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NATURAL HISTORY  
BRITISH INSECTS;

EXPLAINING THEM  
IN THEIR SEVERAL STAGES  
WITH THE HISTORY OF THEIR REPRODUCTION  
AND THEIR USES TO MANKIND

HISTORY OF SUCH MINUTE INSECTS

AS SUBJECTS OF INVESTIGATION BY THE MICROSCOPE

THE WORK ILLUSTRATED BY

ENGRAVED FIGURES

DESIGNED AND EXECUTED FROM DRAWINGS BY

BY R. DONOVAN

VOL. V.

LONDON:

PRINTED FOR THE AUTHOR,

AND IN LAMBERT'S PRINTING OFFICE, 57, PATERNOSTER-ROW.

MDCCLXXII.

THE  
NATURAL HISTORY  
OF  
BRITISH INSECTS;  
EXPLAINING THEM  
IN THEIR SEVERAL STATES,  
WITH THE PERIODS OF THEIR TRANSFORMATIONS,  
THEIR FOOD, OECONOMY, &c.

TOGETHER WITH THE  
HISTORY OF SUCH MINUTE INSECTS  
AS REQUIRE INVESTIGATION BY THE MICROSCOPE.

THE WHOLE ILLUSTRATED BY  
COLOURED FIGURES,  
DESIGNED AND EXECUTED FROM LIVING SPECIMENS.

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By E. DONOVAN.

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VOL. V.

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LONDON:

PRINTED FOR THE AUTHOR,

And for F. and C. RIVINGTON, N<sup>o</sup> 62, ST. PAUL'S CHURCH-YARD.

MDCXCVI.

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The NATURAL HISTORY of BRITISH BIRDS will be published in the same manner.

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\* 10 Ann. c. 19. s. 101.

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ADMISSION OF JUDICIAL OFFICERS

The Board of Judicial Officers is pleased to announce the admission of the following individuals to the Bar of the State of New York for the year ending June 30, 1911.

- 1. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 2. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 3. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 4. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 5. *[Name]*, Esq., of the County of *[County]*, State of New York.
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- 17. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 18. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 19. *[Name]*, Esq., of the County of *[County]*, State of New York.
- 20. *[Name]*, Esq., of the County of *[County]*, State of New York.

Witness my hand and seal of office at the City of New York, this 15th day of June, 1911.

*[Signature]*  
*[Title]*

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T H E  
NATURAL HISTORY  
O F  
BRITISH INSECTS.

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P L A T E CXLV.

PAPILIO RHAMNI.

BRIMSTONE BUTTERFLY.

LEPIDOPTERA.

GENERIC CHARACTER.

Antennæ clavated, or knobbed at the end. Wings, when at rest, erect. Fly by day.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings angulated, entire, pale yellow, with a brown spot near the center of each. Underfide very pale yellow. Antennæ reddish.

PAPILIO RHAMNI. Alis integerrimis angulatis flavis, singulis puncto ferrugineo.—*Linn. Syst. Nat.* 2. 765. 106.  
—*Fn. Sv.* 1042.

*Papilio præcox* sulphurea five flavo viridis, singulis alis macula ferruginea notatis.—*Raj. Inf.* 112. 4.

*Sulz. Inf. tab.* 13. *fig.* 84.

*Roes. Inf.* 3. *tab.* 46. *fig.* 1. 2. 3.

————— 4. *tab.* 26. *fig.* 1. 5.

*Degeer Inf.* 1. *tab.* 15. *fig.* 1. 10.

*Esp. Pap.* 1. *tab.* 4. *fig.* 4.

*Schæff. Elem. tab.* 94. *fig.* 7.

————— *Icon. tab.* 35. *fig.* 1. 3.

The Brimstone Butterfly is common in many places in the month of June in the Fly state. In the Caterpillar state it is seldom taken, and when in chrysalis it is generally concealed among the herbage, where it is almost impossible to be discovered. In this state, like all other species of the Butterfly tribe, it is suspended by the tail, but has such muscular strength, that if touched it can throw itself upright immediately, in the same manner as the Chrysalis of *Phalæna pentadactyla*. It feeds chiefly on buck-thorn, whence it has received the specific name *Rhamni*.

REF  
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## P L A T E CXLVI.

## BOMBYLIUS MEDIUS.

DIPTERA.

Wings two.

## GENERIC CHARACTER.

Trunk taper, very long, between two horizontal valves.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Thorax and body yellowish brown, white at the extremity. Wings with brown spots.

BOMBYLIUS MEDIUS: alis fusco punctatis corpore flavescente postice albo.—*Linn. Syst. Nat.* 2. 1009. 2. 1919.

BOMBYLIUS PUNCTATUS niger villis fulvis, alis fusco punctatis.—*De Geer. Inf.* 6. 269. 2. tab. 15. fig. 12.

*Schæff. Elem.* tab. 27. 1.

———— *Icon.* tab. 78. fig. 3.

*Fab. Syst. Ent.* 802. 2.

———— *Spec. Inf.* 2. 473.

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The Bombylius genus is very concise. *Fabricius* in the *Species Insectorum* enumerates only nine species, of those five are found in Europe, major, medius, minor, ater and fuscus; the three former are natives of this country; the fourth is frequent in Germany, the last

last in Italy.—To these Fabricius has added a few species in his last work *Entomologia Systema*, which have not been described before, but they are all exotics.

The species figured in the annexed plate is not common. It lives on the nectareous juice of flowers. Is found in May.

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F I G. III.

MUSCA HYPOLEON.

DIPTERA.

GENERIC CHARACTER.

A soft flexible trunk, with lateral lips at the end. No palpi.

SPECIFIC CHARACTER.

Eyes brown. Thorax black, margined with yellow. Abdomen black, with five yellow spots. Legs yellow.

*Musca Hypoleon.* *Lin. Syst. Nat.*

*Stratiomys Hypoleon.* *Fab. Mantissa. 2. p. 347. N° 63.*

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This Insect was taken last August, flying among some rushes in Battersea meadows. The line at Fig. 2. denotes the natural size.

WILLIAM W. WATSON  
HARVARD UNIVERSITY  
CAMBRIDGE, MA USA



## P L A T E CXLVII.

## GRYLLUS GRYLLOTALPA.

MOLE CRICKET.

HEMIPTERA.

Shells or upper wings semi-crustaceous, not divided by a straight future, but incumbent on each other, beak curved down.

## GENERIC CHARACTER.

Head maxillous, and with palpi. Antennæ filiform, or taper. Wings folded. Hind legs strong for leaping.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Dark brown. Antennæ filiform, long, small. Head long and small. Four short palpi. Corselet cylindrical, shells small, veined, wings long. Body hairy. Two small tails. Fore feet large, palmated.

*GRYLLUS GRYLLOTALPA.* *Linn. Syst. Nat.* 2. 693. 10.

*Gryllus supra fuscus, subtus ferrugineo flavus, pedibus anticis latis, compressis denticulatis.* *De Geer. Inf.* 3. 517. 2.

*Acheta gryllotaipa*: *alis caudatis elytro longioribus, pedibus anticis palmatis.* *Fab. Syst. Ent.* 279. 1.—  
*Sp. Inf.* 1. 353. 91. 1.

*Catesby Carol.* 1. tab. 8.

*Frisch. Inf.* 11. tab. 5.

*Seb. Mus.* 4. t. 89. fig. 3. 4.

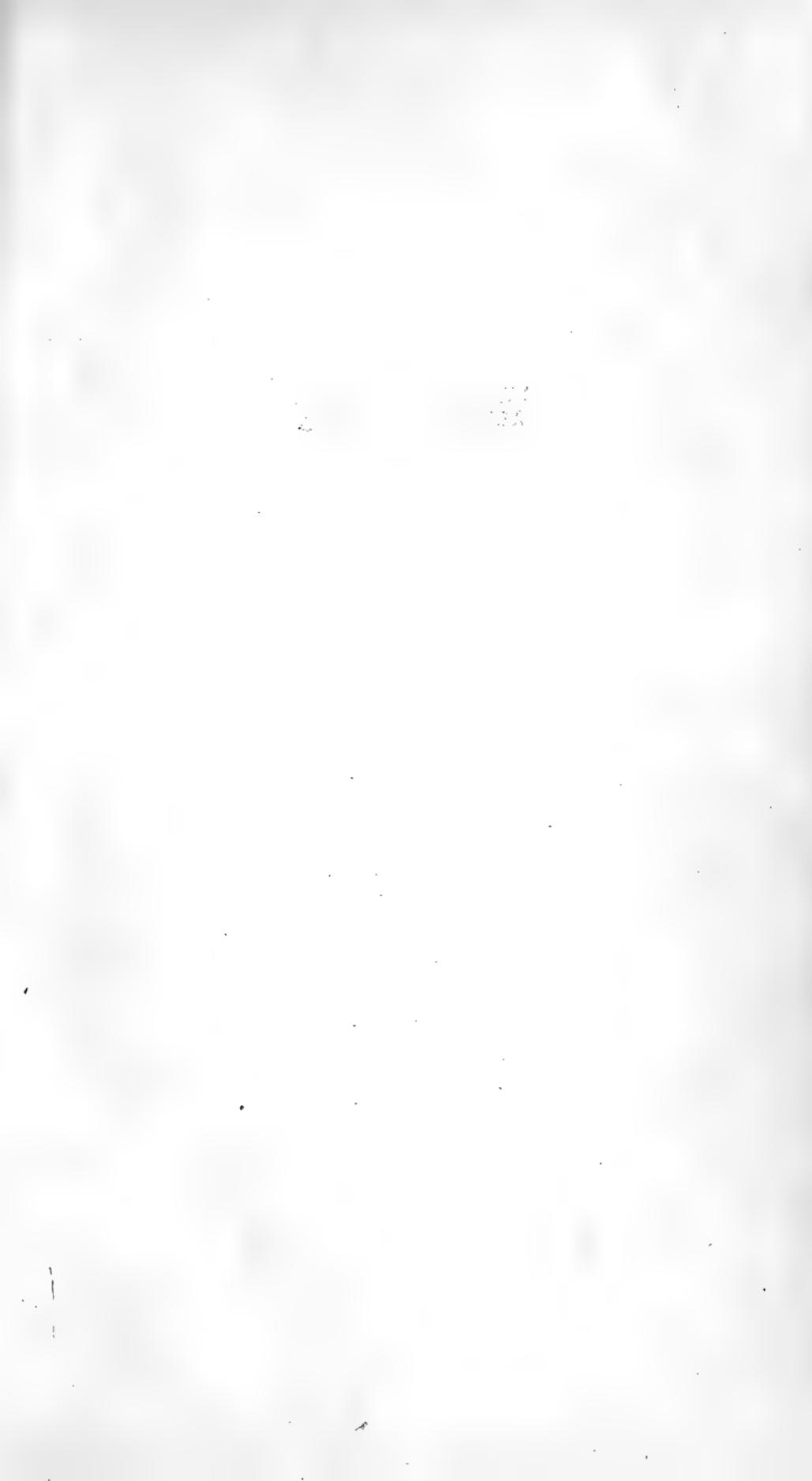
*Sulz. Inf. tab.* 9. fig. 59.

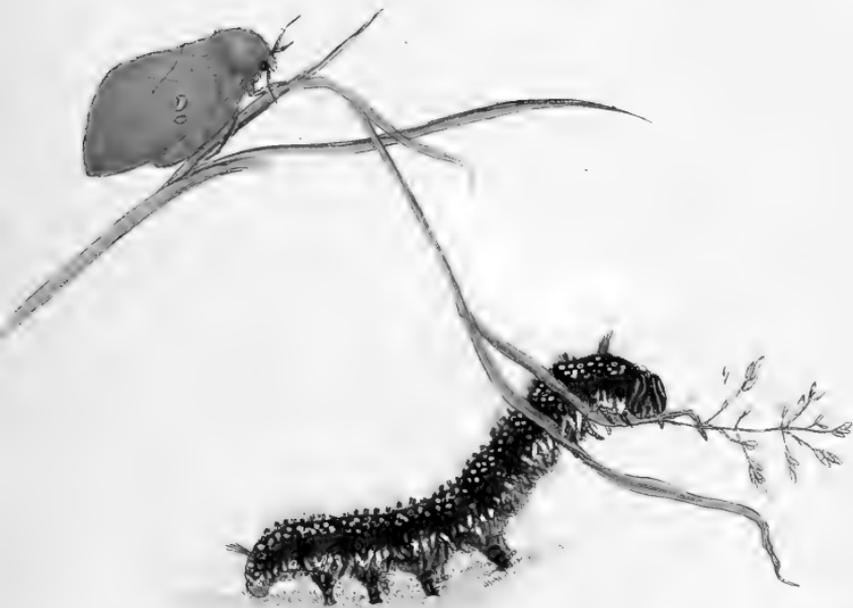
*Roes. Inf.* 2. *Gryll. tab.* 14. 15.

It is scarcely possible to find a more singular creature than the Mole Cricket. It lives in burrows which it forms about an inch or more below the surface of the ground. The female deposits a large bed of eggs about the size of small pease, rather of an oval form, and brownish colour. They are laid in a circular cavity, which is two or three inches wide, and near an inch in height. An aperture is made on one side, with an easy ascent to the surface of the ground, and is ingeniously covered at the top with loose earth. When the young larvæ are first hatched, they scarcely exceed the twelfth of an inch in length. They ascend through the opening, and subsist on the plants nearest their habitation, till their fore claws have acquired sufficient strength to burrow into the earth. In the larva state they nearly equal the perfect Insect in size, and resemble it in every respect, except that they have no wings. The shells appear first; this is the pupa state, and shortly after the membranous wings appear also. It makes very little use of its wings, as they are too weak to support its body long; and indeed it has not much occasion for them, as it lives in the same manner as the Mole, and, like it, is furnished with powerful claws, with which it can burrow through the ground to a very considerable distance.

This destructive creature is generally found in great numbers wherever they once deposit their eggs; for it is impossible to pursue and destroy them without doing much injury to the ground they infest. If they find a way into a kitchen-garden, they sometimes destroy whole beds of young plants in the space of one night; and this is not astonishing, when we consider that they seldom eat any part except the roots, which they nip very close, and consequently the other parts must perish. They seem particularly fond of Lettuces.

Fig. I. one of the fore claws.





## P L A T E CXLVIII.

## PHALÆNA POTATORIA.

DRINKER MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

BOMBYX.

Antennæ, male feathered, female, like a bristle.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Yellow brown. Wings slightly scalloped; on each of the upper wings an oblique line, and two white spots near the anterior margin. Female paler colour than the male.

PHALÆNA POTATORIA: alis reversis subdentatis flavis, striga fulva repandaque, punctis duobus albis.—*Syst. Ent.* 564. 28.

PHALÆNA maxima alis e fulvo flavicantibus. *Raj. Inf.* 143. 3.

*Goed. Inf.* 1. tab. 12.

*Sepp. Inf.* 4. 37. tab. 8.

*Schæff. Icon.* tab. 67. fig. 10. 11.

*Wilk. pap.* 27. tab. 3. b. 2.

The Caterpillars of this Insect feed on grafs, they are found in May, and the Moth appears about the middle of June.

The female differs in several respects from the male; it is of a buff colour, and is generally, though not always, larger. The chrysalis is black, and is enclosed in a strong yellowish case, as shewn in the plate.





## P L A T E CXLIX.

## ATTELABUS CURCULIONOIDES.

## COLEOPTERA.

Wings two, covered by two shells, divided by a longitudinal future.

## GENERIC CHARACTER.

Antennæ thicker towards the end. Head narrow behind. Four joints in each foot.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Shells and thorax red. Head black.

ATTELABUS CURCULIONOIDES: niger thorace elytrisque rubis.—  
*Lin. Syst. Nat.* 2. 619. 3.

Rhinomacer niger thorace elytrisque rubris, proboscide longitudine  
capitis.—*Geof. Inf.* 1. 273. 10.

Curculio Nitens, *Paykull. Monogr.* 130. 122.

*Schæff. Icon. tab.* 56. fig. 7.

*Sulz. Inf. tab.* 4. fig. 12.

A pair of this very singular and rare species was taken on a young nut tree in Darent Wood, Dartford, early in May, -1795.

The remarkable structure of it's head deserves particular notice; it is shaped like a vase, and when the Insect is alive is protruded

far beyond the thorax by it's long slender neck. It has also a very busy motion of it's head from the right to the left when it runs: we observe a similar motion in many Insects; but as few have such a slender neck, it is seldom so quick and repeated as in this.

The natural size is given in the upper part of the plate, the magnified appearance of the head is shewn below.





## P L A T E    C L.

## F I G.    I.

## P H A L Æ N A   M A R G I N A T A.

## L E P I D O P T E R A.

## G E N E R I C   C H A R A C T E R.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

## N O C T U A.

Antennæ setaceous.

## S P E C I F I C   C H A R A C T E R

A N D

## S Y N O N Y M S.

Upper wings, yellow brown, with four streaks of red brown across each; two circles of the same colour in the middle; space next the exterior margin dark colour. Lower wings pale brown with a spot of black in the center, and band of black next the posterior edge.

N O C T U A   M A R G I N A T A: Cristata, alis deflexis flavescens, strigis ferrugineis postice fuscus. *Fabricius Spec. Inf.* 2. 230. 108.—Mant. *Inf.* 2. p. 166. n. 209.

Tabellar. *Verz.* II. heft. p. 41. n. 59. *Noctua rutilago* cristata, alis deflexis flavis, ferrugineo strigosis fasciaque postica fusca; posticis pallidis limbo nigro.

Berliner. *Mag.* 3. Stuct. p. 294. n. 41.

*Phalæna Umbra.* Die Zimmetmotte.

Gesenius *Handb.* p. 162. n. 77. *Phal. Noct. Umbra.* Die Zimmetmotte.

De VILLIERSent. *Linn.* 2. p. 258. n. 280. *Phal. Noctua Marginata.* la Bordure.

*Phalæna Marginata.* Klemann's. *Insecten Geschichte, &c.*

Kurnberg, 1792. Vol. 2. pl. 7. fig. 6. 7. 8.

The

The Synonyms of this rare Insect have been more minutely collected, than is common in the descriptions of this work, as it has been generally considered an undescribed species. Mr. Crow, of Feverham, who has enriched the collections of several gentlemen in London, with many curious Insects, met with two or three specimens of this Moth, and among others sent one to Mr. Bentley, a collector in London, a few years since. I have to acknowledge being favoured with this Insect by LORD WILLIAM SEYMOUR; his Lordship met with it in Wiltshire.

*Fabricius*, in the *Species Insectorum*, has made a very considerable error; and which it is proper to notice in this place, "*Noctua Marginata*, native of America," and described from the Collection of Dr. Hunter, occurs in page 216. spec. 40; and again in page 230. spec. 108, "*Noctua Marginata*, a native of Europe," the present specimen. The former he has indeed changed to "*Noctua Marginella*" in his last work, *Entomologiæ Systematicæ*, but without the slightest notice of the first mistake, or any reference to the *Species Insectorum*.

It appears to be a native of Germany by the last work published by *Klemann*, though perhaps it is very rare in that country as it is given in a supplementary series of plates to his work, and his plates are but a supplement of the more rare Insects, not figured in *Roefel's* publications.

## P H A L Æ N A   A U R A N T I A G O .

O R A N G E   M O T H .

L E P I D O P T E R A .

P H A L Æ N A .

## S P E C I F I C   C H A R A C T E R .

Upper wings orange colour with spots, waves, and streaks of brown; several minute white spots along the anterior margin. Body and lower wings cream colour, with a pale wave in the middle of the latter.

---

This is certainly a non-descript. *T. Marham, Esq. Sec. L. S.* has described it in his manuscript notes under the specific name *Aurantiago*.

The specimen from which the figures in the annexed plate are copied was found on an oak in Richmond Park, in June, 1793. The under-side as well as upper-side is shewn in the plate.







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4



2



5

P L A T E C L I.

F I G. I.

MUSCA BRASSICARIA.

CYLINDRICAL FLY.

DIPTERA.

Wings 2.

GENERIC CHARACTER.

A soft flexible Trunk, with lateral lips at the end. No Palpi.

SPECIFIC CHARACTER

AND

SYNONYMS.

Thorax greenish. Abdomen cylindrical; second and third Segment reddish yellow.

MUSCA BRASSICARIA: antennis setariis nigra, abdomine cylindrico: segmento secundo tertioque rufis. *Fab. Spec. Inf.* 2. 36. 443.—*Syst. Ent.* 25. p. 88.—*Mant. Inf.* I. 2. 43. 345.—*Ent. Syst.* 4. 327. 63.

*Musca cylindrica*: Antennis setariis pilosa cinereo nigra, abdomine cylindrico elongato medio rufo. *Degèer. Inf.* 6. n. 9. p. 30. tab. I. fig. 12.

*Mouche cylindrique*. Ibid.

Die Kohlflye. *Panz. Faun. Inf. Germ.*

The *Muscæ*, if we follow the arrangement of Linnæus, form by far the most extensive of any genus (except Lepidoptera) we have at present any knowledge of. Fabricius enumerates in his last \* Work no less than 202 Species, under the generic title *Musca*; independent of these we find 122, under the head *Syrphus*; 22 under *Rhagio*, and 25 under *Stratiomys*, all of which (with some exceptions) would make by Linnæan arrangement 349 species; not to notice the Insects of the same tribe included under his generic appellations, *anthrax*, *bibio*, *nemotelus*, &c.

*Musca Brassicaria* is not uncommon in gardens in May and June. Sometimes found on Willows.

Fig. 1. One of the Antennæ magnified.

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\* *Syst. Ent.*

## F I G. II.

## A P I S T U M U L O R U M.

SMALL, LONG HORNED BEE.

HYMENOPTERA.

Wings four, generally membranous. Tail of the female armed with a sting.

## G E N E R I C C H A R A C T E R.

Jaws, with a Trunk bent downwards. Antennæ elbowed in the middle. Wings plain. Body hairy. Abdomen connected by a pedicle.

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S.

Antennæ rather longer than the body. Entirely black, with greyish hairs. Jaws yellow.

A P I S T U M U L O R U M. *Lin. Syst. Nat.* 2. 953. 2. edit. 3.—*Fn. Sv.* 1685.

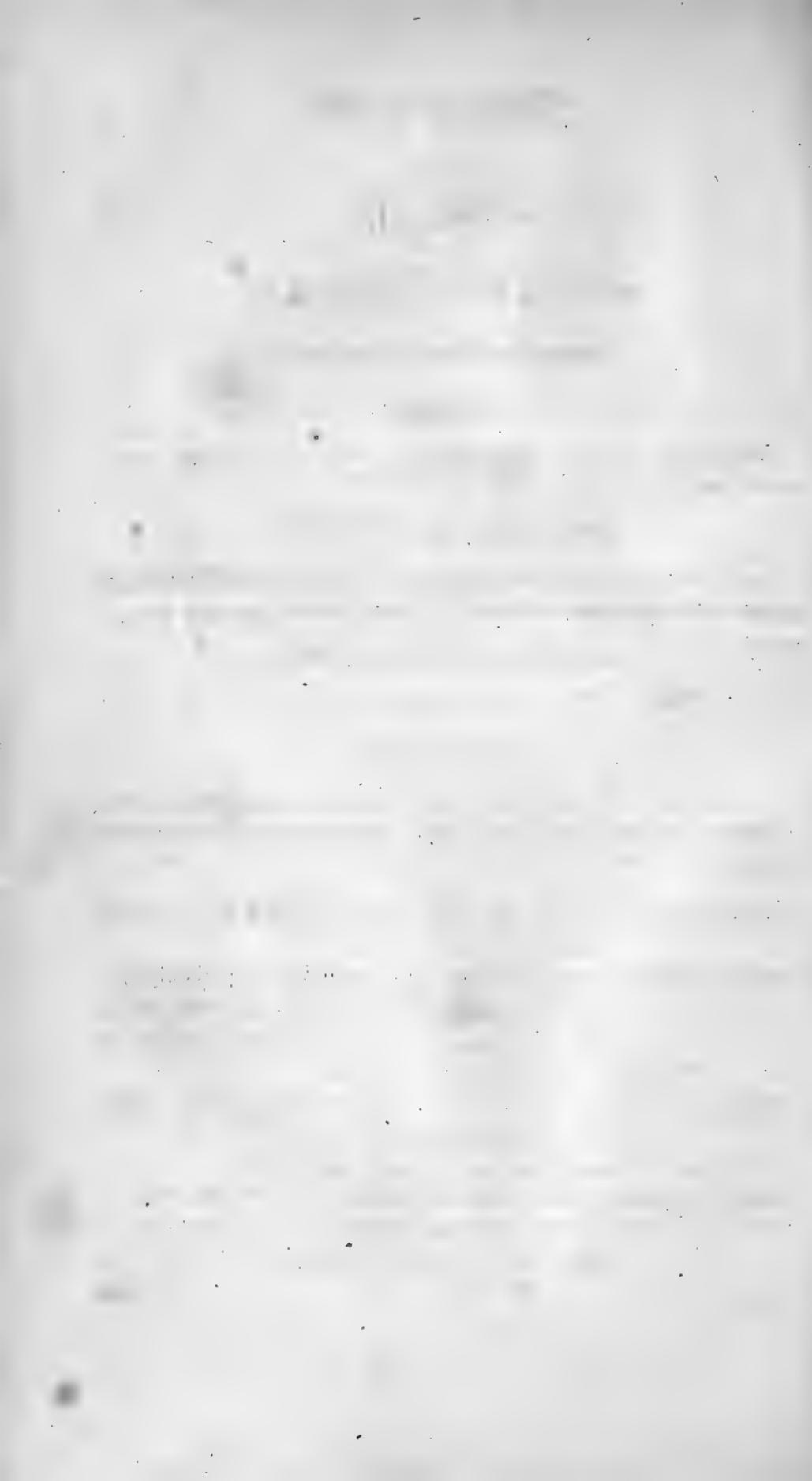
A p i s T u m u l o r u m : Antennis filiformibus longitudine corporis nigri, maxillis flavis. *Fab. Syst. Ent.* 388. 57.—*Spec. Inf.* 1. 486. 122.

*Eucera Tumulorum*, vol. 2. 344. 159.

*Sulz. Hist. Inf. tab.* 27. fig. 14.

---

This extraordinary Bee is found in Summer, against banks, when the weather is fine. Were it not for the remarkable length of the Antennæ, it would scarcely deserve notice, though it is rather a scarce Insect.



## F I G. I I I.

## TABANUS PLUVIALIS.

SPECKLED-WING. STINGING FLY.

DIPTERA.

Wings 2.

## GENERIC CHARACTER.

Antennæ conic, of four Segments. Trunk fleshy, terminated by two lips. Palpi one on each side of the Trunk.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Eyes green. Thorax brown grey, with seven longitudinal lines. Abdomen grey with marks of black. Wings brown speckled with white.

TABANUS PLUVIALIS. *Lin. Syst. Nat.* 16. p. 1001. *edit.* 13. n. 16. p. 2885.—*Fn. Sv.* n. 1887.

*Tabanus Pluvialis*: Oculis fasciis quaternis undatis, alis fusco punctatis. *Fab. Syst. Ent.* n. 16. p. 790.—*Spec. Inf.* 2. n. 23. p. 459.—*Mant. Inf.* 2. n. 26. p. 356.—*Ent. Syst.* vol. 4. p. 369. 134. 32.

*Tabanus fuscus*, alis cinereis, punctis numerosissimis albis. *Geoff. Inf. T.* 2. n. 5. p. 461.

Le Taon à ailes brunes piquées de blanc. *Geoff. Inf.*

Die Regenbreme. *Panz. Faun. Inf. Germ.*

*Reaum. Inf.* 4. tab. 18. fig. 1.

*Harris Inf. angl.* tab. 7. fig. 8.

C 3

Scap.

*Scop. carn. n. 1012.*

*Schrank. Inf. austr. n. 978.*

*Schäffer. Icon. Inf. Ratisbon. tab. 85. fig. 8. 9.*

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During all the Summer months we find this tormenting little Insect in great abundance, in the narrow lanes and skirts of woods, If it settles on the hands, face, or legs, its sting is very acute, and excites an inflammation and swelling in the stung-part, very similar to that we experience from the sting of the *Tabanus cæcutiens*, described in Plate 131, of this Work.

Its sting is most violent about the middle of the day,

## F I G. I V.

## MUSCA BOMBYLANS.

DIPTERA.

MUSCA.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Antennæ feathered. Black and hairy; extremity of the Abdomen yellow.

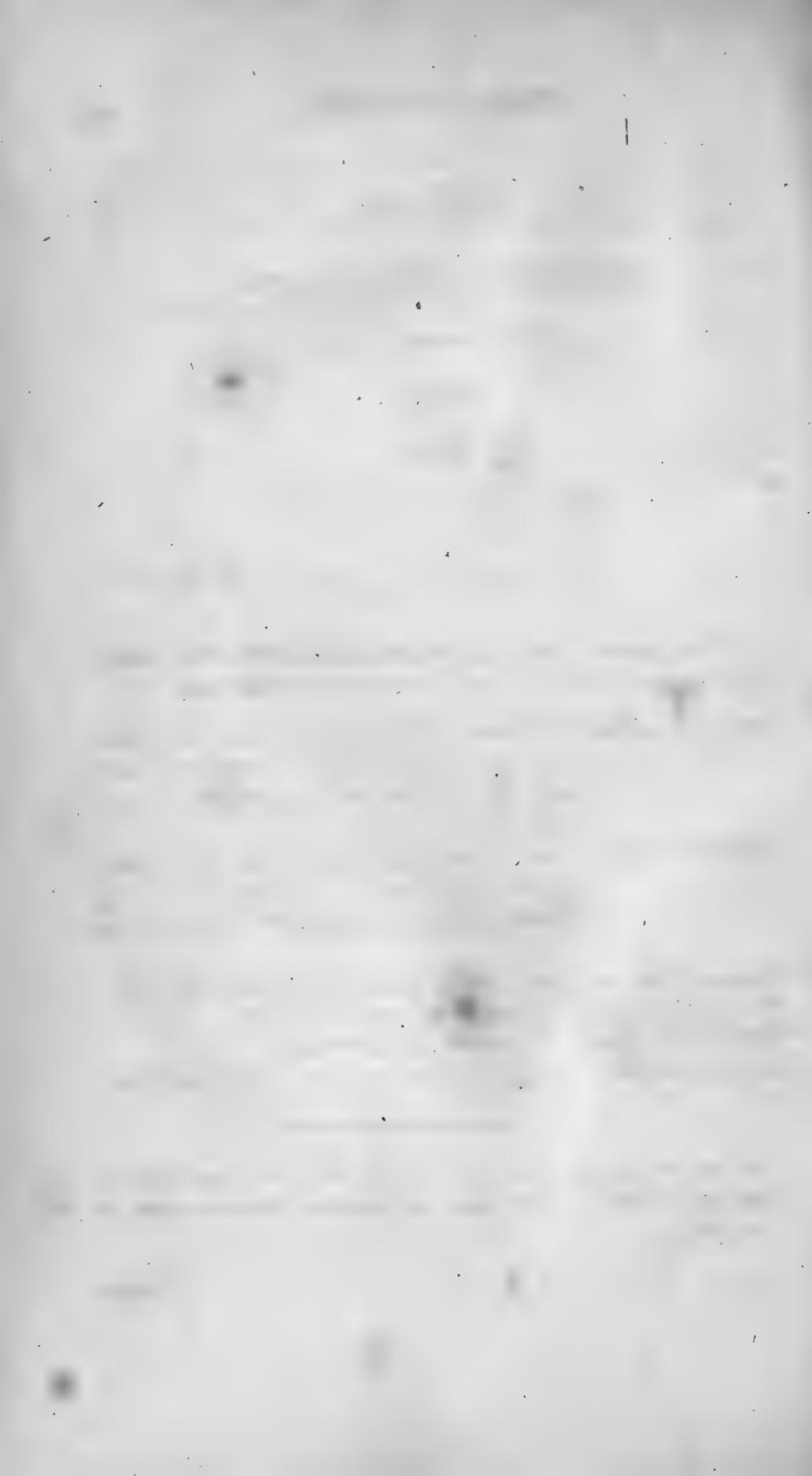
MUSCA BOMBYLANS. *Lin. Syst. Nat.* 25. p. 983.—*Fn. Sv. n.* 1792.  
*Syrphus bombylans*: Antennis plumatis tomentosus niger, abdomine  
 postice rufo.—*Fab. Syst. Ent. n.* 1. p. 762.—*Spec.*  
*Inf.* 2. 1. p. 421.—*Mantissa Inf.* 2. 1. p. 334.—  
*Ent. Syst.* 4. p. 279. 232.

*Conops pocopyges*. *Pod. Mus. græc. n.*

Die hummelartige Schwebfliege. *Panz. Faun. Inf. Germ.*

*Harris. Inf. angl. tab.* 10. fig. 3.

This is a common Fly; and is found in woods in May. A figure of one of the Antennæ is given at Fig. 4.



## F I G. V.

## MUSCA TRILINEATA.

## TRILINEATED FLY.

## DIPTERA.

## MUSCA.

## SPECIFIC CHARACTER

## AND

## SYNONYMS.

Yellow green. Three longitudinal black lines on the Thorax. Abdomen marked with black. Two teeth on the scutellum.

*MUSCA TRILINEATA*: Antennis filatis clavatis, scutello bidentato, corpore viridi, thorace lineis abdomineque faciis nigris. *Lin. Syst. Nat. n. 6. p. 980. edit. 13. n. 6. p. 235.*

*Stratiomys trilineata*: Scutello bidentato, corpore viridi, thorace lineis abdomineque faciis nigris. *Fab. Syst. Ent. n. 7. p. 760.—Spec. Inf. 2. 9. p. 418.—Mantiffa. Inf. 2. 14. p. 331.*

*Stratiomys luteo-virescens*. *Geoff. Paris. T. 2. n. 7. p. 482.*

*Stratyomys fasciata*. *Fourcroy. Ent. Paris. 2. 7. p. 468.*

Grüne Waffenziege. Dreygestreifte Waffenziege.

La Mouche-armée jaune à bandes noires. *Panz. Faun. Inf. Germ.*

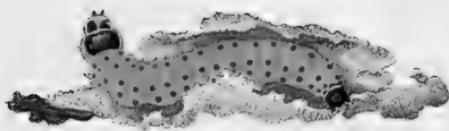
A very curious and scarce species. It was found among some elder leaves which were gathered in Battersea Meadows, early in June, 1795.

When

When this Insect is alive the yellow colour of the body is exceedingly bright, and partakes somewhat of a metallic and green hue in several parts, but this brilliant appearance gradually fades after death.

The line denotes the natural size, it being necessary to give a magnified figure of such a minute Insect.

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## P L A T E CLII.

## P H A L Æ N A A E S C U L I.

WOOD LEOPARD MOTH.

LEPIDOPTERA.

## G E N E R I C C H A R A C T E R.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S.

Wings white, with many dark blue round spots. Six spots on the Thorax.

P H A L Æ N A A E S C U L I elinguis lævis nivea, antennis thorace brevioribus, alis punctis numerosis cœruleo nigris, thorace fenis. *Lin. Syst. Nat.* 2. 833. 83.—*Fn. Sv.* 1150.

*Bombyx Aesculi*, *Mant. Inf.* 2. 116. 85.

*Hepialus Aesculi*. *Fab. Spec. Inf.* 2. 208. 146. 4.

*Coffus Aesculi*. *Wien. Verzeichn. tab. tit. præf. Acta Soc. Berol. phys.* 3. tab. 1. fig. 1. 2.

*Pod. Inf.* 88. 16.

Wood Leopard Moth. *Harris Inf. angl.*

It is to a very singular and trivial circumstance we are indebted for the specimens of both the male and female of this rare species. They were observed together on the bark of an elm tree in the Mall in St. James's Park, by some ignorant persons, who being terrified at their extraordinary appearance, attempted to destroy them, but a gentleman

gentleman who happened to pass by at the same instant, having either more curiosity or less apprehension of danger from touching them, took them up, and preserved them. We conclude they could have but just before come out of their chrysalides, the female being in a most perfect state, and the male equally fine, except that it had lost one of its upper wings.

We must claim the indulgence of the more scientific part of our readers for the minuteness with which we have detailed such trifling circumstances; it can indeed afford very little amusement to them, but, it may serve to remind many who are not in the habit of collecting Insects, that their occasional endeavours would be likely to extend the Science of Entomology; for it often happens that the most assiduous Naturalists are indebted to such persons for the rarest specimens their cabinets can boast.

The Moths were found late in June. On examining the crevices of some of the trees near the spot, we found a quantity of the eggs; they were rather of an oval form, and linked together like a chain, as shewn in the Plate; and having carefully preserved them in a branch of a plumb-tree \* under the bark, we had the satisfaction to see some young Caterpillars produced in a few weeks. But either owing to the want of proper food or good management they all died soon after except two or three, and these never arrived at their full size. The Caterpillar from which the Figure in the annexed is copied, was found under the bark of one of the elm-trees in St. James's Park, but being disturbed, it never became a Pupa. The Caterpillar makes a case, of the dust of the wood which it gnaws, and cements together, and in this it lies concealed beneath the bark. The head of the Caterpillar is hard, and the first ring is furnished with a strong horny substance.

*Harris*, about twenty years ago, was so fortunate as to breed this Moth from the Caterpillar, and we are not acquainted with any

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\* I frequently find, when the Plant of an Insect is unknown, that they will live on the Plumb-tree, when they refuse other food.

similar instance since that time. In the Plates of Roefel, vol. 4, a Figure of the Caterpillar is given, but without either Pupa or Moth, so that were it not for the reference and authority of Linnæus, and since his time, of Fabricius, it would scarcely be known to what Insect it belonged. The eggs we have not found either figured or described, though they are so very singularly united together, and would certainly have been noticed by the ingenious Roefel if he had met with them.

The Antennæ of the female are setaceous, or like a bristle, but that part of the male is both singular and beautiful; it is elegantly feathered next the base, and terminates in a bristle, like the female.







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P L A T E CLIII.

FIG. I.

PHALÆNA EUPHORBIATA.

SMALLEST QUAKER MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

GEOMETRA.

SPECIFIC CHARACTER

AND

SYNONYMS.

Entirely brownish grey without spots.

PHALÆNA EUPHORBIATA : feticornis alis fusco cinereis immaculatis. *Fab. Mantf.* 2. p. 209. n. 202. *Ent. Syst.* T. 3. p. 2. 197. 246.

DE VILLERS *Ent. Lin.* T. 4. p. 509. *De l'Euphorbe.*

Hübners *Beitr.* 1. B. 2. Th. p. 15. *Ph. G. unicolorata.* Tab. 3. fig. L. 2. B. 4. Th. p. 112.

Langs *Berz.* p. 189. n. 1361. 62. *Ph. G. unicolorata.* Der Klein-grave Nachtfalter.

Berlin. *Magaz.* 4. Th. p. 524. n. 44. *Ph. fascata.* Der Sperling.

Der Wolfsmilchspanner. *Klem. Inf. Suppl.* T. 2. Tab. 24. fig. 1. *Wien. Verz.* 116. 9.

*Hybn. Beitr.* 2. tab. 3. fig. L.

This is not an uncommon Moth in some places, yet we find no figure of it in any work on British Insects. In the work of Klemann, quoted in the Synonyms, a figure of it is given without the Larva; from this we may safely infer it is seldom found in that state, or that indefatigable writer would certainly have added it to his Plate.

It is supposed to feed on some plant of the Euphorbia genus, and hence the specific names *fuscata* and *unicolorata* have been abandoned.

The Moth was found late in May.

## FIG. II, III, IV.

## PHALÆNA UDDMANNIANA.

## CHESNUT SPOT MOTH.

## LEPIDOPTERA.

## PHALÆNA.

*Tortrix. Lin.**Pyralis. Fab.*

## \* SPECIFIC CHARACTER

## AND

## SYNONYMS.

Wings greyish brown. An angular shaped chesnut coloured spot on the posterior margin of the first pair.

TORTRIX UDDMANNIANA: alis cinereis: macula brunnea communi transversa. *Lin. Syst. Nat.* 2. 880. 320.—  
*En. Sv.* 1332.

*Pyralis Uddmanniana. Fab. Spec. Inf.* 2. p. 279. n. 22.—*Mant. Inf.* 2. p. 228. n. 35.

Wiener Verz. p. 130. Fam. D. grave Blattwichtler (Ph. Tortrices cinereæ) &c. *l'Uddmann. de VILLERS ent.*

Der himbeer unkler. *Kleman. Inf. Suppl.* Tab. 24.

De PRUNNER larv. d'Eur. p. 35. *Tortrix Uddmanniana.*

This is much rarer than the preceding species, and is also a far more beautiful Insect. We have never found it except about the

D

hazel

hazel nut trees in Coombe Wood, Surry, though it may, no doubt, be met with wherever these trees are found in abundance. Is found in Germany.

The Caterpillar changed to Chrysalis in May. Moth appeared in July.

## F I G . V .

## P H A L Æ N A C A R N E L L A .

ROSE COLOURED VANEAR.

LEPIDOPTERA.

P H A L Æ N A .

*Tinea.*

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S .

Upper Wings rose colour, anterior margin whitish, posterior yellowish. Lower Wings pale.

TINEA CARNELLA : alis anticis flavis : lateribus fanguineis. *Lin.*

*Syst. Nat.* 2. 887. 353.—*Fab. Spec. Inf.* 2. 293. 21.

*Ent. Syst.* 3. *Pars.* 2. 296. 41.

*Wien. verz.* 138. 13.

*Schoeff. Icon. tab.* 147. 2. 3.

*Sulz. Hist. Inf. tab.* 23. fig. 12.

*Purple Vanear?* *Harris. Inf.*

The Larva of this rare and elegant Insect is wholly unknown to Collectors of British Insects. The Moths were formerly taken at the Chalk-pits, near Charton, in Kent, but either the brood has been destroyed, or the seasons so unfavourable, that few, if any, have been seen for several years. The Moth comes forth in May, and, like other species of the same tribe, fly very low, and always settle on the blades of grass, with their Wings folded, so that Collectors can readily distinguish them from other Moths.

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## P L A T E CLIV.

## F I G. I, II, III.

## S C A R A B Æ U S N O B I L I S.

S C A R C E G R E E N C H A F F E R.

C O L E O P T E R A :

Wings two, covered by two shells, divided by a longitudinal suture.

## G E N E R I C C H A R A C T E R.

Antennæ clavated, extremities fissile \*. Five joints in each foot.

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S.

Shining green; shells, full of wrinkles. Thorax not projecting.

*SCARABÆUS NOBILIS*: scutellatus muticus auratus, abdomine postice albo punctato. *Linn. Syst. Nat.* 2. 558. 81.—  
*Fn. Sv.* 401.

*Cetonia nobilis*: aurata, abdomine postice albo punctato, elytris rugosis.  
*Fabr. Syst. Ent.* 43. 5.—*Spec. Inf.* 1. 6. p. 51.

*Scarabæus viridis nitens*, thorace, infra æquali, non prominente.  
*Geoff. Inf.* 1. 73. 6.

*Scarabæus auratus secundus*. *Roef. Inf.* 2. *Scarab.* 1. tab. 3. fig. 1,  
2, 3, 4, 5.

*Scarabæus viridulus* scutellatus aureo viridis nitidus, elytris rugosis abdomine postice albedine maculato, pectore mutico. *Degeër. Inf.* 4. 297. 26.

\* Divided into laminæ, or parts.

This species is not much unlike the *Scarabæus Auratus* (large green Beetle, or Rose Chaffer) but is far more scarce. The larva lives entirely under the surface of the ground, and feeds on smaller Insects. The Jaws are very strong, but in other respects it appears unable to defend itself if attacked. It is very sluggish, and always lies with its body coiled round. The case in which it remains in the pupa state is very strong, and consists of small bits of wood, pebbles, earth, &c. cemented and fastened together, by a slight silky web. It continues during the Winter in this case, and in May the Beetle comes forth.

Fig. 1. The larva. Fig. 2. Pupa. Fig. 3. Perfect Insect.

F I G. IV.

SCARABÆUS LUNARIS,

LUNATED BEETLE.

COLEOPTERA.

SCARABÆUS.

SPECIFIC CHARACTER

AND

SYNONYMS.

Entirely black. On the head a lunated helmet and an erect horn. Thorax with three horns; the center one obtuse and divided by a longitudinal furrow. Eight furrows down each shell.

SCARABÆUS LUNARIS: exscutellatus, thorace tricorni, intermedio obtuso bifido, capitis cornu erecto. clypeo emarginato. *Linn. Syst. Nat.* 2. 543. 10.—  
*Fn. Sv.* 379.

*Fab. Spec. Inf.* 1. 24. 108,

*Copris* capitis clypeo lunulato, margine elevato, corniculo denticulato. *Geoff. Inf.* 1. 88. 1.

*Scarabæus* ovinus tertius f. capite operculato. *Raj. Inf.* 103.

*Scarabæus* nasicornis medius. *Frisch. Inf.* 4. 25. tab. 7.

*Pet. Gazoph. tab.* 138. fig. 4.

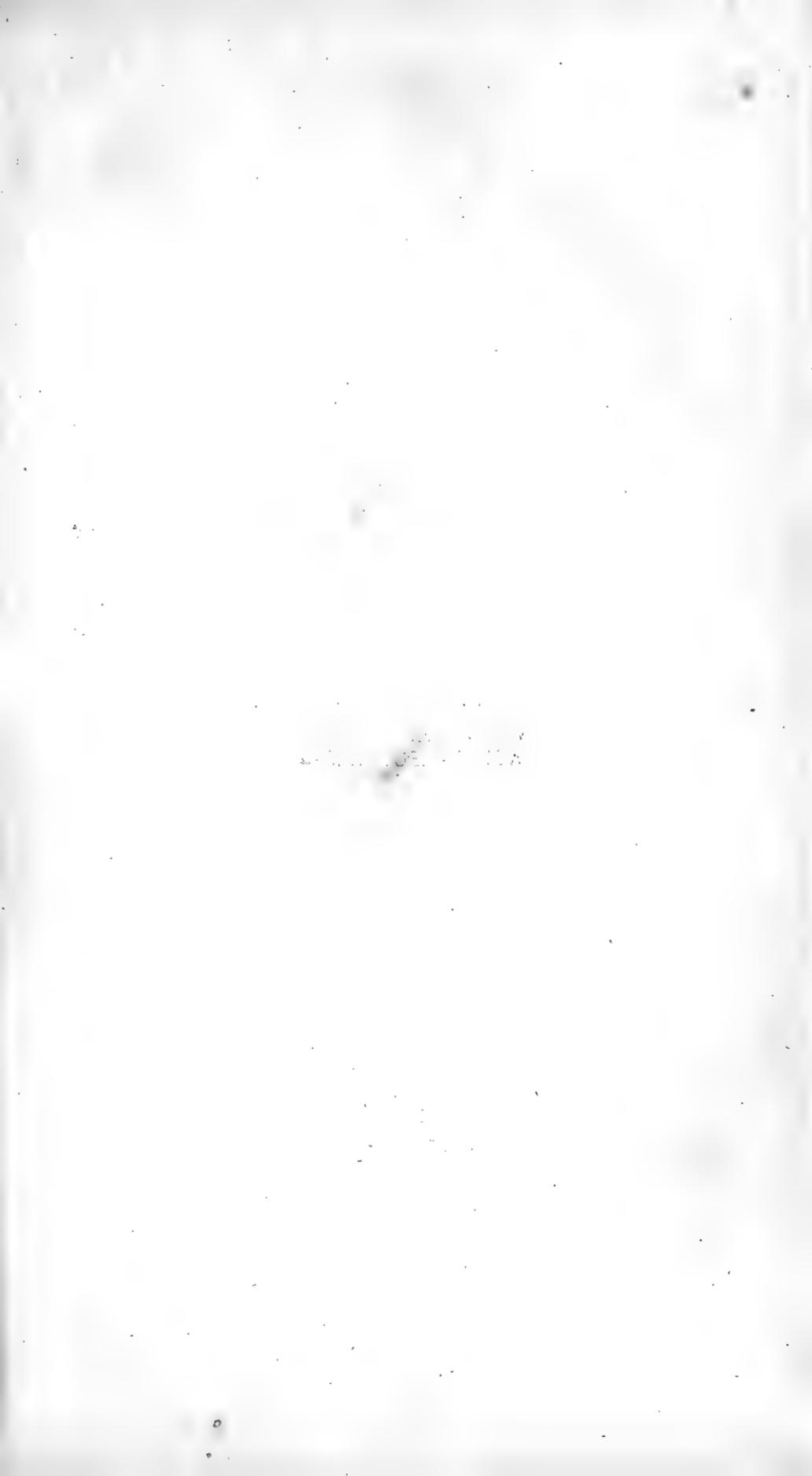
*Schæff. Icon. tab.* 63. fig. 2. 3. ♂. ♀.

*Bergstræff. Nomencl.* 1. 5, 9. tab. 1. fig. 9. et  
tab. 4. fig. 7.

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This is by no means a common Beetle. It is found generally amongst the loose sand on heaths, the dung of animals, or carrion. The female is nearly as large as the male, and has not the erect horn on the head.







## P L A T E CLV.

## SPHINX STELLATARUM.

HUMMING-BIRD HAWK-MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ thickest in the middle. Wings, when at rest, deflexed.  
Fly morning and evening only.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Abdomen thick, brown, and hairy ; tufted at the extremity. First  
Wings greyish brown, with waves of black across. Second Wings  
orange colour.

SPHINX STELLATARUM. *Linn. Syst. Nat.* 2. 803. 27.—*Fn. Sv.* 1094.

*Sesia Stellatarum*: abdomine barbato, lateribus albo nigroque variis,  
alis posticis ferrugineis. *Fab. Syst. Ent.* 548. 3.

*Fab. Spec. Inf.* 2. 154. 6.

*Papilio velocissima*, alis albis brevibus, corpore crasso inter volitandum  
stridorem edens. *Raj. Inf.* 133. 1.

*Roef. Inf.* 1. *papilionum Nocturnorum.* Tab. 8.

*Bradl. Nat. tab.* 26. fig. 1. A.

*Reaum. Inf.* 1. tab. 12. fig. 5. 6.

*Merian. Europ. 2. 33. tab. 29.*

*Schæff. Elem. tab. 116. fig. 3.*

———— *Icon. tab. 16. fig. 1.*

Le Colibri. *Harris. Aurel. pl. 24.*

There are two sorts of Caterpillars belonging to this species. They are alike in size and form, but are very different in colour. One sort is green, the other purplish red, varying much in different specimens, being sometimes almost brown. Both sorts are spotted with minute white specks, which are disposed in regular order over every part, except the belly.

Every Caterpillar is also furnished with a posterior horn, which is blue from the base for more than half its length : the tip is bright orange colour.

The Chrysalis, which is of a pale yellowish-brown at first, changes to a more dusky colour before the Sphinx comes forth.

The Caterpillars feed on several kinds of plants, but seem chiefly to prefer those of the *Galium* genus, particularly, the White \* or Yellow † Lady's Bedstraw, and Cleaves, or Goosegrafs ‡. They go into the ground about the latter end of August, and remain there in chrysalis till April, or May at the farthest.

It is rather a scarce Insect : sometimes visits gardens in the winged state ; and extracts the sweetest juices of the flowers, by darting its long proboscis, or trunk into them ; it is from this peculiarity, and its hovering over the flowers at the same time, like the Humming Birds when they feed, that it has received its English appellation.

\* *Galium Palustre.*

† ——— *Verum.*

‡ ——— *Aperine.*

This Insect is found in most parts of Europe, but it appears is more frequent in Northern Countries. A near variety of it is found in Botany-Bay; and we have specimens of it from North America.

*Sphinx Belis* of Linnæus and Cramer, is described amongst the Synonyms given by Fabricius, as a variety of *Sphinx Stellatarum*, and *Sphinx Ciculus* of Cramer scarcely differs from our Insect.







## P L A T E CLVI.

## F I G. I.

## A R A N E A E X T E N S A.

A P T E R A.

No Wings.

A R A N E A.

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S.

Abdomen long, greenish, and filvery. Legs very long.

A R A N E A E X T E N S A : abdomine longo argenteo virefcente, pedibus longitudinaliter extensis. *Linn. Syst. Nat.* 2. 1033. 22. *Fn. Sv.* 2011.

A r a n e a r e t i a r i a abdomine elongato griseo fusco, pedibus longitudinalibus extensis.

*Degeer. Inf.* 236. 1.

*Geoff. Inf.* 2. 642. 3.

*List. Aran. fig.* 3.

*Raj. Inf.* 19. 3.

This species is particularly distinguished by the length and position of its legs. It runs very fast. Our specimen was taken on an oak, and we do not think it is a ground Spider.

Found in Darent wood, Dartford, in August.

F I G.

## F I G. II.

## A R A N E A G L O B O S A.

GLOBULAR SPIDER.

APTERA.

## G E N E R I C C H A R A C T E R.

Legs eight. Eyes eight.

## S P E C I F I C C H A R A C T E R

AND

## S Y N O N Y M S.

Black. . Abdomen globular, sides crimson.

A R A N E A G L O B O S A : nigra abdominis lateribus fanguineis. *Fab.*  
*Ent. Syst.* 2. 411. 15.

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We have met with this beautiful Spider several times in Caenwood. It was commonly seen on the young oaks. One being confined in a box spun a small web, of a very slight texture. Found in May and June.

F I G.

## F I G. III.

## ARANEA CINEREA.

APTERA.

ARANEA.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Abdomen ash colour, or grey. Thorax and feet yellow-brown.

ARANEA CINEREA: abdomine cinerascente. Thorace pedibusque testaceis. *Panzer.*

Die aschgrave Spinne. *Panz. Inf. German.*

*Aranea Cicurea*, pallide rubra abdomine ovato cinereo. *Fab. Ent. Syst.* 2. 410. 12?

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A common Spider in woods. Found in May and June.

## F I G . I V .

## P H A L A N G I U M B I M A C U L A T U M .

M I N U T E B L A C K S P I D E R , W I T H T W O W H I T E S P O T S .

A P T E R A .

N o w i n g s .

## G E N E R I C C H A R A C T E R .

L e g s e i g h t , e y e s t w o . A b d o m e n r o u n d e d .

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S .

Very minute. Entirely black, except two white spots on the Thorax.

P H A L A N G I U M B I M A C U L A T U M : a b d o m i n e a t r o : m a c u l i s d u a b u s  
albis. *Fab. Ent. Syst. v. 3. n. 8. p. 431.*

Die zwey fleckigte Afterspinne. *Panz. Faun. Inf. Germ.*

This is a very minute Insect; the figure is more than twice the natural size. It was found amongst a great variety of other spiders, in Darent wood, Dartford, about the middle of August.





## P L A T E CLVII.

## PHALÆNA BERGMANNIANA,

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Tortrix Linn. Pyralis Fab.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

First wings yellow, varied with orange colour. Four brown marks across each wing, with spots and streaks of silver down them. Inferior wings grey.

PHALÆNA BERGMANNIANA. *Linn. Syst. Nat.* 2. 878. 307. *Fn. Sv.* 1314.

PHALÆNA BERGMANNIANA: alis anticis luteis flavo punctatis, fasciis quatuor argenteis, tertia bifida. *Fab. Syst. Ent.* 652. 43. *Spec. In.* 2. 285. 59.

*Phalena* antennis filiformibus, alis luteis nitidis, strigis quatuor argenteis.

Phalène à antennes filiformes à trompe à ailes larges d'un jaune orange luisant avec quatre rayes transverses d'un brun argenté. *Phalène chappe jaune à rayes argentées. Degeer Inf.* 2. p. 1. p. 469. n. 4.—*Inf.* 2. I. 346. 4.

*Phal. Pallium aurantium.* spirilinguis, antennis filiformibus. alis rhombeis aurantiis nitidis strigis 4 fusco argenteis. *RETZ. Degeer, p.* 52. n. 147.

*Phal.*

*Phal. Bergmanniana.* Alæ anticæ flavæ nodulis binis, fasciisque (4) argenteis margine fusco-ferrugineo. SCOPOLI *ent Carn.* p. 232. n. 584. fig. 584.

*Tortr. eur. Bergmanniana.* *Jungs alphab. Bess.* 2. Th. p. 75.

*Tortrix Bergmanniana.* la Bergmann. *de VILLERS ent. Lin. T.* 2. p. 396. n. 671.

Der Bergmannsche unkler. *Kleeman Inf.* Nr. 45. 1794.

Metallische Blattwürler (*Phal. Tortrices Metallicæ*) n. 5. *Tortrix. Bergmanniana Wiener. Verz.* p. 126. *Fam. B.*

Bergmannswürler. *Brahms Handb.* 2. Th. 1. *Urb.* p. 237. n. 132

Der Bergmannische Nachtfalter. *Langs Verz.* p. 203. n. 1379, &c.

Linnæus gave this little Moth the specific name *Bergmanniana*, in honour of Prof. Bergmann, a naturalist of distinguished eminence. It is a very pretty Insect; but, when magnified, its appearance is truly superb, the ground colour which is bright yellow, shewing the orange markings to great advantage, and the metallic splendour of the burnished silver appearing like raised work above the stripes or bands of dark brown that cross the upper wings.

We have found this Moth at Highgate. The Caterpillars are yellow, with a streak of green down the back; but the green disappears before the last skin, in which they are of a pale yellow, without any marks whatever. They feed on white thorn.

Fig. 1, 2. The Caterpillars. Fig. 3. Chrysalis. Fig. 4. The same magnified. Fig. 5. Moth. Natural size. Fig. 6. The same magnified.

## F I G .   V I I .

## P H A L Æ N A   S Q U A M A N A .

GREEN TUFTED, OR BUTTON MOTH.

LEPIDOPTERA.

P H A L Æ N A .

Tortrix *Lin.*

## S P E C I F I C   C H A R A C T E R

A N D

## S Y N O N Y M S .

Upper wings green, tufted all over.   Inferior wings pale brown.

P H A L . P Y R A L I S S Q U A M A N A : alis virescentibus scabris.   *Fab. Syst.*  
*Ent.* 651. 36.   *Spec. Inf.* 2. 284. 50.

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This is exceedingly rare. The upper wings are very curious, being entirely covered with tufts of feathers, of various sizes, some brownish, others inclining to white, but most of them are green, which is the ground colour of the wings. Of its Larva we are entirely ignorant; nor can we derive any assistance in that respect from entomological writers, as *Fabricius* only has described the Moth. He says it is a native of England, and preserved in the cabinet of *Mr. Monson*.

Taken in June.







## P L A T E CLVIII.

## PHALÆNA VERSICOLORA.

GLORY OF KENT MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base, Wings in general deflexed when at rest. Fly by night.

*Bombyx.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Antennæ feathered. Male, first wings red brown, with transverse waves, black and white lines, and three white spots at the extreme angle. Second wings orange. Female larger, and colours paler throughout.

PHALÆNA VERSICOLORA: *Lin. Syst. Nat.* 2. 817. 31. *Fn. Sv.*

IIII.

BOMBYX VERSICOLORA: alis reversis griseis nigro-albis thorace antice albo. *Fab. Syst. Ent.* 565. 34.—*Spec. Inf.* 2. n. 50. p. 178.—*Mant. Inf. T.* 2. n. 58. p. 113.

*Phalena* alis lineis albis et nigris undatis. *Gadd. Satag.* 82.

*Roef. Inf.* 3. tab. 39. fig. 3.

*Sulzer Hist. Inf.* tab. 21. fig. 4.

*Fuesl. Magaz.* 2 tab. 1. fig. 4.

Der Buntflügel. Der Hagebuchenspinner.

Das Männchen. *La Versicolore.* (Male.)

Das Weibchen. (Female.) *Panz. Faun. Inf. German.*

F

This

This extremely rare Insect is always considered as a British species, and is usually found in the cabinet of the English entomologist; yet those are German Insects generally, for we know only of one specimen which is clearly ascertained to have been found in this country. The specimen alluded to is in the collection of Mr. Francillon, jeweller, in Newcastle-street, in the Strand: it is a female, and was found by that gentleman's brother in his garden at Carshalton.

Whether Harris ever met with this Insect we cannot pretend to determine; he says it appears in the winged state in April\*. We cannot hesitate to suppose, that this Moth has been found in England several times, particularly in *Kent*; but none of these remain at this period in the collections of the curious.

The Male differs much from the Female: both sexes are shewn in the annexed plate. Fig. I. Male. Fig. II. Female.

*Fuessly*, in a German publication, has given the only figure we are acquainted with of the Caterpillar of this Moth; and *Fabricius* has copied his description from the coloured engraving. It is green, with oblique lines of yellowish brown, and large spots of golden yellow.

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\* *Vide Aurelian's Companion.*

MASSACHUSETTS  
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## P L A T E CLIX.

FIG. I, II, III, IV.

## ONISCUS AQUATICUS.

APTERA.

No Wings.

## GENERIC CHARACTER.

Legs fourteen. Antennæ taper. Body oval.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Ash colour. Antennæ of four joints. At the end of the tail two bifid appendices.

ONISCUS AQUATICUS: cauda rotundata, styli bifurcis, antennis quaternis. *Syst. Ent.* 297. 6.—*Spec. Inf.* 1. 376. 6.

*Oniscus aquaticus lanceolatus*, cauda rotundata, styli bifurcis. *Linn. Syst. Nat.* 2. 1061. 11.—*Fn. Sv.* 2061.

*Squilla Afellus aquatica*, cauda rotundata, styli binis bifurcis. *Degeer. Inf.* 7. 496. 1. tab. 31. fig. 1.

*Afellus aquaticus Gefneri.* *Raj. Inf.* 43. 1.

*Sulz. Hist. Inf. tab.* 30. fig. 12.

*Frisch. Inf.* 10. tab. 5.

*Schæff. Elem. tab.* 22.

This species is less frequent than *Oniscus Afellus*, (Common Woodlouse). It lives in clear waters, most part of the summer. It

scarcely exceeds one half of the length of *O. Afellus* in England, yet if we may form an opinion of the German specimens from those figured by *Sulz*, they are larger than with us.

The *Oniscus Agilis* of *Perfoon*, figured in Panzer's Work\*, corresponds perfectly with ours in size; and the minute markings on the shells, if carefully examined with a glass, will be found nearly alike. The antennæ of the figure in *Sulz* seems rather contrary to the specific character of the insect; and that of Panzer's, though of another species, more resemble those of our specimen.

Of the *Oniscus Afellus* we find different coloured specimens, some are almost white with grey marks, others are nearly deep black; we find also, *Oniscus Aquaticus* liable to variations, though not so much as the former insect in some the light ground colour is very distinct, in others rather confused. Some are deeper coloured; and again, many, when first taken, have a fine glowing, olive brown appearance throughout, though less vivid than that of *Oniscus Agilis* before noticed.

Fig. 1. 2. Natural size. Fig. 3. Magnified. Fig. 4. Antennæ.

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\* *Faun. Inf. Germ.*

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## P L A T E CLX.

## PHALÆNA PUDIBUNDA.

PALE TUSSOCK MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Bombyx.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Wings light, greyish: three transverse waves across each upper wing.

*PHALÆNA PUDIBUNDA*: alis deflexis cinereis, strigis tribus undatis fuscis. *Lin. Syst. Nat.* 2. 824. 44.

*Fn. Sv.* 1118.*Fab. Spec. Inf.* 2. 183. 68.*Ent. Syst. Tom.* 3. p. 1. p. 438. 97.

*Phalæna pectinicornis*, elinguis, alis deflexis cinereo undulatis, fasciis transversis obscurioribus, capite inter pedes porrectos. *Geof. Inf.* 2.

113. 15.

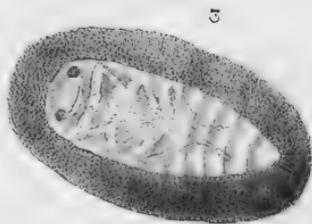
*Phalæna cinerea*, alis oblongis, exterioribus quatuor lineis nigricantibus transversis, distinctis. *Raj. Inf.*

185. 7.

*Roef. Inf.* 1. *phal.* 2. *tab.* 38.*Ammir. tab.* 18.*Goed. Inf.* 3. *tab.* 5.*Merian Europ.* 1. *tab.* 47.*Degeer Inf.* 1. *tab.* 16. *fig.* 11. 12.

The light Tuffock Moth is found late in September, or during the month of October. The Caterpillar is both beautiful and singular: it feeds on the oak, on which it is met with, from the latter end of July till the middle of September, at which time it is of its full size, and becomes a pupa; it spins a web between the leaves, and remains in the chrysalis about thirty days. The eggs are of a pale brownish colour, fig. 1.

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CAMBRIDGE, MA USA



## P L A T E CLXI.

## DYTISCUS MARGINALIS.

LARGE BOAT BEETLE.

COLEOPTERA.

Wings two, covered by two shells, divided by a longitudinal future.

## GENERIC CHARACTER.

Antennæ taper, or clavato-perfoliated. Feet villous and broad.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Black; exterior margin of the thorax and shells yellow. Eyes large, round, black.

**DYTISCUS MARGINALIS**: niger thoracis marginibus omnibus elytrorumque exteriori flavis.

*Lin. Syst. Nat.* 2. 665. 7.

*Fn. Sv.* 769.

*Fab. Spec. Inf.* i. 291. 3.

*Ent. Syst. Tom.* i. 187. 3.

*Dytiscus nigro fuscus nitidus*, thorace undique elytrorumque margine flavo. *Degeer. Inf.* 4. 391. 2. tab. 16. fig. 2.

*Hydrocantharis nostras.* *Raj. Inf.* 93. 1.

*Mouff. Inf.* 164.

*List. Mut. tab.* 5. fig. 42.

*Sulz. Hist. Inf. tab.* 6. fig. 42.

*Roef. Inf.* 2. *Aquat.* i. tab. 1.

*Schæff. Icon. tab.* 8. fig. 7.

β. *Dytiscus semifstriatus fuscus*, elytris fulcis dimidiatis decem.

*Lin. Syst. Nat.* 2. 665. 8.—*Fn. Sv.* 772.

The transformation of any insect from one state to another is both curious and entertaining to an enlightened observer; yet there are a few species whose manners are so peculiar, and their changes so astonishing, that they seem to demand more than ordinary attention; and of this description we consider the subject of the annexed plate. If we speak of it as to its manners collectively, one peculiarity implies a contradiction of the other, for it is an aquatic, a terrestrial, and an aerial creature. Few insects that inhabit the water, in the perfect state ever quit it; and the generality of those whose larvæ live in that element could exist for a few minutes only in it, after they become winged insects; this is particularly noticed of the *Libellulæ*, *Phryganeæ*, *Ephemeræ*, *Tipulæ*, and an immense croud of other insects that are bred in the water; but it appears this insect in the larva state can leave the water without injury, and in the last state, though a winged creature, it lives for the most part in the water, and quits it only in the evenings; or when the pool dries up, it uses its wings in search of another.

In the larva state it is not less remarkable for its savage disposition, than its formidable appearance. The whole body is covered with a hard shell, or coat of mail, and the head is armed with two long, semi-circular, sharp-pointed forceps. It is very alert in the water, and when it takes its prey, which consists of smaller aquatic insects, it plunges these weapons into them, and through a minute aperture, at the extremity, it extracts all their juices. When the time arrives in which it is to become a pupa, it leaves the water and forms a cavity just below the surface of the earth of an oval form: how long it remains in this cavity in the pupa state is uncertain. The beetle comes forth in May.

Much doubt has arose respecting the female of this species; Linnæus, in the *Systema Naturæ*, described the supposed female as  $\beta$  *Dysticus Semistriatus*. Fabricius, in the *Species Insectorum*, adds a long list of synonyms from different entomological writers, several of whom had figured or described it as a distinct species before the time of Linnæus, and some subsequent authors have held the same opinion; but in the last work, *Entomologia Systema*, Fabricius considers it to be  
the

the female, and includes only a few of his former references. Upon the first view of these opinions the point seems undetermined; and though we partly assent to the opinion of the last writer, we must endeavour to be entirely satisfied, before we give a figure of *Dytiscus Semistriatus*.

The upper side of this insect is generally described black; this is not the colour in living specimens: it is of a fine glossy black-green, and the marginal colour brighter than in those that have been dead some time. The greenish hue on the back seldom entirely disappears.

The fore feet of this beetle have an appendage of a very singular structure; it is nearly round, flat beneath, and has in the middle two remarkable circular cavities, with many others more minute: it is supposed, that through minute apertures in these cavities it can emit a kind of oily fluid; or that, by their assistance, it can collect air bubbles, to raise itself from the deep parts of the water to the surface, in an instant. The larva of the *Musca Chamælion*, which lives in the water, collects the air in a bubble within the rays of its tail, and thereby raises itself to the surface in like manner.

Fig. 1. The eggs. Fig. 2. The larva. Fig. 3. The pupa.

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## P L A T E CLXII.

F I G. I, II.

## L E P I S M A P O L Y P O D A.

A P T E R A.

No Wings.

## G E N E R I C C H A R A C T E R.

Legs six, broad and scaly at their origin. Palpi two, moveable.  
Antennæ filiform. Tails three. Body scaly.

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S.

Grey, brown, black intermixed; a very high protuberance on the back. Three tails.

L E P I S M A P O L Y P O D A: saltatoria, cauda triplici, abdominis segmentis subtus utrinque villosis. [*Fab. Spec. Inf.* 1. 380. 2.

*Lepisma poly-poda* scutata, cauda triplici. *Lin. Syst. Nat.* 2. 1012. 2.

*Forticina* teres saltatrix. *Geoff. Inf.* 2. 614. 2.

*Lepisma squamosa* saltatoria, fetis caudæ tribus intermedia majore.  
*Stræm. Act. Hafn.* 9. 575. tab. 2.

Fig. 1. The natural size. Fig. 2. Magnified.

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This is a very rare and curious species; it was found amongst some loose stones, in a damp situation, July, 1796.

P L A T E

THE UNIVERSITY OF CHICAGO

PH.D. THESIS

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PRESENTED TO THE FACULTY OF THE DIVISION OF THE PHYSICAL SCIENCES

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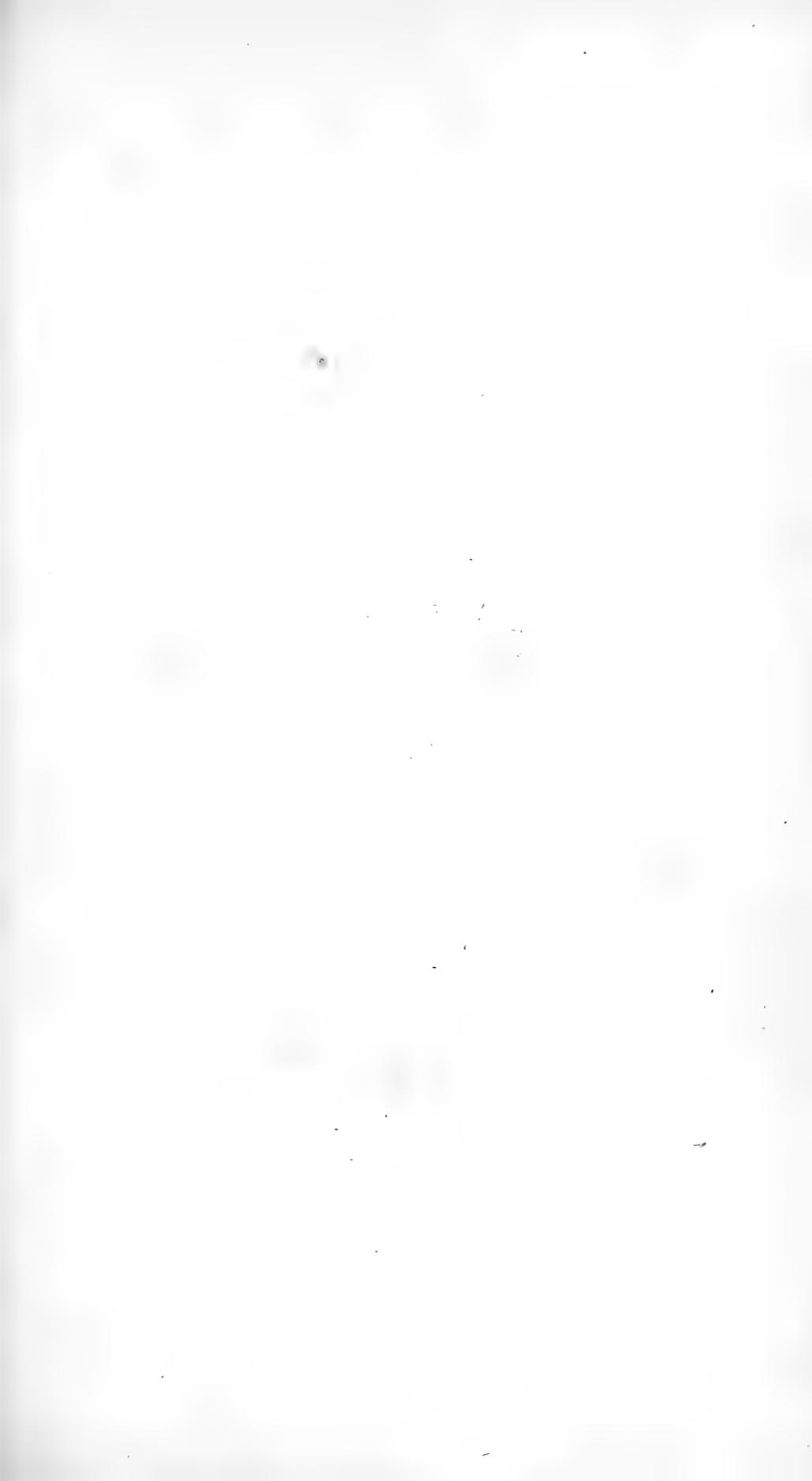
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## P L A T E CLXIII.

PHALÆNA DISPAR.

GIPSEY MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Bombyx.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Female, yellowish white with dark transverse zigzag lines across the upper wings. Male, smaller, dark brown, with lines and waves of black.

PHALÆNA DISPAR: alis deflexis masculis griseo fuscoque nebulosis, foemineis albidis: lituris nigris.

*Lin. Syst. Nat.* 2. 821. 44.*Fab. Spec. Inf.* 2 182. 66.—*Ent. Syst.* 3. pars. 1. 437. 94.*Roef. Inf.* 1 *phal.* 2. tab. 3.*Reaum. Inf.* 2. tab. 1. fig. 11. 14.*Merian. Europ.* 1. tab. 18.*Frisch. Inf.* 1. 14. tab. 3.*Schæff. Icon. tab.* 28. fig. 3—6.*Geoffr. Inf.* 2. 112. 14.

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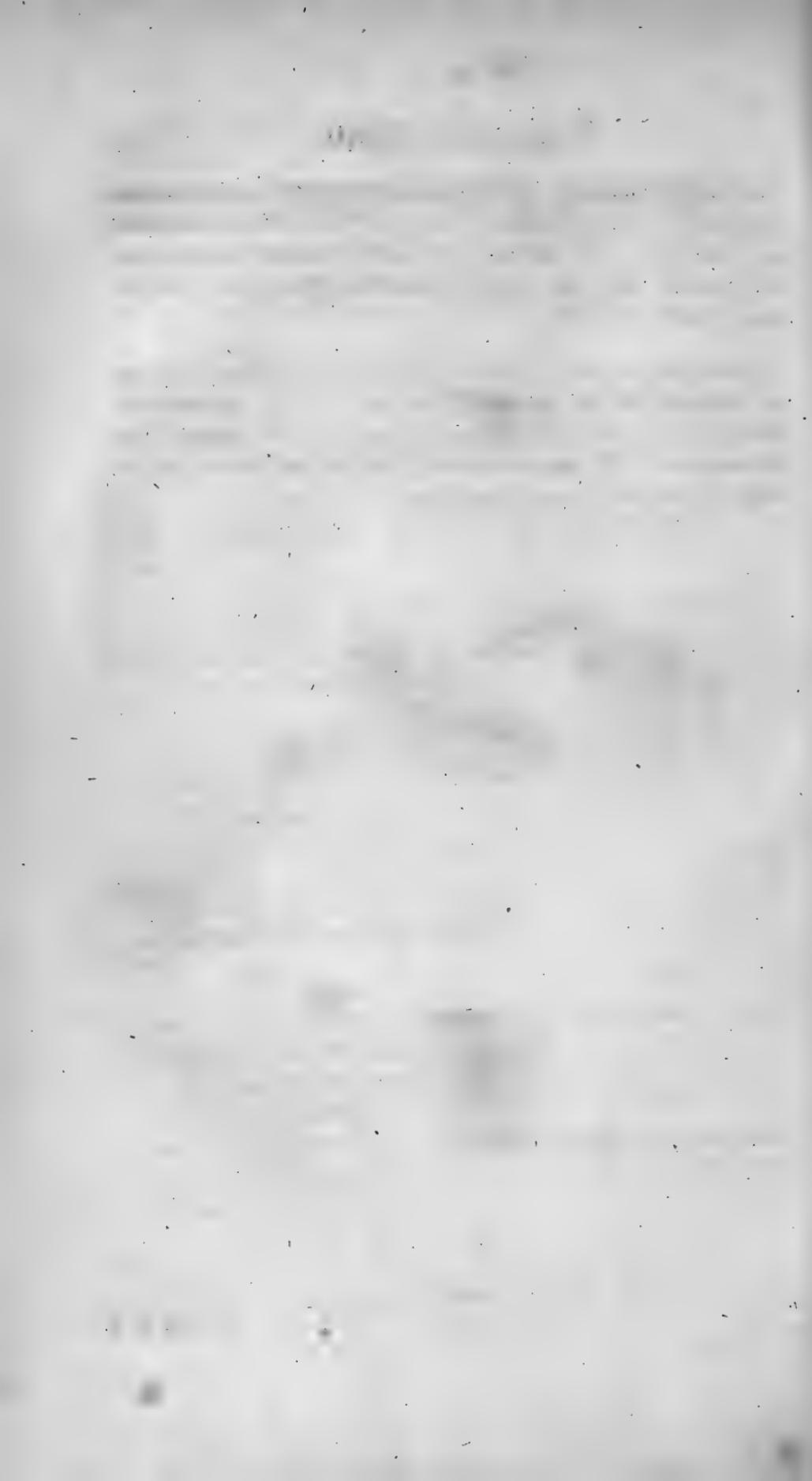
That the *Phalæna Dispar* was not uncommonly scarce about fifteen years ago, is evident from this circumstance, few collections of British insects, that were in the hands of eminent collectors, are without an English specimen, which was procured about that time; and Harris, in 1775, as well as some other writers about the same period, speak confidently of its being found in this country. Berkenhout, in his Synopsis, says, it is “*frequent* about Ealing, in Middlesex.” But this we can, on the best authority, dispute; it never was frequent in that place, though it has several times been met with, by collectors of insects; a parcel of eggs being obtained from them, and hatching, many caterpillars were procured; and these being carefully attended, several moths were also produced. This is not a very extraordinary circumstance, as many of the rarest insects may become common, when the eggs, or a brood of caterpillars, can be discovered.

We are willing to acknowledge, that we have not been more fortunate in our researches for the caterpillar or moth of this species, than any others engaged in the science of entomology; but we have procured from Germany a collection, containing many valuable rarities that have been found in this country at different times; amongst these we have most perfect and finely preserved specimens of *Phalæna Dispar*, in its several states, and these perfectly agree with those formerly collected in England. Our Plate contains only one figure of the caterpillar, and that is of the female. The male differs only in being smaller, and in the size of the head, which is less in proportion than that of the female.

In this instance, we trust, any apology will be unnecessary, though the original specimens were not found in this country: it must be an advantage to the work to contain figures of the rarest insects; and should any of our readers be so fortunate as to find the caterpillar, they will be able to determine the species, and the proper food to rear it on; or, if the brood be extinct, the plate will be more interesting, as there cannot remain a doubt of its having been indigenous in England.

In foreign countries it is very injurious to gardens, and fruit-trees in particular. *Berkenhout* says, it feeds on “Oak, Ash, Apple-trees, &c.” but we are rather inclined to doubt his information, except as to the latter, though he is partly sanctioned by *Linnaeus*. *Geoffroy* says, it feeds on the Elm.

For the time of its appearance we are indebted to *Harris*; he says the caterpillar changed to chrysalis the 11th of July, the moth appeared July 31; from which it appears certain that he reared it from the caterpillar. He has not, however, given a figure of it in the *Aurelian*, or any other of his publications.



...SIVE MITRA...  
KAMARUDDIN BERGHTY  
CAMBRIDGE, MA USA



## P L A T E CLXIV.

## TENTHREDO ROSÆ.

## HYMENOPTERA.

Wings four, generally membraneous. Tail of the females armed with a sting.

## GENERIC CHARACTER.

Abdomen of equal thickness, and closely connected to the thorax. Sting, ferrated, between two valves. Second wings shortest.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Antennæ, head, and thorax black, with a yellow spot on each side of the latter. Abdomen yellow. A black spot on the anterior margin of the wings.

TENTHREDO ROSÆ: antennis septemnodiiis nigra, abdomine flavo, alarum anteriorum costa nigra.

*Syst. Ent.* 322. 26.

*Fab. Spec.* 1. 413. 39.

*Tenthredo Rosæ* antennis clavato, filiformibus nigra abdomine flavo, alarum anticarum costa nigra.

*Lin. Syst. Nat.* 2. 925. 30.

*Fn. Sv.* 1555.

*Tenthredo crocea* thorace supra, capite alarumque margine exteriori nigris. *Geoff. Inf.* 2. 272. 4.

*Tenthredo flava*, antennis clavatis triarticulatis, capite thoraceque nigris,  
 alis anticis nigro maculatis. *Degeer. Inf.*

2. 2. 279. 28. tab. 39. fig. 27.

*Merian. Europ. tab.* 144.

*Goed. Inf.* 2. tab. 3.

*Scop. carn.* 722.

*Reaum. Inf.* 5. tab. 14. fig. 10. 12.

In the larva state, this species feeds on the leaves of the Rose, and from that peculiarity it has received its significant specific name, *rosæ*. The larva casts its skin several times before it becomes a pupa, its exuviae we frequently find adhering to rose-leaves. When the larva is in its last skin it is yellowish, inclining to orange, with many minute black specks, disposed in ringlets, on every joint; but in the early stages of its growth we find them of several shades of colours, between green and orange, and some partake of both colours, and are speckled with black, as in the last skin. The larva is very tender, and, we suspect, is liable to some distemper of a very different kind from any noticed to affect other insects; it then appears sickly, and is covered with a whitish down, or powder, which flies off on the slightest touch. We have often found the larva of another species of the same genus covered with this kind of white powder, but as they always died, it is impossible to determine to what insect they belonged.

In the pupa state, the outer case is not perfectly oval, but rather flattened on the sides; it is generally fastened on a stalk. The perfect insect is found in great plenty during most of the summer months.

Several early systematic writers placed this insect amongst those whose antennæ consisted of seven joints, or articulations: Whence *Linnaeus* \* included the number of the joints with the specific cha-

\* In the last edition of the *Syst. Nat.* "*antennis septemnodis, &c.*" is changed for "*antennis clavato filiformibus, &c.*"

rafter ; and in the Species Insectorum *Fabricius* has followed the same arrangement. Though with the assistance of a microscope we may discover in this, and other species, the exact number of the articulations described, yet they are too minute to serve as part of a good specific character, which should, if possible, be selected from the most conspicuous and peculiar parts of the insect. Fabricius seems to have been aware of this in his last work, *Entomologia Systematica*\*; and has made a very judicious alteration ; though it appears singular for a systematic writer to change “ Antennis filiformibus articulis. 7—9.” for “ Antennis inarticulatis, extrorsum crassioribus.”

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\* *Tom. 2. p. 109. 18.*







## P L A T E    C L X V .

## P H A L Æ N A   O X Y A C A N T H Æ .

EALING'S GLORY.

LEPIDOPTERA.

## G E N E R I C   C H A R A C T E R .

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Noctua.*

## S P E C I F I C   C H A R A C T E R

AND

## S Y N O N Y M S .

First wings, dark brown, with two large irregular spots of white and reddish colour, and a broad space of the same next the exterior margin: in several parts a speckling of fine blueish green. Second wings, and body, plain brown.

P H A L Æ N A   O X Y A C A N T H Æ : cristata alis deflexis bimaculatis : margine tenuiori coerulescente ; lunula alba.

*Lin. Syst. Nat.* 2. 852. 65.—*Fn. Sv.* 1207.

*Fab. Spec. Inf.* 2. 232. 114.—*Ent. Syst. Tom.*

3. pars. 2. p. 93. 277.

*Wien. Verz.* 70. 3.

*Roef. Inf.* 1. phal. 2. tab. 33.

*Wilks. pap.* 12. tab. 1. c. 1.

The

The caterpillar of this species is found on the White Thorn, in April ; in May it becomes a pupa : the moth does not appear before September.

It will be readily conjectured, from its English name, to be more frequently taken about *Ealing*, in *Middlesex*, than elsewhere, though it is not peculiar, like some insects, to one place only. The caterpillar is smooth, or without any hairs ; it eats ravenously, is very sluggish, and forms a fine silky web, in the ground, in which it passes to the pupa state \*. We find the moth very liable to variation in colours ; in some specimens the green is very brilliant, in others the red ; and again, in others, the lunar white marks are very conspicuous. In some specimens, natives of warm countries, we have seen them finer coloured than those from the northern parts of Europe:

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\* In the plate of this species in Roel's German Insects, the silky cone of the pupa is drawn in the convex part of a leaf.





## P L A T E CLXVI.

## LIBELLULA GRANDIS.

LARGEST DRAGON FLY:

NEUROPTERA.

Wings four, naked, transparent, reticulated with veins, or nerves.  
Tail without a sting.

## GENERIC CHARACTER.

Mouth always armed with more than two jaws. Antennæ shorter than the thorax. Wings expanded. Tail of the male forked.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Thorax brown, with two oblique lines of yellow on each side. Abdomen red-brown, with white spots. Wings with a marginal spot.

LIBELLULA GRANDIS: alis glaucescentibus, thoracis lineis quatuor flavis. *Lyn. Syst. Nat.* 2. 903. 9.  
*Fn. Sv.* 1467.

AESHANA GRANDIS: thorace lineis quatuor flavis, corpore variegato. *Fab. Syst. Ent.* 424. 2.—*Spec. Inf.* 2.  
*p.* 525. 133. 2.—*Ent. Syst. T.* 2.  
*p.* 384. 2.

*Libellula fulva*, alis flavescens, thoracis lateribus lineis duabus flavis, fronta flavescens, cauda diphylla. *Geoff. Inf.* 2. 227. 12.

*Libellula fusca*, capite rotundato, thorace lineolis quatuor transversis luteis, alis flavicantibus, abdomine cylindrico.

*Degeer. Inf. 2. 2. 45. tab. 20. fig. 6.*

*Libellula maxima vulgatissima*, alis argenteis. *Raj. Inf. 48. 1.*

*Roef. Inf. 2. Aqu. 2. tab. 2. fig. 1. 2?*

*Schæff. Icon. tab. 2. fig. 4.*

*Aët. Nidros. 3. 412. tab. 6. fig. 9.*

If we except a very small number of exotic *Libellulæ*, *L. Grandis* is the largest insect of the genus known: it is certainly the largest of the European species.

It is not uncommon in woods; but never flies far from the water. In the larva state it lives in the water, and, like others of the same genus already described in this work, does not quit it till it becomes a winged creature. In the larva state it also resembles in its manners those voracious insects that devour smaller insects, and in the winged state it takes moths and other weak insects in its flight. Is found in most of the summer months.





## P L A T E CLXVII.

## STAPHYLINUS RIPARIUS.

BANK ROVE-BEETLE.

COLEOPTERA.

## GENERIC CHARACTER.

Antennæ moniliform\*. Elytra not more than half the length of the abdomen. Wings concealed. Tail armed with two oblong vesicles.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Red-brown. Shells blue. Head and end of the abdomen black.

STAPHYLINUS RIPARIUS: *Lin. Syst. Nat. n. 8. p. 684. Ed. 13. n. 9. p. 2038.—Fn. Sv. n. 846.*

*Staphylinus gregarius. Scop. Carn. n. 308. ic. 308.*

*Staphylin de rivages. Degeer. Inf. 4. p. 28. n. 14. tab. 1. fig. 18.*

*Geoffr. Inf. 1. n. 21. p. 369.*

*Paykull. monogr. Staphyl. n. 19. p. 27.*

*Schäff. Icon. Inf. Ratib. tab. 71. fig. 3.*

*Harrer Befchr. d. Schäff. Inf. 1. Th. n.*

*417. p. 253.*

PÆDERUS RIPARIUS: rufus elytris coeruleis, capite abdominisque apice nigris. *Fab. Syst. Ent. 1. p. 168.—*

*Spec. Inf. T. 1. p. 339.—Mant. Inf. 1. p.*

*223.—Ent. Syst. 2. p. 536.*

Der Strandtraubenkäfer. Der Uferraubkäfer. *Panz. Faun. Inf. Germ. Inhalt des neunten Hefts. tab. 11:*

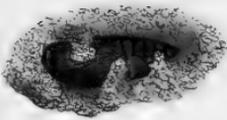
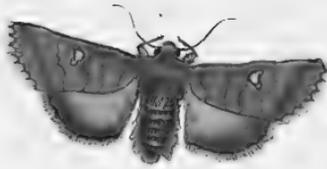
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\* Like a necklace of small beads.

The Staphylini were formerly known among English collectors by the general appellation *Rove-Beetles*; we have in the present instance adopted this English name, and added the only specific distinction which occurs likely to convey the meaning of Linnæus, when he named it *Riparius*.

All the insects of this genus are very voracious. The larvæ so much resemble the perfect insects, that they can hardly be distinguished from them. *Staphylinus Riparius* is found in most parts of Europe. It frequents moist sandy places, and the sides of banks. Found in May. The natural size and magnified appearance is given in the annexed plate.





## P L A T E CLXVIII.

## PHALÆNA SATELLITIA.

SATELLITE MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

Noctua.

## SPECIFIC CHARACTER

AND

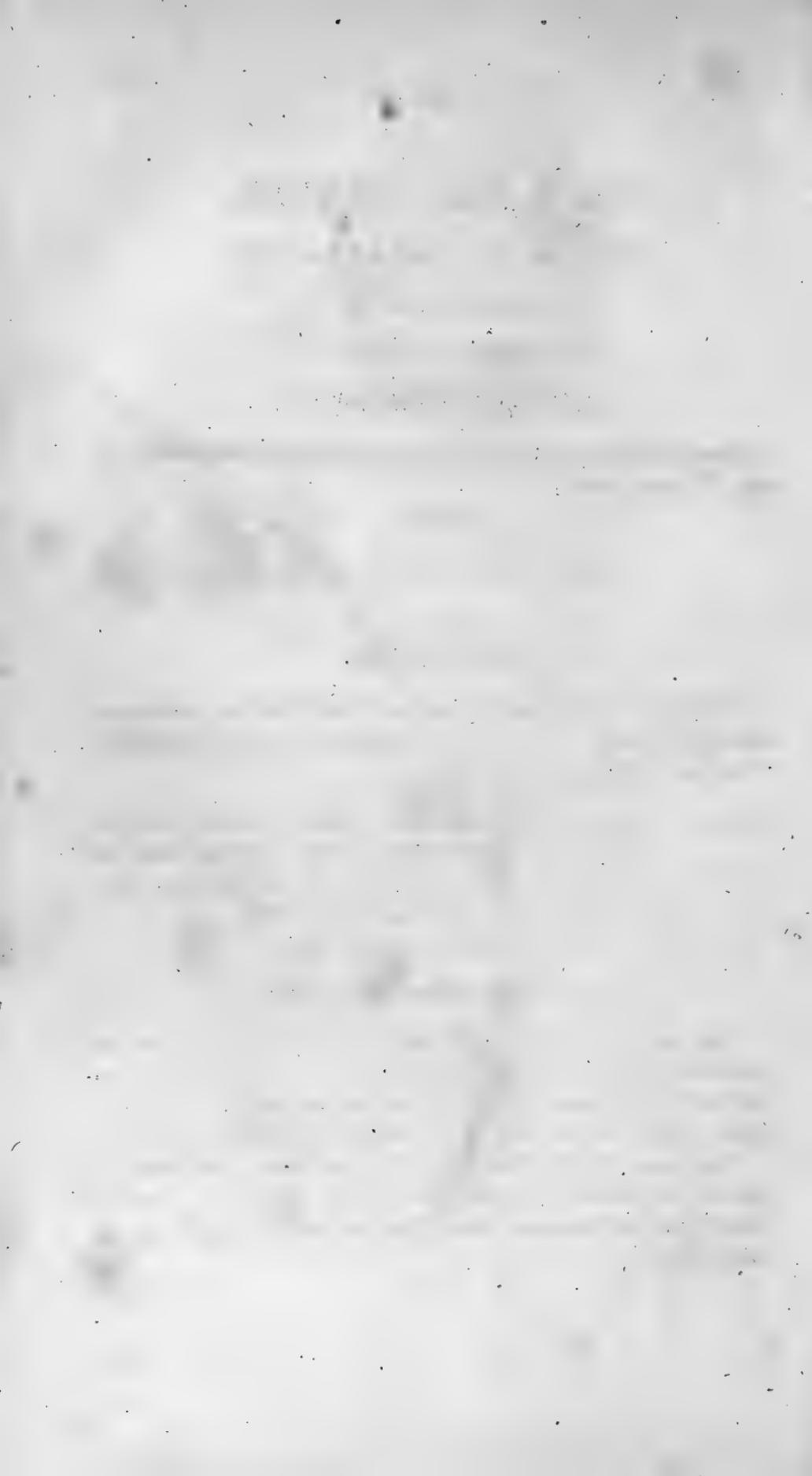
## SYNONYMS.

First wings, exterior margin indented: reddish brown with several dark streaks across: in the center a yellow spot between two smaller white spots. Second wings greyish.

PHALÆNA SATELLITIA: cristata alis deflexis dentatis brunneis: anticis puncto flavo inter punctula duo alba. *Fab. Spec. Inf.* 2. 230. 104. *Lin. Syst. Nat.* 2. 855. 176. *Roef. Inf.* 3. tab. 50.

The caterpillar of this moth feeds on whitethorn, currant and gooseberry-trees, &c. The chrysalis or pupa is enclosed in a strong web of a greyish colour; it is of a dark brown colour. The caterpillar is found in June. In July or August, the moth comes forth.

The upper wings of this moth have a very striking characteristic; that is, the yellowish lunar mark within two small spots: from this character it has been aptly named *Satelliti*; and in English, the *Satellite Moth*.







## P L A T E   C L X I X .

## P A P I L I O   C A R D A M I N E S .

O R A N G E - T I P   B U T T E R F L Y ,   o r ,

W O O D   L A D Y .

L E P I D O P T E R A .

## G E N E R I C   C H A R A C T E R .

Antennæ terminate in a club.   Wings erect when at rest.   Fly in day-time.

\* \* \* \* \*   D a n a i   C a n d i d i .

## S P E C I F I C   C H A R A C T E R

A N D

## S Y N O N Y M S .

Wings rounded, edges very slightly scalloped.   Above white, exterior half of the upper wings orange ; with a black spot in the centre.   Underside of under wings marbled with green.   Female has no orange tip.

PAPILLIO CARDAMINES: alis rotundatis integerrimis albis: posticis subtus viridi marmoratis. *Lin. Syst. Nat.* 2. 761. 85.—*Fn. Sv.* 1039.

*Papilio* minor alis exterioribus albis macula insigni crocea splendentibus, interioribus superne albis, subtus viridi colore variegatis. *Raj. Inf.* 115.

*Roef. Inf. pap.* 2. tab. 8.

*Schæff. Icon.* tab. 91. fig. 1. 3.

——— *Elem. tab.* 94. fig. 8.

PAPILIO CARDAMINES. *Fab. Spec. Inf.* 2. 43. 179.  
*Hafn. Icon. tab.* 9. *fig.* 1.  
*Esp. pap. F. tab.* 4. *fig.* 1.  
 ————— *tab.* 27. *fig.* 2.  
*Wilk. pap.* 2. p. 50. *tab. a.* 5.  
*Robert. Icon. tab.* 21.

Lady of the Woods. *Harris.*

---

This pretty Butterfly may be taken in great abundance in the month of May. The caterpillar is found on various kinds of grass and low herbage: Harris says it feeds on Wild Cole; and other writers mention, *Thlaspi Bursa Pastoris\**, and *Cardamine Pratenfis†*.

The male insect only, has the bright orange colour on the wings, the female is white, with some few marks of black: the underfide is beautifully marbled and mottled with green in both sexes.

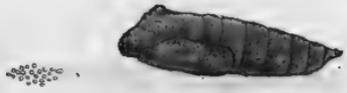
The Caterpillar is common in May and June, and a later brood is found in July; about the latter end of which month it becomes a chrysalis: In May following the Butterfly is produced.

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\* *Shepherd's Purse.*

† *Common Lady's Smock, or Cuckow-flower.*

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## P L A T E CLXIX.

## PHALÆNA SAMBUCARIA.

SWALLOW-TAIL MOTH.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Geometra.*

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Wings angulated, pale yellow, with two transverse lines on each. Second wings with a tail each, and two black spots,

PHALÆNA SAMBUCARIA: pectinicornis, alis caudato angulatis flavescens, strigis duabus obscurioribus, posticis apice bipunctatis. *Lin. Syst. Nat.* 2. 860. 203.—*Fn. Sv.* 122.

*Phalæna* feticornis spirilinguis, alis patentibus sulphureis, linea duplici transversa obscuriori, inferioribus caudatis. *Geoff. Inf.* 2. 138. 58.

*Phalæna*

*Phalæna* media ochroleucos, alis ampliffimis, exterioribus duabus lineis tranfverfis, e fulvo virentibus, interioribus, una divifis. *Raj. Inf.* 177. 1.

*Phalæna* antennis filiformibus, alis latis angulatis luteis, ftrigis duabus obfcurioribus. *Degeer Inf. Verf. Germ.*

2. 1. 327. 3.

*Albin Inf. tab.* 94.

*Roef. Inf.* 1 *phal.* 3. *tab.* 6.

*Petiv. Gazoph. tab.* 51. *fig.* 6.

*Wilks pap.* 38. *tab.* 1. 6. 2.

*Clerk. Icon. tab.* 50. *fig.* 2.

*Schæff. Icon. tab.* 93. *fig.* 8.

*Sepp. Inf.* 6. 1. *tab.* 1.

*Wien Verz.* 103. 1.

Infects, when in the larva ftate, have various means of protecting, or concealing themselves from other fpecies that would annoy them, as well as from birds who prey on them. This remark is partly juftified by the fubject of our annexed plate, the larva of which we find is not furnifhed with any means of defence when attacked: nor of agility to run away, or fecrete itfelf from its enemies; but to compenfate for this, nature has formed it with a fkin of fuch a colour, and ftructure, that its greateft fafety is in its inaction. We frequently fee it faftened by its hind feet to a fmall twig or branch in fuch a pofture, that unlefs it moves, it is fcarcely poffible to difcover it. It is fometimes in an erect poftion, at others with its head downwards, but in an oblique poftion; and, as it hangs in this manner, without the leaft appearance of life for a confiderable time, it exactly refembles a fmall twig of the branch to which it is attached.

The caterpillars are not uncommon in April, or early in May. It feeds on several plants; particularly, when in confinement, it prefers bramble, or white thorn. It is found in the winged state in June, so that it remains a very short time in chrysalis.







## P L A T E CLXX.

## PHALÆNA FRAXINI.

CLIFDEN NON-PAREIL.

LEPIDOPTERA.

## GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Noctua.*

Wings scalloped, grey, with transverse undulated bands of black; in the centre of the wing; second wings black, with a broad curved band of blue across the middle.

PHALÆNA FRAXINI: cristata, alis dentatis cinereo nebulosis: posticis supra nigris: fascia cærulescente.

*Lin. Syst. Nat.* 2. 843. 125.

*Fn. Sv.* 1165.

*Fab. Syst. Ent.* 602. 51.—*Spec. Inf.* 2. 221. 72.—*Ent. Syst. Nat. T.* 3. p. 2. 55. 152.

*Phalæna feticornis spirilinguis*, alis deflexis, superioribus cinereo fuscoque, undulatis, inferioribus nigris, fascia transversa cœrulea. *Geof. Inf.* 2. 151. 83.

*Roef. Inf.* 4. tab. 28. fig. 1.

*Merian Europ.* tab. 46.

*Ammir. Inf.* tab. 25.

*Wilk. pap.* 45. tab. 1. a. 2.

*Eyest. Arch.* tab. 15. fig. 1. 2.

*Wien. Verz.* 90. 2.

From

From the English name given to this beautiful and extremely scarce moth, we learn that it has been taken at Clifden : we have also heard of its being found in other parts of England ; and, if we can rely on our information, a specimen was taken in July, 1795, in the fields.

We have never understood that the larva had been found in this country. Feeds on the ash tree.

BY  
SECURITY  
UNITED STATES



J. L. Admiral, Jr.  
St. Johnston



## P L A T E CLXXI.

T H E

C A T T E R P I L L A R

A N D

C H R Y S A L I S

O F

*PHALÆNA FRAXINI.*


---

The rarity of this subject must plead our apology for the liberty we have taken in introducing it into our work. It is the only instance in which we have given place to a copy from the works of others of any subject, however rare. We have in our possession a preserved specimen of the caterpillar of *Phalæna Fraxini*, sent from Germany; but as it is of that kind in which the colours and form cannot be preserved well, we have preferred giving an exact copy of the caterpillar as well as chrysalis, from the works of a respectable, but little known author, *Ammiral*. This author appears to have been singularly fortunate in presenting a figure of the caterpillar, when the accurate Roefel did not publish a figure of the moth till his fourth volume, and was not then in possession of the caterpillar.

Some of our readers will be perhaps surpris'd to find that our figures precisely agree with those contained in the Aurelian of our countryman *Harris*; but whoever possesses the plates of *Ammiral*, will find that in the most minute parts of *Harris's* plates, he has only traced and reversed the originals of *Ammiral* throughout; and in many instances by a clumsy imitation, in reversing the foliage and flies, has even spoilt the effect, and lost sight of the accuracy of them.

P L A T E







P L A T E CLXXII.

PAPILIO VIRGAURÆ.

SCARCE COPPER BUTTERFLY.

LEPIDOPTERA.

*Papilio ruralis.* *Lin.*

*Hesperia ruralis.* *Fab.*

GENERIC CHARACTER.

Antennæ terminated in a club. Wings, when at rest, erect,  
Fly by day.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings angulated. Upper side of a fine bronze, or red copper colour, with a black margin. Under side light brown, with several white spots, some having a black speck near the middle.

PAPILIO RURALIS VIRGAURÆ. *Lin. Syst. Nat. n. 253. p. 793.*  
*edit. 12. n. 253. p. 2359.—Faun. Suec.*  
*n. 1079.*

*Papilio ruralis Virgaureæ.* *Fab. Syst. Ent. n. 569. p. 126.—*  
*Spec. Inf. 2. 569. p. 126.—Mant. Inf.*  
*2. 721. p. 79.*

K

*Hesperia*

*Hesperia ruralis Virgaureæ*: alis subangulatis fulvis: margine atro, fubtus punctis, nigris albisque.

*Fab. Ent. Syst.* 4. 173. p. 309.

Le Bronzè.

*Geoffr. Inf.* 2. 35. p. 65.

*Papil. d'Europ. tab.* 44. n. 92.

*Esper eur. Schmett.* 1. Th. tab. 19. fig. 2.

*Borkhausen eur. Schmett.* 1. Th. 1. p. 141.

et p. 269.

*Syst. Verz. d. W. Schmett.* 1. p. 80.

L'Argus fatiné. *Ernst.*

Der Goldrathenfalter. Der Feverpapilion. *Panz. Faun. Inf. Germ.*

A specimen of this very superb and rare butterfly has been taken at Cambridge. It has always had a place in the cabinets of English collectors of consequence; but we cannot learn by whom it was first discovered in this country. *Papilia Virgaureæ* and *Papilio Hippothoe*, has been frequently confounded with each other; but on a comparison, a material difference will be discovered.

Harris has made one error, which it is of importance to the English collector to correct; he says, "*Papilio Virgaureæ*, copper, feeds on grafs, found in June and August in meadows, is shining copper, spotted with black." From this it appears he could mean no other than the common copper butterfly, which is found in June and August in meadows, *Papilio Phlæas*; for though the scarce copper butterfly was probably found in his time, it must have been very rare;

rare ; and he would not have omitted in his catalogue of English Lepidoptera, to mention an insect so common as *Papilio Phlaeas*, if he had noticed the other. He has also the same error in his Aurelian.





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## P L A T E CLXXIV.

## BUPRESTIS VIRIDIS.

## GREEN BUPRESTIS.

## COLEOPTERA.

## GENERIC CHARACTER.

Antennæ fetaceous, and as long as the Thorax. Head drawn within the Thorax.

## SPECIFIC CHARACTER

## AND

## SYNONYMS.

Linear, shining blue and green in shades, a few exceedingly minute spots sprinkled over some parts.

*BUPRESTIS VIRIDIS*: elytris integerrimis linearibus punctatus, corpore viridi elongato. *Fab. Spec. Inf.* 1. 281. 54.—*Syst. Ent.* 223. 38.—*Lin. Syst. Nat.* 2. 663. 25.—*Fn. Sv.* 762.

*Buprestis viridis* nitida, corpore elongato, elytris linearibus scabris integerrimus. *Degeer. Inf.* 4. 1. 33. 6. tab. 5. fig. 1.

*Cucuius viridi cupreus oblongus.* *Geoff. Inf.* 1. 127. 5.

*Mordella ferricornis.* *Scop. Carn.* 190.

The Larva of this Insect feeds on the Birch-tree (*Betula Alba*). It is rarely met with in England; and if we may form any opinion from the silence of Naturalists, it is not common in any part of Europe.

F. I. Natural size.

L

P L A T E

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 309

LECTURE 10

THE HADRON SPECTRUM

The hadron spectrum is the collection of all particles made of quarks and antiquarks. It is the most complex part of the Standard Model of particle physics. The spectrum is organized into multiplets based on the symmetries of the strong interaction, SU(3) color and SU(3) flavor. The ground state multiplets are the octet of baryons and the octet of mesons. Excited states are organized into higher multiplets and are often called resonances.

The quark model predicts the existence of many particles that have not yet been discovered. The search for these particles is one of the major goals of modern particle physics.

The quark model also predicts the existence of exotic hadrons, such as tetraquarks and pentaquarks. These particles are made of four or five quarks and antiquarks. They are very rare and difficult to produce in the laboratory. The discovery of these particles would be a major breakthrough in our understanding of the strong interaction.

The quark model is a very successful theory. It has predicted the existence of many particles that have since been discovered. It is one of the most powerful theories in physics.

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## P L A T E CLXXV.

## P H A L Æ N A S C H Æ F F E R E L L A.

LEPIDOPTERA.

## G E N E R I C C H A R A C T E R.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

TINEA.

## S P E C I F I C C H A R A C T E R

A N D

## S Y N O N Y M S.

First wings orange, with spots and stripes of silver: a deep black fringe. Second wings pale black.

TINEA SCHÆFFERELLA: *Linna. Syst. Nat.* 2. 898. 443.—*Fn. Sv.* 1409.

TINEA SCHÆFFERELLA: aliis nigris: disco flavo; strigis lineis duabus punctisque tribus argenteis. *Fab. Spec. Inf.* 2. 303. 79.—*Ent. Syst. Tom.* 3. p. 2. 322. 155.

Linnæus says this beautiful little Insect feeds on the Chestnut. We found it on the Tansey, in May, 1796.

It has not been figured by any author that has fallen under our inspection; and the Synonyms given by Fabricius, in his last work, refer only to the description given by Linnæus, and *Wien. Verz.*\* 138. 21.—The specific name was adopted by Linnæus, and continued

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\* Catalogue of Insects found near Vienna.

by Fabricius, in honour of Schæffer, Author of the *Insecta Ratisbonensia*, and *Fundamenta Entomologica*. *Quarto*. 1747.

The natural size of this Insect is given at the bottom of the Plate; and as it was too minute to admit of the elegant colouring of the original, two figures of its magnified appearance is given above, one in its resting position, the other with the Wings expanded.

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## P L A T E CLXXVI.

## NOTONECTA STRIATA.

## STRIATED BOAT FLY.

## HEMIPTERA.

Upper Wings semi-crustaceous, not divided by a straight future, but incumbent on each other. Beak curved downward.

## GENERIC CHARACTER.

Beak inflected. Antennæ shorter than the Thorax. Wings crossed. Hind Feet hairy, and formed for swimming.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Depressed. Head and Legs yellow; rest pale brown, with numerous minute spots and streaks of dark brown.

NOTONECTA STRIATA. *Lin. Syst. Nat.* 2. 712. 2.—*Sv.* 904.

SIGARA STRIATA: elytris pallidis: lineolis transversis undulatis numerosissimis fuscis. *Fab. Spec. Inf.*—*Ent. Syst.*

*T.* 4. 207. 2.

Corixa. *Geoffr. Inf.* 1. 478. 1. tab. 9. fig. 7.

*Stoll. Cicad.* 2. tab. 15. fig. 13. B.

*Roef. Inf.* 3. tab. 29.

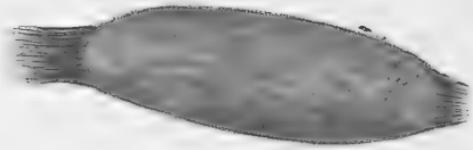
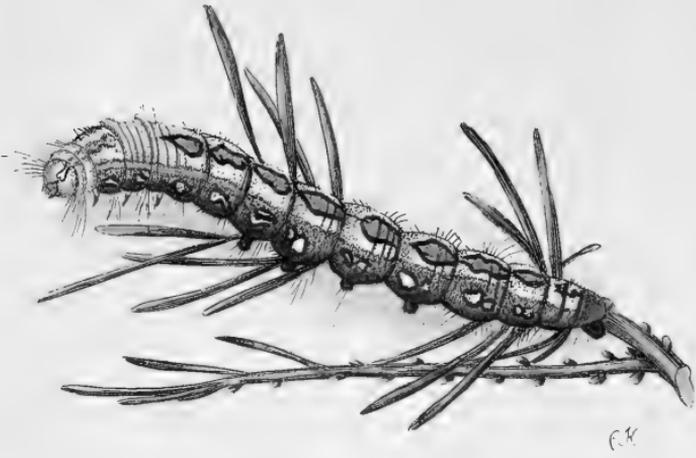
*Schæff. Elem.* tab. 50.

——— *Icon.* tab. 97. fig. 2.

*Fyest. Helvet.* 25. 469.

There are two varieties of this species: one kind being at least twice the size of the other; in every other respect they perfectly agree. This Insect is commonly seen on still waters, in the Summer; when they cause a gentle agitation of the surface, by the quickness of their motions, and row along on their back, with their hinder legs, which are formed for swimming. Both kinds are shown in the Plate, FIG. I. and II. FIG. III. is the largest sort magnified to exhibit the curious markings of the Elytra.

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## P L A T E CLXXVII.

T H E  
C A T E R P I L L A R  
O F  
*P H A L Æ N A P I N I.*

---

We have introduced in the annexed plate, figures of the Caterpillars of *Phalæna Pini*, copied from the works of the two most accurate entomologists that have described or figured the insects of any part of the European continent; and though unfortunately the descriptions are written in a language so little understood as to be wholly useless; the figures are very interesting. In this instance we have deviated no more from our original plan than when we introduced the larva of *Sphinx Euphorbiæ*, and *Phalæna Fraxini*; and we flatter ourselves in thus endeavouring to give the history of a rare insect complete, the approbation expressed by our subscribers, on former occasions, will not be withheld on the present.

Roefel, in 1746, published the *Insecten Beiustigung*; in which work we find a figure of the Caterpillar of *Phalæna Pini*: it accords with the description given by Fabricius; perhaps the description was taken from Roefel's plate. "Larva subcaudata, albo griseo fuscoque variegata, collaribus coeruleis: punctis utrinque rufis." *Fab. Syst. T. 3. p. 2. 426. 62.*

*Kleeman*, the relation and successor of Roefel, in the third part of his supplement, Plate 6. fig. 7\*. has shewn the Caterpillar of this

---

\* Published in 1793.

insect in another skin, or probably it is the Caterpillar of the male, Roefel having only the female in his works; in this specimen the colours are bright, and it is particularly distinguished by the collar being red instead of blue.—As this part of his work is scarcely known, and has not yet been noticed by *Fabricius*, we cannot collect the opinion of any systematical writer, whether it be the other sex, or only a different skin.

The pupa we received with the moths; and the eggs figured in plate 178, were taken from the body of the female.





## P L A T E CLXXVIII.

## P H A L Æ N A P I N I.

## PINE LAPPET MOTH.

## LEPIDOPTERA.

## G E N E R I C C H A R A C T E R.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

*Bombyx.*

Antennæ of the male feathered.

## S P E C I F I C C H A R A C T E R

AND

## S Y N O N Y M S.

First wings grey, speckled with brown: a broad space of red brown across each, and a triangular white spot near the anterior margin.

BOMBYX PINI: alis reversis griseis: fascia ferruginea punctoque triangulari albo. *Linn. Syst. Nat.* 2. 814. 24.—*Fn. Sv.* 1104.—*Fab. Syst. Ent.* 3. p. 2. 426. 62.

*Merian. Europ. tab.* 22.

*Wilks. pap.* 29. *tab.* 3. *b.* 5.

*Roes. Inf.* 1. *phal.* 2. *tab.* 59.

*Schæff. Icon. tab.* 86. *fig.* 1—3.

*Kleman. Inf.* 2. *Suppl. pl.* 6. *fig.* 7.

---

The Pine Lappet Moth is one of those species of insects, that we can have no doubt are natives of this country, from the concurrent testimony

testimony of the respectable authors; though from the scarcity of many amongst them, we should be scarcely inclined to admit them into an English collection without such authority. Perhaps the rarity of some of those insects should be rather attributed to the little attention bestowed on the science of Entomology by such as reside in parts of the kingdom that are most favourable to the increase of insects in general; or to those particularly rare species that are local, or feed only on plants of one kind; such as the *Sphinx Euphorbiae*, and many others.

Wilks has given the Pine Lappet Moth in the third plate of the English butterflies. *Harris* has not figured it in the Aurelian\*, but in the Pocket Companion† he not only describes it amongst the English Lepidoptera, but says, the time of its changing into Chrysalis is *May*, and that it appears in the winged state in June; from this we must suppose, that he had reared it from the Caterpillar. *Berkenhout*, in his synopsis of the natural history of Great Britain‡, has given it without hesitation as an English insect; and the authority of a little tract on insects, by *Martin*§, may be adduced as a further confirmation of its being a native of this country.

This Insect is not uncommon in Germany. *Schæffer* has figured it amongst the insects that are to be found in the environs of Ratisbon; and *Roefel*, without considering it a local species, has given it as a native of Germany. Whether it is found in other parts of Europe, except Switzerland and Germany, we cannot decide; but we have the precise species from *Georgia* in *North America*.

We observe a considerable difference between the colouring of this moth in the works of *Schæffer* and *Roefel*, which is the more remarkable, as they both describe the insects of the same country; the figure given by the latter is much darker in the chestnut colour, and the grey has no appearance of an intermixture of red specks and markings, like that figured in *Schæffer*, which inclines very much to red or flesh colour throughout. *Roefel* has only figured the female; *Schæffer* has given both sexes.

---

\* Published in 1766.

† 1776.

‡ 1789.

§ 1785.





PLATE CLXXIX.

PHALÆNA OO.

HEART MOTH.

LEPIDOPTERA.

GENERIC CHARACTER.

Antennæ taper from the base. Wings in general deflexed when at rest. Fly by night.

NOCTUA.

Antennæ like a bristle.

SPECIFIC CHARACTER

AND

SYNONYMS:

Wings buff, streaked, and marked with red-brown: and a double o in the middle of upper wings.

NOCTUA OO: cristata alis deflexis cinerascens ferrugineo frigidis oo notatis. *Lin. Syst. Nat.* 2. 832. 81.—*Fn. Sv.* 1139.

*Fab. Syst. Ent.* 1. 3. p. 2. 247.

*Wien. Verz.* 87. 1.

*Roef. Inf.* 1. *Phal.* 2. tab. 63.

This Moth is far from common. It is found on the oak, in the Caterpillar state, late in the summer; changes to chrysalis in the first week

week of October; the fly appears late in April, or early in May. *Harris* greatly mistook the meaning of Linnæus, when he says, "Linnæan name, *Sphinx* Oo."





## P L A T E CLXXX.

## ASILUS CRABRONIFORMIS.

HORNET FLY.

DIPTERA.

Wings, two.

## GENERIC CHARACTER.

Trunk horny? long straight, bivalved.

## SPECIFIC CHARACTER

AND

## SYNONYMS.

Body hairy; the three segments next the thorax black, the four others yellow.

*ASILUS CRABRONIFORMIS*: abdomine tomentoso antice segmentis tribus nigris postice flavo inflexo. *Fab. Spec. Inf.* 2. 461. 5.—*Linn. Syst. Nat.* 2. 1007. 4.

*Asilus ferrugineus* abdominis articulis prioribus atris, posteribus quatuor flavis. *Geoff. Inf.* 2. 468. 3. tab. 17. fig. 3.

*Asilus fubhirsutus*, antennis setigeris, abdomine antice nigro postice flavo fulvo. *Degeer. Inf.* 6. 244. 7. tab. 14. fig. 3.

*Musca maxima crabroniformis.* *Raj. Inf.* 267.

*Erax crabroniformis.* *Scop. carn.* 974.

*Schæffer. Icon. tab.* 8. fig. 15.

———— *Elem. tab.* 13.

This

This is a very confined genus. Fabricius in the Species Insectorum describes only thirty-three kinds; of these not more than eight are natives of this country. The *Afilus Crabroniformis* is the largest, and is not uncommon in some places in the summer, particularly frequenting wet meadows, and flying busily about the middle of the day amongst flowers.

Its proboscis is a curious instrument; the sting of it is very painful, and causes a swelling.

# L I N N Æ A N I N D E X.

TO

V O L. V.

## COLEOPTERA.

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## HEMIPTERA.

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## LEPIDOPTERA.

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M

Papilio

# I N D E X.

	Plate	Fig.
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——— <i>euphorbiata</i> - - - -	153	1.
——— <i>Uddmanniana</i> - - - -	154	1. 2. 3.
——— <i>squmana</i> , Green tufted, or Button Moth -	157	7.
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## NEUROPTERA.

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HYMENOP-

# I N D E X.

## HYMENOPTERA.

	Plate	Fig.
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---

## DIPTERA.

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—— brassicaria - - -	151	1.
—— hypoleon - - -	146	2. 3.
—— trilineata - - -	151	5.
Tabanus pluvialis - - -	151	3.
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Bombylius medius - - -	146	1.

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## A P T E R A.

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—— globosa - - -	156	2.



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ERRATA.

## ERRATA.

Page 85, *for* Plate 169, *read* Plate 170.

Page 89, ~~————~~ 170, ~~————~~ 171.

Page 90, line 5, *after* fields, *add* near Hoxton.

Page 91, *for* Plate 171, *read* Plate 172.

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