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# TRANSACTIONS

OF THE

CITY OF LONDON

## Entomological & Natural History Society

*Pl. 17.*

FOR THE YEAR 1907.



PUBLISHED BY THE  
CITY OF LONDON ENTOMOLOGICAL SOCIETY,

THE LONDON INSTITUTION, FINSBURY CIRCUS, E.C.

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CITY OF LONDON

# Entomological & Natural History SOCIETY,

Established 1858.

MEETINGS HELD AT

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FINSBURY CIRCUS, E.C.

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REV. C. R. N. BURROWS AND MESSRS. H. M. EDELSTEN,  
EDWARD HARRIS, J. RICHES AND A. SICH.

# TRANSACTIONS

OF THE

## City of London Entomological

AND

## Natural History Society.

PART XVII.



(1907.)

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WITH LIST OF MEMBERS.

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THE SOCIETY'S ROOMS, LONDON INSTITUTION,  
FINSBURY CIRCUS, E.C.

FEBRUARY, 1908.

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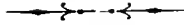


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## REPORTS OF MEETINGS.



Dec. 18th, 1906.—*ENTEPHRIA CÆSIATA* and *E. RUFICINCTATA*.—Mr. E. A. Cockayne short series from Rannoch district, including dark and banded forms of both species.

*PIERIS BRASSICÆ*.—Mr. A. Harrison, a series reared from ova laid by typical ♀, taken at Wavertree near Liverpool. In several of the ♀s, and one or two ♂s, the spots on the forewings, on both the under and upper sides, were connected by black scales, thus forming in the more extreme instances a broad band.

*BINDAHARÆ SUGRIVA*. MIMICRY.—Dr. G. G. C. Hodgson, in exhibiting specimens from Australia, stated that he had observed that this species rested either head downwards or horizontally, so that the ocelli on the underside of the hindwings resembled a head, and the "tails" simulated antennæ; the fact that all the specimens exhibited were more or less damaged at the anal angle of the hindwings, suggested that birds were deceived by the resemblance described.

*JODIA CROCEAGO*.—Mr. A. J. Willsdon exhibited two series: the one bred in Essex from Kent ova was of normal orange colour, while the other bred in Yorkshire from New Forest ova was of a pale salmon pink colour.

PAPER.—Mr. L. B. Prout read a paper on *Entephria caesiata*, printed in extenso in this volume.

Jan. 1st, 1907.—Pocket Box Exhibition.

DWARFED LEPIDOPTERA.—Rev. C. R. N. Burrows, a number of undersized lepidoptera, including *Agrotis puta*, *A. saucia*, *Amathes c-nigrum*, *Plusia chrysitis* and *Heliophila pallens*, taken in September, 1906. Mr. Burrows suggested that the dwarfing was the result of the exceptionally hot and dry season.

*POLIA CHI* FROM YORKSHIRE.—Mr. S. J. Bell, a series from the moors near Whitby, where the species was commonly met with on the stone walls that abound in the district; the specimens were of a uniform pale grey colour.

*ACRONYCTA MENYANTHIDIS*.—Mr. H. M. Edelsten, fine melanic examples from Yorkshire.

*ARGYNNIS SELENE* ABS.—Mr. T. H. L. Grosvenor, a ♂ with confluent marginal spots, and a ♀ much suffused with black, from Ashdown Forest.

*THYATIRA BATIS*.—Mr. L. A. E. Sabine, a specimen with pink coloration much accentuated, from Epping Forest, and another from New Forest, with this coloration entirely lacking as in the Linnæan type.

Jan. 15th, 1907.—*THERA VARIATA* AND *PSODOS TREPIDARIA*—PARALLEL VARIATION.—Mr. E. A. Cockayne, specimens from Rannoch with central fascia on forewings interrupted.

*PHRAGMATOBIA FULIGINOSA*.—A ♀ with yellow abdomen and hindwings, and an example of var. *Borealis*, both from Rannoch. Ibid.

MELANIC LEPIDOPTERA.—Mr. H. M. Edelsten *Synopsisia abruptaria* from Clapton, *Nonagria geminipuncta* and *Phigalia pedaria* from Epping, *N. cannae* and *N. typhae* from Norfolk, *Stauropus fagi* from Epping, and *Cymatophora gemmaria* from Kent. Mr. A. Harrison *Bombycia duplaris* and *Acronicta leporina* from Cornwall and Lanes., *Phaertra rumicis* from Barnsley, *Eupithecia venosata* from Folkestone and Shetland Isles, and *Aplecta nebulosa* from Cornwall, Epping and Delamere. Mr. L. A. E. Sabine, *Phragmatobia fuliginosa* with black body and hindwings. Mr. H. B. Whitehouse, *Lymantria monacha* from Hull.

PAPER.—Mr. L. W. Newman read a paper detailing some of his experiences in breeding melanic lepidoptera. The particulars given showed that as a rule such forms usually bred true—or almost so—after the second brood; the strains, however, usually die out soon after this, presumably owing to weakness due to in-breeding. Mr. Newman claimed that melanism was obviously on the increase in the British Isles, and could not be attributed solely to an increasingly smoke-polluted atmosphere, as the areas affected are widely separated both as regards position and general characteristics, and by no means confined to manufacturing districts.

A vote of thanks to the essayist proposed by Mr. L. B. Prout, and seconded by Mr. S. J. Bell, was duly carried.

Feb. 5th, 1907.—HARTULA HYERANA—TEMPERATURE AND VARIATION.—Dr. T. A. Chapman exhibited specimens showing that out of 15 examples emerging in November, December and January, 13 were decidedly darker in colour than any of 400 specimens which emerged at the normal time, *viz.*, from August to October. Dr. Chapman considered it probable that the low temperature experienced by the pupæ of the late imagines was the direct cause of the latter's tendency to darker coloration, at the same time admitting that the prolongation of the pupal stage (directly due to temperature) might be a contributory cause.

ACRONICTA LEPORINA AB.—Mr. E. A. Cockayne, a specimen from North Sutherland, entirely white save for a large black spot in centre of forewings.

CAMPTOGRAMMA BILINEATA VARS.—Specimens from same district spotted with black.—*Ibid.*

ACALLA LORQUINIANA AND SENTA MARITIMA.—Mr. H. M. Edelsten exhibited a series of the former from Norfolk, and drew attention to the fact that not only did the species resemble a miniature *S. maritima*, but that it had parallel forms of variation.

CIDARIA MIATA.—Mr. A. Harrison, a long series bred in August and September, 1906, from New Forest ova.

PACHYS BETULARIA VARS.—Mr. V. E. Shaw, striking examples of forms intermediate between the type and var. *Doubledayaria*; the specimens were secured at Bexley by sembling with typical bred ♀s. In four nights, 14 typical ♂s, 15 var. *doubledayaria*, 3 light intermediates and 4 dark intermediates were attracted, mostly between 10.30 and 11.30 p.m.

CYMATOPHORA REPANDATA—AB. CONVERSARIA.—A second brood bred September and October, from Torquay ova.—*Ibid.*

COSMIAS FROM PINNER.—Mr. P. H. Tautz, all four species from this

district. *C. pyralina* being taken freely at light in July, and *C. affinis* bred from larvæ beaten out of elm in May.

PAPER.—Mr. E. A. Cockayne read some "Notes from North Sutherland," which are published in full in this volume.

Feb. 19th, 1907.—NONAGRIA GEMINIPUNCTA.—Mr. E. A. Cockayne. melanic specimens from Bournemouth.

PUPATION OF MELIANA FLAMMEA.—Mr. L. W. Newman, pupæ spun up in captivity in reed blades drawn by the larvæ into perfectly cylindrical form; the larva usually pupates in the stem.

PETASIA NUBECULOSA.—A pupa retaining the transparent greenish appearance of a freshly formed pupa but actually a year old.—Ibid.

TOXOCAMPA PASTINUM.—Mr. V. E. Shaw, a series from Walmer, Kent, July, 1906.

LAPHYGMA EXIGUA.—Imagines bred in December, 1906.—Ibid.

DISCUSSION.—Mr. H. M. Edleston's opening of a discussion on the "Wainscots," is included in this volume.

March 5th, 1907.—DONATION TO LIBRARY.—Mr. Mera presented the 1906 volume of the "Entomologists Record."

NOMINATIONS.—The following gentlemen were nominated for membership. Mr. F. B. Cross, Park Villa, Bruce Grove, Tottenham, proposed by Mr. L. B. Prout and Mr. H. M. Edleston. Mr. D. Langford, "Brooklyn" Dollis Road, Church End, Finchley, proposed by Messrs. P. H. Tautz and R. G. Todd. Mr. Edward Reid, "Birdhurst," Chorleywood, near Rickmansworth, Herts, proposed by Messrs. H. M. Edleston and P. H. Tautz.

LEIOPTILUS CARPHODACTYLUS FROM FOLKESTONE.—Dr. T. A. Chapman specimens received from Mr. Purdy—the first British record.

HASTULA HYERANA—PUPAL "FREAK."—A pupa with mandibles of larval pattern.—Ibid.

NEMORIA VIRIDATA.—Dr. G. G. C. Hodgson, a series from Wither-slack, showing variation with regard to pale lines on forewings; in one specimen there was only a single line, in another the lower end of the outer line was bent outwards, and in a third the line was markedly crenulate.

NEMORIA PORRINATA (ZELLER).—Mr. L. B. Prout, specimens from S. Europe, apparently indistinguishable from *N. viridata*, but said to be differentiated by having brown costal dusting and brown frons and forelegs.

HARPYIA BICUSPIS COCOONS.—Mr. L. W. Newman, two cocoons containing living pupæ found on birch trunks in Tilgate Forest.

DIPHTERA ALPIUM (ORION).—Mr. P. H. Tautz, a bred series including a specimen with brown marbling much accentuated, and green ground colour darker and duller than usual.

PAPER.—Rev. C. R. N. Burrows read a paper on *Nemoria viridata* ultimately destined to be published in "The Entomologists' Record." After dealing with the synonymy, and accepting the Linnæan specimen with only one pale line on the forewings as the type, Mr. Burrows dealt with the insects habitat; this he described as very local, there being no records for Ireland, Scotland, Wales or Isle of Wight. He pointed out that this species differed from all the other "emeralds" so far dealt with by him, in that it hibernates as a pupa; moreover, the

larva, while possessing the spicules and transparent plates noticed in other species, does not possess the highly specialized hairs and processes found on the latter. The variation of the imago, which is slight and limited, was also dealt with.

March 19th, 1907.—NEW MEMBERS.—MESSRS. F. B. Cross, D. Langford and Edward Reid, were elected to membership.

NOMINATION.—Mr. A. H. Shepherd, of 81, Corinne Road, Tufnell Park, N., was nominated by Messrs. L. B. Prout and J. A. Clark.

DONATION.—Mr. H. M. Edelsten presented a reprint of his paper on the British *Nonagria neurica*.

PROTECTIVE RESEMBLANCE IN PUPÆ.—Mr. A. Harrison, exhibited stereoscopic photos, taken by Mr. H. C. Maine, of a large *Tineid* (*Binsitta*—? *sp.*), from Upper Burmah, which bears a striking resemblance to the head of a small snake (*Lycodon aulicus*, Linn.) common in Burmah; of two pupæ received, one resembled the type, and another a striking variety of the snake in question.

NEMORIA VIRIDATA AB.—Dr. G. G. C. Hodgson, a specimen ex Mr. Sidney Webb's collection, with very dark green cilia and dark green costa.

PAPER.—In the unavoidable absence of Mr. C. P. Pickett, who was to have read some notes on recent collecting, Dr. G. G. C. Hodgson kindly contributed some interesting notes on *Polyommatus thetis* (*bellaryus*) and its allies; these are printed at the end of the transactions.

April 2nd, 1907.—NEW MEMBER.—Mr. A. H. Shepherd was elected a member of the Society.

LITHOSIA MUSCERDA.—Mr. H. M. Edelsten, larvæ and pupæ reared in captivity.

PHIGALIA PEDARIA, VAR.—Mr. T. H. L. Grosvenor, a series from Reigate, including a melanic ♂ with a metallic green tinge on forewings.

STERRHA OCHRATA.—Mr. V. E. Shaw, larvæ reared from ova laid by ♀ taken at Deal, July, 1906.

SCARCITY OF LARVÆ.—Mr. L. W. Newman reported that in localities where larvæ of *Cosmotriche potatoaria* and *Arctia caia* were usually abundant they were practically non-existent; a few larvæ of the latter found in an abnormally advanced stage suggested that the larvæ had passed the usual hibernating stadium in the previous autumn and the majority had died in consequence during the winter.

April 16th 1907.—DONATION.—The curators announced the receipt from Mr. L. B. Prout of numerous lepidoptera, including *Lycaena arion*, *Laphygma erigua* and *Toxocampa craccæ*.

ITHYSIA LAPPONARIA.—Mr. A. W. Mera 2 ♂s and 1 ♀ recently bred.

NOTOLOPHUS GONOSTIGMA—PABULUM.—In the course of a discussion concerning *N. gonostigma*, Mr. H. M. Edelsten stated that he had observed that in the fens the larvæ hibernated on willows, but left these in the spring and fed up on various low plants.

May 7th, 1907.—DONATIONS.—The curators announced the receipt

of about three dozen lepidoptera from Rev. G. H. Raynor, and several *Cosmia pyralina* from Mr. P. H. Tautz.

EPIRRITAS.—Rev. C. R. N. Burrows bred specimens of hybrid *Epirrita dilutata* × *Christyi*; also a cross between Enniskillen and Lancashire *E. autumnata* closely resembling *E. jiligrammaria*.

May 21st, 1907.—DONATION.—Mr. J. A. Clark contributed a pair of *Anarta cordigera*, from Rannoch, to the Society's cabinet.

NOMINATION.—Mr. O. E. Janson, 95, Claremont Road, Highgate, N., was nominated for membership by Mr. J. A. Clark and Dr. J. S. Sequeira.

XANTHORHÆ FLUCTUATA, was the object of special exhibition and discussion. Rev. C. R. N. Burrows exhibited ab. *Costorata* from Mucking; Mr. J. A. Clark also exhibited this var., and the Linnæan type. A series shown by Mr. J. Riches, also included var. *costorata* from Hornsey.

EGERIA ANDRENÆFORMIS.—Mr. H. M. Edelsten, stems of *Viburnum* showing larval borings with ichneumon cocoons, and an empty pupa case *in situ*.

COLIAS RHAMNI—OVIPOSITION.—Dr. G. G. C. Hodgson exhibited ova, and reported that he had noticed that these were always found in batches of three or more on a leaf; such ova generally hatched simultaneously, pointing to their being all laid by the same ♀.

DRYAS PAPHIA LARVÆ.—Mr. L. W. Newman, larvæ in penultimate stadium, bred *ab ovo*.

June 4th, 1907.—NEW MEMBER.—Mr. O. E. Janson was elected a member of the Society.

ENNOMOS QUERCINARIA—The evening was mainly devoted to the exhibition and discussion of this species.

Rev. C. R. N. Burrows exhibited ab. *equestraria* from Ipswich. Mr. A. W. Mera, very pale specimens from Ipswich, and forms approaching ab. *equestraria* from S. Kensington. Mr. L. B. Prout ab. *infuscata* from S. Kensington, and a pale form from Eynsford.

EUSARCAE ELINGUARIA.—Mr. J. A. Clark, specimens from Scotland of deep almost orange coloration, and without the usual central fascia on forewings.

June 18th, 1907.—NOMINATION.—Mr. A. J. Wightman, "Ailsa Craig," Lewes, Suffolk, was nominated for membership by Messrs. T. H. L. Grosvenor and P. H. Tautz.

CALOCAMPA VETUSTA.—Dr. T. A. Chapman, larvæ from South Tyrol, which, instead of being green as is usually the case in English specimens, were black with yellow dorsal and lateral lines, and pale white subdorsal line.

ITHYSIA LAPONIA, AB.—Mr. E. A. Cockayne, a ♂ with pale yellow costa and dorsal stripe, Rannoch, 1907.

CHILO PHRAGMITELLUS.—Mr. H. M. Edelsten, a very dark, almost black ♂, from Norfolk Broads.

NEMORIA VIRIDATA, ABS.—Dr. G. G. C. Hodgson, two specimens from Surrey, one having reddish forewings flecked with irregular green patches and hindwings of usual green colour, except at the anal angle,

the other being of usual green colour, but dappled with irregular and asymmetrical reddish blotches.

*SYNOPSIS ABRUPTARIA*—*GYNANDROMORPH*.—Mr. C. W. Simmons, a very striking specimen from Holloway, with right wings almost black ♂, and left wings typical ♀.

*GRAPHIPHORA OPIMA*.—Mr. A. J. Willsdon, a series from Epping Forest district, including a pale grey specimen with dark brown central fascia.

*ERANNIS LEUCOPHEARIA*.—Mr. J. A. Clark, very dark specimens with usual pale median band almost obsolete, from New Forest.

Mr. A. H. Shepherd, *E. marginaria* var. *fuscata*, from Huddersfield, and *E. leucophearia* ab. *marmorinaria* from Richmond Park.

*LEPIDOPTERUS OVA ON A BIRD'S WING*.—Mr. T. H. L. Grosvenor reported having found ova of *Macrothylacia rubi* on the wing of a dead jay in Ashdown Forest.

September 3rd, 1907.—*NEW MEMBER*.—Mr. A. J. Wightman was elected a member of the Society.

*NOMINATIONS*.—Mr. C. W. Simmons, 43, Fairmead Road, Tufnell Park, N., was nominated by Messrs. J. A. Clark and J. Riches, and Mr. E. Turner, Manor House, Twickenham, by Dr. J. S. Sequeira and Mr. J. A. Clark.

*ANTHROCERA PALUSTRIS*.—Mr. S. J. Bell, a series from Bude, end of July, 1907, including many with spots more or less confluent, and one example in which the five spots were merged into one blotch occupying more than half the wing area.

Mr. H. M. Edelsten, specimens from Norfolk Broads, end of July, 1907, mostly having the central spots confluent.

*HEMITHEA ÆSTIVARIA LARVÆ*.—Rev. C. R. N. Burrows, larvæ feeding on wild thyme.

*DRYAS PAPHIA*—*VAR. VALEZINA*.—Mr. J. A. Clark, five examples, bred ex twelve pupæ reared from ova laid by *Valezina* ♀.

*SPILODES PALEALIS FROM DOVER*.—Dr. G. G. C. Hodgson, a long series taken between July 24th and August 3rd, 1907.

*THERETRA PORCELLUS, AB.*—A specimen with right wings of normal southern coloration, and left wings of almost unicolorous yellow shade often seen in northern specimens. *Ibid.*

*CALLIMORPHA DOMINULA, AB.*—Mr. C. P. Pickett, a specimen with red ground colour replaced by yellow, from Deal.

*SPILOTE GROSSULARIATA, AB.*—Mr. J. Riches, a series bred from north London larvæ, including two specimens with all the wings powdered with black scales.

September 17th, 1907.—*NEW MEMBERS*.—Messrs. C. W. Simmons and E. Turner were elected members of the Society.

*LYCÆNA ARION*.—Mr. S. J. Bell, a series from N. Cornwall in good condition, although taken during the last week in July.

*AGROTIS OBSCURA*.—Rev. C. R. N. Burrows, two ♀s and ova laid by same, twelve specimens having been taken by him at Mucking during late August and early September.

*CYNATOPHORA GEMMARIA*.—Mr. J. A. Clark, dark specimens, similar to London form, from Pitlochrie, N.B.

*POLYOMMATUS THETIS (BELLARGUS) ♀S WITH ♂ COLORATION*.—Dr.

G. G. C. Hodgson, unusually blue specimens taken in Surrey, Sussex and Kent, between May 26th and July 23rd, 1907; the exhibitor suggested that the tendency to ♂ coloration had some relation to the inclement season.

*SPILOTE ULMATA* AB.—Mr. A. W. Mera, a series from Chalfont Road, including several specimens with black markings almost obsolete.

*MANIOLA TITHONUS*, ABS.—Mr. C. P. Pickett, a long series from Dawlish, August 1st-21st, many showing abnormally large ocelli on forewings, while a few lacked the white central spot in same; several specimens were of a pale *Pamphilus*-like colour.

*COSMOTRICHE POTATORIA*.—Mr. J. Riches, a series from Eastbourne, being as a whole somewhat darker than usual.

*STAUROPIUS FAGI*.—Mr. P. H. Tautz, seven specimens taken at Chorleywood about July 15th, 1907, including one or two rather dark ♂ s.

October 1st, 1907.—*NONAGRIA CANNÆ*—OVIPOSITION.—Mr. H. M. Edelsten, ova *in situ* on *Typhae*. The exhibitor explained that the ♀ was provided with special hooks enabling it to lift up the natural folds in the cuticle of the leaf and deposit the ovum underneath.

*MELITÆA ARTEMIS*.—Dr. G. G. C. Hodgson, series showing parallel variation in widely separated districts, such as Central Ireland and South Wales, Devon, Surrey and S. Wales and Devon, Kent and S. Wales.

*SPIDER PREYING ON LYCÆNIDÆ*.—Dr. Hodgson also exhibited a large red spider observed in abundance on Reigate Hill, where its irregular web, spun close to the ground, was frequently found to contain numbers of *Polyommatus thetis* ♂ s.

*DIANTHÆCIA LUTEAGO* VAR. *FICKLINI*.—Mr. L. B. Prout, a specimen bred July 3rd, 1907, from larva found at Bude, N. Cornwall, end of July, 1906, feeding on roots of *Silene maritima*. The larva was reared on cut root in a tin box, and pupated about the middle of September.

*POLIA NIGROCINCTA*.—Mr. L. A. E. Sabine, a series bred from N. Cornwall larvæ reared on apple and sawlow.

*ADOPEA FLAVA*, RESTING HABIT.—Dr. G. G. C. Hodgson exhibited sketches of a specimen observed resting in the sun in the position assumed by *Nisoniades tages* when at rest at night.

October 15th, 1907.—*LASIOCAMPA CALLUNÆ*, AB.—Mr. J. A. Clark, a ♂ from Dulnaith Bridge with usual pale fascia suffused with brown ground colour.

*COENOBIA RUFA*.—Mr. H. M. Edelsten, a dark red-brown form from Dorset.

*POLYOMMATUS ICARUS*.—Mr. T. H. L. Grosvenor, series from Surrey and Aberdeen, those from the latter district being the larger and more intense in colour.

Dr. G. G. C. Hodgson, specimens taken during 1907, showing an unusually large proportion of blue ♀ s.

*COLOTOIS PENNARIA*, AB.—Mr. A. W. Mera, a ♂, Brentwood, 1907, with lines on forewings very close together, and only faintly indicated.

*MELANIC ENNOMOS AUTUMNARIA*.—Mr. L. W. Newman, a series bred



from pairing of melanic ♂ and typical ♀ from Dover; many of the specimens followed the ♂ parent.

*TOXOCAMPA CRACCÆ*.—Mr. L. B. Prout, specimens from N. Cornwall and N. Devon, 1907; all the specimens were of slaty grey colour, none showing the brownish tinge supposed to be characteristic of N. Devon examples some years ago.

*NONAGRIA GEMINIPUNCTA*.—Mr. J. Riches, a series bred from Lewes pupæ.

*MELIANA FLAMMEA*.—Dr. J. S. Sequeira, specimens taken at light and sugar, Wicken, June, 1907.

*NONAGRIA ARUNDINIS*.—Mr. R. G. Todd, a long series, Wicken, June 10th-23rd, 1907.

*LEUCANIDS FROM TORQUAY*.—Mr. A. J. Willsdon, *Heliophila putrescens*, and *H. vitellina*, September, 1907.

November 5th, 1907. — DEATH OF MEMBER. — The President announced the receipt of advice of the death of Mr. A. H. Shepherd; a motion requesting the secretary to send a letter of condolence and regret was adopted.

*CLEOGENE PELETIERARIA*, SECOND BROOD.—Dr. T. A. Chapman, a living ♂ bred from ova laid in August; attention was drawn to the fact that the throwing of a second brood by an Alpine species, though unexpected, was paralleled by a similar record in connection with *Erebia cassiope*.

*BOMBYCIA OCULARIS FROM FINCHLEY*.—Mr. W. Bloomfield, various lepidoptera collected in Finchley district during 1907, including a single *B. ocularis*.

The usual custom of devoting the first evening in November to the exhibition and exchange of duplicates was maintained.

November 19th, 1907.—DONATION TO LIBRARY. — The librarians announced the receipt from Mr. A. E. Tonge, of a brochure containing many photographs of lepidoptera and lepidopterous ova.

*CAMPTOGRAMMA FLUVIATA AT SUGAR*.—Rev. C. R. N. Burrows, a ♂ taken at sugar at Mucking, October 2nd, 1907.

*ANTHROCERA PURPURALIS (MINOS)*.—Mr. A. Harrison, specimens taken in Carnarvonshire in 1905 and 1907, those taken in the former year being larger and more thickly scaled than the 1907 examples. Mr. Harrison mentioned that in 1907 emergence took place about a month later than in 1905, and suggested that the inclemency of the current year might account for the difference in appearance between the two series.

*MELANIC ANTHROCERA TRIFOLII*.—Dr. G. G. C. Hodgson, three extreme examples with all wings metallic blue-black, and only a trace of the red spots—also six spotted specimens—Surrey, 1907.

*MELANIC EPIRRITA DILUTATA*.—Mr. L. W. Newman, a deep brown-black specimen, Bexley, October, 1907.

*CROCALLIS ELINGUARIA FROM NORTH LONDON, 1882 and 1907*.—Mr. A. J. Willsdon exhibited examples taken at Manor Park in 1882 and 1907, the recent captures being heavily speckled with dark brown, while the 1882 specimens were pale in colour. Mr. Willsdon also exhibited a gynandromorph from the same district, and a specimen

from Torquay, September, 1907, with the central band on forewings very dark, and heavily outlined.

December 3rd, 1907.—ANNUAL MEETING.

*EUVANESSA ANTIOPA*.—Mr. J. A. Clark, a specimen taken at Walthamstow in 1872.

*URBICOLA COMMA*, AB.—Dr. G. G. C. Hodgson, a long series from Surrey including a cream coloured ♂, and another ♂ with underside as dark as in typical ♀.

*HARPYIA BICUSPIS* FROM TILGATE.—Mr. L. W. Newman, 3 cocoons containing living pupæ, found on birch trunks.

*EUPSILIA SATELLITIA*, AB.—Mr. J. Riches, on behalf of Mr. Dewey of Eastbourne, two very dark specimens, and another of uniform brick-red colour.

*EPIRRITA AUTUMNATA* FROM TILGATE FOREST.—Mr. L. A. E. Sabine, three *E. autumnata* taken in 1907, one having the upper wings of a unicolorous pale grey save for a somewhat darker broad central band.

ELECTION OF COUNCIL.—The result of the election of officers for the ensuing year was as follows:—

PRESIDENT.—Mr. A. W. Mera.

VICE-PRESIDENTS.—Dr. T. A. Chapman, and Messrs. J. A. Clark, F. J. Hanbury and L. B. Prout.

TREASURER.—Mr. P. H. Tautz.

LIBRARIANS.—MESSRS. G. H. Heath and V. E. Shaw.

CURATORS.—Dr. G. G. C. Hodgson and Mr. A. J. Willsdon.

SECRETARIES.—MESSRS. S. J. Bell and T. H. L. Grosvenor.

NON-OFFICIAL MEMBERS OF COUNCIL.—Rev. C. R. N. Burrows, and Messrs. H. M. Edelsten, E. Harris, J. Riches and A. Sich.

#### SECRETARIES' REPORT FOR THE YEAR 1907.

It is some four years since the secretaries have been able to obey the strict letter of the rule that decrees that on the occasion of the annual meeting they shall put before members a report on the progress of the Society.

It is, therefore, with a refreshing and pleasurable sensation of change that we announce that we are this year in a position to state that during 1907 some progress has undoubtedly been made; it is modest in degree, but, nevertheless, better to record than dormancy or retrogression.

In the first place the members' roll has been increased, and we have now got well ahead of the limit of 75 members, which number was commented upon a year or so ago as an apparently impassable figure in connection with the number of the Society's adherents.

During the year eight new members have been secured, while two have resigned and two (be it regretfully recorded) have joined the great majority—the one, an honorary member, Mr. J. E. Robson, and the other (only elected in April, 1907), Mr. A. H. Shepherd. Thus last year's total of 75 has been increased to 79. A search through the

records of the Society's doings during the past seventeen years has failed to reveal any record equal to this, and it is to be hoped that, having left the fatal number 75 well behind, we shall soon be requiring an enlarged prospectus to accommodate a steadily increasing membership.

The attendance at the meetings should be a reliable indicator to the Society's activity, and here, also, an advance can be recorded. The average attendance per meeting in 1906 worked out at 16.55, while for 1907 it is 17.55. The highest average on record is, apparently, 18.0 in 1903; the increase in our numbers should enable us to beat the average next year. Next year, be it noted, is the Society's jubilee year, and it would be satisfactory to commemorate same by a record membership and a record attendance.

The increasing attendance and the more numerous exhibits consequent thereon make it more than ever impossible for the reporting secretary to record all the exhibits from his own observations; and he frankly confesses once again that he has no intention of attempting the impossible. Members are, therefore, once more urged to furnish notes on all points worth recording in connection with their exhibits.

The attendance of visitors, unfortunately, goes from bad to worse. In 1905 we averaged 1 visitor per meeting; in 1906, mathematically speaking, only 0.85 of a visitor graced each gathering, while this year the figure has dwindled to 0.6. As about a third of those whose names have appeared on the visitor side of our attendance book during the past four or five years have ultimately become members, this falling off in the number of visitors is obviously a matter for regret.

The largest gathering of the year was on "exchange night," which has proved a popular fixture ever since its introduction in 1903. In connection with this meeting it is worth noting that this year there was more real exchanging going on, and considerably less of that display of faith in the old saw that "the Lord helps those who help themselves," which has tended to detract from the enjoyment of previous exchange evenings. This is a step in the right direction and should encourage the display of more really good insects, thereby rendering the occasion still more attractive. However generous an entomologist may be he cannot but feel somewhat discouraged if his invitation to "help yourselves" is obeyed so literally that his box is converted into a receptacle for a mere aching void.

In respect of our field meetings Providence—or the clerk of the weather—proved less kind. Arrangements were made for three, *viz.*, to Worley, on June 15th; Chalfont Road, July 6th; and Reigate, July 27th. The first meeting was rendered impossible to all but one or two ultra-adventurous spirits by torrential rain; the second was more fortunate as regards the weather of the moment, but insects were lacking owing to the generally inclement season. On the third occasion the weather was cold and dull, and lepidoptera were conspicuous by their absence.

There is, unfortunately, not much to record in the matter of donations. Our worthy President has repeated his annual gift of a volume of the "Record," and this constitutes the only substantial

gratuitous addition to the library. The cabinet has fared rather better, and several of the rarer species of lepidoptera having been presented by Messrs. Clark, Hodgson, Prout, Raynor, and Tautz.

The following programme has been carried out during the year:—

1906, Dec. 18.	<i>Larentia caesiata</i>	...	...	...	Mr. L. B. Prout.
1907, Jan. 1.	Pocket Box Exhibition.				
„ 15.	Notes on breeding <i>Melanic lepidoptera</i>	...	...	...	Mr. L. W. Newman.
Feb. 5.	Notes from North Sutherland	...			Mr. E. A. Cockayne.
„ 19.	Exhibition and Discussion— “Wainscots”	...	opened by		Mr. H. M. Edleston.
Mar. 5.	<i>Nemoria viridata</i>	...	...	...	Rev. C. R. N. Burrows.
„ 19.	<i>Polygonmatus corydon</i> and <i>P. thetis</i> ...				Dr. G. G. C. Hodgson.
Nov. 5.	Exchange Night.				
„ 19.	Special Exhibit— <i>Zygaenidae</i>				
Dec. 3.	Annual Meeting — Presidential Address	...	...	...	Mr. A. W. Mera.

A year or two ago the lack of new names on our programme was a source of anxiety; in the last report we were able to point to one recruit, and during the past year we have secured the support of two members who have not hitherto figured in the annual syllabus—yet another instance of progress made.

It is with feelings of regret—that are shared by his co-secretary—that Mr. E. Harris announces his enforced retirement from active duty owing to ill health. We are confident, however, that his successor, Mr. T. H. L. Grosvenor, will both deserve and receive the same cordial support as has been accorded in the past to the retiring secretary.

S. J. BELL. } *Hon. Secs.*  
E. HARRIS. }

## TREASURER'S ACCOUNT, DECEMBER, 1906, TO DECEMBER, 1907.

## GENERAL FUND.

<i>Dr.</i>	£ s. d.	<i>Cr.</i>	£ s. d.
To Balance from 1906 ..	11 2 1½	By Rent, July 31st, 1906, to July 31st, 1907 ..	12 12 0
„ 51 Subscriptions, 7/6, and 1 Half Subscrip- tion, 5/- ..	19 7 6	„ Insurance .. ..	0 6 3
„ 2 Subscriptions, 5/- ..	0 10 0	„ Attendance .. ..	0 10 0
„ 5 Entrance Fees, 2/6 ..	0 12 6	„ Printing and Stationery	1 12 4
„ 8 Arrears, 7/6, and 2 Arrears, 5/- ..	3 10 0	„ Postage .. ..	1 18 1
„ 8 Subscriptions for 1908, 7/6 .. ..	3 0 0	„ Subscription to <i>Ento- mologist</i> .. ..	0 6 0
		„ Subscription to <i>Ento- mologist's Monthly Magazine</i> .. ..	1 10 0
		„ Books and Binding ..	1 6 0
		„ Dr. Balance Publication Fund, 1905 .. ..	3 16 5
		„ Dr. Balance Publication Fund, 1906 .. ..	2 13 6
		„ Balance in Hand ..	11 11 6½
	<u>£38 2 1½</u>		<u>£38 2 1½</u>

## LIFE MEMBERSHIP FUND.

<i>Dr.</i>	£ s. d.	<i>Cr.</i>	£ s. d.
To 2 Subscriptions at £5 ..	10 0 0	By Balance in hand (at Bank) .. ..	10 0 0
	<u>10 0 0</u>		<u>10 0 0</u>

## PUBLICATION FUND.

<i>Dr.</i>	£ s. d.	<i>Cr.</i>	£ s. d.
To Donations .. ..	6 11 6	By Cost of Printing Transac- tions for 1906 ..	11 3 3
„ Advts. in Transactions	1 6 3		
„ Sale of Copies .. ..	0 12 0		
„ Balance (transferred to General Fund) ..	2 13 6		
	<u>£11 3 3</u>		<u>£11 3 3</u>

Examined and found correct.  
THOS. H. L. GROSVENOR } Auditors.  
ALFRED J. WILLSDON }

C. P. PICKETT (*Hon. Treasurer.*)

## PRESIDENTIAL ADDRESS.

By A. W. MERA.

After the Secretary's report, which has just been read, it appears unnecessary for me to go into any details concerning our Society, beyond expressing satisfaction at the general progress we have made. Considering the unusually poor season that we have just passed through, I think we must agree that the amount of work done by the Society has been most satisfactory.

I have often heard it remarked that a season is considered good or bad according to the amount of work each individual has done, and consequently, what one Entomologist may consider a bad season, another, who has worked harder, will consider very good; but be that as it may, I cannot help coming to the conclusion that the season of 1907 has not been a good one. There is no doubt that the summer has been abnormally cold, and to my knowledge there were night frosts well into June in the neighbourhood of Brentwood in Essex, where I then saw the young oak leaves blackened by frost; and I should think probably that not a month during the whole summer passed without some night frosts.

It will be remembered that in the very early Spring there were a few unusually hot days, which gave promise of a fine and early summer, which, however, was quite delusive. During that early burst of heat, I saw several hibernated *Vanessidae* on the wing, and also a few *Pieris rapae*, which occurred as early as March the 29th and 31st. This is only the second time that I have ever seen *rapae* as early as March, although I know it frequently does occur by then; but with my limited opportunities for observation (having to spend most of my time when the sun is shining in the region of Threadneedle Street), it was something like 40 years since I saw *rapae* in March, and, strangely enough, on both occasions it was on a Good Friday. After that short space of premature summer most of us know what an unsatisfactory turn the weather took.

On June 15th, in most unpropitious weather, our first excursion, led by Mr. Edlesten, to Warley Common, was joined by a handful of members, the party being well protected with water-boots, leggings, and overcoats; however, in spite of everything, we managed to have a most enjoyable outing. Although our captures were naturally few, some very interesting species were taken, including a black specimen of *Stauropus fagi*.

On July 6th, under rather better climatic conditions, our second excursion, to Chalfont Road, was led by Mr. Pickett. We were taken through some magnificent country for collecting, but the day was too dull for day flying insects, and the only one seen by me was a solitary specimen of *Lycaena icarus*. Nevertheless, the weather was not bad enough to prevent moths from emerging, and a large number of *Spilote ulmata* were seen, this being the insect of the day. For some reason this species appeared to be more uniform in markings than it

was the year before, and I was led to understand that it was not so numerous as formerly. Moreover, as far as I saw, none of the smoky leaden-coloured specimens were taken, as they were the year before; this form hitherto was considered to be confined to a certain district in Yorkshire, where for several years it was taken in some abundance, but now I am told that both the var. and type have disappeared from this spot.

Our third excursion, which was conducted by Mr. Grosvenor, to the Reigate district, was also favoured with only very moderate weather, and although I was unable to join the party, I believe only a very moderate number of species were taken.

Perhaps it would not be out of place for me to emphasize the desirability of members joining these outings, as I believe many of us often neglect them. I have generally found that, if the day's outing has not added very considerably to the season's total captures, it is usually a most pleasant social gathering, besides frequently opening up unfamiliar country, which to a collector is always interesting and instructive.

As might be expected with such a remarkably cold summer, some insects delayed the time of their appearance to unusually late dates. Among those that have come under my notice, or have been taken by myself, are *Smerinthus tiliae* on July 25th, at Forest Gate, another being taken as late as September 15th, by Mr. Riches, in the north of London. This, in an ordinary season, would have been put down for a second brood, but following my record of the end of July it seems more than probable that there has been only one brood. *Argynnis paphia* was seen by Mr. Willson on September 30th, in South Devon; some years ago I used to take this insect in some woods near Ipswich, during the first half of July. *Spilote grossulariata* on September 18th, also from South Devon, is another very late date, being a good three months after our London garden specimens had made their appearance; but, doubtless, most of us have noticed that in normal seasons the garden *S. grossulariata* are usually a month in advance of country-bred specimens. *H. semele*, in South Devon, was quite fresh on September 18th; this is an insect which runs well into the autumn, but it is seldom to be found in good condition during the latter part of September. *Pyramidea* was also fresh on September 19th, and *B. muralis* and *C. elinguria*, both on September 18th, all from South Devon. These two latter species are perhaps not quite so remarkable, for although late, they are both sometimes given to hold out for a very long time. *Agrotis cinerea* was taken at Freshwater on July 24th, which is a good six weeks late, and *Arctia villica* on July 23rd, which is also long after the normal time; in the Willesden district, where I used to take the latter freely some years ago, I always expected to find it fully out by June 8th, and frequently it was to be seen some time before that date. *Eremobia ochroleuca*, on September 21st, at Hazeleigh, Essex, is another belated appearance. This may be considered two months late, and finally we come to *Catocala nupta*, which I saw on October 6th, at Leytonstone, while two others were taken in good condition at Woodford on October 11th, which is certainly very late.

Another striking feature of the season has been that a large number of insects that have been kept for ova, have proved infertile, showing clearly that insects will not pair when the temperature is

abnormally cold. There has been some correspondence in some of the journals remarking on the fact that insects have been seen remaining in one position without moving for several nights in succession, and it seems that with a low temperature moths of both sexes have no inclination to move. I myself have noticed *Spilosoma menthastri* doing the same thing. I have also tethered up a female *A. prodromaria*, which remained out a whole week without pairing, owing to a spell of cold weather, and on another occasion in almost the same locality under better climatic conditions, the looked-for result was brought about almost immediately.

The interest taken in the capture of our rarer species or occasional visitors is, perhaps, not so great as it used to be, but even allowing for this, the number of specimens recorded this season still seems very small. There is one notice of *D. livornica* being taken in the early part of the year, and my friend, Mr. Willsdon, took a couple of *L. vitellina* in South Devon in September, but the other rareties which were in such evidence last year, particularly *L. exigua*, have entirely failed to establish themselves, and *H. peltigera*, which last year was in great abundance in Devonshire, has only turned up very sparingly. It is seldom that a year goes by without some special insect being in extra abundance, but it would appear that this year, both rare and common insects have been adversely affected with but very few exceptions. Perhaps one of the exceptions has been that of *Mania maura*, which at any rate in some places has been unusually plentiful.

In the matter of rearing larvæ I have always been inclined to think that cool weather is rather beneficial than otherwise, more particularly when the larvæ are kept indoors, as I have frequently noticed that a burst of heat has proved most disastrous to many species; but I learn from some of the large breeders of insects in our society, that the result of the year's work has been anything but satisfactory. My own experience has been very varied, commencing with an almost complete failure with broods of *Oporabia autumnaria* and *O. Christyi*, with which genus I had hitherto been very successful, and the manner of treatment of which was the same as before. On the other hand, with that troublesome species *T. opima*, I was successful in getting about 100 to pupate. A little later on I was again unsuccessful with a number of *D. fascelina* and *N. zonaria* larvæ, which were sent me from Lancashire. These species are well-known to be difficult when sent away from their native air, but as the *fascelina* were nearly fullgrown when I received them, I reasonably hoped for better results. I once before had an example of what appeared to be the change of air upsetting larvæ. I had been collecting some numbers of *Heliothis dipsacens* larvæ on the Suffolk coast, and whilst staying there my larvæ were doing perfectly well, and some were pupating; but on my return home to London air the larvæ began to sicken at once, and scarcely another larva pupated. I had a few eggs of *N. lapponaria* and I don't think I lost a single larva, yet in some other years they have been almost complete failures. With other commoner species, *T. consonaria* so far has been a complete success, and *D. falcula* did fairly well also; but these two species are generally easy to manage.

As might be expected this has not been a year for any generally single-brooded species to develop a second brood, but rather for double-brooded species to lay over until the spring. This has been pointed



out to me as particularly noticeable in *Pieris napi*, which some of our members have been breeding largely. Doubtless the weather again has been responsible for the absence of our occasional visitors, or perhaps has prevented the possibility of a solitary migrant perpetuating the species for a time. In support of that, I may say that a friend of mine had put out some foreign larvæ of *V. antiopa* in Norfolk during the early summer, and as far as I know none of the imagines have been seen. It may have been an interesting experiment in some ways, but from a collector's point of view the advisability of the experiment is somewhat doubtful.

The result of endeavouring to establish insects in new localities is by no means uniformly successful, even in cases where environment and climate seem all that can be desired. I have been told that many attempts have been made to colonize *E. respertaria* in positions in Yorkshire similar to the original habitat, but in all cases the attempts have proved useless. Personally, I never remember having the satisfaction of seeing a new colony established by my own planting. I once put out a large number of *Z. filipendulae* on what seemed to me a likely spot, but I have never seen the sign of another since the day I put them out. And I have also put out *Liparis dispar*, and these also never occurred again. Perhaps one of the most successful results at colonization that I have ever heard of was that of *Limenitis sibylla* having been taken from St. Osyth, in Essex, to the woods a few miles to the west of Ipswich, by one of the old Ipswich collectors named Seaman. I never knew Seaman personally, for his collecting was about finished when mine began, but it was a tradition handed down that he brought *sibylla* to these woods, and certainly the insect was steadily increasing for many years when I used to work the district. I first took it there in the Sixties, when, if we saw half-a-dozen specimens during the day, we thought them fairly numerous. By 1885 the insect simply swarmed, and in 1894, when I was last there, it was still to be found in large numbers, and now, I am told, it has extended its range considerably beyond where I used to take it. Strangely enough, this seems to be the only insect which, to my knowledge, has increased in numbers within the last forty years in that locality. My old companion, the late G. Garrett, of Ipswich, who was nearly forty years my senior, often used to sigh over the lost species of his early days, which occurred in this favoured spot, some of them being *siuapis*, *athalia*, *promissa*, *sponsa*, *quadra*, and *versicolor*, while I have seen disappear, or almost so, *iris*, *paphia*, and *adippe*. It may be that when an insect is newly introduced into a locality which is favourable to its well-being, that the rate of increase is augmented by the absence of its parasite, which might explain the increase of *sibylla*, while so many other species disappeared from the same district. It seems as if *Callimorpha hera* was a parallel example, although I have no very reliable data to go on. It is believed by many entomologists that *hera* was artificially introduced into Devonshire, and I think that there can be no doubt that it has considerably increased in numbers of late years, and also that it has extended its range very considerably. I believe our friend Mr. Burrows has, to some extent, succeeded in introducing both *C. hera* and *A. sulphuralis* to his own district, as certainly one wild *hera* has been seen, and last year two *sulphuralis* were taken at light a short distance from where the larvæ were put out two years before. This

seems to me to be a very remarkable case of colonization, as the difference of soil and surroundings to the usual habitat of *sulphuralis* is very great. It would seem feasible that a species newly arriving in a strange locality might well escape its natural exterminators for a good many years, and increase and multiply at a far greater rate for some considerable time, until its enemies, in the form of parasites, had found them out, and the balance of Nature was once more adjusted.

Touching on the increase of parasites in certain districts, I may mention that forty years ago the larvæ of *Spilote grossulariata*, which I collected in the London district, were entirely free from any parasite whatever, but some years later they began to be attacked. Last year I gathered some 150 larvæ and I should say certainly two-thirds of them were stung by one or other of four different species of parasites.

It has often struck me, that many London insects are much more given to be stung by parasites than the same species are in less inhabited districts. The only reason that has ever suggested itself to my mind, that might possibly produce that effect, is that there are so few purely insectivorous birds frequenting our London gardens, which would probably tend to keep down the ichneumons to some extent. In country districts, one or two species that appear to be most frequently stung, in and around London, are *Acronycta psi* and *Acronycta aceris*. With these species it is quite a rare thing to find a larva that is not stung, and yet in the country districts it is quite the reverse, perhaps more particularly with *psi*. *Smerinthus ocellatus* is another instance, and formerly *Saturnia carpini* was a most striking case; but that insect is no longer able to live in its old habitat as the place is now covered with houses.

Before concluding, I should like to express my sincere thanks to the officers of the society for the interest they have taken in carrying out the work of the society. Many of the duties entail considerable work and ability, and I think I am expressing not only my own feelings, but those of all the members, when I tender our most sincere thanks.

And lastly, I have again to thank you, gentlemen, for the confidence you have reposed in me, in once more electing me as your President. I trust that the coming year will show no backward movement in our society, and that the many interesting phases of entomology will be pursued as keenly as ever.

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## PAPERS READ BEFORE THE SOCIETY.

### THE VARIATION OF ENTEPHRIA CÆSIATA.\*

(Read December 18th, 1906, by LOUIS B. PROUT, F.E.S.)

In a paper published in the *Entomologist* two or three years ago, on "Some Recurrent Phases of Variation in the *Larentiidae*," (*Entom.*, xxxvii., pp. 151-156), I briefly referred—amongst many other illustrations—to two of the named forms of *Entephria* (*Larentia*) *caesiata*: the first, on page 152, as ab. *glaciata*, Germ., and the other on page 156, as ab. *gelata*, Guen. (misprinted "Germ."). I was not at that time working at the variation of this species in particular, but I took it in hand very shortly afterwards, and soon discovered that Staudinger had been "playing fast and loose" with the varietal nomenclature, in this as in some other cases. I shall show presently that the name ab. *gelata* is not possibly tenable for the form to which—following Staudinger—I applied it. Perhaps I shall be blamed for not having verified it from original sources before having made myself responsible for its use; but while I hold, as strongly as anyone, that no revision of nomenclature should be undertaken without first-hand consultation of the entire literature involved, I would point out that general papers such as the one in question would hardly ever get written at all, if it were not considered allowable to use the standard lists or reference works pending further revisions. However, as soon as I found that there were errors to be corrected, I determined to revise this interesting species as thoroughly as possible, and this evening's contribution is a partial result. My interest in the subject, on other and more important aspects than that of nomenclature, has been continuously enhanced by the accessions of new material in my collection; and although a certain amount of this has been acquired by purchase or exchange, yet it is on occasions such as the present, when I am surveying an extensive series of some variable species, that I feel most keenly the magnitude of my indebtedness to such kind friends as Dr. Chapman, Messrs. A. H. Jones, H. Rowland-Brown, A. Bacot, and others, who so liberally make my collection a receptacle for *Geometrides* collected on their travels.

\* *Entephria*, Hb., *Verz.*, p. 331 (1825?), Warr, *Nov. Zool.*, xii., p. 332 (1905), type *flavicinctata*, Hb.; = *Glaucopteryx*, Hb., *l. c.*, p. 332 (1825?), Pack., *Monogr.*, p. 66 (1876), type *caesiata*, Hb.; = *Larentia*, [Tr. *Schmett. Eur.* v., 2, p. 440 (1825), *non sect. typ.*] Guen., *Ur. et Phal.* x., p. 266 (1858), type *caesiata*, Hb.; = *Aplocera*, Sph., *Cat. Brit. Ins.*, ii., p. 141 (1829), type *caesiata*, Hb. The true type of *Larentia*, Tr., is *clavaria*, Haw. (*cervinata*, Schiff.) as declared by Stephens in 1831 (*Ill. Haust.*, iii., p. 210). Duponchel had in 1829 (*Hist. Nat.*, vii., 2, p. 112) chosen *dubitata*, L., but this was invalid, not being in Treitschke's original genus; and before he had published his next volume (1830), containing a further revision of the genus, Stephens (*Cat. Brit. Ins.*, ii., p. 129, 1829) had restricted it to four species, only three of them Treitschkeian, namely *clavaria*, *chenopodiata* (= *limitata*) and *bipunctaria*.

It will, no doubt, be rightly assumed that it is the variation of the imago of which I intend principally to speak; but it may be of some interest—and the title of my paper certainly does not preclude it—to remark that “The Variation of *Entephria caesiata*” is by no means confined to its final stage. The larva also is very variable, and most of its forms are very gay. It seems to have been first made known by Freyer, is briefly described by Guenée, and has more recently been figured and described by Millièrè (*Nat. Sicil.*, vi., p. 8, pl. i., fig. 16, 1886) and by Buckler (*Larvae*, vii., p. 166, pl. cxxvii., fig. 3, 1897). The description in Buckler was supplied him by Hellins (*Ent. Mo. Mag.*, xii., p. 6), and gives two principal forms of the larva, the first “deep red-chocolate,” the second “a deep bright green,” both having the distinct dorsal ornamentation which makes it such a handsome creature. Buckler figures two of the former main variety, one (fig. 3*b*) being green at the segment incisions. The food-plants, as recorded by Hellins, by Staudinger, Frey, Hoffmann (*Stett. Ent. Zeit.*, xlix., p. 174), and others, are chiefly the species of *Vaccinium* and *Calluna*, though Frey (*Lep. Schweiz*, p. 231) also gives willow and, with a query, young firs, while Millièrè (*Nat. Sicil.*, vi., p. 9) says that in confinement it eats *Prunus*, *Crataegus*, *Cistus*, and *Geranium*, but prefers *Convolvulus arvensis*—*i.e.*, is partially polyphagous. My own acquaintance with the larva is based solely on some which Dr. Chapman kindly sent me, fullfed, in July, 1900, from Pontresina, where he found them feeding on rhododendron—an otherwise unrecorded food-plant, I believe, though related to its favourite pabula. They seemed to be mostly of the purplish-brown form, changing to green when about to pupate, but it struck me that they had been definitely variable, and some probably green throughout, at least, the final instar.

So far as is at present known, *Entephria caesiata* was first detected as a species by Denis and Schiffermüller, who published it in 1775 (*Schmett. Wien.*, p. 111), under the name of *Geometra caesiata*, placing it in “Family L” (subsequently named *Larentia* by Treitschke, *Schmett. Eur.*, v., 2, p. 440, 1825), with the “family” (generic) characters as follow: *Geometrae*, *Mediofasciatae*—upper wings almost as in the preceding” (*i.e.*, “marked transversely on the upperside with parallel, clustered, wavy lines”), marked with curved or waved transverse lines, yet with those in the central area of the wing more massed together and darkened, so as to form a transverse band of almost equal breadth throughout. The species (No. 6, p. 112) comes in section \*\*, “forewings grey,” and is diagnosed as the “blue-grey, dark-striped geometer,” the locality given being Styria. These particulars, taken in conjunction with the testimony of Schiffermüller’s contemporaries, are amply sufficient for the recognition of the species, and Staudinger should not have cited Lang, *Verz.* (1789) as the earliest authority for the name.

Leaving out of consideration the varietal names, there are really remarkably few synonyms for this species. It is, indeed, hard to believe that Schrank, in his studies of the fauna of Bavaria, can have remained unacquainted with it, especially as he clearly did not neglect mountain collecting,\* but a careful examination of the diagnoses of

\* See, for instance, his *Fauna Boica*, ii., 2, pp. 51-52, *alpinata* (= *quadrijaria*, Sulz.) and *carbonata* (= *alpinata*, Scop.).

his undetermined species has failed to discover any description at all applicable to it. I can only record, at present, the following synonyms:—

*miata*, Schwarz, *Beytr.*, ii., p. 154, pl. xx. A., fig. 9 (1794), *nec* Linn. [Schwarz also cites *o-miata*, Müll., in the synonymy, but, although that species has never been determined, Müller's description shows it cannot belong here.]

*infrequentata*, Haw., *Lep. Brit.*, p. 330 (1809). [Haworth's *caesiata*, taken commonly at Peckham in February, cannot have been the "Simon pure" unless the data supplied him were entirely erroneous; his *infrequentata*, without exact locality, certainly represents *caesiata*, and apparently a rather pale form, with the band fairly distinct, though bifid at the costa, as in the type.]

*pyrenaria* (? auct.) *ined.*, is stated by Lalanne (*Man. Ent.*, p. 227, 1822) to be the name under which he has seen *caesiata* "in one collection." I take this opportunity to express my dissent from the view of Rothschild and Jordan (*Revision of the Sphingidae*) that no useful purpose can possibly be served by recording "museum" or other manuscript names in synonymy. On the contrary, I hold it a duty to record them when they are known. It is not inconceivable that cases might arise where important service would be done to biological science by such a course; it is well known that many able writers are careless bibliographers, and may easily publish valuable biological notes in connection with some "museum" name which has never been published, their work, therefore, in the future becoming almost useless. To some extent, I can instance actual cases. For example, in 1816, a French entomologist, Lelorgne de Savigny, published an important work under the title of *Mémoires sur les Animaux sans Vertèbres*, in which he embodies some original studies in the mouth parts of insects; in the course of these there are anatomical details given of four "inedited" species—*Mingas polygona*, *Strigina poae*, *Ismene pelusia*, and *Lyndia canarum*. So far as I have been able to learn, no other reference to these is to be found in literature; but I, for one, should be very grateful to any of his contemporaries whom I might discover to have published a note to the effect that such-and-such known species existed in the Paris Museum, or in Savigny's private collection, under these names, even though the publisher of the note might not have been aware that any other elucidation depended upon it. One or two other, though less striking cases, have come under my notice in my own studies of the literature of the *Geometridae*—*e.g.*, some observations of Scharfenberg's in Scriba's *Journal*, in 1790, included certain "nomina nuda" which, however, have become intelligible through their author's own determinations of them published fifteen years later (in Bechstein and Scharfenberg's *Schädliche Forstinsekten*, vol. iii.).

But I must not spend further time in this digression, as "the variation of *Entephria caesiata*" is awaiting more detailed consideration. The type of the species is the ordinary German and Austrian form, with bluish-grey tint and conspicuous dark band, and is fixed with quite unusual clearness and unanimity. Not only does Schiffermüller's meagre diagnosis point definitely to this form, but the fuller descriptions of Lang, Borkhausen, and Treitschke, and the figure by Hübner (a little *too* blue, but recognisable) also represent the same.

In Central Europe, *E. caesiata* is not nearly so variable as in the far North, or in many parts of Britain; Frey, for instance (*Lep. der Schweiz*, p. 231), says definitely that "compared with high-northern examples (Norway and Iceland) the Swiss *caesiata* varies little." Some of the earliest references to supposed varieties were due to confusion of the allied species with it. Thus several of the older entomologists, even including Staudinger in his earlier days (cfr. *Stett. Ent. Zeit.*, xxii., p. 396), Speyer (*Stett. Ent. Zeit.*, xx., p. 32), and Guenée at first (*Ur. et. Phal.*, ii., p. 273)\* confused either *E. flavicinctata*, Hb., as a whole (Staudinger, Speyer), or in its darkened Scotch form (Guenée), with the present species, calling it *caesiata* var. *flavicinctata*: while one (Freyer, *Beytr.*, v., p. 14, pl. 390, fig. 4) figures as a var. of *caesiata* an example which is certainly in reality *injidaria*, Lah. Even one quite modern writer, Gumpfenberg (*Nova Acta Acad. German.*, liv., p. 390), has attempted to extend the limits of the variation of *E. caesiata* by merging into it a form which has by others been regarded as a distinct species; this is the Asiatic *ravaria*, Lah. (*Verh. Zool.-bot. Ver. Wien*, iii., p. 381, pl. vi., fig. 4), which I shall have to mention later on, but which I may say at once is quite evidently a good species.

The first genuine varieties or aberrations of *Entephria caesiata* to attract attention were apparently those which were brought from Iceland towards the middle of the last century, and those studied by Zetterstedt in Lapland about the same period; and these differed so much from the typical form that it was not unnatural that—considering the small amount of the material then available for comparison—they were considered to be new species and named as such.

First, in chronological order, came Germar's *glaciata* (*Faun. Ins. Eur.*, xv., fol. 18, pl. 18, 1832), described and figured from Iceland, and later recorded from Lapland by Zetterstedt (*Ins. Lap.*, p. 959, 1838), who notes its similarity to *caesiata* and to his *annosata*. But Staudinger was the first to point out (*Stett. Ent. Zeit.*, xviii., p. 257) that it "with certainty belongs here" (i.e., to *caesiata*) "as dark variety." He, however, there diagnoses it as "var. *a*. *Alis anticis nigricantibus*, ♂ ♀," which suggests the more extreme form ("*caesiata* var. *A*" of Guenée), and remarks that it is led up to by a series of aberrations differing in the degree of the darkening. Germar's own diagnosis of his form, was as "fuscous grey," showing the intermediate paler fasciæ as "hoary," or "more whitish"; that is, it was an average darkened form, and not the very extreme thing which is sometimes met with, e.g., in Britain, and which is the "*caesiata* var. *A*" of Guenée (*Ur. et Phal.*, ii., p. 272).

Next Zetterstedt (*Ins. Lapp.*, p. 962, 1839) introduced us to *annosata*, likewise assumed to be a new species, although compared with *caesiata*, to which he had evidently noticed its resemblance. Probably, like *glaciata*, it was described from a single specimen only; he says: "Hab. in Lapponia rarissime" and that it was discovered in the mountains of Dalecarlia by Boheman, and kindly sent him for describing. He distinguishes it from *caesiata* by its rather smaller

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\* It will be remembered that later in the same volume (p. 544) Guenée, having received further material from Doubleday, re-described this Scotch *flavicinctata* as *ruficinctata*, n.sp., which name (as varietal) has priority over var. *obscurata*, Stgr. (*Cat.*, p. 299, 1901).

size, the wings not glaucescent, the medial band entire, not bifid at its extremity, etc. Typical *caesiata*, as he rightly points out, has the dark medial band "bipartite on the costa" (*loc. cit.*, p. 962). The ground colour of *amosata* is said to be hoary, the forewings irrorated with cinereous, the hindwings hoary whitish. Except at the first, when Staudinger (*Stett. Ent. Zeit.*, xxii., p. 396) erroneously gave it for an extreme phase of ab. *glaciata*, the name has always been rightly applied to the aberrations with the central area more strongly and uniformly darkened, but (like *glaciata* in another direction) it grades off into the typical forms through intermediates.

Several years later, Guenée (*Ur. et Phal.*, ii., p. 271, 1858) published another "species," under the name of *gelata*. It was obtained from Iceland, and, as I shall show, was practically identical with *glaciata*, Germ., to which of course it must sink. But as Guenée examined a larger material than his predecessor, it is not surprising that the series should have included an interesting aberration, which, according to his wont, he describes as "var. A," but does not name; nor is it surprising, considering the beauty of this form, that he should have selected it for figuring (pl. 14, fig. 6). What is surprising—or would be so, but that the caprice and vagaries of nomenclators are only too familiar—is that Staudinger (*Cat.*, ed. ii., p. 187, 1871) should have chosen to employ the name of "ab. *gelata*, Guen.," for the aberration A instead of for the form for which it was invented. That Guenée's *gelata* is, for all practical purposes, a synonym of *glaciata*, Germ., is shown by his description of it as dull, fuliginous brown-black, with the fasciæ which border the central area "hardly lighter grey" than the ground colour. Germar, as his figure and description show, happened upon a specimen with rather whiter hindwings than usual; Guenée's form had them "silky pale grey." On the whole, then, as will be seen by comparing the two summaries which I have given, *gelata* is simply a rather extreme phase of the darkened Iceland aberration *glaciata*, Germ.

The beautiful extreme form, "*gelata* var. A" of Guenée, with the ground colour nearly white, and with practically no markings excepting the dark central fascia, has never yet been named. Staudinger first called attention to it in his "Reise nach Island" (*Stett. Ent. Zeit.*, xviii., p. 257), indicating it as "var. b. al. ant. niveis, area basali mediaque grisea nigris ♂ ♀," but not naming it. It is certainly recurrent in Iceland, though probably not frequent even there; Staudinger obtained two of the extremes (♂ and ♀) in his visit to that country, and says (*loc. cit.*, p. 258) that they were "from the north of Siglufjördr, as in general this inclination to whitening is shown almost exclusively in examples from the north. In the lightest specimen from the south, the dusting is especially yellowish, particularly on the nervures." Guenée seems only to have regarded two of the Iceland specimens which he had seen as *gelata*, for he gives Iceland among the localities for *caesiata* also, and says of his new species: "Island Coll. Mus. une ♀ provenant du voyage de la Recherche," and of var. A: "Mêmes provenance et collection." He describes the latter as "grey almost white, and without lines or atoms, with the basal and medial areas of a fuliginous black as in the type. Inferiors with a single line." His figure agrees, showing precisely the same form as one Iceland example in the British Museum collection, and a

specimen sent to me by Staudinger and Bang-Haas as "ab. *gelata*." The locality given me for this, by the way, was "Greenland," but this was probably by a mere oversight; at any rate, I should not feel sufficient faith in a dealer's locality to make use of it for a faunistic record. *E. caesiata* is not supposed to occur in Greenland at all; see, for instance, Aurivillius' "Grönlands Insektsfauna I." (*Bih. Svensk. Vet. Ak. Handl.*, xv., Afd. iv., No. 1, 1890), which gives of *Geometridae*, only *Dasyuris polata*, Hb., a doubtful *Eupithecia* (? *nanata*, Hb., var.), *Operophtera brumata*, L., and *Psychophora sabini*, Kirb. One fine specimen of the form in question ("ab. *gelata*") is recorded by Schneider from Tromsö (*Troms. Mus. Aarsh.*, xv., p. 82).

As this form (*gelata* var. A of Guenée) is still without a name, I propose to name it ab. *prospicuata*,\* since it is certainly the most outstanding form of the species; in a sense it may be said to continue the line of variation suggested in ab. *annosata*, Zett., but it is incomparably more extreme.

The next form named was *inventariaia*, Grote (*Bull. U. S. Geol. and Geogr. Surv.*, vi., p. 591, 1882), which may really be, as Grote believed, a distinct species. I can say very little about it at present, having failed to trace, in our museum, the specimens which will serve as its types. The history of the name is as follows. In 1881, Dr. A. G. Butler received for the British Museum, some examples of North American *Geometrides* from Mr. H. Edwards, and on these he published some notes in the American periodical "Papilio," vol. i., pp. 220-223 (December, 1881). Amongst the notes we read (p. 222): "'*Glaucopteryx caesiata*, Hübner.' Two specimens, Havilah, California. This is not the European *G. caesiata*, the latter has the outer edge of the broad belt across the primaries regular and dentated, whereas this species is more like *G. kollariaria* with a regular sinuated band. I doubt the occurrence of *G. caesiata* in America, although Packard's figure looks rather like the species; it is probable that the insect before me is undescribed." Next year, Grote came to the same conclusion; he writes (*loc. cit.*): "After comparing European specimens with our own, I have made the two following changes in our lists," and the first of these changes is: "*Glaucopteryx inventariaia*, Gr., for *Gl. caesiata*‡ Butler, *Papilio*, i., 222" [the ‡ indicates the invalidity of the name, *i. e.*, "*caesiata*, Butler, nec Lang," as the "Zoological Record" enters it]. Grote probably meant to write *inventaria*, and has his printer to thank for the ungainly name, as well as for several other misprints; but of course the published form must be followed. As I have not found Butler's Havilah specimens in the museum series of *caesiata*, I suspect they turned out to be some entirely different species and have been removed to a more appropriate position, though Mr. Warren tells me he has no recollection of them; I shall hope to light upon them some day. Although it is by no means certain, perhaps hardly even probable—that Grote's American examples which he "compared with European" were really the same thing as Butler's, yet as he has given no trace of description, and has expressly erected the "n. nom." on a reference to Butler, it is quite clear that its application will necessarily be to the specimens partially described in

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\* Since reading this paper I have published it under this name, *Ent. Rec.*, xix., p. 22.



“Papilio.” Of the other American forms or representative species I shall speak later on, as they have as yet (with one possible exception) received no names.

The next name in chronological order was var. *impallescens*, Christ., described from Kurusch, Caucasus, as follows: “Minor. Alis angustioribus, anticis albidis, dense fusco-conspersis, lineis transversis undulatis minus expressis” (“Lepidoptera Nova Faunæ Palæarcticae,” *Iris.*, vi., p. 95, 1893). It will be observed that Christoph rightly erected this as a var. of *caesiata*, not as a new species. Staudinger (*Cat.*, ed. 3, p. 299) indicates that it occurs also in Labrador as a var., but considers it an unimportant one—“vix nominanda.” His diagnosis does not give precisely the same impression as Christoph’s; it runs: “alis minus dense squamatis, semidiaphanis.” I have not seen specimens from either locality, so will not hazard further comment. Of the Labrador form, Möschler writes: “I possess four examples of this species from different localities in Labrador. They vary very little *inter se*, are of the ordinary size, and the colour is rather dull and uniform, but much more like that of the German *caesiata* than that which is exhibited by my Finmark examples, to which, however, they come near in respect of the slight darkening of their markings” (*Stett. Ent. Zeit.*, xlv., p. 122). In the Vienna “Verhandlungen” (xxxiv., p. 304) he gives nearly the same description, making them agree with the German form in the “greenish” coloration of the forewings.

The most recent addition to the varietal nomenclature is var. *norvegica*, Strand (*Nyt. Mag. Nat.*, xl., p. 165, 1902), erected for the Norwegian forms in a paper on the Lepidoptera of (chiefly) Arctic Norway, and which might be diagnosed as: minor (24-31 min.), alis anticis magis unicoloribus, griseis. Strand’s actual description of it gives more detailed measurements, taken from 33 specimens, and some comparison with other forms, but the whole gist of it is contained in the diagnosis I have suggested here; he says “they are of smaller size” (than those of central Europe), “and of a much more uniform grey colour. *Ab. norvegica* is not confined to the arctic regions, individuals from southern Norway must also be referred thereto.” Its author mentions this form again two years later (*Nyt. Mag. Nat.*, xlii., p. 140, 1904) and records some localities from southern Norway—where it seems far scarcer than in the north—but adds nothing else to our knowledge of it.

The only other forms which it appears to me convenient to designate by special names, are two rather extreme aberrations, namely, the most extreme dark form (*caesiata* var. A of Guenée), which, after Staudinger, has been passing as *ab. glaciata*, Germ.; and the form which occasionally turns up in this species, as in so many of its allies, with the central band extremely narrow, and incomplete, or broken. The former I will call

*ab. nigricans*, mihi, n. *ab. caesiata* var. A, Gn., *Ur. et Phal.*, ii. p. 272 = *caesiata* var. a, Stgr., *Stett. Ent. Zeit.*, xviii., p. 257 (“alis anticis nigricantibus”) = *caesiata ab. glaciata*, Stgr., *Cat.* (pro parte) = *caesiata* var., Barr., *Lep. Brit.*, viii., pl. cccxlviii., fig. 1 *g.* This aberration has the wings blackish and more or less glossy, whereas *ab. glaciata*, Germ. = *gelata*, Gn. is much less extreme, being rather of a fuscous grey, or at the darkest, of a “dead” (“mate”) fuliginous colour. That I am justified in separating the two is shown not only by my own

material as exhibited this evening, but also by Guenée's work; for, as the above synonymy shows, he did not even recognize them as co-specific, much less as varietally equivalent.

The other new form may be known as ab. *constricta*, mihi, n. ab. = *caesiata* var., Barr., *Lep. Brit.*, viii., p. 153, pl. cccxlviii., fig. 1c, 1d. Central fascia extremely narrowed, and more or less broken on the inner marginal half of the wing. This is, of course, the phase of "recurrent variation in the *Larentiidae*" discussed by me on pp. 153-5 of my paper in the "*Entomologist*" (vol. xxxvii.), and I have followed Strand's lead, as there alluded to (p. 155), by employing the name of *constricta* for it.

It will be worth while, in view of the additions and corrections proposed above, to tabulate the named varieties and aberrations of *Entephria caesiata*, before concluding with some remarks on its geographical variation in general and on the question of its American representatives.

#### ENTEPHRIA CAESIATA, SCHIFF.

1. *caesiata*, Schiff., Lang, Hb. Blueish-grey, with well-defined dark central band enclosing a pale area on costa.

2. ab. *infrequentata*, Haw. Inclining to cinereous, with the fuscous band as in the type. This may be used, after Guenée, for the somewhat paler forms which are fairly frequent in Britain, though it is really almost synonymous with the type form.

3. ab. *annosata*, Zett. Central band entire, *i.e.*, not enclosing a pale area on the costa.

4. ab. (var. ?) *glaciata* (Keferstein M.S.) Germ. = *gelata* Gn. Darker (brown or more fuscous) than the type, generally weakly marked, and not brightly glossy. In spite of the variability of the species in Iceland, I believe this description applies to a very great majority of the specimens from that country, and that it ought to be regarded as "var." rather than "ab."

5. ab. *prospicuata*, mihi = *gelata* var. A, Gn. = *gelata*, Stgr. Ground colour whitish, central band dark.

6. ab. *nigricans*, mihi = *caesiata* var. A, Gn. = *glaciata*, Stgr. More or less uniform blackish or deep fuscous, darker and more glossy than ab. (var. ?) *glaciata* Germ.

7. ab. *constricta*, mihi. Central fascia much narrowed and more or less broken (*vide supra*).

8. var. *impallesces*, Christ. (Caucasus). Smaller and narrower than the type, wings whitish, densely sprinkled with fuscous, wavy transverse lines indistinct.

9. var. *norvegica*, Strand (Norway). Smaller than the type, wings much more uniform in their tone, the prevailing colour grey.

?10. var. (?) *inventaria*, Grote (California). Said to differ in the contour of the central fascia; perhaps a distinct species (*vide supra*).

In the British Islands, *Entephria caesiata* is subject to a good deal of variation, though all the examples known to me would have to be catalogued under Nos. 1, 2, 3, 6 and 7 of the above-enumerated forms, unless, perhaps, some of the Shetland specimens are true *glaciata*. Most of the forms could probably be obtained in almost any locality where the species occurs at all fully, provided sufficient material were collected. Certainly my friend Mr. Arthur Horne, of Aberdeen, got

together a very fine variable lot, by taking it in large numbers at the Hill of Scolty. The pretty, light-grey forms with distinct markings (*infrequentata*, Haw.), which generally turn up amongst a British series must, I think, be rarer on the Continent, though I have one or two from Simplon and Arolla running towards them. I have said that I do not consider this a thoroughly well-differentiated "ab.," nor do I feel certain that Haworth's "subcinereis" quite represents it, though his citation to his *infrequentata* of "? cyanata, Hb." favours Guenée's idea that he must have been dealing with a pale form, and as Guenée's interpretation seems to have priority, it is best to follow it. Stephens (*Cat. Brit. Ins.*, ii., p. 141; *List Brit. Anim.*, v., p. 194) also cites *infrequentata* as a "var." of *caesiata*, but gives no diagnosis. On the whole, British examples average somewhat smaller than those from central Europe, the normal measurements, as taken from my series, being respectively 30-33mm. and 32-35mm. I have seen the very dark forms (*nigricans*, mihi), from several localities, such as Shetland, Paisley, North Wales (Leech coll.), Yorkshire, etc. Possibly a better percentage are obtainable from the Shetlands than elsewhere, though Hoffmann (*Stett. Ent. Zeit.*, xlv., p. 369), assumes that Shetland specimens do not differ from the rest of the Scotch, since Jenner Weir does not particularly mention the species; and he (Hoffmann) adds a foot note that he has seen *caesiata* from Arran with deep black-grey forewings, only shot with white on the nervures (i.e., ab. *nigricans*), thus forming a sharp contrast to the washed-out grey forms which he has seen from Iceland (? *glaciata*) and the north of Norway (*norvegica*). A few Shetland specimens which I have seen show the brownish colour of ab. (var. ?) *glaciata*, but it is difficult to judge of the exact status of this form without access to fresh bred specimens, as both wear and fading are apt to make them appear more brownish. Barrett mentions, in addition to various aberrations, what may possibly be a local race, but as I have not been able to study it, I can say nothing on the subject at first hand. His words are: "Lastly, specimens from North Wales seem to show a faint tinge of green, and are otherwise dull and shaded off." For the most part, as he says, the colour variations in this species "do not appear to be local" to any material extent.

The general run of European forms (excluding the Arctic) may be treated together. They belong mainly to the type form and ab. *annosata*, with an occasional ab. *nigricans*. The British Museum collection has fairly definite examples of the latter from the Mutzell collection (one, ? locality), and the Zeller collection (one from Freyer, ? locality, and another from Stelzing), but these are pretty uniformly dark, without such distinct white dots as are inclined to appear on our British ab. *nigricans*. There is also a curious dark specimen from the Frey collection (Engadine) which looks almost as if it might be a melanic example of some other species of *Entephria*, perhaps on account of the distinct double row of white dots, the depth of the arches in the subterminal, and the darkened hind-wings, recalling those of *caeruleata*, Guen. (? *flavicinctata*, var.), but which I have decided is veritable *caesiata*: this is presumably the specimen recorded by Frey (*Lep. Schweiz*, p. 231) as taken in 1853. To the ill-defined ab. *annosata* may be referred two from the Zeller collection (one "Schlucken-Alp," from Freyer, the other Raibl), one from the Leech collection (Denmark)

and possibly others. I possess two which have been sent me under this name, but which are only moderately representative of the form, one from Finland, and one from Hochschwab. Most of the continental local lists record it as more or less general, but this does not necessarily imply extreme phases of it. My only specimen from Alsace is large and rather light, with more of a yellowish tinge than the rest of my series. Among those which I bred from Pontresina are one or two of the form of which Barrett speaks admiringly, and which might almost be worth naming, in which the pale area (*i.e.*, of the ground colour) in the middle of the central fascia is continued right across the wing, leaving only quite narrow bars, or boundary-lines darkened. Of the Esthonian form Petersen writes (*Lep. Estl.*, p. 130): "In general our examples are darker than those of central Europe"; but the two which he kindly sent me hardly bear out this impression.

Arctic or high northern specimens are generally smaller\*, and less sharply marked than those of central Europe, and this applies in a general way to those of both northern Scandinavia (*var. norvegica*) and of Iceland (*ab.* or *var. glaciata*, etc.); yet there are definite differences observable between the two races. The Icelandic seem, on the whole, to be about the size of the British, the Norwegian, on the whole, smaller still (see Strand's description of *var. norvegica*, *suprà*). The former, though very inconstant, and abounding in interesting aberrations, favour a brownish tone; the latter, with really extreme aberrations comparatively rare, tend much more to greys. The former are very generally darker than the type, the latter often hardly darkened at all though Schneider (*Troms. Mus. Aarsh.*, xv., p. 82) calls his race "melanotic," and Wocke (*Stett. Ent. Zeit.*, xxv., p. 188) says that examples from Dovrefjeld are mostly very dark grey, entirely without yellow dusting. Iceland, as already mentioned, is the home of the beautiful *ab. prospicuata*, and my series from that country also contains two of the most decided *ab. annosata* I possess (both from Thingvellir), one of them with the ground colour becoming pale, *i.e.*, making some approach to *ab. prospicuata*. Sometimes, on the contrary, the darkening of the whole wing is so extreme as to produce practically *ab. nigricans*, differing chiefly from the British in its browner hue.

As regards the North American forms or representatives, there is still much work to be done. I can add nothing to what I have said on the Labrador form; but Möschler was such a good entomologist, that I am satisfied to accept his dictum as to its specific identity with ours. Nevertheless, it by no means follows from this that the forms recorded from Alberta, Colorado, California, etc., or even from New Hampshire and Massachusetts are the same; Labrador is well-known to have a fauna which is essentially Arctic, and, we might say, essentially European. Packard, to be sure, introduces, *F. carsiata* as American on an apparently abundant material; for he describes (*Monogr.*, p. 67) from "40 ♂ and 40 ♀." But the majority of those seem to have been from Labrador (see p. 68), and the examples sent him from Iceland and the Austrian Alps (p. 69) may also have been pressed into the service for describing, as his "American specimens

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\* Large specimens occur occasionally as an "ab." at Bossekop; two given me by Mr. H. Rowland-Brown measure 36 and 34mm.

are rubbed." Still, he had from other localities what seemed to him to agree entirely with those from Labrador, for he records also the White Mountains and Mount Washington in New Hampshire, some localities in Colorado, and Massachusetts. His description would seem to fit *Entephria caesiata*, or, perhaps, Barrett suggests, *E. flavicinctata*—for he rather emphasizes the "golden scales." His figure (pl. viii., fig. 16) could quite possibly represent the form of *caesiata* with the entire centre of the medial band pale, though it has rather an unfamiliar look; it does not show a discal spot on the hindwings, but this is mentioned in the description as "distinct." I cannot find that he says from which locality the figured specimen came. Of the variation in America he only says that the specimens from near Georgetown, Colo. (8000-9000ft. elevation), have, "perhaps, more golden scales" than others, and that the Labrador examples are a little stunted, agree with those from Iceland as to general appearance and size, but are not quite so dark, and have more golden yellow specks. He has seen no specimens from the United States or Labrador with such clear markings as those received from the Austrian Alps.

Butler and Grote follow with their notes on *E. inventaria* (? n. sp.) already quoted; Grote, it will be observed, does not make any direct reference to Packard's figure or description, though he seems to assume that the whole of the American forms are of one species, and that a different one from the European *caesiata*. After this, I find no American reference till 1896, when Hulst (*Tr. Amer. Ent. Soc.* xxiii., p. 281) transfers *caesiata* to the genus *Mesolenca* (type *albicillata*, L.), but throws no further light on its determination. In Dyar's "List" (p. 280, 1902) it still appears as "*caesiata*, Denis and Schiff." (i.e., as = the European species); "*aurata*, Pack." (which I cannot trace) is added as a synonym, and "*inventaria*, Grote" (*inventaria*) stands as a variety. Finally, my good friend Mr. F. H. Wolley Dod, in his valuable Alberta List, records (*Canad. Ent.*, xxxviii., p. 93, 1906) two forms which have been referred by Mr. Taylor to this species; (1) the "Laggan form" with a "faint though obvious ochreous tinge," and (2) two specimens taken near Calgary in 1904 and 1905, having the ground colour paler, "with distinct smoky central and terminal bands." Mr. Dod has very kindly sent me two of the Laggan specimens, and I feel sure that they represent a distinct species; the different tone, silky texture, absence of distinct discal dot on hindwing, shiny, unmarked undersurface, etc., all point to this. Indeed they are much closer to *ravaria*, Led., from the Altai and Ala Tau districts, and might almost be co-specific with this, or at least with two rather doubtful specimens in the British Museum collection, which are treated as *ravaria*, and which were collected by McArthur at "Kokser" and "Rala." Concerning his forms Mr. Dod wrote me (*in litt.*, June 9th, 1906): "*caesiata* certainly seems to me to contain more than one North American species. I believe I treat of two in my list (*q.v.*), and strongly suspect that that of the Kaslo list\* is a third. Mr. Taylor, by the way, admits that

\* "The lepidoptera of the Kootenai District of British Columbia," by Dr. H. G. Dyar (*Proc. U.S. Nat. Mus.*, xxvii., pp. 779-938, 1904). Here we simply find recorded (p. 896) 28 specimens, dates in June and August to September, which "indicate two broods," and that "this is a high altitude species."—L.B.P.

the Laggan form may be distinct, and I have seen what looks to me like the Calgary species (two specimens only taken) at the coast as *caesiata*." I do not think I have yet sent European *caesiata* to my valued correspondent the Rev. G. W. Taylor, nor can I find that I have had any correspondence with him on the species. I sent it to the other chief student of *Geometridae* across the Atlantic, Mr. R. F. Pearsall of Brooklyn, and he wrote me: "Your *caesiata* I have not critically compared as yet, but it looks just like specimens I take in the Catskill Mountains. I have seen another series taken in White Mountains near Hampshire, with the yellow markings of *caesiata* a bright golden, and heavier. Does this correspond to your species *flavinecata*?" (*in litt.*, December 26th, 1905). Later (January 14th, 1906), he added: "I think I wrote you that your *caesiata* and ours are the same." The matter has not yet proceeded further.

The British Museum only possesses one American example, and this is in very bad condition. It was sent by Mr. Cockerell from Colorado, as "*caesiata*, f. minor," and looks, as far as can be made out, a true *caesiata*, though—like the Laggan species, and Packard's figure—it seems to have the discal dot of the hindwing obsolescent.

A photograph of Hulst's type of *Philereme multivagata* (*Bull. Brookl. Ent. Soc.*, iv., p. 26, 1881), very kindly sent me by Mr. Taylor, also looks extremely like a large specimen of *Entephria caesiata*, only with a dark margin to the hindwing; yet it is difficult to see how Dr. Hulst could, in this case, have placed it in the genus *Philereme* (*Scotosia*).\*

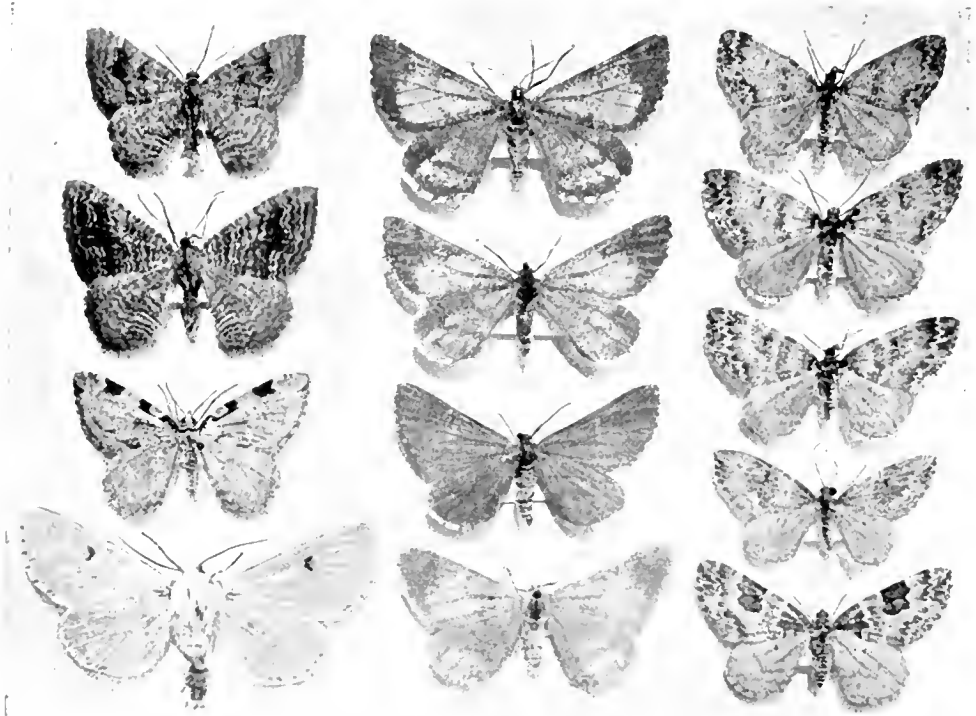
On the whole, it seems best to conclude that the true *caesiata*, or something extremely near it, does occur in several parts of North America, but that another species is mixed up with it—perhaps more than one—and awaiting further study and differentiation. The present would not be a suitable place for naming the *ravaria*-like Laggan species, which, on my assumption of its distinctness, has really no place in a paper on the variation of *Entephria caesiata*. My task for this evening is therefore accomplished, although you will see that there is still need for further sorting-out of the numerous cognate forms in this interesting group.

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\* Since writing this paper I have received a fine specimen of *multivagata*, and find it is a true *Entephria*, closely related to *caesiata*, but distinct.



SOME NORTH SUTHERLAND LEPIDOPTERA.



1. *C. bilineata* ♂ ab.
2. " " ♀ ab.
3. *C. pectinitaria* ab.
4. *A. leporina* ab.

1. *F. piniaria* ♀ ab.
2. " " "
3. " " "
4. " " "

1. *C. corylata*  
var. *albrocrenata*.
2. *C. corylata* ab.
3. " " "
4. " " "
5. " " "



## NOTES FROM NORTH SUTHERLAND.\*

(Read January 15th, 1907, by E. A. COCKAYNE.)

The north-west corner of Sutherland, lying midway between the Orkneys and Shetlands to the east and the Hebrides to the west, ought to be interesting from the entomological point of view. The position of the country, and the fact that little has been written about its larger insects, are my excuses for reading these notes, made during a visit of only fourteen days, and therefore necessarily very incomplete. Unfortunately I have not had time to look up recent records in the magazines, and where I mention that an insect has not been taken in Sutherland before, I mean that such record is not to be found in Meyrick's handbook or Barrett's British Lepidoptera. Notes in brackets on the northern limit of range previously recorded are those given by Barrett, whose nomenclature is also used.

I will begin with a brief description of the district. Tongue, my headquarters, is a small village forty miles from the nearest railway station, from which one has to travel through a bleak and cheerless country of grassy hills, which rise gently on the western side and fall abruptly on the east. One travels for miles without seeing a single tree.

The Kyle of Tongue, on which the village is situated, is a shallow inlet of the sea, into which the Kinloch river, the Allt Rhian and other streams pour their waters. It is protected at the mouth by the picturesque Rabbit Islands, and half way up is almost bridged by a long strip of sand which runs out from the Tongue woods. The western side is low, bare and rocky; the eastern rises steeply from the water to a height of 400 to 500 feet, and is in places clothed with stunted lichen-covered birch trees and, here and there, a rowan or aspen. Past the mouth of the Rhian the land is flat and cultivated as far as the Tongue woods.

These are fairly extensive, and the trees are large. The lower part is level and grassy, and consists chiefly of beech, wych elm and lime. Further back it runs up a steep slope, on which many pines and mountain-ashes grow, and culminates at about 900 feet in a growth of small pines and open heathery moor. The Rhian is bordered by low alders, rowans and sallows, and in places runs through woods of small birches. On the side farthest from the village are meadows with bracken and coarse grasses, and between these and the sea is a wood, An-garbh-chnoc, with pine, spruce, larch, rowan, birch, beech and alder, on a hill about 400 feet high. Owing to our limited time we almost confined our search to the district described, which includes the most fertile, and some of the wilder parts of the neighbourhood.

On our first day, June 30th, we found numbers of larvæ of *Cleoceris viminalis* on sallows near the Rhian, and took some of the largest, from which we bred 27 imagines on July 29th, and the two following days. Compared with my Rannoch specimens the number of dark forms

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\* With plate presented by the author.

(6 out of 27) is somewhat less than from that district (19 out of 59), and they emerged just 20 days later than these. One is a nice dark grey specimen with orbicular and reniform encircled with white. We then climbed a hill overlooking the Kyle, and had a good view of the birch woods below. The trees were thinly covered with leaves and in places were almost as brown and bare as in winter. While we were looking, a party of about twenty black-headed gulls (*Larus ridibundus*) flew over and made their way to the barest part of the wood. Here they dropped to a level with the topmost twigs, and then each in turn kept checking its flight, hovering for a moment and appearing as if about to settle, then flying on to another tree, where it would repeat the same manœuvre.

It was quite evident they were obtaining food, and our curiosity was aroused. When we had climbed down to the wood, we were in no doubt as to the nature of the attraction. Every birch was covered with thousands and thousands of fullgrown larvæ of *Hybernia progemmaria* of every shade from pale to darkest brown. Threads of matted silk hung from tree to tree, and tangled groups of hanging larvæ clung to our clothes as we walked under the branches. Amongst the host of larvæ were a few of *H. defoliaria*, *Cheimatobia boreata* and *C. brumata*. Curiously enough, I find no record for the county of any of the first three of these. Barrett states that *H. progemmaria* is scarce in Aberdeenshire, for *H. defoliaria* he gives Argyle and Perth, and for *C. boreata*, Ross and Moray as the Northern limit.

For the next few days we saw parties of gulls feeding in this way, sometimes only two together, usually four or five, but on July 3rd we saw quite fifty or sixty together, steadily working from end to end of the wood.

A day or two later there was scarcely one, and, on looking at the trees, I found that almost all the vast multitude of larvæ had vanished. The trees, many without a single leaf, and only the leaf stalks to show where they had been, alone bore testimony to their recent presence. These woods appear to have few moths in them: *Cymatophora duplaris*, *Platypteryx lacertinaria* (new, very locally Clydesdale, Argyle and Ross) and *Coremia pectinataria* were captured. In the afternoon we met with more success in the wood, An-garbh-chnoc. Here we saw *Ephyra pendularia* (new to county, Ross and Moray), *Coremia montanata*, *Fidonia piniaria*, *Venusia cambrica* (new: Argyle), *Melanippe tristata* (the usual brown and white Scottish form), *M. subtristata* (a clear black and white form), *Thera variata* (new: Moray in east to Hebrides in west), *Eupithecia lariciata* (? new), *E. satyrata*, and several *Cidaria corylata* (new: Moray and W. Ross).

The last species was past its best. The variety *albocrenata* was far commoner than at Rannoch, and I should think about 30% were of this form instead of about 5%. The majority of the *corylata* were of the broken-barred form, but a good many exhibit a complete central band. In one specimen, a fine female, the costal half only is present, and very clearly defined. I have not seen any description of a similar specimen. The series of var. *albocrenata*—I include under this term, those specimens in which the central band is more or less frosted with white scales, and not limited by black outer and inner lines—show a complete parallelism with the ordinary forms. In most the central band is interrupted, but in a

good many it is complete, and in one or two even broad; in a few nothing of it remains but the black discoidal spot, in others only the costal half is seen. One is rather a rich cream colour.

In contrast with this, I have only met with broken-barred forms both in ordinary *corylata*, and in var. *albocrenata* in the Rannoch district. The lines, too, in the submarginal region are much blacker in Rannoch *albocrenata*, and the transverse line between the basal area and the central band is darker. The Tongue specimens are more uniformly pale.

Near this wood we found larvæ of *Coremia didymata*, from which a normal female imago was bred, of *Cidaria testata* and *Poecilocampa populi* (new: Moray and Argyle).

At night I sugared some birch trees, but the only visitor was another *populi* larva, which was enjoying a comfortable supper of rum and treacle. From these and others I bred a pale male and a dark female imago. With the lantern I found a *Coremia propugnata* and *Cabera pusaria*, of which Barrett says "to Moray if not beyond." It proved to be very common, and I took one slightly damaged specimen in which the first and central lines are approximated, as in the var. *rotundaria* (a form only recorded once from Scotland), but more so on the right than on the left.

Next day July 1st, was dull and cold, and we found little except one worn *Cidaria suffumata* (new: Moray and Hebrides), *Phytometra ænea* (new: Moray and Argyle), *Melanthia ocellata*, *Hepialus velleda*, and one *Emmelesia blandiata*, the last named on the underside of a beech branch. Doubtless the insect was common near the river, where its foodplant was plentiful, but in my experience it is very hard to find in the daytime. In the Rannoch district, though flying abundantly at dusk, I have only found one at rest on a rock, and two or three on tree-trunks.

On a strip of damp ground near the river *E. albulata* (typical) was abundant, and *Tanagra chaerophyllata* occurred, the latter new (Aberdeen and Moray). I found it in many other places later.

Here we found a dozen nearly fullfed larvæ of *Trichinra crataegi* (new: Aberdeen, Argyle, and Inverness). They were feeding exclusively on small mountain ash trees growing amongst birch bushes.

After dinner I strolled out and saw in a rough field, on the other side of the river, four or five black-headed gulls. Standing apart, first one and then another kept making a sudden dash, flying quickly along the ground, and then settling again. I crossed the river and found a sparse growth of bracken where they had been, and I saw a good many *H. velleda* flying swiftly amongst it. Almost every night afterwards I saw some of these gulls take up their positions as the flight-time of *velleda* arrived, and depart as soon as it ended. Out of two dozen *velleda*, varying much in size and colour, there were only two of the variety *gallicus*.

Nearer the river I took a series of *Hydrilla arcuosa* (new: Aberdeen and Perth).

The night was wonderfully light—at this time of year there is no real darkness in these latitudes—and on the way home, about eleven o'clock, I was leaning over a gate, standing quite still, and watching a *C. montanata* flitting up and down over the grass about three yards away. Suddenly a gull flew up behind, checked itself abruptly, opened its mouth, and the moth was gone. The bird never saw me and flew

away leisurely across the field, catching another on its way. A quarter of an hour later there were still two gulls moth-catching, and, to judge by their movements, they enjoyed a good meal. These black-headed gulls appear to be most ardent and successful entomologists. Their methods of capturing *H. humuli*, which I watched at Rannoch last year, and its ally *H. vellea*, were most cleverly adapted to the different flights of the males of these two insects. For the swift and erratic *velleda* they stood still, and only made a sudden flying dash as one went past; while for the hovering ghost moth they flew steadily backwards and forwards, catching them as they went. In both cases they seemed to know exactly what time the insects were beginning their evening flight.

Two of the next three days we spent in Tongue Woods, and took a fine series of *Fidonia piniaria*, which was very abundant. Amongst the males I looked out carefully for cream-coloured forms, but only succeeded in catching four, all smaller, of a paler, dingier colour, and with more black on the wings, than those from the south of England.

The females vary in ground colour from white or cream colour, through various shades of yellowish-brown to drab: some of the last are almost unicolorous. In one of the pale ones, the usually dark costal and apical areas are pale yellowish-brown, giving it a faded appearance. In the forewings, some have the basal stripe along the nervures well marked, some the transverse bar, while in others both are almost obsolete. In several there is a very distinct approach to male colouration.

Above the wood we took two *Coenonympha darus*, which was unexpectedly scarce, a male *Chelonia plantaginis*, *Agrotis porphyrea*, and *Fidonia atomaria*.

In the wood itself we came across *E. lariciata*, *V. cambrica*, *Macaria liturata* (new: Inverness and Ross), *Rumia crataegata* (a pale specimen with red markings almost obsolete), *Coremia ferrugata* (the last two new: Moray) and *E. nanata*.

On July 3rd, I took several very bright males of *Polyommatus alexis* and two females, neither so blue as some Rannoch ones, and a large battered female of *Vanessa cardui*. I also found a female *Arctia fuliginosa* var. *borealis* with a complete black abdominal stripe, a marking I have previously only seen in males.

During the next few days *V. cambrica* was at its best—I saw thirteen on two trees on the 4th—and contrary to expectation I found it very unwilling to fly. They are all paler than my Yorkshire ones.

The next day was bright and sunny, and we saw *Xylophasia rurea* flying at saxifrage, and *Apamea basilinea* at raspberry blossom. Near the village there were several colonies of *Vanessa urticae* larvæ.

In the evening I went to some marshy ground where I had seen great numbers of flower spikes of the butterfly orchis, with a few *Habenaria albidu*, marsh and spotted orchids, hoping they would be visited by one of the *Plusias*.

Very few moths visited them, and I only took five faded *Plusia gamma*, only one of which had pollinia of this orchid attached to its eye. *Plusia bractea* undoubtedly visits this flower, as I have one with a disc firmly attached to each eye, but I suppose it was too early for this insect. Two of the *gamma* had pollinia of one of the other orchids on their tongues, and I noticed some on a *Hadena dentina* found on a

tree trunk, and on *Habrostola tripartita*, *Apamea basilinea*, and *X. rurea*, all taken at other flowers.

There were great numbers of Noctuæ at honeydew, chiefly *rurea* and *basilinea*, with a good many *C. pectinataria*. I also caught one *Noctua plecta*. On the way home I took a *Boarmia repandata* and *Cidaria truncata*, and saw three *H. humuli*.

On Friday I found a beautiful white specimen of *Acronycta leporina*, immaculate but for the black discoidal spot, high up on a rowan, and in the evening took a *C. munitata*. Examining my captures in the house I found I had taken a remarkable aberration of *C. pectinataria*. In this, the wing area along the costa from base to apex is normal, though faded to the usual pinkish colour. The rest of the wing looks silvery-grey with pale grey marks representing the usual black areas. Microscopically it is perfectly fresh, but the scales are unpigmented and thinly scattered, so that the membrane shows between. The grey marks are due to black scales, natural in character and position, but much reduced in number. Amongst others of this species is one with unusually black markings.

In the hotel garden *H. tripartita* was abundant every evening, visiting all the flowers, but on a cold night appeared twenty minutes later than on the warmer ones. I also took seven *pulchrina* at pink campion on different evenings. It is curious that neither of these species visited the orchids only 200 yards away. Amongst other insects obtained at dusk on July 7th, 8th, and 9th, were *H. dentina*, *C. fluctuata* (dark forms), one *Cidaria prunata* (? new), one *Caradrina cubicularis*, *Apamea gemina*, *Emmelesia alchemillata* (new: Moray and Hebrides), *Eupithecia pulchellata*, *E. assimilata* (new: Perth and Ross), *E. fraxinata* (new: S. Scotland only, Edinburgh, Clydesdale and Solway), *E. subfulvata* var. *cognata* (new), and a worn specimen of what may be *E. constrictata* (new). *Fraxinata* was only taken at the end of my visit, and I had no opportunity to follow up the capture, but there are big ash trees not far away.

July 8th was showery and windy, and I noted that *cambrica* was shy and inclined to fly off the trees. On the 8th, I took *Cabera exanthemaria* (new: Ross), one with first and central lines coalescing, and *Eupithecia castigata* (new: Moray) near the Kinloch river. On the 9th I took *Ellopija fasciaria* in Tongue Wood, and another later in An-garbh-chnoc (new: Moray).

One night, seeing a good many *Pieris brassicae* at rest, I took notes at the time, and give them practically verbatim. All were sitting fully exposed, one on a white flower of tradescantia, a large plant with only five flowers; one on the flower of a crucifer, a plant with few leaves but many loosely arranged masses of white flowers; two on upper side of leaves of other plants of the same species near flower heads; one three-quarters of the way up the stem of an oxeye daisy, a big plant, covered with flowers and buds of different heights; one on a leaf of lily plant, which has no flowers. Next night, July 8th, I saw four more all near white flowers. There were many other flowering plants, and those they were on were not near one another. Amongst others were tiger lily, forget-me-not, yellow daisies, larkspurs, blue polemoniums, and pink campion, all of which were examined without result.

If these butterflies do choose a resting place to match their own colour, definite evidence of it is most likely to be obtained in these latitudes, where the much longer period of light, while the insect is still at rest, makes their selection of a suitable sleeping-place so much more important.

With regard to the other "whites," *P. napi* was to be seen in the grassy hollows near the river. This is a new record: South in his recent book states that it has not been recorded from further north than Ross and Moray. *P. rapae* was abundant later in the village, evidently just emerging.

During the remainder of the time we took *Larentia caesiata* commonly, even at sea-level, on the tree trunks and rocks, and two *Acidalia fumata* (new: W. Ross). We also took a few *B. repandata*, rather darker and more uniformly grey than Rannoch ones, on rocks in the woods, and with them three *Dasydia obfuscata* (new: Ross). On the moors larvæ of *Lasiocampa quercus* and *Saturnia carpini* were noticed. On the last day of our visit, numbers of *Argynnis aglaia* suddenly appeared.

We devoted a good deal of time to looking for *Camptogramma bilineata* in the woods near the Kyle, and most of those taken were found on the rocks, often under a ledge. A total of 98 males and 18 females were examined; of the males 22 were quite normal, 55 showed five dark spots on the forewings to a fairly marked degree, of the remainder, some showed general darkening of the ground colour or unusually distinct striæ. In some of the spotted examples the spots are very conspicuous, and in one they meet across the central band. Of the 18 females, only three were without black spots or darkened striæ, and one has the striæ much blackened, and a strong black band running along the inner side of the second line, which gives it a very striking appearance. Another point brought out by my specimens is a certain degree of sexual dimorphism. In every female the ground colour of the forewings is of a soft brown, contrasting with the orange colour of the hindwings. In the males, the upper wings are yellow, and even in the darker specimens, the colour is always different from the brown of the females. In Aberdeenshire I have taken similar brown forms with the commoner yellow ones. In England, this species usually sits amongst the leaves of bushes, whereas here they were frequently exposed on the face of the rocks, and nearly always on the rocks, even though they were often under a ledge. This difference of habit may account for the darker, and less conspicuous colour of the Sutherland form and especially for the browner females.

As a whole the species which show a tendency to melanism are not numerous, and some are actually paler than more southern races.

To sum up, we took a total of 85 species, nearly all in the imago stage, 28 are probably new to the county list, and 3 doubtful. Of these 31, two are noctuæ and 25 geometridæ.

Last.—*Pieris brassicæ*, *P. rapae*, *P. napi*, *Polyommatus alexis*, *V. urticae* (larvæ), *V. cardui*, *Argynnis aglaia*, *Coenonympha darus*, *Poecilocampa populi* (larvæ), *Trichiura crataegi* (larvæ), *Lasiocampa quercus* (larvæ), *Saturnia carpini* (larvæ), *Platypteryx lacertinaria*,\* *Hepialus velleda*, *H. humuli*, *Nemeophila plantaginis*, *Phragmatobia fuliginosa*, *Demas coryli*, *Cymatophora duplaris*, *Acronycta leporina*,

*Agrotis porphyrea*, *Noctua plecta*, *N. c-nigrum*, *Hadena pisi*, *H. dentina*, *Cleoceris riminalis* (larva), *Xylophasia rurea*, *Apanea gemina*, *A. basilinea*, *Taeniocampa gothica* (larva), *T. instabilis* (larva), *Hydrilla arcuosa*,\* *Caradrina cubicularis*, *Plusia pulchra*, *P. gamma*, *Habrostola tripartita*, *Phytometra aenea*.\* *Rumia crataegata*,\* *Cabera pusaria*,\* *C. exanthemaria*,\* *Macaria liturata*,\* *Fidonia atomaria*, *F. piniaria*, *Ellopiia fasciaria*,\* *Dasydia obfuscata*,\* *Boarmia repandata*, *Hybernia progemmaria*,\* *H. defoliaria*,\* *Ephyra pendularia*,\* *Acidalia fumata*,\* *Melanippe tristata*, *M. subtristata*, *Melanthia ocellata*, *Coremia fluctuata*, *C. montanata*, *C. didymata*, *C. pectinataria*, *C. munitata*, *C. propugnata*, *C. ferrugata*,\* *Larentia caesiata*, *Venusia cambrica*,\* *Emmelesia albulata*, *E. alchemillata*,\* *E. blandiata*, *Cidaria corylata*,\* *C. truncata*, *C. prunata* (?\*), *C. suffumata*,\* *C. testata* (larva), *Cauptogramma bilineata*, *Thera variata*, *Hypsipetes impluviata*, *Cheimatobia boreata*,\* *C. brumata*, *Eupithecia nanata*, *E. lariciata* (?\*), *E. castigata*,\* *E. subfulvata* var. *cognata*,\* *E. pulchellata*, *E. pumilata*, *E. assimilata*,\* *E. satyrata*, *E. fraxinata*,\* *E. ? constrictata*,\* *Tanagra chaerophyllata*.\*

\* New.

## NOTES ON THE "WAINSCOTS."

(Read February 19th, 1907, by H. M. EDELSTEN.)

The subject of our exhibition and discussion this evening, "The Wainscots," is a family which has always appealed to me very strongly. I am afraid I cannot tell you very much about this subject, as each year I find I know less and less about them, and my attention has been chiefly devoted to one or two species. Perhaps of all the genera of British lepidoptera the family *Leucania* contains more rare and casual visitors than any other, as the blanks in our cabinet-drawers show. Taking the "Wainscots" as a whole, they may be divided up as follows:—The more or less dry-land species, comprising, *pallens*, *impura*, *comma*, *turca*, *lithargyria* and *conigera*. The water-loving species:—*obsoleta*, *straminea pudorina*, *brevilinea*, *M. flammea*, *S. maritima*, *C. phragmitidis* and *lutosa*, and the *Nonagrias*—*typhae*, *cannae*, *sparganii*, *dissoluta*, *geminipuncta*, and *T. fulva*, *concolor* and *helmanni*; the coast species comprising *elyui*, *littoralis*, *favicolor*, *putrescens*, *T. bondii*, and our rare visitors *S. musculosa*, *L. extranea*, *loryi*, *l-album*, *vitellina* and *albipuncta*. I include the two latter among the visitors, as I feel sure they are not true British species; but there is an importation every few years which just keeps them going, and anyone who has worked the coast, will, I think, agree with me, that a cycle of warm summers generally produces some of our rarities.

Now, as regards the life-history of the "Wainscots":—

The egg-laying is practically the same all through. The ovipositor is pointed and flat so that it can be thrust within the sheathing leaves of reed and grass stems and grass blooms. The eggs themselves in their natural position are generally flattened spheres, those of the *nonagrius* being more flattened than those of the *Leucanids*. The eggs of the internal feeders and those external feeders which require the growing stems to feed in and on, do not hatch till the spring, and are covered with a glutinous substance which protects them from the water, as they are often submerged during the winter; those of the rest hatch in the summer, and the larvæ mostly hibernate small, though some are full-fed before the winter but do not pupate till the spring. The only species I know which pupates in the autumn is *M. flammea*.

I do not propose to deal with all the larvæ separately, the larval habits of most of the "Wainscots" are well-known to you all, I expect. Perhaps a few notes on one or two may be interesting. *Obsoleta* and *straminea* larvæ always strike me as being different from the rest of the *Leucanids*, though this may only be from force of circumstances. Their long flattened bodies are so different from the usual cylindrical *Leucania* larvæ; but when one comes to think the matter out, it is necessary they should be so, as they hide within dead reed stems in the day time, as they are inhabitants of the old reed beds growing in the wetter portions of the fens; and they have nowhere else to go, or the birds would soon find them out. *Brevilinea* has a most curious larval existence; when small, it is an internal feeder; as it grows larger, it comes out to feed on the leaves; when it has finished its supper, it bites a hole in the reed-stem, just below the terminal leaf, and enters the stem to hide during the day; the reeds grow so fast at this season, that by the next morning the sheathing leaf has grown over the hole and the larva is quite hidden, hence it is very rarely ichneumoned. In its last stages it is purely an external feeder, and it pupates on the surface of the fen. *Cannæ*, again, is another curious example; it starts feeding in *scirpus*, and sometimes *iris* and *sparganium*, as also *sparganii* does; then, as it grows, it enters *typha* stems, both *latifolia* and *angustifolia*, and pupates in the interior of the stem, head upwards, as against *typhæ*, which always pupates head downwards. I have sometimes found pupæ of *cannæ* in stems of *scirpus*, *sparganium*, flower stems of *Iris pseudacorus*, and once in the hollow stem of *Cicuta virosa*, though this only occurs, I think, when the stem in which they fed was unsuitable for pupation. The moor-hens are great enemies of *cannæ* and *sparganii*, as the pupæ are always below the emergence hole, and they peck downwards and eat them; but *typhæ* escapes, as it is above the hole. The larvæ of many of our rare species, when we get a hot autumn as we had last year, feed up rapidly, and spin a puparium, and, I think, are thus enabled to stand our climate, whereas they would be killed as small larvæ.

The pupæ of the *Nonagrius* are interesting in possessing a pointed headpiece or beak, with which they break through the outer cuticle of the stem to enable the moth to hatch.

Now, to go on to another subject, *Senta maritima*, in which genus should this species be placed? I believe it is a macro, though the larva is very like a tortrix, and does not resemble any of the wainscots in



any shape or form. Then, as you probably know, it is of a most degraded type, for in captivity it is not particular what it eats, decaying vegetable matter, raw beef, tomato, geranium flowers, its own brethren, spiders, aphides, etc. It chooses as its home the empty reed stems, always finding one that exactly fits it. What is its natural food? I have found them crawling about at night in the old reed beds drinking the dew, and I think its real food must be the confervid growths at the base of the reed stems.

The general colour of the "Wainscots" is rather striking, but it is no doubt due to protective coloration; their habitat is among the reeds and sedges, and the way they choose their resting-places during the day is truly wonderful. I once or twice have found *maritima* in the day time sitting under an old reed stem with its wings wrapped round it, and I had to look several times before I was quite certain about it. Then again, why do Wainscots produce black forms, especially the *Nonagrius*? It cannot be for protection, because they would be so conspicuous on a green or brown stem. I believe Dr. Chapman said he thought it was a reversion to the original type. There is no doubt the reed-colour of the "Wainscots" is assumed to harmonise with its surroundings, and it is an unnatural colour amongst the *Noctuae*: I think it is a point of the deepest interest, as it is such a consistent habit.

As regards the difficulty of collecting a good series of Wainscots, it is no easy matter, as each species has practically a different habitat, and one must go for each species separately. Light is a most attractive medium, and sugar sometimes, but one must study each species; for instance, it is no good going to try and catch *brevilinea* or *flammea* in thick reed beds, or *ulvae* and *dissoluta* on the open fen, though they may all be within a hundred yards of one another. Some of the species are exceedingly local, and I cannot account for this, as many of them are strong fliers, and the food-plants occur all over the country. *Cannae*, for instance, is confined to one little corner of the Broads, but never seems to spread, and *geminipuncta* occurs all through the country, but not in the broads. Then again, many species occur one year and not again for several seasons. Why? Chiefly, I think, owing to the regular cutting of the reeds and rushes, which, being done in the winter, destroys the eggs, but as the demand for thatch or chaff does not increase now, I hope all the indiscriminate cutting and burning will cease, and allow the "Wainscots" to re-establish themselves, and enable us to find out something more about this delightful family.

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## SOME NOTES ON *A. BELLARGUS*, WITH REFERENCES TO ALLIED SPECIES.

(Read March 19th, 1907, by Dr. G. G. C. HODGSON.)

With a view to filling up the gap in the absence of advertised paper, these few notes are hurriedly put together—in *re* mainly *A. bellargus*, and the closely approximating ♀ of *A. corydon* and *P. argus* (*aegon*), and in less degree the species most closely allied to these as occurring in England.

Beginning with *Adonis* (with which solely these notes first set out to deal), the dates in general for this species occur to me, and in this connection, in passing, one cannot refrain from commenting on a phase which must have puzzled us all, *viz.*, the dates one finds given by authorities for various events extraordinarily at variance with experience of present time, *e.g.*, the blooming of plants:—Bee orchis given as flowering in "May" (not exclusively one is only left to infer); *Bellargus*, time of appearance "May and August," Newman, though the first specimens do not invariably emerge till June and September, and if in May quite one of the latter days is the first date. And only by quite artificial means have I ever been able to obtain Bee orchis blossom in May.

Only in three years have I noticed *Bellargus* in May. In two consecutive years, 1905 and 1906, *Bellargus* ♂s seen in May, on 27th and 29th respectively, giving five days and three days of flight for this species.

In one other year (earliest record noted—in diary without year date) May 24th is only other record made earlier than June.

These remarks would be only less emphatic as regards second-brood that it is mainly a September phenomenon in most years. To what is due this discrepancy in statements of competent observers might be a fruitful source of discussion. It is noteworthy that in connection with these we cannot be indebted for unusual records to the artifice of other human beings, with their cuckoo clocks and other devices.

These remarks by no means touch the limits where perhaps lie such records as (? at Selborne) of *M. cinxia* in August. (White, *Natural History of Selborne*.)

*A propos* of *A. bellargus* the following dates collected are perhaps of interest:—Two years, 1877 and 1879, gives us dates November 5th and November 6th; 1889 gives end of October, possibly also November (for these I am indebted to Mr. Sidney Webb); one year, 1903, Surrey North Downs daily in October till 10th.

In connection with this falls the consideration of the extent of the duration of imaginal state in both broods. I believe it used to be considered that as a rule five weeks would fairly cover the combined periods of both broods in imaginal condition.

Thus in 1888, collecting at Bevingdean (Sussex), first (♂) *bellargus* was seen on September 13th, and the first day on which none

were seen was 25th of same month. Not one was seen subsequently in this year. Between these dates it was fairly abundant, and this was a year for a species to linger rather than be hurried in its courses. From two to three weeks usually averaged each brood's days. And only by collecting in a series of localities (seven) could one calculate on working *bellargus* in second brood for five weeks round Brighton. In the earliest locality it would be over (or more than over) before its appearance in the last. This refers to years prior to 1899, and to S. Downs. But in 1903, 1904, 1905, 1906, a new experience has been one's lot.

The dates for these four consecutive years (to which 1907 is added since reading of paper) are—

	FIRST-BROOD.			SECOND-BROOD.		
*1903 .. ..	36	days	.. ..	47	days	.. ..
1904 .. ..	29	„	.. ..	37	„	.. ..
1905 .. ..	63	„	.. ..	47	„	.. ..
1906 .. ..	40	„	.. ..	47	„	.. ..
1907 .. ..	49	„	.. ..	51	„	.. ..

The days on which *bellargus* was on the wing in these years covered over 22 per cent., 18 per cent., 30 per cent., 24 per cent., 27 per cent. of these years respectively.

Leaving the periods of emergence, etc., and diverging to variation in special years—and taking in *corydon* as well—the observation of 1887 and 1888, when I visited regularly two localities, I was firmly convinced that these two years showed as regards themselves as follows:—

1887: very hot, sunny, dry summer; exaggeration of sexual dimorphism, ♂ s brilliant, ♀ s no blue.

1888: Late, wet, mostly wretched summer; most of ♀ s with blue taken this summer, and all the darkest ♂ s taken previously to 1904 were of this year's capture. The comparison of long series of these two years especially of *corydon*, taken in an endeavour to get all possible variation, was most striking in the manner above indicated.

Possibly a further remark or two on other variation in imago of *corydon* will not be quite useless, especially considering that, as regards the differentiation of ♀ of *bellargus* from *corydon*, there is, I believe, no written description which precludes the possibility of error in identification, however easily familiarity may enable one to readily distinguish every individual.

In my former collection I had a *corydon* taken in last week of July, 1888. This verbally (so to say) was indistinguishable from *bellargus* as to colour, shape, fringes, markings of upper- and under-sides, with all the admirable neatness and cleanly marked detail of the latter, except for one character not, to my knowledge, anywhere described as a mark of identification, à propos of which character a series is shown. Not that it never fails, does one suggest; but so often markedly present in *corydon*, it is, I think, final when well-marked.

On the margins of the wings, on the undersides, where the dark line cuts off the fringes from the wing, and where the nervures end

\* In this table one and the same single locality all through.

on this line, there is an increase of the thickness of this line and each nervure at the junction in all the following *Lycaenids*:—*argus* (*aegon*) *astrarche*, *icarus*, *bellargus*, *arion*.

In *corydon*—usually—this results in the wing rays terminating in a longish triangle with the apex well up on the wing rays, a triangle of the same colour as the ground colour of the wing, therefore, in the female, brown of some tint. Present in all wings, usually much less marked in the ♂ than in the ♀, tending also less in ♂ to any exaggeration, and, if unequally marked (except very rarely) on hindwings more marked than on forewings; in *corydon* on the average this presents a great contrast to *bellargus*.

In *bellargus*, the sexual difference is merely less marked; but otherwise similar statement to that *in re corydon* holds good in much less degree. Usually the increase from the little junction triangle is very slight, and of colour of marginal line. Occasionally in ♂ *bellargus* there is marked running of ground colour down wing rays between the “peacock spots.”

As regards the other four species mentioned, except merely giving statistics in table shown, I let them entirely stand over.

In comparing *corydon* and *bellargus* (by means of very limited statistics)—(in ♀)—

The forewing being used for comparison:—

The triangular marking on the disc of this wing being noted and distinguished from mere circumferential thickening at the edge:—

We get

In <i>corydon</i> , Δs well marked in	...	...	...	110
In <i>bellargus</i> ,	“	“	“	0
In <i>corydon</i> , Δs rather more than slight	...	...	...	15
In <i>bellargus</i> ,	“	“	“	15
In <i>corydon</i> , Δs slight or very slight	...	...	...	0
In <i>bellargus</i> ,	“	“	“	131
Specimen of <i>corydon</i> compared	...	...	...	125 in toto
and specimens of <i>bellargus</i> compared	...	...	...	146 in toto

In *corydon*, the chief range of differences occurs in those classed as well marked, 110 out of 125.

In *bellargus*, the chief range of differences similarly is in the 131, not paralleled by *corydon*; but much less difference of degree occurs here than in the well marked *corydon*, which proportionately should be differentiated into many classes.

Compared with the difficulty of a verbal description discriminating these species in the female sex, and habitual (? invariable) easy confidence of the correct expert, and unanimous agreement if required of experts, and compared with the facile and early acquisition of this skill as regards these two insects whose resemblance (much exploited in a comparatively popular sense) is such a difficulty to the beginner, a ridiculous contrast is afforded by the little mentioned resemblance of ♀s of *icarus* and *bellargus* in the case of really puzzling specimens; and here—with these species—this test of the “nervure-triangles” (if I may so designate them), strangely enough, may I think be expected to fail.

At this point one is reminded of one’s intention to claim for

*bellargus* the position of one of the most variable, probably the most variable, of our "blues," the ♂ so much more variable than *icarus*, the ♀s so much more than *corydon*.

One asserts this, prompted by a feeling that it is not too prevalent an opinion, and mentions it in passing to a few details yet to be mentioned with regard to *bellargus*, as to variation, etc., first as regards habits, which should be kept to the front, as otherwise I confess perhaps too liable to be relegated to a back ground.

In contrast with what one has usually considered characteristic of the species, one notes that as often as not (probably), the only specimen of *bellargus* seen on the first day of its season (first or second brood indiscriminately) has been a ♀—on one occasion (Folkestone)—two days before a ♂ has been seen.

And again, as regards a second example of a solitary ♀ in 1905, on Surrey Hills, more than a mile from any *hippocrepis* or from any *bellargus* specimen otherwise, a typical ♀ *bellargus* was taken (and released) in September.

Then as regards markings: during the last four years in Kent, in Sussex, in Surrey, during constant collection of *bellargus* in both broods, we have observed in all broods a tendency in *ab. striatus*, to blue band in ♀s on secondaries, and a definite tendency to *obsoleti*: while in Sussex and Surrey, previous to 1898, nothing of this kind ever fell to ones lot. (From 1898 to 1904, being abroad, no English collecting was done.)

And—still as regards ♀s—in 1903 was especially noticeable in Surrey the tendency to alteration of colours during the progress of the autumn. Towards the end of the brood the later ♀s were more often plain, and dull, brown, drab-black, with reduced orange crescents (particularly hindwings), reduced striation of fringes, and increase of tendency of gray apices to forewings. This probably is habitual with prolonged, late autumn broods, or those where termination has been affected by cold, some approaching closely the only two ♀s affected (as was known to be the case) by frost which I have seen. These would be parallel to the grayish-coloured ♂s, also approaching those taken after frost.

In the variations of the ♀, the blue of particular individuals seems much more variable than in *corydon*. The blue band within the margin of hindwings seems peculiar to *bellargus* among ♀s of "Blues."

Turning to the variation of ♂, it often seems as if the frequency and kind of variation of the less aberrant individuals is liable to be under-estimated.

Of course the deep iron-gray, as well known in the late Mr. Sabine's collection, the pale silvery steel, the absolutely altered by bleaching with pinky tinges, and the extreme of commoner shades, as green and violet, are too well-known to be mentioned, except as not immediately under consideration.

But the remaining numbers, including an enormous percentage after excluding the above, still include many exceptions, such as the very pale, the pure blue of a deeper colour than any average specimen, the grayish and very deep-coloured individuals, and still yet some exceptionally brilliant, before the rest can be put down as a fairly homogeneous residue, even yet slightly green or slightly violet. Some

of these exceptions seem to be somewhat, at least, local in Kent or Sussex as at all common, *viz.*, the pale blue, very pale, and very dark blue.

And still left to be mentioned are the variations of borders of primaries, the white edge within the fringe, the black spots to hindwings, with and without white edges, and the rare, though slight, markings similarly to upperwings. These and the amount of black on nervures, on margin, in fringes, transversely, longitudinally, and the dusky to grey and almost black fringes. The latter matters, relating it to *hylas*, are all deserving, and needing, too, still a great amount of work.

And, finally, on the undersides probably no other English "Blue" is more variable on underside, or more interesting as to amount of sexual variation, and resemblance by variation in colour, than *bellargus*.

Finally, to bring to a close these disjointed and rambling remarks, an apology is needed for their superficiality, which would have been somewhat mended but for their hurried concoction, owing to this being no specially prepared, no foreseen paper, which facts, I hope, will partially justify the offering of remarks, based, as you will understand, on such ignorance as leads one to consider such blues as *corydon* and *aejon* to be allied much more closely than most of our "blues."

This arises, of course, from aforesaid superficiality, which judges from the imagines with undersides showing (1) sometimes or often "blue studs" in marginal spots of secondaries; (2) tendency to white nervures on discs; (3) tendency for the groundcolour to run down nervures broadly to margin, spreading there in a triangle—and with uppersides in ♂ with variation from a plain marginal line to wings, through a row of spots of varying sizes with and without varying amount of white to a broad homogeneous black band—the wing rays varying from blue ground colour through varying amount of black pigment to marked black wedges on upper wings; the black discoidal spot so often present in both, even on hindwings\*.

It must be allowed, however, that these points of resemblance are fairly closely confined to these species. Nevertheless, parallel arguments probably exaggerate also the nearness of *icarus* and *bellargus* in relationship, through the close parallelism of the ♂s (colour only, and not too unreservedly excepted), and, indeed, also, only less so of ♀s, and including the underside marking, where the "nervure-triangle" seldom is well marked, and increased chiefly (though, even here, rarely) in ♂s by ground colour spreading between "peacock-spots."

Based entirely on points like these, one fully recognises the superficiality of the argument; but this feeling is, nevertheless, strong enough, in contrast with any appreciation of a close relationship between *corydon* and *adonis*, to lead to one's arrangements placing *argus* and *corydon* alongside, and *adonis* and *icarus* alongside, even though this *should* necessitate separating *corydon* and *adonis* from juxta-position.

To these notes (and accidentally omitted from them when read)

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\* [Also, as well-known now, both hibernate in ova; a much less "superficial" resemblance, perhaps. October 2nd, 1907.]

may be added to variations common to *corydon* and *aeon*, and not to *icarus* and *bellargus*, an occasional aberration in *aeon* and *corydon*, showing a few black spots additional to the discoidal spot on upper wings, and, perhaps, in both on hindwings, in much same position as in *arion*. This is quite distinct, probably from the variation in scaling allowing some reproduction of markings of undersides on uppersides, probably most commonly in *icarus*.

## A. BELLARGUS ON WING.

1903	{	First-brood, June 2 to July 8 .. .. 36 days	} 22% of year.
	{	Second-brood, August 24 to October 9 .. .. 47 days	
		(With interval 47 days) Total, 11 $\frac{2}{7}$ weeks.	
1904	{	First-brood, June 6 to July 4.. .. 29 days	} 18%.
	{	Second-brood, August 20 to September 25 .. .. 37 days	
		(With interval 46 days) Total 9 $\frac{3}{7}$ weeks.	
1905	{	First-brood, May 27 to July 29 .. .. 64 days	} 30%.
	{	Second-brood, August 12 to September 27 .. .. 47 days	
		(With interval 14 days) Total 15 $\frac{2}{7}$ weeks.	
1906	{	First-brood, May 29 to July 7 .. .. 40 days	} 24%.
	{	Second-brood, August 8 to September 13 .. .. 48 days	
		(With interval 31 days) Total 12 $\frac{4}{7}$ weeks.	
1907	{	First-brood, May 26 to July 23 .. .. 59 days	} 30%.
	{	Second-brood, August 24 to October 13 .. .. 51 days	
		added after. (With interval 31 days) Total 15 $\frac{5}{7}$ weeks.	

## NERVURE-TRIANGLE OF ♀ IN SIX SPECIES OF BLUES.

		NONE	SLIGHT	VERY SMALL	MARKED	GOOD	EXCESSIVE
<i>Argus</i>	(125) ..	1	15	51	45	13	—
<i>Corydon</i>	(125) ..	—	—	4	11	39	71
<i>Bellargus</i>	(146) ..	52	79	12	3	—	—
<i>Icarus</i>	(155) ..	64	51	35	5	—	—
* <i>Astrarche</i>	( 84) ..	30	33	20	1	—	—
* <i>Arion</i>	( 13) ..	12	1	—	—	—	—

\* ♂ s as well as ♀ s.

## DESIDERATA FOR THE SOCIETY'S CABINET.

## LEPIDOPTERA.

1. *In Micros*.—Many species are not represented by a single specimen, and in only a few species is the series complete.
2. *In Macros*.—In the case of nearly all rarities only a type or no example. Of less rare species many species will bear improvement.

RHOPALOCERA.—All good specimens, with data, acceptable. New series specially required of *L. arion*, *H. actaeon*, and *H. sylvanus*.

HETEROCCRA.—(South list, 1884.)

C. Porcellus	P. Leucophea	A. Cordigera
T. Apiformis	M. Albicolon	H. Peltigera
T. Crabroniformis	M. Furva	E. Fasciana
S. Scoliiiformis	A. Connexa	T. Craccæ
S. Sphægiformis	A. Ophiogramma	B. Notha
S. Asiliformis	C. Haworthii	B. Cinctaria
S. Myopiformis	C. Ambigua	D. Obfuscaria
S. Formiciformis	A. Corticea	G. Papilionaria
S. Ichneumoniformis	A. Cinerea	P. Pustulata
S. Chrysidiformis	A. Ripæ	T. Lactearia
N. Strigula	A. Aquilina	Z. Porata
N. Albulalis	A. Obelisca	Z. Annulata
N. Centonalis	A. Præcox	Z. Orbicularia
N. Senex	A. Obscura	A. Luteata
N. Mundana	A. Ashworthii	A. Candidata
L. Muscerda	N. Depuncta	A. Sylvata
L. Lutarella	N. Ditrapezium	E. Obliterata
L. Deplana	M. Dahlii	N. Cambrica
E. Cribrum	N. Sobrina	A. Ochrata
H. Asella	N. Castanea	A. Bisetata
D. Fascelina	T. Orbona	A. Contiguaria
T. Grætægi	A. Pyramidea	A. Dilutaria
P. Populi	P. Leucographa	A. Holosericata
E. Lanestrus	P. Hyperborea	A. Circellata
B. Quercus	T. Populeti	A. Marginepunctata
D. Furcula	T. Pulverulenta	A. Straminata
D. Bifida	O. Suspecta	A. Immutata
N. Trepida	O. Croceago	A. Fumata
N. Trimacula	X. Fulvago	A. Strigilaria
C. Duplaris	T. Retusa	A. Degeneraria
C. Fluctuosa	C. Pyralina	C. Rotundaria
A. Ridens	D. Irregularis	M. Alternata
A. Tridens	D. Templi	M. Liturata
A. Leporina	E. Lichenea	F. Carbonaria
A. Aceris	A. Nigra	O. Filigrammaria
A. Strigosa	H. Adusta	E. Afinitata
A. Ligustri	H. Glauca	E. Alchemillata
A. Auricoma	H. Dissimilis	E. Tæniata
A. Menyanthidis	H. Contigua	E. Minorata
L. Obsoleta	H. Rectilinea	E. Consignata
L. Favicolor	X. Arcola	E. Pulchellata
M. Flammea	X. Socia	E. Pygmæata
S. Maritima	C. Verbasci	E. Subfulvata
T. Extrema	C. Lychnitis	E. Plumbeolata
N. Neurica	C. Asteris	E. Scabiosata
N. Arundinis	C. Absinthii	E. Helveticaria
C. Lutosa	C. Chamomillæ	H. Satyrata
H. Micæa	H. Triplasia	E. Castigata
L. Exigua	P. Interrogationis	E. Pusillata
N. Reticulata	A. Melanopa	E. Irriguata



E. Constrictata  
 E. Albipunctata  
 E. Expallidata  
 E. Absinthiata  
 E. Minutata  
 E. Lariciata  
 E. Dodoneata  
 E. Exiguata  
 E. Sobrinata  
 E. Togata  
 E. Coronata  
 E. Debiliata  
 C. Sparsata

L. Sexalisata  
 L. Halterata  
 L. Viretata  
 L. Carpinata  
 L. Polycommata  
 T. Simulata  
 T. Firmata  
 H. Ruberata  
 H. Trifasciata  
 H. Sordidata  
 M. Ocellata  
 M. Albicillata  
 M. Galiata

A. Nigrofasciaria  
 A. Berberata  
 C. Fluviata  
 P. Lapidata  
 P. Vittata  
 S. Vetulata  
 C. Miata  
 C. Sagittata  
 C. Silaccata  
 C. Prunata  
 C. Dotata  
 C. Paludata  
 L. Griseata

GERALD HODGSON.

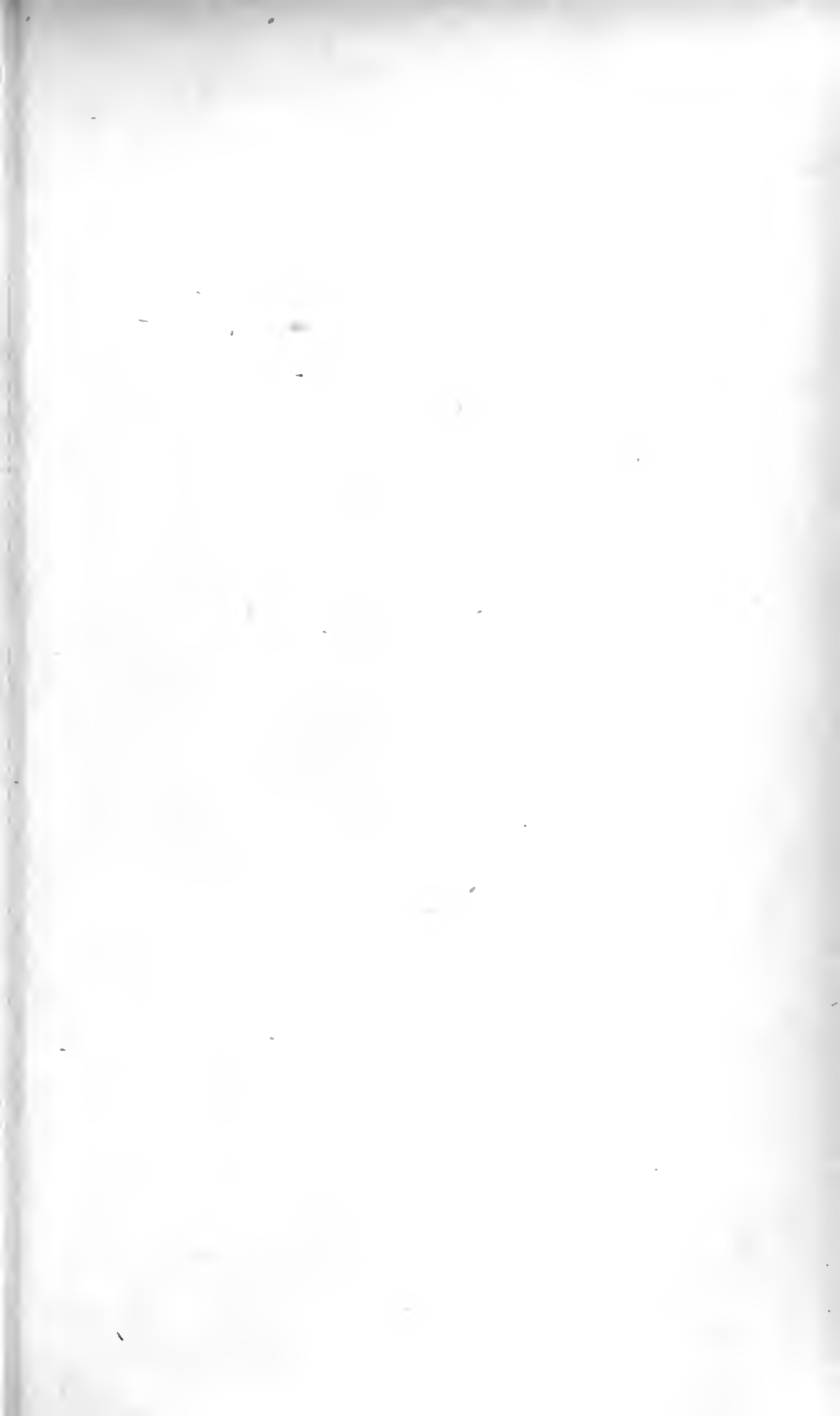
A. J. WILLSDON.

*Hon. Curators.*

**PRESENTED**  
**30 JUL 1908**



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# City of London Entomological & Natural History Society.

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**T**HIS SOCIETY has for its object the diffusion of the science of Natural History, by means of papers, discussions, exhibitions, and the formation of collections for reference. Since its commencement in 1858, a valuable and useful Library has been formed, which comprises, amongst other works, sets of the "Zoologist" (1843—1897), "Entomologist" (Vols. 1—40), "Entomologist's Monthly Magazine" (Vols. 1—42), and the "Entomologist's Record and Journal of Variation" (Vols. 1—18). There is also a collection of British Lepidoptera, and collections of other orders are now in course of formation.

The meetings take place on the first and third Tuesdays in each month, EXCEPT JULY AND AUGUST, from 7.30 to 9.30 p.m., at the London Institution, Finsbury Circus, E.C., which is easily accessible from all parts. Exhibits are made at every meeting, and papers read on various Natural History Subjects, a special feature being the systematic discussion and exhibition of interesting groups of insects, etc.

The Entrance Fee is Two Shillings and Sixpence, and the Annual Subscription Seven Shillings and Sixpence, payable in advance, being fixed at as moderate a sum as is possible, consistent with the proper maintenance of the Society and its work, in order that all may avail themselves of the benefits offered. The Society therefore looks with confidence for the support of all who are interested in the study of Natural History.

The year commences on the first Tuesday in December, but intending members may join at any time, the ballot being taken at the next ordinary meeting after that on which they are proposed.

Further information may be obtained from the corresponding Secretary.





