

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/
Couverture de couleur

Coloured pages/
Pages de couleur

Covers damaged/
Couverture endommagée

Pages damaged/
Pages endommagées

Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

Cover title missing/
Le titre de couverture manque

Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

Coloured maps/
Cartes géographiques en couleur

Pages detached/
Pages détachées

Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/
Transparence

Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

Quality of print varies/
Qualité inégale de l'impression

Bound with other material/
Relié avec d'autres documents

Continuous pagination/
Pagination continue

Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/
Comprend un (des) index

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Title on header taken from: /
Le titre de l'en-tête provient:

Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

Additional comments: /
Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below /
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The Canadian Entomologist.

VOL. XVII. LONDON, ONT., SEPTEMBER, 1885.

No. 9

LARVA OF PARASA CHLORIS, H.-SCH.

BY G. H. FRENCH, CARBONDALE, ILL.

Length .50 of an inch, elliptical, as is the usual shape of the *Lymacodes* group, nearly .20 of an inch high and about the same width. The dorsum has four lines of purplish black alternating with white, and bordered outside with yellowish white or pale yellow. The region of the subdorsal line is a bright vermilion ridge with yellowish white tubercles arising from joints 2, 3, 4, 7, 10 and 12, those on joint 2 moderately short, but those on joints 4 to 12 are nearly one fourth of an inch long; all of them spiny. There are short bunches of spines on the intervening joints, as it were representatives of missing tubercles. In the subdorsal space are four scarlet lines alternating with lines of yellowish white, the middle yellowish line instead of being continuous, consists of alternate blotches of vermilion and yellowish white. The substigmatal line is vermilion, bordered as the subdorsal with pale yellow, and this also has its row of yellowish white spiny tubercles, each about one sixteenth of an inch long. Below this is a single dark purple line bordered each side with a lighter shade, and below this a vermilion line or rather a series of tubercles without spines in place of the prolegs. Legs 6, no prolegs, but the under side of the body consisting of a muscular pad upon which the insect glides along instead of walking. Head brown, retractile when at rest into the joint back of it.

The food plants of this peculiar larva seem to be apple and rose. In 1880 one was brought to me on an apple leaf. This one soon died; but last season, September 18, 1884, another was found on a rose leaf that soon spun its cocoon, but it did not change to a chrysalis till the following spring. As soon as found the larva was placed in a jelly glass, and it spun on the under side of the cover with the cocoon touching the side. When the cover was taken off this broke the cocoon, leaving a small piece attached to the glass. Through this small opening the larva could be seen every time the cover was removed to moisten the contents of the

dish, till after the warm spring weather had roused the most of insect life into activity. The imago appeared July 14, 1885. The cocoon was .50 of an inch long, dark brown, smooth, egg-shaped like the others of the group, and smooth on the inside. The empty pupa skin is thin, pale brown.

A PRELIMINARY LIST OF THE ARTHROGASTRA OF NORTH AMERICA (EXCLUDING MEXICO.)

BY LUCIEN M. UNDERWOOD, PH. D., SYRACUSE, N. Y.

The Arthrogastra of North America have scarcely been studied except in two or three families, the principal part of the American literature consisting of scattered notes and descriptions. Two or three more pretentious papers have been published by Wood, Putnam and Hagen. A broad field for study is open for future investigators. In order to call attention to the group and secure such co-operation of collectors as may be possible, the following preliminary list of twenty genera and fifty-nine species has been prepared. A few forms are added from Lower California and Cuba which will probably be found within the limits of the United States. Additions and corrections to the list are solicited, as well as specimens from all parts of the country, for which a suitable return will be made.

FAMILY PHRYNIDÆ.

I. PHRYNUS, Oliv.

I. P. ASPERATIPES, Wood. Proc. Phila. Acad. 1863, 111: Jour. Phila. Acad. 2nd series, v., 375 (1874).

Hab. Lower California.

FAMILY THELYPHONIDÆ.

I. THELYPHONUS, Latr.

I. T. GIGANTEUS, Lucas. Magazin de Zoologie (Guerin) 1835. Wood, Jour. Phila. Acad., 2nd series, v., 374 (1874).

T. excubitor, Girard, in Marcy's Rep. Exploration Red River, 265, Pl. xvii., fig. 1-4 (1854).

Hab. Southwest United States.

FAMILY SOLPUGIDÆ.

I. DATAMES, Simon.

1. *D. FORMIDABILIS*, Simon. Annales de la Soc. Entom. de France, ix., 136 (1879).

D. striatus, Putnam. Proc. Davenport Acad., iii. 255, 266, Pl. i., fig. 1, Pl. ii., fig. 7 (1883).

Hab. California, Arizona.

2. *D. PALLIPES*, Simon. Ann. de la Soc. Entom. de France, ix., 139 (1879). *Putnam*, Proc. Davenport Acad., ii., 184 (1880); *Ibid.*, iii., 267, Pl. i., fig. 6 (1883).

Galeodes pallipes et subulata, Say., in Long's Exped. to Rocky Mts. (1823).

Hab. Kansas, Colorado, Utah, Wyoming, Nevada.

3. *D. SULFUREUS*, Simon. Ann. de la Soc. Entom. de France, ix., 142 (1879). *Putnam*, Proc. Davenport Acad., iii., 267 (1883).

Hab. Georgia, Texas, Colorado.

4. *D. CALIFORNICUS*, Simon. Ann. de la Soc. Entom. de France, ix., 143 (1879). *Putnam*, Proc. Davenport Acad., iii., 266, 267, Pl. iv., fig. 32-40 (1883).

Hab. California, Arizona.

5. *D. GIRARDII*, Putnam. Proc. Davenport Acad., iii., 257, 267, Pl. ii., fig. 12 (1883).

Galeodes subulata, Girard, in Marcy's Rep. Expl. Red River, 241 (1854). (Not *G. subulata*, Say.)

Hab. Texas, New Mexico, Arizona.

6. *D. GENICULATUS*, Simon. Ann. de la Soc. Entom. de France, ix., 136 (1879). *Putnam*, Proc. Davenport Acad. iii., 268 (1883).

Gluvia geniculata, Koch. Archiv für Naturgesch., viii., 355 (1842).

Hab. Texas.

II. GLUVIA, C. Koch.

1. *G. ELONGATA*, Koch. Archiv für Naturgeschich., viii., 350-356 (1842). *Putnam*, Proc. Davenport Acad., iii., 268 (1883).

Hab. Texas.

III. CLEOBIS, Simon.

1. *C. CUBÆ*, Simon. Annales de la Soc. Entom. de France, ix., 149 (1879). Putnam, Proc. Davenport Acad., iii. 268, Pl. i., fig. 5 (1883).

Galeodes Cubæ, Lucas, in Histoire physique, politique et naturelle de l'Isle de Cuba, par M. Ramon de la Sagra, Pl. v., fig. 6 (1857).

Cleobis Stimpsoni, Putnam. Proc. Davenport Acad., iii., 261 (1883).

Hab. Florida, Cuba.

FAMILY SCORPIONIDÆ.

1. BUTHUS, Leach.

1. *B. BIACULEATUS*, Latr., in Coll. de Museum. Wood Jour. Phila. Acad., 2nd series, v., 368 (1874).

Hab. Florida.

2. *B. BOREUS*, Wood, Jour. Phila. Acad., 2nd series, v., 368 (1874).

Scorpio boreus, Girard, in Marcy's Rep. Exploration Red River, 238, Pl. xvii., fig. 5-7 (1854).

Hab. Utah.

3. *B. CALIFORNICUS*, Wood, Jour. Phila. Acad., 2nd series, v., 364 (1874).

Scorpio Californicus, Girard, in Marcy's Rep. Exploration Red River, 240 (1854).

Hab. California.

4. *B. CAROLINIANUS*, Wood, Jour. Phila. Acad., 2nd series, v., 363 (1874).

Scorpio Carolinianus, Beauv., Insect. Rec. en Afrique et en Amerique, 190, Pl. v., fig. 3 (1805).

Buthus vittatus, Say., Jour. Phila. Acad., ii., 61 (1821): Coll. Writings, ii., 11.

? *Scorpio Sayi*. Girard, in Marcy's Exploration Red River, 240 (1854).

? *Vajovis Carolinus*, Koch, Die Arachniden, x., 7, fig. 759.

Hab. So. States, Texas, Kansas.

5. *B. EMARGINATICEPS*, Wood. Proc. Phila. Acad., 1863, 109; Jour. Phila. Acad., 2nd series, v., 367, Pl. 40, fig. 1, 1a, 1b, 1c (1874).

Hab. Lower California.

6. *B. EUSTHENEURA* [U. S.] Wood. Proc. Phila. Acad., 1863, 109; Jour. Phila. Acad., 2nd series, v., 368 (1874).

Hab. Lower California.

7. *B. EXILICAUDA* [U. S.] Wood. Proc. Phila. Acad., 1863, 107; Jour. Phila. Acad., 2nd series, v., 366 (1874).

Hab. Lower California.

8. *B. HIRSUTUS*, Wood. Proc. Phila. Acad., 1863, 108; Jour. Phila. Acad., 2nd series, v., 367, Pl. 40, fig. 1, 1a, 1b, 1c (1874).

Hab. Lower California.

9. *B. LESUEURII*, Gervais, Archiv du Museum, iii., 226, Pl. xi., fig. 27-29, (1844); Apteres, iii., 61, (1844); Wood, Jour. Phila. Acad., 2nd series, v., 365, (1874).

Hab. Cuba.

10. *B. PUNCTIPALPI*, Wood. Proc. Phila. Acad., 1863, 109; Jour. Phila. Acad., 2nd series, v., 369 (1874).

Hab. Lower California.

11. *B. SPINIGERUS*, Wood. Proc. Phila. Acad., 1863, 110; Jour. Phila. Acad., 2nd series, v. 370, Pl. 40, fig. 2, 2a, 2b (1874).

Hab. Texas.

II. CENTRURUS, Gervais.

1. *C. PHAIODACTYLUS*, Wood. Proc. Phila. Acad., 1863, 111; Jour. Phila. Acad., 2nd series, v., 372, Pl. 40, fig. 3, 3a, 3b (1874).

Hab. Utah.

III. SCORPIO, DeGeer.*

1. *S. ALLENII*, Wood. Proc. Phila. Acad. 1863, 107; Jour. Phila. Acad., 2nd series, v., 372 (1874).

Hab. Lower California.

IV. UROCTONUS, Thorell.

1. *U. MORDAX*, Thorell. Ann. and Mag. Nat. Hist., xvii., 11.

Hab. California.

* I have omitted from the list DeGeer's species, *S. punctatus*, *S. maculatus*, *S. testaceus*, *S. australis*, as unrecognizable.—Cf. Memoirs Insectes, vii., 343-348.

FAMILY CHERNETIDÆ.

I. CHELIFER, Geoff.

1. *C. CANCROIDES*, Latr. Hist. Nat. Crust., etc., vii., 141, Pl. 6, fig. 2 (1804). *Hagen*, Record Amer. Entom., 1868, 51; Amer. Nat., ii., 216 (1869); Proc. Boston Soc., N. H., xiii., 264 (1870).

Hab. U. S., generally to California (Simon).

2. *C. MURICATUS*, Say. Jour. Phila. Acad., ii., 63 (1821); Coll. Writings, ii., 11; *Hagen* Record Amer. Entom., 1868, 51; Proc. Boston Soc., N. H., xiii., 266 (1870).

Hab. "North America" (Say).

3. *C. SCABRICULUS*, Simon. Ann. de la Soc. Entom. de France, series v., viii., 154 (1878).

Hab. California.

4. *C. ACUMINATUS* Simon. Ann. de la Soc. Entom. de France, series v., viii., 156 (1878).

Hab. California.

5. *C. ALIUS*, Leidy. Proc. Phila. Acad., 1877, 261.

Hab. Pennsylvania.

6. *C. WRIGHTII*, Hagen. Record Amer. Entom., 1868, 52; Proc. Boston Soc., N. H., xiii., 267 (1870).

Hab. Cuba.

II. CHERNES, Menge.*

1. *C. OBLONGUS*, Hagen. Record of Amer. Entom., 1868, 51; Proc. Boston Soc., N. H., xiii., 268 (1870).

Chelififer oblongus, Say. Jour. Phila. Acad., ii. (1821); Coll. Writings, ii., 12.

Hab. "North America" (Say).

2. *C. SANBORNII*, Hagen. Record of Amer. Entom., 1868, 51; Proc. Boston Soc., N. H., xiii., 268 (1870).

Hab. Massachusetts.

* Simon reunites the genera *Chelififer* and *Chernes*, which were separated by Menge, who was followed by L. Koch. He claims that the characters hitherto regarded as generic, are merely gradal, and that while certain widely separated species have these characters clearly marked, in others they gradually approach each other. In deference to American writers I leave them for the present. Cf. Les Arachnides de France, vii., 19 (1879).

III. CHTHONIUS, C. Koch.

1. C. CÆCUS, Packard. Amer. Nat., xviii., 203 (1884).

Hab. Virginia.

2. C. PACKARDII, Hagen.

3. C. PENNSYLVANICUS, Hagen. Record of Amer. Entom., 1868, 52 ;
-
- Proc. Boston Soc., N. H., xiii., 268 (1870).

Hab. Pennsylvania.

IV. OBISIUM, Leach.*

1. O. BRUNNEUM, Hagen. Record of Amer. Entom., 1868, 52 ;
-
- Proc. Boston Soc., N. H., xiii., 269 (1870).

Hab. "North America."

2. O. CAVICOLA, Packard. Amer. Nat., xviii., 202 (1884).

Hab. Virginia.

3. O. THEVENETI, Simon. Ann. de la Soc. Entom. de France, series
-
- v., viii., 156 (1878).

Hab. California.

4. O. MACILENTUM Simon. Ann. de la Soc. Entom. de France, series
-
- v., viii., 157 (1878).

Hab. California.

FAMILY GONYLEPTIDÆ.

I. PHRIXIS.

1. P. LONGIPES, Cope. Third and Fourth Geol. Rep. Indiana, 180
-
- (1872).

Hab. Indiana.

FAMILY PHALANGIDÆ.

I. PHALANGODES, Tellkampff.

1. P. ARMATA, Tellkampff. Archiv für Naturgeschichte, 1844, 320,
-
- Pl. viii., fig. 7-12.

Acanthocheir armata, Lucas. Annales de la Societè Entom. de
France, viii., 977 (1860). *Wood*, Comm. Essex Inst., vi., 36 [Sep. 27]
(1868).*Hab.* Mammoth Cave, Kentucky.* This genus has usually been credited to Illiger, but as Simon shows (*Les Arachnides de France*, vii., 51) it properly belongs to Leach.

2. *P. FLAVESCENS*, Simon. Les Arachnides de France, vii., 156, note (1879).

Erebomaster flavescens, Cope, Amer. Nat., vi., 420 (1872); Third and Fourth Geol. Rep. Indiana, 180 (1872).

Scotolemon flavescens, Packard. Bull. U. S. Geol. Survey (Hayden) iii., 165 (1877).

Hab. Wyandotte Cave, Indiana.

3. *P. ROBUSTA*, Simon. Les Arachnides de France, vii., 156, note (1879.)

Scotolemon robustum, Packard. Bull. U. S. Geol. Survey (Hayden) iii., 164 (1877).

Hab. Utah.

II. PHALANGIUM, L.

1. *P. BICOLOR*, Wood, Comm. Essex Inst. vi., 28 [19]. (1868).

Hab. Pennsylvania.

2. *P. CALCAR*, Wood. Comm. Essex Inst. vi., 26 [17]. (1868).

Hab. Virginia.

3. *P. CINEREUM*, Wood. Comm. Essex Inst. vi., 25 [16]. (1868).

Hab. New York.

4. *P. DORSATUM*, Say. Jour. Phila. Acad. ii., 66 (1821); Coll. Writings ii., 13; *Wood*, Comm. Essex Inst. vi., 18 [9]. (1868).

Hab. New York, Pennsylvania, Dist. of Columbia.

5. *P. EXILIPES*, Wood. Comm. Essex Inst. vi., 23 [14]. (1868).

Hab. Nevada, California.

6. *P. FAVOSUM* Wood. Comm. Essex Inst. vi., 28 [19]. (1868).

Hab. Nebraska.

7. *P. FORMOSUM* Wood. Comm. Essex Inst. vi., 30 [21]. (1868).

Hab. Pennsylvania, Dist. of Columbia.

8. *P. GRANDE* Say. Jour. Phila. Acad. ii., 67 (1821); Coll. Writings ii., 14; *Wood*, Comm. Essex Inst. vi., 34 [25]. (1868).

Hab. So. States.

9. *P. MACULOSUM*, Wood. Comm. Essex Inst. vi., 31 [22]. (1868).

Hab. Pennsylvania, Virginia.

10. *P. NIGROPALPI*, Wood. Comm. Essex Inst. vi., 22 [13]. (1868).

Hab. Pennsylvania.

11. *P. NIGRUM*, Say. Jour. Phila. Acad. ii., 66 (1821); Coll. Writings, ii., 14; *Wood*, Comm. Essex Inst. vi., 34 [25]. (1868).

- Hab.* North Carolina, South Carolina, Georgia, Texas, Nebraska.
 12. *P. PICTUM*, Wood. Comm. Essex Inst. vi., 30 [21]. 1868.
Hab. Massachusetts.
 13. *P. VENTRICOSUM*, Wood. Comm. Essex Inst. vi., 32 [23]. (1868).
Hab. Pennsylvania, Nebraska.
 14. *P. VERRUCOSUM* Wood. Comm. Essex Inst. vi., 29 [20]. (1868).
Hab. United States.
 15. *P. VITTATUM*, Say. Jour. Phila. Acad. ii., 65 (1821); Coll. Writings ii., 13; *Wood*, Comm. Essex Inst. vi., 20 [11]. (1868).
Hab. So. States, Texas, Nebraska.

III. CYNORTA.

1. *C. ORNATA*, Simon (?)
Gonyleptes ornatum, Say. Jour. Phila. Acad. ii., 68 (1821); Coll. Writings ii., 15; *Wood*, Comm. Essex Inst. vi., 37 [28]. (1868).
Hab. Georgia, Florida.

IV. NEMASTOMA, C. Koch.

1. *N. TROGLODYTE* Packard. Bull. U. S. Geol. Survey (Hayden) iii., 160 (1877).
Hab. Utah.
 2. *N. INOPS*, Packard. Amer. Nat. xviii., 203 (1884).
Hab. Kentucky.

V. OLIGOLOPHUS, C. Koch.*

1. *O. BICEPS*.
Mitopus biceps, Thorell. Bull. U. S. Geol. Survey (Hayden) iii., 525 (1877).
Hab. Colorado, Idaho.

VI. PHLEGMACERA, Packard.

1. *P. CAVICOLEUS*, Packard. Amer. Nat. xviii., 203 (1884).
Hab. Kentucky.

VII. TARACUS, Simon.

1. *T. PACKARDI*, Simon. Comptes rendus Societe Entom. de Belgique, 2nd series, No. 64 (1879).
Hab. Colorado.

* *Mitopus* Thorell is joined to *Oligolophus* C. Koch by Simon, Les Arachnides de France, vii., 239 (1879).

ON THE DISTRIBUTION OF THE GENERA OF CARABIDÆ
ALONG A RIVER SYSTEM.

BY C. H. T. TOWNSEND, CONSTANTINE, MICH.

The St. Joseph River runs nearly diagonally through the township of Constantine, from N. E. to S. W. A small affluent, called Fawn River, empties into it at the point where the town itself is located.

The characteristic vegetation along the banks of the main river above town is beech, maple, elm, iron-wood, walnut, butternut, papaw, magnolia (or a tree very nearly allied), spice-bush, prickly-ash, sumach, witch-hazel, wild grape, ash, oak and hickory, with many quite rare and beautiful wild flowers, such as are found in rich and favorable places. But that of the affluent region is almost entirely oak and hickory (mostly oak), with hazel, sumach, a few poplars, willows, and in some places cedars, but with few wild flowers of any account. The cedars are also found upon the main river, both above and below town. This difference in vegetation is probably due to a difference in the nature of the soil, the lower and richer soil of parts of the main river producing a richer and more varied flora than the higher and poorer parts adjoining the affluent.

Now I have noticed in collecting that the *Carabidæ* seem to be distributed in a somewhat systematic manner along the main river and its affluent, genera occurring on the former which are not found along the latter, and less frequently *vice versa*. On the main river I have taken *Omophron*, *Helluomorpha*, *Galerita*, *Brachylobus* (*Lithophilus* [Say]), *Dicaelus*, *Hestonotus* and *Amphasia*, which I have not taken on the affluent. *Galerita*, however, I have taken on the prairie to the south, but this partakes more of the nature of the main river region.

While on the affluent I have taken *Notiophilus*, *Calosoma* and *Pasimachus*, which I have not taken on the main river. The *Notiophilus* is a specimen which I have determined to be *sibiricus* Mots. It was taken on 19th October, 1884, while I was chopping over some sod with a hatchet on an elevated grassy bank, which formed an open spot in the woods at this place. As this is the only specimen of the genus I have up to this time met with here, it may be found yet upon the main river. Of *Calosoma*, I have often taken *calidum* (Fab.), and once *scrutator* (Fab.), up the affluent. The latter, a very rare insect here, three or four specimens only having been taken to my knowledge within the last

eleven years, I should have expected to find on the main river, as the rarer and more beautiful genera seem to be found there more frequently. However, one or two of the specimens were taken in town, and may belong to either region; and I think very likely that *calidum* (Fab.) is found up the river in the fields.

The genera I have observed upon both the main river and the affluent are *Scarites*, *Brachynus*, *Platynus*, *Pterostichus*, *Chlaenius* and *Harpalus*. I think I have also taken *Galerita* on the affluent, but such occurrence is rare. *Brachynus* and *Chlaenius* are much more abundant on the main stream, as indeed are nearly all of those given. I know of only two specimens of *Brachynus* being taken on the affluent, while in damp or wet places on the main river, which are much better suited to them, they are quite plentiful. Of the genera *Carabus* and *Cychnus*, I have never met with a representative here in any section.

This distribution is undoubtedly due to the richer flora of the main river producing more varied species upon which the *Carabidae* prey, and also to that to which in turn the richer flora is due, namely, the richer soil and more favorable locality.

MONOGRAPH OF THE EMBIDINA.

(Continued from page 155.)

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

6. *Oligotoma Westwoodi*, n. sp.

O. Westwoodi Hag., Synops. Embid., p. 222 (no description, not named.)

Length of body $4\frac{1}{2}$ mill.; exp. of wings 7 mill.

Male: As the specimen is enclosed in copal (*Gummi anime*), the colours are not certain, but the head, with antennæ and palpi, the thorax and the legs in part, seem to have been blackish-fuscous; head more Raphidia-like than in any other species; more than half longer than broad; the rounded sides sloping down, the occiput less than half as broad as the front part with the eyes; head above slightly convex, epistom large, convex; eyes large, prominent, about orbicular, with a small ex-

cision for the insertion of the antennæ; facets large, globose; antennæ long, reaching the end of the metathorax, inserted in a longer socket, 15-jointed; 1st joint a little thicker, cylindrical, half as broad as long; 2nd as long as broad; all others obclavate, to three times longer than broad, but the 3rd to 5th a little shorter than the rest, the last one more ovoid, with tip rounded; there seems not to be wanting any joint more. Labrum large, rounded, a little darker in middle; max. palpi 5-jointed, the three basals alike, short, as broad as long; 4th a little longer, 5th longer, ovoid; labial palpi 3-jointed, apical joint longer, ovoid. Prothorax as broad as occiput, about quadrangular, broader near the mesothorax; a deep transversal sulcus a little before middle, where the sides are notched; legs as usual, femoral and basal joint of fore legs elongate-inflated; middle legs less strong.

Wings very little longer than the abdomen, narrow, $\frac{3}{4}$ mill. broad, four times longer than broad, rounded on tip, hairy around and on the membrane, which is rugose, smoky, with four white longitudinal bands, the fifth near the costa being almost obsolete. Subcosta dark, ending unconnected after the basal fourth of the wing; a little earlier in the hind wings. Radius a little before the tip of the wing connected below with one long vein, which runs parallel to the radius and ends on the tip. This vein represents the sector and its upper branch (McLachl.); the sector itself is wanting from the place where the upper branch originates (it is marked by a small break of the vein) to the tip. There is no other vein in the wing except the strong anal vein originating from the base of the sector shortly before a transversal between the sector and radius. I have for convenience always used McLachlan's names of the veins, though it is obvious by this species that what he calls upper branch is really the prolongation of the sector itself. I will try later to give a homology of all the veins of the wing. The hind wings have exactly the same very simple venation; the discoidal cell is open. The abdomen is not entirely visible from above, as a Hymenopterous insect, partly overlaying. The segments are equal, once broader than long, except the two last ones, which are considerably shorter; the apical margin of the last one is cut asymmetrically, the right half of it considerably shorter than the left side; appendages as long as the four last segments, stout, two-jointed; the apical joints cylindrical, rounded at tip, as long as the basal ones; the appendages are asymmetrical, the right one stout, straight, a little longer, the left one curved, a little thinner. No side-view is possible. Between

the appendages is projected a broad inflation, narrower on tip, and just on its middle a spine coming from the right, as long as the basal joint, cylindrical, sharp on tip, somewhat curved to the right; a much smaller and shorter spine on the left side does not exceed the inflation. Abdomen from below with penultimate segment as long as the others, very dark, blackish; last segment pyramidal, rounded on tip, the left side asymmetrical, stronger notched.

In the same lot of copal I received another specimen of exactly the same size, but differing as follows: The whole insect has copal colours, less dark, only the head is dark brown. Both antennæ are only 14-jointed; the apical joint is ovoid, without any traces on tip of a broken-off segment. Wings pale, but with obvious traces of a smoky color and white longitudinal bands; the discoidal cell is closed in all four wings by one strong transversal vein, and two in the left anterior wing; all wings show 4 to 5 small costal transversals in the apical half, but these may also exist in the other specimen, the costal margin of which is not plainly visible.

The venation is alike, but all veins not developed are indicated by a series of small, darker hairs inserted in a more visible and deeper hole. I have formerly pointed out that just the same occurs in the wing cases of the *Calopteryx* nymphs. The appendages are to be seen well from below; they are alike; the right spine is longer, less thick, bifid on tip; near by is a short, cylindrical, curved tube, with open end; the left spine is triangular at base, the apex twisted and sharply pointed.

One joint more or less of the antennæ, one transversal more or less in the wing, can of course not be a specific difference. The marked character of the right spine between the appendages would be of importance; if it would be possible to examine the same organ in the other specimen. This is not the case, and therefore the existence of a similar character is at least not impossible.

Hab.—I received both specimens forty years ago among other copal insects bought from the large Drogues House Gehe in Dresden, Germany. It was sold as East Indian copal. Later I discovered that all copal sold at that time as East Indian copal came from Salem, Mass. It is indeed probably Zanzibar copal; this trade was then entirely in the hands of Salem merchants; the copal was brought to Salem by the extensive East Indian trade of this city, and sold to Europe.

I request the honor of dedicating this gentle species, the smallest

known, to the first monographer of *Embia*, the Veteran Entomologist—Indefatigatus, Doctissimus!

The rudimentary venation separates this species from all known, by the want of the lower branch of the sector.

Prof. Westwood in his monograph, l. c., p. 374, mentions two apparently distinct species in gum copal, probably from the eastern coast of Africa, in the collection of Dr. Strong, of Brook Green—"one which from its size may probably be the *Embia Savignyi*; seemed to possess 14-jointed antennæ." The size of *E. Savignyi* is so much larger that this copal species can not be *O. Westwoodi*.

The other species was of still larger size, with slightly stained wings and 24 joints in the antennæ. Both are unknown to me.

The published copal insects contain no *Embia*. A careful examination of the large collection of copal insects here did not give any more *Embia*.

7. *Oligotoma nigra*, n. sp. ;

Embia nigra Hagen, Synop. Psoc. et Embid., l. c., p. 221-222 (no description).

Male, dry: Length of body 8 mill.; exp. of wings 13-15 mill. Head dark fuscous, a little shining, sparingly covered with small pale hairs; head a little longer than broad; the part behind the eyes narrower, rounded, nearly orbicular; above slightly convex; eyes large, black; epistom quadrangular; labrum large, fuscous in middle, rounded; antennæ longer than head and prothorax, 13 joints present, fuscous, very hairy, hairs long, brown; 1st joint cylindrical, a little thicker than the others, once longer than broad; 2nd cylindrical, short, as long as broad; 3rd as long as 1st, larger on tip; 4th to 6th short, very little longer than broad, thicker on tip, 5th and 6th longer and thicker than 4th; 7th to 9th about alike, similar to the preceding ones, but longer; 10th to 13th longer, about four times longer than broad, more cylindrical; rest wanting. Another specimen has also 13 joints, but here the 10th to 13th are not so elongated; perhaps the difference is caused by the preparation. Mandibles strong, brown, with three black sharp teeth on tip; the right mandible has the inner teeth shorter; max. palpi 5-jointed, the two apical ones longer, the last one ovoid; lab. palpi 3-jointed, fuscous, the apical longer, ovoid; labium pale, rounded, bifid; head below brown, mentum blackish. Prothorax brown, much narrower and shorter than the head, a little longer than broad, and dilated to the wings; sides oblique; a transversal sulcus

after the apical third; the sulcus prolonged near the sides towards the base, inclosing an elevated part (les trois festons de Rambur).

Wings smoky fuscous, the median and the anal veins darker, blackish; five longitudinal white bands; four to five fine costals in the apical part; two (in one hind wing, four) transversals in the cell. Legs brown, articulations paler; dilated in the usual way, so far as it can be observed, the 1st joint of tarsi not very much dilated. Abdomen brown, last segment nearly cleft by a deep sulcus, nearer to the right; appendages long, very hairy; basal joint longer than the last segment, apical joint longer and thinner; right spine long, slowly thicker towards the base; tip sharp, bent up a little; this spine is turned strongly to the left, as long as the intro-mittant, cylindrical tube; the left spine is half as short, the sharp apical end returned. I can not ascertain if there is any asymmetry of the appendages.

The description is made from three males, showing the smaller dimensions, collected in Upper Egypt; the fourth, a little larger and much darker, collected near Cairo, is alike; the end of the abdomen is not visible.

Female? dry. Length of body 10 mill.

The two females before me differ from the males by similar characters as *O. Michaeli*. The body is black, a little hairy, somewhat shining, except the head, which is finely aciculate above. Head more rounded, the eyes small, not prominent; antennæ (only 13 joints present) short; 1st joint thicker, cylindrical; 2nd very short, annular; 3rd longer, larger at tip; all the following alike, short, nearly globular; the 2nd to 4th joint a little paler than the others, which are blackish. Prothorax a little broader than in the male; mesothorax longer, narrower towards the prothorax, without any traces of wings; metathorax similar; legs black, articulations paler; the enlarged parts, principally the basal joint of the tarsus of fore legs, stronger developed and more enlarged. An external spine on the basal joint is perhaps present. Abdomen longer, black; last segment rounded on tip; the appendages thick, very short, the apical joint a little longer; the abdomen of these carded specimens can not well be examined, but I believe that I am seeing a female genital opening. I can not find any asymmetry.

Hab. The larger winged male and the two females, called larvæ by Prof. Schaum, were collected by him on the island of Rhoda, near Cairo, Egypt, end of January, 1851, by beating the grass with the net in the

evening. The winged one was very agile in flying. Of the wingless ones he never took more than two at one beat, and they moved around like a slow Staphylin. They were very rare in February. The smaller ones were collected by him in February, 1852, in Middle and Upper Egypt. They are said to be very common in summer.

The winged *O. nigra* is entirely different from *E. mauritanica* Lucas. In 1857 I had the opportunity of seeing the only copy of the splendid and very expensive Explor. de l'Algerie then existing in Germany, belonging to the R. Library in Berlin. Even then, the copy being at the binder's, I had only a hurried glimpse, together with the late Prof. Schaum, who believed his species to be identical with the species of Mr. Lucas. This explains the question mark after *E. nigra* in my Synopsis. Now I have this expensive work in my room! I remark this fact only to explain the difficulties with which entomologists had to contend thirty years ago. That the winged specimens are different from *E. Savignyi* is directly obvious. I can not decide if the wingless form belongs to the winged one. Prof. Schaum considered it to be the larva, but as it is of the same size with the winged, this is scarcely probable, except (being females) by assuming that the female imago is much larger. The symmetrical appendages are very different from those of the males, and it could be presumed that the wingless form belongs to *E. Savignyi*; but this species seems to be different. Therefore we have to wait for new observations. As I received first the black wingless form, I applied to it the name *E. nigra*, which I would not change as the name had been quoted by several authors.

A wingless specimen collected by the late Prof. Loew in Asia Minor, probably near Kellemsch, is similar, but less dark. The pinned specimen, 8 mill. long (last segment wanting), may belong to *O. nigra*. Head and prothorax similar, antennæ short, with 17 joints. The color of the abdomen below yellowish brown. The condition of the specimen is too indifferent to say more than to note the occurrence of a species similar to *O. nigra* in Asia Minor.

8. *Oligotoma antiqua*.

Embia antiqua Pictet and Hagen. Berendt Bernstein Ins. ii., p. 56, pl. 5, f. 7.

Male? wingless. Length of the body 10 millim.

Body dark, sparingly villous; head oblong, a little narrower behind and rounded; above light convex, smooth, depressed behind the eyes,

which are small, not prominent ; antennæ as long as head and prothorax, 18-jointed ; 1st cylindrical, thicker ; 2nd very short ; 3rd as long as 1st, the rest shorter, thicker on tip, the last one ovoid ; max. palpi 5-jointed, the last one fusiform, longer ; labial palpi 3-jointed, the last longest ; labrum rounded ; epistom short, broad ; prothorax narrower and shorter than the head, quadrangular, sides straight, front angles sharp, hind angles rounded, a transversal sulcus in the frontal third ; mesothorax quadrangular, longer than prothorax, near the front margin on each side an oblique impression, and behind a small horizontal one ; metathorax similar, but shorter ; no traces of wings. Abdomen with 9 oblong dorsal segments, the 8th shorter, apical margin notched ; 9th large, conical, with a strong longitudinal impression, nearer to the right ; below 8 segments, the last large, ovoid ; appendages strong, very villous ; apical joint thinner, cylindrical ; the basal a little curved ; legs strong, villous, femora of fore and hind legs and basal joint of tarsi of fore legs largely inflated.

Hab. Four specimens in Prussian amber ; I have little doubt that it belongs to *Oligotoma* ; the apparent asymmetry of the last dorsal segment makes me believe that the appendages are also asymmetrical, as I had seen them so when studying the specimens ; but these parts were not well visible. I have amended the description after manuscript notes, namely, the antennæ, which are there given with 19 joints, because the socket is counted as 1st joint. Since then more specimens have been found, but no winged ones.

9. *Embia Savignyi*.

Savigny Descript. d'Égypte Néuropt. pl. 2, f. 9-10 (no name).

Embia Audouin Expl. sommaire du planches, p. 194.

E. Savignyi Westwood, Trans. Linn. Soc., vol. xvii., p. 372, pl. ii., f. 1.

E. Savignyi Burm., Handb. vol. ii., p. 770, 1.

E. Savignyi Ramb., Neur. p. 311, 1.

E. Aegyptiaca Blanch., Hist. Ins. p. 48. (Not seen by me.)

E. Savignyi Brauer., Neur. Europas, 1876, p. 32.

Length of the body 9 mill. ; with wings, 12 mil. ; exp. of wings nearly 20. The measures are only approximative, the condition of the specimen not allowing more.

Male. Body leather-yellow, somewhat shining, villous ; head about quadrangular, rounded behind, rather flattened above, a little depressed transversely behind the eyes ; antennæ broken (Burmeister quotes 17 joints, Savigny figures only 15) ; eyes large, black, notched before ; max.

palpi 5-jointed, brownish. Prothorax much narrower than the head, enlarged towards the wings; a little longer than broad, sides straight; in the anterior third a transversal sulcus; behind convex, divided by an impressed middle line. Mesothorax with a transversal elevation divided in the middle between the base of the wings. Legs a little darker with the usual dilatation of femur and the basal joint of tarsi of fore legs. Wings longer than the abdomen, a little broader than those of *Oligotoma*, light brownish-smoky, with five longitudinal white bands; the inferior branch of the sector is again furcated (and occasionally a third time, as in one wing of Savigny's figure and in the specimen before me). Four to five partly incomplete costal transversals, two in the closed cells, and several more in the two or three spaces between the sector-branches. Abdomen enlarged behind, last ventral segment larger, convex, shining, brown. Appendages broken; two-jointed, long, thick, after Savigny and Rambur. I presume the specimen to be a male, because no female genital opening is visible.

There exists no description of Savigny's type except Rambur's of the incomplete specimen in the Jardin de Plants in Paris, which has probably been figured by Savigny. Burmeister has described some specimens in the Museum in Berlin, Prussia, and my specimen is one of them.

Hab. Egypt, Savigny and Ehrenberg in Berlin Museum.

The figures by Savigny are excellent, as usual; it is to be remarked that he has seen and figured f. 9, u. e., the opening of the spinning glands inside of the labium.

Rambur, l. c., p. 312, carefully describes a larva which belongs very probably to this species. The patria of the larva, which is now in De Selys-Longchamps collection, is unknown. Perhaps it may be a female.

A wingless specimen collected by Prof. Schaum near Athens, Greece, November, 1851, now in my collection, agrees very well with Rambur's description; 10 mill. long, brownish-ferruginous, villous; the end of the abdomen of the carded specimen is not well visible. The head is a little more oval and not so distinctly quadrangular as in *E. Savignyi*. Antennæ short, 17 joints. The body is narrower than in *E. Savignyi*. Otherwise it has the characters described before as belonging to the female, namely, the small, non-prominent eyes, and the external spine of the basal joint of tarsi of fore legs. Of course it can not be decided if this specimen belongs to *E. Savignyi* or not. Prof. Schaum had also collected a winged specimen at the same place, which was unfortunately lost. Prof. Brauer, l. c., quotes this species from Southern Russia with? (authority not stated).

NOTE ON HABIT OF LARVA OF *P. ATALANTA*.

BY W. H. EDWARDS, COALBURGH, W. VA.

In C. ENT., 14, p. 223, I stated that Newman, in Nat. Hist. Br. But., described the mature larva as pupating in a case specially prepared for the purpose on the plant it had been feeding on: "from the roof of this the caterpillar suspends itself and becomes a chrysalis." Also quoted from Harris, who says the larva "seeks a suitable place in which to undergo its transformations." In the conclusion of the paper, vol. 15, p. 19, I said that I had never found a case with pupa in it, though I had often taken cases with the larvae in earlier stages, and I ventured the conjecture that both Harris and Newman were right, but that in our climate the larva pupated differently from its habit in England.

On 24th July last, I received from Mr. Philip Laurent, of Philadelphia, about a dozen cases of *Atalanta*, each made of a single nettle leaf and containing a pupa suspended from the top. Mr. Laurent wrote that in 1882 this butterfly was very common, and that in a short time, on one occasion, he found 125 pupae in leaf cases; and that as far as observed, the larva selects a large leaf for its last case, in which it transforms; that as a rule it makes its last meal out of the outer end of the case, eating about an inch thereof; that he has however taken many that were not eaten at all; has also seen several in which pieces were eaten out of the side of the leaf.

I am glad to have this positive evidence; my opinion was based on the fact of never having found such a case, together with the testimony of Dr. Harris, as I understood it. But it is probable that I was wholly mistaken, and that the American habit of the species is like that in England. *Atalanta* was abundant here in 1881, but I have seen few individuals since. Just so *P. Cardui* was the most common butterfly here all through the season of 1884, and this year I have not seen one.

CORRESPONDENCE.

Dear Sir: While out for an ornithological ramble here on Cote des Neiges Mountain this afternoon, I observed a large number of *Danais archippus* congregated together; numbers were clustered on dead branches of trees and underbrush, also on ferns. I could easily have caught a

hundred without moving more than ten paces. I don't remember having seen this species so abundant here for several years. Last year *Pyrameis cardui* appeared to me to be the most plentiful butterfly here, during August and September. I also noticed a large number of this latter species on the marshes of Lake St. Peter, about sixty miles down from Montreal. This was in the early part of September, last year. If you consider the above notes interesting enough to publish, I should like to know the cause of the above mentioned assemblage of *archippus*. The weather was showery in the morning, and sunshiny in the afternoon, with a stiff breeze blowing from the south.

Montreal, 22nd Aug., 1885.

ERNEST D. WINTLE.

CRYPTOBIUM FLAVICORNE, LEC.

Dear Sir: In his recent very interesting "A Study of the Species of *Cryptobium* of North America," Trans. Am. Ent. Soc., 1885, Dr. Horn has united with *pallipes* the forms hitherto known as *latebricola* and *flavicornes*. Having lately shown him a series of specimens in which the males have a denticle on the middle of the hind margin of the sixth (fifth visible) ventral segment, he writes that in none of the males of *pallipes* in his cabinet does this little tooth exist, and that he thinks it could not have existed in any specimens of the series which he examined while preparing his paper. He thinks, however, that the species thus indicated is the *flavicornes* Lec., and says the females are only distinguishable by the very pale rufo-testaceous antennæ of *flavicornes* and the more or less piceous antennæ of *pallipes*. Immature females of the latter in Dr. Horn's cabinet and in my own appear indistinguishable from *flavicornes*.

FREDERICK BLANCHARD.

Dear Sir: Whilst being out on a drive through the country last summer, I noticed a small yellow butterfly near the road side, too small to be a *Colias philodice* Godt. I jumped off the wagon and captured it, after a brief chase. To my astonishment, it proved to be a fresh specimen of *Terias lisa* Boisd., the first one ever taken in this locality.

I think it will be well to remember the following: To prevent moulding of the sand used for relaxing specimens, put a few drops of carbolic acid in the water to moisten the sand with; it also prevents the moulding of specimens should they be closed up too long.

PH. FISCHER, Buffalo, N. Y.