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No. 2

COLLECTING AT THE ELECTRIC LIGHT, 1886.

BY HENRY S. SAUNDERS, LONDON, ONT.

On the evening of Saturday, May 22nd, 1886, being the first warm evening after the electric light system was started in London, hundreds of "electric light bugs" (*Camptobrochis grandis*) and large green Calosomas (*Calosoma scrutator*) came into the city, and from that time on throughout the summer, and even as late as Nov. 2nd, the lights continued to attract hundreds of insects every warm evening.

There are some general points I should like to mention before giving the list in detail:—The lights around which all the collecting was done, were in store windows, or just outside of them, and these were in the centre of the city; the insects were either on the glass, on the woodwork around it, or on the sidewalk. Moths were taken with a bottle as in sugaring; beetles taken by hand and put into a separate bottle. Cyanide of potassium I found the best poison; a few drops of chloroform on cotton would quiet them more quickly, but was more troublesome, the chloroform having to be frequently renewed, occasionally as often as four or five times during the same evening, and sometimes even then the moths would be found alive the next morning.

My collecting was all done between 10 and 12 p. m. No lights were lit on Sundays, and I was out of the city from July 24 to Aug. 9.

On very cold nights very few insects would come out; on cool nights a few moths were always to be found, but seldom any beetles; on warm nights both beetles and moths were plentiful. Beetles were *very* plentiful only on the warmest evenings.

Often on wet evenings the Sphingidæ would be plentiful when there was scarcely anything else out.

My record of dates is very incomplete, as I had no idea while collecting of publishing them in this way.

There are about 35 Lepidoptera and 5 Coleoptera that I have not suc-

ceeded in getting named; the Orthoptera, Hemiptera, etc., I scarcely collected at all; having but little time at my disposal, I thought it wiser to give attention mainly to those orders in which I was more particularly interested.

I take this opportunity of thanking Prof. C. H. Fernald, of Amherst, Mass., Mr. Jas. Fletcher, and Mr. W. H. Harrington, of Ottawa, for the kind assistance they have given me in naming specimens.

LEPIDOPTERA.

Nymphalidæ.

Vanessa antiopa, *Linn.*, June 21.*

Sphingidæ.

Deilephila chamænerii, *Harr.*, June

1-22.

“ *lineata*, *Fabr.*, Sept. 4.

Everyx myron, *Cram.*, June 17 to

July 15, constant. Very common.

Ampelophaga versicolor, *Harr.*,

July 17.

Smerinthus geminatus, *Say*, June 15.

Paonias excaecatus, *A. & S.*, June

14, July 9. Common.

Calasymbolus myops, *A. & S.*, July.

Triptogon modesta, *Harr.*, June

29, July 12.

Cressonia juglandis, *A. & S.*, June

2-18.

Ceratomia amyntor, *Hubn.*

Daremma undulosa, *Walk.*, June

28, July 10. Common.

Sphinx drupiferarum, *Ab. & S.*,

June 8 to 22. Common.

“ *kalmiae*, *A. & S.*, June 8.

“ *eremitus*, *Hubn.*, May 31.

Dilophonota ello, *Linn.*, Sept.

28-30.†

Ægeriadaæ.

Trochilium——? May 28-29, June

14, July 1-16. Very common.

Eudryas unio, *Hubn.*, June 15-16,

July 1, Aug. 9. Common.

“ *grata*, *Fabr.*, June 25,

July 1, 7, 19. Common.

Ctenucha virginica, *Charp.*, June 19.

Bombyces.

Nola ——? July 16.

Hypoprepia fucosa, *Hubn.*, July 20.

Euphanessamendica, *Walk.*, June 21.

Crocota treatii, *Gr.*, July.

Arctia virgo, *Linn.*, var. *parthenice*,

July 19.

“ *Saundersii*, *Gr.*, August 24.

Pyrrharctia isabella, *Abb. & S.*, June

5 to July 20, very common.

Phragmatobia rubricosa, *Harr.*,

July 15.

Leucarctia acraea, *Drury*, June 23,

August 19.

Spilosoma virginica, *Fabr.* Very

common from May 26th to Aug.

20; one taken Oct. 20.

Hyphantria cunea, *Drury*, June 19,

July 20.

Euchaetes egle, *Drury*, June 28.

Halisidota caryae, *Harris*. Very

common from May

27 to June 25.

“ *maculata*, *Harris*, June

7-25. Common.

* This butterfly I did not see in motion; it was in rather a sleepy condition, and may possibly have flown there during daylight.

† Eight specimens of this moth were taken in London about this time.

- Orgyia leucostigma*, A. & S., July 14-20, Sept. 24, Oct. 22.*
Euclea querceti, H. S., June 16, July 1.
Ichthyura inclusa, Hubn., Aug. 11.
 " *albosigma* Fitch, May 27, June 15.
Datana ministra, Drury, June 14, 16, 23, July 9.
 " *integerrima*, G. & R., June 23, July 9.†
Nadata gibbosa, A. & S., July 3.
Gluphisia trilineata, Pack.
Seiroidonta bilineata, Pack.
Notodonta stragula, Gr.
Cœlodasys unicornis, A. & S.
Heterocampa marthesia, Cram.
 " *astarte*, Doubl.
 " *cinerea*, Pack.
Cerura borealis, Boisd., June 5-16.
 " *cinerea*, Walk., May 28, June 15.
Actias luna, Linn., June 7.
Telea polyphemus, Cram., June 2, 28, 30, July 2. Common.
Platysamia cecropia, Linn.
Dryocampa rubicunda, Fabr., May 26 to July 1. Very common.
Clisiocampa americana, Harris, July 1, 5.
Gastropacha americana, Harris, June 16, July 22.
Tolype laricis, Fitch, Aug. 13, 24.
Prionoxystus robiniaë, Peck.
 Noctua.
Raphia abrupta, Gr., (?) June 15.
Habrosyne scripta, Gosse, July 23.
Apatela occidentalis, G. & R., May 29, June 11. Common.
 " *vinnula*, Gr.
- Apatela lepusculina*, Guen.
 " *morula*, G. & R., June 24.
 " *innotata*, Guen.
 " *rubicoma*, Guen..
 " *americana*, Harr., June 9, 18, July 1. Very common.
 " *hæsitata*, Gr.
 " *brumosa*, Guen., June 1.
 " *dissecta*, G. & R., July 6.
 " *oblinita*, A. & S., June 8, 15. Very common.
Arsilonche albovenosa, G., May 27, June 9.
Harrisimemna trisignata, Walk., July.
Microcoelia diptheroides, Guen., June 14, 16.
Agrotis C nigrum, Linn., June 19, 21, 23, Aug. 21, 24, 26, 30. Very common.
 " *haruspica*, Gr., July 7.
 " *fennica*, Tausch., Aug. 10.
 " *subgothica*, Haw., August 24, 30.‡
 " *tricoso*, Lintn., Aug. 12, 13.
 " *pecta*, Linn., May 29, June 1, 19, 21, 23, 25, Aug. 11, 12, 18, 20, 24, 26. Common.
 " *clandestina*, Harris, June 28, 29.
 " *scandens*, Riley, June 15, 19. Common.
 " *murenula*, G. & R.
 " *tessellata*, Harris, June 26, 29. Common.
 " *campestris* var. *decolor*, Morr., July 2, 6.
 " *collaris*, G. & R.
 " *annexa*, Tr. (?).

* None seen between July and September; those taken in the fall were larger and darker than in the summer.

† At the time of collecting I did not know the difference between these two species of *Datana*; judging from the specimens taken they were probably both quite common.

‡ August 24 was the first time I took this moth, and on that evening it was very common.

- Agrotis volubilis*, *Harv.*, June 14.
 " *ypsilon* *Rott.*, June 17, Sept. 25, Oct. 22, Nov. 2. Common.
 " *pressa* *Gr.*
Mamestra adjuncta, *Boisd.*, June 4, Aug. 13.
 " *lubens*, *Gr.*
 " *legitima*, *Gr.*, July 5, 19.
 " *subjuncta*, *G. & R.* (?)
 " *trifolii*, *Rott.*, May 29, June 15, Aug. 20. Very common.
 " *renigera*, *Steph.*, Aug. 24, 30, Sept. 25. Common.
 " *lorea*, *Guen.*, June 18, 21.
Luceria passer, *Guen.*, June 23, July 3.
Hadena devastatrix, *Brace.*
 " *arctica*, *Boisd.*, June 17, July 21. Common.
 " *sputatrix*, *Gr.*, Aug. 18.
 " *suffusca*, *Morr.*
 " *mactata*, *Guen.*, July 9, 16.
Perigea xanthioides, *Guen.*
Dipterygia scabriuscula, *Linn.*, June 7.
Hyppa xylinoides, *Guen.*, Aug. 24.
Valeria Grotei, *Morr.*, May 29.
Homohadena badistriga, *Gr.*, July 10.
Brotolomia iris, *Guen.*
Euplexia lucipara, *Linn.*
Helotropha reniformis *var. atra*, *Gr.*, July 3.
Apamea sera, *G. & R.*, July 18.
 " *nictitans*, *Wlk.*
Gortyna cataphracta, *Gr.*, Sept. 24.
Achatodes zeae, *Harris.*
Sphida obliquata, *G. & R.*
Heliophila pallens, *Linn.*, Aug. 21, 22. Not seen at any other time.
 " *albilinea*, *Hubn.*, Aug. 10.
 " *phragmitidicola*, *Guen.*, Aug. 10, 12, 19.
Pyrophila tragopogonis, *Linn.*, July 12. Common.
 " *pyramidoides*, *Guen.*, Aug. 10.
Orthodes infirma, *Guen.*
Orthosia ferrugineoides, *Guen.*
 " *euroa*, *G. & R.*, July 16.
Scoliopteryx libatrix, *Linn.*, June 29, July 7.
Cucullia asteroides, *Guen.*, Aug. 24.
 " *intermedia*, *Spey.*, May 28.
Adipsophanes miscellus, *Gr.*, July 9.
Crambodes talidiformis, *Guen.*, May 29, July 3.
Nolaphana malana, *Fitch.*, July 19.
Marasmalus histrio, *Gr.*, July 16.
Abrostola urentis, *Guen.*, July.
Plusia aerea, *Hubn.*
 " *aereoides*, *Gr.*
 " *balluca*, *Gey.*, July 9.
 " *contexta*, *Gr.* (?) Aug. 19.
 " *Putnami*, *Gr.* (?) June 16.
 " *mappa*, *G. & R.*, July 19.
 " *precationis* *Guen.*, May 22, 28, 29, July 15, 21, Aug. 12, 26, Oct. 22. Very common.
 " *simplex*, *Guen.*, May 29, June 21, 25, July 10, 12. Common.
Chloridea rhexiae, *Ab. & S.*, Oct. 20.
Rhodophora florida, *Guen.*, July 8.
Heliothis armiger, *Hubn.*, sept. 24, Oct. 20.
Pyrrhia (angulata), *Gr.* or *experiments*, *Walk.* (?), June 1, July 1.
Tarache erastrioides, *Guen.*, June 15, Aug. 11.
 " *candefacta*, *Hubn.*, May 30.
Chamyris cerintha, *Guen.*, June 19, 21.
Eustrotia albidula, *Guen.*, June 14, 26.
 " *muscosa*, *Guen.*, June 26, July 21.

- Eustrotia carneola*, *Guen.*, May 29,
30, June 1, 19, 25, 28,
30, July 1. Very
common.
- “ *apicosa*, *Haw.*, June 15.
- Placodes cinereola*, *Guen.*, June 9, 16.
- Drasteria erectea*, *Cram.*, July 15,
19, 20, 21, Aug. 10, 11, 18, 20.
Very common.
- Catocala concumbens*, *Walk.*,
Aug. 24.
- “ *briseis*, *Edw.*, (?) Aug. 26.
- “ *parta*, *Guen.*, Aug. 20.
- Parthenos nubilus*, *Hubn.*, July 9.
- Panopoda rufimargo*, *Hubn.*
- Ypsia undularis*, *Drury*, May 23,
29, June 4, 23.
- Homopyralis tactus*, *Gr.*, June 15.
- Pseudaglossa lubricalis*, *Gey.*, July 9.
- Rivula propinqualis*, *Guen.*, June 9,
14, 15.
- Phalenophana rurigena*, *Gr.*, June 29.
- Capis curvata*, *Gr.*, July 5.
- Hypena baltimoralis*, *Guen.*, June
5, 11.
- “ *evanidalis*, *Rob.*, July 9, 14.
- “ *scabra*, *Fabr.*, Aug. 18.
- Geometridæ.*
- Choerodes transversata*, *Drury*,
Aug. 12.
- Tetracis crocallata*, *Guen.*, May 29,
June 11.
- “ *lorata*, *Gr.*, June 1, 5, 7.
- Matanema quercivoraria*, *Guen.*,
July 9.
- “ *carnaria*, *Pack.*, May
29, June 12.
- Ennomos alniaria*, *Linn.*, Aug. 24.
Very common.
- Eudalimia subsignaria*, *Hubn.*, July
5, 12, 20.
- Endropia obtusaria*, *Hubn.*, June 24,
July 3.
- “ *bilinearia*, *Pack.*, July 19.
- Endropia armataria*, *H. S.*, June 14.
Very common.
- “ *hypochraria*, *H. S.*, June
8, 14.
- Sieya macularia*, *Harris*,¹ July 3.
- Angerona crocataria*, *Fab.*, June 21,
23, 26, 29. Very common.
- Nematocampa filamentaria*, *Guen.*,
May 29.
- Plagodis phlogosaria*, *Guen.*, July 15.
- Hyperitis amicaria*, *H. S.*, June 8.
- Aplodes Packardaria*, *Gr.*, May 23.
- Ephyra pendulinaria*, *Guen.*, Aug. 22.
- Acidalia inductata*, *Guen.*, Aug. 11.
- “ *quadrilineata*, *Pack.*, June
16, 17.
- “ *enucleata*, *Guen.*, July 8, 15.
- Stegania pustularia*, *Guen.*, July 5.
- Deilinia variolaria*, *Guen.*, July 9.
- Semiothisa ocellinata*, *Guen.*, Aug. 11.
- Phasiane trifasciata*, *Pack.*, Aug. 9.
- Lozogramma defluata*, *Walk.*,
June 17.
- Eufitchia ribearia*, *Fitch.*, July 3, 8.
- Haematopis grataria*, *Fabr.*, Aug. 13.
- Hemerophila unitaria*, *H. S.*, May 29.
- Cymatophora pampinaria*, *Guen.*,
July 21.
- Tephrosia anticaria*, *Walk.*, July 7.
- Eubyja cognataria*, *Guen.*, June 11,
July 9.
- “ *quernaria*, *A. & S.*, May 29.
- Hybernia tiliaria*, *Harris*, Oct. 22.
- Heterophleps harveiana*, *Pack.*, (?)
June 11.
- “ *triguttata*, *H. S.*,
June 16, 28, July 16.
- Lobophora montanata*, *Pack.*, June 4.
- Triphosa indubitata*, *Gr.*, Oct. 22.
- Phibalapteryx latirupta*, *Walk.*, (?)
July 8.
- “ *intestinalis*, *Guen.*,
May 23.
- Rheumaptera ruficollata*, *Guen.*
- “ *lacustrata*, *Guen.*,
May 23, 29.

- Ochyria ferrugaria, *Linn.*, Aug. 13.
 " designata, *Hubn.*, May 29.
 Petrophora diversilineata, *Hubn.*,
 July 8.
 Hydrionema trifasciata, *Borkh.*,
 July 3, 5.
 Epirrita perlineata, *Pack.*, July.
 Plemyria fluviata, *Hubn.*, July 12.
 " multiferrata, *Walk.*, June
 15.
 Glaucopteryx cumatilis, *G. & R.*
 June 15.
 Eupethecia miserulata, *Grote*, May
 28, June 17, 19, 25, July 9.
 Common.
- Pyralidæ.*
- Asopia farinalis, *Linn.*, June 16, 29,
 July 1, 21. Very common.
 " costalis, *Fabr.*, June 28, 29,
 30, July 12, 15, 21, 23, Aug.
 9, 12, 24, 26. Very common.
 " olinalis, *Guen.*, July 8; 9.
 Cordylopeza nigrinodis, *Zell.*, July.
 Dicymolomia decora, *Zell.*, June 21,
 July 5.
 Scoparia centuriella, *S. V.**
 " libella, *Gr.*, June 28, July
 3, 15, 16.
 Botys badipennis, *Gr.*, Aug. 11.
 " marculenta, *G. R.*
 " gentilis, *Gr.*, Aug. 13.
 " venalis, *Gr.*, July 5.
 " illibalis, *Hubn.*, June 15, July 7.
 " plectilis, *G. R.*, June 21.
 Nomophila noctuella, *S. V.*, July 6,
 9, 15. Common.
 Diathransta octomaculalis, *Fern.*,
 MSS., July 3, June 15.
 Desmia maculalis, *Westw.*, June 24,
 July 16.
 Hydrocampa genuinalis, *Lea.*, June
 12, 15, 16, 18.
 " ekthlipsis, *Gr.*, June 15.
- Cataclysta fulcalis, *Clem.*, June 14,
 15, 21.
 " angulatalis, *Lea.*, May 29,
 Aug 11. Common.
 Homophysa (—?) July 15.
 Nephopteryx basilaris, *Zell.*, July.
 Salebria fusca, *Haw.*, June 28, July 3.
 Anerastia haematica, *Zell.*, June 14,
 15, 16.
 Euphestia ochrifrontella, *Zell.*, July.
 Argyria nivalis, *Drury*, July 15.
 Crambus leachellus, *Zinck.*, June 21,
 July 1, 3.
 " agitellus, *Clem.*, June 21.
 " agitellus var. alboclavel-
 lus, *Schl.*, July.
 " albellus, *Clem.*, June 28,
 July 3, 21.
 " bipunctellus, *Zell.*, July 16.
 " topiarius, *Zell.*, July 3, June
 14, 23.
 " exciccatus, *Zell.*, May 29;
 this specimen much
 darker than the others.
 June 15, 19, July 3, 20.
 Very common.
 " luteolellus, *Clem.*, July 5.
 " ruricollellus, *Zell.*, Aug. 11.
 Schoenobius longirostellus, *Clem.*,
 July 8.
 " clemensellus, *Rob.*,
 June 15, July 3.
 Common.
- Tortricidæ.*
- Cacocia rosaceana, *Harris*, June 19,
 20, Aug. 11.
 " argyrospila, *Walk.*, July 7.
 Loxotaenia clemensiana, *Fern.*, June
 14, 23.
 Ptycholoma melaleucana, *Walk.*,
 June 14, 28.
 Lophoderus quadrifasciana, *Fern.*,
 June 28, July 1, 3.

* Very common on June 28, when I saw it for the first time this season; afterwards a few only were seen for a week or two, after which I did not see it again.

- Tortrix albicomana, *Clem.*, July 1. Carpopapsa pomonella, *Linn.*, Aug.
 " peritana, *Clem.*, July 8, 9. 12.
 " fumiferana, *Clem.*, June 16.
 " conflictana, *Walk.**
- Cenopsis pettitana, *Robs.*, June.
 Dichelia sulfureana, *Clem.*, June.
 Conchylis angulifasciana, *Zell.*,
 June 7.
 Eccopsis exoleta, *Zell.*, June 23.
 Penthina frigidana, *Pack.*, July 15.
 " nimbata, *Clem.*, July 3.
 Sericoris constellatana, *Zell.*, June 14.
 Steganoptycha pinicolana, *Zell.*,
 July 19.
- Hyponomenta multipunctella, *Clem.*
 July 3, 21.
 Coleophora corruscipennella, *Clem.*,
 June 29, July 22.
- Tineade.*
- Pterophoridae.*
- Oxyptilus periscelidactylus, *Fitch.*,
 July 1, 3, 5.
 Pterophorus marginidactylus, *Fitch.*,
 June 24, 28, July 1. Common.

COLEOPTERA.

- Carabidae.*
- Calosoma scrutator, *Fab.*, May 22--
 29, June 29.
 " Wilcoxi, *Lec.*, June 1.
 Nebria ———? June 14, 15.
 Clivina americana, *Dej.*
 Nomius pygmaeus, *Dej.* July 8,
 June 14. Very common.
 Bembidium planum, *Hald.* July 7.
 " patrule, *Dej.*, July 16.
 Amara avida, *Say*, July 2, 10, 19.
 " obesa, *Say*, July 2, 10.
 Diplochila major, *Lec.*, June 14, 16.
 Badister pulchellus, *Lec.*, Aug. 21.
 Platynus metallescens, *Lec.*, June 15.
 " placidus, *Say*, July 16,
 June 15, Aug. 10.
 " obsoletus, *Say*, June 27,
 July 2.
 Lebia grandis, *Hentz.*, Sept. 24.
 Brachynus cordicollis, *Dej.*, June 15.
 Chlaenius sericeus, *Forst.*, June 14,
 15. Common.
 " tricolor, *Dej.*, May 29,
 June 14, July 5.
- Agonodorus lineola, Fab., June 14.*
 Very common.
 " pallipes, *Fab.*, May 22,
 June 14, July 5, 7,
 10. Very common.
 Harpalus viridiæneus, *Beauv.*,
 June 14.
 " caliginosus, *Fab.*, July
 16, 25, Aug. 9.
 " pennsylvanicus, *DeG.*,
 July 5, June 14, 15,
 Aug. 9, 10 11, 12,
 20, 24.
 Anisodactylus discoideus, *Dej.*,
 June 1, 14.
- Dytiscidae.*
- Hydroporus signatus, *Mann.*
 Colymbetes sculptilis, *Harr.*, June
 14, 11, 24. Very
 common.
 " ———? July.
 " biguttulus, *Lec.*, June 15,
 (v. c.) 16, July 2, 3, 5.
 Very common.
 " ———? May 22, July 2, 3.

* Saw for the first time on June 28, when it was very common; a few only were to be seen the next three or four evenings, after which I did not see it again.

- Dytiscus fasciventris*, *Say*, May 22, June 16, July 3, 5, 12, 16, 10, Oct. 22. Very common.
- " *cordieri*, *Aubé*, July 1, 3, 5, 21. Common.
- " *Harrisii*, *Kirby*, July 5, 19, 21. Common.
- Gyrinidaë.*
- Gyrinus ventralis*, *Kirby*, July 3, 5.
- Dineutes assimilis*, *Aubé*, May 29, Sept. 23.
- Hydrophilidaë.*
- Hydrophilus glaber*, *Hbst.*
- Hydrocharis obtusatus*, *Say*, July 3, 5, 10. Very common.
- Philhydrus diffusus*, *Lec.*, July 5.
- Hydrocombus lacustris*, *Lec.*, July 16.
- Hydrobius fucipes*, *Linn.*, June 14, 15, 24, July 3, 10.
- Cercyon unipunctatum*, *Linn.*, Aug. 9.
- Silphidaë.*
- Necrophorus americanus*, *Oliv.*, May 29, June 16, 24, July 10, 19. Very common.
- " *orbicollis*, *Say*, June 25, July 19.
- Silpha surinamensis*, *Fab.*, May 22, June 1, 2, 8, 25, July 1, 19, 20, Aug. 23. Very common.
- Staphylinidaë.*
- Bledius semiferrugineus*, *Lec.*, June 14, July 8, Aug. 9. Common.
- Coccinellidaë.*
- Adalia bipunctata*, *Linn.*, July 19.
- Mycetophagidaë.*
- Typhœa fumata*, *Linn.*, Aug. 9.
- Dermestidaë.*
- Dermestes lardarius*, *Linn.*, Oct. 22.
- Attagenus megatoma*, *Fab.*, July 6.
- Lathridiidaë.*
- Corticaria pumila*, *Lec.*, (?) July 16, to Aug. 20. Very common.
- Elateridaë.*
- Alaus myops*, *Fab.*, June 14.
- Melanotus communis*, *Gyll.*, June 9, 26, July 1, 2, 10, 15, 21. Very common.
- Athous cucullatus*, *Say.*
- Asaphes memnonius*, *Hbst.*, July 1, 3, 10. Very common.
- Lampyridaë.*
- Pyropyga nigricans*, *Say*, July 9.
- Photuris pennsylvanica*, *De G.*, June 23, July 2.
- Podabrus basilaris*, *Say.*
- " *modestus*, *Say*, June 29.
- Ptinidaë.*
- Trypopytis serviceus*, *Say*, July 15.
- Bostrychus bicornis*, *Web.*
- Cupesidaë.*
- Cupes capitata*, *Fab.*, Sept. 24.
- Lucanidaë.*
- Lucanus dama*, *Thunb.*, July 10.
- " *placidus*, *Say.*
- Passalus cornutus*, *Fab.*
- Scarabæidaë.*
- Copris anaglypticus*, *Say*, June 14, 15. Common.
- Aphodius granarius*, *Linn.*, June 14, May 29.
- Odontaeus cornigerus*, *Melsh.*
- Trox porcatus*, *Say*, June 14.
- " *aequalis*, *Say*, June 14 (v. c.)
- " *striatus*, *Melsh.*
- Dichelonycha linearis*, *Schon.*, May 29.
- Lachnosterna fusca*, *Froh.*, May 29, 22, 31. Very common.

Lachnosterna cognita, *Burm.*
Pelidnota punctata, *Linn.*, July 3.
Cotalpa lanigera, *Linn.*, May 22,
 29, 31, June 1. Common.
Ligyris relictus, *Say*, Aug. 9.
Xyloryctes satyrus, *Fab.*

Cerambycidae.

Criocephalus agrestis, *Kirby*, June
 28, 27, July 10.
 Very common.
Chion garganicus, *Fab.*, June 14.
Xylotrechus colonus, *Fab.*, July 5.
Centrodera decolorata, *Harr.*,
 June 14.
Monohammus confusor, *Kirby*.
Urographis fasciatus, *De G.*, June 14.
Eupogonius vestitus, *Say*, July 16.
Saperda calcarata, *Say*, July 3.
 " *vestita*, *Say*, June 14.
 " *tridentata*, *Oliv.*, June 14,
 15, 16. Common.

Chrysomelidae.

Diabrotica vittata, *Fab.*, Sept. 24.

Tenebrionidae.

Tenebrio molitor, *Linn.*, June 14,
 July 2, 5. Very common.
Hoplocephala bicornis, *Oliv.*,
 June 14.

Cistelidae.

Allecula nigrans, *Melsk.*

Pythidae.

Salpingus virescens, *Lec.*, July 5.

Anthicidae.

Notoxus anchora, *Hentz.*

Curculionidae.

Listronotus caudatus, *Say*, June 14.
 " *appendiculatus*, *Boh.*,
 June 14.
Pachylobius picivorus, *Germ.*,
 June 14.
Hylobius pales, *Hbst.*, June 15.

Anthribidae.

Cratoparis lunatus, *Fab.*, June 16.

ORTHOPTERA.

Platyphyllum concavum, July 16.

HYMENOPTERA.

Ophion bilineatus (?) May 29. Common.

DIPTERA.

Stomoxys calcitrans.

Chrysops striatus (?)

NEUROPTERA.

Corydalis cornuta, June 26, 30, June 1, 16, 25, July 21, Aug. 11,
 July 5, 19, 20, 24.
Chauliodes pectinicornis, May 29, *Neuronina postica* (?) May 29, June
 14, July 1, 9.

HEMIPTERA.

Camptobrochis grandis, May 22, 31, June 1, 9. Very common; afterwards
 a few seen occasionally through June, July and August.

NOTE ON HEMARIS UNIFORMIS AND ARCTIA SAUNDERSII.

BY A. R. GROTE, BREMEN, GERMANY.

I have sufficiently shown in various places (and the enquiring student may consult the originals) that Kirby's description of *Ruficaudis* contradicts that of *Uniformis*, in what we must regard as essential particulars in this genus. We have not here to do with a species; but, according to Mr. Hulst's statements, with a dimorphic form of *Thysbe*, in which the inner margin of the terminal band of primaries is *even*, not *dentate*, on the interspaces. Now this character is not at all alluded to by Kirby. He describes a *Sesia* allied to the European, and he says and knows nothing about *Thysbe* or *Pelagius* or *Cimbiciformis*. Kirby should not have described *Uniformis* without comparing it with its ally—its other well known form. Notwithstanding the probabilities of the case or the possibilities, it never can be proved from the books that Kirby did describe *Uniformis* as *Ruficaudis*. This is a matter of scientific importance, because we are the first to point out that two distinct "forms" if not "species" were passing as *Thysbe*, the differences which constantly divide them being first pointed out by us, first used as the basis by which they can be correctly separated and named in collections. It is therefore no matter of simply restoring an older name. It is an attempt at construing an older name and one which does not really apply. The attempt is therefore to be deprecated as unscientific. The whole point lies in the separation of the forms passing current as "*Thysbe*." In this lay the scientific value of the writings of Mr. Robinson and myself. This discovery, important or not important (real it certainly is), was made by us and is covered by the designation we apply to the plain form, and, according to all sense and the principles of scientific nomenclature, this name should henceforward apply. Clemens does not recognize *Ruficaudis*; Fernald mentions our insect as "*Uniformis*;" I take it for granted that these or similar considerations have influenced his course. It is years and years ago since I studied Kirby in the original, at least fifteen years before Mr. Hulst's time. It needed not that this industrious, but in his earlier studies somewhat inconsiderate writer, should tell *me* of the probabilities of what Kirby's might be. At the best they are probabilities. I take it, that to be correct, scientifically correct, the form of *Thysbe* with *even* edge to the external band of primaries and of the same or similar size with the type,

should be called *Uniformis* G. & R., without any reasonable doubt. I will not enter here into the question of the even banded forms, *Buffaloensis* and *Floridensis*. The larva of the former is described by Professor Lintner. The latter has not been examined in sufficient quantity. I think now that both these forms are distinct, certainly sufficiently so as to merit a distinct title, if not of specific value. *Fuscicaudis*, Boisd., is, from the markings of the abdomen, certainly a distinct species. After myself examining specimens I can come to no other conclusion.

Quite similar arguments show that we are justified in calling the smaller of the two forms of *Arctia*, which have buff striped, black fore wings, and red, spotted secondaries, by the name *Saundersii*. I carefully considered Kirby's description of *Parthenice* after my discovery that two species were passing as *Arctia virgo* in collections. The character which separates the two is the narrower ochre veining of *Saundersii*. Again as with the *Hemalis*, Kirby fails to compare his species with *Virgo* Linn., which it was his business to know had he intended to describe as closely allied a species as *Saundersii* is. I pass by the probably correct surmise of Mr. Hy. Edwards that Kirby describes an unimportant variety of *Virgo*, assuming this author to be correct. But be this as it may, I am the first to scientifically separate the forms, to carefully describe them, to figure them side by side (at my own expense, which was a good deal in those days), to give the essential characters by which they may be known and named henceforth. This being so, it is inconsiderate, and, scientifically speaking, an erroneous view which would overturn this real work and restore a name which can never be proved to be correctly applied. Always there must be a doubt hanging over the name *Parthenice*, from Kirby's own fault in ignoring *Virgo*. But there is no doubt about *Virgo* or *Saundersii*. I cleared those doubts up years ago, and Mr. Hulst should have profited by my work rather than attempt to re-introduce the uncertainty which I had, I think properly, dissipated.

ELAPHIDION VILLOSUM, FABR.

BY FREDERICK CLARKSON, NEW YORK.

In support of the record relating to the periods of transformation of this beetle, and the probable cause of their pruning the branches of the Oak, which I had the pleasure to contribute to the XVII Vol. of this

journal, I now add some further facts, resulting from a recent visit to Clermont, N. Y.

On the 29th of October I gathered from under a group of *Quercus tinctoria*, seven branches that had been pruned by this longicorn. The tunnels were from ten to fifteen inches long, in branches from one-half to three-quarters of an inch in thickness. The branches I carefully divided lengthwise, so that the parts could be replaced in position. Six of them contained the pupa, one the larva, which pupated November 4th. One of the pupæ I preserved as a specimen. The imagines appeared on the following days: Nov. 14th, 22nd, 26th, 29th, Dec. 9th and 25th, all females.

These transformations were rather hindered than advantaged by meteorological conditions, for they occurred in a room having a northern exposure, in which, during the period of the transformations, the thermometrical record differed but little from that in the shade without. Had the branches remained upon the ground, the included insect would have received all the benefits resulting from the direct rays of our Indian Summer's sun, as well as the moisture from the ground; influences that ordinarily assist development. As the imagines appeared they were examined and replaced in their tunnels, where they now remain in a passive state, and not likely, I think, to exhibit their natural activity until next May or June.

The object of the paper referred to, as well as this article, is to present facts that seemingly disprove certain theories relating to the habits and metamorphoses of this beetle, which have been formulated by distinguished sires and accepted by their credulous sons. What Drs. Peck, Fitch and Harris have written upon this subject has been substantially repeated by almost every entomologist who has undertaken a history of this beetle. We are very apt to fall into line when we have an abiding confidence in a leader. While I am unwilling to deny the conclusions of these naturalists, I yet think that the facts related go to show that the insect matures at a period earlier than that named by them, and that the benefits supposed to result from the dismemberment of the branch, in so far as the changed environment is concerned, are wholly unnecessary to the development of the included insect, and that there is a plausibility in the inference, if not a certainty as to fact, that the object of pruning the branch is to prevent the flow of sap. If the habits of this beetle as given by these doctors are to be regarded as *ipso facto*, then we must admit the

possession of a faculty in these lower organisms that towers above instinct and presents the feature of intelligent reason. This is a subject that cannot very well be discussed in these pages, yet it may not be out of place to say that able writers on the question very generally admit that the habits of insects follow a prescribed law, by some regarded, in a materialistic sense, as mechanical; and by others, spiritually considered, as in furtherance of a divine edict. This latter view is very cleverly presented by St. George Mivart, in *Organic Nature's Riddle*: "Our experience," he writes, "is in favor of the existence of an intelligence which can implant in and elicit from unconscious bodies activities that are intelligent in appearance and result 'Unconsciously intelligent action,' improperly called 'intelligent,' is that which is called intelligent only as to its results and not in the innermost principle of the creatures which perform such actions." "Instinct," Todd says in his *Cyclopædia of Anatomy and Physiology*, "is a special internal impulse urging animals to the performance of certain actions which are useful to them or to their kind, but the uses of which they do not themselves perceive, and their performance of which is a necessary consequence of their being placed in certain circumstances."

If such definitions are accepted, how are they to be reconciled with the marvellous statement as given by Dr. Fitch? That the larva should prune the branch to prevent the flow of sap would be a necessary consequence of its being placed in certain circumstances, but to do so that the branch may fall to the ground presents a course of reasoning that relates to a condition foreign to the then existing environment. The habits of this beetle from the period of egg-hatching, as given by Dr. Fitch, displaying as it did to him extraordinary intelligence, impress me as presenting the most natural instinctive qualities. The ova, he says, is deposited on a small green twig, the soft pulpy tissues of which nourish the infant larva, which when increased in size and strength, attacks the hard wood of the branch, transversely, in a circular direction, consuming it all, leaving the branch supported only by the bark. From these premises, without pursuing the subject further, it is evident that the infant larva requires sap-wood for its sustenance, which it derives from the twig, but so soon as its strength permits, it seeks for dead-wood by attacking the branch, which is found more and more free from sap as the work of severance progresses. The aim therefore from the start is to obtain the dead-wood,

and when the branch is eaten through the larva continues its feeding in forming a tunnel through that portion of the branch which is cut off from the supply of sap.

The instinct of insects is wonderful enough, and more accurate perhaps than a mental process, but while we justly ascribe to them all the attributes pertaining to their natural gift, we are not warranted in imputing to them an intelligence only to be arrived at through a course of reason.

BOOK NOTICE.

THE BUTTERFLIES OF NEW ENGLAND, with original Descriptions, accompanied by eight lithographic Plates, in which are given at least two hand-colored Figures of each Species. By C. J. Maynard. Boston, Bradlee Whidden, 1886.

The author of this work is a well-known taxidermist and ornithologist, who here endeavors "to present recognisable figures and intelligible descriptions of the Butterflies," etc. The drawings and descriptions, he says, are original, but he has been obliged to compile descriptions of the larva and pupa from works of various authors, and is indebted to such works for many notes upon habits, distribution, etc.

He has coined a new set of names for the veins of the wings, and likewise a set of English names for the several species. No authority follows the specific names in the text, but those "who are curious to learn who first described any given species, can ascertain by referring to an Index," etc. He sees no reason why polymorphic forms, which he calls "phases of coloration," should receive names, and in this connection thinks that entomologists have overlooked the results of an important law, that of reversion. The classification adopted is that used in the arrangement of the collection of the Boston Soc. N. Hist., "merely because of its simplicity," and hence the series begins with the Satyridæ, and Papilio stands next the Hesperidæ. By all which it will be seen that the author has ideas of his own, but is not very well read in the recent literature of lepidopterology.

The plates are described as hand-colored, and it seems to be implied that the coloring therefore is something superior. Whereas it is very bad indeed—could not well be worse. This is conspicuously so in *Limenitis*,

Vanessa, Grapta, Argynnis, and Euptoieta. *Papilio Troilus*, plate 7, is simply atrocious. I doubt very much if any one not familiar with the butterflies could identify several of the species of *Thecla* from the figures, and I am sure they could not identify many of the *Hesperians*. And the drawing is of the roughest.

In giving a title, the author should have respected the claim of Mr. Scudder, who, as all the world knows, has been engaged for years on "The Butterflies of N. E.," and is about publishing the same.

Whenever in this book larvæ or habits are treated of, there are pretty sure to be errors, both of commission and omission, and this is inexcusable, as in nearly or quite every instance, careful descriptions of the preparatory stages and habits were or could have been before the compiler. The result is such as to destroy largely any value the text might have. Thus:

Under *N. Canthus*, we are told that the larvæ are green. Now there are green larvæ, but so far as has been observed, the larger number are buff. See CAN. ENT., xv., 64. Also it is said of this species that the larva moults three times in fall, then hibernates, and moults three times in spring. No butterfly larva moults six times, and those treated of vary in habit. Some moult twice and hibernate, then three times in spring, while other larvæ go to pupa in one season with but four moults.

Of *N. Eurytris*, we read: "Larva not dissimilar to that of *Alope*, but smaller." There is no near resemblance whatever between the larvæ of these two species in any stage, but a great and generic difference.

Of *D. Archippus*, we read that the larvæ moult three times, whereas they moult four. See Psyche, ii., 53.

Of *Arg. Cybele*: "The earlier stages of this species are not very well known. The larvæ have been kept in confinement by Mr. Edwards, and moulted five times, and during the winter went into the chrysalis state." I gave full account of all stages of the larva, CAN. ENT., xii., 141, and therefore the early stages are very well known, and a life history, vol. vi., p. 121; and the pupation took place, not in winter, but in May.

L. Disippus: Larva described as having a horn on second ring, and on third, fifth, etc., a spiny process each, the eleventh with two short spines. Now every ring mentioned here has a pair of processes instead of a single one. In the account of the habits of this species, not a word is said of the case made by the larva for hibernating. On the contrary, we have the incorrect statement that the larvæ remain in pupa all winter.

The most remarkable thing in the history of North Am. butterfly larvæ is the making these cases by all the species of *Limenitis*, and it would seem incredible that the merest collector should not have known that. How comes it then that no mention of such a habit should be found in a work professing to have been written for instruction of beginners? Nothing is said under *Ursula* of such cases, but under *Arthemis* we are told that the larvæ "construct a case of leaves," instead of a case from a single leaf. Moreover the larvæ of these three species of *Limenitis* are described as regards the processes on them as if they were radically different from each other, whereas they are all built on the same pattern, and where one has a process all have a similar one.

Of Argynnis *Myrina*, we read that the larvæ moult three times. Now the larvæ of the early brood moult four times, and of the late brood, five. C. ENT., vii., 189.

Under Mel. *Phaeton*, we read that these butterflies have restricted areas, living in peaty meadows, and that the larvæ make a web, but no mention is made of the food-plant, *Chelone glabra*, which grows in such meadows or in swamps, and is the reason for the presence of the butterflies there.

Under *Thecla Irus*, we read that Mr. Edwards says the eggs are laid on wild plum, etc., "very interesting," etc. I said nothing of the kind. My account was of *T. Henrici*, and I expressly said that I could not get *Irus* to lay on plum.

Under Lyc. *Pseudargiolus*, Mr. Edwards is quoted as saying that hibernating larvæ produce typical *Pseudargiolus* in spring. On the contrary, the larvæ in no case hibernate, but the pupæ do, some to produce *Violacea*, some *Pseudargiolus*.

Of Fenesica *Tarquinius*, we read that the larvæ feed on wild currant, whereas they feed on aphides only.

Of *Anthocharis Genutia*: "There are two broods in the season, the first of which appears in July." There is but one brood in the year, and the chrysalis hibernates. The early butterflies, from these chrysalids, appear at Newburgh, N. Y., early in May. Doubtless just as early in Conn., which is given as their N. England habitat.

Of *Papilio Troilus*: "The larvæ spin a little roof over the leaf, drawing the edges together." That might do for *Pyrameis Atalanta*, but not for *Troilus*. The larva, as soon as out of egg, cuts into the border of the leaf about one tenth inch and draws the part over, holding it down by a

few threads. The nearly mature larva turns over the side of the leaf, and loosely stitches down the edge, but there is at no time a roof spun, nor is there any roof except what the turned leaf makes.

Such a list of blunders shows heedless and ignorant compiling. Another class shows want of knowledge of the butterflies. Thus, *D. Portlandia* is compared with *N. Canthus*, "which it resembles quite closely." It has but a very distant resemblance to *Canthus*, differing in size, shape and markings. So *Portlandia* is compared with *N. Eurytris*, just as erroneously as in the other case.

As to polymorphism, the phenomena are ignored everywhere, and the names of the forms often, as per Preface, but sometimes the names are given.

It certainly is proper that such a remarkable peculiarity in the life history of a species should be recognised, and the different forms indicated by name. Indeed they are by lepidopterists. Often they are more distinct from each other than are many allied species. "Mr. Sprague informs me that the first brood of *G. Comma* is dark in color, while the next is lighter." What Mr. Sprague means is this, that the brood proceeding from eggs of the hibernating butterflies (form *Harrisii*), is the dark or summer form (*Dryas*), and the late brood, from eggs of *Dryas*, is *Harrisii*. "I think however that specimens having the peculiar rusty under surface to the wings are confined to particular localities, hence, judge that perhaps different food plants produce varying color." Now these rusty examples are the females of the form *Dryas*, this species being in the summer form sexually dimorphic, as well as seasonally. I have repeatedly showed the distinction between the two principal forms of *Comma*, CAN. ENT., vi., 157; x., 69; xiv., 189. Also in But. N. A., vol. 1, a plate is devoted to each form, and each sex is figured on both surfaces. The dimorphism of both sorts is universal wherever *Comma* is found, and food has nothing to do with it, more than has locality.

Under the head of *G. Interrogationis*, we are told that there are two broods, in June and September, and that "Mr. Edwards states that he has raised both forms *Fabricii* and *Umbrosa* from one brood of larvæ, but that Mr. Sprague, who has had a wide experience with our native species, informs me that he has invariably found the dark form is the early or summer form, and the lighter the later. Consequently very early in the spring he has caught *Fabricii*, this being the autumnal form which hibernates." The dark form is *Umbrosa*, the name indicating the color, and is the pro-

duct in New England as elsewhere of the form *Fabricii*. Our author proceeds: "The reason for this variation" (that is, between the dimorphic forms) "is difficult to explain, as neither food nor atmospheric change appear to have anything to do with it, for we find that Mr. Edwards has produced both forms where the larvæ were found under precisely the same circumstances." Both the forms spoken of are figured in *But. N. A.*, vol. 1, and the life history at Coalburgh is given at length. Also in *C. E.*, x., 73, and xiv., 201. I gave the result of many years observations at Coalburgh on this species, stating that all the hibernating butterflies had been *Fabricii*, except in a single instance; that the eggs laid by females of this early *Fabricii* produced a mixed brood, the large majority of individuals being *Umbrosa*. And eggs of *Umbrosa*, of this mixed brood, again produced a mixed brood, the large majority still being *Umbrosa*. But that eggs of these last *Umbrosa* had produced *Fabricii* only, late in the year, and these were hibernators. At the north, where there are two broods only, the dimorphism is complete, and this is the case with all seasonally-dimorphic species of butterflies, which are also only two-brooded. But at the south, or where the length of the warm season permits one or more additional broods to mature—and these seem to be inserted between the two original ones—the result in such additional broods is a mixture of the two forms. But in the case of *Interrogationis*, there is a preponderating tendency towards the summer form, *Umbrosa*, imperfectly counteracting the inherited tendency of the species to produce the winter form *Fabricii*, as it would in New England.

These results are not only interesting but biologically very important, and the forms are not to be regarded as simple variations. Food has nothing to do with dimorphism, nor has atmospheric change, but climate has. Vide Weismann, vol. 1. In my paper referred to, *CAN. ENT.*, x., p. 73, I offered a conjecture that at the north, *Fabricii* would be found to be the winter form and *Umbrosa* the summer, and expressed a hope that some lepidopterist would examine into the matter and report. If Mr. Sprague has made the necessary observations, I hope he will publish them.

Under *Melitæa* (*Phyciodes*) *Tharos*, we are told that the larvæ of first brood give the "butterflies known as *Morpheus*," while the larvæ of the second hibernate, to produce "the butterfly known as *Myrina*," in June. That is a mistake for *Marcia*. But here again the names of the forms had to be used to make the story intelligible.

Satyris Alope is given as one species, *S. Nephela* as another, though

both are but dimorphic forms of the same species, as I have set forth in C. E., xii., 21. In B. N. A., vol. 2, two plates are devoted to these forms and varieties, and the whole history is given. It is a very curious history too, and one not to be neglected in a work meant for instruction.

A particularly objectionable feature of the work in hand is the manufacture of English names for the species, one and all. The custom of applying such names will never become general in this country, and fortunately. In Europe, before the binomial nomenclature was invented, it was natural that there should be local names for such striking objects as butterflies. A few, some half dozen, European species have become domesticated on this continent, and I have noticed that Americanized English collectors are fond of recalling the vernacular names they knew at home. But even these names have nowhere come to be used commonly here. Some of our authors, however, have exerted themselves to fix such names on all the American butterflies, and the result is fantastic. The greatest sinner in this respect, I regret to have to say, is Mr. Scudder, but as he has lately announced, *Science*, No. 194, that he regards all names as necessary evils, it would seem to follow that a superfluity of names is an unnecessary evil; therefore I hope to see these appendages dropped in his forthcoming work. No one but the contrivers use them; they do not stick to the insect. No better illustration of this could be offered than in Mr. Maynard's book. What Mr. Scudder calls Blue-eyed Grayling, the other calls the Yellow-spotted Wood; what one calls Eyed Brown, the other Ten-spotted Quaker! what one calls The Viceroy, the other the Banded Red; what one calls the Great Spangled Fritillary, the other the Yellow-banded Silver Wing. Now the butterfly last spoken of is known as *Argynnis Cybele*, the name a beautiful one, by the side of which the appellations above given are as tawdry as they are long-winded. So all through. It is best in Entomology, as in every other kind of learning, that beginners begin right, and as every species has its proper specific name, by which it is universally known, and of which it can never be divested, no elementary work has a right to teach otherwise.

The descriptions of the insects are well enough, except as to the nerves of the wings. These organs have ages ago received names which have been accepted, and there is no reason whatever for changing them, especially in a work of the character of this one. "Middle" is no more simple than "median," and means the same thing; "upper vein" instead

of "sub-costal" is misleading, in fact wrong, because the uppermost vein is the costal.

And the arrangement of families was adopted "merely because of its simplicity," but wherein that consists it would be hard to discover. It is not a natural arrangement; if it was, the Satyridæ would next precede the Hesperidæ. However there has been a fashion these last years for artificial grouping of the butterflies, and our author is not without reputable company in his choice.

In conclusion, the illustrations in this work, poor as they are, will answer some purpose; the text, so far as it is incorrect, is worse than nothing. The field is still open for a well-illustrated book on the same butterflies, written by one who is acquainted with his subject.

W. H. EDWARDS.

CORRESPONDENCE.

ON THE GENUS QUADRINA.

Dear Sir,—I notice the remarks of Mr. Smith, in "Entomologica Americana" (vol. ii., 1886, page 124), merely to state that in my original description I comment upon this singular genus and say that "it may be catalogued next to *Gloveria*." I further regard its affinities to the *Ceratocampidæ*, and I intended to place it with this group in my catalogue. By a mistake of the printer it was thrown into the preceding group. It is clear that I regarded the insect as allied to *Citheronia*, and Mr. Smith's remarks as to *Hemileuca* are uncalled for. I say distinctly, "altogether it is removed from *Coloradia*" (*Papilio*, I., 175). In fact, I regard *Quadrina* as the remains of an old type, synthetic, in that it embraces characters of existing sub-families of the *Bombycidæ*. It is an example of what I have called attention to, viz., the existence in America of older types than elsewhere, such as the *Paleohesperidæ* of my classification. I am decidedly opposed to the idea that *Quadrina* is a Cossid. I regard it as a type between *Gloveria* and *Citheronia*. I classed it with the *Ceratocampians*. We know neither the male nor the larva. It is premature to be exact as to its location. It may well afford a new sub-family type. I feel confident that the larva will be an external not an internal feeder. It may point to the way in which the *Ceratocampians* and the internal feeders with similar habitus are phyllogenetically related.

A. R. GROTE, Bremen, Germany.