are unauthorised introductions – these have occurred from time to time in the last 20 years in the general area of Derbyshire, Notts. and Yorkshire – or sample mixing.

The wider *Aricia* picture

Tables 4 and 5 have been produced to show the male lunulation position at selected sites. Table 4 figures start with the standard 5&6 mufl since previous papers have largely concentrated on these. Figures for 6 mufl are also included for the first time and are much more searching. It can be seen that they have decreased from 100% ($p=1.0$) in the Canaries (and almost certainly in parts of Spain) down to less than 60% ($p<0.6$) at Casa de Campo near Madrid, Table 4/2, both the above being considered as *cramera*. This site is only some 75 km east of the Sierra de Gredos mountain range, Table 5/13), and will have been affected by its relative proximity. It has to be remembered that we are talking about interpenetration shortly after the last ice-age, not last year. Looking at combined figures, the *agestis* examples from England and the Peak District are distinctly lower ($p=0.5$-0.3) while all other examples are well under $p=0.3$ and reduce to 0, numbers 7-17 all being $p<0.1$ or $=0$.

Table 4. Lunulation from selected sites.

NO. LOCALITY	5&6 mufl	p	6 mufl	p	0 mufl	p
1 Tenerife, Canaries	11/11	1.0	11/11	1.0	0/11	0
2 Nr Madrid, Spain	70/73	0.959	41/73	0.562	0/73	0
3 S England	208/252	0.825	103/252	0.409	0/252	0
4 Peak District	125/157	0.796	54/157	0.344	1/157	0.006
5 near Pickering	18/44	0.409	10/44	0.227	0/44	0
6 Kaiserstuhl, SW Germany	22/40	0.55	9/40	0.225	1/40	0.025
7 inland Durham NZ33	12/50	0.240	2/50	0.04	1/50	0.020
8 Skane ex Sandhammaren	10/20	0.5	1/20	0.05	1/20	0.05
9 Chiasso, TI, Switzerland	5/18	0.278	0/18	0	2/18	0.111
10 Sandhammaren, S Sweden	15/62	0.242	2/62	0.032	9/62	0.145
11 N Lancashire	41/210	0.195	10/210	0.048	58/210	0.276
12 coastal Durham	16/177	0.090	3/177	0.017	56/177	0.316
13 SW Scotland	7/35	0.200	3/35	0.086	7/35	0.200
14 SE Scotland	3/47	0.064	0/47	0	15/47	0.319
15 Scotland N of Forth to Inverness	10/286	0.035	0/286	0	164/286	0.573
16 Hirsthals, N Denmark	1/20	0.05	0/20	0	11/20	0.55
17 Scotland N of Inverness	0/13	0	0/13	0	10/13	0.769

Whereas Table 4 deals with the picture at the higher lunulation end of the spectrum, Table 5 has some overlap and continues down to the poorest lunulation. It consists mainly of Scandinavian data * (Høegh-Guldberg, 1966) together with nos. 3&4, the author's south England and Durham data, which act as a link with Table 4 for lunulation. The right-hand column gives the % with no lunules on any upper wing, var. *unicolor*. This column has not been previously included. Nos. 12 and 13 were so poorly lunulated on the upper forewings that hind wings were also noted. The broad picture is of a complete range of 6 mufl from 100% to 0% between the Canaries and the north of Scotland, with, at the other end of the scale 0 mufl from 0% to 100% and with %s of var. *unicolor* from 0% up to c60%. Note that it is relatively easy to see small numbers of lunules at the bottom end of the scale, even if they are faint. At the other end it is not possible to judge a small diminution in the lunule size of a well lunulated male which will still have 6 ufl.

Table 5. Scandinavian and mountain lunulation

NO. LOCALITY	4-6 mufl	p	0 mufl	p	V unicolor	p
1* Skane ex Sandhammaren	44/55	0.800	0/55	0	0/55	0
2* Sandhammaren	103/175	0.589	1/175	0.006	1/752	0.006
3 south England	242/252	0.960	0/252	0	-	-
4 Inland Durham NZ33	38/50	0.760	1/50	0.020	-	-
5* Oland	9/24	0.375	1/24	0.042	0/24	0
6* Gotland	7/24	0.292	0/24	0	0/24	0
7* Denmark *agestis*	93/122	0.762	0/122	0	0/122	0
8* Jomfruland, S Norway	6/42	0.143	7/42	0.167	0/42	0
9* Hirsthals, N Denmark	5/239	0.021	58/239	0.243	24/239	0.100
10* Lyngenfjord, N Norway	0/9	0	7/9	0.778	2/9	0.222
11* Uppland, C Sweden	0/19	0	6/19	0.316	2/19	0.105
12* Angermanland, N Sweden	0/8	0	6/8	0.75	5/8	0.625
13 Sierra de Gredos, C Spain	0/13	0	13/13	1.0	1/13	0.077
14 Haldenstein, Swiss Alps	2/19	0.105	17/19	0.895	5/19	0.263

Near Pickering and similar areas

The colonies near Pickering are typically at Ellerburn and Pexton Banks at the southern fringe of the north Yorkshire moors, some 18 km north west of the Yorkshire Wolds. The 5&6 mufl is distinctly lower (Tables 4 and5, approximately 40%) than the *agestis* colonies with a minimum of 70%. The female lunulation however is unchanged at c100% with 6 fufl. Occasionally the apical lunule is not much more than a trace, but nevertheless female lunulation provides no segregation. The following genetic comments are relevant (Wynne, pers. comm., 2002): 'In this connection mtDNA has only one quarter the effective population size of nuclear genes (e.g. allozymes)) and this contributed to a clear line between haplotypes some 150 km north of the univoltine-bivoltine boundary. Information re hybrids came via a nuclear gene'. From the lunulation point of view, the fact that males are a better sex for comparison has an echo in genetic analysis.

Re. the gap of 15% between the lower *agestis* 5&6 mufl limit of 70% and the next colonies at c55%, the inference is that there is a certain stability about *agestis* which enables its lunulation to be unchanged from the south coast up to the Yorkshire Wolds: one would expect a trend of increased *artaxerxes* moving north from the south coast but, if present, this has not altered the lunulation pattern appreciably.

Table 6 shows the make-up of figures for the Pickering area. It mostly contains small numbers (3 to 8) which can be at completely opposite ends of the lunulation spectrum. The demarcation line is between 4 and 5 mufl, and Table 7 shows the much higher occurrence of 4 mufl compared with south England and the Peak District.

Table 6. Pickering data.

Museum	Page	Collection	Locality	Date	MC	MP	MT
Keighley	M1	CR Haxby	Pickering	1958	8	12	20
Scarboro'	M2	E Richards	Newton Dale	1.8.55	0	3	3
Peterboro'	M3	Cabinet N	Pickering		1	1	2
Doncaster	M10	A Norris	Gundale		1	0	1
Leicester	M18	Smith	Pickering		4	2	6
"	M19	CP Pickett	"		0	8	8
"	M20,21	A Lisney	"		4	0	4
Field	-	B Smyllie	Ellerburn Bk	9.7.01	4	0	4
Totals					22	26	48

Without last row p = 18/44 = 0.409. With last row p = 22/48 = 0.458

The above data indicate that there are distinct differences between Pickering, Kaiserstuhl etc. and the *agestis* colonies as far as 5&6 or 6 mufl is concerned. When data from any colony like Pickering is examined, variability as met in Table 6 is also a feature. The other end of the spectrum is the position at 0 mufl where at Table 4/5 none are recorded out of 48. So, if the decision was based on good lunulation, Pickering and similar sites would be categorised as intermediates. On the other hand, classifying via 0 mufl would be more lenient, thus expanding the *agestis* area, and including areas in different countries where *agestis* is already nominated.

Take Baden-Württemberg (BW) in south-west Germany where *agestis* and *artaxerxes* are both recorded and mapped, with the additional comment that hybrids are also found (Ebert & Rennwald, 1991). The shadow from the Alps extends a long way northwards down the Rhine valley. In the NW corner of BW the colonies near Mannheim, c230 km north of the Swiss border are little different to Kaiserstuhl in Table 7, and it is not until Mainzersand, a little west of Mainz at 270 km, that *agestis* figures similar to those in the UK are recorded. However, only one 0mufl specimen (totals in brackets) was recorded for Kaiserstuhl (41) and none for Weinheim/ Mannheim (37). So it may be expedient to define *agestis* colonies as those which have

Table 7. Pickering and Kaiserstuhl 4 mufl

LOCALITY	MC/MT	p	4 mufl/MT	p
South England	208/252	0.825	34/252	0.135
Peak District	125/157	0.796	29/157	0.185
Pickering	22/48	0.409	18/48	0.375
Kaiserstuhl	22/40	0.55	15/40	0.375

a suitably low 0 mufl content, rather than those which are within the standard statistical 5 & 6 mufl limits using p=0.825 from larger numbers. Just as in the UK *agestis* sites, lunulation will be at its maximum early on in the flight period and to the lepidopterist in the field this will show up as well lunulated. The type of variation shown by Table 6 is typical of Pickering and similar colonies.

Discussion

It is best to start by examining the present position concerning lunulation and genetic analysis. Until relatively recently species have been identified by morphological characteristics; the advent of genetic analysis has provided an opportunity to apply a cross-check from a different angle. It is very important to determine if variable morphological characteristics do or do not match up to analysis. From the lunulation point of view, this means, firstly, that the data built up to record variation has to provide meaningful rather than random information and secondly that conclusions arising from scrutiny of the data have also to be correct. When aspects of the development of a genus over tens of thousands of years are attempted there is plenty of room for a degree of deviation from what will eventually be found out by expanding knowledge and techniques. In all this the data remain constant and will provide a pole-star reference. Aagaard *et al* (2002) did not cover Pickering, and as mentioned above the Peak District samples have a question mark against them, particularly since the genetic results for the Yorkshire Wolds further north come into line with lunulation.

It is reasonable to make two predictions – first that enough of the general picture has been pieced together so far to indicate that morphological and genetic information will eventually be seen to coincide and second that morphological characteristics provide a more sensitive indicator than genetic analysis in its present state of development. Information via morphology will provide comparative data without being able to give firm percentages on the amount of interpenetration.

The lunulation checks were originally built up to compare the Peak District race with other *agestis* colonies, later with other UK areas. This is important because it led to 5&6 mufl being selected as a yardstick for good lunulation, and with over 80% of males in *agestis* colonies having this lunulation there is an understandable tendency to regard *agestis* as one end of the spectrum. It is as far as the UK is concerned, but later data from Spain and the Canaries gives a wider backdrop to the situation. This is where the more stringent 6 mufl data is important. The well lunulated *agestis* is now by no means so well lunulated on the absolute scale, and even *cramera* does not have a uniform lunulation. Everything is part of a progression from 100% to 0% or 0% to 100% for the two opposite ends of the lunulation spectrum. It does therefore seem necessary to highlight an aspect of *Aricia* previously mentioned (Smyllie, 2001). The two races which drifted apart to reach no lunules and a full set of lunules on the upper wings are represented today by *cramera* and *allous/artaxerxes/morronensis*. This means that genetic analysis should be able to compare well lunulated *cramera* with poorly lunulated *allous* and follow the variation through the intermediate stages. So far *cramera* has not featured in the equation via genetic analysis as far as the author is aware. It is therefore desirable to obtain analytical data for *cramera*.

Nomenclature

Aricia nomenclature would be a fertile ground for a politician – there are different aspects to be taken into account so that good cases can be made out for most alternative names. It is worth considering these in order to examine the variables involved. First of all there are the two extremes *cramera* and *allous* (or equivalents). The initial problem is to decide how much penetration from the other end can be allowed: if for example the figures were to be 10% at each end, this would leave 80% to account for. Figures of 5% would leave 90% while greater than 10% at each end are likely to be too high. Assuming that 10% is about right, this still leaves 80% to be allocated. The simplest solution is just to have one name, *agestis*. This however covers a wide range, some of which has fairly obvious morphological differences. So the next step would be to split the whole range into 4 with *agestis* covering the well lunulated portion and some other name covering the remainder. Provided the general mechanism is understood a number of names can be put forward – *salmacis*, *montensis*, intermediates or hybrids to name a few. It is felt that splitting the range into 4 would be the best option, and also that defining *agestis* as having less than 10% of 0 mufl would be better than taking a stricter line on limits imposed by 5&6 or 6 mufl. In practice the 0 mufl could be set at no more than 1 in a minimum of 20. This will give 5% while 2 would give 10% and be regarded as too high. There are 2 quite good reasons for this suggestion.

1 In practice it would split the remaining 80% more evenly.

2 Several countries, eg Denmark and Germany, already attach the name *agestis* to areas which, like Kaiserstuhl, would not fit the 5% significance limits based

on the well lunulated UK colonies. It would classify the colonies at Pickering and at Perthichwareu in N Wales (Smyllie, 1992a) as *agestis*. Switzerland also has *agestis* and this still presents a problem because of the proximity of these better lunulated colonies to the Alps. Samples (Smyllie, 2001) labelled from Orvin (2 with 0 mufl out of 9) and Chiasso (2 with 0 mufl out of 16) would both fail the *agestis* test via 0 mufl. As a general rule it would not be possible to move from either *cramera* to hybrids or *allous/artaxerxes* to *agestis* without the intermediate stage having occurred. The word 'hybrid' is used reluctantly. It has the advantage of being short, but can give the impression that hybrids only occur over one part of the four, rather than throughout.

Alternative ranges are as in Table 8: there may be occasions in the 4-stage situation where a colony does not fit into designated limits in both columns: in any such case, the general situation and colonies nearby have to be considered. Also it may be possible for variation over a period of time to change the status of the 'hybrid' colonies. Incidentally the possibility of very varied lunulation at one site has been attributed to *agestis* and *allous* co-existing (Høegh-Guldberg, 1966). This has been investigated and found not to occur (Smyllie, 1998). What does occur is phased emergence.

Table 8. Nomenclature limits.

'sub-species'	5&6 mufl%	0 mufl%
cramera	90 min.	10 max.
agestis	90-30	10 max.
'hybrids'	30-10	10-30
allous	10 max.	30 min.

Summary and conclusions

1 Genetic analysis and mufl data show considerable agreement, so it is reasonable to assume that lunulation data can make a positive contribution to residual grey areas in the UK and also to the overall situation in Europe west of Switzerland including Scandinavia. The same basic principles will apply anywhere for this genus.

2 The data bank is very stable, particularly for those areas with larger numbers.

3 In looking at the longer term history of the genus *Aricia*, previous conclusions (Smyllie, 2001) are reiterated

4 Interpenetration and phased emergence are fundamental aspects of a coherent explanation for *Aricia*.

5 Lunulation is backed by other morphological aspects such as white discal scales (Smyllie, 1992b), variation in ocelli pupillation (Smyllie, 1997), and egg reticulation (Smyllie, 2001)

5 The interpenetration is between *cramera* and *allous* or its equivalents. The sequence with brief comments is: *cramera* - some over-lunulated females are found at least as far north as Durham (Jarvis, 1969): *agestis* – stable lunulation over large areas; 0 mufl less than 10%: 'hybrids' – poor lunulation and/or 0 mufl 10%+: *allous* – very poorly lunulated

6 Eventually genetic analysis and lunulation etc. will line up though more development in analysis will be necessary.

7 The situation in several other butterfly species will be similar to *Aricia* though not obvious morphologically. Small White, *Pieris rapae* (Smyllie, 1997) and Common Blue, *Polyommatus icarus* are examples.

8 The factors involved should be useful in enlarging practical knowledge about butterflies generally, rather than being looked on as an abstract theory.

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SOME OBSERVATIONS ON THE SLENDER-STRIPED RUFOUS MOTH *COENOCALPE LAPIDATA* (HB.) (LEP.: GEOMETRIDAE)

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Abstract

Observations on the Slender-striped Rufous moth *Coenocalpe lapidata* (Hb.), a UK Biodiversity Action Plan species, are presented. To facilitate recording, colour photographs of both the larva and the larval habitat are presented.

The Slender-striped Rufous *Coenocaple lapidata* (Hb.) was identified as a priority for research and conservation by Waring (1994) who summarised the knowledge of its ecology and distribution at that time. The National Moth Recording Network (Waring, 1999) had received or otherwise obtained post-1980 records from only four sites in Britain, three in Scotland and one in northern England. Earlier records report the moth from about a dozen scattered sites in the Highlands and western Scotland, including the island of Canna. It is probable that the moth persists, unrecorded, at some of these sites and at other places today. It has also been found in northern-western Ireland in the past. The purpose of this article is to provide a summary of the several pieces of research on the species undertaken by the author and collaborators since 1994 and to supply tips and encouragement to others interested in investigating the distribution, status and ecology of this moth.

Plate J: Adult Slender-striped Rufous *Coenocalpe lapidata* (Hb.)

Visits to sites in Perthshire and East Ross in 1994

In late September 1994 the author visited the best-known British site for the Slender-striped Rufous, near Trinafour in mid-Perthshire, where the moth has been known since at least the 1950s (Waring, 1994a). The aim was to collect data to guide future searches for this moth and to improve our knowledge of the ecology of the species. David Barbour and I also followed up some recent records from a site by Lairg, East Ross, where the moth had been recorded at a Rothamsted light trap on repeated occasions between 1985 and 1990. Over the fence from the Lairg trap site we found several hectares of sheep pasture dominated by rushes *Juncus effusus*. Here we saw a male and female Slender-striped Rufous at rest on *Juncus* stems by searching after dark on 29 September 1994, having been unsuccessful in finding the moth there by day. Two males and two females were found in a similar search the following night and five males came to a Robinson light trap I operated all that night on the site (30 September 1994).

The Lairg site was searched throughout two afternoons and a morning, watching out for females, which sometimes fly by day. I was hoping to observe egg-laying and get an indication of larval foodplants. No egg-laying was seen by day or night but the weather was poor for much of the time, with prolonged rain. Sometimes the adult moths have been seen flying in numbers on sunny afternoons but disappearing as soon as the sun becomes obscured by cloud (Graham Collins and John Chainey, pers. comm.).

The larval foodplant(s) are currently unknown. Botanical descriptions were made at each point where a moth was found at rest at the Lairg site, with the aim of narrowing down the range of possibilities, and a selection of the same plants was presented to females for egg-laying in captivity. Creeping Buttercup *Ranunculus repens* was found below every resting moth and was sometimes the only broadleaved plant present amongst the rushes on which the moths perched. Tormentil *Potentilla erecta* and Marsh Pennywort *Hydrocotyle vulgaris* were the only other frequent herbs. A on this work was produced for Scottish Natural Heritage in 1994. The main conclusions were that the Creeping Buttercup was a strong candidate as a larval foodplant, that the moth could well occur in many open, *Juncus*-dominated places within the known range and in other upland areas and that little effort has been made to search for new localities in the last thirty years. Records indicate that the moth flies in early September in Perthshire, but in late September and into October further north. Because the moth was only reported from six 10km squares between 1960 and 1980, and four between 1980 and 1995, but is likely to be more widespread, Red Data Book Category 3 – Rare, was suggested as the most appropriate conservation category for the moth at that time (Waring, 1995a). Subsequently the moth has been reported from a small number of addition sites distributed over a wide area and the conservation grade of Nationally Scarce category A is considered the most appropriate based on available information (Waring *et al.*, 2003).

Observations from rearing in captivity

The author collected eggs from three females in September 1994 to enable study of the larvae, with the aim of increasing the chances of finding them in the wild and establishing the larval foodplant(s). The females attached their small yellow eggs singly to the leaves and stems of any plants with which they were enclosed, but mainly the eggs were laid low down on stems and on the base of the containers in which they were confined. Many eggs were only weakly attached or laid loose and dropped through the vegetation to roll about on the floor of the container. This suggests it is up to the caterpillars hatching in the spring to locate suitable food. The eggs over-wintered successfully in plastic boxes in a sheltered spot outdoors in Peterborough and the larvae hatched over a period of two weeks from 10 March 1995. They were then brought indoors to increase their rate of development so that details of their habits and photographs of the larvae could be produced in time to help searches of actual and potential breeding grounds in the field season of 1995. A photograph and notes on the habits of the larvae were published (Waring, 1995c) and the photograph is included in Waring *et al.* (2003). The newly hatched larvae were given leaves of Meadow Buttercup *Ranunculus acris* and a cultivated *Potentilla* on the basis that plants of both genera were the most frequent of herbs where the adult moths were found. Leaves of a cultivated *Clematis montanum* were also provided on the basis that the Rev. J. Hellins (1887-1901) reported rearing some larvae on *Clematis* in the nineteenth century, even though *Clematis* is absent from the breeding grounds in Scotland. The larvae reared in 1995 started feeding mainly on the *Clematis* but also nibbled the *Ranunculus*, on both of which they were successfully reared to pupae. Some were confined to *Ranunculus* exclusively, to confirm that they could complete their development on this plant. Both plants belong to the Ranunculaceae. There was no interest in the *Potentilla* (Rosaceae). Once the larvae were growing, some were offered *Potentilla* again, and also Dandelion *Taraxacum officinale* agg., which is often accepted by larvae which are genuinely polyphagous on low plants. Neither of these plants was accepted, even when the larvae were offered no alternative. Feeding was mainly after dark and as the larvae grew in size, they tended to move off the foodplant to rest by day. So, if you wish to discover the larvae and natural foodplant of this moth in the wild, the hot tip is to search *Juncus* flushes, by night for preference, looking out for a greenish yellow larvae, probably on *Ranunculus* leaves. At the time of writing (January 2004), the author has not had the opportunity to search for larvae at any of the sites where the moth is currently known to occur, and no one else has reported successfully finding the larva in the wild.

Searches in Northern Ireland in 1998

The Slender-striped Rufous was searched for on the 17 and 19 September 1998 on the rough moorland pasture between Cuilcagh mountain and Florencecourt, County Fermanagh, by the author with a team from Butterfly Conservation Northern Ireland Branch (Waring, 1998). The moth is one of fifty moth species on the Butterfly Conservation Regional Action Plan for Northern Ireland. It was last recorded in the province on 20 September 1914 by J.E.R. Allen, at this locality. The lack of records from the intervening decades may be simply because no-one has searched for the moth or been in the locality at the right time subsequently. The habitat is thought to have changed little since 1914. We found rushy places with buttercups *Ranunculus* spp., just like those occupied in Scotland, but we did not see the moth despite hunting by day and running a number of light-traps all night. The weather was against us however. The first night (17 September 1998) was so windy that an actinic trap on a similar site nearby was blown over and both nights were cold. Return visits were made by Ian Rippey and others before the end of the flight season in the hope of seeing the moth, but these were also unsuccessful.

Searches in Scotland and Northern Ireland in 2003

The Slender-striped Rufous was the subject of fieldwork by the author in Scotland and Northern Ireland again in 2003. As part of a Field Studies Council Moth Course held at Kindrogan Field Centre, Perthshire, 15-18 September in 2003, the author led the participants in an investigation of the habits and habitat of the moth at Trinafour, and showed them how to find the moth so that they could search for it elsewhere in Scotland. With the permission of the private owner, eleven of us, plus Tom Prescott, Julie Stoneman and party from Butterfly Conservation, assembled at the site and conducted police-cordon-style searches through the rushy habitat from just before dusk until well after dark. We also operated six light-traps from dusk until 00.30hrs. Lynne Farrell, who was with us from SNH, recognised immediately from the presence of plants such as Harebell *Campanula rotundifolia* and Quaking-grass *Briza media* that there was base-rich flushing of this predominantly acidic site, and she confirmed the dominant rush as *Juncus acutiflorus*. A male Slender-striped Rufous in fair condition was disturbed from amongst rushes and grass as soon as we arrived at 19.45 hours, which was a great encouragement. About ten individuals were noted on the wing between 19.50-20.00 hours, of which at least three were females (Waring, 2003). Egg-laying has not been reported in the wild and we were not fortunate enough to see it but eggs were subsequently obtained from the three females, which again laid them freely when kept in small plastic boxes with samples of the plants from the flush. Buttercups *Ranunculus* spp. were present, but not as abundantly as at Lairg.

Like Trinafour, the site at Lairg is another rushy flush with base enrichment. There are in fact large lime-rich rocks scattered about the site. This factor may help explain the scattered distribution of the moth and narrow down future searches.

On the night of 14 September 2003 half a dozen of us had searched and operated a light trap from dusk until 23.30hrs amongst rushes and buttercup in rough pasture at Dun Coillich, near Glengoulandie, only eight miles south-east of Trinafour, without success, and others have tried prospecting likely places for it with negative results, so the moth is not easily found. This was also the case in Northern Ireland where I joined Maurice Hughes (BC Development Officer), David Allen, Kenny Murphy and Vincent McLaughlin after the Scottish work, taking with me a live female Slender-striped Rufous to show them. From 23-25 September we searched a number of sites near Cuilcagh mountain and elsewhere in Co. Fermanagh (including Legalough and apparently suitable habitat within parts of the extensive limestone scarp) without success. The results of this work will be recorded in a report by David Allen and Maurice Hughes (in prep.) for the Environment & Heritage Service (EHS) of Northern Ireland.

Fig. 1. Breeding site for *Coenocalpe lapidata* at Trinafour, Perthshire, September 1994.

Fig. 2. Final instar larva of *Coenocalpe lapidata* and feeding damage to leaf.

PLATE K

Conclusions

The following conclusions can be drawn from this work:

- The Slender-striped Rufous is a nationally scarce species.
- It is likely that additional breeding sites remain to be discovered within Scotland.
- Whether the moth survives in Northern Ireland is not known, but there appears to be much potentially suitable habitat.
- Buttercups such as Creeping Buttercup and Meadow Buttercup will probably prove to be the main larval foodplant(s).

The following recommendations for further work by conservation agencies are made:

- Establish contact with the owners of occupied sites, as has now been done at Trinafour, and liaise concerning any proposed changes of site management.
- Monitor numbers of the moth and site condition with an annual visit if possible.
- Determine whether base-rich flushing is common to all the sites from which the moth has been recorded. If so, this may prove helpful in narrowing down potential sites for future searches.
- Search occupied sites for larvae, using the guidance above, to determine the larval foodplants and improve our understanding of the habitat requirements of this interesting but poorly recorded moth.

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EXPERIENCES FROM BREEDING *APATURA IRIS* (L.) NYMPHALIDAE IN SWITZERLAND FROM 1982 TO 2002

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Abstract

Details are described of the breeding protocol, seasonal distribution of early stages, parasitism and pattern of emergence of *Apatura iris* (L.) in the neighbourhood of Basel, Switzerland from 1982 to 2002. Early stages are most readily found in the first three weeks of August. Eggs are laid between the leaf edges and the midrib. Males emerged significantly earlier than females. Emergence dates are related to spring temperatures; emergences have occurred earlier in the season year on year correlating with increasingly warmer springs. There was a gradual decrease in the numbers of imagines observed in the wild over the 21 years, possibly due to a decrease in the numbers of *Salix caprea* plants. Parasitism by *Psilomastax pyramidalis* Tischbein 1868 (Ichneumonidae), is discussed.

Introduction

The following observations on the purple emperor, *Apatura iris*, were made in the neighbourhood of Basel, Switzerland, from 1982 until 2002. Ova and first and second instar larvae were collected in the wild and bred on sallow, *Salix caprea* (L.) in the author's gardens. The resulting imagines were released baek into the woods that had been the souree of the ova and larvae. This aeeount outlines the protoeol for breeding the butterfly and the findings over this 21 year period.

Searching for ova and larvae

Ova and larvae were searehed for on *Salix caprea* in several woods around Basel in north-west Switzerland and just over the border in France, a few kilometres west of Basel, from July until Oetober each year. Usually, the shaded side of the bushes were searehed and only the branehes within reaeh at full stretch were examined. Of 175 eggs noted over 11 years, 161 were plaeed between the leaf edge and midrib, and only 14 on the midrib; based on the area of leaf available to ovipositing females, there is a bias in egg-laying on the midrib ($e^2{}_1$ = 10.03, P = 0.0015). No distinetion was noted as to whieh side of the midrib, right or left, was used ($c^2{}_1$ = 0.2, P = 0.66) and all eggs were laid on the upper leaf surfaee.

Heslop et al (1964), and Friedrich (1977) report that most sueeess is to be had by searehing sallows in shady positions along the rides or edges of woods. Heslop et al (1964) reports report that mature female sallows are favoured. For practical reasons, I invariably searched relatively young sallows (three to four years old) that were not more than a few metres high and I did not differentiate between males and females. Although the shady side of a bush yielded the best results, it was possible to find larvae on the west and south facing sides, provided the leaves were well within the bush, and therefore mostly shaded from the sun by the surrounding foliage. Willmott (1987) has referred to favoured breeding areas in woods, where most of the larvae could be located. In my experience, the greatest number are to be found in areas of woods where the sallows occurred in clumps of at least six, rather than on solitary bushes. In particular, the best areas were those where general tree felling had taken place three to five years previously, and which had been invaded by pioneering sallow. Morris (1938) states that sallows in young birch and ash plantations are favoured because the foliage of the latter is comparatively sparse, giving some shelter but not keeping out too much sunshine. There are several reports of varieties of *Salix* other than *S. caprea* being used; I have found larvae and eggs on *S. cinerea* and *S. alba,* but never very many.

Although larvae may be found throughout the year apart from during the flight period, experience indicates that the period before winter hibernation is best, with the first three weeks of August presenting the highest yields (Fig 1). This is probably due to increased losses due to insect and bird predation as time goes on (Warren 1992). The sharp drop in yield from the third to the last week in August is noteworthy.

Breeding

August until November

Salix caprea was planted in the gardens of the houses I occupied, but was never allowed to grow very high; this was achieved by frequent cutting back throughout the growing season, so that the bushes were never more than about 2.5 metres high and 2 metres in girth. Pruning was managed to achieve a wide canopy, tapering down towards the ground, so that the leaves of the lower branches, used by the larvae, were shaded.

Plate L. Freshly emerged adult of *Psilomastax pyramidalis* Tischbein on pupa of *Apatura iris* (L.).

Table 1. Incidences of parasitism (*Psilomastax pyramidalis*).

YEAR	NUMBER OF PUPAE	NUMBER PARASITIZED	% PARASITIZED	PARASITIZED PUPAE IN ORDER OF EMERGENCE (JUNE)
1993	31	5	16	2nd, 3rd, 14th,15th,16th
1994	10	0	0	
1995	27	0	0	
1996	5	0	0	
1997	14	0	0	
1998	20	2	10	1st, 2nd
1999	18	3	17	1st, 3rd, 12th
2000	17	2	12	6th, 7th
2001	13	2	15	4th, 9th
2002	14	3	21	1st, 2nd, 7th
TOTALS*	**169**	**17**	**11**	

*from 1982 until 1992, 50 pupae were brought through and none were parasitised.

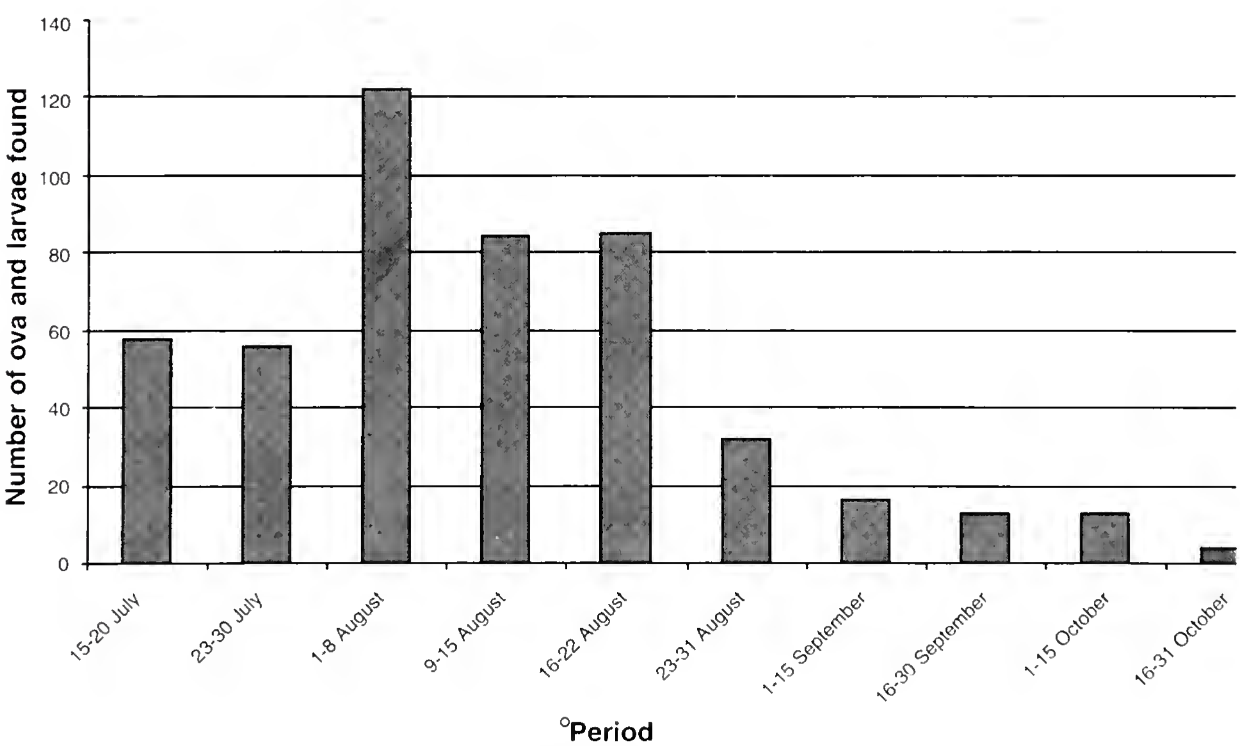

Fig. 1. The timing in observations of larvae found in woodland near Basel 1982 –2002.

For optimum control while they were still very small, larvae were kept, immediately after collection, in small, closed, glass or plastic bottles, outside in a shaded position, until the first week in September. Sallow leaves were renewed every three to four days. The larvae were carefully transferred to the fresh leaves by means of a small soft-haired paintbrush. The bottles were carefully cleaned and dried on the inside every three days. Twice every day, larvae, which had wandered onto the walls of the vessels, were transferred back to leaves. At the beginning of September, the larvae, usually second instar, were transferred to the leaves of a growing *Salix* bush in the garden. Only branches low down on the bush, facing north or north-east and in the shade, were used for the transfer in order to avoid exposing the larvae to the afternoon sun. The branches containing the larvae were enclosed in small mesh nylon netting. Before transferring larvae to a branch, the leaves and branches were very carefully examined for predatory insects, particularly ants, spiders, beetles, and earwigs, and these were all removed. I had not considered that ants would be a problem until, on one day, I observed an ant carry away a stiff first instar larva.

It was not usually necessary to carry out any further transfers before hibernation took place in November, since eating is slow during this phase. The larvae do not grow much during these three months, achieving a maximum length of about 10 mm. This contrasts starkly with the post hibernation period, when they almost quadruple in size in just six weeks.

Winter Hibernation

When the leaves fall, there is a risk that the larvae may be sometimes exposed to bright winter sunshine, so it is important to provide artificial shade in these circumstances. Spraying with water during dry periods is also considered to be beneficial. Hibernation took place in one of three positions: either on a bud, on the inside of the netting; or on a leaf. Most of the leaves fall from the branch to the bottom of the net, and the larvae find their way back to fresh leaves in early April. The loss during hibernation varied from 10% to 20%.

Post Hibernation

The larvae often stir and move about in March under very mild weather conditions. It is particularly important to keep them shaded at this time because they are very vulnerable to desiccation just before the sallow buds open, which does not usually occur before the first week in April. The larvae move on to the leaves even before they have unfurled properly, and nibbled areas of buds just before opening are often the first signs of activity. The change of colour from the winter camouflage of grey/brown to match the bright green of the young sallow leaves takes one to two weeks to be complete, so the larvae in the wild are particularly exposed and vulnerable to birds at this stage.

When this colour change is complete, they are quite difficult to locate. Feeding and growth is rapid from early April, and the larvae have to be moved to new branches about every ten days until pupation takes place sometime during the last two weeks in May. Normally, some 10% of larvae during this stage develop a black colouration, which spreads from the rear, and eventually consumes the whole body. This is presumably a fungal disease.

Pupal Period

The time between a larva moving to the underside of the leaf and the moment of pupation lasts from three to five days. After moving to the leaf underside, the colour gradually changes from bright green to a very pale green and, just before pupation, to an almost translucent hue. The actual pupation process, observed from beginning to end only on one occasion, took one hour. The mean time spent as a pupa was 19 days for females (range 14-31 days, n = 88), and 21 days for males (range 14 –28 days, n = 114). This does not include parasitised pupae, or second-generation examples (see below). A tendency exists for the earlier the pupation date, the longer the pupation period; this is significant only for the females (males: $r = -0.08$, $P = 0.28$; females: $r = -0.29$, $P = 0.0001$) Some 28 pupae failed to develop into imagines; 18 of these were parasitised (see below).

Emergence

From a total of 274 ova and 476 larvae collected, 202 perfect imagines emerged (27%). The mean period over which emergence took place was 14 days (range 5 to 27 days). Males emerge before females (Fig. 2), an observation which agrees with the general experience of observations in the field for many species (Morbey & Ydenberg, 2001). Specimens bred in captivity appeared to emerge earlier than first observations in the wild, by approximately one week, on average. This may be due to the somewhat more sheltered environment in captivity (sallow enclosed in fine mesh nets, thus reducing wind chill factor slightly) though it may well be owing to the advantage of detecting early eclosions in the controlled conditions compared to observations made in woodlands.

First emergences correlate closely with spring temperatures (February to June: Pearson $r = -0.42$ to -0.80, $P < 0.0001$; Fig. 3), indicating earlier emergences with warmer conditions and demonstrating that temperature plays a clear role in development time. Moreover, during the study period spring temperatures were noted to increase (February to June: $r = 0.31$ to 0.64, $P < 0.0001$; Fig. 4) and linked with this emergences have occurred earlier throughout the 21-year period ($r = -0.67$, $P < 0.0001$; Fig. 5). This important relationship is explored in greater detail elsewhere (Dell & Dennis, in prep.).

Parasitism

Details on parasitism are dealt with in more detail in a note to be published in the *Bulletin of the Basel Entomological Society*. In 6 out of the 10 years, from 1993 until 2002, but never during the period 1982 until 1992, it was observed that the parasite *Psilomastax pyramidalis* Tischbein 1868 (Ichneumonidae) emerged from about 15% (N = 18) of the pupae (Table 1). Plate L shows a freshly emerged wasp on the *iris* pupal case. On consulting Heslop and Friedrich's works (loc cit), and Dr Mark Shaw, it was clear that parasitism of the ova, larva and pupa of *A. iris* is rare. It is probable that the female wasp lays her eggs in ova or first and/or second instar *A. iris* larvae in the wild, before they are collected. The questions as to why, during my studies, this phenomena was only encountered after 1993, and also why it was more frequent than had been previously reported, remain unanswered.

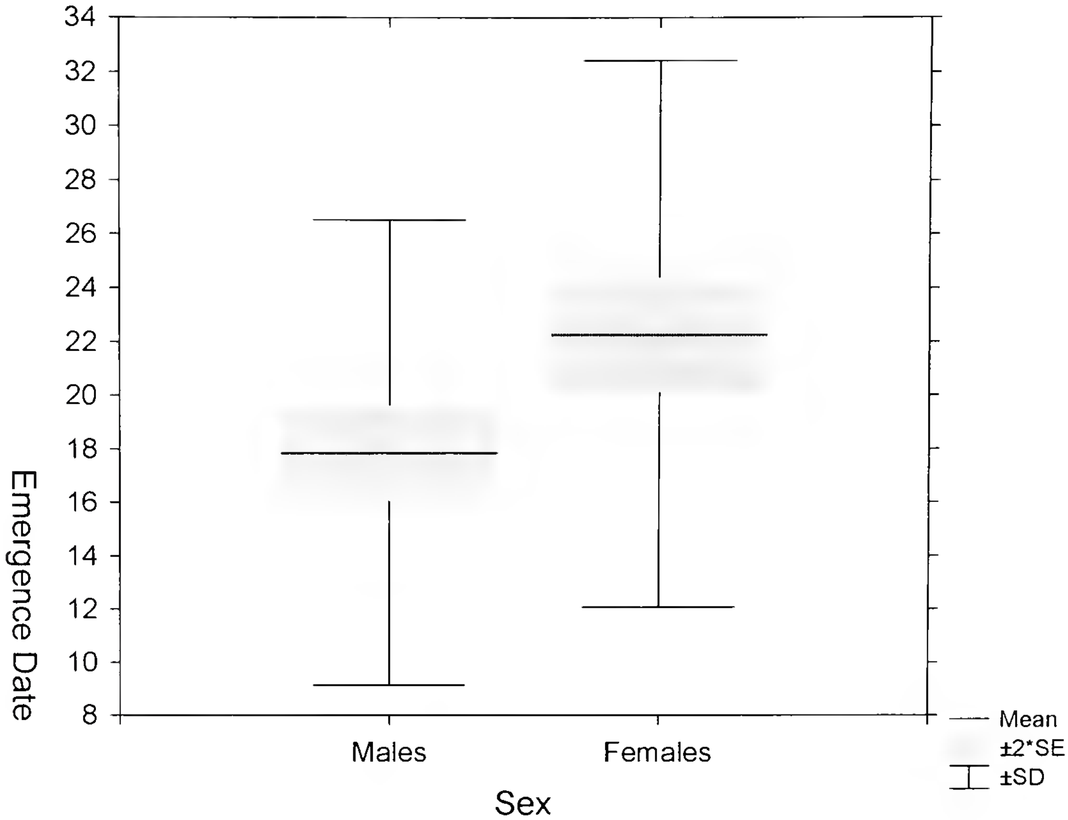

Fig. 2. Emergence times (days after May 31) of male and female *A. iris* near Basel between 1982 and 2002. SE is standard error and SD is standard deviation.

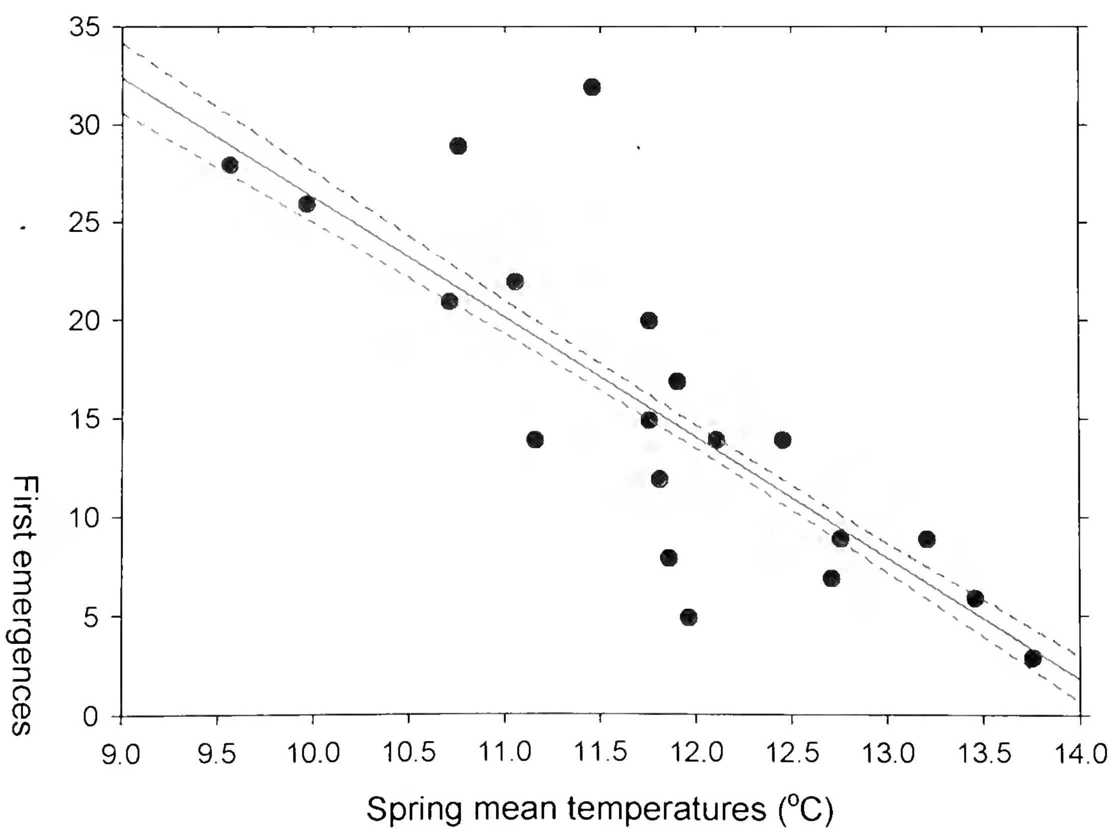

Fig. 3. The relationship between first emergence dates (days after May 31) of *A. iris* and spring temperatures (average of April and May means).

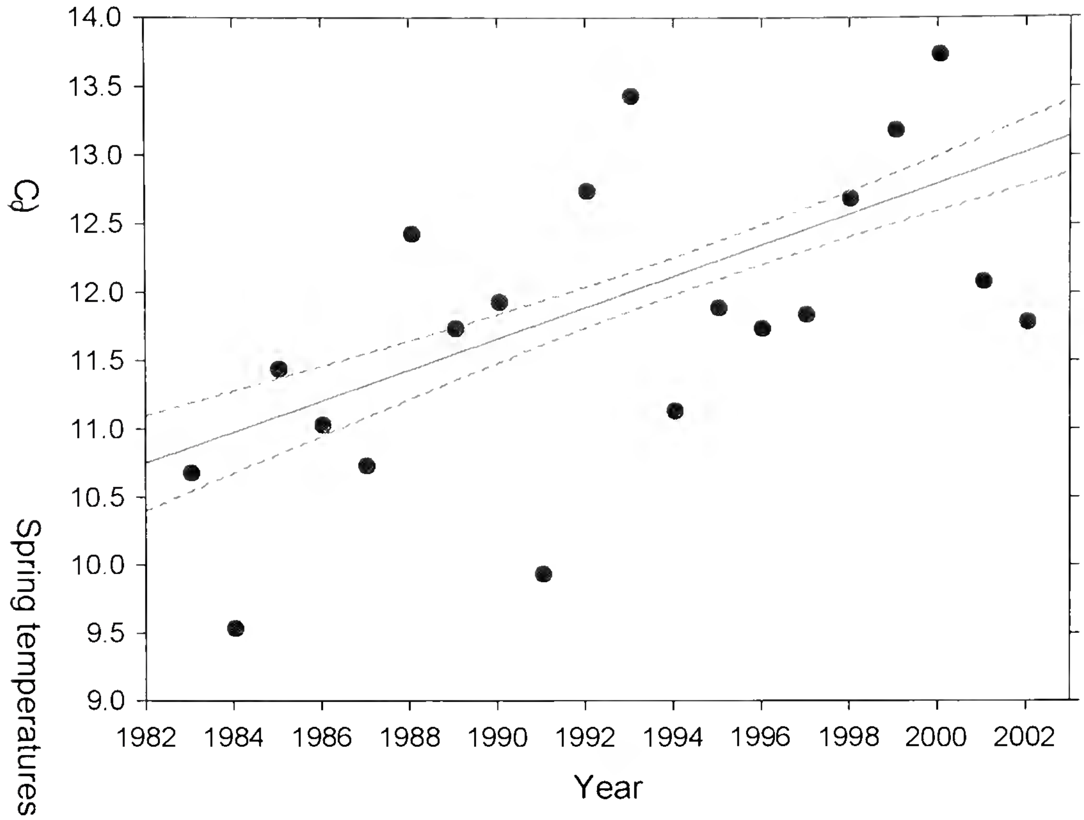

Fig. 4. Relationship between spring temperatures (average of April and May) and year for the period 1982 and 2002.

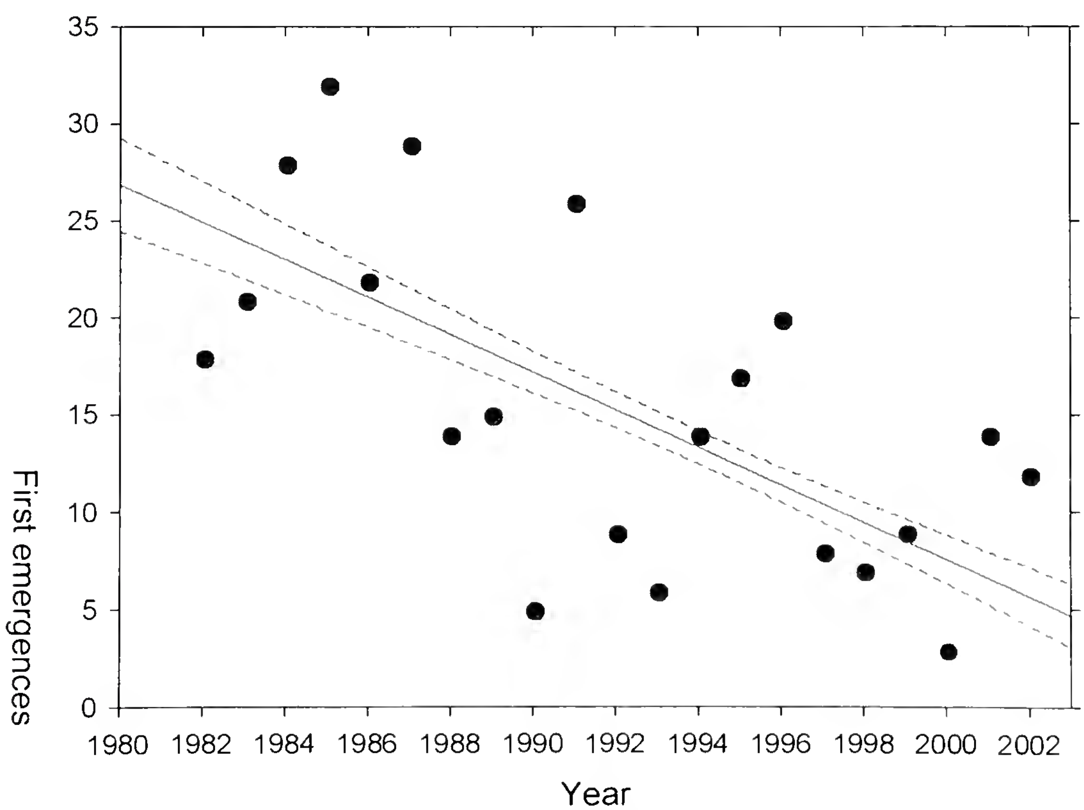

Fig. 5. Relationship between first emergences (days after May 31) and year for the period 1982 and 2002.

Second generation

In late August 2000, it was noticed that one of the 21 larvae in captivity was developing more quickly than the others; on 28 August it was 23 mm long, whereas the rest were about 10 mm. On 20 September, this larva pupated, and a perfect male emerged on 23 October (=34 days as pupa, which is about twice as long as the normal pupal period). In 2001, again, out of 29 larvae, one developed rapidly (23 mm long on 2nd September). Pupation took place on 6 October, and a male emerged on 4 November (=30 days as pupa).

In 2002, one larva also grew quickly, but did not attain the pupal stage and died in the 4th instar in November.

Heslop et al. (1964) mention that instances have been recorded of *A. iris* larvae continuing to feed in late autumn and completing their transformation to the imago stage before Christmas. He also writes of a "recent and unprecedented tendency towards second-broodedness", as well as the unusually short imaginal seasons of 1949 and 1959 being followed by a tendency towards a second brood.

Friedrich (1977) states that a regular second generation is not known, and that observations of the imago in autumn are very rare. Both Friedrich and Heslop speculate that a second generation would be encouraged if the larvae could be presented with fresh Sallow leaves for as long as possible, and this is achievable by cutting back the bush in May, when fresh shoots will be produced, which would last longer as green leaves into the autumn. In the wild, sallow leaves tend to turn yellow from late September. Since, in my small garden, it was necessary to cut back the rapidly growing sallow at monthly intervals throughout the growing season, the larvae were thus presented with fresh leaves until well into October, before they started to turn yellow. In view of this, and if Heslop and Friedrich's hypothesis is correct, I should have experienced a second generation regularly from 1982 onwards; this was not the case. The only time Friedrich managed to achieve a second generation was by keeping the livestock inside, and by continually offering the larva fresh leaves. Interestingly, Heslop describes taking a larva off a yellowing leaf one autumn (where it had already spun up the leaf), and placing it on the sprig of a new plant that had been cut back in June. It began to eat the fresh green leaves and continued to do so until January, under natural conditions, when it finally spun up when frost touched the plant. Heslop does not go on to say whether this larva pupated.

My somewhat warmer breeding conditions (larvae in a bottle outside until end of August, and reduced wind chill factor, subsequently, because of the net) would also favour rapid development, but why only during these last three years? What triggered these instances, and why only in these three years (2000, 2001, 2002) is difficult to explain. What is clear is that even when, very occasionally, a second-generation imago comes through, it has little or no chance of finding a mate, and, in any case the autumn climate in northern Europe would not allow the development of larvae from second generation pairing to the normal hibernation stage.

Adults

It is not within the scope of this report to deal with the adult insect, apart from the following comments. In the wood where most of the activities took place, just on the western edge of Basel, no indication of 'master tree', or 'assembly' behaviour of the imagines could be ascertained, as has been frequently described for *iris* in the U.K. There was a gradual decrease in the numbers of imagines observed in the wild over these 21 years, possibly due to a decrease in the numbers of *Salix caprea* over this time period as a result of forestry activities.

All reared insects were released into the wild. About two hours after emergence, the adult insects were taken to the wood where the larvae/ova had been found the previous year, and released. If release took place during sunny weather, the males invariably flew straight up into the trees and landed at a height of at least 10 metres. Females, however, were not so active and were placed low down on sallow or other convenient bush, where they were often found again two or three hours later. Females were released in various parts of the wood, but, during the last two to three years of this study, they were all placed on young sallow bushes growing together in a circumscribed area (about 600 square metres).

When eggs and larvae were searched for subsequently, greater concentrations were found within the area of female release, compared with other parts of the wood. This suggests that the females are relatively immobile before mating and up to the time of egg laying, and lay a large proportion of their eggs within the vicinity of emergence. Clearly, more work would have to be carried out to substantiate this, since it contradicts the accepted truth that the female flies far and wide during egg laying in order to spread its progeny.

Acknowledgements

I am grateful to Dr Mark Shaw, National Museums of Scotland, Edinburgh, for personal communication concerning parasitism and to Dr Roger Dennis of the Oxford Brookes University (Biological Sciences) for performing the statistical analyses and for helpful discussions

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Stictopleurus abutilon (Rossi) and _S. punctatonervosus_ (Goeze) (Het.: Rhopalidae): New records mainly from Essex

The two British *Stictopleurus* species are rhopalid bugs with a largely transparent and un-punctured base to the forewings. They are dark brown or yellow-brown with pale spots around the abdomen, and a broad almost spoon-shaped tip to the scutellum, especially in *S. abutilon*. In Shirt (1987. *British Red Data Books: 2. Insects*. NCC) there are no post-1900 records given for Britain for either *Stictopleurus abutilon* or *S. punctatonervosus* and they were both listed as Appendix species (believed extinct). They were also considered Extinct in Kirby (1992. *A review of the scarce and threatened Hemiptera of Great Britain*. JNCC, Peterborough) who states that there are confirmed old records for *S. abutilon* from Deal in East Kent, Ashstead in Surrey, Bournemouth in South Hampshire and Hurn in Dorset. There was no strong evidence that the species was ever established in Britain, although the existence of three specimens from Bournemouth suggests the possibility that a population was at least temporarily established. There are confirmed records of *S. punctatonervosus* for Charlwood in Surrey and Holm Bush in West Sussex, but none later than 1870. It was apparently established at the Charlwood locality, having been taken there in 1860, 1869 and 1870 (Kirby *op. cit.*). An Essex record, made near Chelmsford in June 1950 by J. H. Flint, was based on a misidentification for *Rhopalus subrufus* (Kirby 1997. Essex Heteroptera report for 1996. *Essex Naturalist* (New series) **14**: 18-20).

S. punctatonervosus was rediscovered in Britain by Jerry Bowdrey (1999. *Ent. Rec.* **111**: 135-136) in 1997 when he collected a specimen whilst vacuum sampling dry, sparsely-vegetated ground for invertebrates at The Moors, Colchester (OS grid reference TM 0124) on 17 July 1997. On 23 September 1997, a second example was taken at West Bergholt Heath (TL 9527) from bare, sandy ground. A third *Stictopleurus* taken at West Mersea (TM 0012) on 30 July 1998 has now re-determined by Dr Bowdrey as *S. abutilon* (pers. comm.). All these sites are in North Essex (Vice County 19).

Richard Jones (2000. *Stictopleurus punctatonervosus* (Goeze, 1778) (Hem.: Rhopalidae) breeding in Middlesex. *Ent. Rec.* **112**: 267-268) swept two specimens of *S. punctatonervosus* from the flowery area of rough grassland on the embankment of the River Thames next to Chelsea Power Station on 8 August 2000. He realised that he had earlier taken two specimens from Woodlands Farm, Bexley, swept in a derelict farm building site on 7 July and 20 August 1998, and one specimen taken with *S. abutilon* at West Acton on 5 October 1999, swept on a rough grassy embankment.

Kirby (1997. *op. cit.*) records *S. abutilon* new to Essex on the basis of one collected at the Essex Filter Beds (TQ 361867) by D. J. P. Miller at MV light on 14 August 1996. He notes that the species has recently been recorded from several locations in the south of England, and appears to have established breeding populations in the relatively mild climate of recent years.

I first collected both species in 2000 — *S. punctatonervosus* from tall open flower-rich herbaceous vegetation at the side of railway sidings in Haringey, Middlesex

Table 1. New records of *Stictopleurus punctatonervosus*

Date	Site	Vice county	O. S. Grid reference	Quantity	Collector
8 July 1998	Bexley	16	TL 5172	1	C. W. Plant
30 June-12 July 2000	Haringey, railway sidings	21	TQ 3090	3	P.R. Harvey
21 September 2000	Colchester, The Moors	19	TM 0124	1	J.P. Bowdrey
13 August 2001	Pitsea Untidy Industries	18	TQ 7387	2	P.R. Harvey
23 August 2001	Pitsea Untidy Industries	18	TQ 7387	1	P.R. Harvey
5 July 2001	Colchester, Mason Way, Osilid Works	19	TL 997263	1	P.R. Harvey
1 August 2001	Kennett	26	TL 690688	1	P.R. Harvey
26 July 2001	Isle of Dogs	21	TQ 372798	2	P.R. Harvey
26 September 2001	Colchester, Mason Way, Osilid Works	19	TL 998262	3	J.P. Bowdrey
18 July 2002	Red Lodge	26	TL 6970	1	P.R. Harvey
25 October 2002	Abbey Road, Barking probably *punctatonervosus*	18	TQ 442833	1 nymph	P.R. Harvey
28 May 2003	Cuxton Pit	16	TQ 722679	1	P.R. Harvey
16 June 2003	Former Royal Ordnance site	18	TQ 3798	1	P.R. Harvey
28 June 2003	West Thurrock PFA lagoons (north)	18	TQ 5877	3	P.R. Harvey
07 July 2003	Orsett Camp (Springfields) Sand Pit	18	TQ 661809	2	P.R. Harvey
09 July 2003	Sandon Pits	18	TL 7404	1	P.R. Harvey
18 July 2003	Former Royal Ordnance site	18	TQ 3798	1	P.R. Harvey
20 August 2003	Anchor Field	18	TQ 591779	3	P.R. Harvey
22 August 2003	Queens Park, Billericay: grassland	18	TQ 6796	1	P.R. Harvey
26 August 2003	Cuxton Pit	16	TQ 722679	3	P.R. Harvey
11 September 2003	Belmont Road allotment site, Grays	18	TQ 605780	2	P.R. Harvey
13 September 2003	Swanscombe Peninsula	16	TQ 6076	1	C. W. Plant
15 September 2003	Medway Valley Park	16	TQ 7367	1	P.R. Harvey
21 September 2003	Headcorn, River Beult	15	TQ 8244	2	P.R. Harvey
21 September 2003	Dering Wood	15	TQ 8944	2	P.R. Harvey
26 September 2003	Canvey Northwick	18	TQ 768833	1	P.R. Harvey
18 October 2003	Cornard Mere	26	TL 890388	3	P.R. Harvey
21 October 2003	Stratford Marsh	18	TQ 377841	4	P.R. Harvey
29 October 2003	Stanway, Holly Road (indoors)	19	TL 955237	1	N. Cuming

Table 2. New records of *Stictopleurus abutilon*

Date	Site	Vice county	O. S. Grid reference	Quantity	Collector
30 July 1998 (redet.)	West Mersea, St Peters Well	19	TM 0012	1	J.P. Bowdrey
11 August 2000	Broom Hill, West Tilbury	18	TQ 6577	1	P.R. Harvey
10 August 2001	Colchester, Middlewick Ranges	19	TM 0125	1	J.P. Bowdrey
20 August 2002	Hornchurch Country Park,	18	TQ 5384	1	P.R. Harvey
10 July 2003	Tilbury Environmental centre site	18	TQ 657759	1	P.R. Harvey
15 August 2003	Orsett Camp (Springfields) Sand Pit	18	TQ 661809	1	P.R. Harvey
18 August 2003	Former Royal Ordnance site	18	TQ 3798	1	P.R. Harvey

between 30 June and 12 July and *S. abutilon* from Broom Hill near West Tilbury in South Essex on 11 August, probably swept in similar habitat. Subsequently both species have turned up many more times, especially *S. punctatonervosus* (see Tables 1 and 2), from several vice counties including East and West Kent, Middlesex, West Suffolk, as well as North and South Essex.

If my own experience is anything to go by, then *S. abutilon* is currently much scarcer than *S. punctatonervosus*. My own records also suggest that *S. punctatonervosus* is now likely to be found in almost any dry open herbaceous or 'wasteground'-type habitat in Suffolk, Essex, Middlesex and Kent. The species was found at practically every Essex site surveyed in 2003, including a generally species-poor rough grassland public open space adjacent to an allotment site in Grays. During a field meeting in Kent, ostensibly looking for spiders, on 21 September, the species was swept from open herbaceous vegetation in two out of the three localities visited, in one case in what appeared to be a set-aside field adjacent to the River Beult. On a spider meeting to Cornard Mere in West Suffolk on 18 October we had sat down for lunch in a set aside field adjacent to the Mere. I casually commented to the others that I had been finding *S. punctatonervosus* in lots of places this year, wherever the habitat contained areas of open tall herbaceous vegetation, and said, "I'll just go and have a sweep to see if it turns up again". A few minutes later, I had three specimens from the area near where we were seated!

It seems probable *S. punctatonervosus* is now frequent in much of south-eastern England wherever there is suitable open habitat, and it. It is worth noting though that many sites containing the species have been good quality dry grassland or brownfield invertebrate localities rather than set aside.

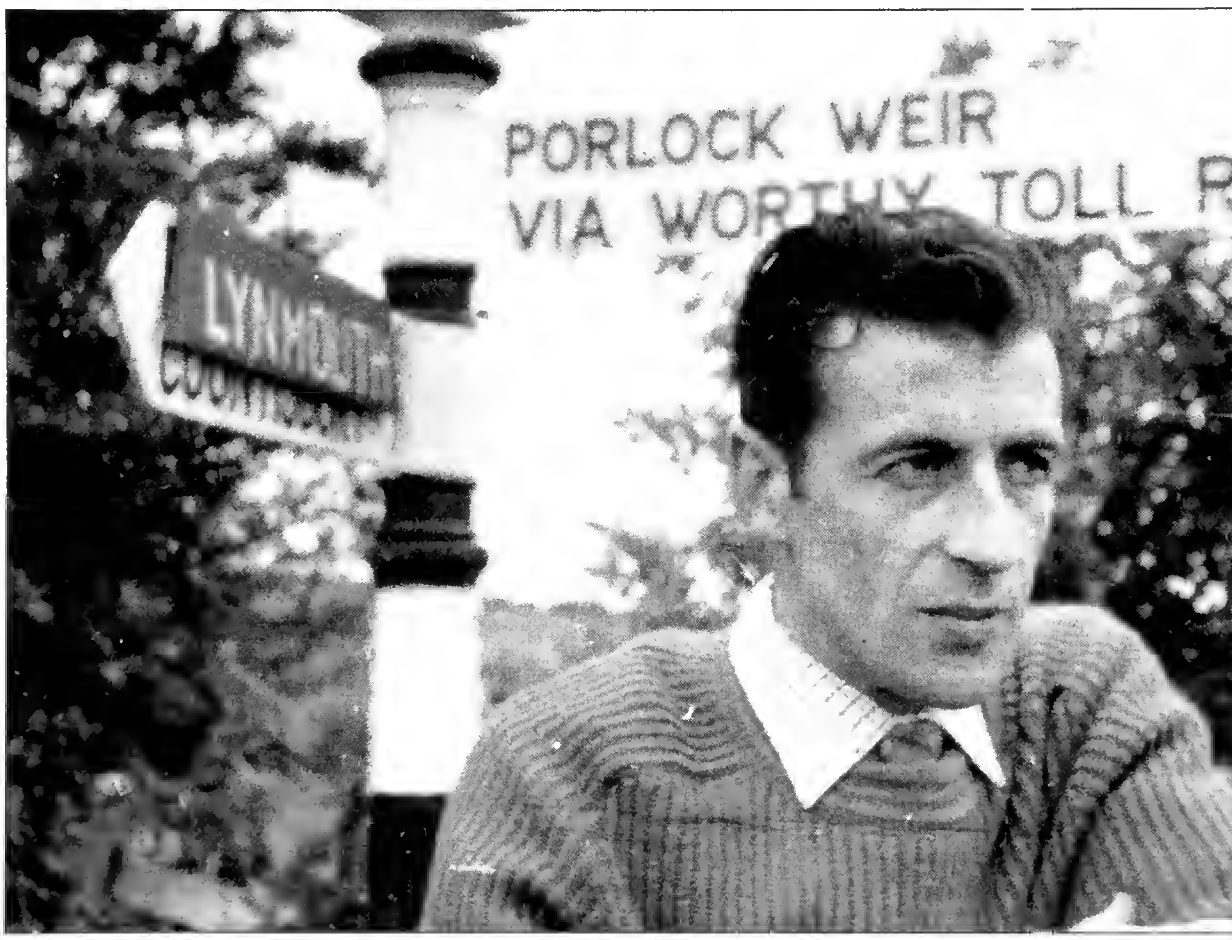
I am grateful to Dr Peter Kirby for identifying or confirming the identity of most of my *Stictopleurus* specimens, and to Jerry Bowdrey, Nigel Cuming and Colin Plant for permission to include their records in this note.— PETER HARVEY, 32 Lodge Lane, Grays, Essex RM16 2YP.

OBITUARY

John Robbins

1927 to 2004

The death of John Robbins, from Porlock, Somerset on 31 May 2004, after a short illness, will have affected many people. John was a kind and generous man with many interests – evident from the diversity of people contacted to write this obituary. They range from personal friends, to the Exmoor Natural History Society and lepidopterists throughout the country.



John was born in Pontypridd, South Wales on 30 August 1927 and his parents moved to Cornwall shortly after his birth to set up a business in Porthleven, near Helston. At the age of 18, John did his National Service and spent time in Japan as part of this. He saw the effects of the bombing of Hiroshima, which affected him deeply. After the war he resumed his studies and completed his degree, which enabled him to manage Chemist shops in the West Country. He married Audrey and bought his shop in Minehead, where he remained in business until he retired. He finally settled in Luckbarrow, on the edge of Exmoor, in a house with a large garden of two and a half acres. Not only did this garden hold a large badger sett, but John allowed the Exmoor Natural History Society to plant a collection of *Sorbus* trees, which at the time contained representatives of the complete British list for this genus.

John's initial interest was botany and he built up an impressive collection of botanical books. This was to lead him later in life to look at larvae feeding on these plants stimulating his interest in the microlepidoptera, which then further progressed to the study of leaf miners. In both these fields John became expert, being friends with the eminent lepidopterists of the time, such as Maitland Emmet, Brian Baker and Teddy Pelham-Clinton. They helped to encourage his interest in entomology, which he took up late in his life.

He was one of those lepidopterists who built up an impressive garden list, heading towards the (almost mythical) one thousand species; his garden count was 960 species in 2002. Of the almost 1300 moth species recorded in Exmoor, John had personally contributed over 1100 of them. His garden would regularly be host to over 650 species each year. He contributed many new records to Somerset and he may have been the only man in England with *Schiffermuellerina grandis* (Desvignes) in his garden. Even in his last year he added seven new species to the Exmoor list, including the first record of *Perittia obscurepunctella* (Stt.) in 79 years.

He willingly gave of his time to help others and was a leading member of the Exmoor Natural History Society. His death was a great loss to that Society. He authored *The Moths and Butterflies of Exmoor National Park* and his proof reading and teaching skills were put to very good use by them. He regularly lead leaf-miner walks and one of his last was in September 2003, looking at leaf-miners, galls and insects on *Salix* species, as a two day field visit, organised by the British Entomological and Natural History Society and the British Plant Gall Society.

My contact with John was through leaf mines and it is to him that I, and others, owe a huge debt of gratitude. He would carefully look through the specimens posted to him and then provide a wealth of detailed identification aids and breeding tips to these mines, kindly and gently pointing out botanical misidentifications which would have lead to me sometimes incorrectly naming the miners. These replies seemed to come almost by return post.

He was unusual in that he was interested in all orders of leaf miner, not restricting his interest to just those of the Lepidoptera. He would regularly record around 120 species of lepidopterous leaf miners locally each year and his records of miners other orders stood at over 140 species. It is a pity that he didn't write a guide to leaf miners himself, but his wealth of knowledge has proved valuable in the initial stages of the new "AIDGAP" guide to British leaf miners, being written at the present by Brian Pitkin and Colin Plant. He helped build up the leaf mine collection at The Bristol Museum, donating many specimens to this.

Talking to others it has become apparent that John has not only helped and inspired many people throughout his life, but also had very diverse interests, ranging from falconry to coin and stamp collecting to the RSPCA and developing skills as a trout tickler! He will be very much missed.

My thanks are to the many people who helped me with details about John, but especially to Cyril Bleazard, his friend, who provided much information about John's life.

Rob Edmunds

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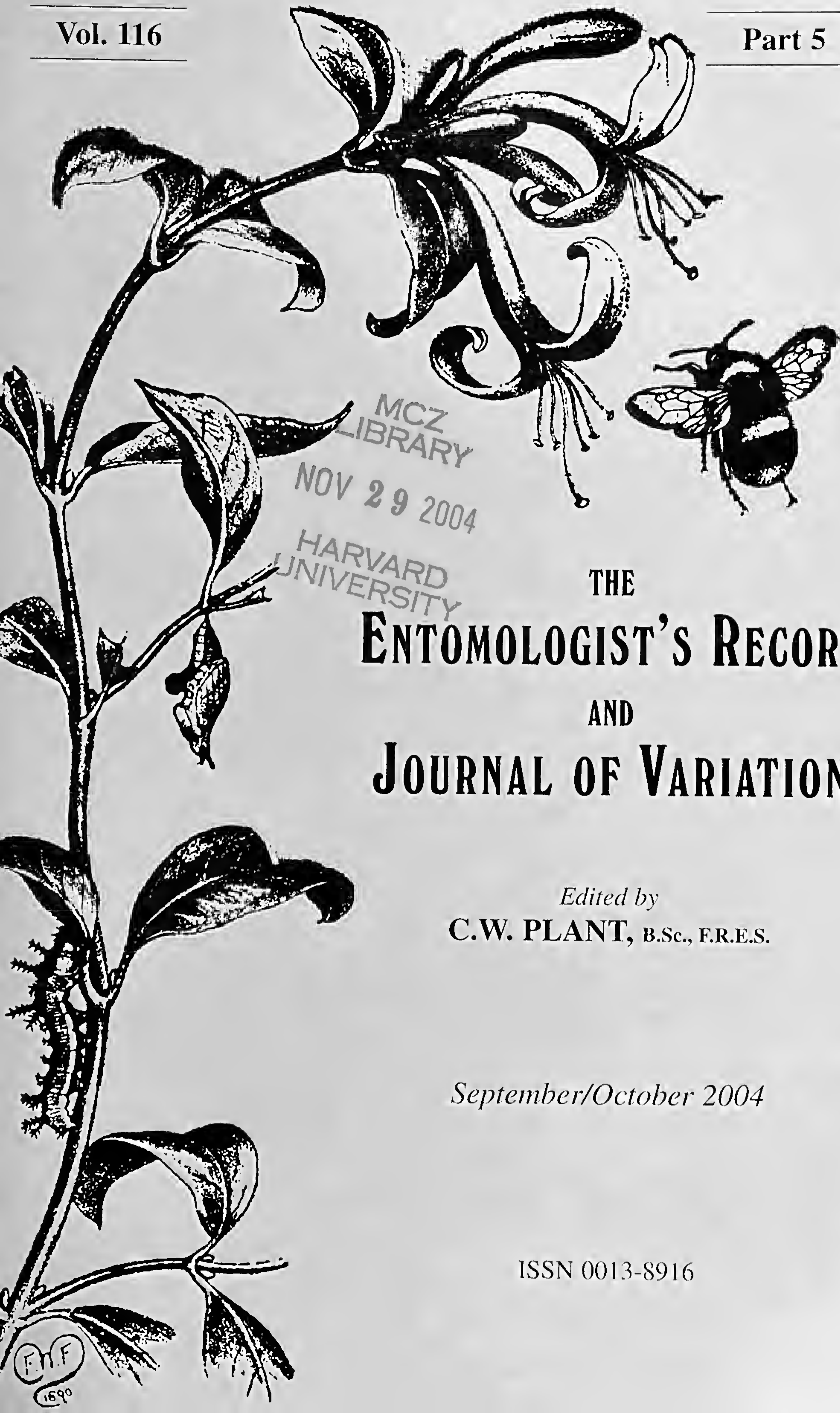

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MICROLEPIDOPTERA REVIEW OF 2003

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Abstract

Noteworthy records of microlepidoptera, including some new to the British Isles and new vice-county records, made during 2003 are listed and discussed.

Introduction

We are delighted to report that 67 recorders have contributed records to this microlepidoptera review and we offer our very grateful thanks to them. They are listed later. The continuing increase in interest and expertise gives hope for the future and it is amazing that so many new vice-county records are still being made. We believe that this is due partly to a previous lack of knowledge but also to real changes in distribution. Many species, some referred to specifically below, are clearly spreading in the British Isles, sometimes following recent arrival from the Continent and sometimes presumably because of recent climatic changes and/or the increase in range and abundance of their foodplants. For some species, the improvement in knowledge has followed the publication of identification guides, or of information on their life cycles, or points of difference from similar species. We now have texts for all major groups of microlepidoptera in Britain and this is paying dividends.

The new VC records are identified from maps held by JRL, (originally prepared by Maitland Emmet), and we are increasingly being asked whether these distribution maps can be made more easily available. For groups such as the Gelechiidae there is little problem. The maps published in Moths and Butterflies of Great Britain and Ireland Vol. 4(2) (Emmet and Langmaid (eds), 2002) are reasonably up-to-date and it is an easy matter to use the annual reviews to update them. However, the maps in MBGBI for the Nepticulidae are now significantly out of date, for example, and so it is not easy to discover the current position. Readers will probably know that there is a distribution scheme for the leaf mining groups, as well as for the gelechiids, but even so it would be nice to have more ready access to the overall maps. The problem is twofold. First of all, the older VC records on the maps do not necessarily have full data associated with them, so that there is an issue of interpretation. More importantly, the maps are not in a publishable format and so the labour of producing useable maps would be very great! If readers see an easy solution, we would be interested to hear it.

In 2003 the weather was exceptionally warm, with several hot, dry interludes. Every month from January to September had well above average temperatures, with a record British high of 38.5° in Kent and a Scottish record of 32.9° in the Borders, both in August. October was then rather cold, although sunny, before a mild November and a very changeable but average December. Of special interest was the very warm spring, which got the microlepidoptera off to an early start, and the equable September, allowing the completion for many species of extra broods. It isargued widely that such late broods are not necessarily helpful, in that they leave insufficient time for larvae to feed up before winter sets in, but there is no scientific evidence to substantiate this view.

Climate change seems to have brought more frequent extreme weather events and 2003 was no exception. In March the temperature at Altnaharra in Sutherland rose from –9°C overnight to 18°C by day, the greatest diurnal range ever recorded in Britain. As often during spells of high pressure, clear skies allowed cool night-time temperatures, such as -3.4°C in Cornwall in mid-May and high temperatures set off thunderstorms resulting in very heavy rainfall. Shepshed in Leicestershire experienced 39mm in one hour in June, Carlton in Cleveland had 48mm in 15 minutes in August and Cardinham in Cornwall had 58mm in 12 hours in July. Snowfall was very patchy, although the north suffered in both January and February and there was snow on Dartmoor in October. Whether these extreme events have a consequence for microlepidoptera is not known.

Ancylosis cinnamomella was recorded as new to the British Isles at Portland Bird Observatory in August and is likely to be a stray migrant; however, although it was originally thought that the same might apply to *Metalampra italica*, found in Plympton, Devon, also in August, others have since been seen at the same site and some also in Hertfordshire, raising the possibility that this new species has now established breeding colonies. This certainly applies to *Ectoedemia hannoverella*, which was first noted as tenanted mines in hybrid poplar on 25 September 2002 at Mildenhall (VC 26) and has since been bred also from other areas in East Anglia. This may be a recent arrival, or perhaps an overlooked species, but it is certainly well established now.

New to Wales were *Calybites phasianipennella* , *Argyresthia trifasciata* and *Eucosma aemulana*, all of which are likely to be resident there. The same applies to *A. cupressella* from Belfast and *Teleiodes luculella* from Cronykeery, both new to Ireland, whereas *Evergestis extimalis*, also from Cronykeery, is likely to be a migrant. Shetland often turns up migrants new to Scotland and in 2003 at Eswick, *Trachycera suavella* and *Pima boisduvaliella* were both recorded. The other new Scottish species, namely *Biselachista scirpi, Monochroa cytisella* and *M. lucidella* may well be residents. All three were found in the Borders, reasonably near their other British sites.

As widely predicted, *Cameraria ohridella* has spread rapidly, following its arrival in 2002 and it is now spread across several vice-counties near to London. *Brachmia inornatella* has also spread from East Anglia and the extreme south-east to Hampshire. Now that the larval habits of *Mompha bradleyi* are better known this has also been found in three new vice-counties; and *Eucosma parvulana* has been reliably separated from other close relatives and has also been recorded in three vice-counties.

We have been able to include national grid references more frequently this year and to add more information on the stage recorded, and we would welcome records including these details. Please do send in your records for 2004, using our standard format in WORD files, wherever possible, so as to reduce our own re-typing. JRL's email address, 'john@langmaidj.freeserve.co.uk', is the best contact point.

We are most grateful to all our recorders for 2003, namely D.J.L. Agassiz, C. Ayres, J. Baker, H.E. Beaumont, D.T. Biggs, K.P. Bland, S.P. Clancy, J. Clifton, G.A. Collins, M.F.V. Corley, P.D.M. Costen, C.A. Darbyshire, A.M. Davis, B. Dickerson, R.J. Dickson, R.D. Edmunds, B, Elliott, R. Elliott, D. Evans, C.H. Fletcher, N. Fletcher, R.G. Gaunt, D.J. Gibbs, B. Goodey, A.N. Graham, J.E. Graham, D.G. Green, M.W. Harper, C. Hart, R.J. Heckford, B.P. Henwood, J.B. Higgott, S.H. Hind, D. Hipperson, S.A. Knill-Jones, N.A. Littlewood, N.R. Lowe, K. McCabe, J.A. McGill, A.J. Mackay, D.V. Manning, S. Nash, R.M. Palmer, S.M. Palmer, M.S. Parsons, S.J. Patton, C.W. Plant, E.A. Pratt, A.W. Prichard, J.T. Radford, A.P. Russell, K. Saul, I.R. Sims, M.P. Skevington, D.J. Slade, B. Smart, E.G. Smith, I.F. Smith, M.H. Smith, P.H. Sterling, I.R. Thirlwell, A. Tyner, M. J. Wall, N. Whinney, D. Williams. We are also especially indebted to Ian Thirlwell, who helped in the time-consuming task of transferring records to maps.

In the following systematic list, SEM stands for 'Scottish Entomologist's Field Meeting', which was held at Cromarty and was attended by several of the recorders. The journals are abbreviated as follows: *Ent. Gaz.* For *Entomologist's Gazette*; *Ent. Rec.* for *Entomologist's Record and Journal of Variation*; and *BJENH* for *British Journal of Entomology and Natural History.* New vice-county records are shown with the VC number both <u>underlined</u> and in **bold** type.

SYSTEMATIC LIST

MICROPTERIGIDAE

2 *Micropterix mansuetella* Zell. — Alner's Gorse ST7310 (9) 14.v.2003, first county record since 19th century — P. Davey *per* PHS

3 *M. aureatella* (Scop.) — Berriedale ND1122 (**<u>109</u>**) 17.vi.2003 — DW; Lettermore G8483 (**<u>H35</u>**) 15.v.2003 — CA

4 *M. aruncella* (Scop.) — Berriedale ND1122 (**<u>109</u>**) 17.vi.2003 — DW

5 *M. calthella* (Linn.) — Hillockhead, Black Isle NH7560 (**<u>106</u>**) 29.vi.2003 — SEM; Lettermore G8483 (**<u>H35</u>**) 15.v.2003 — CA

ERIOCRANIIDAE

7 *Eriocrania chrysolepidella* Zell. — Netherclay (**<u>5</u>**) vacated mine on *Corylus* 28.v.2003 — JAMcG

10 *E. salopiella* (Staint.) — Sandown SZ5783 (**<u>10</u>**) vacated mines on *Betula* 5.vii.2003, det. JRL — DTB; Nagshead RSPB Reserve SO6108 (**<u>34</u>**) mines on *Betula* 10.vi.2002 — DJG; Pembrey Forest SN30 (**<u>44</u>**) vacated mine on *Betula* 16.vi.2003 — ANG; Holcroft Moss SJ6893 (**<u>59</u>**) tenanted mines on *Betula* sp. 5.v.2003 — KM; Torroy NH5497 (**<u>106</u>**) tenanted mines on *Betula* 3.v.2003 — DW; Loch a'Mhuilinn NC1649 (**<u>108</u>**) tenanted mines on *Betula* 3.v.2003 — DW; Berriedale ND1122 (**<u>109</u>**) tenanted mines on *Betula* 5.v.2003 — DW

11 *E. cicatricella* (Zett.) — Glen Affric NH22 (**<u>96</u>**) iv.2003, det. MRY — D. Barbour *per* MRY

12 *E. sangii* (Wood) — Morfa Harlech SH5732 (**<u>48</u>**) tenanted mines on *Betula* 25.v.2003 — ANG & JEG; Loch a'Mhuilinn NC1649 (**<u>108</u>**) tenanted mines on *Betula* 3.v.2003 — DW; Berriedale ND1122 (**<u>109</u>**) tenanted mines on *Betula* 5.v.2003 — DW

NEPTICULIDAE

33 *Bohemannia auriciliella* (Joann.) — Wickham Common (11) 29.vi.2003, second county record — RJD

21 *Ectoedemia sericopeza* (Zell.) — Cockayne Hatley TL2549 (**30**) in Rothamsted trap 6-12.viii.2003, genitalia det. — DVM

22 *E. louisella* (Sirc.) — Ravensdell Wood TL0114 (**20**) 31.v.2003 — CWP

23 *E. argyropeza* (Zell.) — Northfield Wood TM0260 (**26**) tenanted mines on *Populus tremula* 1.xi.2003 — AWP; Ty'n-y-bwlch SH8431 (**48**) tenanted mines on *Populus tremula* 4.xi.2003 — ANG & JEG; Flixton SJ7493 (**59**) tenanted mines on *Populus tremula* 7.xi.2003 — KM; Dunbeath ND1530 (**109**) tenanted mines on *Populus tremula* 13.x.2003 — DW

24a *E. hannoverella* (Glitz) — Ipswich TM2043 (**25**) tenanted mines on *Populus* × *canadensis* 1.x.2002 — N. Sherman; Mildenhall TL7276 (**26**) tenanted mines on *Populus* × *canadensis* 25.ix.2002 — AWP & JC; Thetford TL8782 (**28**) tenanted mines on *Populus* × *canadensis* 13.xi.2003 — A. Musgrove. *Ent. Rec.* **116**: 153-157, **New to the British Isles**

25 *E. intimella* (Zell.) — Morfa Harlech SH5632 (**48**) 13.vi.2003, genitalia det. — ANG & JEG; Culloden Wood, Balloch NH7346 (**96**) tenanted mines on *Salix caprea* 8.xi.2002, moths bred — DW; Rogie Falls NH4454 (**106**) tenanted mines on *Salix caprea* 19.x.2003 — DW

28 *E. angulifasciella* (Staint.) — Bunchrew NH6145 (**96**) tenanted mines on *Rosa* sp. 5.x.2003 — DW

34 *E. occultella* (Linn.) — Nantgwyn SN3623 (**44**) 29.v.2003 — JB

35 *E. minimella* (Zett.) — Lord's Lot Wood SD5470 (**60**) vacated mines on *Betula* sp. 1.xi.2003 — SMP

36 *E. quinquella* (Bed.) — Denton Wood SP8557 (**32**) tenanted mines on *Quercus* 30.x.2003 — DVM

39 *E. heringi* (Toll) — Avon Gorge ST5673 (**6**) 9.vi.2003, genitalia det.; Nagshead RSPB Reserve SP6108 (**34**) 10.vi.2003, genitalia det. — DJG; Trawscoed SH8432 (**48**) tenanted mines on *Quercus* sp. 26.x.2003 — ANG & JEG

42 *E. septembrella* (Staint.) — Muir of Ord NH5348 (**96**) tenanted mines on *Hypericum* sp. 5.x.2003; Learnie NH7560 (**106**) tenanted mines on *Hypericum* sp. 28.x.2003 moths bred — DW

50 *Stigmella aurella* (Fabr.) — Invermoriston NH4226 (**96**) tenanted mines on *Rubus* sp. 2.xi.2003 — DW

54a *S. pretiosa* (Hein.) — Achany NC5700 (**107**) mines on *Geum rivale* 7.x.2003, moths bred — DW

55 *S. aeneofasciella* (H.-S.) — Loch Kirkaig NC0719 (**105**) tenanted mines on *Potentilla erecta* 10.x.2003; Torroy NH5497 (**VC106**) tenanted mines on *Potentilla erecta* 4.x.2003; Muie NC6604 (**107**) vacated mines on *Fragaria vesca* 19.ix.2003; River Inver NC 0923 and NC1023 (**108**) 10.x.2003 tenanted mines on *Potentilla erecta*; Berriedale ND1222 (**109**) tenanted mines on *Potentilla erecta* 20.ix.2003 — DW

57 *S. filipendulae* (Wocke) — Brassey SP1322 (**33**) mine on *Filipendula vulgaris* 21.ix.2003 — G. Meredith *per* RGG

58 *S. ulmariae* (Wocke) — Wareham Meadows SY9288 (**9**) vacated mines on *Filipendula ulmaria* on 9.viii.2003 — PHS

59 *S. poterii* (Staint.) f. *serella* Staint. — Cabrach NH379289 (**94**) vacated mines on *Potentilla erecta* 5.x.2003 — MRY

64 *S. continuella* (Staint.) — Torroy NH5497 (**106**) vacated mine on *Betula* 4.x.2003; Ravens Rock, Altass NC4900 (**107**) vacated mine on *Betula* 11.x.2003 — DW

65 *S. speciosa* (Frey) — Pikeshaw Wood SE3955 (**64**) vacated mine on *Acer pseudoplatanus* 23.x.2003, det. HEB — CHF

66 *S. sorbi* (Staint.) — Stallode TL6983 (**26**) vacated mine on *Sorbus aucuparia* 3.x.2003 — AWP

67 *S. plagicolella* (Staint.) — Culnakirk NH4953 (**96**) vacated mines on *Prunus spinosa* 5.x.2003 — DW

68 *S. salicis* (Staint.) — Lein of Garmouth NJ3265 (**95**) tenanted mines on *Salix aurita* 1.x.2003 — DW

72 *S. myrtillella* (Staint.) — Charnwood Lodge SK4615 (**55**) vacated mines on *Vaccinium myrtillus* 26.vii.2003 — AJM; Baines Crag SD5461 (**60**) vacated mines on *Vaccinium myrtillus* 27.viii.2003 — SMP

73 *S. trimaculella* (Haw.) — Muir of Ord NH5348 (**96**) tenanted mines on *Populus* sp. 5.x.2003, moths bred — DW

80 *S. ulmivora* (Fol.) — Ripon Parks SE3174 (**64**) vacated mines on *Ulmus glabra* 5.ix.2003, det. HEB — CHF

84 *S. ruficapitella* (Haw.) — Kindrogan Field Centre NO0562 (**89**) tenanted mines on *Quercus* 25.x.2003, moth bred — DW

86 *S. roborella* (Johan.) — Balmacara NG8027 (**105**) tenanted mines on *Quercus* 18.x.2002, moths bred, genitalia det.; Altass NH5099 (**107**) tenanted mines on *Quercus* 19.x.2002, moths bred, genitalia det.; Loch a'Mhuilinn (**108**) tenanted mines on *Quercus* 27.ix.2002, moths bred, genitalia det.; Berriedale (**109**) tenanted mines on *Quercus* 8.x.2002, moths bred, genitalia det. — DW

89 *S. basiguttella* (Hein.) — Cheltenham (**33**) vacated mine on *Quercus robur* 26.vii.2003 — G. Meredith *per* RGG

90 *S. tiliae* (Frey) — Hackfall Woods SE2377 (**64**) vacated mines on *Tilia* sp. 25.x.2003, det. HEB — CHF

92 *S. anomalella* (Goeze) — Findhorn Bay NJ0464 (**95**) tenanted mines on *Rosa* sp. 1.x.2003 — DW

98 *S. catharticella* (Staint.) — High Batts NR SE2976 (**64**) tenanted mines on *Rhamnus cathartica* 24.x.2003, det. HEB — CHF

102 *S. aceris* (Frey) — East Ham TQ4283 (**18**) mine on *Acer campestre* 30.x.2003 — CWP

113 *S. sakhalinella* Pupl. — Assington TL9336 (**26**) mine on *Betula* 26.x.2003 — N. Sherman *per* AWP

114 *S. glutinosae* (Staint.) — Morfa Harlech SH5732 (**48**) tenanted mine on *Alnus glutinosa* 1.viii.2003 — ANG & JEG; Glen Convinth NH5035 (**96**) tenanted mines on *Alnus glutinosa* 5.x.2003 — DW

115 *S. alnetella* (Staint.) — Morfa Harlech SH5732 (**48**) vacated mine on *Alnus glutinosa* 1.viii.2003 — ANG & JEG

OPOSTEGIDAE

119 *Opostega salaciella* (Treits.) — Achany NC5700 (**107**) 7.viii.2003 — DW

121 *Pseudopostega crepusculella* (Zell.) — Thornham Estate TM1072 (**25**) 7.vii.2003 — NW

TISCHERIIDAE

127 *Emmetia angusticollella* (Dup.) — Stallode TL6983 (**26**) mines on *Rosa canina* 3.x.2003 — AWP

INCURVARIIDAE

128 *Phylloporia bistrigella* (Haw.) — Pembrey Forest SN3803 (**44**) 13.vii.2003 — JB

129 *Incurvaria pectinea* Haw. — Tir Stent SH7516 (**48**) cut-outs and one tenanted mine on *Betula* sp. 20.ix.2003 — ANG & JEG

136 *Lampronia corticella* (Linn.) — Berriedale ND1122 (**109**) 17.vi.2003 — DW

ADELIDAE

152 *Adela rufimitrella* (Scop.) — Horsenden Hill Farm (**21**) 24.v.2003 — R. Terry *per* CWP, *Ent. Rec.* **115**: 195; Loch a'Mhuilinn NC1649 (**108**) 3.v.2003 — DW

HELIOZELIDAE

154 *Heliozela sericiella* (Haw.) — Milton NH4930 (**96**) vacated mines on *Quercus* 5.x.2003 — DW

PSYCHIDAE

185 *Luffia ferchaultella* (Steph.) — Elan Valley SN9162 (**43**) cases 10.vii.2003 — AMD

TINEIDAE

199 *Psychoides verhuella* Bruand — Morfa Harlech SH5732 (**48**) larvae on *Phyllitis* 15.iii.2003, moths bred — ANG & JEG; Eccleston SJ4162 (**58**) larvae on *Phyllitis* 16.xi.2003 — IFS

217 *Nemapogon wolffiella* Karsh. & Niel. — Stony Stratford SP8040 (**24**) 4.viii.2003 — M. Killeby *per* DVM; Narborough Bog SP5497 (**55**) 3.vi.2003, genitalia det. AJM — MPS

219 *N. ruricolella* (Staint.) — Regent's Park, London (**21**) 7.vii.2003, genitalia det. — T. Freed *per* CWP

228 *Monopis weaverella* (Scott) — Morfa Harlech SH5732 (**48**) 31.v.2003, genitalia det. — ANG & JEG

238 *Niditinea striolella* (Mats.) — Highnam Wood RSPB Reserve SO7720 (**34**) 11.vi.2003 — DJG

239 *Tinea columbariella* Wocke — Rushmere St Andrew TM2043 (**25**) 23.vi.2003, genitalia det. — JBH

245 *T. pallescentella* Staint. — Lightfoot Green SD5133 (**60**) 14.vi.2003 — SMP

246 *T. semifulvella* Haw. — Achany NC5700 (**107**) 9.vii.2003 — DW

BUCCULATRICIDAE

266 *Bucculatrix nigricomella* Zell. — Hutton Conyers SE3273 (**65**) 29.v.2003, det. HEB — CHF

272 *B. cidarella* Zell. — Milton NH4930 (**96**) vacated mines on *Alnus glutinosa* 5.x.2003 — DW

273 *B. thoracella* (Thunb.) — Luccombe (**10**) vacated mines and moulting cocoons on *Tilia* × *vulgaris* 4.viii.2003 — BE & JRL

274 *B. ulmella* Zell. — Fridd Fawr SH8503 (**47**) larva on oak 2.viii.2003 — IFS & D.J. Poynton; Copt Hewick SE3471 (**64**) 19.x.2003, det. HEB — CHF; Milton NH4930 (**96**) vacated mines on *Quercus* 5.x.2003; Learnie NH7560 (**106**) vacated mines on *Quercus* 28.ix.2003 — DW

DOUGLASIIDAE

398 *Tinagma ocnerostomella* (Staint.) — Ketton Quarry SK9705 (**55**) 14.vi.2003, genitalia det. — AJM

ROESLERSTAMMIIDAE

447 *Roeslerstammia erxlebella* (Fabr.) — Billinge SD5202 (**59**) 22.iv.2003 — CAD; Crathie (**92**) 18.vi.2003 — RJH

GRACILLARIIDAE

280 *Caloptilia cuculipennella* (Hübn.) — Rosemarkie NH7458 (**106**) larval spinnings on *Fraxinus* 28.vi.2003, moths bred — SEM

281 *C. populetorum* (Zell.) — Funtley SU5608 (**11**) 4.iv.2003, genitalia det. RJD — M. Opie *per* RJD; Markfield SK4910 (**55**) 7.viii.2003 — AJM

284 *C. rufipennella* (Hübn.) — Trawscoed SH8432 (**48**) 6.xi.2003 — ANG & JEG

288 *C. stigmatella* (Fabr.) — Scoltia G6797 (**H35**) 22.vii.2003 — JBH

290 *C. semifascia* (Haw.) — Stour Wood TM1831 (**19**) 18.vii.2003 — JC; Ravensden TL0854 (**30**) vacated spinnings on *Acer campestre* 18.x.2003 — G. Dennis *per* DVM

293 *C. syringella* (Fabr.) — Craigiefield, Mainland HY4612 (111) mines on *Symphoricarpos albus* 16.vi.2003, moths bred, previously unrecorded foodplant — KPB

294 *Aspilapteryx tringipennella* (Zell.) — Scoltia G6797 (**H35**) 20.vii.2003 — JBH

296 *Calybites phasianipennella* (Hübn.) — Epping Forest TQ4399 (**18**) 25.viii.2003 — T. Green *per* BG; Morfa Harlech SH5732 (**48**) 18.vii.2003, genitalia det. — ANG & JEG, **New to Wales**

299 *Parectopa ononidis* (Zell.) — Reading SU6669 (**22**) 24.vii.2003 — GAC; Cockayne Hatley TL2549 (**30**) in Rothamsted trap 9-11.vii.2003 — DVM

302 *Parornix fagivora* (Frey) — Brandon TL7685 (**26**) larval spinning on *Fagus* 3.x.2003 — AWP

304 *P. devoniella* (Staint.) — Milton NH4930 (**96**) vacated mines and folds on *Corylus avellana* 5.x.2003; Shieldaig NG8072 (**105**) vacated mines and folds on *Corylus avellana* 5.x.2003 — DW

309 *Deltaornix torquillella* (Zell.) — Inchmarlo (**91**) 15.vi.2003, genitalia det. — C.W.N. Holmes *per* RMP

315 *Phyllonorycter harrisella* (Linn.) — Gearrchoille Community Wood, Ardgay NH5989 (**106**) mines on *Quercus* 17.x.2003, moth bred — DW

320 *P. quercifoliella* (Zell.) — Berriedale ND1122 (**109**) mines on *Quercus* 13.x.2003, moths bred — DW

321a *P. platani* (Staud.) — Swindon SU1485 (**7**) mines on *Platanus* 20.x.2003 — SN; Cogenhoe SP8360 (**32**) mines on *Platanus* 2.x.2003 — F.A. Higgs *per* DVM

331 *P. lantanella* (Schrank) — Rushmere St Andrew TM2043 (**25**) mines on *Viburnum tinus* 5.iv.2003 — JBH

332 *P. corylifoliella* f. *betulae* (Zell.) — Berriedale ND1122 (**109**) mines on *Betula* 4.viii.2003 — DW

332a *P. leucographella* (Zell.) — Sampford Peverell ST034146 (**4**) mines on *Pyracantha* 31.xii.2003 — MRY; Lackham Wood ST9269 (**7**) 15.x.2003 — DJG; Bangor (**49**) mines on *Pyracantha* 3.i.2003 — ST; Arnside SD4678 (**69**) mines on *Pyracantha* 19.xii.2002 — A. Cannell *per* SMP

337 *P. hilarella* (Zett.) — Thetford TL8681 (**26**) mine on *Salix* sp. 22.vii.2003, moth bred — A. Musgrove *per* AWP

340 *P. scopariella* (Zell.) — Morfa Harlech SH5733 (**48**) 22.vi.2003 — ANG & JEG

344 *P. strigulatella* (L. & Z.) — Fleet (**12**) mines on *Alnus incana* 8.x.2003, first confirmed VC record — RDE; Scorton SD5050 (**60**) 1.v.2003 — SMP

348 *P. quinqueguttella* (Staint.) — Morfa Harlech SH5733 (**48**) mines with pupal exuviae on *Salix repens* 22.vi.2003 — ANG & JEG; Torroy NH5497 (**106**) tenanted mines on *Salix repens* 5.viii.2003 — DW

351 *P. lautella* (Zell.) — Nidd Gorge SE3258 (**64**) tenanted mines on *Quercus* sp. 31.x.2002, moths bred, det. HEB — CHF

356 *P. tristrigella* (Haw.) — Milton NH4930 (**96**) mines on *Ulmus glabra* 5.x.2003, moth bred; North Kessock NH6547 (**106**) mines on *Ulmus glabra* 2.ix.2002, moths bred — DW

358 *P. froelichiella* (Zell.) — Invernaver NNR NC6816 (**108**) mines on *Alnus glutinosa* 14.ix.2003, moths bred — DW

360 *P. kleemannella* (Fabr.) — Invernaver NNR NC6816 (**108**) mines on *Alnus glutinosa* 14.ix.2003, moths bred — DW

363 *P. platanoidella* (Joann.) — Sutton Howgrave SE3178 (**65**) vacated mines on *Acer platanoides* 18.ix.2003 — CHF

366a *Cameraria ohridella* Deschka & Dimic — West Hyde TQ0391 (**20**) mine on *Hippocastanum* 5.xi.2003, det. CWP — A. Piper *per* CWP; Sunbury on Thames TQ1070 (**21**) mines 2.x.2003, det. CWP — D.A. Prance *per* CWP; Oxford SP5108 (**23**) mines vii.2003 — C. Tyler-Smith, *Ent. Rec.* **115**: 220; Medmenham (**24**) mine 26.ix.2003 — IRS

367 *Phyllocnistis saligna* (Zell.) — Dovercourt TM2230 (**19**) 22.vii.2003 — BG

369 *P. xenia* Hering — Portsmouth SU6701 (**11**) vacated mines and cocoons on *Populus alba* 27.x.2003 — JRL & BE; Sidlesham SZ8697 (**13**) mines and cocoons on *Populus alba* 17.x.2003, moths bred — JRL, SJP, BE & B.A. Gale; Trimley St Martin (**25**) mines on *Populus alba* 7.ix.2003 — JBH

CHOREUTIDAE

385 *Anthophila fabriciana* (Linn.) — Lettermore G8483 (**H35**) 15.v.2003 — CA

387 *Prochoreutis sehestediana* (Fabr.) — Minsmere TM4467 (**25**) 2.viii.2003, genitalia det. — AWP; Sculthorpe Moor TF9030 (**28**) 24.vii.2003, genitalia det. JC — T. Clifton *per* JC; Nagshead RSPB Reserve SO6108 (**34**) 7.viii.2003 — DJG

388 *P. myllerana* (Fabr.) — Hampton Court Park (21) 8.viii.2003, genitalia det. and larvae on *Scutellaria* sp., confirmed as resident in Middlesex — R.W.J. Uffen *per* CWP; Ditchford Lakes NR SP9368 (**32**) 21.v.2003 — G. Boyd *per* DVM

389 *Choreutis pariana* (Linn.) — Bishop Burton SE9840 (**61**) 27.ix.2003 — M. Coverdale *per* HEB; Achany NC5701 (**107**) larvae on *Malus* 7.vii.2003 — DW

GLYPHIPTERIGIDAE

391 *Glyphipterix simpliciella* (Steph.) — Dunbeath ND1530 (**109**) 17.vi.2003 — DW; Lettermore G8483 (**H35**) 15.v.2003 — CA

392 *G. schoenicolella* (Boyd) — Belmaduthy, Black Isle NH6457 (**106**) larvae on *Schoenus nigra* 29.vi.2003, moths bred — SEM

393 *G. equitella* (Scop.) — Petit Bot, Guernsey WV3075 (**113**) 16.v.2002, det. PHS — PDMC

395 *G. haworthana* (Steph.) — Torroy NH5497 (**106**) pupae in *Eriophorum angustifolium* 17.iv.2003, moths bred; Braemore NC5402 (**107**) pupae in *Eriophorum angustifolium* 17.iv.2003, moths bred — DW

470 *Orthotelia sparganella* (Thunb.) — Morfa Harlech SH5732 (**48**) 5.viii.2003 — ANG & JEG

YPONOMEUTIDAE

403 *Argyresthia glabratella* (Zell.) — Talybont Forest SO0617 (**42**) larval feeding signs on *Picea abies* 22.iv.2003 — JRL

404 *A. praecocella* Zell. — Belmaduthy Dam, Black Isle NH6456 (**106**) larval feeding signs in old fruits of *Juniperus communis* 28.vi.2003 — SEM

407 *A. dilectella* Zell. — Johnstown SN3919 (**44**) 25.vi.2003 — JB

409 *A. ivella* (Haw.) — Pwll-y-wrach SO1632 (**42**) larvae on *Malus sylvestris* 23.iv.2003, moths bred — JRL; Tir Stent SH7517 (**48**) 18.vii.2002 — M.J. Hammet & M. Hull *per* ANG

409a *A. trifasciata* Staud. — Marford (**50**) 31.v.2003 — M.J. White, **New to Wales**, *Ent. Rec.* **115**: 225-226

409b *A. cupressella* Wals. — Stoke Holy Cross TG2301 (**27**) 6.vi.2003 — A. Musgrove *per* KS; Belfast J3371 (**H39**) 16.vii.2003 — JBH, **New to Ireland**

412 *A. pygmaeella* ([D. & S.]) — Strathoykel NC4600 (**106**) 26.vi.2003; Altass NH5099 (**107**) 25.vi.2003 — DW

415 *A. retinella* Zell. — Berriedale ND1122 (**109**) 6.vii.2003 — DW

416 *A. glaucinella* Zell. — Rushmere St Andrew TM2043 (**25**) 12.vii.2003 — JBH

417 *A. spinosella* Staint. — Elveden Forest TL7980 (**26**) 30.v.2003 — HEB

421 *A. bonnetella* (Linn.) — North Kessock NH6547 (**106**) 25.vi.2003 — DW

422 *A. albistria* (Haw.) — Rosemarkie, Black Isle NH7357 (**106**) 29.vi.2003 — SEM

425 *Yponomeuta padella* (Linn.) — Dalry NX6085 (**73**) 8.viii.2002, det. KPB — J. Mackay *per* KPB

431 *Y. sedella* Treits. — Brandon TL7686 (**26**) 5.vii.2003 — G. Austin *per* AWP

437 *Swammerdamia caesiella* (Hübn.) — Kirkconnell Flow NX9669 (**73**) 15.vi.2002, det. KPB — R. & B. Mearns *per* KPB; Cabrach NH379289 (**94**) larva on *Betula* 5.x.2003 — MRY

442 *Cedestis gysseleniella* (Zell.) — Inchmarlo (**91**) 25.vii.2003, genitalia det. — C.W.N. Holmes *per* RMP

443 *C. subfasciella* (Steph.) — Worsell Wood SO2558 (**43**) 5.vii.2003 — AMD; Belmaduthy NH6457 (**106**) 28.vi.2003 — SEM

445 *Ocnerostoma friesei* Svens. — Stony Stratford SP8040 (**24**) 8.x.2003, genitalia det. DVM — M. Killeby *per* DVM; Hensol Forest (**41**) 27.iii.2003, det. DJS — D. Gilmore & M. Powell *per* DJS; Launde Park Wood SK8003 (**55**) 28.iii.2003, genitalia det. AJM — APR & AJM

449 *Prays fraxinella* (Bjerk.) — Hillockhead, Black Isle NH7560 (**106**) 29.vi.2003 — SEM

453 *Ypsolopha dentella* (Fabr.) — Berriedale ND1122 (**109**) 6.vii.2003 — DW

456 *Y. horridella* (Treits.) — Maulden Wood TL03U (tetrad ref.) (**30**) 6.viii.2003 — C.W. Plant *per* DVM

458 *Y. alpella* ([D. & S.]) — Crawley (**14**) 29.vii.2003 — BS

460 *Y. parenthesella* (Linn.) — Knockman Wood NX4168 (**73**) 10.viii.2002, det. KPB — J. Mackay *per* KPB

251 *Ochsenheimeria taurella* ([D. & S.]) — Maulden Wood TL03U (tetrad ref.) (**<u>30</u>**) 6.viii.2003 — C.W. Plant *per* DVM; Hutton Conyers SE3273 (**<u>65</u>**) 5.vii.2003, det. HEB — CHF

464 *Plutella xylostella* (Linn.) — Scoltia G6797 (**<u>H35</u>**) 18.vii.2003 — JBH

469 *Eidophasia messingiella* (F. v. R.) — Melbury Park ST5805 (**<u>9</u>**) 26.vi.2003 — PHS & P. Davey; Barton (**29**) 14.v.2003 — J.R. Dawson; High Batts NR SE2976 (**<u>65</u>**) 11.vii.2003, det. HEB — CHF, J.C. Warwick & S.P. Worwood

471 *Digitivalva perlepidella* (Staint.) — Roundway Hill Covert NR SU0063 (**7**) mine on *Inula conyzae* 18.iv.2003 — DJG

472 *D. pulicariae* (Klim.) — Landguard TM2831 (**<u>25</u>**) 7.viii.2003 — N. Odin *per* JBH; Pembrey Forest SN3803 (**44**) 27.vii.2003 — JB

473 *Acrolepiopsis assectella* (Zell.) — Horsenden Hill Farm (**21**) iii.2003, det. CWP — R. Terry *per* CWP, *Ent. Rec.* **115**: 195; Bristol ST6173 (**34**) 10.v.2003; Droitwich SO8862 (**37**) 25.iv.2003 — N. Gregory

476 *Acrolepia autumnitella* Curt. — Thetford TL8681 (**26**) 22.vii.2003 — A. Musgrove *per* AWP; Warton SD4128 (**<u>60</u>**) found dead indoors 10.xii.2003 — SMP; Potteric Carr SE5900 (**63**) tenanted mines on *Solanum dulcamara* ix.2003, moths bred — HEB & R.I. Heppenstall

LYONETIIDAE

254 *Leucoptera laburnella* (Staint.) — Dunbeath ND1530 (**<u>109</u>**) tenanted mines on *Laburnum* sp. 26.viii.2003 — DW

264 *Bedellia somnulentella* (Zell.) — Milden TL9445 (**26**) mine on *Convolvulus* sp. 7.ix.2003 — AWP; Hindolveston TG0429 (**27**) larvae on *Convolvulus arvense* 3.ix.2003 — JC

COLEOPHORIDAE

491 *Coleophora gryphipennella* (Hübn.) — East Beach, Nairn NH8957 (**<u>96</u>**) cases on *Rosa pimpinellifolia* 29.ix.2003 — DW

493 *C. serratella* (Linn.) — Berriedale ND1122 (**<u>109</u>**) cases on *Betula* 5.v.2003, moth bred — DW

494 *C. coracipennella* (Hübn.) — Ketton Quarry SK9705 (**55**) 17.viii.2002, genitalia det. — AJM

494a *C. prunifoliae* Doets — Sculthorpe Moor TF9030 (**28**) 24.vii.2003, genitalia det. — JC; Cockayne Hatley TL2549 (**30**) in Rothamsted trap 11-13.vii.2003, genitalia det. — DVM

495 *C. spinella* (Schrank) — Markfield SK4910 (**55**) 8.vii.2003, genitalia det. — AJM; Auchencairn NX8051 (**73**) 2003, genitalia det. KPB — E.A.M. MacAlpine *per* KPB

496 *C. milvipennis* Zell. — Wood of Brae, Black Isle NH6963 (**<u>106</u>**) one case on *Betula* 28.vi.2003 — SEM

501 *C. siccifolia* Staint. — Stonely, Ford End TL1066 (**<u>31</u>**) 13.vi.2003 — BD; Wardley Wood SK8499 (**<u>55</u>**) 21.vi.2003, genitalia det. AJM — APR & AJM

502 *C. trigeminella* Fuchs — Rooksmoor ST7310 (**<u>9</u>**) empty case on *Malus sylvestris* 23.viii.2003 — PHS

513 *C. potentillae* Elisha — Ipswich TM2043 (**25**) 5.vi.2003, genitalia det. JC — N. Sherman *per* AWP

515 *C. albitarsella* Zell. — Kemeys Graig ST3891 (**35**) case on *Glechoma* 11.x.2003 — DJS

516 *C. trifolii* (Curt.) — Ipswich TM2043 (**25**) 10.vii.2003 — N. Sherman *per* AWP

517 *C. alcyonipennella* (Koll.) — Havergate Island TM4147 (**25**) 5.vi.2002, genitalia det. JC — N. Sherman *per* AWP

518 *C. mayrella* (Hübn.) — Pembrey Forest SN3902 (**44**) 13.vi.2003 — JB; Morfa Harlech SH5732 (**48**) 4.vii.2003 — ANG & JEG

519 *C. deauratella* (L. & Z.) — Scoltia G6797 (**H35**) 20.vii.2003, genitalia det. — JBH

521 *C. conyzae* Zell. — Clipsham Quarry SK9815 (**55**) 11.vii.2003, genitalia det. AJM — MPS & APR

523 *C. hemerobiella* (Scop.) — Waresley Wood TL2654 (**31**) 22.vii.2003 — BD

524 *C. lithargyrinella* Zell. — Berriedale ND1122 (**109**) one case and many mines on *Stellaria holostea* 20.ix.2003 — DW

526 *C. laricella* (Hübn.) — Findhorn NJ045646 (**95**) 7.vi.2003, genitalia det. — MRY; Duartmore NC1937 (**108**) cases on *Larix* 3.v.2003, moths bred — DW

530 *C. lixella* Zell. — Pembrey Burrows SS4199 (**44**) 8.vii.2003 — JB

532 *C. albidella* ([D. & S.]) — St Peters, Guernsey WV2578 (**113**) 13.vii.2001, genitalia det. PHS — PDMC; Scoltia G6797 (**H35**) 20.vii.2003, genitalia det. — JBH

533 *C. anatipennella* (Hübn.) — Pembrey Forest SN3803 (**44**) 14.vi.2003 — JB

536 *C. betulella* Hein. — Ipswich TM2043 (**25**) 18.vi.2003, genitalia det. JC —N. Sherman *per* AWP; Whetstone SP5595 (**55**) 12.vi.2003, genitalia det. AJM — MPS

541 *C. pyrrhulipennella* Zell. — Loch a'Mhuilinn NC1649 (**108**) case on *Erica cinerea* 3.v.2003 — DW

544 *C. albicosta* (Haw.) — Dalry NX6085 (**73**) 16.vi.2002, det. KPB — J. Mackay *per* KPB; Lettermore G8483 (**H35**) 29.v.2003 — CA

547 *C. discordella* Zell. — Horsenden Hill TQ1684 (**21**) vii.2003, genitalia det. BG — R. Terry *per* CWP; Scoltia G6797 (**H35**) 19.vii.2003, genitalia det. — JBH

549 *C. pennella* ([D. & S.]) — Ketton Quarry SK9705 (**55**) 14.vi.2003, genitalia det. — AJM

559 *C. peribenanderi* Toll — Flint Castle SJ2473 (**51**) cases on *Cirsium arvense* 26.viii.2003 — IFS

562 *C. asteris* Mühl. — Heswall shore SJ2580 (**58**) cases on *Aster tripolium* 6.ix.2003, moths bred — IFS

564 *C. obscenella* H.-S. — Learnie NH7560 (**106**) cases on *Solidago virgaurea* 7.ix.2003; Berriedale ND1122 (**109**) cases on *Solidago virgaurea* 13.x.2003 — DW

565 *C. saxicolella* (Dup.) — Markfield SK4910 (**55**) 12.vii.2003, genitalia det. — AJM; Cromarty, Black Isle NH7867 (**106**) 28.vi.2003, genitalia det. MRY — SEM

566 *C. sternipennella* (Zett.) — Rushmere St Andrew TM2043 (**25**) 10.vii.2003, genitalia det. — JBH

568 *C. versurella* Zell. — Elm's Farm, Icklesham (**14**) 30.ix.2003, genitalia det. MSP — I. Hunter *per* MSP; Sharow Mires SE3370 (**64**) 25.vi.2003, genitalia det. HEB — CHF, J.C. Warwick & S.P. Worwood

572 *C. vestianella* (Linn.) — Rushmere St Andrew TM2043 (**25**) 22.vi.2003, genitalia det. — JBH

552 *C. lassella* Staud. — Cockayne Hatley TL2549 (**30**) in Rothamsted trap 28.v-3.vi.2003, genitalia det. — DVM

581 *C. taeniipennella* H. – S. — Pembrey Forest SN3901 (**44**) 17.vi.2003, genitalia det. — ANG; Higher Poynton SJ9484 (**58**) cases on *Juncus articulatus* 22.viii.2003 — SHH; Falls of Fender NN8766 (**89**) 19.vii.2003, genitalia det. — KPB; Belmaduthy Dam, Black Isle NH6456 (**106**) 28.vi.2003, genitalia det. JRL — SEM; Lyrawa Bay, Hoy ND2998 (**111**) 17.vi.2003, genitalia det. — KPB

583 *C. tamesis* Waters — Pembrey Forest SN3901 (**44**) 17.vi.2003, genitalia det. — ANG; Markfield SK4910 (**55**) 13.vii.2003, genitalia det. — AJM; Hillockhead, Black Isle NH7560 (**106**) 29.vi.2003, genitalia det. JRL — SEM; Belfast J3371 (**H39**) 16.vii.2003, genitalia det. — JBH

584 *C. alticolella* Zell. — Hill of Harley ND3765 (**109**) 12.vi.2003, genitalia det. — KPB

ELACHISTIDAE

593 *Elachista regificella* Sirc. — Kirkhope Linns NT3824 (**79**) mines on *Luzula sylvatica* 3.v.2003 — KPB

597 *E. atricomella* Staint. — Elveden Forest TL7980 (**26**) 30.v.2003 — HEB

599 *E. alpinella* Staint. — Ilton ST3318 (**5**) larvae on *Carex acutiformis* 14.vi.2003 — PHS & JRL; Morfa Harlech SH5732 (**48**) 21.vi.2003, genitalia det. — ANG & JEG

600 *E. luticomella* Zell. — Holme Fen, Middle Covert TL2188 (**31**) 7.v.2003 — BD

602 *E. apicipunctella* Staint. — Elveden Forest TL7980 (**26**) 23.iv.2003 — HEB; Berriedale ND1122 (**109**) 17.vi.2003 — DW

606 *E. humilis* Zell. — Ellington Banks SE2773 (**64**) 18.vi.2003, genitalia det. HEB — CHF & J.C. Warwick

610 *E. argentella* (Cl.) — Cromarty, Black Isle NH7867 (**106**) 28.vi.2003 — SEM

611 *E. triatomea* (Haw.) — Hillockhead, Black Isle NH7560 (**106**) 29.vi.2003 — SEM

613 *E. subocellea* (Steph.) — Elveden TL7880 (**26**) 18-21.vii.2003 — Lancashire Moth Group — *per* AWP

621 *E. subalbidella* Schl. — Luffenham Heath SK9501 (**55**) 23.v.2003 — MPS, APR & AJM

624 *Biselachista trapeziella* (Staint.) — Cromarty, Black Isle NH7867 (**106**) tenanted mines in *Luzula sylvatica* 28.vi.2003 — SEM

627 *B. scirpi* (Staint.) — Auchencairn NX8051 (**73**) 2003, genitalia det. KPB — E.A.M. MacAlpine *per* KPB, **New to Scotland**

631 *Cosmiotes freyerella* (Hübn.) — Elveden TL7880 (**26**) 18-21.vii.2003 — Lancashire Moth Group — *per* AWP

632 *C. consortella* (Staint.) — Weaveley Wood TL2254 (**31**) 7.vii.2003 — BD

OECOPHORIDAE

636 *Denisia similella* (Hübn.) — Charnwood Lodge SK4615 (**55**) 13.vi.2003, genitalia det. AJM — APR & AJM

638a *D. albimaculea* (Haw.) — Thornton SK4607 (**55**) 21.vi.2003, genitalia det. AJM — D. Wright *per* MPS

640 *Batia lunaris* (Haw.) — Pembrey Burrows SS4199 (**44**) 8.vii.2003 — JB; Hutton Conyers SE3273 (**65**) 3.vii.2003, det. HEB — CHF

642a *Metalampra italica* Baldizzone — Plympton SX5457 (**3**) 16.viii.2003 — RJH, **New to the British Isles**

649 *Esperia sulphurella* (Fabr.) — Findhorn NJ045646 (**95**) 24.v.2003 — MRY

653 *Aplota palpella* (Haw.) — Highnam Wood SO7719 (**34**) 4.viii.2003 — DJG

663 *Diurnea fagella* ([D. & S.]) — Berriedale ND1122 (**109**) larvae on *Fagus sylvatica* and *Quercus* 6.vii.2003 — DW

664 *D. lipsiella* ([D. & S.]) — Penbryn SN1843 (**45**) 10.xi.2003 — RE

668 *Luquetia lobella* ([D.& S.]) — Bleasby (**56**) 1.vi.2003 — JTR

670 *Depressaria daucella* ([D. & S.]) — Lettermore G8483 (**H35**) 9.v.2003, det. JRL — CA

671 *D. ultimella* Staint. — Montgomery Castle SO2196 (**47**) larva in stem of *Apium nodiflorum* 4.viii.2003 — IFS & D.J. Poynton; St Asaph (**51**) larvae in stems of *Apium nodiflorum* 17.vi.2003, moths bred — IFS; Cronykeery T2998 (**H20**) 16.v.2003 — AT

674 *D. badiella* (Hübn.) — Weaveley Wood TL2254 (**31**) 17.ix.2003 — BD

676 *D. pulcherrimella* Staint. — Scoltia G6797 (**H35**) 19.vii.2003, genitalia det. — JBH

678 *D. sordidatella* Tengst. — Dingyshowe Bay, Mainland HY5403 (**111**) larva on *Heracleum* 14.vi.2003, moth bred — KPB

685 *Levipalpus hepatariella* (L. & Z.) — Glen Callater (92) over 40 larval tubes, larvae seen, amongst *Antennaria dioica* 19.vi and 21.vi.2003 (latter with MRY), moths bred; Gleann an t-Slugain (92) over 100 larval tubes, larvae seen, amongst *Antennaria dioica* 20.vi.2003, moths bred; Morrone Birkwood (92) 10 larval tubes, larvae seen, amongst *Antennaria dioica* 20.vi.2003; Glen Lui (92) 1 larva amongst *Antennaria dioica* 21.vi.2003; Glen Clunie (92) 3 larva amongst *Antennaria dioica* 22.vi.2003 — RJH, *Ent. Gaz.* **55**: 1-13

689 *Agonopterix ciliella* (Staint) — Berriedale ND1122 (**109**) larvae on *Aegopodium podagraria* and *Heracleum sphondylium* 6.vii.2003, moths bred — DW

697 *A. arenella* ([D. & S.]) — Cronykeery T2998 (**H20**) 14.ii.2003 — AT

704 *A. scopariella* (Hein.) — St Annes SD3329 (**60**) 12.iv.2003, genitalia det. SMP — J. Steeden *per* SMP

705 *A. umbellana* (Fabr.) — Charnwood Lodge SK4715 (**55**) 22.viii.2003 — AJM

GELECHIIDAE

726 *Metzneria metzneriella* (Staint.) — Ilton ST3319 (**5**) 14.vi.2003 — PHS & JRL; Pembrey Forest SN3902 (**44**) 25.vi.2003 — JB

727 *M. neuropterella* (Zell.) — Walberton SU9605 (**13**) 4.viii.2003 — JTR

730 *Apodia bifractella* (Dup.) — Pembrey Forest SN3803 (**44**) 18.viii.2003 — JB

732 *Eulamprotes unicolorella* (Dup.) — Bloody Oaks Quarry SK9710 (**55**) 29.v.2003, genitalia det. AJM — MPS, APR & AJM

733 *E. wilkella* (Linn.) — Findhorn NJ045646 (**95**) 7.vi.2003 — MRY

728 *Monochroa cytisella* (Curt.) — Dalry NX6085 (**73**) 23.vii.2000, det. KPB — J. Mackay *per* KPB, **New to Scotland**

736 *M. lucidella* (Steph.) — Stony Stratford SP8040 (**24**) 9.vii.2003, genitalia det. DVM — M.Killeby *per* DVM; Morfa Harlech SH5732 (**48**) 21.vi.2003, genitalia det. — ANG & JEG; Auchencairn NX8051 (**73**) 2003, genitalia det. KPB — E.A.M. MacAlpine *per* KPB, **New to Scotland**

740 *M. hornigi* (Staud.) — Gravesend TQ6374 (**16**) 15.vi.2003 — DJLA

742 *M. lutulentella* (Zell.) — Owston Meadows SE5511 (**63**) 26.vii.2003, genitalia det. — HEB

744a *M. moyses* Uffen — Shotover Moor SY9985 (**9**) tenanted mines on *Bolboschoenus maritimus* 18.ix.2003 — PHS

746 *Chrysoesthia drurella* (Fabr.) — Staplegrove (**5**) 12.viii.2003 — JAMcG; Shrewsbury Battlefield SJ5117 (**40**) tenanted mines on *Atriplex* sp. 3.viii.2003 — IFS & D.J. Poynton

747 *C. sexguttella* (Thunb.) — Cromarty, Black Isle NH7867 (**106**) 27.vi.2003 — SEM

748 *Ptocheuusa paupella* (Zell.) — Pembrey Forest SN3902 (**44**) 25.vi.2003 — JB; Misson Carr (**56**) 12.viii.2003 — JTR

755 *Stenolechia gemmella* (Linn.) — West Tanfield SE2476 (**65**) 6.viii.2003, det. HEB — CHF, J.C. Warwick & S.P. Worwood

756 *Parachronistis albiceps* (Zell.) — Archers Wood TL1781 (**31**) 26.vi.2003 — BD

760 *Exoteleia dodecella* (Linn.) — Pembrey Forest SN3901 (**44**) 17.vi.2003, genitalia det. — ANG; Morfa Harlech SH5732 (**48**) 21.vi.2003, genitalia det. — ANG & JEG; Hutton Conyers SE3273 (**65**) 16.vi.2003, det. HEB — CHF

778 *Bryotropha umbrosella* (Zell.) — Coul Links (**107**) 23.vi.2003 — RJH

779 *B. affinis* (Haw.) — Johnstown SN3919 (**44**) 3.viii.2003 — JB

782 *B. senectella* (Zell.) — Roadside verge north of Dornock Firth Bridge (**107**) 23.vi.2003 — RJH

783 *B. boreella* (Dougl.) — Derwentdale SK1791 (**63**) 23.vii.2003 — NAL

787 *B. terrella* ([D. & S.]) — Scoltia G6797 (**H35**), 20.vii.2003, genitalia det. — JBH

788 *B. politella* Staint — Broughton Down SU2733 (**11**) 24.vi.2003, genitalia det. — BE; Grey Mare's Tail NT1615 (**72**) 12.vii.2003 — KPB

765 *Teleiodes vulgella* ([D. & S.]) — Pembrey Forest SN3902 (**44**) 25.vi.2003 — JB; Hutton Conyers SE3273 (**65**) 16.vii.2003, det, HEB — CHF

769 *T. wagae* (Nowicki) — Boys Wood SU0509 (**9**) 30.v.2003 — P. Davey *per* PHS; Pucketty Farm (**22**) 2.vi.2003, genitalia det. — MFVC

774 *T. luculella* (Hübn.) — Cronykeery T2998 (**H20**) 10.vii.2003 — AT, **New to Ireland**

775 *T. sequax* (Haw.) — Fordon chalk bank TA0575 (**61**) larval spinnings on *Helianthemum* 12.v.2003, moths bred — HEB

767 *Carpatolechia decorella* (Haw.) — Enderby Quarry SP5399 (**55**) 5.vii.2003 — MPS; Gait Barrows NNR SD4777 (**60**) 12.iv.2003, genitalia det. SMP — L. Sivell *per* SMP; Dalmeny Park NT6077 (**84**) 24.viii.2003 — KPB

770 *C. proximella* (Hübn.) — Pembrey Forest SN3803 (**44**) 30.v.2003 — JB

772 *C. fugitivella* (Zell.) — Scoltia G6797 (**H35**) 18.vii.2003 — genitalia det. — JBH

776 *Teleiopsis diffinis* (Haw.) — Hutton Conyers SE3273 (**65**) 23.vii.2003, det. HEB — CHF

859 *Psoricoptera gibbosella* (Zell.) — Greno Wood SK3295 (**63**) 8.viii.2003, genitalia det. — HEB; West Tanfield SE2476 (**65**) 6.viii.2003, det, HEB — CHF, J.C. Warwick & S.P. Worwood

792 *Mirificarma mulinella* (Zell.) — Yaxley, West End TL1791 (**31**) 5.ix.2003, det. DVM — A. Frost *per* BD; Leckhampton Hill SO9519 (**33**) 16.viii.2003, genitalia det. DJG — G. Meredith *per* RGG

793 *M. lentiginosella* (Zell.) — Ilton ST3319 (**5**) larvae on *Genista tinctoria* 14.vi.2003 — PHS & JRL

801a *Gelechia senticetella* (Staud.) — Slough (**24**) larvae on *Thuja* sp. 5.iv.2003, moths bred — RJH; Yaxley, West End TL1791 (**31**) 19.vii.2003, det. BD — A. Frost *per* BD

802a *G. sororculella* (Hübn.) — Loch Tallant, Islay NR4450 (**102**) 22.vii.2003, det KPB — S. Smith & B. Little *per* KPB

806 *G. nigra* (Haw.) — Maulden Wood TL03U (tetrad ref.) (**30**) 9.vii.2003, genitalia det. DVM — C.W. Plant *per* DVM

812 *Scrobipalpa instabilella* (Dougl.) — Flint Castle SJ248734 (**51**) larvae on *Atriplex portulacoides* 6.iv.2003 — IFS

813 *S. salinella* (Zell.) — Barnes TQ2276 (**17**) 9.viii.2003, genitalia det. MSP — AMD; Pembrey Forest SN3803 (**44**) 18.viii.2003 — JB

815 *S. nitentella* (Fuchs) — Cromarty, Black Isle NH7867 (**106**) 28.vi.2003, genitalia det. MRY & JRL — SEM

818 *S. atriplicella* (F. v. R.) — Misson Carr (**56**) 12.viii.2003 — JTR

822 *S. acuminatella* (Sirc.) — Dalry NX6085 (**73**) 8.v.2002, det KPB — J. Mackay *per* KPB

826 *Caryocolum vicinella* (Dougl.) — Doolin R0597 (**H9**) larvae on *Silene maritima* 3.vi.2000, moths bred, det DJLA — SPC

829 *C. marmorea* (Haw.) — Pembrey Burrows SS4199 (**44**) 28.v.2003 — JB; Mullock Bay, Dundrennan NX7043 (**73**) 22.viii.2003, det KPB — R. & B. Mearns *per* KPB

832 *Caryocolum blandella* (Dougl.) — Castlemuir Point NX7947 (**73**) 6.viii.2003, det KPB — R. & B. Mearns *per* KPB

841 *Sophronia semicostella* (Hübn.) — Potteric Carr SE5900 (63) 17.vi.2003, second VC record, the first being in 1837 — HEB

844 *Syncopacma larseniella* (Gozm.) — Brampton Wood TL1870 (**31**) 15.vii.2003 — BD; Pickworth Great Wood SK9815 (**55**) 19.vii.2003, genitalia det. AJM — MPS, APR & AJM

845 *S. sangiella* (Staint.) — Scoltia G6797 (**H35**) 20.vii.2003, genitalia det. — JBH

854 *Anacampsis blattariella* (Hübn.) — West Tanfield SE2476 (**65**) 6.viii.2003, det, HEB — CHF, J.C. Warwick & S.P. Worwood

856 *Anarsia spartiella* (Schrank) — Auchencairn NX8051 (**73**) 2003, genitalia det. KPB — E.A.M. MacAlpine *per* KPB

857 *A. lineatella* Zell. — Walditch (**9**) 15.vii.2003 — MSP

858 *Hypatima rhomboidella* (Linn) — Dunbeath ND1530 (**109**) 27.vii.2003 — DW

855 *Acompsia cinerella* (Cl.) — Tiroran, Mull NM4627 (**103**) 20.vi.2003, det. DGG — JAMcG & W. Urwin *per* DGG

866 *Brachmia blandella* (Fabr.) — Moelfre SN3334 (**44**) 15.vii.2003 — JB

867 *B. inornatella* (Dougl.) — Old Basing SU6653 (**12**) 30.vi.2003, det. MJW — J. Andrews *per* MJW

809 *Pexicopia malvella* (Hübn.) — Lavington Down SU0147 (**8**) 26.vi.2003 — EGS & MHS

840 *Thiotricha subocellea* (Steph.) — Bullen Hill Farm ST8957 (**8**) 1.vii.2003, genitalia det. — EGS & MHS

AUTOSTICHIDAE

871 *Oegoconia deauratella* (H.-S.) — Whetstone SP5595 (**55**) 7.vii.2003, genitalia det. AJM — MPS

871a *O. caradjai* Pop.-Gorj & Cap. — Bishop's Stortford TL4820 (**20**) 10.vii.2003, genitalia det. — CWP

BLASTOBASIDAE

873 *Blastobasis lignea* Wals. — Findhorn (**95**) 16.viii.2003 — JAMcG

874 *B. decolorella* (Woll.) — Bryn Siriol SM9436 (**45**) 17.ix.2003 — RE; Mullock Bay, Dundrennan NX7043 (**73**) 22.viii.2003, det KPB — R. & B. Mearns *per* KPB; Berriedale ND1122 (**109**) 17.vi.2003 — DW; Quoyberstone HY4612 (**111**) 14.vi.2003 — KPB & S.V. Gould

875 *B. phycidella* (Zell.) — Bridport (**9**) larva in pomegranate (origin unknown) x.2002, moth bred — MSP

BATRACHEDRIDAE

879 *Batrachedra pinicolella* (Zell.) — Brampton Wood TL1869 (**31**) 10.vii.2003 — BD

MOMPHIDAE

880 *Mompha langiella* (Hübn.) — Fleet (**12**) mines and cocoons on *Epilobium montanum* 18.vii.2003, moths bred — RDE, *Ent. Rec.* **115**: 226

881 *M. terminella* (H. & W.) — Rewell Wood (**13**) 26.vi.2003 — MSP

885 *M. conturbatella* (Hübn.) — Worsell Wood SO2558 (**43**) 5.vii.2003 — AMD

886 *M. ochraceella* (Curt.) — Hutton Conyers SE3273 (**65**) 16.vi.2003, det. HEB — CHF

889a *M. bradleyi* Riedl — Tintinhull House ST5019 (**5**) galls on *Epilobium hirsutum* 22.vii.2003; Hengrove Park ST5968 (**6**) galls on *Epilobium hirsutum* 8.viii.2003, moths bred — DJG; Letcombe Regis, Wantage (**22**) vii.2002, genitalia det. MFVC _ P.D. Kyle *per* MFVC; Hencliff Woods ST6371 (**34**) vacated galls on *Epilobium hirsutum* 26.iii.2003 — DJG

890 *M. jurassicella* (Frey) — South Croydon TQ3363 (**17**) 31.iii.2003, genitalia det. — GAC

892 *M. subbistrigella* (Haw.) — Cronykeery T2998 (**H20**) 27.i.2003 — AT

COSMOPTERIGIDAE

894 *Cosmopterix zieglerella* (Hübn.) — Dogmersfield SU7853 (**12**) two vacated mines on *Humulus* 3.ix.2003 — RDE, *Ent. Rec.* **116**: 70; Ravensden TL0854 (**30**) mines on *Humulus* 7.ix.2003 — J.E. Childs *per* DVM

898 *Limnaecia phragmitella* Staint. — Morfa Harlech SH5732 (**48**) 4.vii.2003 — ANG & JEG

898a *Pyroderces argyrogrammos* (Zell.) — St Peters, Guernsey (**113**) 16.v.2002 — PDMC, *Ent. Gaz.* **55**: 161-165, **New to the Channel Islands**

902 *Chrysoclista lathamella* Fletch. — Misson (**56**) 8.vi.2003 — JTR

903 *C. linneella* (Cl.) — Willen SP8741 (**24**) 4.viii.2003 — G.E. Higgs *per* DVM

904 *Spuleria flavicaput* (Haw.) — Nantgwyn SN3623 (**44**) 28.v.2003 — JB

905 *Blastodacna hellerella* (Dup.) — Cronykeery T2898 (**H20**) 2.vii.2003 — AT

908 *Sorhagenia rhamniella* (Zell.) — South Croydon TQ3363 (**17**) 8.vii.2003, genitalia det. — GAC

SCYTHRIDIDAE

914 *Scythris crassiuscula* (H. – S.) — Windrush Valley SP1422 (**33**) 20.vii.2003, genitalia det. DJG — G. Meredith *per* RGG

915 *S. picaepennis* (Haw.) — Pembrey Forest SN3804 (**44**) 12.vi.2003 — JB

918 *S. limbella* (Fabr.) — Stony Stratford SP8040 (**24**) 7.viii.2003 — M. Killeby *per* DVM

920 *S. potentillella* (Zell.) Hampton Court Park (**21**) 8.viii.2003 — R.W.J. Uffen *per* CWP

TORTRICIDAE

921 *Phtheochroa inopiana* (Haw.) — Morfa Harlech SH5732 (**48**) 18.vii.2003 — ANG & JEG

929 *Phalonidia vectisana* (H. & W.) — Auchencairn NX8051 (**73**) 2003, genitalia det. KPB — E.A.M. MacAlpine *per* KPB

942 *Aethes piercei* Obraz. — Tulloch Meadow NH9416 (**96**) 31.v.2003 — MSP

956 *Cochylidia implicitana* (Wocke) — Barlocco Bay NX7947 (**73**) 6.viii.2003, det. KPB — R.& B. Mearns *per* KPB, *Ent. Rec.* **116**: 72

960 *Falseuncaria ruficiliana* (Haw.) — Thurbeare Quarrylands ST2721 (**5**) 8.viii.2003 — DE

964a *Cochylis molliculana* Zell. — Reading SU6669 (**22**) 6.viii.2003, genitalia det. — GAC

965 *C. hybridella* (Hübn.) — Rushmere St Andrew TM2043 (**25**) 13.vi.2003 — JBH; Ketton Quarry, SK9705 (**55**) 26.vi.2003 — AJM & APR

966 *C. atricapitana* (Steph.) — Cromarty, Black Isle NH7867 (**106**) 28.vi.2003 — SEM

967 *C. pallidana* Zell. — Willen SP8741 (**24**) 7.vii.2003, genitalia det. DVM — G.E. Higgs *per* DVM

968 *C. nana* (Haw.) — Pembrey Forest SN3803 (**44**) 30.v.2003 — JB

983 *Choristoneura hebenstreitella* (Müll.) — Mildenhall TL7474 (**26**) 28.vii.2003 — J.C. Clarke *per* AWP; Worsell Wood SO2557 (**43**) 5.vii.2003 — AMD

985 *Cacoecimorpha pronubana* (Hübn.) — Tal y Bont SH5822 (**48**) 3.x.2003, det. ANG — J.M. Hicks *per* ANG

987 *Ptycholomoides aeriferanus* (H. – S.) — Minsmere TM4467 (**25**) 5.vii.2003 — AWP; Trawscoed SH8432 (**48**) 14. vii.2003 — ANG & JEG

988 *Aphelia viburnana* ([D. & S.]) — Little Scatwell, Strathconon NH3756 (**106**) 30.vi.2003 — DW

989 *A. paleana* (Hübn.) — Berriedale ND1122 (**109**) larvae on *Plantago lanceolata* 17.vi.2003 — DW

998 *Epiphyas postvittana* (Walk.) — Cronykeery T2998 (**H20**) 11.x.2003 — AT; Belfast J3371 (**H39**) 16.vii.2003, genitalia det. — JBH

1001 *Lozotaeniodes formosanus* (Gey.) — Thornton SD3442 (**60**) 2003, det. SMP — S. Hayhow *per* SMP

1011 *Pseudargyrotoza conwagana* (Fabr.) — Dunbeath ND1530 (**109**) 17.vi.2003 — DW

1016 *Cnephasia longana* (Haw.) — Pembrey Burrows SS4199 (**44**) 2.vii.2003 — JB

1023 *C. genitalana* P. & M. — Letcombe Regis, Wantage (**22**) 19.viii.2002, genitalia det. MFVC _ P.D. Kyle *per* MFVC

1024 *C. incertana* (Treits.) — Inchmarlo (**91**) 22.vi.2003, genitalia det. — C.W.N. Holmes *per* RMP

1026 *Exapate congelatella* (Clerck) — Torroy NH5497 (**106**) larvae on *Myrica gale* 14.vi.2003, moth bred; Achany NC5700 (**107**) 3.xi.2003 — DW

1034 *Spatalistis bifasciana* (Hübn.) — Llangorse SO1327 (**42**) 22.vi.2003 — NRL

1035 *Acleris bergmanniana* (Linn.) — Cromarty, Black Isle NH7867 (**106**) 28.vi.2003— SEM

1038 *A. laterana* (Fabr.) — Achany NC5700 (**107**) 9.viii.2003, genitalia det. — DW

1039 *A. comariana* (L. & Z.) — Scoltia G6797 (**H35**) 22.vii.2003 — genitalia det. — JBH

1046 *A. shepherdana* (Steph.) — Wareham SY9186 (9) 22.viii.2003, first county record since 19th century — P. Davey, per PHS

1051 *A. logiana* (Cl.) — Fleet (**12**) 26.i.2003, det. JRL — RDE, *Ent. Rec.* **115**: 227-228

1053 *A. hastiana* (Linn.) — Torroy NH5497 (**106**) larvae on *Salix aurita* 5.viii.2003, moth bred — DW

1054 *A. cristana* ([D. & S.]) — Penbryn SN1843 (**45**) 15.x.2003 — RE

1055 *A. hyemana* (Haw.) — Fenny Stratford (**24**) 27.ii.2003, det. JRL — L.J. Hill *per* JRL, *Ent. Rec.* **115**: 178-179; Halsary ND1850 (**109**) 12.ii.2003 — DW

1059 *A. abietana* (Hübn.) — Achany NC5700 (**107**) 6.iv.2003 — DW

1061 *A. literana* (Linn.) — Luffenham Heath SK9501 (**55**) 2.viii.2003 — AJM & MPS

1062 *A. emargana* (Fabr.) — Achany NC5700 (**107**) 1.ix.2003 — DW

1013 *Olindia schumacherana* (Fabr.) — Learnie NH7560 (**106**) 25.vi.2003 — DW

1068 *Celypha rivulana* (Scop.) — Bridge of Canny (**91**) 4.vii.2003 — C.W.N. Holmes *per* RMP

1074 *Olethreutes palustrana* (L. & Z.) — Berriedale ND1122 (**109**) 6.vii.2003 — DW

1079 *Piniphila bifasciana* (Haw.) — Morfa Harlech SH5732 (**48**)21.vi.2003, genitalia det. — ANG & JEG

1085 *Metendothenia atropunctana* (Zett.) — Minsmere (**25**) 3.v.2003, genitalia det. — JBH; Torroy NH5497 (**106**) 25.v.2003 — DW

1089 *Apotomis semifasciana* (Haw.) — Cronykeery T2998 (**H20**) 21.vi.2003 — AT; Scoltia G6797 (**H35**) 18.vii.2003, genitalia det. — JBH

1099 *Endothenia marginana* (Haw.) — Sark WV4675 (**113**) 31.v.2003 — PHS, PDMC & R.A. Austin; Scoltia G6797 (**H35**) 18.vii.2003, genitalia det. — JBH

1101 *E. ustulana* (Haw.) — Ilton ST3319 (**5**) 14.vi.2003 — PHS & JRL

1109 *Lobesia littoralis* (H. & W.) — Hillockhead, Black Isle NH7560 (**106**) 29.vi.2003 — SEM

1110 *Bactra furfurana* (Haw.) — Hertford TL3413 (**20**) 19.vii.2003, genitalia det. CWP — A. Wood *per* CWP

1123 *Ancylis laetana* (Fabr.) — Hatherleigh SS5302 (**4**) 31.v.2003 — BPH & R. McCormick

1133 *Epinotia bilunana* (Haw.) — Freshwater (**10**) 26.vi.2003 — SAK-J; Pembrey Forest SN3803 (**44**) 30.v.2003 — JB

1141 *E. nemorivaga* (Tengst.) — North Dalchork NC5819 (**107**) 28.v.2003; Halsary ND1530 (**109**) larvae mining *Artostaphylos uva-ursi* 11.ix.2003 — DW

1142 *E. tedella* (Cl.) — Eathie, Black Isle NH7763 (**106**) 27.vi.2003 — MRY

1144 *E. signatana* (Dougl.) — Rushmere St Andrew TM2043 (**25**) 7.vii.2003, genitalia det. — JBH

1146 *E. rubiginosana* (H.-S.) — Pembrey Burrows SS4199 (**44**) 28.v.2003, det. JRL (from photo) — JB; Morfa Harlech SH5732 (**48**) 28.v.2003, genitalia det. — ANG, J. Clark & R. Searle

1147 *E. cruciana* (Linn.) — Wood of Brae, Black Isle NH6963 (**106**) 28.vi.2003 — SEM

1149 *E. crenana* (Hübn.) — Wood of Brae, Black Isle NH6963 (**106**) larvae on *Salix caprea* 28.vi.2003, moths bred — SEM

1151 *E. trigonella* (Linn.) — Totland (**10**) 5.vi.2003 — SAK-J; Bould Wood (**23**) 4.ix.2003 — MFVC

1153 *E. sordidana* (Hübn.) — Pembrey Forest SN30 (**44**) 17.ix.2003 — JB

1157 *Crocidosema plebejana* Zell. — Landguard TM2831 (**25**) 12.viii.2003, genitalia det. JBH — N. Odin *per* JBH

1158 *Rhopobota ustomaculana* (Curt.) — Greendams (**91**) pupae on *Vaccinium vitis-idaea* 26.v.2003, moths bred — C.W.N. Holmes *per* RMP

1168 *Gypsonoma sociana* (Haw.) — Oldmeldrum NJ823279 (**93**) 24.vi.2003 — MRY

1170 *G. oppressana* (Treits.) — Sharow Mires SE3370 (**64**) 25.vi.2003, det. HEB — CHF, J.C. Warwick & S.P. Worwood

1176 *Epiblema trimaculana* (Haw.) — Oldmeldrum NJ823279 (**93**) 21.vi.2003 — MRY

1179 *E. incarnatana* (Hübn.) — High Batts NR SE2976 (**65**) 8.viii.2003, det. HEB — CHF, J.C. Warwick & S.P. Worwood

1180 *E. tetragonana* (Steph.) — Pembrey Forest SN30 (**44**) 19.vi.2003, genitalia det. — ANG

1189 *Eriopsela quadrana* (Hübn.) — Sear Close (**64**) 30.v.2003, genitalia det — RJH

1193 *Eucosma tripoliana* (Barr.) — Flint Castle saltings SJ2473 (**51**) larvae in flowers of *Aster tripolium* 26.viii.2003, moths bred; Heswall saltings SJ2580 (**58**) larvae in flowers of *Aster tripolium* 6.ix.2003, moths bred — IFS; Cockersands SD4254 (**60**) 1.viii.2003, genitalia det. SMP — B. Cockburn & L. Sivell *per* SMP

1194 *E. aemulana* (Schäg.) — Morfa Harlech SH5732 (**48**) 5.viii.2003, genitalia det. — ANG & JEG, **New to Wales**

1196 *E. metzneriana* (Treits.) — Canvey Island TQ7683 (**18**) 26.vi.2003 — J.R. Dawson & D.G. Down *per* BG

1197 *E. campoliliana* ([D. & S.]) — Morfa Harlech SH5732 (**48**) 4.vii.2003 — ANG & JEG; Scoltia G6797 (**H35**) 19.vii.2003 — JBH

1200 *E. hohenwartiana* ([D. & S.]) — Scoltia G6797 (**H35**) 20.vii.2003 — JBH

1200a *E. parvulana* (Wilk.) — Chapel Porth SW6948 (**1**) 19.vii.2002, female genitalia det. — RJH

1205a *Spilonota laricana* (Hein.) — Folksworth, Townsend Way TL1489 (**31**) 12.vii.2003, det. DVM — A. Frost *per* BD; Burfa Bank SO2860 (**43**) 6.vii.2003 — AMD; Wood of Brae, Black Isle NH6963 (**106**) 28.vi.2003 — SEM

1207 *Clavigesta purdeyi* (Durr.) — Pembrey Forest SN3803 (**44**) 27.vii.2003 — JB

1209 *Pseudococcyx turionella* (Linn.) — Rickmansworth (**20**) 17.v.2003 — CWP

1211 *Rhyacionia pinicolana* (Doubld.) — Worsell Wood SO2558 (**43**) 5.vii.2003 — AMD; Pembrey Forest SN4001 (**44**) 9.vii.2003 — JB

1215 *Thaumatotibia leucotreta* (Meyr.) — Anderton SJ6475 (**58**) indoors 9.iii.2003, det. JRL (from photo) — A. Wander

1216 *Enarmonia formosana* (Scop.) — Hutton Conyers SE3273 (**65**) 23.vi.2003, det. HEB — CHF

1229 *Pammene albuginana* (Guen.) — Elveden TL7880 (**26**) 16-23.vi.2003, det. HEB — B. Statham *per* AWP

1230 *P. suspectana* (L. & Z.) — Ledbury (**36**) 10.viii.2003, genitalia det. — MWH

1233 *P. aurita* Raz. — Tal y Bont SH5822 (**48**) 29.vii – 12.viii.2003, genitalia det. ANG — J.M. Hicks per ANG

1245 *Grapholita janthinana* (Dup.) — Wharley Point SN3309 (**44**) 12.vii.2003 — JB

1246 *G. tenebrosana* (Dup.) — Regent's Park, London (**21**) 28.v.2003 — T. Freed *per* CWP

1249 *G. lobarzewskii* (Now.) — Catherington SU6915 (**11**) 16.vi.2003, genitalia det. JRL — R.J. Moore *per* JRL; Walberton SU9605 (**13**) 17.vi.2002 — JTR

1252 *G. lunulana* ([D. & S.]) — Lydney SO6302 (**34**) 18.v.2003 — RGG; Tulloch Meadow NH9416 (**96**) 31.v.2003 — MSP

1254 *Cydia strobilella* (Linn.) — St Peters, Guernsey WV2578 (**113**) 15.iv.2003, det. PHS — PDMC

1259 *C. fagiglandana* (Zell.) — Yaxley, West End TL1791 (**31**) 14.vii.2003, det. DVM — A. Frost *per* BD; Pembrey Forest SN3803 (**44**) 27.vii.2003 — JB

1262 *C. amplana* (Hübn.) — Walberton SU9605 (**13**) 17.viii.2002 — JTR

1267 *C. cosmophorana* (Treits.) — Hurst Wood, Peters Green (**20**) 30.v.2003 — CWP

1273 *Dichrorampha petiverella* (Linn.) — Pembrey Forest SN4001 (**44**) 14.vii.2003 — JB

1276 *D. plumbagana* (Treits.) — Brown's Hill Quarry, SK7423 (**55**) 30.v.2003, genitalia det. — AJM

1281 *D. simpliciana* (Haw.) — Pembrey Forest SN4001 (**44**) 14.vii.2003 — JB

1282 *D. sylvicolana* Hein. — Rooksmoor ST7310 (**9**) 8.vii.2003, det. PHS — P. Davey *per* PHS

1283 *D. montanana* (Dup.) — Pembrey Forest SN3902 (**44**) 30.vi.2003 — JB

1286 *D. sedatana* Busck — Bleasby (**56**) 9.vi.2003 — JTR

1287 *D. aeratana* (P. & M.) — Ilton ST3319 (**5**) 14.vi.2003 — PHS & JRL; Enderby Quarry SP5399 (**55**) 11.vi.2003, genitalia det. AJM — MPS

EPERMENIIDAE

481 *Epermenia falciformis* (Haw.) — Mont d'Aval, Guernsey WV3080 (**113**) 27.viii.2003, det. PHS — M. Simmons *per* PDMC

483 *E. chaerophyllella* (Goeze) — Berriedale ND1122 (**109**) larvae on *Heracleum* 19.vi.2003 — KPB; Scoltia G6797 (**H35**) 20.vii.2003 — JBH

PYRALIDAE

1296 *Crambus silvella* (Hübn.) — Offwell Woodland SY1899 (**3**) 5.viii.2003 — Devon Moth Group, *Ent. Rec.* **115**: 288-289; Walberton SU9605 (**13**) 18.vii.2003 — JTR

1314 *Catoptria margaritella* ([D. & S.]) — Trowlesworthy Warren (3) ova laid by captives females late July to early August 2002, larvae ate *Campylopus flexuosus* then *Eriophorum angustifolium*, moths bred, larva previously unknown in the British Isles — RJH

1315 *C. furcatellus* (Zett.) — Ben Wyvis NH4669 (**106**) 5.viii.2003 — D. Evans *per* AMD

1316 *C. falsella* ([D. & S.]) — Pembrey Forest SN3902 (**44**) 25.viii.2003 — JB

1329 *Donacaula forficella* (Thunb.) — Hutton Conyers SE3273 (**65**) 23.vi.2003, det. HEB — CHF

1331 *Acentria ephemerella* ([D. & S.]) — Belfast J3371 (**H39**) 16.vii.2003 — JBH

1336 *Eudonia pallida* (Curt.) — Gwithian Green (1) one larva on *Calliergonella cuspidata* 19.iv.2003, moth bred, larva previously unknown in the British Isles — RJH

1340 *E. truncicolella* (Staint.) — West Tanfield SE2476 (**65**) 6.viii.2003, det HEB — CHF, J.C. Warwick & S.P. Worwood

1343 *E. delunella* (Staint.) — Worsell Wood SO2558 (**43**) 5.vii.2003 — AMD

1344 *E. mercurella* (Linn.) — Cromarty, Black Isle NH7867 (**106**) 28.vi.2003 — SEM

1345 *Elophila nymphaeata* (Linn.) — Scoltia G6797 (**H35**) 20.vii.2003 — JBH

1350 *Nymphula stagnata* (Don.) — Scoltia G6797 (**H35**) 19.vii.2003 — JBH

1357 *Evergestis extimalis* (Scop.) — Coatham Steel Works, Tees-mouth NZ5725 (**62**) 21.vii.2003 — CWP; Cronykeery T2998 (**H20**) 24.vii.2003 — AT, **New to Ireland**

1362 *Pyrausta purpuralis* (Linn.) — Wood of Brae, Black Isle NH6963 (**106**) 28.vi.2003 — SEM

1376 *Eurrhypara hortulata* (Linn.) — Montrose NO7056 (**90**) vi.2003 — Scottish Wildlife Trust *per* MRY; Cromarty, Black Isle NH7867 (**106**) 28.vi.2003 — SEM

1377 *Perinephela lancealis* ([D. & S.]) — Worsell Wood SO2558 (**43**) 5.vii.2003 — AMD

1387 *Nascia cilialis* (Hübn.) — Totland (**10**) 7.viii.2003 — SAK-J

1390 *Udea prunalis* ([D. & S.]) — Scoltia G6797 (**H35**) 19.vii.2003 — JBH

1401 *Maruca vitrata* (Fabr.) — Hitchin (**20**) larva on imported beans v.2003, moth bred — J. Webb & K. Robinson *per* CWP

1403 *Diasemiopsis ramburialis* (Dup.) — Pembrey Forest SN3901 (**44**) 17.vi.2003 — ANG

1403a *Duponchelia fovealis* Zell. — Plymouth (**3**) indoors 14.xi.2003 — RJH; Walter's Ash SU8497 (**24**) indoors 21.viii.2003 — NF

1415 *Orthopygia glaucinalis* (Linn.) — Burfa Bog SO2761 (**43**) 7.vii.2003 — AMD

1416 *Pyralis lienigialis* (Zell.) — Wyke Regis SY6676 (**9**) 17.vii.2003 — D. Foot *per* PHS

1425 *Galleria mellonella* (Linn.) — West Bridgford SK5936 (**56**) 11.viii.2003 — R. Fox *per* AMD

1428 *Aphomia sociella* (Linn.) — Cromarty, Black Isle NH7867 (**106**) 28.vi.2003 — SEM

1429 *A. zelleri* (Joannis) — Swanage SZ0380 (**9**) 14.vii.2003 — EAP

1430 *Paralipsa gularis* (Zell.) — Layer-de-la-Haye TL9619 (**19**) 14.vi.2003 — P. Pyke & BG

1433 *Cryptoblabes bistriga* (Haw.) — Belfast J3371 (**H39**) 16.vii.2003 — JBH

1435 *Conobathra tumidana* ([D. & S.]) — Totland (**10**) 16.vii.2003 — SAK-J

1437 *Acrobasis consociella* (Hübn.) — Pembrey Forest SN4001 (**44**) 9.vii.2003 — JB

1438 *Trachycera suavella* (Zinck.) — Eswick, Shetland HU4853 (**112**) 30.vii.2003, genitalia det. JC — P. Harvey *per* JC, **New to Scotland**

1441 *Oncocera semirubella* (Scop.) — Chard ST3309 (**5**) 18.vi.2003 — DE

1447a *Sciota adelphella* (F. v. R.) — Grain TQ8876 (**16**) 14.vii.2003 — A.G.J. Butcher *per* AMD; Eccles on Sea (**27**) 30.vi.2003 — N. Bowman *per* DH

1453 *Pima boisduvaliella* (Guen.) — Tees-mouth NZ5725 (**62**) 21.vii.2003 — CWP; Eswick, Shetland HU4853 (**112**) 22.vii.2003, genitalia det. JC — P. Harvey *per* JC, **New to Scotland**

1454b *Dioryctria sylvestrella* (Ratz.) — Ventnor (**10**) 4.viii.2003 — J. Halsey *per* IRT; Catherington SU6915 (**11**) 19.vii.2003, det. AMD — R.J. Moore *per* JRL; Chiddingfold Forest SU9834 (**17**) 22.vi.2003 — AMD; Mundford TF8093 (**28**) 21.vii.2003 — M. Raven & A. Musgrove *per* KS; Maulden Wood TL0683 (**30**) 9.vii.2003 — CWP

1455 *D. simplicella* Hein. — Pembrey Forest SN3803 (**44**) 30.v.2003 — JB

1458 *Myelois circumvoluta* (Geoff.) — Worsell Wood SO2558 (**43**) 5.vii.2003 — AMD

1486 *Apomyelois bistriatella* (Hulst) — Cronykeery T2998 (**H20**) 12.viii.2003, second Irish record, — AT

1461 *Assara terebrella* (Zinck.) — Totland (**10**) 11.vii.2003 — SAK-J

1466a *Ancylosis cinnamomella* (Dup.) — Portland Bird Observatory SY6868 (**9**) 11.viii.2003, genitalia det. PHS — M. Cade *per* PHS, **New to the British Isles**

1470 *Euzophera pinguis* (Haw.) — Lightfoot Green SD5133 (**60**) 6.viii.2003 — SMP

1471 *E. osseatella* (Treits.) — Isle of Grain (**16**) 8.viii.2003 — A.G.J. Butcher

1473 *Ephestia elutella* (Hübn.) — Carmarthen SN4120 (**44**) indoors 11.ix.2003 — JB

1476 *E. cautella* (Walk.) — Felixtowe (**25**) 14.x.2003 — JBH & N. Odin

1481 *Homoeosoma sinuella* (Fabr.) — Aber Dysynni SH5603 (**48**) 14.vi.2003 — ANG & JEG

1484 *Phycitodes saxicola* (Vaugh.) — Morfa Harlech SH5732 (**48**) 21.vi.2003, genitalia det. — ANG & JEG

1485 *P. maritima* (Tengst.) — Morfa Harlech SH5732 (**48**) 4.vii.2003, genitalia det. — ANG & JEG

PTEROPHORIDAE

1491 *Oxyptilus distans* (Zell.) — Walberton (**13**) 3.x.2003, genitalia det. CH — J.T. Radford *per* CH

1495 *Marasmarcha lunaedactyla* (Haw.) — Barnet TQ2596 (**21**) 7.vii.2003 — R. Terry *per* CWP

1506 *Stenoptilia millieridactyla* (Bruand) — Edinburgh NT2571 (**83**) 4.vii.2003 — KPB

1507 *S. zophodactylus* (Dup.) — Clipsham Quarry SK9815 (**55**) 11.vii.2003, genitalia det. AJM — APR & MPS

1508 *S. bipunctidactyla* (Scop.) — Hutton Conyers SE3273 (**65**) 15.ix.2003, det. HEB — CHF

1509 *S. pterodactyla* (Linn.) — Scoltia G6797 (**H35**) 20.vii.2003, genitalia det. A.J. Mackay — JBH

1518 *Ovendenia lienigianus* (Zell.) — Hoylake SJ2088 (**58**) 15.vii.2003 — SHH & KM

Sclerocona acutellus (Eversmann) (Lep.: Pyralidae): Some additional records

Further to my note on *Sclerocona acutellus* (*antea* 145 – 146), Bernard Skinner, who maintains the national record of immigrant Lepidoptera, has very kindly provided me, via the Editor, with some additional information and a small correction. To deal with the latter first, the captor of the Leckford, Hampshire specimen on 8 August 1988 was the late D. H. Sterling and not his son, P. H. Sterling.

The following additional information supplements the records that I summarised in my Note: The undated example taken at West Wittering, West Sussex was in fact encountered on 13 June 2000 and originally reported in the immigration review in this journal (*Ent. Rec.* **113**: 253). It is a pity that the original source, where the full date is given, was not quoted in *Atropos* **11**: 56, which was my own source for the record.

The following additional records are available:

Bradwell-on-Sea, Essex, 15 June 2000 by S. Dewick (*Ent. Rec.* **12**: 57);

West Wittering, West Sussex, 25 June 2001 by M. Love (unpublished);

Milton-on-Stour, Dorset, 14 July 2003 by Mark Parsons (unpublished, in the Dorset Moth Group Newsletter, number 11, page 26).

I am most grateful to Bernard Skinner for taking time to assemble this information and to communicate it to me.— RACHEL TERRY, 92 Woodville Road, Barnet, Hertfordshire EN5 5NJ.

Hazards of butterfly collecting – Rap in Ghana – October, 2003

In October/November 2003 I went to rap in Ghana. No ... nothing to do with popular music. This was a multidisciplinary rap mission under the aegis of the Rapid Assessment Programme (RAP) of Conservation International. The task was to survey three rainforests in Ghana to assess their suitability for inclusion in the Ghana National Parks' system or given better protection in other ways. The forests to be visited were designated by the forestry authorities as *Globally Significant Biodiversity Areas* (GSBAs) during the 1990s. No further logging was to take place, while hunting and the collecting of minor forest produce were not permitted. In principle this constituted a welcome addition to the formal national parks Ghana, which constitute only 1.25% of the original forest cover in the country.

Though engaged in finalizing my book, the *Butterflies of West Africa – origins, natural history, diversity, conservation*, I decided to accept the invitation to participate. I had not swung a butterfly net in a West African forest for nearly three years; two of the forests were in unusually good condition and so remote that I had never reached them before; the weather should be good; and I had little previous experience of multidisciplinary missions.

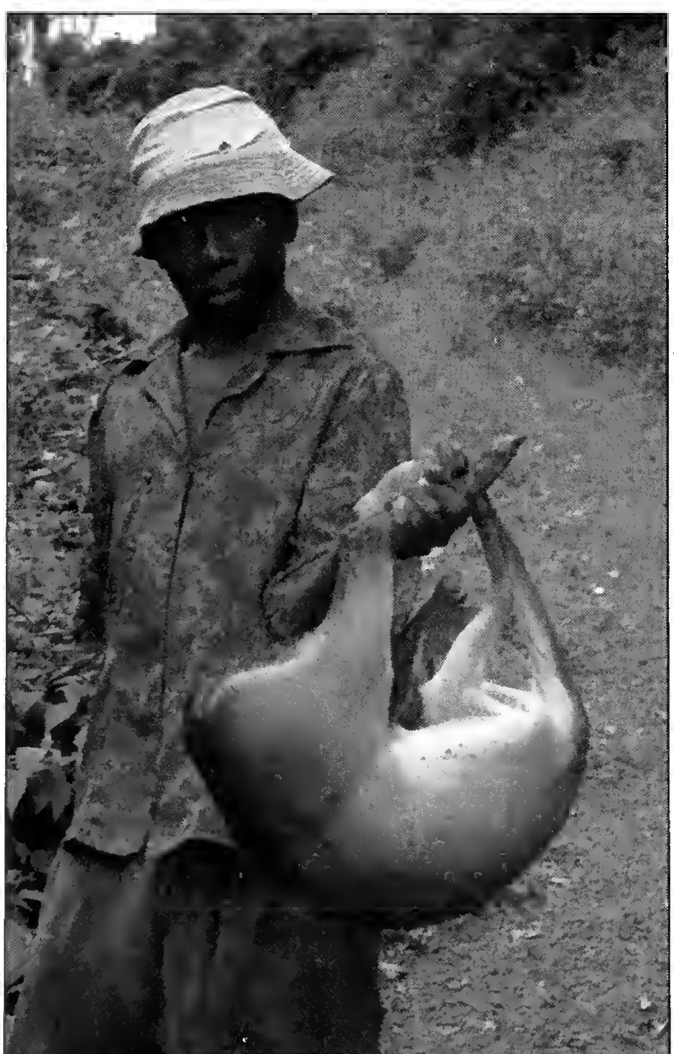
After briefing in Accra we set off for the Draw River Forest, near the Côte d'Ivoire border, some 300 km west of Accra – Ghana's highest rainfall zone. We were about 16 biologists from Ghana, Sierra Leone, USA, UK, and Germany, with specialists in plants, birds, butterflies, other insects, reptiles and amphibians, small mammals, large mammals, and primates. All packed with our *impedimenta* into an imposing convoy of four 4x4 cars and a minibus.

We had hoped to arrive at our campsite by 16.00, but various delays and road conditions saw us pitching tents in the dark at about 19.30. Our generator was not functional so we worked by the car headlights. I had never seen my tent before and put it up somewhat unprofessionally. My camp bed turned out to be as easy to assemble as my first meeting with 'Rubic's cube'. After a quick dinner the effects of four different flights lasting 23 hours and another 14 hours in sundry airports since Hanoi gave me a good sleep. I actually slept through a tropical downpour. When I woke up at dawn my tent was pretty wet inside, and it was destined not to dry out for the next 22 days.

The rainy season had been both extensive and extended. A layer of cloud hung over the forest just 400 metres from camp. There was no point in leaving camp till it began lifting at 10.30 and by 12.00 the sun had begun warming up even the butterflies of the forest floor, among which are some of the best indicator species of forest quality. By 13.30 the weather closed in, thunder rumbled, and by 14.00 I was drenched by a fierce tropical downpour, its ferocity somewhat mitigated by the forest canopy. Fine forest, few butterflies. This was to be the norm. A full 17 days adjacent to excellent forest with good access collapsed into a total of the equivalent of just seven full 'collecting days'. And not only that, but the extended rainy season had put fresh hatchings on hold. Most of the butterflies of the forest proper were not only keeping their heads down; most of them were evidently biding their time safely as pupae or late instar larvae, waiting for better times. The Lycaenidae and the Hesperiidae were conspicuous by their absence (and that is 60 percent of the total); most butterflies present were very worn and had evidently been around for a long time.

I was faced with what American colleagues might describe as 'suboptimal field collecting conditions'. The total for the trip was 256 species. This may sound like a lot, but good collecting conditions should have seen me approaching 400. I got four (!) butterflies that I was really glad to take back to Hanoi, the best being *Euriphene leonis*, an essentially Sierra Leone butterfly new to Ghana. On top of that, villagers and poachers that I met did not address me as usual with a good 'afternoon' or a 'whiteman'; it was invariably a rather disconcerting 'old man' – meant respectfully, and perhaps appropriate since I will have turned sixty by the time you read this - but still!

There were some bright points. Talking to my colleagues with their different collecting and observation techniques was good fun. I now know how to stuff a shrew in the field, which might come in handy. Or how to tickle the belly of a frog to make it lie still for photography. I even managed to catch a very rare frog. And the primate specialist had a worse time than I. Poaching pressures were extreme. Despite hard work and many nights sleeping in the rain inside the forest he saw monkeys just twice, heard monkeys three times, and found two chimpanzee nests. He usually works with a habituated group of chimpanzees in Taï National Park in Côte d'Ivoire; I don't think I could have mustered his good-natured patience.



A poacher with Maxwell's Duiker. Happy to be photographed.

Another bright point was our cook, Isaac, a veteran of the Ghana Army. He managed to serve breakfast, lunch, and dinner for all - despite the odd hours that many specialists worked. I don't think everybody was in camp at any one time. Our beer supply (what with three Germans, a Brit, and a Dane) also worked, even if it sometimes took a car more than four hours to fetch it. Not only armies walk on their stomachs!

The forests visited were generally good. Poaching was the main problem. We collected hundreds of spent cartridges and dozens of snares. We hope our report can help to get better protection and education of local communities. If not, most large mammals and the monkeys will probably go extinct. They are not many species - a few dozen - but without them the forest ecosystem is not complete. And that Ghana cannot afford.

All in all, to paraphrase the last lines by Solszenitshyn in the ending of his book 'One day in the life of Ivan Denisovitch': 'I had collected a few interesting butterflies. The inside of the tent had not been all <u>that</u> wet. The food was pretty good and the beer supply could usually be replenished. No-one got mad at each other. I had even caught a rare frog. All in all it had not been a bad trip'. And it was a firm reminder that there is a reason they are called **rain**forests.

BOOK NOTICE

HAZARDS OF BUTTERFLY COLLECTING

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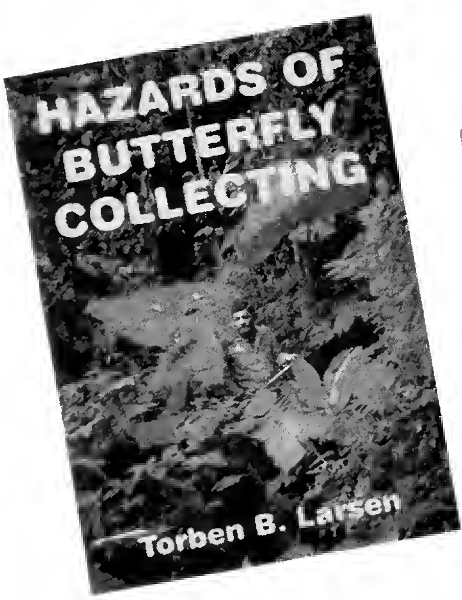


Experience the lighter side of field entomology with Torben Larsen as he describes his experiences from around the world.

The "Hazards" were begun in 1979 at the request of the editor of the *Entomologists' Record and Journal of Variation*, but the series somehow petered out. There was a restart in *Butterfly News* in 1987, but that magazine folded. Since 1989, one has been published every two months in the original journal.

Now Cravitz Printing and Torben Larsen have compiled a collection of these short anecdotes into a single volume.

The "Hazards" relate the experiences of an entomologist travelling the world in search of butterflies. Their aim is primarily to amuse, but they also try to convey how interesting butterflies are, as well as why butterfly study and collecting is such a satisfying pastime.

The moths of Oxey Wood, Milton Estate, near Helpston, Northamptonshire, 2001-2003

Oxey Wood is one of a number of small woodlands on the Milton Estate, near Helpston, in Northamptonshire (VC 32, O. S. grid reference TL 124033). During the early 1990s, I investigated the moth fauna of various of these woodlands (see Waring 1992. *Butterfly Conservation News* **51**: 59-62, 52: 48-56 and Waring *et al.* 1993. Butterfly Conservation News 54: 52-61), but Oxey Wood was not one of them. In each of the three years 2001 to 2003 I made single light-trapping visits to Oxey Wood in search of the White-spotted Pinion moth *Cosmia diffinis* and the Square-spotted Clay *Xestia rhomboidea* as part of the Action for Threatened Moths Project co-ordinated by Butterfly Conservation and part-funded by English Nature. Successful larval searches for the Square-spotted Clay were also mounted, as part of a joint project between Butterfly Conservation Cambridgeshire & Essex Branch and Writtle College. The results of the larval searches were reported by Waring (2003. *British Wildlife* **14**: 362).

Oxey Wood contains are large amount of Wych Elm *Ulmus glabra*, mainly as tall re-growth, more so than any other of the Milton Estate woodlands. Wych Elm is a recorded larval foodplant of the White-spotted Pinion, an elm specialist which is a UK Biodiversity Action Plan priority species (1999. UK Biodiversity Group Tranche 2 Action Plans. Vol. IV- invertebrates. English Nature.). The moth is currently being found only in Cambridgeshire, Huntingdonshire, Essex and Bedfordshire (Waring, Townsend & Lewington, 2003. *Field guide to the moths of Great Britain and Ireland.* British Wildlife Publishing). The first light-trapping visit was made on 26 August 2001, when three Robinson traps were operated from dusk (20.15 hrs) until 23.15 hrs by which time few additional moths were arriving. The date was on the late side for the White-spotted Pinion and none were seen amongst the 21 species recorded. The most noteworthy moths were the Maple Prominent *Ptilodon cucullina* (which occurs regularly in the nearby village of Werrington), the Black Arches *Lymantria monacha* and the Pinion-streaked Snout *Schrankia costaestrigalis*. The visit in 2002 was made on 12 August, a much more promising date, by which time the White-spotted Pinion is usually at peak numbers in its nearby sites in Huntingdonshire and Cambridgeshire. On this occasion a single standard Heath-pattern actinic trap was operated from dusk until dawn on a photocell switch in a central glade surrounded by Wych Elm. Again, no White-spotted Pinion nor other elm-dependent moths were seen, but a single Square-spotted Clay *Xestia rhomboidea* in good condition was present amongst the 38 macro-moths of 14 species trapped. This is the first record of the species for Oxey Wood, which does not appear to have been light-trapped previously. Follow-up searches for the larvae in the spring of 2003 confirmed that the moth breeds here, as also at nearby Hilly Wood in 2002 and 2003. The Black Arches was found again and a Flame Carpet *Xanthorhoe designata* is worthy of mention. On 5 August 2003 another recording session was made with the same actinic trap, from dusk to dawn in exactly the same place as in 2002. Both the White-spotted Pinion and the Square-spotted Clay wererecorded in numbers by the author and colleagues in the Huntingdonshire and Cambridgeshire sites the same week (e.g., at Overhall Grove, (e.g., at Overhall Grove, Cambs. on 7 August, Waring, 2003. *British Wildlife* **15**: 61). The White-spotted Pinion was in peak numbers, but the Square-spotted Clay had not yet reached its peak. Neither species was seen in Oxey Wood on this occasion although we knew the Square-spotted Clay to be resident. This result is a reminder of the hit and miss nature of light-trapping populations of moth at low density, especially with actinic traps. However, the catch of other moths was a large one: 81 macro-moths of 27 species, due to extremely warm days and nights at this time. Among the moths was a Lesser-spotted Pinion *Cosmia affinis,* an elm-dependent close relative of the White-spotted Pinion which is proving to be more widespread. This is the first ever record of the species from Oxey Wood, nor did we encounter it in the other Milton Estate woods inspected in the early 1990s. However, elm and its dependent species were not targeted at that time and populations of the Lesser-spotted Pinion could easily have missed detection. Other noteworthy species recorded at Oxey Wood on the night of 5 August 2003 were singletons of the Black Arches again, Maiden's Blush *Cyclophora punctaria*, Small Waved Umber *Horisme vitalba* and two rather worn Large Twin-spot Carpet *Xanthorhoe quadrifasiata*.

I would like to thank the Milton Estate for permission to record moths on the site, all those who have accompanied the author on the various sessions, in particular Mick Beeson. and Butterfly Conservation Headquarters and Cambridgeshire & Essex Branch, English Nature and Writtle College, Essex, for financial support.— PAUL WARING, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS.

European Corn Borer *Ostrinia nubilalis* (Hb.) (Lep.: Pyralidae) on hops in Kent

Stem-boring caterpillars were found infesting a one-hectare experimental planting of dwarf hops *Humulus lupulus* at East Malling (O.S. grid reference TQ 7057) in July 2003. A survey of 2800 plants on 15 August 2003 showed that 80% were infested and that tunnels occurred at all heights up to the trellis support wire at 2.5m. By August, many of the plants were suffering die-back of the cone-bearing lateral shoots. The continued presence of caterpillars in the tunnels during September, and their habit of tunnelling upwards rather than downwards suggested that the species responsible was not Rosy Rustic moth *Hydraecia micacea* (Esper), a minor pest of hops in UK first taken in the 1920s (Theobald, F.V., 1928. Notes on hop insects in 1927. *Entomologist*, **16**: 121-122). This was confirmed when six male and one female *O. nubilalis* emerged from stem samples collected on 6 November 2003 and stored for six weeks in a domestic refrigerator to satisfy any diapause requirements before being returned to room temperature. The adult moths emerged in March-April 2004.

Ostrinia nubilalis has been recorded from hops wherever they occur in continental Europe. Its incidence on hop has increased recently coincident with the introduction of imidacloprid, a target specific aphicide which replaced broad-spectrum organophosphorus products (eg Jastrzebski, A., 1999. The occurrence of European corn borer on hops. *Progress in Plant Protection* **39:** 436-438). Insecticides were last used on the dwarf hop planting at East Malling in 2001. No infested plants were found prior to 2003, nor at two sites in the west midlands (SO5840 and SO7359) and one in east Sussex (TQ7057) in 2003. The latter three sites were monitored regularly because they represented commercial grower trials to manage dwarf hops without insecticides.

Goater (*British Pyralid Moths*, Harley) notes that *O. nubilalis* was a rare immigrant to the UK before the 1930s, but has since established on waste ground in counties bordering the Thames estuary and in towns along the south coast, almost entirely associated with mugwort (*Artemisia vulgaris*). Three morphologically indistinguishable strains of *O. nubilalis* occur in continental Europe (Anglade, P. et al., 1984. Intraspecific sex-pheromone variability in the European corn borer, *Ostrinia nubilalis* Hbn. (Lepidoptera, Pyralidae). *Agronomie* **4**: 183-187), with different host ranges, and separable by their responses to different blends of the sex pheromone stereoisomers. In northern France, the E-phenotype infests hops and mugwort and the Z- phenotype maize (Bourguet et al, 1999. La Pyrale maïs dans les houblonnières du Nord. Une race à part? *Phytoma* **517:** 48-49). Therefore, Emmett's warning (*A field guide to smaller British Lepidoptera*, p 217), that *O. nubilalis* could become a pest of maize in UK, may reflect less of a crisis than the proximity between crop and moth might otherwise imply. However, if the phenotype feeding on mugwort in UK is the same as that which infests mugwort and hops in northern France (Bourguet et al, loc cit), a possibility that we are investigating currently, it begs the question; why has *O. nubilalis* apparently not been taken from wild/feral hops in UK in the last 70 years, nor on commercial plantings in the seven years since imidacloprid's introduction?

Ostrinia nubilalis could prove an Achilles heel for dwarf hop growing as currently practised. Tall hops are grown up temporary supports and all potentially infested stems are cut down and destroyed before shoots emerge from the perennating underground rootstocks the following spring. By contrast, dwarf hops are grown up semi-permanent supports, so the stems in which the moths pupate are not removed each year.— COLIN A.M. CAMPBELL and EMMA TREGIDGA, East Malling Research, New Road, East Malling, Kent ME19 6BJ (E-mail colin.campbell@emr.ac.uk)

Northern Arches *Apamea zeta* Tr. ssp. *assimilis* (Doubleday) (Lep.: Noctuidae) discovered in Roxburghshire (vice-county 80)

One individual of the Northern Arches was trapped using a 125-watt mercury vapour Robinson trap at Wester Branxholme Loch, Roxburghshire (O.S. grid reference NT 421110) on 26 July 2004. The trap was operated overnight and emptied shortly after dawn.

This represents a new vice-county record and only the fourth record of this species for southern Scotland (see Mearns & Mearns, *Antea*: 103) of what is more often thought of as a speciality of the Scottish Highlands.

The trap was situated in an area of calcareous fen dominated by Slender Sedge *Carex lasiocarpa*, fringed by willows *Salix* spp. The fen is atypical of the general vegetation in the area. The majority of the Wester Branxholme Loch Site of Special Scientific Interest is an area of wet heath and there are also extensive areas of dry

Heather *Calluna vulgaris* dominated grouse moor and grassy sheep pasture adjacent to the site. It is likely that the moth had travelled from one of these areas of acid vegetation to the trap, as it is associated with these habitats and not with calcareous fen elsewhere in Scotland. The mire is situated in a shallow basin at 270 metres above sea level between Chapelhill (313 metres) and The Steel (326 metres). Although the Northern Arches is thought of as an upland species there are no hills above 400 metres within several kilometres.

The weather on 26 July 2004 was mild and overcast. There was a good catch of 45 species of macrolepidoptera in the single trap. No immigrant species were recorded on that or the three previous nights, when traps were run elsewhere in Roxburghshire. It is probable that the species is breeding in the area, although further records would help to confirm this. It seems likely after this record, and last year's records in Dumfriesshire, that the Northern Arches may turn up in other sites in the Southern Uplands if more light trapping is carried out at moderate to high altitudes.

I would like to thank Bob Palmer for confirming the identity of the specimen and Keith Bland for discussing the idea for this Note.— JEFF WADDELL, Bonavista, Heatheryett, Galashiels, Selkirkshire TD1 2JL.

Ectropis bistortata (Goeze) and *Biston strataria* (Hufn.) in January

Afresh specimen of *Ectropis bistortata* was seen on an oak trunk in the local woodland at Bexley, Kent, on 7 January 2004, a good two months early, during a spell of mild weather. On 28 January 2002, a *Biston strataria* was seen at my garden mv light at Dartford, during a very short spell of mild weather, about a month before its usual emergence period begins here in late February (rather than in March, as formerly). However, this will not have occurred in 2004 with its long spell of very cold weather lasting into March.— B. K. WEST, 56 Briar Road, Dartford, Kent DA5 2HN.

Langmaid's Yellow Underwing *Noctua janthina* (D.&S.) (Lep.: Noctuidae) on Guernsey: a tale of prophecy and hope

On 5 August 1997, David Agassiz, who was staying on the island, generously gave up a morning of his holiday to cycle to my house and go through my collection of microlepidoptera with me. Such was the scale of my misidentifications that he spent considerably longer on the task than he had anticipated, even missing his lunch, but for me it was a most stimulating morning, and two things in particular (apart from how little I knew about micros) have stuck in my memory. First, David brought with him a Pine-tree Lappet *Dendrolimus pini*, a large moth for a microlepidopterist, which he had found in his trap that morning and the first I had ever seen, and, second, he told me about *Noctua janthina* and how he felt it would eventually reach the Channel Islands and that I should keep a watch out for it. He explained how the hindwing differed from that of *Noctua janthe*, the Lesser Broad-bordered Yellow Underwing, and so for the past seven seasons I have carefully lifted the forewing of every *janthe* I have seen, using on old bent setting needle kept specially for the purpose, and peered hopefully at the hindwing. On 16 July 2004, having examined 272 consecutive specimens, my first *janthe* of the season proved to be *janthina*. — P. D. M.Costen, La Broderie, La Claire Mare, St. Peters, Guernsey GY7 9QA (E-mail: pcosten@guernsey.net).

The Scarce Chocolate-tip *Clostera anachoreta* (D.& S.)(Lep.: Notodontidae) on Alderney

A female Scarce Chocolate-tip came to actinic light in a small garden in the centre of St.Anne on Alderney on the night of 14-15 May 2004. This is a species of moth new to Alderney, although known from Jersey where it has been recorded on several occasions (D.J.Wedd pers.comm.) and from the Cotentin peninsula, just nine miles away, where it is described as "rare: isolated individuals" (Quinette and Lepertel, 1992. *Les Macrolépidoptères du département de la Manche*).

A second specimen was taken by Graeme Neal, also at actinic light, on the night of 15-16 June 2004 in his garden which is about 250 metres from the site of the first capture. — P.D.M. Costen, La Broderie, La Claire Mare, St.Peters, Guernsey GY7 9QA. (E-mail: pcosten @guernsey.net)

The Splendid Brocade *Lacanobia splendens* (Hb.) (Lep.: Noctuidae) in Surrey in 2004

On 29 June 2004, I ran two traps at the Old Stores Meadows Reserve (my back garden) in Capel, Surrey (VC 17, O. S. grid reference TQ 176404). Amongst the 337 moths (of 99 species) captured was an unfamiliar species that I potted from a side wall on a check round at midnight. I retained the specimen alive in the fridge, and a week later was able to show it to two Surrey lepidopterists who did not recognise it, but thought that it might be an odd Bright-line Brown-eye *Lacanobia oleracea* (L.). To be fair to them, I did show it to them in rather poor light around a moth trap. On 15 July, I joined the Herts Moth Group trip to Broxbourne Wood, Hertfordshire and showed it to Colin Plant. Unfortunately, by this stage it had lost most of its scales and was in a rather sorry state. Nevertheless, Colin provisionally identified it as a male Splendid Brocade *L. splendens* (Hb.) – confirming this the next day after comparing it with European specimens in his collection.

The Splendid Brocade *Lacanobia splendens* was added to the British fauna by Tim Peet (2003. *Atropos*, No. 20: 64) who reported a capture on Guernsey, Channel Islands on 17 July 2003 and referred to examples having been taken at Portland [Dorset] and Dungeness [East Kent] on the mainland, though without details. Later, Martin Cade (2004. *Atropos*, No. 22: 42 – 43) provided a list of all nine known mainland British records, from eight localities, along with three from the Isles of Scilly and four from the Channel Islands, as follows:

Mainland British Records: 14 June 2003: Dymchurch, Kent (J. Owen); 16 June 2003: Dymchurch. Kent (J. Owen); 24 June 2003: Lydd, Kent (K. Redshaw); 30 June 2003: Wyke Regis, Dorset (D. Foot); 1 July 2003: Portland Bill, Dorset (M. Cade & D. Walbridge); 1 July 2003: Puddletown, Dorset (H. Wood Homer); 5 July 2003: Totland, Isle of Wight (S. Knill-Jones); 5 July 2003: Swanage, Dorset (R. Cox); 7 July 2003: Boys Wood, Dorset (P. Davey). **Isles of Scilly:** 15, 25 & 29 July 2003: St. Mary's (M.A. Scott). **Channel Islands:** 5 July 2001: St. Peters, Guernsey (P. Costen); 17 July 2001: Icart Point, St Martins, Guernsey (T. Peet); 21 June 2003: (two), Surville, Jersey (R. Long); 5 July 2003: St. Peter Port, Guernsey (P. Costen).

I understand from Colin Plant, via Mark Tunmore, that further examples were captured at Maenporth, Cornwall, on 10 June by G. Davis and Durlston Country Park, Dorset, on 20 July by D. C. Brown. One wonders if this is a fresh immigration or whether these are the progeny of 2003 immigrants. The only other immigrant species in my own trap on the same night was a single Small Mottled Willow *Spodoptera exigua* (Hb.) The species is illustrated in colour in *Atropos* No. 22, Plate 3, Fig. 9.— DUNCAN FRASER, 123 The Street, Capel, Dorking RH5 5JX.

Chloroclysta truncata (Hufn.) (Lep.: Geometridae): the return of ab. *russata* Hb. to north-west Kent

A further significant step in the decline of industrial melanism was heralded with the presence of a specimen of ab. *russata* Hb. of this species at my garden mv light on 20 September 2003. This is the brightest form of *truncata* to be found in southern Britain, characterised by its white, forewing central band, which contrasts with the dark markings. Though common in East Kent, here it has been replaced by melanistic forms. It follows the reappearance of ab. *griseovariegata* Mull. here in 1992, and which is slowly increasing in incidence.

In 2003, the population of *C. truncata* here is still dominated by the ab. *rufescens* Prout complex (mainly *fuscorufescens* Prout) and the melanic ab. *perfuscata* Haw.; the extreme melanic form *mixta* Prout and *nigerrima* Fuchs are all but eliminated from the region. However relative stability in polymorphism in *C. truncata* is still a long way off.— B. K. WEST, 36 Briar Koad, Dartford, Kent DA5 2HN.

The Scarce Tissue *Rheumaptera cervinalis* Scop. (Lep.: Geometridae) from two sites in Hertfordshire

Geescroft Wilderness, one of the long-running woodland light-traps on Rothamsted Farm (trap No. 22, O.S. Grid Ref.: TL 132128), recorded three specimens this year – on the nights of 15/16 and 16/17 April; and 16/17 May. It last occurred in this trap in 2000; and indeed, has significantly declined at this site since a peak in 1979, with several gaps of years with no records.

Harpenden IV (trap No. 594, O.S. Grid. Ref.: TL 153133), a relatively new Rothamsted trap site, recorded four specimens – one each on the nights of 6/7, 9/10, 10/11 and 13/14 May.

The last Hertfordshire record was in 2003, with the previous being 2001; however, 2004 appears to have been a particularly good year for this species.

Not a very common visitor to light, this species can often be over-looked, so may be more common than is realised. The fact that it has taken to feeding on cultivated species of *Berberis* (there is a large plant near trap 594) means that its range is not affected by the occurrence of its natural foodplant, Barberry *Berberis vulgaris*. — PHILIP J. L. GOULD, Co-ordinator of Light-trap Network, Rothamsted Insect Survey, Plant & Invertebrate Ecology Division, Rothamsted Research, Harpenden, Hertfordshire, AL5 2JQ (E-mail: phil.gould@bbsrc.ac.uk).

Invitation to Contribute to Invertebrate Biodiversity Prioritisation

The UK Biodiversity Action Plan (BAP) is a key part of the nature conservation effort towards ensuring that the United Kingdom fulfils its obligations under the 1992 Convention on Biological Diversity. Under the BAP, target driven Species Action Plans (SAPs) and Habitat Action Plans (HAPs) are prepared for those species and habitats that could face extinction or dramatic decline without concerted efforts.

Currently the BAP lists 391 Priority species, 44% of which are invertebrates. Listing has succeeded in greatly raising the profile of such species, together with the funding for survey and monitoring, autecological research and site management.

The list of BAP Priority Species is to be reviewed in 2005. This includes a full review of the existing priority list and is an opportunity to put forward species to be listed that are in urgent need of action.

To ensure that the conservation needs of invertebrates are represented in the review process, Invertebrate Link (Joint Committee for the Conservation of British Insects – JCCBI) has contracted Buglife – The Invertebrate Conservation Trust, to help co-ordinate relevant input to the review by:

- identifying coordinators for groups of invertebrate taxa, who will liaise with other relevant experts in reviewing the conservation status of British species and suggesting what changes should be made to the current list of BAP Priority Species;
- assisting coordinators in the review process as far as possible. For example, through JNCC, raw lists of British species for each group of invertebrate taxa will be produced, showing their current conservation designations (where this information is readily available), providing a template against which coordinators can work;
- collating a proposed list of invertebrates to be put forward in the BAP review process;
- presenting the list to DEFRA by early 2005 after which there will be two further stages of Government led prioritisation applied.

The general criteria for selection are unlikely to differ from those used for the original BAP lists published in 1995. These were based on international conservation status, rarity and rates of decline. However, the available data for many invertebrate taxa are not sufficient to establish whether, for example, a species has declined by more than 25% in the last 25 years. For this reason, we are keen to encourage a pragmatic approach to the selection of invertebrate Priority Species, drawing on the knowledge of relevant experts to make judgments within the bounds of the selection criteria and available data. More detailed guidance on the criteria is in preparation.

The UK's Biodiversity Action Plans are critically important to the conservation process. It is essential that invertebrates, 44% of all species, are properly incorporated. This project aims to achieve that and we look forward to working with all those who will be involved.

Specialist societies have been asked to nominate an individual/individuals to coordinate their inputs, but anyone is welcome to put forward what they regard as the best new candidates for Priority Species status.

If you would like to have an input into the process please contact us and indicate which species or taxonomic group you would like to be involved with.— MATT SHARDLOW, Conservation Director, Buglife, 170A Park Road, Peterborough PE1 2UF (E-mail: matt.shardlow@buglife.org.uk).

Platyedra subcinerea (Haw.) (Lep.: Gelechiidae): new to Bedfordshire

A single female *Platyedra subcinerea* (Haw.) was taken at a 15 watt actinic light on 29 May 2004 at Clophill, Bedfordshire. This is a species found only in the south of the British Isles and believed to be in decline (Emmet, A. M., Langmaid, J. R. *et al* 2002. *The Moths and Butterflies of Great Britain and Ireland*, **4** (2)). Interestingly for me, its favoured hibernation site is thatch, and my current residence is thatched.

My sincere thanks go to David Manning, the Bedfordshire County Micro-moth Recorder for determining the record.— L. J. HILL, 8 The Green, Clophill, Bedfordshire MK45 4AD.

Lepidoptera of Bulgaria – an emendation

In our earlier list of species recorded in Bulgaria during May 2002 (Plant, Fraser & Gorman, *Ent. Rec.* **115**: 131 – 143), we noted that our record of the geometrid moth *Dyscia conspersaria* (D.& S.) from the Struma Valley (Kresna Gorge) on 25 May 2002 would represent a new species for the Bulgarian fauna if it proved to be taxonomically distinct from *D. sicanaria* (Oberthür), which we also collected. The genus *Dyscia* Hübner has recently been subjected to a taxonomic review by Trusch & Erlacher (2002. *European Journal of Entomology* **99**: 529 – 541) and it is clear from this review that *D. conspersaria* is indeed specifically distinct from *D. sicanaria* (more correctly referable to *innocentaria* Christoph).

During July 2004, Dr. Robert Trusch, Lepidoptera Curator at the Staatliches Museum für Naturkunde Karlsruhe, Germany, e-mailed me expressing surprise that *conspersaria* might be in Bulgaria. He very kindly examined all four specimens and reported that all are, in fact, *innocentaria*. Accordingly, our record of *D. conspersaria* (1♂, 3♀♀) is no longer valid and should be deleted from the published list. For those interested, the distribution of *Dyscia* species may be gleaned from Trusch & Erlacher (2001. Zur Morphologie, Verbreitung, Bionomie und Identifikation der *Dyscia*-Arten (Lepidoptera, Geometridae: Ennominae). – *Bonner Zoologische Monographien* **49**: 1 – 116).— COLIN W. PLANT, 14 West Road, Bishops Stortford, Hertfordshire CM23 3QP (E-mail: cpauk1@ntlworld.com)

The Brimstone Moth *Opisthograptis luteolata* (L.) (Lep.: Geometridae). Comments on the early generation

The relatively lightly marked, moths of generation la (from winter pupae) regularly produce even more lightly marked specimens on occasions and which appear to be confined to this generation in the bivoltine population of north-west Kent. On 15 May 2004, a specimen almost devoid of brown markings attended my garden mv light. It retained only the forewing dark sub-apical mark, but not the brown triangle beyond, and the dark outline of the discal spot but not its usual accompanying costal blotch. The hind wings retained a weak discal macule. It would seem best to be classified as ab. *flavissima* Krulikowskyi, which in Goodson and Reid (unpublished, for internal use in the British Museum (Natural History)), is translated as "Almost entirely yellow with only slight remnants of the usual costal markings". I possess two further specimens from the same source, taken on 17 May 1989 and 15 May 1998.

This aberration may be considered one of a series which represent stages in reduction of brown markings, culminating in their complete absence as illustrated in Barrett (1900. *The Lepidoptera of the British Islands*. VI), which he asserts are a feature of the species in Somerset and other western counties. Two others in this series are ab. *apicolutea* Cockayne and ab. *delineata* Lempke, both of regular occurrence here, but only in generation la. Thus, I have specimens of ab. *apicoluta* from Dartford dated 13 May 1986, 9 May 1989 and 14 June 989 and ab. *delineata* from Dartford on 15 May 1988, 17 May 1989 and 24 May 1989.

Generation 1b specimens in north-west Kent are in general larger, brighter, the brown markings more intense; the forewing has a very well developed apical triangle and similarly strong adjacent costal mark representing the termination of the weak postmedian line. The forewing mid-costal blotch is prominent and often encroaches along the costa to some extent; marginal dots at vein ends are usually well developed on the hind wings, but less so on the forewings. Although the two emergences of the first generation tend to overlap they are usually readily distinguishable. It is a relatively stable form, variation tending in the direction of heavier markings.

The only aberration in generation 1b I have encountered is a specimen of the very rare ab. *nebulosa* West from Dartford Heath on 7 June 1979 – a specimen with considerable brownish suffusion and determined as of gen. Ib by, among other features, well pronounced dots at vein ends on all wings. A specimen was taken by I. Lorimer at Totteridge, Hertfordshire in 1963 and was exhibited at the Annual

Exhibition of the South London Entomological and Natural History Society and is illustrated in their Proceedings for that year, but without complete date. The Dartford specimen is illustrated in *Ent. Soc.* **87**:141. The only other example of which I am aware is that taken on the Isle of Mull, in October 1877. According to Heslop-Harrison (1955. *Ent. Rec.* **67**:175), on some of the Inner Hebridean islands *O. luteolata* has two emergences a year, the first from over-wintered pupae and the second, in August, from over-wintered larvae, a regime in part corresponding to that in south-east England. However, a specimen taken as late as October suggests a representative of a true second generation.

In the Highlands of Scotland *O. luteolata* is mainly univoltine with one emergence period from over-wintered pupae; all wild larvae I have obtained from rowan *Sorbus aucuparia* have pupated in the autumn, and the moths have emerged in April and May. They appear to be the largest strain in Britain, and in appearance otherwise resemble most closely those of generation Ia in north-west Kent. Regarding the brown markings, the forewing apical blotch is not as solid, while the mid-costal mark shows little tendency to encroach along the costa, contrasting sharply with southern specimens from generation Ib, but resembling those of generation Ia. These univoltine moths also display a tendency towards obsolescence of the marginal dots at the vein ends, and the transverse fascia are more obscure. Thus they most resemble generation 1a specimens from south-east England, except in size, and contrast sharply with those of generations 1b and 2 further south.

The pale yellow variety of *O. luteolata* also appears to be of higher incidence in certain generations than others. This is ab. *intermedia* Harrison, perhaps often overlooked and mistaken for a faded or worn specimen. I possess three specimens from Dartford dated 27 August 1982, 16 September 1998 and 9 September 1989 – thus all from generation 2. A fourth specimen was bred from a wild larva on rowan at Grantown on Spey, Moray, emerging 22 April 1964.

The above observations suggest that within the differences which characterise the different emergences there is a tendency for further variations to occur, and these may be specific to one or more generations. Some observations may not be statistically significant, especially those made on populations other than in north-west Kent where thirty-five years of mv light operation has been the main basis of observation of a very common species.— B. K. West, 56 Briar Road, Dartford, Kent. DA5 2HN.

A melanic Marbled White (*Melanargia galathea* (L.) ab. *nigra* Frohawk) in Kent

On 27 July 2004, John Webspper and I were visiting Lydden Down National Nature Reserve, near Dover, when we noticed what we thought at first to be a dark coloured Meadow Brown *Maniola jurtina* (L.) flying in a rather odd manner. We followed it and obtained good, close views over the next ten to fifteen minutes and noted that the upper sides of all four wings were almost entirely black. When the butterfly settled in order to feed, the usual pale markings of the underside of a "normal" Marbled White were clearly visible. The post-discal ocelli were seen in spaces 2, 3,4 6 and 7. This variety of the Marbled White has been described as ab. *nigra* Frohawk (Frohawk,

1938. *Varieties of British Butterflies*, Plat 7, Figs. 1 and 2) and is apparent sufficiently unusual to warrant reporting here.— MICHAEL H. SYKES, Hazelwood, Hawksdown, Walmer, Deal, Kent CT14 7PH.

Black-veined White *Aporia crataegi* (L.) (Lep.: Pieridae) egg-laying on *Amelanchier ovalis* (Rosaceae)

Whilst staying at Soldeu, Andorra, during July 2004 at an altitude of 1800 metres, I found *Aporia crataegi* to be quite common, apparently well above the level of its well-known fruit tree larval host plants. However, near the village I found several egg batches on the leaves of *Amelanchier ovalis* a small shrub found on steep rocky cliffs at up to 2400 metres in the Pyrenees and in similar habitats on other European mountain ranges. This high altitude potential larval host does not appear to have been recorded before.— DAVID GALL, 5 Culborough Road, Lichfield, Staffordshire WS13 7NG.

Further records of the Queen of Spain Fritillary *Issoria lathonia* (L.) (Lep.: Nymphalidae) in Britain during 2003

Since my observation of a Queen of Spain Fritillary here at my home address on 3 August 2003 (incorrectly printed as 30 August 2003 in the original article – see *Ent. Rec.* **115**: 284) I have received a most interesting letter from Dr A. L. Butler of Towcester, Northamptonshire. Dr Butler encountered a male Queen of Spain Fritillary in a wood just west of Salisbury, Wiltshire on 23 July 2003. This individual was on the ground in an area adjacent to a field containing many plants of Heartsease *Viola lutea*, which I understand is the continental foodplant of the larvae. A further individual is reported from an undisclosed location in Cambridgeshire on 24 July 2004 by Bowles and Fox (Wildlife Reports: Butterflies. *British Wildlife* **15**(1): 58 – 60). I have also heard unconfirmed rumours of sightings in East Anglia during the same year.

The wide geographical separation of the records is strongly suggestive of primary immigration. Dr Butler also saw *Vanessa atalanta* (L.) ab. *klemsiewiczi* Schill and *V. cardui* (L.) ab. *pallida* Schoyen on 23 July 2003 in the same wood near Salisbury, amongst many typical examples. I also took *V. cardui* (L.) ab. *pallida* Schoyen in Staffordshire on 8 August 2003 – a very pale dwarf form which stood out amongst the many normal-sized individuals feeding on the garden flowers.— JAN KORYSZKO, 3 Dudley Place, Meir, Stoke-on-Trent, ST3 7AY.

The spread of *Cameraria ohridella* (Deschka & Dimic) (Lep: Gracillariidae) into Hampshire

I first found a few mines of *Cameria ohridella* in a small cluster of Horse Chestnut trees *Aesculus hippocastanum* in Camberley, Surrey in late June 2004. As this was just over the border with North Hampshire I decided to get on my bike (literally) and look to see if this miner had reached that county. I cycled from Fleet to Aldershot and Farnborough on 27 June, looking carefully at the many Horse Chestnut trees, but with no success. As I was returning home I spotted a few Horse Chestnut trees in a cul-de-sac in Southwood (VC 12) and it was there that I found a few mines of *Cameraria ohridella*, which I believe is the first record for Hampshire.

I took a voucher specimen and sent two mines to Ian Kimber and kept two myself, attempting to breed this moth through. We had success, with three out of the four mines producing moths, the first emerging on 10 July.

In both instances the mines have been located in cul-de-sacs, in Camberley close to the busy A.30 road and in Southwood adjacent to the main London Waterloo to Basingstoke railway line. The rapid spread of this moth will obviously be transport assisted and sites close to main routes could be productive in searching for initial infestations.— ROB EDMUNDS, 32 Woodcote Green, Fleet, Hampshire GU51 4EY (E-mail: r.edmunds@ntlworld.com).

Two new records for the Monti Cilento National Park (Italy): *Satyrium acaciae* (Fabricius) and *S. w-album* (Knoch) (Lep.: Lycaenidae).

The Parco Nazionale del Cilento e Vallo di Diano, to give it the full title, occupies an area of approximately 2000 square kilometres in the south of the Province of Salerno, Campania, Italy. The park consists of several mountainous areas: M. Alburni (1742 m) in the north, M. Bulgheria (1225 m) in the south, M. Cervati (1852 m) in the east and M. d. Stella (1131 m) in the west. Its habitats are very varied from the high meadows of Cervati, through heavily wooded slopes to dry garrigue and many moist river valleys below. A total of 108 species of butterfly has been recorded from the park (Volpe & Palmieri, 2001. *Farfalle Italiane: 1. Campania and Territori Limitrofi*. Associazione Naturalistica Arion, Castel Volturno – Caserta, Campania, Italy). My wife and I visited the park on several occasions between 20 June and 5 July 2004. On 27 June we climbed up a steep path above San Angelo a Fasanella in the Mti. Alburni region and, at an altitude of about 700 metres, reached some old fields, which had not been cultivated for many years. At the side of the original track through the fields stood an almost dead Sweet Chestnut tree *Castanea sativa*; this had sprouted from its base to about five metres in height and was in flower, attracting many insects to its nectar. Among these were three hairstreaks: *Satyrium ilicis* (Esper), which was very common throughout the park, *S. acaciae* (Fabr.) and *S. w-album* (Knoch), the latter two species having not been reported from the park previously (Volpe, G., pers. comm.). Both sexes of *S. acaciae* were common, feeding also from the large mounds of Bramble *Rubus fruticosus*; the many small (approximately one metre high) bushes of *Prunus spinosa*, around which both males and females were flying, were obviously their larval foodplant. Three quite fresh females of *S. w-album* were taken on 27 June and more were seen on 2 July, again around the flowers of the same Sweet Chestnut tree; they were not observed to use any other nectar source. No males were seen on either occasion and at first glance no larval foodplant was visible. However, some 50 metres from the chestnut tree, there were some young (c. 6m high) trees of Smooth-leaved Elm *Ulmus carpinifolia* which, so far as we are aware, has not been recorded specifically as a larval foodplant for *S. w-album*. As no males or females were seen around these trees, we could not be certain whether they were being used but a further search, to a radius of approximately 100 metres revealed no further potential larval food source. *Strymonidia acaciae* was also found along a grassy track lined with *P. spinosa* at c. 750 metres above Corleto Monforte, some seven kilometres to the southeast. With its wide variety of habitats this large area could easily conceal other previously unrecorded species and visits either earlier or later in the year could very well be rewarding.— P. J. C. RUSSELL, Oakmeadow, Wessex Avenue, East Wittering West Sussex PO20 8NP.

Volucella inanis (L.) (Diptera: Syrphidae) in the West Midlands

A single adult was trapped in a house in Selly Oak, Birmingham (O.S. grid reference SP 048831) on 14 June 2003, and appears to be a the most northerly example so far detected in Britain, with the majority of recent records centred around the south-east and south-west of England (Ball and Morris, 2000. *Provisional atlas of British hoverflies (Diptera, Syrphidae)*. Biological Records Centre). It is possible that this species may become established in Birmingham in future.— ALEX J. RAMSAY, Centre for Agri-Environmental Research, Department of Agriculture, University of Reading, Earley Gate, Reading RG6 6AR.

Wahlgreniella nervata (Gillette) ssp. _arbuti_ Davidson (Hem:Aphidinae: Macrosiphini) in Norfolk

During the second week of June 2004 my wife noticed that the leaves at the lower half of a three metres tall Strawberry tree *Arbutus unedo* in this garden were dull grey-green and drooping in contrast to those of the upper half of the tree which were yellow-green and upright. On examination I found a heavy aphid infestation in younger stages of development. I immediately applied a proprietary insecticide, which had a dramatic effect in reducing the attack.

I then consulted Clive Carter, a long-standing colleague and aphid specialist, who using my telephoned description narrowed the identification down to the genus *Wahlgreniella*, and then on receipt of adults confirmed *W. nervata* (Gillette) ssp. *arbuti* Davidson. He advised that the insect, although little recorded in the UK, was in no need of conservation so I prepared to spray again only to find so few adults and but two batches of nymphs, that I left them to their own devices and within a few weeks none were to be seen.

Clive Carter pursued the matter of UK records first with V. E. Eastop, who examined the aphid collection in the Natural History Museum, South Kensington and who found the only East Anglian occurrence to have been at "Lowestoft Suffolk

8.7.1974 coll. C.F"; other records came from near London, namely Hertfordshire, Bedfordshire, Surrey and Sussex. A further possible record came from Andrew Halstead at Royal Horticultural Society, Wisley, who unearthed an instance received on 10 May 1957 from a Surbiton (Surrey) garden on *Arbutus menziesii*; other records of aphids on *Arbutus* came in 1993, 1995 (3), 1998 and 2000 (3). A further record was that from Ruislip, Middlesex in 2000.

W. nervata arbuti belongs to a group of mainly host-alternating aphids, but some species, of which this is an example, has only one hostplant and which reproduces by parthenogenesis throughout the year without producing true sexual forms that would pair and lay eggs. There has been little sign of the insect since late June and the tree has freely regenerated growth from the attacked parts. No previous attack had been noticed in the life of this twenty-years old tree,

The nymphs are identifiable by swollen tubes with dark tips and the adults have dark bands across the abdomen (adapted from Aphids on the World's Trees by R. L. Blackman and V. F. Eastop CAB International, 1994). I found the adult's large wing etched venation to be attractive and dragonfly-like.

These Caston specimens are preserved in the Natural History Museum. I am grateful to Clive Carter for his advice and pursuit of records and to V.F. Eastop and A. Halstead for so kindly supplying them.— G. M. HAGGETT, Meadows End, Northacre, Caston, Norfolk NR17 1DG.

Last call for flea (Siphonaptera) specimens

The Biological Records Centre is planning to publish an enlarged second edition of the *Atlas of the Distribution of British Fleas*, originally published in 1974. For this to be as up-to-date as possible could readers send any specimens that they have for identification and recording. Providing they are accompanied by data any quantity, from singles to hundreds, all will be welcome, whether they come from cats, dogs, from bird nesting boxes to voles, rabbits, badgers, etc. Identifications will be given and the specimens incorporated in RSG's collection unless their return is required, in which case return postage would be appreciated. — R. S. (BOB) GEORGE, 54 Richmond Park Avenue, Bournemouth BH8 9DR.

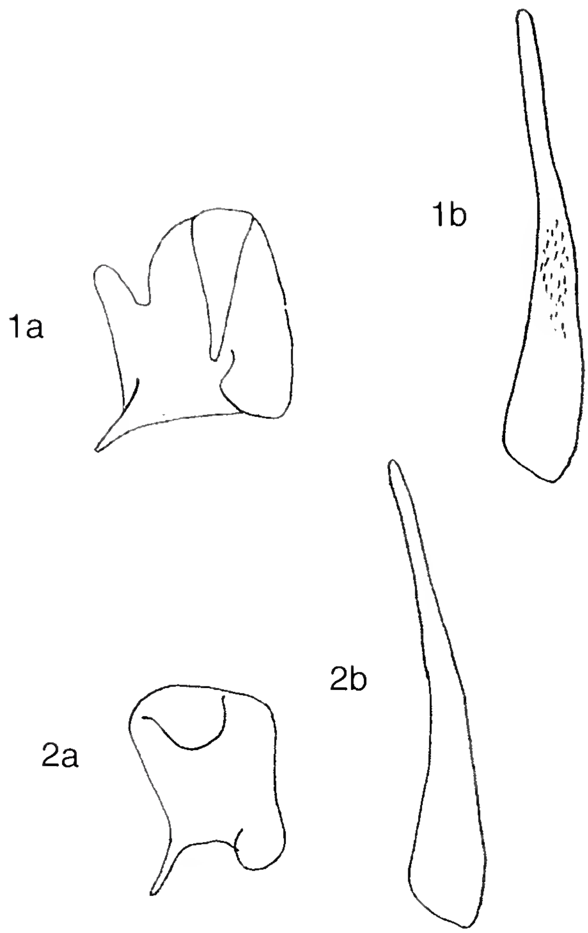
***Tinagma balteolella* (Fischer von Roesl.) (Lep.: Douglasiidae) in the East Thames Corridor**

At around 11.00 hours on 17 May 2004, I netted two small and unfamiliar moths in flight over a few isolated plants of Viper's Bugloss *Echium vulgare* in weak sunshine at the site of the former Beckton Gas Works in East London (VC 18: South Essex). The insects, though somewhat metallic in appearance, were distinctive in having practically no markings whatsoever, save a small, pale tornal spot that was very obvious in the sunlight. Reference to Heath & Emmet (1985. *Moths and Butterflies of Great Britain and Ireland* volume 2. Harley Books) suggested that the moths might be male *Tinagma balteolella*. Unfortunately, the usefulness of the early volumes of this series of books is severely limited, since they do not contain any drawings of the genitalia of most included species, and I am most grateful to David Manning for locating drawings in Falkovich & Medvedev (Eds.) (1990. *Keys to the insects of the European part of the USSR*. **4**: Lepidoptera), and for e-mailing me a scanned image. Dissection of one of my moths proved that they were indeed male *Tinagma balteolella*.

Tinagma balteolella was added to the British fauna by David Agassiz from the coastal sand dunes [at Sandwich] in East Kent (Agassiz, 1976. *Ent. Gaz.* **26**: 291 – 293) and for some years was known in Britain only from that locality. During 1987, Paul Sokoloff collected dead stems of the foodplant, Viper's Bugloss *Echium vulgare* from the shingle at Dungeness in order to breed out *T. ocnerostmella* and the following May was surprised to rear large numbers of adults of *T. balteolella* (Sokoloff, 1988. *Ent. Rec.* **100**: 152). As far as I am aware, the only other record for *balteolella* in Britain relates to adults collected by Norman Heal at Rye Harbour in East Sussex on 27 May and 2 June 1986 (N. Heal Pers. comm.). This discovery was reported by Richard Fairclough, who seems to have incorrectly given the year as 1985, but who himself found larvae in 1986, though failed to rear them through (Fairclough, 1989. *Ent. Rec.* **101**: 34).

The Beckton Gas Works site is a classic post-industrial site in the urban area of East London; it is scheduled for a housing development. The chemically contaminated ground is sparsely-vegetated save for a few areas where birch and sallow trees form small copses. In common with many sites in this region of East London/south-west Essex, the ground contains a high proportion of pulverised fuel ash (PFA), which renders it structurally similar to sand, albeit chemically base-rich. This type of substrate is of immense importance in this region because it supports nationally significant assemblages of aculeate Hymenoptera, amongst other taxa. Harvey & Plant (1996. A provisional list of the bees, wasps and ants (Hymenoptera: Aculeata) of Essex. *The Essex Naturalist* **13** (new series): 43 – 115) recorded 68% of the British aculeate fauna in this region, a figure that has risen now to around 75%. Many other Nationally Rare and Nationally Endangered taxa are thriving in this area, which extends east from London's Tower Bridge along the northern side of the Thames Estuary and which has become widely known as the East Thames Corridor. This area also includes the remaining former chalk pits and exposed areas of Thanet sand that overlie the Upper Chalk around Grays-Thurrock and was discussed in detail by Peter Harvey (Harvey, 2000. The East Thames Corridor: a nationally important invertebrate fauna under threat. *British Wildlife* **12**: 91 – 98). Viper's Bugloss still persists at several sites in the Corridor, though many of its former stations have been destroyed as the never ending march of new housing development continues to eliminate important and irreplaceable invertebrate habitats in the south-east of England.

Since the genitalia of neither British *Tinagma* species are illustrated in the British entomological literature, the opportunity is taken to illustrate the salient features here.



Simplified illustrations of left valvae (a) and aedeagi (b) of *Tinagma* species. 1. *Tinagma balteolella* (F. v. R.) Beckton, South Essex, 17.v.2004; 2. *T. ocnersotomella* (Stt.) – after Falkovich & Medvedev (1990).

For those who may wish to try to find this moth in new localities, it may be of interest that Paul Sokoloff (*op. cit.*) collected dead stems of the foodplant in autumn and left them hanging outside all winter, exposed to the elements, before bringing them indoors in late April (during 1988); his moths emerged from 9 May onwards.— COLIN W. PLANT, 14 West Road, Bishops Stortford, Hertfordshire CM23 3QP (E-mail: cpauk1@ntlworld.com).

Spondylis buprestoides (Linnaeus, 1758) (Col.: Cerambycidae) found near a timber merchant in the Orpington area (Kent)

On the evening of the 22 vii 2004, I observed two black beetles at the base of a poplar tree at the edge of a common bordering the river Cray (O.S. grid reference TQ 467672). From a distance they appeared to be lesser stag beetles *Dorcus parallelipipedus* (L.) which are relatively common in the area. However, after capture, it became clear that the beetles had filiform antenna and were not stag beetles but a species of longhorn. Another specimen was found on a pine in a small church yard next to the common (TQ 468671). A further two examples were found at the first location the following evening.

The species is not native of the British Isles but was easily identified as *Spondylis buprestoides* using a French field guide (Auger, *Atlas des Coléoptères de France*, volume II, 4th edition, 1976, Boubée). Those beetles are shiny black, of cylindrical shape with large mandibles. The elytra possess carinae, which are less marked in the female. The five specimens collected measured between 17 and 22 mm, the two females being slightly larger than the three males.

Spondylis buprestoides is the only species of its genus in Europe. According to du Chatenet (2000, *Coléoptères Phytophages d'Europe*, Volume I, N.A.P. Editions) it is relatively common and widely distributed throughout continental Europe but is absent from the north of the Scandinavian peninsula, the south of Spain and north of Italy. It is also absent from the extreme north of France and part of Belgium.

The species develops in pine or other coniferous trees and it is likely that those specimens have been introduced with some timber. According to Hickin (1987, *Longhorn Beetles of the British Isles*, Shire Natural History) it has been known for some longhorn species, for example *Ergates Faber* L., to have a full life cycle in British timber yard. A timber merchant is very close to the collection locations (TQ 467670) and two building yards are also selling timber in the vicinity (TQ 468675 and TQ 468674). Pieces of sawn but not processed pine, some still with bark, used for packaging were found in a skip at the timber merchant. The beetles could have been imported in such unprocessed timber. Although, the British climate would not be an issue, it seems unlikely that the species will settle durably as there are very few conifers in the area (one pine, three dead and one live spruces in the church yard and a few conifers in the near by Orpington Priory Park – TQ 467668).— MARC E. MIQUEL, 7 Albert Road, St Mary Cray, Kent BR5 4AF (E-mail: marc.miquel@kcl.ac.uk).

Larvae of Four-spotted Moth *Tyta luctuosa* (D. & S.)(Lep.: Noctuidae) found in Lincolnshire

The Four-spotted Moth *Tyta luctuosa* is generally associated with sun-trap situations, light, well-drained soils which warm up rapidly, and the larvae feed only on Field Bindweed *Convolvulus arvensis*. On 26 June 2003 Robin Field, Graham Watkins and I found seven larvae of the Four-spotted Moth *Tyta luctuosa* during a nocturnal search from 23.00 – 01.30 hours on a south-facing slope of limestone grassland in a valley in Lincolnshire.

This site is known to have supported a population of this moth since the 1980s (Tony Smith, pers. comm.) and on 8 June 2002, James McGill and I counted a minimum of 62 adults on this slope. This is the highest total on any British site since 2000 (Waring, 2002. Wildlife reports - Moths. *British Wildlife* **14**: 58). Six of the seven larvae found on 26 June 2003 were in the final instar. Most were in a small part of the site in a south-facing position, at the foot of a small quarry, amongst a grassy sward dominated by Tor-grass *Brachypodium pinnatum* and other grasses, with trailing Field Bindweed and some small patches of bare ground. The sward height was a fairly uniform at 7 centimetres, measured by the Boorman drop-disc method (see Waring, 1992. *British Butterfly Conservation Society News 50*: 51-53). The site has received apparently favourable grazing management by cattle during the decade I have known it. It is a Site of Special Scientific Interest (SSSI) and is covered by a management agreement with English Nature.

Adjacent to the SSSI is another open field of similar habitat. This has a different ownership and the owners are interested in the moth and other wildlife. We have seen a few Four-spotted moths flying over this land, but were unsure whether they were breeding residents or wanderers from the SSSI. On the evening of 29 June 2004, I searched this area for larvae after dark to see if I could confirm breeding here. I am delighted to report that I found larvae at each of four likely-looking spots at which I searched, throughout the upper slope of this property, spread over a distance of just over 100 metres. I found a total of nine larvae during my forty-minute search, which started at midnight. I was finding larvae at the rate of about one per minute of actual search, with the rest of the time spent walking from one spot to the next and in filming the larvae and sward conditions on video-tape. I am sure there were a great many more larvae on the slope. The sward is best described as mainly grasses, with much Field Bindweed entwined up the vertical stems of the grass flowerheads and with a very low density of plants of other species present. Although the flowerheads of the grasses were up to knee-height, the main bulk of the grass plants was about ankle-deep only and was so sparse that much bare limey earth was visible between the grass-blades. It was a dark night with no moon visible, and dry, calm, mild weather (I was searching in rolled shirt-sleeves). The owners have been informed of this discovery of larvae and plans are now in place to maintain the habitat in its present condition.

The above work took place as part of a national project on the Four-spotted Moth, a UK Biodiversity Action Plan Priority Species. The work is being coordinated by Writtle College and the Cambridgeshire and Essex Branch of Butterfly Conservation, with funding from English Nature and the help of many volunteers. I would particularly like to thank Robin Field, Chairman of this Branch of BC, for all his help with the running of this project, and the private owners of the sites for their cooperation and interest. For more information on the current status and habits of the Four-spotted moth, see the references below. — Paul Waring, Reader, Centre for Environment & Rural Affairs, Writtle College, Essex. Contact address: Windmill View, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS.

MICHAEL CHALMERS-HUNT

We were saddened to learn of the recent death of Michael Chalmers-Hunt, editor of this journal from 1973 to 1985. We would hope to publish an entomological obituary in due course and the Editor would be pleased to hear from anyone who may wish to contribute to this.

BOOK REVIEWS

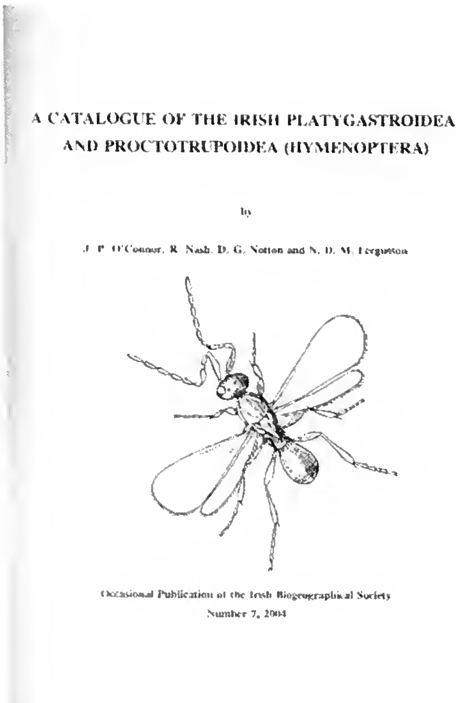
Bumblebees by **Murdo Macdonald**. Scottish Natural Heritage, 2004. 36 pp., paperback, 210 x 200 mm. ISBN 1 85397 364 5. £4.95, available from the publisher at SNH Design and Publications, Battleby, Perth PH1 3EW.

As one in the series *Naturally Scottish*, edited by Lynne Farrell for Scottish Natural heritage, this richly illustrated paperback booklet takes the form of a brief introduction to bumblebees – the genus *Bombus* (including subgenus *Psithyrus*). The target audience is evidently the general public and it is interesting to read the English names that have been applied to all the Scottish species; there do not seem to be any Scottish Gaelic names! Five short chapters discuss bumblebee ecology under broad headings of "How they feed", "How they breed", "How they fly and why they sting", "Where they live" and "Threats". These are followed by a closing chapter entitled "Conservation – how you can help bumblebees".

There are only 36 pages, and much of this space is occupied by photographs, so the amount of text is limited. It is presented in an easy to read format and will appeal to the majority of non-specialist readers. That appeal will, however, surely be limited to people who already do have some interest and I cannot perceive the general public paying a fiver for a book on bees unless some interest already exists. Nevertheless, the work presents a comprehensive introduction to Scottish bumblebees and is certainly an invaluable resource for anyone planning a talk on the subject to their local natural history society.

A catalogue of the Irish Platygastroidea and Proctotrupoidea (Hymenoptera) by **J. P. O'Connor, R. Nash, D. G. Notton and N. D. M. Ferguson**. Occasional publication of the Irish Biogeographical Society, number 7, 2004. 112 pp., paperback, folded and stapled to A5. ISBN 0 9511514-6-0. Published by the Irish Biogeographical Society, National Museum of Ireland, Kildare Street, Dublin, Republic of Ireland at 10 or £10 Sterling, inclusive of postage.

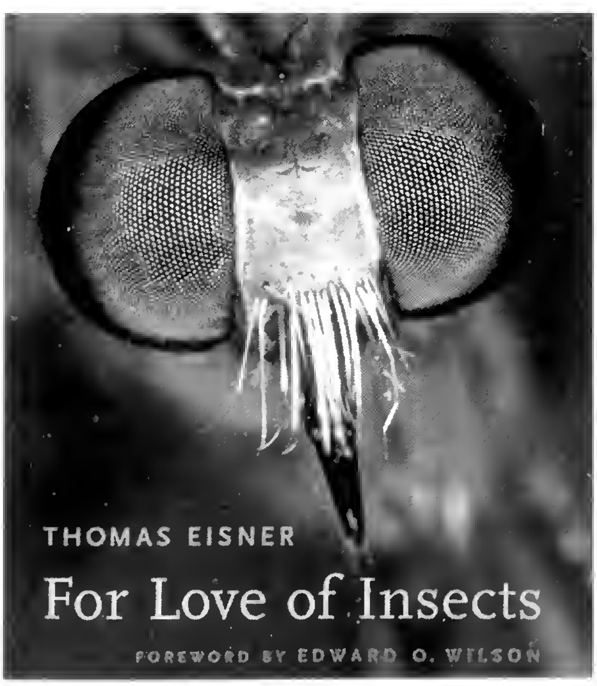
Previous catalogues in this series cover the Braconidae (Occasional Publication number 4) and the Chalcidoidea (Occasional Publication number 6) and have already been reviewed in the pages of this journal. This latest contribution to the little studied and poorly understood Parasitica should at least provide a staring point for anyone who has an interest in the Irish fauna and it is a pity that there are no companion publications on the British species. The catalogue covers the families Platygastridae and Scelionidae in the Platygastroidea and families Diapriidae, Heloridae and Proctotrupidae in the Proctotrupoidea and lists 316 species currently



known to occur in Ireland. Of these, 25 are recorded here as new to that country. All validated records of the species are listed by county. Two Plates (one in colour) plus the cover illustration, reproduce drawings by A. H. Haliday, originally published in the *Entomological Magazine*. The work is dedicated to Gilbert Nixon (1905 – 1987) in recognition of his important contribution to knowledge of the Irish proctotrupoid fauna.

The wish is expressed in the Preface that this work "will encourage more research on these fascinating insects". I echo that sentiment, but wonder how many entomologists will rise to that particular challenge. I have jars and jars of such species from Malaise traps but not on iota of an idea what to do with them all other than merely to preserve them for posterity. The Parasitica as a whole represent a colossal gap in the available identification literature. Of course, one cannot write keys until one knows which species should be included, and so the series of checklists is an important first step, but I do hope that some provisional keys, at least to genera, are planned for the not too distant future.

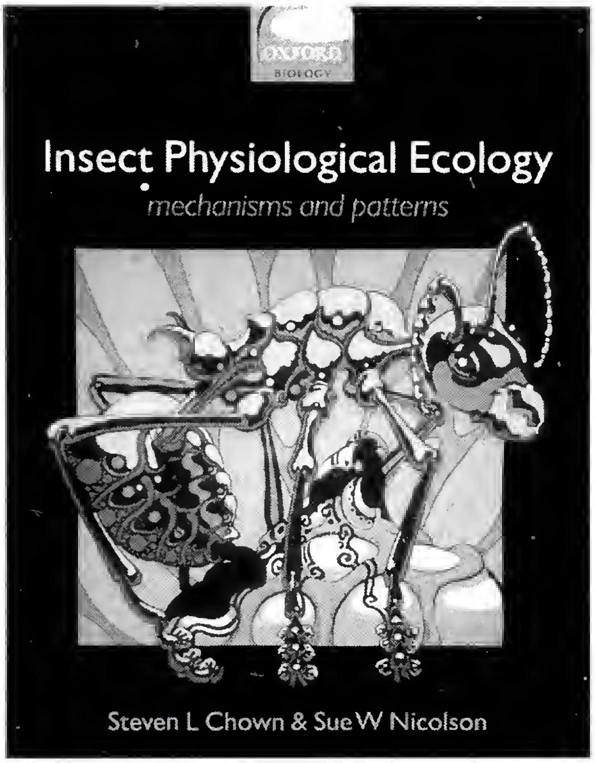
For love of insects by **Thomas Eisner**. 450 pp., 410 x 243 mm., hardback, ISBN 0 674 01181 3. Harvard University Press, 2004. Available from bookshops at £19.95, or direct from the publisher's distributors John Wiley and Sons Ltd, 1 Oldlands way, Bognor Regis PO22 9SA (add postage for a total of 1.410 Kg.).



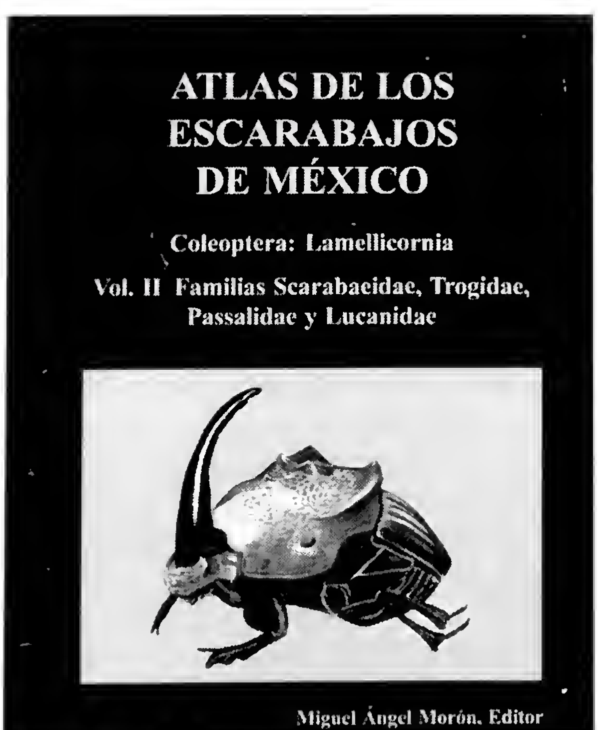
This reviewer is well known for his dislike of the self-congratulatory style of presentation that is a feature of many books from "across the pond"; he also has little knowledge of, and even less interest in, the New World entomological fauna. How surprising then that he actually liked this well-illustrated book by Thomas Eisner! Dr Eisner is Professor of Chemical Ecology at Cornell University and a great deal of this book reflects this fact. However, the reader should not be put off by this fact and I suggest that the style of the book actually works in favour of the layman understanding some of the more complex matters presented.

I have not read the book from cover to cover, but I did read in detail the opening chapter about the Bombardier Beetles *Brachinus* spp. and found it most fascinating. Perhaps this is in part because *Brachinus crepitans* is found in Britain, but there is a lot of information there not only about the beetles but also concerning the various methodologies that can be used in experiments with insects. The book is well presented, though the spine is broken in the review copy, and at just under twenty quid it is not a bad price by modern standards. Worth adding to the letter to Santa Claus.

Insect physiological ecology: mechanisms and patterns by **Steven L. Chown and Sue Nicolson**. 246 pp., 189 x 247 mm., paperback, ISBN 0 19 851549 9. Oxford University Press, 2004. £32.50. (Hardback version also available, ISBN 0 19 851548 0, £70). Available from bookshops or from OUP at Great Clarendon Street, Oxford OX2 6DP.



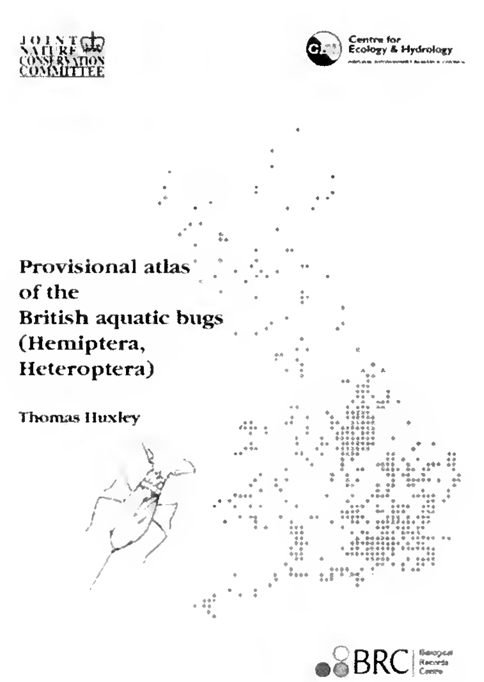
For those who wish to take their entomological studies that bit further, this is a book well worth reading. Though the subject covered is complex, to say the least, the presentation of this work 0makes it relatively easy reading. An introductory chapter is followed by five others, entitled "Nutritional physiology and ecology", "Metabolism and gas exchange", "Water balance physiology", "Lethal temperature limits" and "Thermoregulation", before the "Conclusion". The original research for this book, on the part of the authors, was undertaken in the Southern hemisphere, and throughout the book various biological differences between the two hemispheres are hinted at. As the authors comment in their Preface, this is not only biologically interesting, but may also have profound consequences for the way in which humans "attempt to manage the global experiment they have set in motion". There are, of course, far too many results presented to permit a thorough review of them all here, and insect physiology is not the strongest subject for one whose university years were squandered on biochemistry and microbiology. However, this work does present a great deal of original data and is likely to become required reading for anyone studying entomology the level of first degree upwards.



Atlas de los Escarabajos de México, Coleoptera: lamellicornia. Vol. II Familias Scarabaeidae, Trogidae, Passalidae y Lucanidae edited by **Miguel Ángel Morón**. 228 pp., 214 x 274 mm., softback, ISBN 84 931847 5 6. Argania Editio, 2003. 95 EUROS plus 5 EUROS postage from the publishers at Balmes 61, pral. 3, 08007 Barcelona, Spain.

This is the second volume in the series *Atlas de los Escarabajos de México*. Although maps of Mexican scarabaeids will be of rather limited appeal amongst British Isles entomologists, the work contains rather more than mere distribution maps and presents a great deal of further information that is not traditionally associated with an "Atlas". The efforts of nine separate authors are expertly combined by Dr Morón, who himself contributed many of the excellent pen and ink "habitus" drawings of the beetles covered by the book. There are also 11 pages of colour plates of adult beetles, with either four or nine insects per page depending on the size of the beast. If one is interested in Mexican beetles this is clearly an invaluable guide, though the text appears to be in Spanish and may hinder some. As an entomological end-product, this book exhibits a very high standard of accuracy and presentation, and it is unfortunate only that its appeal to British and European entomologists is likely to extend more in the direction of professional coleopterists than towards the amateur collector.

Provisional atlas of the British aquatic bugs (Hemiptera, Heteroptera) by **Thomas Huxley**. 118 pp., A4, paperback and perfect bound. ISBN 1 8703393 67 8. Published by the Biological Records Centre, 2004. Available from the BRC, Monks Wood, Huntingdon PE28 2LS. Price £8.

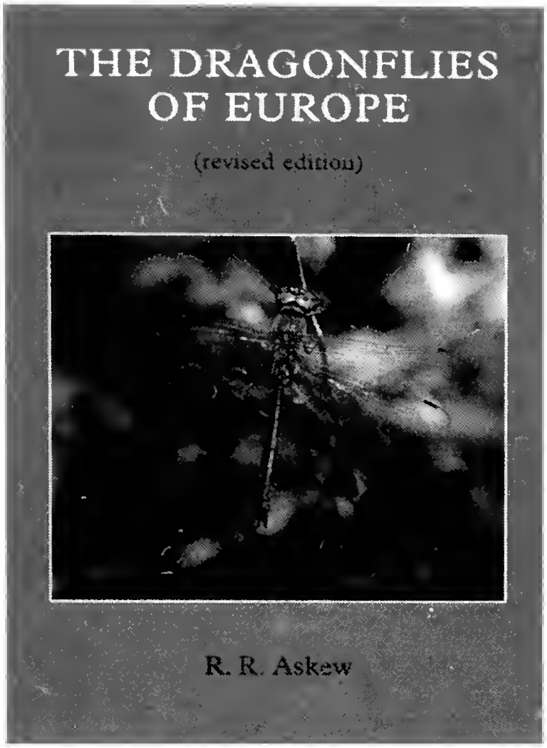


This latest in the series of provisional atlases from the Monks Wood stable is likely to be well received by a great many people. Unlike the terrestrial bugs, water bugs can be readily identified using modern and available keys and it is a pleasure to at last be able to see the distribution and status of some of our more familiar species. Distribution maps are presented for 61 species in Great Britain, though Ireland is excluded. The recording unit is the ten-kilometre square and the familiar use of solid dots (1970 to 31 July 2001) and open circles (pre-1970) is deployed. Each species is discussed alongside its map. The number of records in the database is noted, along with the number of ten-kilometre squares in which the species is recorded. A note of how many squares have only pre-1970 records is presumably intended to flag up species that may have declined. The distribution pattern mapped is discussed briefly and there is also a paragraph on the habitat required by each species. What I find particularly useful is the final paragraph entitled "Helpful hints" for each species, in which the salient recognition features are discussed and sometimes drawn.

This splendid effort from Thomas Huxley is very long overdue and is commended to anyone who owns a pond net. My only criticism is that perhaps the thirty-year span for "recent" records is too long. Surely there have been many changes over that period and in particular, many water bodies have vanished. As with all provisional atlases, the purpose is not only to summarise current knowledge but also to stimulate further field survey so that knowledge can be expanded. If it is successful in this latter intention, I would rather hope that the final version would utilise a much shorter date band for "current" records.

The dragonflies of Europe (revised edition) by **R. R. Askew**. 308 pp., 32 colour plates, 513 text figs and 114 distribution maps. Paperback, 168 x 232 mm., ISBN 0 946589 75 5. Harley Books, 2004. Available from the publisher at Martins, Great Horkesley, Essex CO6 4AH. £30 plus postage and packaging.

This is a revision of the original work of the same title, that was produced by Harley books as a hardbound volume, with their familiar white dust jacket, in 1988. That somewhat expensive



original *magnum opus* has been very much regarded as a "shelf copy" by many purchasers; the production of the revised edition as a softbound volume at just slightly larger than A5 size will surely allow it to be regarded as a "going out copy". The overall layout appears to be identical to that of the original version, with pages merely shrunk to the new, smaller size. This has been achieved without any loss of clarity in the author's superb illustrations. Revisions to the text are presented as a supplementary chapter, on pages 213 – 222, space having been made, apparently, by the omission of the original chapter concerning species known only from the fossil record.

The list of references to published material has been revised to incorporate additions in the single list.

This method of revision has a drawback in that having looked up a species in the body of the book it is now necessary to look up the same species in the Supplement, in order to ensure that no changes have been made. On the other hand, this system does allow any changes to be immediately identified, rather than lost amongst the original text, and I suppose one could always annotate the original text with a pencil. Presumably, it has also served to keep the price down to an acceptable level. In reality, very few revisions affect British species and so the problem may only arise if using the book overseas – in which case the portability of the revised work will far outweigh any such small inconvenience.

This is a book that is well worth having – whether you have the original hardback version or not. I commend it to anyone preparing their Xmas list!

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Please note that the editor's e-mail address has been changed to:
cpauk1@ntlworld.com

Continued from back cover

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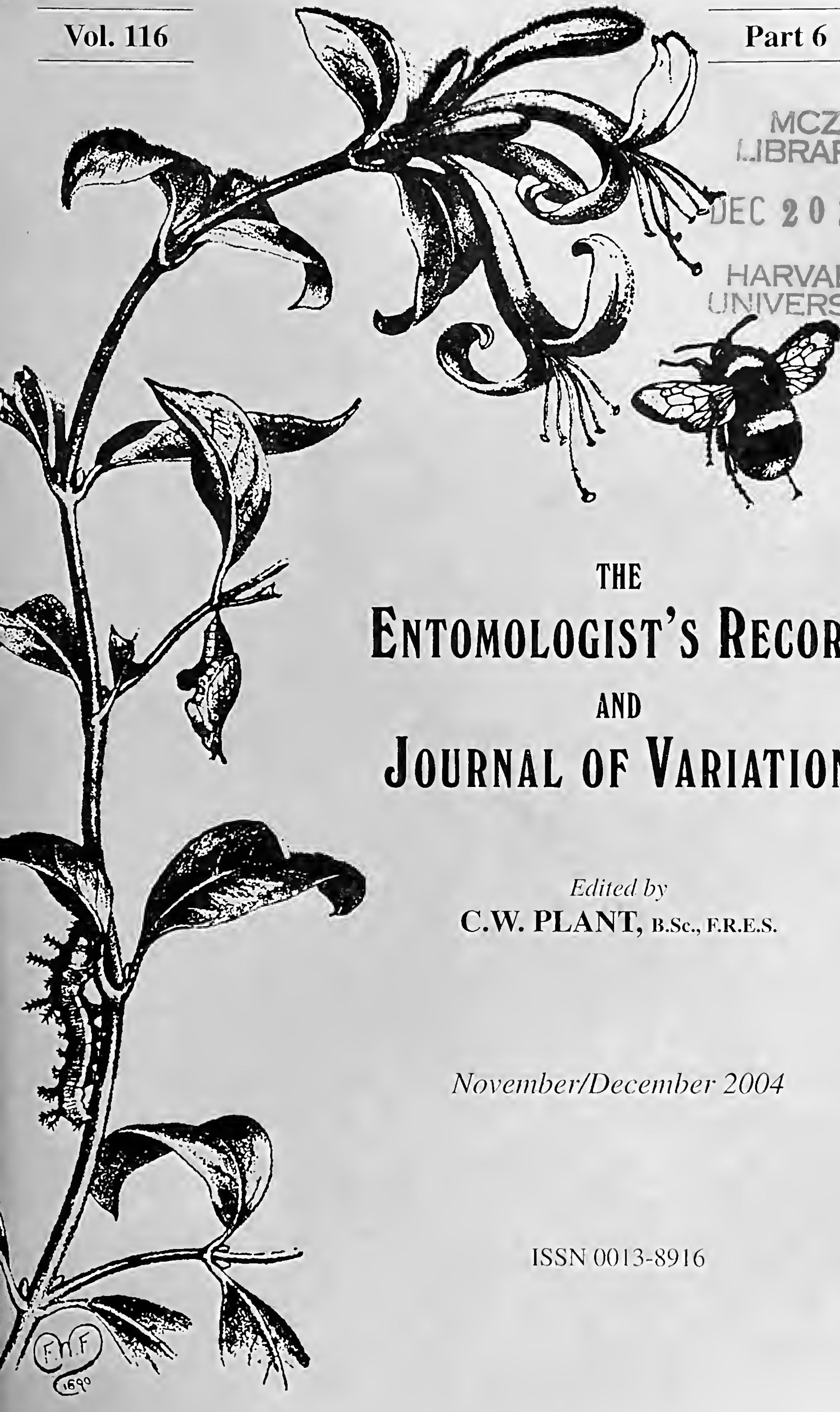

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- We may also accept contributions on **European insects** if these are likely to be of interest to British readers, such as species likely to colonise Britain (especially where these contributions include identification keys or photographs), or accounts of entomological trips to places that may be of interest to other readers.
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- We accept all formats from hand-written notes upwards. However, we prefer submissions via e-mail, or on floppy diskette. Files must be in a PC-compatible format that is readable by Microsoft Word 2000. Originals are required for all photographs, drawings, diagrams, graphs, histograms and similar, though Tables may be incorporated into word processor files. For details, visit the web site or contact the Editor direct.

AN ANALYSIS OF MOTH WINGS FOUND AT THE FEEDING PERCH OF A BROWN LONG-EARED BAT *PLECOTUS AURITUS* (L.) (CHIROPTERA: VESPERTILIONIDAE) IN BLUNTISHAM, CAMBRIDGESHIRE, FROM 1980-1983

J. NICK GREATOREX-DAVIES[1], EDDIE JOHN[2] AND HENRY R. ARNOLD[3]

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Abstract

The wing remains of a total of 2,039 moths were collected from underneath the feeding perch of a Brown Long-eared Bat during 1980-83. Approximately 96% of the moths were of the family Noctuidae. The majority of the moth species identified are widespread and common in suburban habitats and probably reflected local conditions. Fifty-six percent were of just four species: the Dotted Rustic *Rhyacia simulans* (Hufn.), the Mouse Moth *Amphipyra tragopoginis* (Cl.), the Common Rustic *Mesapamea secalis* agg. and the Stout Dart *Spaelotis ravida* (D.& S.). Of these, the Dotted Rustic was experiencing a population explosion in eastern England at the time of the survey and the Stout Dart had also been increasing in previous years. Both these species and the Mouse Moth, aestivate or roost in sheds, outbuildings, under bark etc. The predominance of these species in the prey is discussed and it is suggested that these bats may be able to locate and exploit collections of aestivating or roosting Lepidoptera. Comparisons are made with several other similar British surveys. Only six species were common to all surveys.

Introduction

The Brown Long-eared Bat *Plecotus auritus* (L.) is one of Britain's commonest and most widely distributed species of bat and feeds exclusively on insects and other arthropods (Swift & Racey, 1983; Stebbings, 1988; Shiel *et al.*, 1991). The bat belongs to a group known as gleaning bats, in that a substantial proportion of their diet is caught by "gleaning" prey items off vegetation, the ground or other substrate rather than by aerial hawking (Anderson & Racey, 1991; Shiel *et al.* 1991). The presence of deciduous woodland in the vicinity of the bats' roost sites is thought to be key as a foraging habitat (Swift & Racey, 1983; Entwistle *et al.*, 1996). Suburban situations where there are plenty of deciduous trees are presumably also suitable.

A much higher proportion of moths is found in the diet of many gleaners than in that of many bats that are primarily aerial hawkers (Rydell *et al.*, 1995). A substantial part of the Brown Long-eared Bat's diet consists of noctuid moths. However, studies involving the analysis of faecal pellets from the roosts of these bats have revealed that they eat a wide range of other invertebrates including flies, beetles, caddis flies, shield bugs, lacewings, centipedes, spiders, earwigs etc. (Swift & Racey, 1983; Rydell, 1989; Shiel *et al.*, 1991). Depending on the time of year and location, the bat's diet may be expected to include 20-70% moths though 20-40% appears to be more usual (Swift & Racey, 1983; Rydell, 1989; Rydell *et al.*, 1995; Shiel *et al.*, 1991). Moths may be favoured prey items, as when moths are most abundant (in July and August), they form a substantially higher proportion of the bat's diet than other orders which are also more abundant in midsummer (Shiel *et al.*, 1991; Williams, 1939).

Many moths (and some other insects) have primitive ears, known as tympanic membranes. These tympanate moths include Noctuidae, Geometridae, Notodontidae and Pyralidae, but not the Hepialidae (Faure *et al.*, 1993; Fullard, 1987). Tympanate moths are best able to hear the echolocation sounds of bats within the range of 20 to 40 KHz (Faure *et al.* 1990; Rydell *et al.* 1995). Aerial-hawking bats tend to emit long, high intensity ultrasonic echolocation calls of relatively low frequency in order to locate prey accurately at a distance while flying. These calls tend to be within the optimum hearing range of tympanate moths (Faure *et al.*, 1993; Rydell *et al.*, 1995). On hearing an approaching bat's ultrasonic calls these moths will take evasive action. Tympanate moths are about 40% less likely to be caught by aerial-hawking bats than non-tympanate moths (Rydell *et al.*, 1995) and consequently many aerial-hawking bats feed mainly on insects other than moths (Rydell *et al.*, 1995).

Gleaning bats (sometimes called "whispering", "quiet" or "listening" bats) have relatively broad wings (for slow, hovering flight) and large ears (for listening for sound produced by their prey). More often than not they locate their prey by listening for prey-generated sounds, such as fluttering, and may approach and capture their prey in silence, i.e. without using echolocation at all (Anderson & Racey, 1991; Faure & Barclay, 1992). When they do use echolocation to capture prey they emit short, low intensity (faint), high frequency ultrasonic sounds which are both relatively quiet and outside the optimum hearing range of tympanate moths, thereby escaping detection (Faure *et al.*, 1990; Waters & Jones, 1995). A proportion of their prey, including moths, is also caught by aerial hawking.

The frequent presence of non-flying arthropods in the bat's diet (e.g. the report of centipede remains in faecal pellets in an Irish study by Shiel *et al.*, 1991), suggests that the bats may also be able to hear the pattering of tiny feet (all those legs may not be such a good idea after all!) or may detect the disturbance of litter over which the arthropods are crawling. Long-eared Bats also have relatively large eyes compared with other species of bat, so eyesight may be also be used for prey location

Hibernating or roosting Lepidoptera may also be eaten by Long-eared Bats. The remains of the Herald Moth *Scoliopteryx libatrix* (L.) and the Small Tortoiseshell butterfly *Aglais urticae* (L.) have been found under bat perches (Poulton, 1929; Roer, 1969; Thompson, 1982; Warne, 1985; Chris Hall *pers. comm.*). However at other times hibernating Lepidoptera are left untouched (Roeder & Fenton, 1973). It has been suggested that bats may also be able to locate their prey by smell (Roer, 1969). Chris Hall (*pers. comm.*) reports that a Brown Long-eared Bat would not approach closer than about 15 centimetres to proffered moths if they had been kept in a match box rather than a glass jar, suggesting that the bat could smell residual chemicals from the previously stored matches.

Large prey items (especially noctuid moths) are taken to temporary feeding perches to be consumed; small prey items are presumably eaten while the bat is in flight, or whole while the bat is perching. The location of these perches can be found by the presence of discarded insect remains (chiefly moth wings) and bat droppings underneath the perch, particularly where the perches are situated in a place where there is little wind to blow the insect remains away.

In August 1980, EJ discovered a feeding perch of a long-eared bat in a 'built-in' car port, open to the south, adjoining a residential house in the village of Bluntisham, Cambridgeshire (in Huntingdonshire, vice county 31). The bat was presumed to be the Brown Long-eared Bat. The only other species of long-eared bat in Britain is the very rare Grey Long-eared Bat *Plecotus austriacus* (Stebbings, 1988). This has subsequently provided us with an opportunity to investigate the diet of the Brown Long-eared Bat with respect to larger moths, perhaps to shed some light on the feeding behaviour of the bat and on the abundance and behaviour of moths in the area, and to make some comparisons with other similar studies, notably those of Thompson (1982) and Howes (1996, unpublished study), and those detailed by Poulton (1929). The habitat surrounding the feeding perch consisted of suburban gardens (to the east and west), a large playing field with scattered lines of mature and younger deciduous broad-leaved trees (north), and an extensive orchard of plum, apple and pear less than 30 metres away to the south.

On 9 August 1983, a dead Brown Long-eared Bat (positively identified) was found, still clinging to the wall, at the feeding perch. Numbers of moth wings collected had been high for several days previous to this, and although numbers of wings found subsequently dropped markedly, wings continued to be deposited in the same corner of the car port until the end of September. This strongly suggests that at least two bats were using the feeding perch, at least for a time (Figure 2).

Methods

Remains of moth wings were collected daily in 1980 beneath the temporary feeding perch at Bluntisham, from 6 August until 6 September, after which no more moth wings appeared that year. Similar collections were made daily in 1981, 1982 and 1983 from under the same perch from the first day in each year that moth wings appeared until no more wings were found at the end of the summer. Business commitments, requiring EJ to spend time away from home, account for the lack of data in early September of some years. Daily collections were kept separate for later identification.

Moth species were subsequently identified from the wing remains, as far as possible by pairing up wings to avoid duplication, and tending to err on the side of caution. It is likely, therefore, that the numbers of moths identified are slightly underestimated.

At the time the moth wings in this study were identified in the early 1980s, the species now known as the Common Rustic *Mesapamea secalis* and the Lesser Common Rustic *Mesapamea didyma* were treated as one. In 1983, two species were formally recognised. Although the wing remains were retained, the two species cannot be reliably separated without examination of the genitaliaand so, for the purposes of this study these two species have been lumped together.

Results

A total of 2,039 individual moths of 72 species was identified from wing remains collected at the Bluntisham bat perch between 1980 and 1983 (Table 1). In 1980, 93% of these were noctuid moths and in each of the following three years approximately 96% of the moths were noctuid moths making an overall average for the four years of 95.9% (Table 2). The remaining moths were a few representatives of the families Hepialidae, Pyralidae, Geometridae, Thyatiridae, Arctiidae and single representatives of the families Oecophoridae and Notodontidae.

In the years 1981, 1982 and 1983, 58%, 54% and 60% of the total moths comprised just four Noctuid species, namely the Dotted Rustic, the Stout Dart, the Common Rustic group and the Mouse Moth. The percentage each species made of the total in each of the three years and in 1980 is shown in Table 2.

Table 3 lists the 20 most frequent species (over the four years) at the Bluntisham feeding perch, and gives the percentage each made of the total catch in each year at Bluntisham. The table also shows a comparison with other surveys for those 20 species. Other datasets in the table are from Sheffield in 1921 (Poulton, 1929, but collected by Whitaker); Skelton in 1979 and 1980 (Thompson, 1982) and from Rossington near Doncaster in 1984 and 1991 (Howes, 1996, unpublished study). The survey entitled "1929 various" is a combination of a number of smaller surveys, individual details of which are given by Poulton (1929). These smaller datasets are from various British locations and dates (between 1905 and 1928) and as such are not strictly comparable with the other surveys, but they have been included here for interest.

Just six species of moth are common to all the surveys: the Large Yellow Underwing, the Lesser Yellow Underwing, the Heart and Dart, the Dark Arches, the Common Rustic and the Mouse Moth. The Large Yellow Underwing was always among the top three most frequent prey items in the earlier surveys, and at Rossington in 1991. However at Bluntisham it came out seventh overall, but second in the incomplete series of 1980. The Cabbage Moth *Mamestra brassicae* (L.) and the Silver Y *Autographa gamma* (L.) were also found more frequently overall at Bluntisham than the Large Yellow Underwing.

Figures 1-3 show the number of moths identified from the daily collections in the years 1981-83. In 1982, moth wings appeared somewhat earlier than in 1981 and 1983. The figures also show the number of Dotted Rustic, Stout Dart and Mouse Moth identified from daily collections, the differences in phenology of the three species being apparently reflected in the catches.

Discussion

Since the moth wings for this study were collected, a great deal more has become known about the feeding habits and diet of the Brown long-eared Bat, particularly from studies using captive bats and from studies involving the analysis of faeces from wild bats. It was previously thought that Brown Long-eared Bats fed predominantly on noctuid moths, whereas it has become clear that moths make up only between 20-40% of the bats' diet on average. At the height of summer, moths

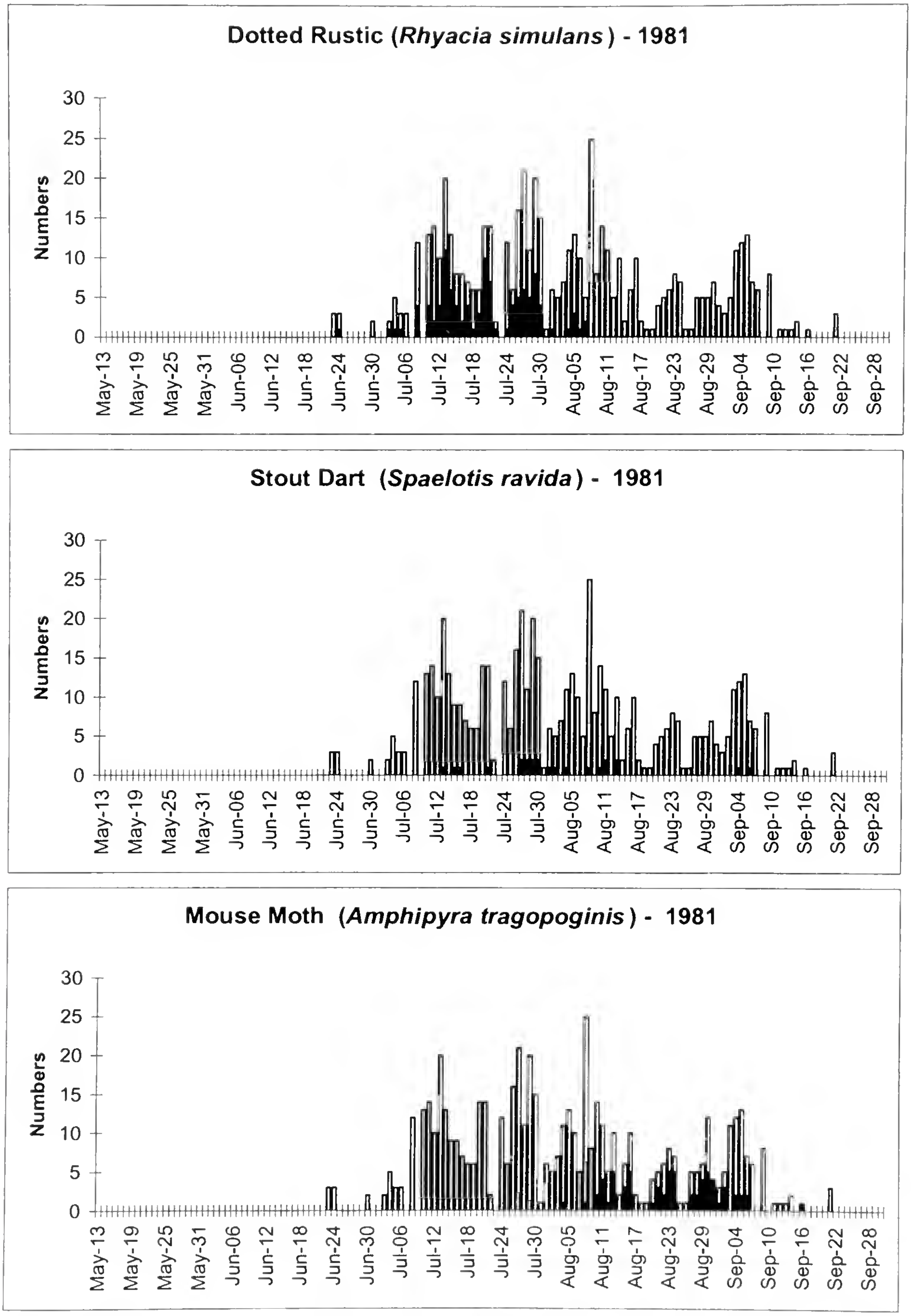


Figure 1. Total nos. of individual moths (wing remains) (clear + solid bar) and nos. of three species of noctuid moths (solid bar) collected daily in 1981 from under a feeding perch of a Brown Long-eared Bat in Bluntisham, Cambridgeshire.

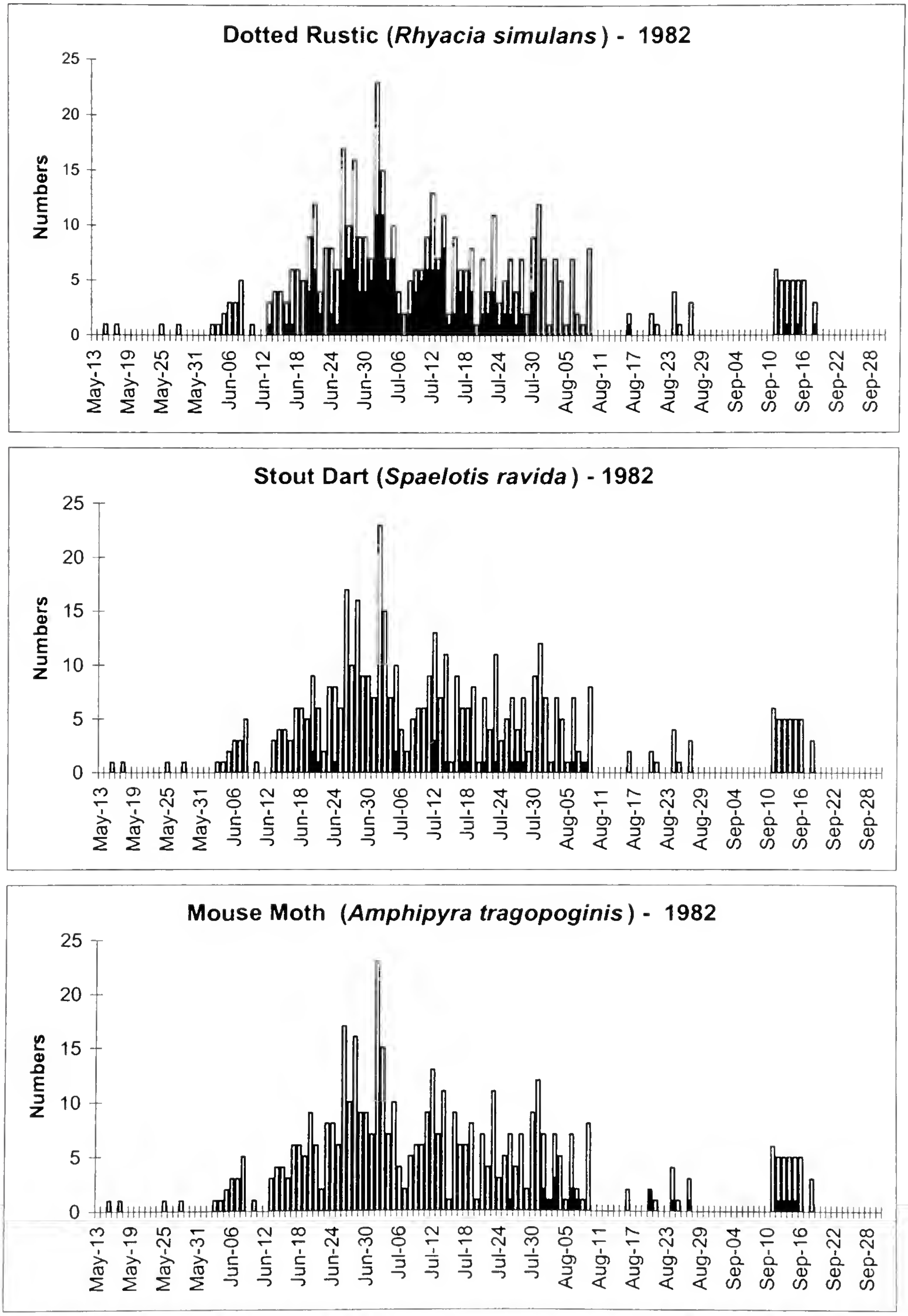
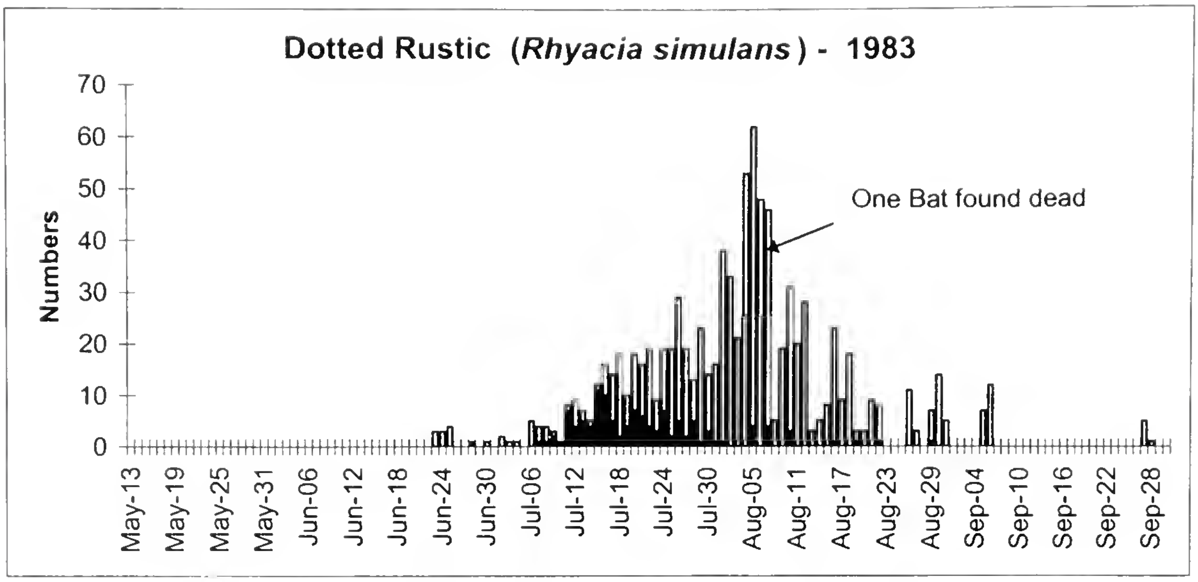
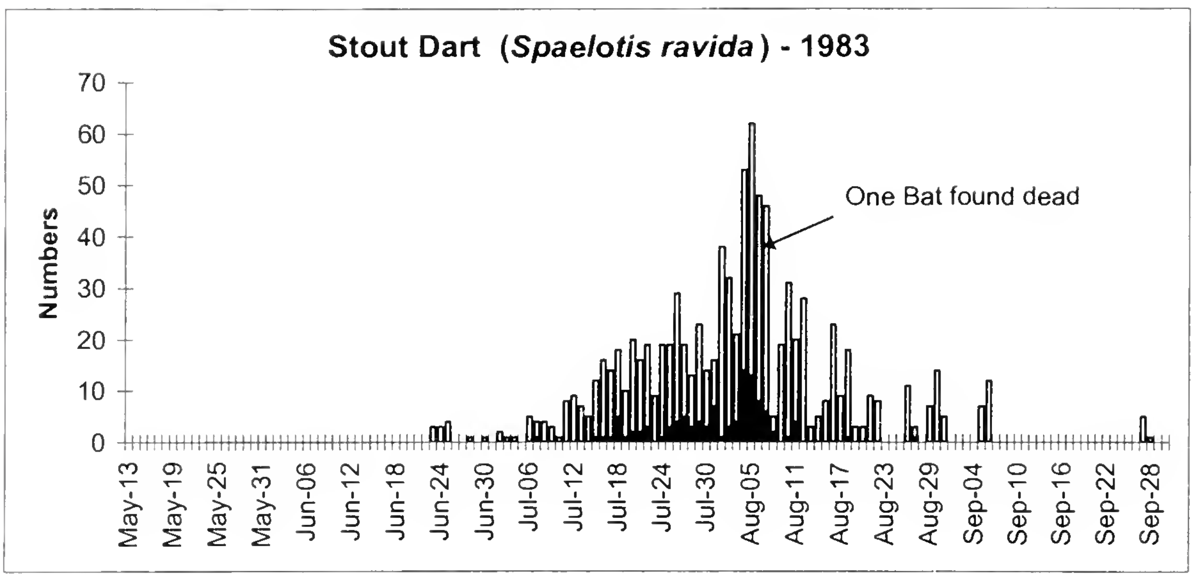


Figure 2. Total nos. of individual moths (wing remains) (clear + solid bars) and nos. of three species of noctuid moths (solid bar) collected daily in 1982 from under a feeding perch of a Brown Long-eared Bat in Bluntisham, Cambridgeshire.





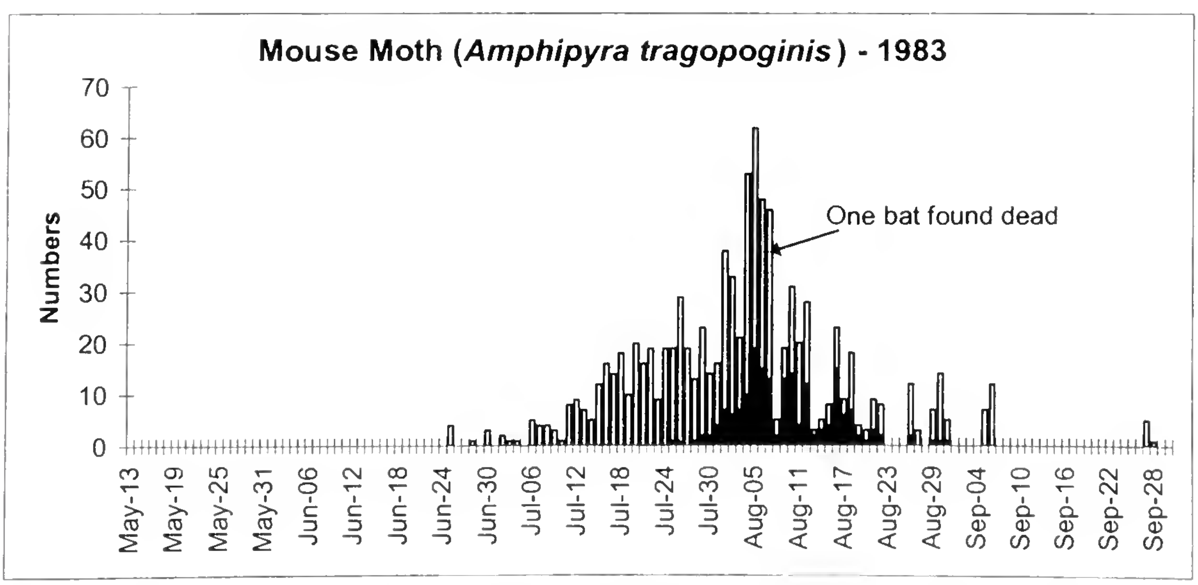


Figure 3. Total nos. of individual moths (wing remains) (clear + solid bar) and nos. of three species of noctuid moths (solid bar) collected daily in 1983 from under a feeding perch of a Brown Long-eared Bat in Bluntisham, Cambridgeshire.

may make up a higher proportion of the diet than this, suggesting that moths may be favoured prey items when they are readily available. In this study, discussion can therefore only focus on the larger moths, most smaller moths (including most Geometridae), along with arthropods of other orders, being presumed to have been consumed while the bat(s) was in flight or eaten whole while perching.

The very high proportion of noctuid moths (96%) identified from wing remains, compared with other families of moths, is consistent with expectations based on other surveys. This compares favourably with the 94% noctuids identified from the Skelton series in 1979 and 1980 (Thompson, 1982). At Sheffield in 1921 (Poulton, 1929), 98% of the 799 moths identified were Noctuidae. At Rossington the two series were made up of almost 100% Noctuidae, with the only other prey item being three Small Tortoiseshells.

Moths taken can be expected to reflect the habitat surrounding the roost of the bats and also reflect the habits of the moths themselves, i.e. their catchability (with respect to the bat), availability and palatability. So at Skelton, for example, the high proportion of Cabbage Moths (Table 3) reflected the presence of kitchen gardens in the vicinity of the feeding perch where brassicas were the predominant vegetable grown (Thompson, 1982). This species was also a frequent prey item at Bluntisham and again probably reflected the presence of brassicas in local vegetable plots. Most of the moth species found in this study therefore came as no surprise, being among the most common and frequently encountered species in suburban habitats in southern Britain and also among those most frequently taken at light traps in the area (Huntingdonshire, vice county 31) at the time of year that the bat was operating (Barry Dickerson *pers. comm.*).

The daily fluctuations in numbers of moths brought to the feeding perch is likely to reflect weather conditions on different nights; an analysis of the data with local meteorological data would probably confirm this. However if the bat uses more than one feeding perch, this may compound differences caused by weather.

Aestivating and roosting moths

Of the four most frequently found moths at the feeding perch, the abundance of the remains of the Dotted Rustic and the Stout Dart was certainly unexpected. The Dotted Rustic was not found in the samples of the earlier surveys referred to here (Table 3), however it did contribute to a very high proportion of the catch at Rossington in both 1984 and 1991, especially in 1984 (Table 3). This moth was also one of the species recorded by Warne (1985) at a bat feeding perch at Hilton in Derbyshire in 1984, but no numbers are given. The Stout Dart also occurred in significant numbers at Rossington in 1984.

The Dotted Rustic used to be considered as "nationally scarce" in Britain. However the appearance of the Dotted Rustic in the bat's diet corresponded with a population explosion of this species in eastern England, which started in the late 1970s (Waring, 1992). In fact the first county record for this species for the old county of Huntingdonshire was on 27 August 1979 (Scott, 1979). In 1980, a further 18 examples were recorded in Huntingdonshire, including the 9 found at the Brown

Table 1. Annual totals of moths (estimated from wing remains) collected from under a feeding perch of a Brown Long-eared Bat in Bluntisham, Cambridgeshire in the years 1980-1983.

Family	Sub-family	Species	Bradley no.	Species	1980	1981	1982	1983	Total
Hepialidae		Ghost Moth	14	*Hepialus humuli*		1	1	3	**5**
		Orange Swift	15	*Hepialus sylvina*		1	1	3	**5**
		Common Swift	17	*Hepialus lupulinus*	2	1	1		**4**
Oecophoridae	Depressariinae		715	*Agonopterix capreolella*		1			**1**
Pyralidae	Crambinae			*Crambus* spp.			2		**2**
			1304	*Agriphila straminella*		1			**1**
			1305	*Agriphila tristella*	1	1		1	**3**
	Schoenobiinae		1329	*Donacaula forficella*		1			**1**
	Pyraustinae	Small Magpie	1376	*Eurrhypara hortulata*			1	11	**12**
		Mother of Pearl	1405	*Pleuroptya ruralis*			1	1	**2**
	Pyralinae	Large Tabby	1421	*Aglossa pinguinalis*			2	2	**4**
	Galleriinae	Bee Moth	1428	*Aphomia sociella*		2	1	2	**5**
Thyatiridae	Thyatirinae	Buff Arches	1653	*Habrosyne pyritoides*		4	5	2	**11**
Geometridae	Sterrhinae	Small Blood-vein	1682	*Timandra comae*	1		1		**2**
		Riband Wave	1713	*Idaea aversata*	1			1	**2**
	Larentiinae	Garden Carpet	1728	*Xanthorhoe fluctuata*	1	3			**4**
		Yellow Shell	1742	*Camptogramma bilineata*				1	**1**
		Dark Spinach	1749	*Pelurga comitata*	1				**1**
	Ennominae	Swallow-tailed Moth	1922	*Ourapteryx sambucaria*		1		1	**2**
		Willow Beauty	1937	*Peribatodes rhomboidaria*		3		7	**10**
Notodontidae	Phalerinae	Buff-tip	1994	*Phalera bucephala*	1				**1**
Arctiidae	Arctiinae	Buff Ermine	2061	*Spilosoma luteum*	2	1			**3**
		Ruby Tiger	2064	*Phragmatobia fuliginosa*		1		1	**2**
Noctuidae	Noctuinae	Garden Dart	2082	*Euxoa nigricans*	14	7	3	21	**45**

Family	Sub-family	Species	Bradley no.	Species	1980	1981	1982	1983	Total
		Turnip Moth	2087	*Agrotis segetum*	1	7	25	10	**43**
		Heart and Dart	2089	*Agrotis exclamationis*		5	24	10	**39**
		Dark Sword-grass	2091	*Agrotis ipsilon*		3	2	12	**17**
		Shuttle-shaped Dart	2092	*Agrotis puta*	2			7	**9**
		Flame	2098	*Axylia putris*				1	**1**
		Flame Shoulder	2102	*Ochropleura plecta*				9	**9**
		Dotted Rustic	2105	*Rhyacia simulans*	9	111	158	113	**391**
		Large Yellow Underwing	2107	*Noctua pronuba*	17	26	14	17	**74**
		Lesser Yellow Underwing	2109	*Noctua comes*	11	17	4	25	**57**
		Least Yellow Underwing	2112	*Noctua interjecta*		3	7	18	**28**
		Stout Dart	2113	*Spaelotis ravida*	3	23	19	106	**151**
		Ingrailed Clay	2120	*Diarsia mendica*				3	**3**
		Setaceous Hebrew Character	2126	*Xestia c-nigrum*	1	13	3	33	**50**
		Double Square-spot	2128	*Xestia triangulum*			1		**1**
		Square-spot Rustic	2134	*Xestia xanthographa*	1	4	2	8	**15**
	Hadeninae	The Nutmeg	2145	*Dicestra trifolii*		1	1	3	**5**
		Cabbage Moth	2154	*Mamestra brassicae*	14	43	16	22	**95**
		Dot Moth	2155	*Melanchra persicariae*		6	1	2	**9**
		Bright-line Brown-eye	2160	*Lacanobia oleracea*	3	10	11	6	**30**
		Smoky Wainscot	2198	*Mythimna impura*	1	2	1	3	**7**
		Common Wainscot	2199	*Mythimna pallens*		2	2	4	**8**
	Cuculliinae	Dark Brocade	2250	*Blepharita adusta*			1		**1**
		Lunar Underwing	2270	*Omphaloscelis lunosa*			1	1	**2**
		Orange Sallow	2271	*Xanthia citrago*	1				**1**
	Acronictinae	Dark Dagger/Grey Dagger	2283/4	*Acronicta tridens/psi*	1		2		**3**
		Knot Grass	2289	*Acronicta rumicis*			1	1	**2**

Family	Sub-family	Species	Bradley no.	Species	1980	1981	1982	1983	Total
		Coronet	2291	*Craniophora ligustri*				1	**1**
	Amphipyrinae	Copper Underwing	2297	*Amphipyra pyramidea*	1	2			**3**
		Mouse Moth	2299	*Amphipyra tragopoginis*	24	67	19	177	**287**
		Straw Underwing	2303	*Thalpophila matura*	1	4		1	**6**
		Angle Shades	2306	*Phlogophora meticulosa*	1	26	23	22	**72**
		Dark Arches	2321	*Apamea monoglypha*	8	8	3	16	**35**
		Light Arches	2322	*Apamea lithoxylaea*	1	1	7	2	**11**
		Large Nutmeg	2333	*Apamea anceps*		2	4		**6**
		Rustic Shoulder-knot	2334	*Apamea sordens*		1	5		**6**
		Marbled Minor	2337	*Oligia strigilis*		1	5		**6**
		Cloaked Minor	2341	*Mesoligia furuncula*		2			**2**
		Common Rustic	2343	*Mesapamea secalis agg.*	13	117	51	134	**315**
		Flounced Rustic	2353	*Luperina testacea*		1	1	1	**3**
		Rosy Rustic	2361	*Hydraecia micacea*		4			**4**
		The Uncertain	2381	*Hoplodrina alsines*	1	3	2		**6**
		Mottled Rustic	2387	*Caradrina morpheus*			1		**1**
		Pale Mottled Willow	2389	*Paradrina clavipalpis*		1	1	2	**4**
		unknown species	-	unknown species			1		**1**
	Plusiinae	Burnished Brass	2434	*Diachrysia chrysitis*		1		1	**2**
		Silver Y	2441	*Autographa gamma*	4		12	63	**79**
		Spectacle	2450	*Abrostola tripartita*		1			**1**
	Catocalinae	Red Underwing	2452	*Catocala nupta*				1	**1**
	Ophiderinae	Herald	2469	*Scoliopteryx libatrix*	1	1	2	3	**7**
Totals:					144	548	452	895	**2039**
Number of species:									72

Long-eared Bat's feeding perch that year (Greatorex-Davies, 1981). The Stout Dart was also experiencing a time of relative plenty, Skinner (1984) states ". . .this species is now flourishing in many parts of southern, central and eastern England . . .".

Both these species emerge in late June and in July but can be found through to September or even October. Both aestivate for a time in refuges such as sheds, outhouses and other buildings, or under loose bark (Skinner, 1984). Dotted Rustics have been found aestivating together in numbers in outbuildings (Barry Dickerson *pers. comm.*).

Both the Dotted Rustic and the Stout Dart are caught in the Rothamsted light traps, but relatively infrequently. However, from those that have been caught it appears that the Dotted Rustic reached a peak in abundance between 1984 and 1988, whereas the Stout Dart seemed to peak between 1968 and 1978 (Ian Woiwod *pers. comm.*). Since then it appears that both species have declined.

The Mouse Moth emerges later than the preceding two species (as was reflected in the captures at Bluntisham, see Figures 1-3), but can also be found roosting together in numbers by day in similar situations. This moth is often abundant and occurs regularly in light traps. What is perhaps more interesting is that it is the most frequent species caught in the 12 metre Rothamsted suction traps, indicating that this species is a high flyer! (Ian Woiwod *pers. comm.*) (Taylor, 1974). The Mouse Moth was by far the most abundant moth caught in a Rothamsted suction trap at Cardington during August and September 1959 (Taylor & Carter, 1961). Greater than an order of magnitude more individuals (355) of this species was taken than the next most abundant species on that occasion, the Large Yellow Underwing (14), another apparent favourite of the Brown Long-eared Bat (Thompson, 1982).

The apparent selection of species that roost or aestivate in buildings etc. and under bark is intriguing. As has already been mentioned, Small Tortoiseshell butterflies are also sometimes included as prey items. Proportionately large numbers of Small Tortoiseshell wings (49 out of a sample of 128 forewings) were found at a Long-eared Bat perch in a church belfry in North Wales in late March 1995 (Chris Hall *pers. comm.*). Other species present (eg Large Yellow Underwing) indicated that at least some of the wing remains collected had been there since the previous summer. The Old Lady Moth (*Mormo maura*) (Linnaeus 1758) has also been found as a prey item on occasions (Poulton 1929; Chris Hall *pers. comm.*), including one in the porch of the church in Hemingford Grey, Huntingdonshire, in the summer of 1995. It may be that these bats are able to locate and exploit aestivating or roosting moths. Perhaps if one of a group of roosting moths flutters and is heard by a bat, the lives of the whole collection of hibernators are put in jeopardy. They can certainly readily locate and capture moving prey while on the ground (Poulton, 1929; Chris Hall *pers. comm.*), and these moths may roost in similar locations to the bats themselves, therefore becoming particularly vulnerable to predation. Swift & Racey (1983) found the remains of clothes moths (Tineidae) and blowflies (Calliphoridae) in faeces of Brown Long-eared Bats which were roosting in the attic of a large house. As both these types of insect commonly occur in such roof spaces, the authors suggest that the bats caught them inside the roost. Roer (1969) suggested that long-

Table 2. The percentage of the total number of moths identified from wing remains at the Bluntisham Brown Long-eared Bat feeding perch for the four most frequent moth species (all Noctuidae), remaining Noctuidae, other families and total Noctuidae for the years 1981-83.

Year:	**1980**	**1981**	**1982**	**1983**	**1981-83**	**All years**
Dotted Rustic *Rhyacia simulans*	6.3%	20.3%	35%	12.6%	20.2%	19.2%
Common Rustic *Mesapamea secalis* agg.	9%	21.4%	11.3%	15%	15.9%	15.4%
Mouse Moth *Amphipyra tragopoginis*	16.7%	12.2%	4.2%	19.8%	13.9%	14.1%
Stout Dart *Spaelotis ravida*	2.1%	4.2%	4.2%	11.8%	7.8%	7.4%
Other Noctuidae:	59%	38%	41.8%	36.8%	38.3%	39.8%
Other families:	6.9%	4%	3.5%	4%	3.9%	4.1%
Total Noctuidae:	**93%**	**96%**	**96.5%**	**96%**	**96.1%**	**95.9%**
Total numbers:	144	548	452	895	1805	2039

eared bats could locate stationary prey by smell, after finding that a captive bat confined in a cage with hibernating Herald Moths and Small Tortoiseshell butterflies would feed on them (quoted in Thompson, 1982).

However there may be other reasons for the predominance of these moths as prey items. For example, it could be the sheer abundance of the species concerned, or particular selection by the bat for these species from other situations (e.g. presence at honeydew, ability to identify from fluttering sounds or by smell), or some other unknown or unconsidered aspect of the moths' behaviour causing them to be particularly vulnerable to predation.

Aposematic moths

There is conflicting evidence as to whether some moths, notably the Arctiidae, are avoided by long-eared bats because they are distasteful. From this and the previous studies examined here, it would appear that arctiids are mostly avoided. Only two species of Arctiid were among the prey items identified at Bluntisham, the Buff Ermine *Spilosoma luteum* (Hufn.) (three specimens) and the Ruby Tiger *Phragmatobia fuliginosa* (L.) (two specimens). Arctiids were also found in other studies (Poulton, 1929; Thompson, 1982), but, as here, in low numbers and nearly all were the Buff Ermine. However two White Ermine *Spilosoma lubricipeda* (L.) were included in one of the series detailed by Poulton (1929). The Buff Ermine emerges slightly later and, having a lower level of toxins than the White Ermine, is likely to be less distasteful to the bat.

Table 3. Comparisons between different British surveys: the percentage of the total number of moths identified from Brown Long-eared Bat feeding perches at various sites in different years for the 19 most frequent species identified (overall) at Bluntisham, listed in order of abundance. Data for Sheffield and "various" are taken from Poulton 1929; Skelton: Thompson 1982; and Rossington: Howes 1996.

P = present, but in very low numbers; - = not recorded; blank square = data unavailable.

Year:	**1921** Sheffield	**1929** Various	**1979** Skelton (York)	**1980** Skelton	**1980** Bluntisham	**1981** Bluntisham	**1982** Bluntisham	**1983** Bluntisham	**1984** Rossington (Doncaster)	**1991** Rossington
Total no. of moths in sample:	**799**	**529**	**160**	**809**	**144**	**548**	**452**	**895**	**48**	**149**
	%	%	%	%	%	%	%	%	%	%
Dotted Rustic *Rhyacia simulans*	-	-	-	-	6.3	20.3	35.0	12.6	67.0	29.5
Common Rustic *Mesapamea secalis* agg.	9.9	5.5	5.6	9.8	9.0	21.4	11.3	15.0	-	0.7
Mouse Moth *Amphipyra tragopoginis*	4.9	8.3	1.9	-	16.7	12.2	4.2	19.8	13.0	6.0
Stout Dart *Spaelotis ravida*	-	-	-	-	2.1	4.2	4.2	11.8	6.0	-
Cabbage Moth *Mamestra brassicae*	5.3	4.0	20.6	9.8	9.7	7.8	3.5	2.5	-	-
Silver Y *Autographa gamma*	1.1	4.2	10.0	18.0	2.8	-	2.6	7.0	-	-
Large Yellow Underwing *Noctua pronuba*	22.9	33.3	16.8	29.2	11.8	4.7	3.1	1.9	2.0	20.8
Angle Shades *Phlogophora meticulosa*	0.6	1.1		p	0.7	4.7	5.1	2.5	-	-
Lesser Yellow Underwing *Noctua comes*	6.5	7.4	26.8	10.9	7.6	3.1	0.9	2.8	2.0	12.1

Year:	1921 Sheffield	1929 Various	1979 Skelton (York)	1980 Skelton	1980 Bluntisham	1981 Bluntisham	1982 Bluntisham	1983 Bluntisham	1984 Rossington (Doncaster)	1991 Rossington
Setaceous Hebrew Character *Xestia c-nigrum*	-	0.4	-	-	0.7	2.4	0.7	3.7	-	-
Garden Dart *Euxoa nigricans*	-	0.9	-	-	9.7	1.3	0.7	2.3	-	-
Turnip Moth *Agrotis segetum*	0.9	1.3	-	-	0.7	1.3	5.5	1.1	-	2.7
Heart and Dart *Agrotis exclamationis*	0.4	1.1		p	-	0.9	5.3	1.1	-	3.3
Dark Arches *Apamea monoglypha*	26.4	13.4	6.9	6.7	5.6	1.5	0.7	1.8	6.0	13.4
Bright-line Brown-eye *Lacanobia oleracea*	0.3	1.1	-	1.4	2.1	1.8	2.4	0.7	-	-
Least Yellow Underwing *Noctua interjecta*	-	-	-	-	-	0.5	1.5	2.0	-	-
Dark Sword-grass *Agrotis ipsilon*	-	0.8	-	-	-	0.5	0.4	1.3	-	-
Square-spot Rustic *Xestia xanthographa*	0.6	0.2	-	-	0.7	0.7	0.4	0.9	-	0.7
Small Magpie *Eurrhypara hortulata*					-	-	0.2	1.2	-	-
Buff Arches *Habrosyne pyritoides*	-	-		0.1	-	0.7	1.1	0.2	-	-

At the Skelton feeding perch in 1979 a single specimen of the Garden Tiger moth *Arctia caja* (L.) was found (Thompson, 1982). The moth was untouched except for tooth marks deeply embedded in its thorax, suggesting that the moth was dropped in disgust!

In contrast to the above, on 17 June 2002, Martin Corley (*pers. comm.*) found mostly arctiid remains at a long-eared bat's feeding perch on his farm in Oxfordshire. At the perch he found the wing remains of at least 25 Buff Ermines and seven White Ermines. The only other moth remains he found at the perch were those of six Ghost Moths *Hepialus humuli* (L.) and one Large Yellow Underwing. This bat at least seemed to like these arctiids.

Acknowledgements

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Geranium Bronze *Cacyreus marshalli* (Butler, 1898) (Lep.: Lycaenidae) and other interesting butterflies on Fuerteventura, Canary Islands

I visited Fuerteventura during March and April of 2004 in two entomological trips. Several butterflies species were seen at the west and south of the islands. One example of *Danaus plexippus* (L.) was seen at Vega de Río Palmas while *Danaus chryssipus* (L.) was flying between Betancuria and the last locality, and probably, belongs to the Barranco de Ajui population. Its food plant is, in this island, *Callanma burchardi*, which grew in some locations at Vega de Río Palmas. In this area there were also many *Euchloe belemia hesperidum* (Rothschild), only seen in March, as well as *Pontia daplidice* (L.), *Colias crocea* (Fourc.), *Euchloe charlonia* (Donzel), *Vanessa cardui* (L.) and *Polyommatus icarus* (Rott.), all of them seen in March and April.

At the southern end of Fuerteventura (Jandía), near Morro Jable, I caught one example of *Zizeeria knysna* (Trimen), which has a few records from this island. This lycaenid was flying closed to damp ground into the hotel. On 9 April, while I was investigating the presence of *Leptotes pirithous* (L.) on the edge of the salt marsh in front of lighthouse, I could see several specimens of *Cacyreus marshalli* and caught one male. Inside the hotel where I stayed, another male was caught and I also saw a female. The presence of this butterfly in Fuerteventura could be the result of accidental introduction from the neighbouring island (Lanzarote) through the trade in ornamental plants between both of islands (although I could not find any signs of eggs or larvae on plants of *Pelargonium* sp.). On the other hand it could, perhaps, have come with the dust-laden strong winds that often they arrive from the nearby African coast, approximately 114 kilometres distant. This is a new record of this butterfly for Fuerteventura which, apparently, continues its advance through all the Canary Islands.— BENEDICTO ACOSTA FERNANDEZ, Molino de Viento,19. 3° B, 35004 Las Palmas de Gran Canaria, Spain (E-mail: benedictoacosta@redfarma.org).

A surprising record for *Eucosma tripoliana* (Barrett) (Lep.: Tortricidae)

On the night of 13 August 2004, I operated a m.v. moth trap in the garden of my sister-in-law at Longbridge Deverill, Wiltshire. It was something of a surprise in the morning to find three slightly worn specimens of *E. tripoliana*, sufficiently remarkable for me to dissect one to confirm the identity. Not only does this constitute a new county record, but the site is inland, about 50 miles from the coast whether north and south, and the only known food plant *Aster tripolium* is consequently not recorded anywhere near this locality. The species is not known to migrate and there were no other indicators of migrant activity in the trap. The remaining option is that an alternative host plant is being used, the trap was placed near the Wylie river, so an examination of riverside Compositae might be worthwhile. — DAVID AGASSIZ, 23 St James's Road, Gravesend, Kent DA11 0HF.

Tree Lichen Beauty *Cryphia algae* (Fabr.) (Lep. Noctuidae), breeding in Britain

The remarkable coincidence of *Cryphia algae* visiting my garden mv light at Dartford, Kent in the three consecutive years 2000, 2001 and 2002, one specimen in each year, in a locality rarely associated with immigrant moths from the Continent, was reported in *Ent. Rec.* **115**: 39. The moth was first reported in Britain 1859 in Cheshire, doubtless having arrived amongst imported material; records of immigrants did not commence until the 1990s. In 1990, a specimen was reported in Guernsey by Michael Chalmers-Hunt and Bernard Skinner (*Ent. Rec.* **104**: 123). In 1991, two examples were recorded on the south coast of England, to be followed by two more in 1992 and six in 1995 (Burrow, *Ent. Rec.* **108**: 153). The peak of this invasion during the 1990s occurred in 1996, thirteen specimens being seen along the south coast of England, and one inland at a garden in Bishop's Stortford, Hertfordshire (summarised in Skinner and Parsons, *Ent. Rec.* **111**: 153). Subsequently numbers seen annually fell and in 2000 only five specimens were recorded for the south coast, plus one at Dartford, (summarised by Skinner and Collins. *Ent. Rec.* **116**: 15). The example that I recorded at Dartford in 2002 was not the only one to be seen in north-west Kent in that year, five being noted at Barnehurst by Tony Steele at his garden m.v. light, in a large mainly residential area two and a half miles to the north (Waring, 2003. *British Wildlife* **14**: 211).

In 2003, two moths were observed at Dartford, on 27 July and 10 August, and others were seen at Barnehurst. In addition to immigrants recorded on the south-east coast of Kent, four specimens were seen in Regents Park, Central London, by Tim Freed, the first on 8 July being significantly earlier than the main invasion on the coast (Plant, 2003. *Ent. Rec.* **115**: 292).

In 2004, my garden mv light attracted fifteen examples of *Cryphia algae* on 27 July (1), 30 July (1), 31 July (2), 21 August (3), 4 August (1), 6 August (1), 7 August (2) and 8 August (4). This provides substantial evidence for the presence of a local breeding colony. However, of more significance is the experience of Tony Steele at Barnehurst, which he has kindly given me permission to quote. His garden light trap attracted forty-seven specimens of *C. algae* from 27 July to 22 August, with a maximum of nineteen on 29 July. Of these, the 34 examples seen up to and including 29 July were removed and not released until after 29 July, precluding duplicate sightings.

Dartford and Barnehurst, although close to the Thames Estuary, are nevertheless remote from the coastal locations visited in small numbers by immigrant *C. algae* each year for over a decade. The evidence suggests a local breeding population of the species in a restricted area of north-west Kent, probably for a period of four years. My garden, within close proximity to a large mixed woodland, suggests that the latter might be the focus of local breeding, but the Barnehurst experience indicates otherwise, and that this species' habitat comprises the gardens, wasteland and parkland of residential estates in these instances, perhaps also mixed woodland in the case of Dartford.— B. K. West, 36 Briar Road, Dartford, Kent DA5 2HN.

Hazards of butterfly collecting. Pity poor Buddha – South India, September, 1986

I set out with Gordon Thompson on 16 September 1986 in search of *Papilio buddha* Westwood. It was extremely rare in the Nilgiri Mountains where I lived at the time, and generally rare everywhere (I had seen only three in four months). It was also usually impossible to catch. *P. buddha* (the Buddha Peacock) is one of the metallic green Swallowtails of the *Papilio palinurus*-group. It is among the most beautiful butterflies in India, or for that matter the world; all the Peacock Swallowtails are beautiful but somehow the tone of green, vivid yet soft, and lacking any blue gives it an edge, perhaps a lack of some slight garishness. Gordon knew a place some 200 km further north in the Kanara District of Karnataka State, and that was where we were heading.

Papilio buddha is strictly endemic to the true lowland rainforests of the Western Ghats and does not extend to Sri Lanka; this pattern is shared with Malabar Banded Swallowtail *P. liomedon* Moore and the Malabar Raven *P. dravidarum* Wood-Mason, as well as red-bodied Malabar Rose *Pachliopta pandiyana* Moore. The huge Southern Birdwing *Troides minos* Cramer is somewhat more robust, frequenting also less dense forest and higher altitudes. The Crimson Rose *Pachliopta hector* L., the Blue Mormon *Papilio polymnestor* Cramer and the Common Banded Peacock *Papilio crino* Fabricius inhabit drier areas, though *P. polymnestor* also flies in forest; all three extend to Calcutta and Bangladesh, but are still effectively South Indian endemics, and do not reach Calcutta every year. Finally, the Paris (Tamil) Peacock *Papilio paris tamilana* Moore is so distinctive that it could be considered a species in its own right. So, *P. buddha* forms part of an unusually large group of endemic and semi-endemic Swallowtails given the relatively low overall level of endemicity in South India.

Gordon had fixed us up with a lovely forest bungalow, inside the forest along a lovely river, and we had a simple dinner. Gordon promised better next day, for he would be casting for *masheer* in the river bubbling past our veranda. We listened to the 22.00 news on the BBC World Service; of all things to take to the bush a radio capable of getting the World Service is the one I would most miss.

Over breakfast Gordon told me that his *buddha*-place had been discovered about fourteen years earlier and had been the only place they knew where *P. buddha* was quite common. It was on some old temple grounds, about 150 metres from the forest edge, a wasteland that had numerous large *Clerodendron squamosum* bushes, with their huge, almost spherical scarlet flower-clusters. All Swallowtails in the area converged on these flowers in the morning hours from 09.00 till 13.00. Gordon also said that *buddha* was attacked by a species of sunbird that did not attack other Swallowtails, which sounded odd; he said there would be ample opportunity to observe it.

We reached the spot early; Gordon insisted that we should see the first Swallowtails actually leaving the forest. There were hardly any butterflies when we arrived, but soon they started coming, in ones or twos. Once there, they stayed for a long time, and soon more Swallowtails were milling about than I have ever seen on a single flower patch. It did not take long to get a good series of all the South India endemics and some voucher material of the other *Papilio*. *Pachliopta*, *Chilasa*, and *Graphium* were very thin on the ground so we got 'only' 12 Swallowtails in all – out of a South Indian total of 19.

There were several Sunbirds around, too. Of these, only one would chase or attack the *P. buddha*. This was the male of the tiny Purple-Rumped Sunbird *Nectarinia zeylonica sola* Viellot, which arrived on the scene a bit later than the first *P. buddha*. The moment a male of one of these Sunbirds spied a *P. buddha* approaching, they flew off to intercept, with audible clicks of the beaks. The much larger butterfly was mostly chased off without evident harm, but sometimes bits of wing fell off first, and in one case the forewing costa was broken and the butterfly wholly disabled. Those *P. buddha* that managed to reach the flowers, suffered less aggression. During our two days we saw more than 25 such attacks.

The immediate thought was that the Sunbird was trying to protect an important food source, *Clerodendron* being a fine nectar plant not only in India. However, no other Swallowtails were attacked, though their flight patterns were quite similar, and none of the few Sunbirds of other species ever attacked butterflies at all – nor did females of the perpetrator. I believe the true answer is that the Sunbird looks at *P. buddha* as a supernormal rival. The green band of the Swallowtail is of just the same tone as the crown and scapulars (wing-shoulders) of the bird, but much more extensive. The evidence was a bit too thin for acceptance of the paper by a major ornithological journal, but I do not have the imagination to find another reason. For more information on South Indian Swallowtails and *P. buddha* see my separate papers (1987. *Papilio Intl.*, **3**:202-205, and 1998. *Papilio Intl.*, **4**: 275-294).

In the afternoon we collected in the forest but saw very few Swallowtails. At 15.00 Gordon went off fishing for *masheer*, one of the best sporting fish in India. I went to see him in his little pool and was able to imagine that it was a pleasant way of passing time. He only got two fish, each adequate for one person; the taste of *masheer* is great, the eating of food gathered by your own expedition giving an added pleasure. But those small additional, free trifurcate bones are a nuisance. I would prefer my fish bigger, which is still possible in India. Gordon later showed me pictures of some of his best catches, sometimes in rivers so small they looked incapable of housing a family of sticklebacks.– TORBEN B. LARSEN, Bangladesh, World Bank, 1818 H. Street N. W., Washington D.C., 20433, USA (E-mail: torbenlarsen@compuserve.com).

Butterfly Recording Scheme for Cyprus – a request for records

Readers with an interest in the butterflies of Cyprus may well be aware that I have published distribution maps, based on UTM 10 km squares (John, E. 2000. Butterflies of Cyprus 1998 (Records of a year's sightings) in *AES Pamphlet* No.15). The addition of records from many more sources enabled updated versions of these maps to be published in Makris (2003. *Butterflies of Cyprus*. Bank of Cyprus Cultural Foundation, Nicosia).

I am now in the process of converting all records to re-distribute them within UTM 5 km squares, and hope to have these published in the not too distant future. I should be most interested to hear from any reader who has not previously been in touch and who may have records to contribute – whatever the vintage. Those who contributed significantly to the records for Makris (2003) received a complimentary copy of the book, courtesy of the publishers. While I cannot commit myself to making a similar offer, this will again be my intention. I mention this merely as an alluring incentive!

Anyone wishing to have more information on the Recording Scheme, or on the butterflies of Cyprus, is invited to visit my website http://www.grayling.dircon.co.uk/index.html or is most welcome to contact me direct.— EDDIE JOHN, Davies Cottage, Penllyn, Cowbridge, Vale of Glamorgan CF71 7RQ (E-mail: eddie@grayling.dircon.co.uk).

Barberry Carpet Moth *Pareulype berberata* (D. & S.) established in Lincolnshire

On 29 June 2004, I was most pleased to beat a single larva of the Barberry Carpet moth *Pareulype berberata* from the site in Lincolnshire where we have been making efforts to establish a population of this endangered species, for which collecting without a licence is illegal under Schedule 5 of the Wildlife & Countryside Act (1981). The larva was released back onto the bushes and beating was limited so as not to overly disturb the rest of the population. The significance of the discovery is that it confirms that the moth has bred for a minimum of six generations in the wild in Lincolnshire since the last release of livestock (900 larvae) at this site on 13 July 2001. The first release (1300 larvae) was in June 1999, with a second release (569 larvae) on 28 June 2000. Prior to this project, the Barberry Carpet moth was last seen in Lincolnshire on 22 May 1918, by the Rev. S. Proudfoot at North Somercotes (Duddington & Johnson, 1983. Lincolnshire Naturalists' Union). During the late 1980s and 1990s, I made several attempts to find the species in Lincolnshire, Nottinghamshire and Yorkshire, but without success, including numerous searches over a ten year period at the release site. The Barberry Carpet formerly occurred in many counties in England, and reached at least as far north as Yorkshire, but it has declined massively as a result of agricultural measures to eradicate Barberry from the countryside (Waring, 2000. *British Wildlife* **11**: 175-182). Bushes of Common Barberry *Berberis vulgaris*, the sole larval foodplant in the wild, have been grubbed up by many farmers, where-ever found, ever since the late nineteenth century when

Barberry was discovered to be a secondary host of the Wheat-rust fungus *Puccinia graminis*. Barberry eradication was being recommended by the Ministry of Agriculture, Food and Fisheries (MAFF) at least as recently as the 1970s and I have seen that it still takes place, even though the modern strains of Wheat now grown are rust-resistant. By 1987, only one population of the Barberry Carpet Moth was known to survive in England and this was lost in the 1990s as a result of scorching of the occupied bushes by a fire in an adjacent field of stubble. Further information on this moth and its conservation is provided in the selected references below and in a series of confidential reports to English Nature.

The establishment project in Lincolnshire is part of a species recovery programme which has been funded by English Nature and is in partnership with the Lincolnshire Wildlife Trust. I am now continuing the Lincolnshire part of the project with support from Writtle College, Essex.— PAUL WARING, Reader, Centre for Environment & Rural Affairs, Writtle College, Essex. Contact address: Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6 LS (E-mail: paul_waring@btinternet.com).

A weekend's mothing on Alderney

From 14-16 May 2004 Dr Phil Sterling joined my wife Pat and me as guests of Dr Struan Robertson on Alderney. Our visit coincided with the Alderney Wildlife Trust's Wildlife Weekend and we were able to join in some of their events, notably the evening bat walks lead by Struan and a boat trip to see the offshore Gannet colonies. Alderney is the third largest of the Channel Islands and the most northerly. It is also the closest to France; the Normandy coast, some eight miles away, can often be seen clearly. Indeed, on several occasions during our visit, the enormous nuclear waste reprocessing plant at Cap de la Hague was glimpsed glinting alarmingly in the late spring sunshine.

Although the island is small, about 3½ miles long by 1½ miles wide and covering under 2000 acres, there is a variety of habitats including rocky shores, sandy beaches and dunes, wetland, nutrient-poor grassland and heathland. Even though the island has sometimes been described as being treeless – as long ago as 1862 Ansted and Latham in *The Channel Islands* held that "Alderney and Sark are very badly provided with trees" - this was not our impression (nor of Sark). Certainly this view might still be gained today when approaching the island by air, but the valleys and a number of other areas are wooded, although there appeared to be few trees older than 60 years as large numbers were felled for fuel by the German occupying forces during the latter part of World War II. Ash *Fraxinus excelsior*, Sloe *Prunus spinosa* and *domestica*, Grey Willow *Salix cinerea* ssp. *cinerea* and some short-lived Elm *Ulmus* spp. suckers are present, but Sycamore *Acer pseudoplatanus* is by far the most common species. But if the island does not completely want for trees, it does lack hedgerows, and this deficit is a relic of a strip agriculture and communal rough grazing system, which was employed well into the last century.

In preparation for our visit, a search of the literature revealed that nothing has been published on the Lepidoptera of Alderney, certainly in the journals available to us, since the Guernsey naturalist Luff published a series of five papers in the years from 1874 to 1903. However, Rich Austin, the Guernsey Moth Recorder, was able to provide us with a list of 229 macrolepidoptera and 108 microlepidoptera species made up mainly of his own observations and those of visitors whose records had been passed to him, and to this we were able to add a further 18 species.

Actinic light traps were run at two sites. In Struan's garden in St. Anne we took the Scarce Chocolate-tip *Clostera anachoreta* which has been the subject of a separate note in this journal (*antea*. 222). In a wooded area near Longis Common we were pleased to find the Early Tooth-striped *Trichopteryx carpinata* which has been recorded from La Manche, Normandy, although not from the area closest to Alderney. This is a new vice-county record. In the same area the galls of *Monochroa cytisella* were noted on Bracken *Pteridium aquilinum* and larvae collected from a White Poplar *Populus alba* proved on rearing to be those of *Gypsonoma aceriana*.

Also in St. Anne, we found three case-bearing species all of which are new to the island: at our host's house, larvae and adults of the Common Clothes Moth *Tineola bisselliella* were noted in and around a piece of discarded carpet. At the cricket ground at Les Buttes, during a barbecue, the cases of *Bankesia conspurcatella* were found in great numbers on fences posts just below the level of the grass, a habitat quite different from those in which we have found the moth on Guernsey and Sark (Costen, 2003, *Ent. Rec.* **115**: 224-225; Sterling & Costen, in press, *Ent.Gazette*). On several algae-covered walls Phil found many cases of *Luffia ferchautella* which is of particular interest as only *Luffia lapidella* had been recorded previously from the Channel Islands. The cases were notably smaller than those of *lapidella* and from the several he collected only females emerged but then, in September, hundreds of tiny larvae with minuscule cases were seen crawling around the pot in which the females were being kept. In the absence of any males these must have developed parthogenetically, hence their identification as *ferchautella*.

The extent of coastal heathland, about 400 acres, mostly concentrated to the south-west of this small island, surprised us. We noted the beautiful Spotted Rock-rose *Tuberaria guttata* in large numbers, and the Greater Broomrape *Orobanche rapum-genistae*, which is parasitic on Prostrate Broom *Cytisus scoparius maritimus*, was also surprisingly frequent. Some of the moths found there, although new to the island list, were not unexpected, for example, *Pempelia palumbella* and *Eudonia angustea*, but another pyralid, *Mecyna asinalis*, was remarkable because its foodplant, Wild Madder *Rubia peregrina*, is very rare on Alderney. However, the one known stand of the plant showed the typical signs of *asinalis* feeding and Phil found a larva although, unfortunately, I failed to rear it through to the adult stage. Interestingly, there are three reliable recent records of this moth from Guernsey where Wild Madder was last recorded in 1870.

Further to the west, at La Giffoine, a search of the Prostrate Broom produced larvae of three species which were all reared through to the adult stage: *Agonopterix scopariella, Agonopterix nervosa* and *Mirificarma mulinella*.

At Saye Bay, on the north of the island, a search of the Sea-holly *Eryngium maritimum* specifically for larvae of *Agonopterix cnicella* was successful and the single larva found was reared through to the adult stage. This was of special interest as several previous searches on Guernsey, and especially on Herm, had proved unsuccessful. And at Crabby Bay some old stems of Viper's-bugloss *Echium vulgare* were gathered and a month later produced a large number of *Tinagma ocnerostomella*. Both of these species are new vice-county records. At Braye Bay Phil found a larva *of Acleris aspersana* feeding on Creeping Cinqufoil *Potentilla reptans* and two adults of *Aproaerema anthyllidella*.

Finally, since Phil mentioned to me in passing several years ago that the moth I had been recording for some time in Guernsey as *Cydia succedana* was in fact not that species at all but *Cydia ulicetana*, and that *succedana* was a different species apparently not found in Britain, I have become interested in this common tortricid which is found in numbers in Guernsey wherever Gorse *Ulex europaeus* grows. A short series was collected from several parts of Alderney and on dissection all proved to be *ulicetana* as has been the case with specimens examined from Guernsey, Sark and Herm.

As always I am grateful to Phil Sterling for his support and on this occasion especially for checking a few of my *ulicetana* dissections. Struan Robertson could not have been more hospitable nor Roland Gauvain and Graeme Neal of the Alderney Wildlife Trust more helpful.— P. D. M. COSTEN, La Broderie, La Claire Mare, St. Peters, Guernsey GY7 9QA. (E-mail: pcosten@guernsey.net).

Lymantria monacha (L.) (Lep.: Lymantriidae): extension of range

This species seems not to have been an inhabitant of north-west Kent, including what is now regarded as south-east London, for some two hundred years, excepting at Darenth Wood during the 1860s and the West Wickham area a decade earlier (Chalmers-Hunt, 1961-63. The Butterflies and Moths of Kent. Suppl. *Ent. Rec.* **74**: 58). As that author suggests, the species had a largely Wealden distribution in Kent. A hundred years later, in the mid-twentieth century, the species was again reported as present in the West Wickham area, due to a lack of published records or a recrudescence following long absence. Also, in the 1940s it was noted in the well-wooded Petts Wood neighbourhood. However, no further records appeared in Chalmers-Hunt's work, which included records until 1980.

Two male *Lymantria monacha* observed on a high wall behind a street light at Dartford on 24 August 1946 seem to be the first for this area. The location is not far from my present residence where I commenced to operate an m.v. light in 1969 However, more than fifty years were to elapse before *L. monacha* came to the light, suggesting that the 1946 specimens were vagrants from elsewhere. Two males were attracted to the light in 2002, on 28 July and 3 August. A further specimen arrived on 30 July 2003 and in 2004 two more appeared – on 20 and 25 July. This suggests the species may be established locally, probably in the neighbouring mixed woodland, indicating an extension of range as has occurred with several other species in north-west Kent for the first time, or after a very long apparent absence, such as *Hyloicus* *pinastri* (L.), *Eilema depressa* (Esp.)., *Aporophyla nigra* (Haw.) and *Chloroclysta siterata* (Hufn.)— B. K. WEST, 36 Briar Road, Dartford, Kent DA5 2HH.

EDITORIAL NOTE: Records of Black Arches *Lymantria monacha* in Hertfordshire and Middlesex appear to confirm B. K. West's supposition that this species is extending its range. In these two counties, the species began to appear during 1997 and 1998 at well-recorded sites from which it had until then been apparently absent (see discussion and distribution map in Plant, 1999. *London Naturalist* **78**: 147 – 171). In Hertfordshire alone, published records suggest (Foster, 1937. *Trans. Herts Nat. Hist. Soc.*) that it was widespread in the older woodlands of southern Hertfordshire from around 1890 to the 1930s (though this is supposition as Foster's records were seldom accompanied by dates). However, in the years from about 1950 to 1970 there were reports from only four sites. In the years 1997 to 2003, on the other hand, the Herts Moth Database shows records from no less than 60 sites and these are spread across the entire county including the largely oak-free northern half, on the border with Cambridgeshire, suggesting that some other trees or trees and being used by the larvae. I have recorded larvae feeding on Hornbeam in Hertfordshire in 2000.— COLIN W. PLANT

Some observations on moths nectaring at flowers

Like many entomologists, I have piles of diaries, field note-books and files stacked full of interesting observations which I have never reported. The writing of the new Field Guide to Moths (Waring, Townsend & Lewington, 2003) provided an all too brief opportunity to re-examine some of these accumulated data. One of the topics I seem to have recorded a lot of information about and never brought together concerns moths nectaring at flowers at dusk and after dark. A brief search of the standard textbooks of the last 150 years shows that many include a short discourse on the value of examining natural attractants including flowers, over-ripe fruit, aphid honeydew and oozing sap when searching for moths. Generally, the merits are extolled of investigating catkins of sallows such as Goat Willow *Salix caprea* in the spring, Ivy blossom *Hedera helix* in the autumn, and plants such as Ling Heather *Callnna vulgaris* and Common Ragwort *Senecio jacobaea* in the summer, Honeysuckle *Lonicera periclymenum* for long-tongued hawk-moths such as the Large Elephant Hawk *Deilephila elpenor*, along with inspections of naturalised exotics such as Buddleia *B. davidii*, Red Valerian *Centranthus ruber* and garden cultivars of Tobacco plant *Nicotiana* spp. and Phlox *Phlox paniculata*. If you want more detail on which species visit what and when, one of the best sources is still J.W. Tutt's "Practical Hints for the Field Lepidopterist (1901-1905, reprinted by the AES in 1994), which is always a source of inspiration and fascination. Having re-read the above and conducted a brief computer literature search, which of course failed to find the myriad of relevant observations included in reports of field meetings and excursions in the entomological journals, I include the following thoughts and observations as a small and possibly preliminary contribution to compliment others on the subject, and in the hope that it will stimulate others to report the more interesting of their discoveries.

Numbers of moths visiting flowers after dark

First I find that the numbers of moths seen visiting flowers are seldom reported. On a good night considerable numbers can be seen. For example, on the night of 31 July 1984 I counted the following moths nectaring at the flowers at 22.00 hours, just after dusk, on a 100 metre by 3metre stretch of a somewhat larger stand of flowering Creeping Thistle *Cirsium arvensis* growing along the main north-south ride through the centre of Waterperry Wood in Oxfordshire:

> Mottled Beauty *Alcis repandata* 17 individuals, Common Footman *Eilema lurideola* 13, Small Fan-footed Wave *Idaea biselata* 9, Common Wave *Cabera exanthemata* 8, July Highflyer *Hydriomena furcata* 7, Rosy Footman *Miltochrista miniata* 4, Maiden's Blush *Cyclophora punctaria* 3, Dunbar *Cosmia trapezina* 2, Common Emerald *Hemithea aestivaria* 2, Common Rustic/Lesser Common Rustic *Mesapamea* agg. 2, Dark Umber *Philereme transversata* 1, Snout *Hypena proboscidalis* 1. Total 68 macro-moths of 12 species.

The previous night had seen the first significant rain for weeks. It remained cloudy that morning, clearing to a sunny warm afternoon and a clear, still evening with an air temperature of 12°C and a new crescent moon when the above count was made. The results demonstrate that geometrid moths are sometimes much more numerous than noctuids in visiting flowers and that arctiids such as the Common Footman also can be frequent.

Comparison with moths at sugar

The moths visiting flowers on a particular night can be quite a different range of species to those visiting sugar, wine-ropes and other such baits on the same night. For example, on the same night the above count was made on flowers, I painted single vertical sugaring strips 30 cm × 2 cm on the trunks of 15 trees along the edge of the same woodland compartment. The sugaring mixture comprised Fowler's black treacle, stale Guinness beer and a couple of drops of amyl acetate. About thirty moths of five species were recorded, as follows:

> Common Rustic/Lesser Common Rustic 1 or 2 per strip, Dark Arches *Apamea monoglypha* 1, Herald *Scoliopteryx libatrix* 1, Smoky Wainscot *Mythimna impura* 1, Heart and Dart *Agrotis exclamationis* 1.

The sugar attracted only noctuid moths and only one of the species seen at the flowers, even though the most numerous moths on the flowers were geometrids and arctiids. I have recorded a few of the latter, and of other families such as the Thyatiridae, at this particular blend of sugaring mixture on other nights, but it seems general experience that noctuid moths overwhelmingly predominate at this type of attractant.

Flower inspection for recording less frequent moths

Although the majority of species seen visiting flowers are likely to be those also numerous at light-traps in the same habitat, less frequently seen species also turn up regularly, such as the Dark Umber above, so a search of the flowers in the neighbourhood is always worthwhile to compliment light-trapping and other field techniques. Examination of flowers such as Lesser Burdock *Arctium minus* and Teasel *Dipsacus fullonum* can be the best way of seeing the Square-spotted Clay *Xestia rhomboidea* early in the night because it has proved to be generally a late arrival at light-traps, often not entering them until well after midnight and thus being missed by some people who do not trap all night (see *British Wildlife* **14**: 134).

There are some well-known reports of flowers used as day-time lures for particular species, such as the Broad-bordered White Underwing *Anarta melanopa*, which can be attracted by taking scented garden flowers such as Cherry Laurel *Prunus laurocerasus* up into its montane moorland habitats. The same technique has been used for the Bee Hawk-moths *Hemaris* spp. in the lowlands. Clearwing moths are sometimes found at flowers such as Common Hawthorn *Crataegus monogyna*.

Moths visiting flowers of grasses and reeds

I have often seen moths such as the Angle Shades *Phlogophora meticulosa* and various of the wainscots such as the Smoky Wainscot, Common Wainscot *M. pallens* and Striped Wainscot *M. pudorina* visiting the flower-heads of grasses in meadows and sand-dunes, and of Common Reed *Phragmites australis* in fens. Frequently such flower-heads are found to be sticky with the products of ergot fungus, which is the reason the moths are visiting them, as Angus McCrae and I discovered for ourselves about twenty years ago, never got round to publishing at the time, but which was subsequently reported via Jon Clifton (*Atropos* **10**: 53).

A few interesting records of nectaring moths

The extent to which moths show preferences for particular species of nectar flowers is likely to vary from one species to another. Some are not very choosy. The subject of flower selection and preference has received much more attention from butterfly enthusiasts. Factors such as proboscis length and the dimensions of flowers are important, colour and scent may be and of course not all flowers produce nectar, and some only at certain times of the day or night. In my own garden, it is obvious that Gatekeeper butterflies *Pyronia tithonus* mainly visit our Fleabane *Pulicaria dysenterica* and are seldom seen on the Hemp Agrimony *Eupatorium cannabinum* flowering alongside at the same time, and much loved by nymphalids such as the Peacock *Inachis io* and Red Admiral *Vanessa atalanta* which show little or no interest in the Fleabane, although the Painted Lady *V. cardui* and Small Tortoiseshell *Aglais urticae* sometimes visit Fleabane as well. At night the Hemp Agrimony flowers are alive with moths. A typical evening on my two garden clumps, each roughly 2m x 2m, on 27 July 2003, produced Mother of Pearl *Pleuroptya ruralis* 6, Common Rustic/Lesser Common Rustic 2, Common Carpet *Epirrhoe alternata* 2, Riband Wave *Idaea aversata* 1, Yellow Shell *Camptogramma bilineata* 1, Silver Y 1, Garden Pebble *Evergestis forficalis* 1. The Fleabane was devoid of moths this particular night and is generally much less popular.

Below, I take the opportunity of reporting a few of my observations of moths nectaring at native flowers. I have selected them on the basis that the moth or the native plant is not one of those usually quoted elsewhere. Unfortunately, until, if ever, all my notes are entered onto a data-base, much information has proved too time-consuming to retrieve at present. This problem will be familiar to many of us. We all need several life-times to adequately process the data we can collect in the field. Hopefully others with time and interest might assemble more extensive tables from their own field notes. I would urge compilers of county lists to include as much of this type of information as possible, in addition to locally obtained larval foodplant records and other such detail, because county lists can provide a marshalled repository for this information. Species-specific ecological observations of all types are increasingly of interest now that more effort is being directed at surveying moths and managing habitats to conserve them.

Table: Selected interesting nectaring records (see text)

Moth	**Flower visited dusk onwards**	**Date**
Silver Y *Autographa gamma*	Common Hawthorn *Crataegus monogyna*	Late May
Maiden's Blush *Cyclophora punctaria*	Alder Buckthorn *Frangula alnus*	Late June
Common Emerald *Hemithea aestivaria*	Wild Privet *Ligustrum vulgare*	Mid July
Mottled Beauty *Alcis repandata*	Wild Privet *Ligustrum vulgare*	Mid July
Common Wave *Cabera exanthemata*	Wild Privet *Ligustrum vulgare*	Mid July
Scallop Shell *Rheumaptera undulata*	Valerian *Valeriana officinalis* by day (13.00 hours)	Mid July
Dark Umber *Rheumaptera undulata*	Creeping Thistle *Cirsium arvensis*	Late July
Brimstone *Opisthograptis luteolata*	Wild Parsnip *Pastinaca sativa*	Early August
Birch Mocha *Cyclophora albipunctata*	Common Ragwort *Senecio jacobaea*	Early August
Yellow Shell *Camptogramma bilineata*	Betony *Stachys officinalis*	Early August

For those who have a garden "at their command" as Tutt put it, rather characteristically, nectar plant information can also be used as a guide as to what to plant to attract moths, somewhat as advised by L. Hugh Newman in his classic

"Creating a butterfly garden" and by other authors of numerous later works. The most popular among the nectar plants I grow in my own slightly alkaline garden with Lepidoptera in mind, are Goat Willow, Marjoram *Origanum vulgare*, Buddleia, Hemp Agrimony, Fleabane and Lavender *Lavandula* spp. and all reward inspection for moths after dark.

On mothing at sallow catkins

When Tutt and others refer to "sallowing" for moths they are mostly concerned with nocturnal inspecting and beating of the catkins of the Goat Willow *Salix caprea*, which I have found to be by far the most attractive sallow for nectaring moths. Some of the trees produce the familiar yellow male catkins, other trees produce the greener female catkins. As Tutt observed, both the male and female catkins are attractive to moths. Moths often get some of the pollen on their bodies and can visit in such numbers that they must provide an important means of pollination. I have noticed that the green female catkins have a faint but fragrant scent, but you may need to hold the catkin to your nose to detect it. On some nights I have seen several dozen nectaring moths of the genus *Orthosia* on sallow catkins by the light of my torch beam, and have had more than fifty by gently tapping a catkin-laden branch over my beating tray. Usually there are a few Red Chestnut *Cerastis rubricosa* amongst the Quakers and Drabs, and there is always the chance of a more unusual species. As Tutt reported over one hundred years ago, the density of moths visiting sallow catkins is usually greatest where sallow trees are thinly scattered, rather than where they occur in large groups, and the largest numbers of moths are seen on the edges of woodland and mature scrub, rather than in very open conditions. The moths begin to arrive from dusk and accumulate in the first hour or two of darkness.

Moths visiting Ivy flowers

Ivy is an important nectar source and a major attractant for moths at a time of the year when there are likely to be few other nectar flowers in the vicinity. In *Br. J. ent. Nat. Hist.* **16**: 51-53, Martin Townsend and I reported how we recorded 14 species of moths at a clump of flowering Ivy on 23 September 2000 at the Rushy Meadows SSSI in Oxfordshire. Seven of these species were not seen at any of the six mercury vapour light-traps which were operated on the site that night. We also reported that there was a progression of different species to the ivy during the course of the night, with several not arriving until after 01.00 hours.

Moths visiting Buddleia

The summer of 2003 seemed to me to be a particularly good one for seeing moths feeding at flowers after dark. This may have been a consequence of the many warm dry nights, in southern Britain, coupled with occasional rain, such that the vegetation did not become too dry and nectar flow was maintained. A particularly sight was recording between twenty and thirty Silver Y moths *Autographa gamma* most actively visiting a single bush of *Buddleia davidii* at dusk on the hot night of 6 August 2003 (27°C at dusk, 15°C minimum night temperature) at our local allotments in Werrington, Peterborough. With individual moths making short looping flights to other flowers on the bush, and with several individuals doing so at any one time, illuminated by a nearby yellow sodium street-light, the bush looked just like a firework splitting sparks!

This publication was prepared in my new appointment as part-time Reader at Writtle College, University of Essex. I am most grateful to Writtle College for the financial support to enable me to prepare these and other moth data for publication and to initiate new lines of moth research. — PAUL WARING, Reader, Writtle College. Address for correspondence: Windmill View, 1366 Lincoln Road, Werrington, Peterborough, PE4 6LS. (E-mail: paul_waring@btinternet.com).

Applications for permits to collect Lepidoptera in Spain for scientific purposes

There seems to be a good deal of confusion amongst British entomologists concerning the scientific study of butterflies and moths in Spain. The purpose of this note is to clarify matters as they stand at November 2004.

The starting point is that collecting without a permit is illegal; this *appears* to include using a net even if specimens are not retained. However, permits are obtainable if the rules are followed and if sufficient time is allowed for the advance applications for permits. To stand any chance of being successful, you must ideally belong to *SHILAP* (Sociedad Hispano-Luso-Americana de Lepidopterologica). This Society it is open to all persons and institutions with interest on the study of the Lepidoptera all over the World. The annual subscription is paid at the beginning of the year and is €60.10 for the Fellows and €150.25 for institutions. You may pay by Postal Money Order, with credit card or by bank-transfer provided that there is no cost to SHILAP. Payment request should be made to the SHILAP account at Bank Bilbao Vizcaya Argentaria [Madrid] (bank code IBAN ES06 0182 1216 2802 0151 5543). The postal address of the society is SHILAP, Apartado de Correos 331, E-28080 Madrid, Spain and the e-mail address of the Director is *avives@eresmas.net*. In addition to being able to apply for permits, Fellows also receive the journal *Revista de Lepidopterologia*. Permit applications must satisfy the following conditions:

1. SHILAP's annual fee must be paid before applying for the permits.

2. A letter applying for the permit must be addressed to the General Secretary of SHILAP, including name, surname, address, Passport number, telephone number and fax number with country code and prefix, and/or e-mail address. This must reach the General Secretary **at least 45 days in advance** of the foreseen collecting activity.

3. The following data must be provided – the proposed collecting area (province and/or autonomous community), expected dates (days, months, even the whole year), collecting methods (entomological net, generator, etc), taxonomic groups of interest to be collected (species, genera, families and/or superfamilies) and any other data the applicant wishes to add.

4. All members of SHILAP who apply for these permits to collect Lepidoptera in Spain for scientific purposes, will be included in a *Project of Scientific Investigation* created by the Society and called "Lepidopterological Fauna of the Iberian Peninsula, Balearic Islands and Macaronesian region".

5. In order to contribute to this scientific project, you must send to SHILAP two paper copies of the list of recorded species together with a file in EXCEL format (only) on a diskette, indicating the Family, Subfamily, Tribe, name of the species (genera, species, author name and year), town, UTM, province, dates of capture, collector and numbers of males and females captured). Sequence and names should follow *Catalogo sistemdtico y sinonimico de los lepidopteros de la Peninsula Iberica y Baleares (Insecta: Lepidoptera) (Segunda pane)* (A. Vives Morena, 1994).

6 You may only collect a maximum of five examples of each taxon.

7 If any new species are discovered publication **must** be offered to the journal *Revista de Lepidopterologia* and a part of the Type series must also be donated to SHILAP for later incorporation to the collection of Lepidoptera of the National Museum of Natural History in Madrid, Spain.

It is hoped that by following these few simple rules, entomological research in Spain may continue to be undertaken by British citizens. It should be added that Portugal is not a party to these rules and collecting there for scientific purposes is, apparently, controlled in the same manner that it is in Britain. Collecting in Andorra, which lies on the border between Spain and France, is restricted in the same manner as collecting in Spain, but I have been unable to discover, for the moment, how to best apply for permits.— Colin W. Plant, 14 West Road, Bishops Stortford, Hertfordshire CM23 3QP.

ARASCHNIA LEVANA (L., 1758), A NEW SPECIES FOR THE MACEDONIAN BUTTERFLY FAUNA (LEP. : NYMPHALIDAE)

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Abstract

Araschnia levana (Lepidoptera: Rhopalocera: Nymphalidae) is recorded for the first time in the fauna of the Republic of Macedonia from Shar Planina Mountains, Skopje region, Jakupica Mountains, Ograzhden Mountains, Galichica Mountains, Kavadarci and Kratovo region. Records are mapped for Mcedonia and the flight period is discussed.

Introduction

Butterflies (Rhopalocera) are one of the best studied animal groups in the Republic of Macedonia. Intensive research was conducted during the twentieth century by many authors and number of articles was published. The most comprehensive work was that of Thurner (1964) where 185 species of Rhopalocera were published. It was supplemented by Schaider & Jaksic (1988) and total of 199 species was presented, with maps of distribution. Further investigation revealed that *Gonepteryx cleopatra* L., 1767 should be included in Macedonian butterfly fauna (Krpac & Mihajlova, 1997). With the present inclusion of *Araschnia levana* a total of 201 species are now known for the Republic of Macedonia.

Investigations were undertaken in different regions of Macedonia. Some of them (in the Shar Planina Mountains, Ograzhden Mountains and Jakupica Mountains) were conducted as research projects for the Biology Students' Research Society. Voucher specimens from this study are retained in the author's private collection and in the collection of Ljubomir Stefanov (Skopje).

Results and discussion

The world distribution of *Araschnia levana* covers Central and East Europe, Central Asia to North-East China, Korea and Japan. Within the Balkans it is not reported from Albania, Macedonia and Central and South Greece (Pamperis 1997; Tolman 1997).

The only data concerning the presence of *A. levana* in Macedonia is that in Thomas (1993). That paper is in effect the field diary of Werner Thomas, published after his death but it has apparently been overlooked in subsequent works, such as Tolman (1997) and Krpac & Mihajlova (1997). However, as a result of the present research, conducted over the past eight years, 13 examples of *Araschnia levana* were encountered in seven regions in the Republic of Macedonia. Regions, localities, altitude, habitat type, date, number of specimens and collection where the specimens are kept, are given in the following list:

Shar Planina Mountains

Kuchi Baba (Tri Vodi), 1330 m, road in the beech forest, 18.06.1996 (not collected). Recorded by Slavcho Hristovski - Skopje.

Skopje region
Katlanovo (Laka), 400 m, 01.08.1999, along River Pchinja, riparian habitat: 1 ex. (not collected). Recorded by Metodija Velevski - Skopje.

Jakupica Mountains
Above v. Nezhilovo, 800-900 m, road in oak forest, 17,18,19.07.1999: 4 ex. (coll. D. Melovski).

Kavadarci region
Moglishte, Vatasha, 500 m, 08.04.2001: 2 ex. (coll. Lj. Stefanov).

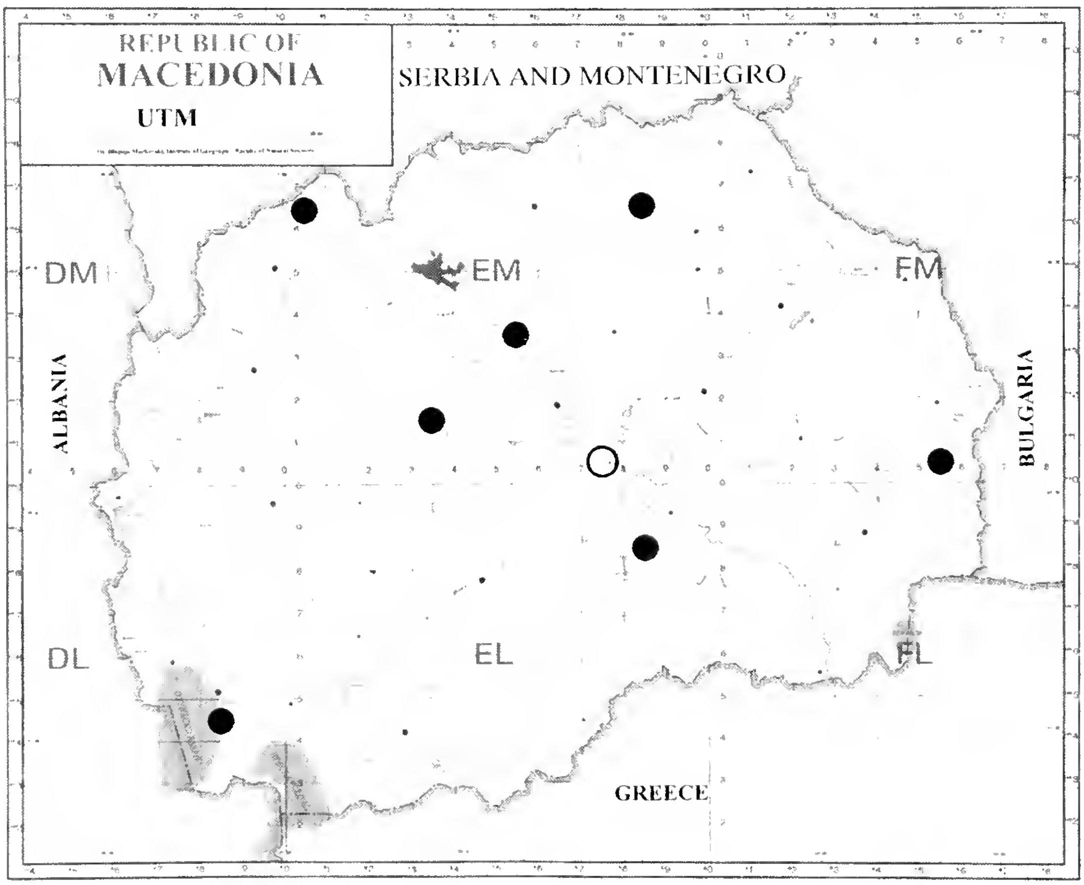

Fig. 1. Distribution of *Araschnia levana* in Macedonia
- ● **New data**
- ○ Data published by Thomas (1993)

Ograzhden Mountains
Ezhovo Brdo, 1150 m, near mountain stream, 15.07.2000: 1 ex. (coll. D. Melovski);
1 km W of Suvi Laki, 950 m, near mountain stream, 17.07.2000: 1 ex. (coll. D. Melovski).

Kratovo region
v. Kuklica, near Kriva Reka river, 650 m, willow belt, 23.06.2004: 2 ex. (coll. Lj. Melovski).

Galichica Mountains
v. Elshani, fields with hedgerows of *Juglans regia*, on flower of *Sambucus ebulus*, 23.07.2004: 1 ex. (photographed by Lj. Stefanov).

The distribution of *Araschnia levana* in Macedonia is presented on Fig. 1. Specimens from The Shar Planina, Jakupica, Ograzhden and Galichica Mountains and the Skopje and Kratovo regions were summer forms, collected from late June to the end of July. The only spring forms were recorded in the Kavadarci region, recorded in April.

The habitats from which the adult *Araschnia levana* were recorded were beech forests on Shar Planina Mountains, oak forests on Jakupica Mountains and riparian habitats along the Rivers Pchinja and Kriva Reka and near a mountain stream on Ograzhden Mountain. The record on Galichica Mountain refers to agricultural land, but this is situated in the oak belt of the mountain.

Acknowledgements

I would like to thank Dr. S. Abadjiev (Sofia, Bulgaria) for his valuable help and Slavcho Hristovski for his guidance during preparation of this paper.

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Square-spotted Clay *Xestia rhomboidea* (Esp.) (Lep.: Noctuidae) in Essex, first discovery of the caterpillar in the county

On 15 March 2004, a caterpillar of the Square-spotted Clay *Xestia rhomboidea* was found at Free Wood, Elmdon, in Essex, the first ever found in the county, providing proof that the moth is resident in Essex. It was found by Robin Field at 20.47 hours, at rest head downwards on a dead stem of Common Nettle *Urtica dioica* above fresh nettle foliage at the end of a search by nine of us from 20.20 to 20.50 hours. The larva was in an area of fairly sparse ground vegetation just inside the edge of the wood. The accompanying photograph, taken at the time, shows the habitat at the exact spot. Colin Plant (centre) is pointing at the larva with his torch. It is between him and the bag on the ground. There are shrubs within three metres, but the larva is in a more open situation and there are scattered grass tussocks for shelter.

It is instructive to examine how this result is the culmination of the combined efforts of various members of the mothing community, coupled with an increasingly

Standing over the first larva of *X. rhomboidea* discovered in Essex, at Free Wood, Elmdon, 25 March 2004.

focused and strategic approach resulting from the UK Biodiversity Action Plan process. The search was stimulated by the recent publication of *The Moths of Essex*, compiled by Brian Goodey (2004), which was launched at the annual meeting of the Essex Moth Group, on 28 February 2004. The status of the Square-spotted Clay in Essex is given therein as vagrant, rare, with 2002 the most recent record, but a note that Phil Jenner has been recording the adult as frequent in the Chrishall area, in the extreme north-west of the county, suggested the moth might be resident. As a result PW contacted Phil Jenner and was able to propose the search at the Essex Moth Group meeting. It transpires that Phil moved to Chrishall in 2000 and has been recording about half a dozen adult Square-spotted Clay annually at sugar patches. He had kept some voucher specimens which supported the records and had taken the trouble to send the data to the county recorder. Meanwhile, John Chainey and Jenny Spence had noticed and reported two adults nectaring on some flowers of a teasel *Dipsacus* on 9 August 2002 along the north edge of Free Wood, which is just 3 km to the east of Phil Jenner's garden. By day on 15 March 2004, Phil and PW reconnoitered the environs of Phil's garden and went to Free Wood and three other nearby woodlands with records of the moth, one in Essex and the others across the county boundary in Hertfordshire. PW was able to select the most promising places to search for the larvae, based on knowledge gained and the many successful searches we have made as part of the project. As soon as it was dark, all three of the Essex sites were searched by a team of volunteers, and the larva was found exactly where John Chainey had seen the adults at Free Wood. The volunteer searchers who came forward were, in part, motivated by the chance see the caterpillar of this nationally scarce moth for the first time and to learn how to search for it. Armed with this knowledge, they were able to plan searches for larvae at other sites. Subsequently, on the night of 16 March 2004 Jim Reid searched Melwood, a small woodland near Meldreth, Cambridgeshire and found six Square-spotted Clay larvae in ten minutes searching. On 17 March Ted Ponting found two more larvae in Essex, feeding on Common Nettle next to an elm copse in Langley Upper Green.

The map for the Square-spotted Clay in *The Moths of Essex* shows that all the records for that county since 1990 are from two 10 km squares in the extreme north-west. Only one of these has earlier records, from 1960-89. However, shading of eight additional 10 km squares scattered around the periphery of Essex shows that the Square-spotted Clay was recorded more widely prior to 1960.

The larval search was undertaken as a part of a three year Biodiversity Action Plan project on this moth, being co-ordinated by the authors for Butterfly Conservation's Cambridgeshire and Essex Branch, with assistance from the Centre for Environment and Rural Affairs at Writtle College, Essex and a grant from English Nature. An abbreviated account of the discovery has already been presented in *British Wildlife* 15(5): 361-362). One correction has been made to that work – Phil Jenner moved to Chrishall in 2000, not 1999 as previously stated.— PAUL WARING and ROBIN FIELD, Centre for Environment & Rural Affairs, Writtle College, Essex. Contact address: Windmill View, 1366 Lincoln Road, Werrington, Peterborough PE4 6 LS (E-mail: paul_waring@btinternet.com).

Larval foodplants of the Barred Sallow moth *Xanthia aurago* (D. & S.) (Lep.: Noctuidae)

Some of the species of moths of the genus *Xanthia* are Nationally Scarce, others of Local status. Most are associated with woody plant species which are often minor components of the tree and shrub layer. As such, they are of great use to ecologists and conservationists. Presence of these moths helps in making the case for surveys to find out the distribution of such tree species on site. It also provides justification for special conservation measures to ensure adequate representation of such plants for all dependent invertebrates when felling, thinning, coppicing and other forms of management are planned. The Orange Sallow *X. citrago* feeds on limes *Tilia* spp., the Dusky Lemon Sallow *X. gilvago* on Wych Elm *Ulmus glabra* and the Pale Lemon Sallow *X. ocellaris* on Black Poplar *Populus nigra* and hybrids. The much more widespread, well-distributed and numerous Sallow *X. icteritia* and Pink-barred Sallow *X. togata* feed on a range of sallows and poplars but begin larval development in the catkins and are of great use in flagging up the need to maintain trees of these species large enough to produce catkins, which are hugely important as sources of nectar and other food for a great many insects. Furthermore, the genus *Salix* is now recognised as supporting more species of insects in Britain than any other plant genus, including *Quercus* (Kennedy & Southwood, 1984. The number of species of insects associated with British trees: a re-analysis. *Journal of Animal Ecology* **53**: 455-478).

The remaining member of the genus *Xanthia* in the British Isles is the Barred Sallow *X. aurago*. Since the nineteenth century, the standard textbooks state that this feeds on Beech *Fagus sylvatica* and Field Maple *Acer campestre*. From an ecologist's point of view, Beech is absent or not native over much of the range of the moth in Britain and on many sites the moth is therefore assumed to be dependent on Field Maple. This adds another dimension, because Field Maple is regarded as an indicator of ancient woodland sites in some parts of Britain (Rackham, 1980. *Ancient Woodland*). Accuracy in our knowledge of the foodplants of this species (as with many others) can be of considerable importance. Waring, Townsend and Lewington (*op. cit.*) add Pedunculate Oak *Quercus petraea* to the species from which the caterpillar of the Barred Sallow has been obtained from the wild and subsequently reared successfully. This is based on a record of a single larva beaten by Martin Townsend in Wychwood Forest, Oxfordshire in the spring of 2000, the adult emerging successfully in September 2000. Whilst having no reason to doubt this record, I decided I would try and obtain some eggs from the next female Barred Sallow I trapped so that I could rear the larvae and investigate their ability to feed on the stated foodplants. As Maple (Aceraceae), Beech and Oak (Fagaceae) is an odd combination of unrelated plants, I determined I would also offer other plants that are frequent where the moth occurs. In this I was intrigued to find that in Austria the Barred Sallow is considered polyphagous, according to the "HOSTS" database of larval host plants on the website of the Natural History Museum, although their source apparently does not list the species from which it has been obtained. Heath & Emmet (1984, *The moths of Great Britain and Ireland*. Vol. 10) in fact add that in captivity the larvae will accept Hornbeam *Carpinus betulus*, which is also listed by Allan (1947. *Larval foodplants*) who adds Sycamore *Acer pseudoplatanus* - a close relative of maples. The only other foodplant listed on the HOSTS website is *Vaccinium* (species not specified) based on a report from Finland.

On 28 September 2003, I light-trapped a female Barred Sallow in fresh condition in a Robinson light-trap in my garden in Peterborough. By 1 October, she had laid about thirty, bright orange eggs. These were over-wintered outdoors in a metal dustbin in a shady place at the far end of my garden. On 31 March 2004, the Field Maple in a hedgerow of native species I have established along one boundary had just started coming into leaf so I brought half of the batch of eggs indoors with leaves, for observation, and supplied the rest with leaves outdoors. On 2 April, the eggs started to hatch both indoors and outdoors and the signs of larvae feeding on the leaves were apparent the next day. Black frass was also seen collecting in loosespinnings of silk made over the underside of the leaves by the first instar larvae. The larvae grew rapidly as they were taken around the country on various trips, spending most of their time in the warmth of the car or indoors, so while their hatching time was probably about the same as in the wild, their development was likely to have been accelerated by higher temperatures. By 22 April, when I had a chance to begin experiments, the larvae had just started their final instar and had been feeding solely on Field Maple foliage. On 22 April, I offered several of the larvae freshly expanded Beech leaves from the local woodlands. These they accepted straight away and consumed large areas of the leaf. While the leaves of Field Maple and Beech had nearly reached full-size by this date, it is worth noting that the leaves on the oaks were still small, brownish and furled. On 23 April, I divided the larvae between a number of containers, one or two larvae in each, with each container holding exclusively the foliage of Pedunculate Oak, Common Hawthorn *Crataegus monogyna*, Hazel *Corylus avellana*, English Elm *Ulmus procera*, or Goat Willow *Salix caprea*, while retaining other larvae on Field Maple and Beech. Twenty-four hours later the leaves of all the above species showed extensive feeding damage, evidence of sustained feeding by all the larvae. The larvae were inspected that morning at 08.00 hours, at which time several were actively feeding in the subdued light in the garage where they were kept. On 24 April, fresh leaves of the same species were added to each container, placing them over the leaves from the previous day, and one leaf of Field Maple was also added to see if this would be devoured in preference to the other species. Twenty-four hours later, at 10.00 hours on 25 April, the results were as follows: The larvae on Oak had eaten all the furled leaves and only the bracts remained, but the leaf of Field Maple in the box was completely undamaged. Likewise those on Elm and Beech had eaten large holes in the leaves (about 25% of leaf area consumed), but had not touched the Maple leaf. Those on Goat Willow and Hazel had continued to eat more, consuming up to 50% of the area of the smaller-sized leaves, but had also eaten a large amount of the Maple leaf. Those on the Common Hawthorn had eaten a little more but had damaged the Maple leaves extensively, consuming up to 50%, as had those on Maple alone. Several of the larvae were still in the act of feeding at this time. Evidently the larvae had not sought out the Maple leaves in strong preference over the other species available and some of the larvae may not have discovered the Maple leaves at all overnight.

Clearly, final instar larvae of the Barred Sallow are capable of feeding on the foliage of a wide range of unrelated broad-leaves in captivity. It is common experience that larvae often feed on a wider range of foodplants in confinement and in mainland Europe than they do in the wild in the British Isles, where they are often on the edge of their range and appear to be more restricted in habitat as well as foodplant. It is also frequently found that late instar larvae will eat and thrive on a wider range of foodplants than are accepted by the first instar. Both these observations limit the extent to which the above findings can be extrapolated to what happens in the wild in the British Isles, but at the very least we should be cautious in assuming that Field Maple, Beech and perhaps Oak are the only plants which our native populations of Barred Sallow are exploiting. Personally, I have never knowingly beaten the larva of the Barred Sallow in twenty years of beating a wide range of plants for moth larvae throughout the year. However, I have never searched for this species in particular and have beaten very little Field Maple or Beech in April or early May and at night. Accordingly, on the night of 14 May 2004 I went out to search one of our nearest and best stands of Field Maple, at Brakes Wood on the Milton Estate, near Castor Hanglands National Nature Reserve, Peterborough, accompanied by Mick Beeson. I spent 30 minutes beating from 23.00-23.30 hours but found no larvae of the Barred Sallow. I hope to try again on a range of dates and sites in 2005. Meanwhile, if anyone has found and fed wild larvae of this species, particularly on foodplants other than Field Maple and Beech, I would be interested to hear from them.

Incidentally, the orange colour and domed shape of the freshly laid egg of the Barred Sallow is a perfect match to the small cushions of an orange mould which often develop on the stems of Field Maple, birches and probably other shrubs in the autumn. Later the fertile eggs turn a less conspicuous inky blue, in which state they remain until hatching in the spring. Infertile eggs can remain orange in the spring. I can also confirm that the larvae rest within their cocoons for several weeks before pupating and that adult moths were successfully reared from larvae no matter which of the above foodplants they had eaten in the final instar, though for practical reasons all of them were reared predominantly on Field Maple before and after the described feeding experiments.

I would like to thank Mick Beeson of the Milton Estate, Peterborough, for his help both in the field and in obtaining access permission from the Estate and Writtle College, Essex, for support in writing up these observations.— PAUL WARING, Reader, Centre for Environment & Rural Affairs, Writtle College, Essex. Address for correspondence: Windmill View, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS.

ADDENDA ET CORRIGENDA

The following errors in relation to volume 115 (2003) have been communicated to the Editor:

page 284 The Queen of Spain Fritillary *Issoria lathonia* (L.) was recorded in Staffordshire on 3 August 2003, not on 30 August 2003 as printed. We apologise for this typing error on our part.

page 280 We are advised that the captions to Plates L and M are transposed. Thus, the upper picture, Plate L, is of the specimen collected at Charleval whilst the lower picture, Plate M, is that taken at St. Pierre de Vassols.

The following correction to volume 113 (for the year 2001) has been submitted.

pages 266 and 267. A section of text is missing, between the final word '*Gegenes*' ending page 266 and 'annually' on page 267. The complete sentence overlapping these two pages should read: "Two new butterfly species have been added to the Híos list, *Gegenes pumilio* (Hoffmansegg, 1804) (April 2000 at Kambiá Beach in north-west Híos; Dr Mike Hull) and *Danaus chrysippus* (Linnaeus, 1758) (recorded annually since 1996; voucher specimen taken at Káto Faná in south Híos in May 1996; Mr Mike Taylor)."

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