

THE
TRANSACTIONS
OF THE
ENTOMOLOGICAL SOCIETY
OF
LONDON
FOR THE YEAR
1871.

LONDON:
PRINTED FOR THE SOCIETY BY H. G. ROWORTH,
11, RAY STREET, FARRINGTON ROAD,
SOLD AT THE SOCIETY'S APARTMENTS, 12, BEDFORD ROW,
AND BY LONGMAN, GREEN, READER AND DYER,
PATERNOSTER ROW.

. 1871.

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THE
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I. *A Monograph on the Ephemeroidea*. By the Rev. A.
E. Eaton, B.A.

[Read 5th December, 1870.]

Part I. The Nomenclature of the *Ephemeroidea*.

THE present communication is an introduction to a series of papers on the *Ephemeroidea*. In these papers I hope to give a detailed account of the organization and development of some characteristic British species of the Family. My original plan was to treat of the British Fauna alone. In the course of my investigations, however, I found that the nomenclature of the Family at large was corrupt, and therefore I have been led to review the synonymy of the whole group. In order to accomplish this, I have been obliged to give at second-hand descriptions of many foreign species. These incorporated descriptions I have, for the sake of uniformity, translated into Latin.

It is always difficult, and sometimes impossible, to identify species by reference to mere colour descriptions and admeasurement, without recourse to the distinctions afforded by special structures. I have therefore avoided the use of analytic tables and diagnoses for the determination of species.

Structure has not hitherto received sufficient consideration in descriptive publications; which makes it necessary to examine all authentic specimens of described *Ephemeridæ* extant in collections, before the synonymy of the known species can be settled. With a view to reform, I have examined the undermentioned collections. Lists of the type specimens in each are given under the titles of the works in which they were originally described. Should I have opportunity, I will notice the contents of the principal French and German collections in some future part of my work.

Through the kindness of Dr. Gray, I had unlimited access to the collections in the British Museum, comprising Stephens' collection (see Steph. 1835-6), Mr. Wollaston's collection (see Hag. 1865), and the general collection of *Neuroptera* (see Walk. 1853 and 1858-9).

At the Linnean Society's Library I examined the collection of Linné (see Lin. 1746).

Mr. R. M'Lachlan has given me every assistance, by placing in my hands his valuable foreign collection (M'Lach. 1868, Etn. 1871), and his British collection (Etn. 1870), and making them to all intents my own.

Through the hospitality of Mr. J. C. Dale, I had the pleasure of spending several days in gathering information concerning the geographical range of species in his British collection, and in describing the rarities in his foreign collection (see Etn. 1871).

In the Museum at Oxford, with the permission of Professor Westwood, I inspected the University's general collection (Etn. 1871), Prof. Westwood's collection (Westw. 1840), and Mr. A. Ronalds' collection (Ron. 1836).

The cabinets of my own University contain no remarkable *Ephemeridæ*.

Some Australian species, sent by Professor M'Coy, of Melbourne, to Mr. F. Walker, were forwarded to me (Etn. 1871); and Mr. P. C. Wormald obliged me with the loan of his collection.

At Geneva, M. A. E. Pictet very kindly submitted to me the remains of Professor J. F. Pictet's collection (Pict. 1843-5), and some Spanish *Ephemeridæ* which he had himself collected (Ed. Pict. 1865).

M. de Selys-Longchamps' collection, containing valuable type specimens, was sent to me (see Lat. 1805; Guer. 1829-43; Ramb. 1842; Hag. 1858-9, 1861, 1864; Etn. 1871).

The late State Entomologist of Illinois entrusted me with some authentic specimens of American species which he transmitted for the British Museum (Walsh 1862-3).

My own types of new species are placed in the British Museum.

In the subjoined list of publications relating to the *Ephemeridæ*, the titles of those which I have been unable to collate are distinguished by asterisks prefixed; and the names originated in each work are given after its title. My thanks are due to Mr. G. R. Crotch, of the Cambridge University Library, for the great assistance he has rendered me in the preparation of the bibliographical portion of this paper; and I am also under great obligations to Mr. J. C. Dale, Professor Westwood, Mr. C. O. Waterhouse, and Mr. R. M'Lachlan, for enabling me to give references to scarce books.

Authors anterior to those of the seventeenth Century are mentioned by Clutius (1634), and by Pictet (1843-5). The following list is arranged in chronological order, and the abbreviations employed in the citations are given in brackets, immediately after the year of publication,

1634 (Clut.). Ang. Cluyt, Opusc. duo singularia; ii. De Hemerobio sive Ephéméro, pp. 61-103.

1663 (Mey). J. de Mey, in J. Gødart's *Metamorph. et Hist. Nat. Ins.* i. Appendix, pp. 193-200.

1675 (Swam.). J. Swammerdamm, *Ephemerita vita*.—[See Tyson, 1681.]

*1680 (Bleg.). N. de Blegny, De quelques papillons qui paraissent une fois tous les ans sur les bords de la Meuse; in *Temple d'Esculape*, An. 2e, p. 188 (Hag.).

1681, E. Tyson, (a translation of) *Ephemerita vita*, by J. Swammerdamm, pp. 44, pla. 8, 4to.

*1718, J. J. Baier, *De Ephemerita vita, Adagium medicinalium centuria*, pp. 54 (Hag.).

*1723 (Kul.). J. A. Kulmus, Von einem gewissen Fisch-Insect; in *Breal. Natur. u. Kunstgesch.* pp. 292-3 (Hag.).

1735 (Lin. S. N. i). K. Linné, *Systema Naturæ*, ed. i.—*Insecta*, . . . *Angioptera*, . . . *Ephemera*.

1737-8 (Swam.). J. Swammerdamm, *Biblia Naturæ*, i. 234-70; ii. pla. xiii-xv.

1740 (Lin. S. N. ii). K. Linné, *Systema Naturæ*, ed. ii., p. 60. *Gymnaptera*.

1741 (Targ.). G. Targioni-Tozzetti, Lettera sopra una numerosissima specie dei farfalle vedutasi in Firenze; pp. 32, frontisp. figs. 1-5.

1742 (Réaum.). B. A. F. de Réaumur, Des Mouches appellés Ephémères; *Mém. pour servir à l'hist. des Ins. vi.*, pp. 457-522, pls. xlii-xlvi.

1746 (Col.). P. Collinson, Some observations on a sort of *Libella* or *Ephemeron*; in *Phil. Trans. vol. xliiv.*, p. 329, pl. ii. 2-4.

1746 (Lin. F. S. i). K. Linné, *Fauna Suecica*, ed. i. pp. 226-7, Nos. 750-5.

[In Linné's own interleaved copy of this work, MS. names are written before the index numbers; viz. :—" *vulgata* " before 750; " *bioculata* " before 751; " *mutica* " after 752; " *culiciformis* " before 753; " *horaria* " before 754, above " *minima* " erased; and " *vespertina* " before 755. References are made in the text to some of his earlier publications; viz. :— after 751, *Acta Upsal.* (1736) p. 27. 2; after 754, *Act. Ups.* p. 27. 3; and to his *Iter Oeland.* (*Oelandska Resa*, 1745) p. 21.

In his cabinet are—2 ♀ sub. spurious, and 1 ♂ sub. ticketed 750 (perhaps by Linné junr.) of *E. vulgata*; 2 ♂ im. spurious, of *L. marginata*; 1 ♀ sub. spurious, and 1 ♀ sub. ticketed " *nigra* " in Linné's MS., of *L. marginata*; 2 ♀ im. spurious, labelled " *culiciformis*," of a *Canis*; 2 ♀ im. spurious, of *C. dipterum*; 1 ♂ im. ticketed 751 (in the same handwriting as the 750 under the *E. vulgata* ♂ sub.) of *Siphylurus Linnaeanus*, nov. sp.; and 2 ♀ im., unlabelled, and spurious, of *Heptagenia elegans*.

The Librarian of the Linnean Society (who rendered me every assistance during my examination of the collection), thinks that the numbers 750 and 751 are Linné's autograph, as the " *nigra* " undoubtedly is. There is a close resemblance between these figures and certain others in the handwriting in the Author's own books. However, notwithstanding that the tickets are apparently in Linné's autograph, and the specimens are seemingly Linnean, it is evident that the specimens ticketed 751 and *nigra* are not authentic, because they altogether disagree with the diagnoses 751 in F. S. i., and 1478 *nigra* in F. S. ii., respectively. The MS. reference to " *Schæf. ic.* 175, f. 1, 2 " under *E. bioculata* (an entirely different insect from the one figured) in the Author's own copy of S. N. xii., suggests the possibility of the specimens in question having been placed by Linné in his cabinet after the publication of S. N. xii.; and if this were the case, these specimens having been newer than the original types, it is likely that they may have been in a better condition than those, and thus have stood a greater chance than they of being kept by the owner.]

1747 (Lin. S. N. v.). K. Linné, *Systema Naturæ*, ed. v. [Reprinted in 1748.] *Ordo 3, Neuroptera*, p. 62. *E. maculata*, *E. minima*.

1749 (Roes.). A. J. Rösel, *Insecten Belustigung*. ii. 58-60, pl. xiii. 1-6. \

[Pictet quotes certain names as of the authorship of Rösel (whose descriptions and figures are not named). These names probably originated in C. Schwarz's " *Nomenclator über die in den Röselschen Insect. Belust. &c.*," which was published many years later (1793-1830).]

*1753 (Pontop.). E. Pontoppidan, *Det første Försög paa Norges naturlige Historie*. Vol. ii. ch. ii. (An edition in German, 1754, and another in 1765; see Pontop. 1765).

1755 (De G.). K. de Geer, *Observations sur les Ephémères*; in *Mém. Sav. Etr. Acad. Paris*, ii. 461-9. pl. xvii. 1-2.

*1757 (Schæf.). J. C. Schæffer, *Das fliegende Uferas oder der Haft &c.*, p. 34. [Reprinted in his " *Abhandlungen von Insecten*," iii. 30, pl. i.] (Hag. and Pict.).

1758 (Lin. S. N. x.). K. Linné, *Systema Naturæ*, ed. x; i. 546-7. *E. vulgata*, *bioculata*, *culiciformis*, *horaria*, *mutica*, *vespertina*.

[The author's interleaved copy of S. N. x. contains the following MS. notes and references:—

E. vulgata, Note; *E. cauda* 3-seta corpore luteo, alis hyalinis reticulatisque [= *E. danica*, Müll. ?]; ref. after 750, *Geof.* 2, p. 238, n. 1, *Sulz. Ins.* t. 17, f. 103. Note; *E. ———*, *Bœs. ins.* 2. *aquat.* t. 12, f. 2, 6. *E. cauda* trisetis alis albis margine exteriore fusco. *Habitat* Upsaliæ, *Fabricius*....*Corpus* fuscum [evidently *marginata*, L.]. On p. 547, and the opposite leaf—*E. bioculata*, ref. after 751, *Geof.* 2, p. 239, n. 5, t. 13, f. 47. Note; 2 alis ut totum corpus pallide flavescentibus. *E. culiciformis*, ref. after 753, *Geof.* 2, p. 240, n. 6: ref. after *Bœsel*, *Poda*, *ins.* t. i. f. 10. *E. horaria*, ref. after 754, [*Geof.*] 2, p. 240, n. 8. *E. mutica*; Note, *E. cauda* biseta, alis albis hyalinis striatis, thorace fusco, abdomine albo; ref. *Geof.* 2, p. 240 [n. 7]. *E. vespertina*, Note; cauda trisetis; ref. after *œl.* 21, *Geof.* 2, p. 239, n. 4.

1760 (Kr.). C. C. Kramer, *Dissertatio inauguralis, sistens specimen Insectologiæ Danicæ*,...præsidi B. J. de Buckwald, M.D., p. 26. [A mere list.]

1761 (Lin. F. S. ii.). K. Linné, *Fauna Suecica*, ed. ii. pp. 376-8, Nos. 1472-80. *E. fuscata*, *diptera*, *nigra*, *striata*. [The Author's copy has no MS. notes.]

1761 (*Sulz. Ken.*). J. H. Sulzer, *Die Kennzeichen der Insekten*, p. 43, pl. xvii. 103.

1761 (*Pod. Mus. Gr.*). N. Poda, *Insecta Musæi Græcensis*, pp. 97-8, pl. i. 10. *E. ignita*, *maculata*, *speciosa*.

*1763 (*Pontop. Atl.*). E. Pontoppidan, *Den Danske Atlas*, pl. i.

1763 (*Scop. E. Carn.*). G. A. Scopoli, *Entomologia Carniolica*, pp. 263-4, Nos. 683-7, pl. xxxviii. 683. *E. gemmata*, *albipes*, *parvula*.

1764 (*Geof.*). E. L. Geoffroy, *Histoire Abrégée des Insectes qui se trouvent aux environs de Paris*, ii. 234-41, Nos. 1-8, pl. xiii. 4.

1764 (*Müll. F. Fr.*). O. F. Müller, *Fauna Insectorum Friedrichsdalina*, p. 63, Nos. 554-7. *E. danica*.

1765 (*Pontop. Nat.*). E. Pontoppidan, *Die Naturhistorie in Danemark*, p. 223, Nos. 1-3, pl. xvii. [A wretched figure.]

1766 (*Schæf. Elem.*). J. C. Schæffer, *Elementa Entomologica*, pl. lxii. 1-3.

*1766-9 (*Hout.*). M. Houttuyn, *Natuurkundige Beschrijving der Insekten* (*Hag.*).

1767 (Lin. S. N. xii.). K. Linné, *Systema Naturæ*, ed. xii., part ii. pp. 906-7, Nos. 1-11. *E. lutea*, *marginata*.

[Linné's own (not interleaved) copy of S. N. xii. contains the following MS. references. On p. 906.—*E. vulgata*, after *Carn.* 683, f. 683, *De Geer* 2, t. 16, f. 1-9, 1-13; after *Sulz.* . . . f. 103, *Schæf. Ic.* 9, f. 5. *E. vespertina*, after *œl.* 21, *Bœs. ins. aqu.* t. 17, f. 14. *E. bioculata*, after *Suec.* 1473, *Schæf. ic.* 175, f. 1, 2. On p. 907—*E. nigra*, after *Suec.* 1478, *Schæf. ic.* 154, f. 1, 2. *E. diptera*, after *Suec.* 1477, *De Geer*, 2, t. 18, f. 5.]

*1769-72, J. Berkenhout, *Outlines of the Natural History of Great Britain and Ireland*. [The *Entomology* is reproduced in ed. ii., 1789.]

1771 (*De G. Mem.*). K. de Geer, *Mémoires pour servir à l'histoire des Insectes*, t. ii. part 2, pp. 621-56, Nos. 1-5, pls. xvi-xviii. [Pl. xvii. fig. 13, is not that of a gill of a true *Leptophlebia*.]

- *[1778], J. Hill, A decade of curious insects, pls. vii, viii. [*E. culiciformis*, Hill, is a *Perla*; *E. rupestris*, Hill, is a *Trichopteron*.] (Hag.)
- *1774 (Schäf. Abh.). J. C. Schäffer, Abhandlungen von Insecten, iii. 30. (Pict.).
- 1775 (Georg. Bem.). J. G. Georgi, Bemerkungen auf einer Reise im Rüssischen Reiche, i. 190. [A mere list.]
- 1775 (Fab. S. E.). J. C. Fabricius, Systema Entomologiæ, pp. 303-304, Nos. 1-11. Ordo Synistata. *E. venosa*.
- 1776 (Schäf. Ic.). J. C. Schäffer, Icones Insectorum circa Ratisbonam indigenorum. Vol. i. pl. ix. 5, 6; xliii. 7. Vol. ii. pl. cliv. 1, 2; clvi. 2, 3; clxxv. 1-3. Vol. iii. pl. cciv. 3; ccxix. 2, 3; ccxxxix. 4, 5. [For Panzer's nomenclature, see Pz. 1804.]
- 1776 (Mül. Pr.). O. F. Müller, Zoologiæ Danicæ Prodomus, pp. 142-3, Nos. 1640-51. *E. plumosa, sulphurea, diaphana, luteola, russula, annulata, berlinensis*.
- 1776 (Sulz. Gesch.). J. H. Sulzer, Abgekürzte Geschichte der Insecten, pp. 169-71, pl. xxiv. 6, 7. *E. helvola*.
- 1776 (Schr. Beyt.). F. v. P. Schrank, Beyträge zur Naturgeschichte, p. 82. *E. flava*.
- 1777 (Fab. Gen.). J. C. Fabricius, Genera Insectorum, p. 244. *E. halterata*.
- 1781 (Barb.). J. Barbut, Les Genres des Insectes de Linné, pp. 209-13, pl. xi. 1-4.
- 1781 (Schr. En.). F. v. P. Schrank, Enumeratio insectorum Austriæ indigenorum, pp. 302-5, Nos. 602-6.
- 1782 (Fab. Sp.). J. C. Fabricius, Species Insectorum, i. pp. 383-5, Nos. 1-12.
- 1782 (Har. Exp.). M. Harris, An Exposition of English Insects, pl. vi. 1-3.
- 1783 (Retz.). A. J. Retzius, Caroli De Geer Genera et Species Insectorum, pp. 56-7, Nos. 180-4. *E. communis, albipennis, cincta, fusco-grisea*.
- 1785 (Thunb.). K. P. Thunberg, Donationes Thunbergianæ; in Mus. Nat. Acad. Upsaliensis, p. 81. [A mere list.]
- 1785 (Fourc. E. Par.). A. F. Fourcroy, Entomologia Parisiensis, ii. 350-2, Nos. 1-8. *E. reticulata, viridescens*.
- 1787 (Fab. Mant.). J. C. Fabricius, Mantissa Insectorum, i. 243-4, Nos. 1-12.
- 1789 (Berk. Outl.). J. Berkenhout, Outlines of the Natural History of Gt. Britain and Ireland, ed. ii., i. 150, Nos. 1-5.
- 1789 (Raz.). G. de Razoumouky, Histoire Naturelle du Jorat, p. 210.
- 1789 (Vill.). C. J. de Villers, Caroli Linnæi Entomologia, iii. 16-22, Nos. 1-20, pl. vii. 3. *E. nervosa*.
- 1789 (Rœm. Gen.). J. J. Römer, Genera Insectorum Linnæi et Fabricii iconibus illustrata, pl. xxiv. 6, 7. Explic. p. 23. [Figures reproduced from Sulz. 1776.]
- 1789 (Zsch.). J. J. Zschach, Museum Leskeanum, i. 150, Nos. 13-20. [Names were assigned by Gmêlin in 1790.]
- 1790 (Ros. F. Etr.). P. Rossi, Fauna Etrusca, ii. 7-9, Nos. 672-7.
- *1790, J. G. Georgi, Versuch einer Beschreibung der Residenzstadt St. Petersburg. (Hag.)

1790 (Gmél.). J. F. Gmélin, *Linnæi Systema Naturæ*, ed. xiii., t. i. part v. pp. 3628-30, Nos. 1-18. *E. notata, testacea, ferruginea, stigma, tænis*.

1791 (Ol. Enc. Méth.). G. A. Olivier, Article "Ephemera," in *Encyclopédie Méthodique*, vi. 404-22. *E. longicauda, virgo*.

1791 (Fisch. Vers.). J. B. Fischer, *Versuch einer Naturgeschichte von Lävland*, pp. 337-8, Nos. 564-6.

1793 (Fab. E. S.). J. C. Fabricius, *Entomologia Systematica emendata et aucta*, t. iii. part i. pp. 68-71, Nos. 1-16. *E. marocana, brevicauda*.

*1794, U. J. Seetzen, *Beitrag zur Naturgeschichte der Ephemera lutea, L.*; in *Meyer's Magaz. f. d. Thiiergegeschichte*, i. 41-63 (Hag.).

1796 (Don. B. L.). E. Donovan, *Natural History of British Insects*, iv. 53, pl. cxxviii.

*1796 (Licht.). Lichtenstein, *Cat. Mus. Holthuisen*, iii. 193, No. 52. *E. noveboracana*. (Hag.)

1796 (Lat. Préc.). P. A. Latreille, *Précis des Caractères Génériques des Insectes*, p. 96.

1798 (Cuv. Tab. Elem.). G. L. C. D. Cuvier, *Tableau Elem. de l'Hist. Nat. des Animaux*, livr. vii. pp. 483-5. *Agnathes*.

1798 (Sehr. F. B.). F. v. P. Schrank, *Fauna Boica*, pp. 196-9, Nos. 1937-49. *P. erythrophthalma, fuscula, familiaris*.

1798 (Ced.). J. Cederhjelm, *Faunæ Ingricæ Prodrömus*, pp. 133-5, Nos. 407-13.

1800-2, J. G. Georgi, *Geogr. physik. und naturhist. Beschr. des Russischen Reichs*. *1800, Thl. iii. vi. 1802, p. 324. *E. fuliginosa*.

1801 (Web.). F. Weber, *Observationes Entomologicæ*, pp. 99-100. *E. atrostoma*.

1802 (Will.). Dr. Williamson, *On the Ephoron leucon*, usually called the White Fly of Passaik River; in *Trans. Amer. Soc. Philad.* v. 71-3.

1802 (Illig.). J. K. W. Illiger, *Magazin für Insectenkunde*, i. 187-8, No. 17. *E. ros-aquæ*.

1802 (Walck.). C. A. Walckenaer, *Faune Parisienne*, ii. 7-10, Nos. 1-11.

*1802. *Elements of the Natural History of the Animal Kingdom*; ed. anonym. [See 1817, Stewart.]

1804 (Pz. Explic. Schæf. Ic.). G. W. F. Panzer, in the explanation of Schæffer's *Icones*. (see 1776). *E. hyalina, Semblis marginata*.

1806 (Pz. F. Germ.). G. W. F. Panzer, *Faunæ Insectorum Germanicæ Initia*, Heft xci, Nos. 16, 17.

1806 (Lat. H. N.). P. A. Latreille, *Hist. Nat. des Crustacés et des Insectes*, xiii. 98-100, Nos. 1-19. *E. Swammerdiana*. *Subulicornes*.

[In M. de Selys-Longchamps' collection is Latreille's type of *E. Swammerdiana*, *Pal. longicauda*, 1 ♂ subim.]

1806 (Dum. Z. Anal.). A. M. C. Duméril, *Zoologie Analytique*, pp. 246-7.

1806, G. Shaw, *General Zoology*, vol. vi. part ii. pp. 249-53, pl. 81-2. *E. Swammerdiana*.

1807 (Lat. Gen.). P. A. Latreille, *Genera Crustaceorum et Insectorum*, iii. 184.

1810 (Lat. Con. Gen.). P. A. Latreille, *Considerations Générales sur l'Ordre Naturel des Insectes, &c.*, p. 263 & p. 434.

1815, W. E. Leach, Article "Entomology" in Brewster's Edinburgh Encyclopædia, ix. 137. Tribe 2, EPHEMERIDES. Fam. 1, BAETIDA. Gen. 488, *Baetis*; *B. bioculatus*. Gen. 489, *Cloeon*; *C. pallida*, Leach, MSS. *E. diptera*, Lin. Fam. 2, EPHEMERIDA. *E. vulgata*, Lin. [The article being contributed anonymously, Leach quoted his own MSS.]

1817 (Cuv. R. A. i.). G. L. C. D. Cuvier, Le Règne Animal, ed. i., t. iii. pp. 426-30.

1817 (Lamarck, i). J. B. P. A. de M. Lamarck, Histoire Naturelle des Animaux sans Vertébrés, iv. 218-22.

1817 (Sav.). J. C. L. de Savigny, Description de l'Égypte. Histoire Naturelle, Planches, t. ii. Névroptères, pl. ii. 4-8. [In t. i. 194, Explic. des Pls., he merely states that the figures belong to the Gen. *Ephemera*.]

1817 (Stew. Elem.). Stewart, Elements of the Natural History of the Animal Kingdom, ed. ii., vol. ii. pp. 224-6, Nos. 1-9.

*1818, F. v. P. Gruithuisen, in Salz. Medic. Zeit. No. 92. Ephem. larva. (Hag.)

1819 (Sam. E. Com.). G. Samouelle, The Entomologist's useful Compendium, pp. 259-60, pl. vii. 2. Also p. 65. [An incorporation of Leach's MS. with modifications. Fam. *Ephemerides* is put for Tribe *Ephemerides*, Leach; and Leach's named Families are ranked as nameless *Stirpes*.]

1821, W. Wood, Illustrations of the Linnæan Genera of Insects, ii. 21-3, pl. xlvii.

1823 (Dum. Con. Gen.). A. M. C. Duméril, Considerations Générales sur la Classe des Insectes, p. 204, pl. xxviii. 4, 5.

1823 (Say, W. Q. R.). T. Say, Descriptions of Neuroptera collected by the Expedition under Major S. H. Long; in *The Western Quarterly Reporter, vol. ii. p. 162-3; repr. by Le Conte 1859, vol. i. 171-2. *Baetis femorata*, *Cloeon posticata*, *Ephemera cupida*.

1824 (Say, Long's 2d Exp.). T. Say, Narrative of an expedition to the source of St. Peter's River, under Major S. H. Long; *W. Q. R. vol. ii. 303-5; ed. Le Conte 1859, vol. i. 203-4. *Baetis bilineata*, *alternata*, *alba*.

1824, J. Fleming, Article "Insecta," in Encyclopædia Britannica, Supplem. vol. v. 53. *Ephemeradæ*.

1825 (Lat. Fam.). P. A. Latreille, Familles Naturelles du Règne Animal, p. 434.

1825 (Dum. Elem.). A. M. C. Duméril, Elemens des Sciences Naturelles, ii. 142, pl. v. 16-7.

1827, C. G. Carus, Entdeckung eines einf. Blutkreisla. &c., *p. 16, pl. iii. Isis, iv. 317, pl. iv. 3. [Circulation in an *Ephem.* nymph.]

1828, O. G. Costa, Fauna di Aspromonte, pl. i. 2.

1829 (Cuv. R. A. ii.). G. L. C. D. Cuvier, Le Règne Animal, ed. ii. t. v. pp. 241-4.

1829 (Gor. & Prit.). Goring and Pritchard, Natural History Objects for the Microscope, *ed. i; ed. iii. pp. 61-9, pl. ii. 4-6.

1829, J. F. Stephens, The Nomenclature of British Insects (ed. i. of the Catalogue,) ii. 305-7, Nos. 3369-3409. [A mere list.]

1829, J. Curtis, A Guide to the Arrangement of British Insects, columns 132-3. [A mere list.]

1829-43 (Guér. Ic.). F. E. Guérin-Méneville, Iconographie du Règne Animal, vol. ii. part i. pl. lx. 7-9, vol. iii. 384. *E. limbata*.

[In M. de Selys-Longchamps' collections are Serville's types of *E. LIMBATA*, *Hexagenia*, 1 ♂ im.; *E. DIPTERA*, *Cloeon*, 1 ♂ im.]

1831, C. J. Carus, Fernere Untersuchungen über den Blutlauf in Kerfen; in Act. Acad. Leopold. Carol. Akad. t. xv. Abth. ii. p. 11. [A mere statement that circulation is observable in the wings of *E. lutea* and *marginata*.]

1832, R. Wagner, Beobachtungen über den Kreislauf des Blutes und den Bau des Rückengefäßes bei den Insecten; in Isis, ix. 322, pl. ii. 1.

1832 (Grif. A. K.). G. R. Gray, The Class "Insecta," in Griffith's Animal Kingdom, ii. 296 and 313-20, pl. xciv. 7, 9. [Figures from Guér. Ic.]

1833 (Bowerb.). J. S. Bowerbank, Observations on the circulation of blood in Insects; in Ent. Mag. i. 239-44, pl. ii. 1-6.

1834, A. H. Davis, Metamorph. of Ephemera; in Ent. Mag. ii. 322-3.

1834 (Sam. Ent. Cab.). G. Samouelle, Entomological Cabinet, ii. No. 53, pl. xxiv. 1.

1834 (Curt. Phil. Mag.). J. Curtis, Descriptions of some nondescript British species of May-flies of Anglers; in Lond. and Edinb. Philos. Mag. ser. 3, pp. 120-2. *E. fusca*. *B. dispar*, *costalis*, *elegans*, *mellea*, *straminea*, *flavescens*, *lateralis*, *semicolorata*, *carnea*, *vernus*, *autumnalis*. *C. marmoratum*, *obscurum*, *unicolor*, *dimidiatum*. *Brachycercus Harrisella*, *chironomiformis*, *minima*. [The numbers prefixed to the names in the text refer to the second ed. of the Guide.]

1834 (Curt. B. E.). J. Curtis, British Entomology, vol. xi. No. & pl. cccclxxxiv.

1835, E. Newman, The Grammar of Entomology, pp. 248 and 255. *Ephemerites* and *Ephemerina*.

1835 (Lamarck, ii.). J. B. P. A. de M. Lamarck, Hist. Nat. des Animaux sans Vertèbres, ed. ii., t. iv. 422-5. *E. Swammerdamia*.

1835-6, Allen Thompson, Article "Circulation," in Tod's Cyclopædia of Anatomy and Physiology, i. 651-2.

1835 (Ste. III.). J. F. Stephens, Illustrations of British Entomology, Mandib. vi. 53-70, pl. xxix. *E. cognata*, *talcosa*, *submarginata*, *dispar*, *apicalis*, *rufescens*, *rosea*, *helvipes*, *dubia*, *minor*. *Cænis macrura*, *dimidiata*, *pennata*, *interrupta*. *Ba. longicauda*, *subfusca*, *obscura*, *cingulata*. *Cl. ochraceum*, *hyalinatum*, *albipenne*, *cognatum*, *virgo*.

[The specimens in Stephens' collection are named in accordance with his Catalogue, not with the Illustrations. The ticketed specimens, however, partake in some measure of the nature of type specimens. Many of them are no doubt the originals of the descriptions in the Illustrations; for Stephens had not access to many collections of *Ephemeridæ*; his descriptions are mostly taken from dried examples; and many of these specimens are of an older date than 1835. Those of them which conform to the descriptions in the Illustrations similarly named, may, therefore, be presumed to be virtually authentic.

The collection comprises:—*E. VULGATA*, 5 ♂ im.; *COGNATA*, 3 ♂, 5 ♀ im.; *STIGMA*, 2 ♂ im.; *TALCOSA* 1 ♀ im.; *LUTEA*, 1 *Heptagenia elegans*, ♂ im.; *MARGINATA*, 2 *H. semicolorata*, ♂ im.; *SUBMARGINATA*, 1 *L. helvipes*, ♀ im., & 1 *B. phæops*, ♂ im.; *DISPAR*, ♂, 1 im., 1 subim.; *NRIGICANS*, 4 ♂ im.; (*DILUTA*, absent); *APICALIS*, 2 *Eph. ignita*, ♂ im., and 1 *B. phæops*, ♂ im.; *RUFESCENS*, 2 ♂, 8 ♀ im.; *DUBIA*, 2 ♂ im.; *HELVIPES*, 1 ♀ im.; *ROSEA*, 1 ♂, 1 ♀ im.; (*VESPERTINA*, absent). (*CÆNIS MACRURA*, wanting); *C. PENNATA*, 1 ♀; *BREVICAUDA*, 1 ♀; *CHIRONOMIFORMIS*, 1 *macrura*, ♀; *DIMIDIATA*, 2 ♂, 1 ♀. *BAETIS CAUDATA*, 1 ♂, 2 ♀ im.; *VENOSA*, 1 ♂, 2 ♀ im.; *SUBFUSCA*, 1 ♀ im.; *FLAVESCENS*, ♂ 1 subim., ♀ 1 im.; *BASALIS*, 2 ♂ im.; *STRIATA*, *B. phæops*, ♀ 1 im., 1 subim.; *PELOPA* (= *phæops*) 1 ♀ subim.; *OBSCURA*, 1 ♀ im.; *HORARIA*, 1 *Cloeon*, sp. dub., ♀ subim. and

Eph. ignita, 1 ♂, 1 ♀ im.; CULICIFORMIS, 4 *B. phæops*, ♂ im. and 1 *Closon*, sp. dub., ♀ subim.; FUSCATA, 1 *bucerratus*, ♂ im., 1 *C. luteolum*, ♂ im., *binoculatus*, ♂ 1 im., 1 subim., 2 *phæops*, ♂ im.; BIOCULATUS, 1 ♂ im., 7 *luteolum*, ♂ im.; CINGULATA, 2 ♂ im. CLOEON DIPTERA, ♀ 5 im., 3 subim.; OCHREACEA, 2 *C. luteolum*, ♀ im., 1 *B. binoculatus*, ♀ subim.; OBSCURA, 1 *B. binoculatus*, ♀ damaged; HYALINATA, 3 *C. luteolum*, ♀ im.; DORSALIS, 3 *C. luteolum*, ♂ im.; COGNATA, 1 ♂ im.; CONSOBRINUS, ♂ 4 im., 1 subim.; VIRGO, 1 *dipterum*, ♂ im., 1 *russulum*, ♀ im., damaged. There are also—*E. minor*, 1 ♀ im.; *B. lateralis*, 1 ♂ im.; *B. annulata*, 1 ♀ im.; *B. parvula*, 1 ♂ im.; and *B. verna*, 1 ♀ im.

*1836, F. J. Ehrenberger, *Dissertatio inauguralis Zoologica de Neuropterorum anatomia et physiologia*. (Hag.)

1836 (Westw. Part. Cyc.). J. O. Westwood, in Partington's *British Cyclopædia*, ii. 439. *Macrocerus*.

1836 (Ronalds i.). A. Ronalds, *The Fly-fisher's Entomology*, ed. i. [Pls. ix, xiii. & xiv. alone in this edition are worth citing. The figures in the later editions are mostly inferior to those in ed. i.]

[The types comprise, — ii. *Baetis phæops*, ♀ subim.; iii. *Heptagenia longicauda*, ♀ im.; viii. *H. venosa*, ♀ im.; xv. *H. longicauda*, subim.; xvi. *Baetis*, sp. dub., subim.; xvii. *Baetis*, sp. dub.; xix. *H. elegans*, ♀ 1 im., 1 subim.; xxii. *H. insignis*, ♂ subim.; xxiii. *Baetis*, sp. dub., subim.; xxv. a fragment; xxviii. *E. danica*, ♀ subim.; xxix. *E. danica*, ♀ im.; xxxi. *E. vulgata*, ♂ im.; xxxii. & xxxiii. absent; xxxviii. & xlii. each *H. longicauda*, subim.; xliii. *Cl. russulum*, ♀ subim. The Roman numerals are index numbers to the work.]

1837, G. Dahlbom, *Kort Underättelser om skandinaviska Insekter*, pp. 227-8, No. 151.

1838 (Curt. B. E.). J. Curtis, *British Entomology*, vol. xv., No. & pl. dcccviii.

1838, J. T. Lacordaire, *Introduction à l'Entomologie*, ii. 77. [Circulation described.]

1838 (Perch. Gen.). E. Guérin & A. B. Percheron, *Genera des Insectes*, &c., livr. vi. pl. iv. *E. albicans*.

1839 (Burm. Handb.). H. C. C. Burmeister, *Handbuch der Entomologie*, Bd. ii. Abth. ii. pp. 796-804 and 1015. *Orycypha lactea, luctuosa, discolor. Cloe halterata, pumila. (Baetis) fusca, marginalis, aurantiaca, reticulata, luridipennis. Palingenia horaria, dorsalis*.

1839, G. Newport, Article "Insecta," in *Tod's Cyclopædia of Anatomy and Physiology*, ii. 864, fig. 345; and (circulation) p. 979.

1839, T. Say, *Descriptions of New N. American Neuropterous Insects*; in *Journ. Acad. Nat. Sci. Philadelphia*, viii. 41-4; ed. Le Conte, 1859, ii. 411-13. *B. interpunctata, arida, verticis, obesa. E. hilaris*.

1840 (Zet.). J. W. Zetterstedt, *Insecta Lapponica*, columns 1044-6, Nos. 1-9. *E. hyalinata, vitrea*.

1840 (Westw. Intr.). J. O. Westwood, *Introduction to the modern classification of Insects*; vol. ii. *Addenda*, p. viii. Text, pp. 24-34, fig. lxi. 1-20. *Generic Synopsis*, p. 47, *Addenda to the Generic Synopsis*, 158. *Neuropt. Biomorphotica. Leptophlebia, Brachyphlebia*.

[The types in Prof. Westwood's Cabinet, are:—LEPTOPHLEBIA, 1 *marginata*, ♀ im., and 1 *Eph. ignita*, ♂ im.; BRACHYPHLEBIA, 2 *Ba. binoculatus*, ♂ im.; BAETIS, *Heptag. elegans*.]

1840, Triepke, *Einige Bemerkungen über Ephemera flosaquæ*, Illiger; in *Stet. Ent. Zeit.* i. 54-8.

1840, F. S. Voigt, *Lehrbuch der Zoologie*, v. 309-11.

1840, G. A. W. Herrich-Schäffer, Fauna Ratisbonensis, von K. L. Koch, Dr. A. Schäffer, und F. Forster, p. 346, Nos. 161-88. [A list.]

1840 (Blanch. N. H.). E. Blanchard, Hist. Nat. des Insectes, t. i. p. xxiv. Introd. Anatomie et Physiologie (circulation by Brullé); t. iii. 52-5, Nos. 1-11, pl. iii. 1.

1841 (Duf. Beech.). Léon Dufour, Recherches anatom. et physiolog. sur les Orthoptères, les Hyménoptères, et les Névroptères, part iii., in Mém. par divers savans, Institut. de France, t. viii. pp. 560-4, 578-82; pl. xi. 167-8, anatomy. P. 580, footnote, *E. flavipennis, nigrimana*.

1841 (Burm.). H. C. C. Burmeister, Article "Ephemera," in Ersch & Gruber's Encyclopädie der Wissenschaften. Theil xxxv. 312-16.

1842 (Ramb. Névr.). J. P. Rambur, Hist. Nat. des Ins. Névroptères, pp. 293-9, pl. viii. 2. *E. hispanica, angustipennis, flavicans, rufa, chlorotica, obscura, subinfuscata, brunnea, affinis*.

[The types sent to me by M. le Baron E. de Selys-Longchamps were:—*E. LUTEA*, 1 *E. glaucops*, ♀ im.; *E. HISPANICA*, 1 *E. danica*, ♂ im.; *E. LONGICAUDA*, 1 *Palingenia longicauda*, ♂ subim.; *E. ANGUSTIPENNIS*, 1 *Heptagenia*, ♀ subim.; *E. FLAVICANS*, 1 *Potamanthus luteus*, ♀ im.; *E. RUFa*, 1 *Heptagenia (venosa?)*, ♀ im.; *E. CHLOBOTICA*, 1 *Pot. luteus*, ♂ subim.; *CLOE OBSCURA*, 4 *Cloeon*, ♀ subim.; *C. SUBINFUSCATA*, 1 *Cloeon*, ♀ subim.; *C. BRUNNEA*, 1 *Heptagenia lateralis*, ♂ subim.; *C. AFFINIS*, 1 *Cloeon dipterum*, ♂ im.; *C. PUMILA*, 1 *Cloeon russulum*, ♂ im.; *C. HALTERATA*, 1 *Cloeon russulum*, ♀ im.

There were also *CLOE DIPTERA*, 1 *Cloeon dipterum*, ♀ im.; *E. MADRITENSIS* (Ramb. MS.), 1 *Heptag. angustipennis*, ♀ im.; *E. LONGICAUDA*, 1 *Pot. luteus*, ♂ im.; and a *CENTROPTILUM LUTEOLOM*, ♂ im.; from Rambur's collection, not types.]

1843, J. Atkinson, Notes on Ephemera, in The Zoologist, i. 272-5.

1843-5 (Pict. Eph.): F. J. Pictet, Hist. Nat. des Ins. Névroptères. Famille des Ephémérines. *E. glaucops, guttulata. Pal. puella, indica, Savignyi. Ba. fluminum, cyanops, montana, purpurascens, semitincta, corea, flavola, guttata, australasica. Potamanthus Ferreri, Geerii, castaneus, brunneus, gibbus, æneus*, (and *erythrocephalus*, a misprint for *erythrophthalmus*). (*Cloe*) *Rhodani, translucida, alpina, melanonyx, litura, fasciata, undata. (Cænis) grisea, argentata, varicauda, oophora. Oligoneuria anomala*.

[As the authentic and spurious specimens are not distinguished in M. Pictet's collection, an accurate enumeration of them could not be made. The collection contained:—*E. VULGATA, E. danica; DANICA, vulgata; GLAUCOPS. BA. FLUMINUM*, subim.; *VENOSA*, im.; *CYANOPS; PURPURASCENS, venosa*, ♂ im.; *SEMICOLORATA*, ♂ and ♀ im.; *SEMITINCTA, semicolorata*, ♂ and ♀ im. *POT. (marginatus, L.)* unnamed; *GEERII, L. helvipes*, ♂ im. subim.; *CINCTUS, L. cincta*, and 1 *fusca; ERYTHROPTALMUS, E. ignita. CLOE RHODANI, B. Rhodani*, with 2 *C. luteolum*, subim., and 1 *C. russulum*, ♂ im.; *PUMILA; TRANSLUCIDA, C. luteolum; MELANONYX, C. russulum*, ♂ im., var. I; *DIPTERA; CÆNIS LACTEA; (POLYMITARCTYS SAVIGNII*, unnamed).]

1845 (Schn.). W. G. Schneider, Verzeichniss der von Herrn Zeller im Jahre 1844 in Sicilien und Italien gesammelten Neuropteren, &c.; in Stet. Ent. Zeit. vi. 340, Nos. 13-14. (*Cloe*) *fusca*.

1846 (Fons.). E. L. J. H. Boyer de Fonscolombe, Notes sur huit espèces nouvelles d'Hyménoptères et de Névroptères trouvées aux environs d'Aix; in Ann. Soc. Ent. Fr., ser. 2, t. iv. 49-51. *E. caliciformis* (a misprint).

1846 (?), (Lab. & Imh.). J. D. Labram and L. Imhoff, Insecten der Schweiz, Bd. iv. (one plate, not numbered).

1847, M. C. Verloren, Sur la circulation dans les Insectes; in Mém. Couron. Acad. Roy. Belg. t. xix. 49, pl. i.

1847, Ant. & Giov. Bap. Villa, Comparsa periodica delle Efimere nella Brianza; in *Economista*, Novemb. 1847, p. 1-6 [illustrated].

1847 (Lat. Nouv. Dict.). P. A. Latreille, Nouv. Dict. d'hist. Nat., t. x. 348-9, pl. xix. 5.

1848 (Corn.). C. Cornelius, Beiträge zur näheren Kenntniss der *Palin-genia longicauda*, Ol.; 38 pp., 4 pl.

1848 (Cuv. B. A., Crochard ed.). E. Blanchard, in Cuvier's Reg. Anim. by Crochard, t. xiii. 88-92, t. xiv. pl. cii. 1-1c.

1848 (Cal.). L. Calori, Sulla generazione vivipara della *Clos diptera*; in *Nouv. Ann. So. nat. Bologna, ix. 38-53, pls. ii-iii. 1-18; separate, pp. 16.

1849 (Hag. Ueber.). H. A. Hagen, Uebersicht der neueren Literatur, betreffend die Neuropteren Linné's; in Stet. Ent. Zeit. x. 354-71. [In the critique of Pict. Ephem. (1843-5), Dr. Hagen indicated in this paper a genus *Potamanthus*, restricted (type *P. gibbus*, Pict.); but he did not adopt the genus in his later writings. Mr. Walsh afterwards described this genus, with additional species, under the name *Ephemerella*. I have passed by Dr. Hagen's usage, and have adopted the later name for the genus.]

*1850, L. H. Fischer, Beiträge zur Insecten-Fauna um Freiburg im Breisgau; in Jahresb. des Mannheim. Ver. für Naturk. pp. 60-70 (Hag.).

1851 (Sieb. Beitr. xii.). C. T. E. von Siebold, Beiträge zur Fauna der wirbellosen Thiere Preussens (12th Beitr.); in *Neu. Preuss. Provinzial Blatt. Bd. xi. 3, Nos. 1-18. [A mere list.]

1851 (Blanch. Ohili). E. Blanchard, in C. Gay's Historia física y política de Chile, vi. 103-7; Atl. Zool. Ent. Névro. lam. ii. 2-3. (*Clos vitripennis*).

*1852 (Imh. Bericht). L. Imhoff, *Oligoneuria rhenana*; in Bericht über Verhandl. d. naturf. Gesellsch. in Basel, x. 177-80. *O. rhenana*.

*1853, J. A. Herklots, Het Haft, de langgestaarte Eendagsvlieg; in Jahrb. k. Zool. Genootsch. Amst. pp. 117-123.

*1853, Forster, Notiz über die Eintagsfliege; in Corresp. Bl. zool. mineral. Ver. Regensburg, vii. 91-3.

1853 (Kirsch. Ent. Misc.). C. L. Kirschbaum, Entom. Miscellen; in Jahrb. Vereins f. Naturk. Nassau, Heft. ix. pp. 44-5.

1853 (Walk. Cat.). F. Walker, List of Neuropterous Insects in the British Museum. Part iii. pp. 535-86. *E. simulans*, *Colombica*, *decora*, *Hebes*, *australis*. *Pal. lata*, *viridescens*, *occultata*, *natata*, *humeralis*, *bicolor*, *pallipes*, *concinna*, *nebulosa*, *albiflura*, *latipennis*, *vitrea*. *Ba. angulata*, *remota*, *vicaria*, *basalis*, *tessellata*, *albiritta*, *annulata*, *Taprobanes*, *determinata*, *invaria*, *fusca*, *debilis*, *canadensis*, *fuscata*, *scita*, *torrida*, *ignota*. *Cen. diminuta*, *sinensis*, *perpusilla*.

[The general collection of the British Museum contained in 1853:—*E. VULGATA*, ♂ 1 subim., 2 im., 1 *danica*, ♀ im.; *DANICA*, 2 ♀ im.; *SIMULANS*, 1 *decora*, ♂ subim.; *COLOMBICA*, 1 *Leptophlebia*, ♀ subim.; *DECORA*, 1 ♂ im.; (*HEBES*, wanting); *AUSTRALIS*, subim. 1 ♂, 3 ♀. *POT. LUTEUS*, 1 *Leptophlebia marginata*, ♂ subim.; *MARGINATUS*, 1 ♂ im.; *CINCTUS*, 1 *Leptophlebia fusca*, ♂ im.; *EYTHROPTHALMUS*, *Ephemerella ignita*, 2 ♀ im.; *ROSEUS*, *E. ignita*, 1 ♀ im.; *COSTALIS*, im. 1 ♂, 2 ♀. *PAL. VIRGO*, 1 ♂ subim.; *ALBICANS*, 1 ♀ im.; *LATA*, 3 ♂ subim.; *VIRIDESCENS*, 1 *H. bilineata*, ♀ subim.; *OCULTATA*, *bilineata*, 3 ♀ subim.; *NATATA*, 2 *E. decorata*, ♀ subim.; *HUMERALIS*, 1 ♀ subim.; *BICOLOR*, 1 *Siphurua*, ♀ subim.; *PALLIPES*, *Leptophlebia cupida*, 1 ♂ subim., 2 ♀ im.; *CONCINNA*, *L. cupida*, 1 ♂ im.; *NEBULOSA*, 2 *Leptophlebia*, ♂ im.;

ALBIFILUM, *Campsurus albifilum*, 1 ♂ im. & *A. curtus*, 1 ♂ im.; LATIPENNIS, 1 (♀ subim., ♀ im., ♂ im.), & 1 sp. dub. ♀ subim.; VITREA, 1 *Heptagenia*, ♀ subim. BA. FLUMINUM, *H. venosa*, 2 ♀ subim.; VENOSA, 1 *H. longicauda*, ♂ ♀ im.; MONTANA, 2 *H. insignis*, ♂ im.; LATERALIS, 1 ♀ im.; SEMICOLORATA, 1 ♂ im.; CEREALIS, 1 *H. flavipennis*, ♂ ♀ im.; FLAVIOLA, *H.* 1 ♀ im. subim., sp. dub. 1 ♀ subim.; AUSTRALASICA, 2 *Leptophlebia*, ♂ im.; ELEGANS, 1 *H.* ♀ subim.; SUBFUSCA, 1 *Leptophlebia marginata*, ♂ im.; LURIDIPENNIS, 1 *H.* ♂ im.; ANGULATA, 1 *Hexagenia bilineata*, ♂ im.; (REMOTA, wanting); VICARIA, 1 *H.* ♂ im.; BASALIS, 1 *H.* ♂ im.; TESSELLATA, 1 *H. vicaria*, ♀ subim.; ALBIVITTA, *Hexagenia*, ♂ 1 subim. 2 im.; ANNULATA, 1 *Siphilurus*, ♂ im.; TAPROBANES, 1 *Leptophlebia*, ♂ im.; DETERMINATA, 1 *H.* ♂ im. (now a fragment merely); INVARIATA, 3 *Ephemerella*, ♂ im.; FUSCA, (a. b.) *H.* ♂ ♀ im., (c), *Leptophlebia cupida*, 1 ♂ im.; DEBILIS, 1 *L. cupida*, ♂ im.; CANADENSIS, 2 *H.* ♂ im.; FUSCATA, 1 *Ephemerella invaria*, ♂ im. subim.; SCITA, 2 *Leptophlebia* ♂ im.; TORRIDA, 1 *H.* ♀ im.; IGNOTA, 1 *Isonychia*, ♂ im.; No. 45, 1 *Leptophlebia cupida*, ♀ im. CL. BIUCULATA, (e, f), 2 ♂ im., (g) sp. nondescript. 1 ♂ im.; PUMILA, 1 *B. binoculatus*, ♂ im.; TRANSLUCIDA, 2 *B. binoculatus*, ♀ im.; DIPTERA, (a-c) ♀ im.; CULICIFORMIS, 1 *Leptophlebia helvipes*, ♀ im.; STRIATA, 2 *Ephemerella ignita*, ♀ subim.; VERA, 1 *B. phaeops*, ♂ im.; CINGULATA, 1 *Ephemerella ignita*, ♂ im.; HYALINATA, 1 *binoculatus* & 1 *luteolum*, ♀ im.; CÆN. BREVICAUDA, 1 ♀ im.; DIMINUTA, 1 ♂ im.; SIKENSIS, 1 *Closon russulum*, ♂ im.; PERPUSILLA, 1 ♂ im.]

1854 (Pict. Trait. de Pal.). F. J. Pictet, *Traité de Paléontologie* (ed. 2) ii. 371. *Palingenia macrops*, *Baetis anomala*, *Potamanthus priscus*.

*1854 (Letz.). K. Letzner, Ueber *Palingenia virgo*; in *Arbeit. schles. Gesellsch.* p. 101.

1854 (Hag.). H. A. Hagen, Ueber die Neuropteren der Bernstein Fauna; in *Verh. zool.-bot. Ver. Wien*, iv. 221-32. [A mere list, containing the new names:—*Palingenia gigas*, *Baetis longipes*.]

1854 (Hag.). H. A. Hagen, Auffällig nördliches Vorkommen dreier grosser südeuropäischer Insekten; in *Stet. Ent. Zeit.* xv. 316-19.

1855 (Hag.). H. A. Hagen, Die Ephemeriden-Gattung *Oligoneuria*; in *Stet. Ent. Zeit.* xvi. 267-70, tab. i. *O. rhenana*, var. *pallida*.

1856 (Pict. & Hag.). F. J. Pictet and H. A. Hagen; in C. G. Berendt's *Organische Reste im Bernstein*, Bd. ii. 73-7, tab. vi. 1, 2; viii. 5. *Ba. gigantea*, *grossa*.

1856 (Ronalds, v.). A. Ronalds' *Fly-fishers' Entomology*, ed. v. [In this edition, names were added to the original explanations of plates, and No. 29 is an Ephemeroidea.]

1857 (Brauer). F. Brauer, *Neuroptera Austriaca*, pp. xvi, xvii. 24-27.

1858-59 (Hag. Syn. Ceyl.). H. A. Hagen, *Synopsis der Neuroptera Ceylons*; in *Verh. zool.-bot. Gesells. Wien*, Part I, 1858, vol. viii. pp. 476-7, Nos. 22-31. *Pot. fasciatus*, *annulatus*, *femorialis*. (*Cloe tristis*, *consueta*, *solida*, *signata*, *marginalis*. Part II, 1859, vol. ix. p. 206, Nos. 29-30.

[In the collection of M. de Selys-Longchamps are the types of:—*P. fasciatus*, *Ephemerella*, 1 ♀ subim.; *P. ANNULATUS*, *Leptophlebia*, 1 ♂ im.]

1859 (Hag.). H. A. Hagen, Ueber das Vorkommen von *Palingenia longicauda* in Preussen; in *Stet. Ent. Zeit.* xx. 431.

1859 (Schi.). J. C. Schiödt; in *Berlin. Ent. Zeit.* iii. 143.

1859 (Say, Le Conte rep.). J. L. Le Conte, *The complete Writings of Thomas Say on the Entomology of N. America*, i. 171-2 (Say, W. Q. R.); i. 203-4 (Say, Long's 2d. Exp.); ii. 411-13 (Say, *Journ. Acad. Nat. Sc. Philad.* 1839).

1860 (Walk.). F. Walker, Characters of undescribed *Neuroptera* in the collection of W. W. Saunders, Esq., F.R.S.; in Trans. Ent. Soc. Lond. N. S. vol. v. pp. 196-9. *E. dislocans*. *Pot. exspectans*. *Pal. continua*, *annulifera*. (*Cloeon*) *debilis*.

[The types, now in the British Museum, are *E. DISLOCANS*, *Leptophlebia*, 1 ♂ im.; *P. EXSPECTANS*, *Ephemera*, 1 ♀ subim.; *P. CONTINUA*, *Hexagenia albivitta*, 1 ♀ im.; *P. ANNULIFERA*, *Heptagenia*, 1 ♀ im.; *C. DEBILIS*, *Baetis*, 1 ♀ im.]

1860 (Kolen.). F. A. Kolenati, Einige neue Insekten-Arten von Alt-ater; in Wien. Ent. Monatschrift, iv. 383. *Ba. iridana*.

1860 (Hag.). H. A. Hagen, Examen des Névroptères (non Odonates) recueillis en Sicile par E. Bellier de la Chavignerie; in An. Soc. Ent. Fr. 3 ser., viii. 746. *Ba. Bellieri*.

[The type in M. de Selys-Longchamps' collection is *B. BELLIERI*, *Heptagenia*, 1 ♀ im.]

1861 (Hag.). H. A. Hagen, Synopsis of the Neuroptera of N. America, with a list of the S. American species; in Smithsonian Miscellaneous Collections, pp. 38-55. *E. pudica*. *Pal. Hecuba*, *decolorata*. *Ba. ignava*. (*Cloes*) *mollis*, *pygmaea*, *vicina*. *Cæ. amica*. [*Ba. tessellata* and *Cloes unicolor* are paronyms.]

[The types in the collection of M. de Selys-Longchamps are:—*P. HECUBA*, *Euthyplocia*, 1 ♀ im.; *B. VICARIA*, *Heptagenia luridipennis*, 1 ♂ im.; *C. MOLLIS*, *Leptophlebia*, 1 ♂ im.]

1861, F. Loew, Beiträge zur Kenntniss der Orthopteren; in Verh. zool.-bot. Gesells. Wien, xi. 409-10.

1862, B. D. Walsh, List of the Pseudo-Neuroptera of Illinois contained in the cabinet of the writer, &c.; in Proc. Acad. Nat. Sc. Philad. pp. 367-81. *Ba. sicca*. *Pot. odonatus*. *Pal. vittigera*, *flavescens*, *pulchella*, *terminata*. *E. flaveola*. *Ephemerella excrucians*, *consimilis*. *Bætisca* (*obesa*, Say). (*Cloes*) *ferruginea*, *fluctuans*, *dubia*, *mendax*.

[The types sent by the late Mr. Walsh to me were:—i. *PENTAG. VITTIGERA*, 1 ♂ im.; ii. *HEXAG. LIMBATA*, 1 ♂ im.; iii. *HEPTAG. FLAVESCENS*, 1 ♂ im.; iv.-vii. *BÆTISCA OBESA*, 4 (♂ im., ♀ im., ♂ subim., ♂ pupal shell); viii. ix. *EPHEMERELLA EXCRUCIANS*, 2 *E. invaria*, ♂ im. The Roman numerals denote those on the tickets affixed to the types in the British Museum.]

1863 (Hag. & Walsh). Observations on certain N. American Neuroptera, by H. A. Hagen; with notes and descriptions of new species of N. American Pseudo-Neuroptera, by B. D. Walsh; in Proc. Ent. Soc. Philad. ii. 169-179 (Hag. Obs.); and ii. 188-207 (Walsh, Notes). *Cænis nigra* (undescribed). *Pentagenia*; *Hexagenia*; *Heptagenia*. *Pentag. quadrupunctata*. *Heptag. simplex*, *cruentata*, *maculipennis*. *E. myops*.

1863 (Hag. Brit. Syn.). H. A. Hagen, Synopsis of the British *Ephemeridæ*; in Entomologist's Annual, pp. 1-35.

1863, J. Lubbock, On the development of *Chloeon* [*Ephemera*] *dimidiata*, Part I; in Trans. Lin. Soc. Lond. xxiv. 61-78, pls. xvii-xviii.

1864, B. D. Walsh, On the pupa of the Ephemerous genus *Bætisca*; in Proc. Ent. Soc. Philad. pp. 200-6.

1864, J. F. Stein, Beitrag zur Neuropteren-Fauna Griechenlands; in Berlin. Ent. Zeit. vii. 411. *Pot. Krueperi*.

1864 (Meyer). L. R. Meyer-Dür, Zusammenstellung der auf meiner Reise durch Tessin und Ober Engadine, &c.; in Mith. Schw. Ent. Ges. i. 219-21. *Ba. Picteti*.

1864 (Hag.). H. A. Hagen, Névroptères (non Odonates) de la Corse, &c.; in An. Soc. Ent. Fr. ser. 4, vol. iv. pp. 88-9. *Ba. fluminum*, var. ? *fallax*, *sebrata*. *Pot. modestus*.

[In the collection of M. de Selys-Longchamps are Dr. Hagen's types of *B. FLUMINUM*, *Hept. sebrata*, 1 ♂ im.; *B. FALLAX*, 1 *sebrata*, ♂ subim.; *B. SEBRATA*, 1 ♂ subim., 1 ♀ im.; *B. VENOSA*, 1 subim., 1 ♀ im.; *P. MODESTUS*, 1 *Leptophlebia*, ♂ im., and 1 *B. Rhodani*, ♀ subim.; *C. PUMILA*, 1 *B. ♀* subim.; *C. RHODANI*, 1 *B. ♂* im.; *C. DIPTERA*, 2 *Cloeon*, ♂ im.]

1865 (Hag.). H. A. Hagen, The Neuroptera of Madeira; in The Entomologist's Monthly Magazine, i. 25-6. (*Cloe*) *maderensis*.

[In Mr. Wollaston's collection (Brit. Mus.) are *C. DIPTERA*, 2 *Cloeon*, ♀ im.; *C. MADERENSIS*, *B. Rhodani*, ♂ 4 im., ♀ 2 im., 1 subim.]

1865 (Ed. Pict.). A. E. Pictet, Synopsis des Névroptères d'Espagne, pp. 22-6, pl. iii. *Ba. flavida*, *sylicicola*.

[In M. Ed. Pictet's collection were *B. FLAVIDA*, *Stiphylurus*, ♂ im.; *B. SYLVICOLA*, *Heptagenia*, ♂ im., named; and *Ephemerella ignita*, ♂ im., from San Ildefonso, unnamed.]

1865 (A. Müll.). A. Müller, Observations on the habits of *Oligoneuria rhenana*; in Ent. Mo. Mag. i. 262.

1865 (Etn.). A. E. Eaton, Occurrence of the female imago of *Cloeon* under submerged stones; in Ent. Mo. Mag. ii. 14. (*Baetis*.)

1865, Lubbock (see 1863), Part. II, in Trans. Linn. Soc. xxv. 477-92, pl. lviii-lix.

1865, W. Houghton, *Ephemer*, the May Fly; in The Intellectual Observer, vi. 147-54, pls. i, ii.

1866, Tuffen West, Description of the Skin cast by an *Ephemer* in its Pseudimago condition; in Trans. Microscop. Soc. Lond. xiv. 69-70, pl. vii. 8-11.

1866 (A. Müll.). A. Müller, Further Notes on *Oligoneuria rhenana*; in Ent. Mo. Mag. ii. 182.

1866, F. Loew, in Verh. zool.-bot. Ges. Wien, xvi. 947.

1866 (Etn.). A. E. Eaton, On some species of the Orthopteron genus *Cloeon*, Leach, (as limited by M. Pictet); in Ann. & Mag. Nat. Hist. ser. 3, vol. xviii. pp. 145-8 (illustrated). *Clocoptis*.

1867 (Etn.). A. E. Eaton, On some British Neuroptera; in Ann. & Mag. Nat. Hist. ser. 3, vol. xix. p. 401.

*1867, M. T. Ratzel; in Zeitsch. f. wiss. Zool. xviii. 99. [On the egg of an Ephemerid.]

1867 (Oul.). B. Oulianine, (in Russian), Neuroptera and Orthoptera of the province of Moscow, pp. 25-9.

1868 (M'Lach.). B. M'Lachlan, On a new species belonging to the Ephemerideous Genus *Oligoneuria*; in Ent. Mo. Mag. iv. 177-8. *O. Trimeniana*. [The type is 1 ♀ im., in Mr. M'Lachlan's collection.]

*1868, H. Gernacher, Beiträge zur Kenntniss des Eies der Ephemeriden; in Zeits. f. wiss. Zool. xix. 95.

1868 (Braun. Ver.). F. Brauer, Verzeichniss der bis jetzt bekannten Neuropteren im Sinne Linné's; in Verh. zool.-bot. Gesellsch. Wien, xviii. 361, 363, 387-9.

1868 (Braun. Reise Novara). F. Brauer, Reise der Fregatte Novara, Zool. Theil, Bd. ii. Abth. i. 104. [A list.]

1868, B. D. Walsh, The Bug-hunter in Egypt (S. Illinois); in *The American Entomologist*, i. 6, fig. i. b. c.

1868 (Hag.). H. A. Hagen, On *Lachlania abnormis*, a new Genus and Species from Cuba, belonging to the *Ephemerina*; in *Proc. Boston Soc. Nat. Hist.* pp. 372-4, fig.

1868 (Etn.). A. E. Eaton, in *Trans. Ent. Soc. Lond.* 1868, p. 142. *Ecdyonurus* (misreading for *Ecdyurus*).

1868 (Etn.). A. E. Eaton, An outline of a re-arrangement of the genera of *Ephemeridæ*; in *Ent. Mo. Mag.* v. 82-91. *Tricorythus*, *Campsurus*, *Polymitarcys*, *Coloburus*, *Siphylurus* (mis-spelt *Siphlonurus*).

1868 (Etn.). A. E. Eaton, On some points in the anatomy of the immature *Cenis macrura* of Stephens; in *Trans. Ent. Soc. Lond.* 1868, pp. 279-82.

1869 (Ausser. Neur. Tirol.). C. Ausserer, Neurotteri Tirolesi; in *Annuario della Soc. Natur. Modena*, An. iv. 131-7.

1869 (Etn.). A. E. Eaton, On *Centroptilum*, a new genus of the *Ephemeridæ*; in *Ent. Mo. Mag.* vi. 132. *Centroptilum (luteolum)*.

1870 (Etn.). A. E. Eaton, On some new British species of *Ephemeridæ*; in *Trans. Ent. Soc. Lond.* 1870, pp. 1-8. *E. lineata*. *Cl. simile*. *Centropt. pennulatum*. *Ba. scambus*, *atrebatinus*, *phaeops*, *tenax*, *bucera-tus*, *niger*. *Siphyl. armatus*, *lacustris*. *Heptag. volitans*, *insignis*.

1870 (Etn.). A. E. Eaton, A Catalogue of British Neuroptera. [The Fam. *Ephemeridæ*]. Pp. 7-11. [A mere list.]

1871 (Etn.). A. E. Eaton. In this present monograph I describe the following new genera and species. (*Campsur.*) *cuspidatus*, *quadridentatus*; (*Athenopus*) *curtus*; (*Polymit.*) *Savignii*; (*Euthyplocia*); (*Ephem.*) *immaculata*, *serica*; (*Leptophl.*) *furcifera*, *inconspicua*, *dentata*, *strigata*, *nodularis*, *auriculata*, *mollis*; (*Centropt.*) *stenopteryx*; (*Baetis*) *finitimus*, *amicus*, *pictus*; (*Siphyl.*) *Linnæanus*; (*Isonychia*) *manca*; (*Colobur.*) *hal-leuticus*; (*Cronicus*); (*Heptag.*) *nivata*, *borealis*, *cupulata*, *alpicola*: in all, four new genera, twenty-four species.

[The types of new species described in (Etn. 1870) and (Etn. 1871) are in the following collections:—

In Mr. Wormald's, *S. armatus*; in Linné's, *S. Linnæanus*; in Mr. Walker's, *L. furcifera*, *C. hal-leuticus*; in Mr. Dale's, *C. 4-dentatus*, *S. Linnæanus*, *H. borealis*; in M. de Selys-Longchamps', *C. cuspidatus*, *Euthyplocia*, *L. mollis*; in the Oxford Museum, *E. immaculata*, *L. inconspicua*; in Mr. McLachlan's, *P. Savignii*, *Euthyplocia*, *L. strigata*, *nodularis*, *auriculata*, *mollis*, *C. stenopteryx*, *B. pictus*, *I. manca*, *S. armatus*; the rest are in the British Museum.]

Nominibus homonymicis signa anteposita significant:—

|| nomen præoccupatum.

‡ nomen abusum.

Signo ! nomini auctoris præmisso, me exemplar typicum insecti sui vidisse, significatur.

Ante nomina generum numeralia loca systematica generum designant.

INDEX SPECIERUM,

Operibus supra enumeratis descriptarum.

- IV. *ASTHENOPUS*, n. g.—*Palingenia*, auct., p. Typ. *A. curtus*.
curtus, ! nov. sp.; in *Palingenia*, Hag., *Campsurus*, Etn. [not described];
 ♂ im.
dorsalis, Burm.; in *Palingenia*, Burm.
- XX. *BÆTIS*, Leach, 1815; Sam. 1819; Etn. 1868. Typ. *B. binoculatus*.
 † *Baetis*, Say, Curt., et auct., p.—*Heptagenia*, &c.
albivitta, ! Walk. Cat. 566; Hag. Am. Syn. 804, list; = *Hexagenia*, ♂ im.
albus (alba), Say, Long's 2d Exp. ii. 805; Le Conte, rep. i. 204; Walsh,
 Proc. Ent. Soc. Philad. ii. 170, 193, Note 12, in *Clos* (A.); in
Palingenia, Hag. ♀.
alpinus, Pict.; in *Clos*, Pict.; *Closon*, Walk.
alternata, Say, Long's 2d Exp. ii. 304; Le Conte, rep. i. 203; Hag. Am.
 Syn. 49; Walsh. Proc. Acad. Nat. Sc. Philad. 1862, p. 369, &
 Proc. Ent. Soc. Philad. ii. 169, 189 = *Siphylurus*.
amicus, ! nov. sp.
angulata, ! Walk. Cat. 564 = *Hexagenia bilineata*, ♂ im.
angustipennis, ! Ramb. in *Ephemera*; Ed. Pict. Nevr. d'Esp. 23 = *Hepta-*
genia, ♀ subim.
annulata, Pr., in *Ephemera*;— indeterminate.
 † *annulata*, ! Walk. Cat. 567; Hag. Am. Syn. 48 = *Siphylurus*; ♂ im.
anomala, Pict. Trait. de Pal. ed. 2, ii. 371; Hag. Verh. zool.-bot. Ver.
 Wien, 1854, p. 237; Hag. & Pict. Org. Rest. im Bernst. ii. 75,
 pl. vi. 1, b. c. = *Cronicus*, ♂ im.
arida, Say, Journ. Acad. Nat. Sc. Philad. viii. 42; Walk. Cat. 562; Le
 Conte, rep. ii. 412; Hag. Am. Syn. 46; Walsh, Proc. Acad. Nat.
 Sc. Philad. 1862, p. 370, & Proc. Ent. Soc. Philad. ii. 170, 191,
 Note 8, 192, Note 11 = *Siphylurus*.
atrolatinus, ! Etn. Trans. Ent. Soc. 1870, p. 4, ♂.
aurantiaca, Burm. Handb. ii. 801; Her.-Schæf. 846; Pict. Ephem. 191;
 Walk. Cat. 560 = *Heptagenia iridana* ?
australasica, Pict. Ephem. 189, pl. xxiv. 1, 2; Walk. Cat. 559 = *Lepto-*
phlebia, ♂.
autumnalis, Curt. Phil. Mag. 1834, p. 121; Ste. Ill. vi. 67 = [probably a
 monstrous ♂] *binoculatus*.
basalis, ! Walk. Cat. 565 (nec Ste. Cat.); Hag. Am. Syn. 50 = *Heptagenia*,
 ♂ im.
Bellieri, ! Hag. An. Soc. Ent. Fr. 1860, p. 746 = *Heptagenia*, ♀ im.
bilineata, Say, Long's 2d Exp. ii. 308; Le Conte, rep. i. 203 = *Hexagenia*,
 ♂ im.
binoculatus (*bioculata*), Lin., in *Ephemera*, Lin.; Leach, E. Enc. ix. 137;
 Sam. E. Comp. 259, Ent. Cab. ii. n. 53, pl. xxiv. 1; Ste. Ill. vi.
 65.
bucrotus, ! Etn. Trans. Ent. Soc. 1870, p. 5; ♂ im.
canadensis, ! Walk. Cat. 569; Hag. Am. Syn. 47 = *Heptagenia*, ♂ im.

BAETIS (continued).

- carnea*, Curt. Phil. Mag. 1834, p. 121; Ste. Ill. vi. 65; Pict. Ephem. 198; Walk. Cat. 560; indeterminable.
- cerea*, Pict. Ephem. 183, pl. xxiii. 2; Walk. Cat. 558=*Heptagenia flavipennis*, ♂ im.
- cingulata*, ! Ste. Ill. vi. 67=*Leptophlebia fusca*, ♂ im.
- costalis*, Curt. Phil. Mag. 1834, p. 120; Ste. Ill. vi. 64; Pict. Ephem. 194; Walk. Cat. 561=*Heptagenia elegans* (♀ im. s. s., Curt.; ♂ im., ! Ste.).
- || *costalis*, Burm. Handb. ii. 800; Brau. Reise Novara (1868)=*Leptophlebia*, subim.
- culiciformis*, Lin.; in *Ephemera*, Lin.; sp. dub.
- ‡ *culiciformis*, ! Ste. Ill. vi. 66=*phæops*, ♂ im.
- cyanops*, Pict. Ephem. 171, pl. xx. 2; Walk. Cat. 556 = *Heptagenia elegans*, ♂ im.
- debilis*, ! Walk. Cat. 569; Hag. Am. Syn. 46=*Leptophlebia cupida*, ♀ im.
- || *debilis*, ! Walk.; in *Closon*, Walk.=*Baetis*, ♀ im.
- ‡ *debilis*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 371; Proc. Ent. Soc. Philad. ii. 170; (in *Baetis* [C], Walsh)=*Siphilurus*?
- determinata*, ! Walk. Cat. 567=*Heptagenia*, ♂ im.
- dispar*, Curt. Phil. Mag. 1834, p. 120; B. E. xi. 484; ! Ste. Ill. vi. 63=*Heptagenia venosa*, ♂ im.
- elegans*, Curt. Phil. Mag. 1834, p. 120; ! Ste. Ill. vi. 64; Pict. Ephem. 198; Walk. Cat. 560; Hag. Brit. Syn. 25=*Heptagenia*.
- fallax*, ! Hag. An. Soc. Ent. Fr. 1864, p. 38=*Heptagenia sebrata*, ♂ subim.
- fasciatus*, Pict.; in *Cloe*, Pict.; *Closon*, Walk.
- femorata*, Say, W. Q. R. ii. 162; Le Conte, rep. i. 171; Hag. Am. Syn. 48; Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 368, & Proc. Ent. Soc. Philad. ii. 169, 188, Note 6=*Siphilurus*.
- ? *ferrugineus*, Walsh; in *Cloe* (A), Walsh; ♂ im.
- finitimus*, ! nov. sp.
- flaveola*, Pict. Ephem. 186, pl. xxiii. 4; ! Walk. Cat. 559; Hag. Am. Syn. 44=*Heptagenia*; ♀ im. Pict., ♀ subim. & im. Walk.
- flavescens*, Curt. Phil. Mag. 1834, p. 121; Pict. Ephem. 198; Walk. Cat. 561; probably *binoculatus*, subim.
- flavida*, ! Ed. Pict. Nevr. d'Esp. 24, pl. iii. 1-6=*Siphilurus*, im.
- fluctuans*, Walsh; in *Cloe* (B), Walsh.
- fluminum*, Pict. Ephem. 164, pl. xvi.-xix.; Lab. & Imh., Bd. iv.; Walk. Cat. 556; Brau. N. Aust. 26; Meyer-Dür, Mitt. Schw. Ent. Ges. i. 221; Ansser. Neur. Tirol. 184=*Heptagenia*.
- ‡ *fluminum*, ! Hag. An. Soc. Ent. Fr. 1864, p. 38; Stet. Ent. Zeit. xxvi. 229 (list)=*Heptagenia sebrata*, ♂ im.
- forcipula*, Pict. Ephem. 169, Note=*Heptagenia venosa*?, ♂ im.
- fusca*, Burm. Handb. ii. 800; Her.-Schæf. 346; Sieb. Beitr. xii. 3; [misprinted *fusa*, Walk. Cat. 541, in synonf.]=*Leptophlebia vespertina*.
- || *fusca*, ! Walk. Cat. 568; Hag. Am. Syn. 45=*Heptagenia*, im.
- fuscata*, Lin., in *Ephemera*; ! Ste. Ill. vi. 66=*binoculatus*, ♂ im.

BARTIS (continued).

- || *fuscata*, ! Walk. Cat. 570; Hag. Am. Syn. 47 = *Ephemerella invaria*, im. ♂, & subim.
- ? || *fuscus*, Schn.; in *Cloe*, Sohn.
- gigantea*, Hag. & Pict. Org. Reste im Bernst. ii. 75; incertæ sedis.
- grossa*, Hag. & Pict. Org. Reste im Bernst. ii. 75; incertæ sedis.
- guttata*, Pict. Ephem. 187, pl. xxiv. 3; Walk. Cat. 559 = *Heptagenia*, ♀ im.
- horaria*, ! Ste. Ill. vi. 66; a *Cloeon*, ♀ subim., indeterminable.
- ignava*, ! Hag. Am. Syn. 47 = *Leptophlebia cupida*, ♀ subim.
- ignota*, ! Walk. Cat. 571 = *Isonychia*, ♂ im.
- interlineata*, Walsh, Proc. Ent. Soc. Philad. ii. 188; [for *Siphylurus femoratus*, Walsh, if distinct from *S. femoratus*, Say].
- interpunctata*, Say, Journ. Acad. Nat. Sc. Philad. viii. 41; Pict. Ephem. 194; Walk. Cat. 562; Le Conte, rep. ii. 411; Hag. Am. Syn. 44 = *Heptagenia*.
- invaria*, ! Walk. Cat. 568; Hag. Am. Syn. 48 = *Ephemerella*, ♂ im.
- iridana*, Kolan. Wien. Ent. Monatschr. iv. 383 = *Heptagenia*.
- lateralis*, Curt. Phil. Mag. 1834, p. 121; ! Ste. Ill. vi. 65; Pict. Ephem. 175, pl. xxi.; Walk. Cat. 557; Hag. Brit. Syn. 28 = *Heptagenia*.
- longicauda*, ! Ste. Ill. vi. 63; Pict. Ephem. 193; Walk. Cat. 560 = *Heptagenia*.
- ‡ *longicauda*, Hag. Brit. Syn. 24 = *Heptagenia flavipennis*, ♀ im.
- ‡ *longicauda*, ! Ronalds, ed. v. pl. ix. = *Heptagenia venosa*, ♀ im.
- longipes*, Hag. Verh. zool.-bot. Ver. Wien, 1854, p. 7; Hag. & Pict. Org. Rest. im Bernst. ii. 76; incertæ sedis.
- luridipennis*, Burm. Handb. ii. 801; Pict. Ephem. 193; ! Walk. Cat. 563, ♂ im.; Hag. Am. Syn. 49 = *Heptagenia*.
- lutea*, Hag. Brit. Syn. 23 = *Heptagenia elegans*.
- luteolus*, Müll.; in *Ephemeræ*, Müll.; ! Etn. Ent. Mo. Mag. v. 88 = *Centroptilum*.
- marginalis*, Burm. Handb. ii. 801; Her.-Schäf. 346; Sieb. Beit. xii. 3; — description = *Heptagenia elegans*? — [reference = *Potamanthus luteus*?]
- melanonyx*, Pict.; in *Cloe*, Pict.; *Cloeon*, Walk.
- mellea*, Curt. Phil. Mag. 1834, p. 121 = *Potamanthus luteus*, subim.
- montana*, Pict. Ephem. 173, pl. xx. 3; Walk. Cat. 557; Brau. N. Aust. 26; Ausser. Neur. Tirol. 134 = *Heptagenia*, ♂ im.
- ‡ ? *montana*, Hag. Brit. Syn. 26 = *Heptagenia insignis*, im.
- niger* (*nigra*), Lin.; in *Ephemeræ*, Lin.; Ste. Ill. vi. 67; (Ronalds, ed. i. pl. ix. 16-17 [? 17, type]); ! Etn. Trans. Ent. Soc. 1870, p. 6.
- || *nigra*, Hag. Stet. Ent. Zeit. xxvi. 229 = *Heptagenia*?
- novboracana*, Licht.; in *Ephemeræ*, Licht.; Hag. Am. Syn. 50 = *Heptagenia luridipennis*?
- obesa*, Say, Journ. Acad. Nat. Sc. Philad. viii. 43; Pict. Ephem. 195; Walk. Cat. 563; Le Conte, rep. ii. 412; Hag. Am. Syn. 45 = *Batisca*, subim.
- obscura*, ! Ste. Ill. vi. 65; Walk. Cat. 558 = *Ephemerella ignita*, ♀ im.
- ‡ *obscura*, Hag. Brit. Syn. 27; ? Pict. Ephem. 182, pl. xxiii. 1 = *Heptagenia lateralis*, ♂ im.

BARTIS (continued).

- phæops*, ! Etn. Trans. Ent. Soc. 1870, p. 4.
pictus, ! nov. sp.
Picteti, Meyer-Dür, Mitt. Schw. Ent. Ges. i. 221 = *Heptagenia*, subim.
posticatus, Say; in *Closon*, Say; *Cloe*, Hag.
procellaria, Fuessly, in *Ephemera*; Hag. Stet. Ent. Zeit. xxvi. 229; sp. incertæ sedis.
propinquus, Walsh; in *Cloe* (B), Walsh.
pumilus, Burm.; in *Cloe*, Burm.; *Closon*, Walk.
purpurascens, Pict. Ephem. 174, pl. xx. 4; Walk. Cat. 557; Brau. N. Aust. 26; Ausser. Neur. Tirol. 135 = *Heptagenia venosa* ?
pygmæus, Hag.; in *Cloe*, Hag.
remota, Walk. Cat. 564 = *Coloburus humeralis*, im.
reticulata, Burm. Handb. ii. 801; Her.-Schæf. 346; Pict. Ephem. 193; Sieb. Beit. xii. 3; Walk. Cat. 561 = *Leptophlebia helvipes*, subim. ?
Rhodani, ! Pict.; in *Cloe*, Pict.; *Closon*, Walk.
scambus, ! Etn. Trans. Ent. Soc. 1870, p. 3.
scita, ! Walk. Cat. 570 = *Leptophlebia*.
semicolorata, Curt. Phil. Mag. 1834, p. 121; ! Ste. Ill. vi. 64, pl. xxix. 2; ♂ im.; Pict. Ephem. 178, pl. xxii. 4-9; Walk. Cat. 557; Hag. Brit. Syn. 26 = *Heptagenia*.
semilincta, Pict. Ephem. 180, pl. xxii. 1-3; Walk. Cat. 558; Brau. N. Aust. 26; Ausser. Neur. Tirol. 133; (misprinted *semitireta* in Hag. Uebers. 368) = *Heptagenia semicolorata*, var. ? ?
sicca, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 371, Proc. Ent. Soc. Philad. ii. 170, 191, Notes 9, 10, 192, Note 11 = *Siphilurus*.
speciosus, Pod.; in *Ephemera*, Pod.; sp. incerta.
straminea, Curt. Phil. Mag. 1834, p. 121 = *Heptagenia elegans*, subim. sicca.
striata, ! Ste. Ill. vi. 65 = *phæops*, ♀.
subfusca, ! Ste. Ill. vi. 64; Pict. Ephem. 194; Walk. Cat. 561 = *Heptagenia longicauda*, ♀ im.
sulphurea, Pict. Ephem. 185, pl. xxiii. 3; Walk. Cat. 558; Ausser. Neur. Tirol. 134 = *Heptagenia elegans*, ♂ im. ?
sylvicola, ! Ed. Pict. Nevr. d'Esp. 24, pl. iii. 7-12 = *Heptagenia*, im.
Taprobanes, ! Walk. Cat. 567; Hag. Ceyl. Syn. 476 = *Leptophlebia*, ♂ im.
tenax, ! Etn. Trans. Ent. Soc. 1870, p. 5; ♂ im.
tessellata, ! Walk. Cat. 566 = *Heptagenia vicaria*, ♀ subim. ?
 || *tessellata*, Hag. Am. Syn. 50 = either a *Heptagenia*, or *Leptophlebia Colombiæ*, ♀ subim.; (preserved in alcohol).
torrida, ! Walk. Cat. 571 = *Heptagenia*, ♀ im.
undatus, Pict.; in *Cloe*, Pict.; *Closon*, Walk.
unicolor, Hag.; in *Cloe*, Hag.
venosa, ! Ste. Ill. vi. 63; Burm. Handb. ii. 801; Her.-Schæf. 346; Pict. Ephem. 167, pl. xx. 1; Sieb. Beit. xii. 3; Walk. Cat. 556; Brau. N. Aust. 26; Hag. Brit. Syn. 22; Meyer-Dür, Mitt. Schw. Ent. Ges. i. 221; ! Hag. An. Soc. Ent. Fr. 1864, p. 38; Oul. 1867, p. 27; Ausser. Neur. Tirol. 133 = *Heptagenia*.

BAETIS (continued).

- terna*, ! Ste. Ill. vi. 66=*phaeops*.
ternus, Curt. Phil. Mag. 1834, p. 121=*præc*.?
? verticis, Say, Journ. Acad. Nat. Sc. Philad. viii. 43; Walk. Cat. 562
 Le Conte, rep. ii. 412; Hag. Am. Syn. 46; Walsh, Proc. Ent.
 Soc. Philad. ii. 204, Note 19.
vicaria, ! Walk. Cat. 565; Hag. Am. Syn. 48=*Heptagenia*, ♂ im.
sebrata, ! Hag. An. Soc. Ent. Fr. 1864, p. 38=*Heptagenia*, ♂ subim. ♀ im.
 XVII. BÆTISCA, Walsh; in *Baetis*, Say. Typ. *B. obesa*.
obesa, Say, in *Baetis*, Say; ! Walsh, Proc. Acad. Nat. Sc. Philad. 1862,
 p. 378; Proc. Ent. Soc. Philad. ii. 187, iii. 200-6, fig.
 BRACHYCERCUS, Curt. (1834)=*Cænis*, Ste. (1835-6), p.
chironomiformis, Curt. Phil. Mag. 1834, p. 122=*Cænis*.
Harrisella, Curt. *ib.*; (Har. Exp. pl. vi. 1-3)=*Cænis luctuosa*, ♀, ?
minima, Curt. *ib.*=*Cænis dimidiata* ?
 BRACHYPHEBLIA, Westw. (1840)=*Baetis*, Leach (1815).
bioculata, ! Westw. Intr. ii. 25, Add. to Gen. Syn. 158=*Baetis binocu-*
latus, ♂ im.
 XV. CÆNIS, Ste. (1835-6); in *Ephemera*, Lin.; *Brachycercus*, Curt.;
Ozycypha, Burm. Typ. *C. macrura*.
amica, Hag. Am. Syn. 55=*diminuta*, ♂ im. ?
argentata, Pict. Ephem. 279, pl. xliii. 6; Walk. Cat. 581; ♀ subim.
brevicauda, ! Ste. Ill. vi. 61; Pict. Ephem. 286; Walk. Cat. 582=*dimi-*
diata, ♀ im.
chironomiformis, Curt. in *Brachycercus*; ! Ste. Ill. vi. 62; ♀ im. (mis-
 printed *chironoformis*, Hag. Brit. Syn. 11, in synonym.).
dimidiata, ! Ste. Ill. vi. 61; Pict. Ephem. 286; Walk. Cat. 582; Hag.
 Brit. Syn. 12; Oul. 1867, p. 27; im.
diminuta, ! Walk. Cat. 584; Hag. Am. Syn. 55; ♂ im.
discolor, Burm.; in *Ozycypha*, Burm.
grisea, Pict. Ephem. 278, pl. xlv. 1, 2; Walk. Cat. 581; Brau. N. Aust.
 25; Ausser. Neur. Tirol. 133=*macrura*.
halterata, Hag. Brit. Syn. 11=*chironomiformis*.
 ‡ *halterata*, ! Etn. Trans. Ent. Soc. 1868, pp. 279, 280, 281=*luctuosa*,
 ♂ im. & nymph.
Harrisella, Ste. Ill. vi. 61; Pict. Ephem. 286; Walk. Cat. 583=*luc-*
tuosa, ♀.
hilaris, Say; in *Ephemera*, Say; Walk. Cat. 583; Hag. Am. Syn. 54;
 Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 381, Proc. Ent.
 Soc. Philad. ii. 179.
interrupta, Ste. Ill. vi. 63; Pict. Ephem. 287; Walk. Cat. 583=*macrura*, ♀.
lactea, Burm.; in *Ozycypha*, Burm.; ! Pict. Ephem. 276, pl. xliii. 1-4 &
 xlv.; Walk. Cat. 581; Hag. Stet. Ent. Zeit. xxvi. 229=*chirono-*
miformis.
luctuosa, Burm.; in *Ozycypha*, Burm.; Pict. Ephem. 283, pl. xlv. 3;
 Walk. Cat. 582; Hag. Stet. Ent. Zeit. xxvi. 229.
macrura, Ste. Ill. vi. 60, pl. xxix. 1; Walk. Cat. 583; Hag. Brit. Syn.
 10; ! Etn. Trans. Ent. Soc. 1868, pp. 279-82.

OÆNIS (continued).

- [*nigra*, Hag. MS., Walsh, Proc. Ent. Soc. Philad. ii. 179; not described.]
oophora, Pict. Ephem. 284, pl. xlv. 4; Walk. Cat. 582; ♀ im.
pennata, ! Ste. Ill. vi. 61; Pict. Ephem. 286; Walk. Cat. 583 = *dimidiata*, ♀.
perpusilla, ! Walk. Cat. 586; Hag. Ceyl. Syn. 477; ♂ im.
sinensis, ! Walk. Cat. 584 = *Closon russulum*, ♂ im.
varicauda, (Sav. 1817, pl. ii. 6, 7), Pict. Ephem. 281, pl. xliii. 5; Walk. Cat. 581 = *Tricorythus*, ♂ im. ♀.

III. CAMPSURUS, Etn. 1868; in *Ephemera*, Perch.; *Palingenia*, auct. Typ. C. *latipennis*.

- albicans*, Perch.; in *Ephemera*, Perch.; *Palingenia*, Pict.; ♂ im.
albifilum, ! Walk.; in *Palingenia*, Walk.; ♂ im.
curtus, ! Etn. Ent. Mo. Mag. v. 84 [not described] = *Athenopus*, ♂ im.
cuspidatus, ! nov. sp., ♂ im.
latipennis, ! Walk.; in *Palingenia*, Walk.; ♂ im.
? puella, Pict.; in *Palingenia*, Pict.; ♀ im.
quadridentatus, ! nov. sp., ♂ im.

XIX. CENTROPTILUM, Etn. 1869; *Baetis* (A), Etn. 1868. Typ. C. *luteolum*.

- lituratum*, Pict.; in *Closon*, Pict.; *Closon*, Walk.
luteolum, Müll.; in *Ephemera*, Müll.; *Baetis*, Etn. 1868; ! Etn. Ent. Mo. Mag. vi. 132.
pennulatum, ! Etn. Trans. Ent. Soc. 1870, p. 2.
stenopteryx, ! nov. sp.

CLOSON, Lubbock (1863) = *Closon*, Leach (1815).

- dimidiatum*, Lub. Trans. Lin. Soc. xxiv. 61-7, pls. xvii-xviii; *id.* xxv. 477-96, pl. lviii-lix. 18 = *Closon russulum*.
dipterum, Lub. *ib.* cit. xxv. pl. lix. 19-21 = *Closon dipterum*.

CLOE, Burm. (1889) = *Baetis* & *Closon*, Leach, 1815, & *Centroptilum*, Etn. 1869.

- affinis*, ! Ramb. Nevr. 298 = *Closon dipterum*, im.
albipennis, ! Ste. in *Closon*; Pict. Ephem. 271 = *Centroptilum luteolum*, ♂ im.
alpina, Pict. Ephem. 257, pl. xl. 5 = *Baetis*, ♂ im.
culiciformis, ! Ronalds, v. No. 25 [misprint for *culiciformis*] = *Baetis*, [sp. indeterminable].
autumnalis, Curt. in *Closon*; Pict. Ephem. 270; vide *Baetis*.
bioculata, Lin., in *Ephemera*, L.; Pict. Ephem. 244, pl. xxxiv-v.; Hag. Am. Syn. 52 (teste Walk., sed vide Walk. Cat. 572), Stet. Ent. Zeit. xxvi. 229; Oul. 1867, p. 28 = *Baetis binoculatus*.
brunnea, ! Ramb. Nevr. 298; Walk. Cat. 577, var. ? *halterata*; Ed. Pict. Nevr. d'Esp. 26 = *Heptagenia lateralis*, ♂ subim.
cingulata, ! Ste. in *Closon*; Pict. Ephem. 271 = *Leptophlebia fusca*, ♂ im.
cognata, ! Ste. in *Closon*; Pict. Ephem. 272 = *Closon dipterum*, ♂ im.
consueta, Hag. Ceyl. Syn. 477; incert. gen. (Gen. XXII).
culiciformis, Lin., in *Ephemera*, L.; Pict. Ephem. 270; Hag. Am. Syn. 54 = *Baetis*, sp. dub.
dimidiata, Curt. in *Closon*; Pict. Ephem. 272 = *Closon russulum*.

CLOON (continued).

- diptera*, Burm. Handb. ii. 798; Her.-Schäef. 346; ! Pict. Ephem. 266, pl. xlii.; Schn. Stet. Ent. Zeit. vi. 340; Cal. (1846); Sieb. Beit. xii. 3; Brau. N. Aust. 26; ! Hag. An. Soc. Ent. Fr. 1864, p. 89, and Ent. Mo. Mag. ii. 25; Ed. Pict. Nevr. d'Esp. 25; Oul. 1867, p. 27; Ausser. Neur. Tirol. 136=*Closon diptera*.
- ‡ *diptera*, Ronalds, v. No. 16=*Baetis niger*, subim.
- dubia*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 380, Proc. Ent. Soc. Philad. ii. 178=*Closon*.
- fasciata*, Pict. Ephem. 262, pl. xli. 4; Hag. Am. Syn. (list) 304=*Baetis*, ♀ im.
- ferruginea*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 379=? *Baetis*, im., subim.
- fuctuans*, Walsh, l. c., & Proc. Ent. Soc. Philad. ii. 178=*Baetis*, ♀ im.
- fusca*, Schn. Stet. Ent. Zeit. vi. 340=? *Baetis*, ♀ im.
- fuscata*, Pict. Ephem. 261, pl. xl. 1; Oul. 1867, p. 28=*Leptophlebia cincta*, ♂ im.
- halterata*, Burm. Handb. ii. 798; Her.-Schäef. 346; ! Ramb. Nevr. 299; (misprinted *halterata* in Sieb. Beitr. xiii. 3)=*Centroptilum luteolum*, ♂ im.
- horaria*, Lin., in *Ephemera*, L.; Ramb. Nevr. 299; Pict. Ephem. 270; Oul. 1867, p. 29=? *Cenis dimidiata*.
- hyalinata*, ! Ste., in *Closon*, Ste.; Pict. Ephem. 271=*Centroptilum luteolum*, ♀ im.
- litura*, Pict. Ephem. 260, pl. xli. 1-3=*Centroptilum*.
- maderensis*, ! Hag. Ent. Mo. Mag. ii. 25=*Baetis Rhodani*.
- marginalis*, Hag. Ceyl. Syn. i. 477, ii. 206; incert. sed. (Gen. XXII, ♀).
- melanonyx*, Pict. Ephem. 258, pl. xl. 6=*Baetis*, ♂ im.
- mendas*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 381, & Proc. Ent. Soc. Philad. ii. 178=*Closon*.
- mollis*, ! Hag. Am. Syn. 52 [not described]=*Leptophlebia*, ♂ im.
- obscura*, ! Ramb. Nevr. 297=*Closon*, ♀ subim.
- ochracea*, ! Ste., in *Closon*, Ste.; Pict. Ephem. 271=*Centroptilum luteolum*, ♀ im.
- posticata*, Say, in *Closon*, Say; Hag. Am. Syn. 53=*Baetis*, ♂ im.
- propinqua*, Walsh, Proc. Ent. Soc. Philad. ii. 207; [for *vicina*, Walsh] = *Baetis*.
- pumila*, Burm. Handb. ii. 799; Her.-Schäef. 346; Pict. Ephem. 253, pl. xl. 2; Sieb. Beit. xii. 3; Brau. N. Aust. 26; ! Hag. An. Soc. Ent. Fr. 1864, p. 89; Meyer-Dür, Mitt. Schw. Ent. Ges. i. 221; Ausser. Neur. Tirol. 136=*Baetis*.
- ‡ *pumila*, Hag., in *Closon*; Oul. 1867, p. 28=*Baetis binoculatus*.
- ‡ *pumila*, ! Ramb. Nevr. 298=*Closon ruseolum*, ♂ im.
- pygmaea*, Hag. Am. Syn. 54; Walsh, Proc. Ent. Soc. Philad. ii. 178 = *Baetis*, ♀ im.
- Rhodani*, ! Pict. Ephem. 248, pl. xxxvi-ix.; Brau. N. Aust. 26; ! Hag. An. Soc. Ent. Fr. 1864, p. 89; Meyer-Dür, Mitt. Schw. Ent. Ges. i. 221; ?, Oul. 1867, p. 28; Ausser. Neur. Tirol. 136=*Baetis*.

CLOE (continued).

- signata*, Hag. Ceyl. Syn. i. 477, ii. 206; incert. gen. (Gen. XXII.)
- solida*, Hag. Ceyl. Syn. i. 477; incert. gen. (Gen. XXII. ♀).
- striata*, Lin., in *Ephemera*, L.; Pict. Ephem. 270; Oul. 1867, p. 28 = *Baetis pumilus*, ?; vide *Ephemera*.
- subinfuscata*, ! Ramb. Nevr. 298; Walk. Cat. 577 (var. ? *halterata*) = *Cloeon*, ♀ subim.
- translucida*, ! Pict. Ephem. 255, pl. xl. 3, 4 = *Centroptilum luteolum*, im.
- tristis*, Hag. Ceyl. Syn. i. 476; incert. gen. (Gen. XXII, ♀ subim.).
- undata*, Pict. Ephem. 264, pl. xli. 5; Hag. Am. Syn. 53 = *Cloeon*?, ♂ im.
- unicolor*, Curt., in *Cloeon*, Curt.; Burm. Handb. ii. 798; Pict. Ephem. 271; Sieb. Beit. xii. 3 = *Cloeon*, sp. dub.
- || *unicolor*, Hag. Am. Syn. 54; ? Walsh, Proc. Acad. Philad. 1862, p. 380, & Proc. Ent. Soc. Philad. ii. 178 = *Baetis*.
- verna*, Curt., in *Cloeon*, Curt.; Pict. Ephem. 270 = *Baetis phaeops*?
- vespertina*, Lin., in *Ephemera*, L.; Oul. 1867, p. 29 = *Leptophlebia*?
- vicina*, Hag. Am. Syn. 54; Walsh, Proc. Ent. Soc. Philad. ii. 178 = *Cloeon*.
- ‡ *vicina*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 380, & Proc. Ent. Soc. Philad. ii. 207, Note 20 = *Baetis propinquus*.
- virgo*, ! Ste., in *Cloeon*, Ste.; Pict. Ephem. 272 = *Cloeon dipterum*, ♂ im.
- XVIII. CLOEON, Leach (1815); in *Ephemera*, Lin.; *Cloe*, Burm. p.; *Cloeopsis*, Etn., olim. Typ. *C. dipterum*.
- albipenne*, ! Ste. Ill. vi. 69; *albipennis*, Walk. Cat. 579 = *Centroptilum luteolum*, ♂ im.
- alpina*, Pict., in *Cloe*; Walk. Cat. 574 = *Baetis*.
- autumnalis*, Curt., in *Baetis*, Curt.; Walk. Cat. 578; vide *Baetis*.
- bioculata*, L., in *Ephemera*, L.; Walk. Cat. 572, 1 a-f = *Baetis binoculatus*.
- ‡ *bioculatum*, Hag. Brit. Syn. 34; ! Etn. An. & Mag. Nat. Hist. 1866, p. 147 = *Centroptilum luteolum*.
- cingulata*, Ste., in *Baetis*, Ste.; Walk. Cat. 578 = *Leptophlebia fusca*, ♂ im.
- cognatum*, ! Ste. Ill. vi. 69; *cognata*, Walk. Cat. 579 = *dipterum*, ♂ im.
- consobrinum*, ! Ste. Ill. vi. 69 = *dipterum*, ♂ im.
- culiciformis*, ! Walk. Cat. 576 = *Leptophlebia helvipes*, ♀ im.
- debilis*, ! Walk. Trans. Ent. Soc. N. S. v. 199 = *Baetis*, ♀ im.
- dimidiatum*, Curt. Phil. Mag. 1834, p. 121; Hag. Brit. Syn. 32; *dimidiata*, Walk. Cat. 580 = *russulum*.
- ‡ *dimidiatum*, ! Ste. Ill. vi. 69 = *dipterum*, ♂ im.
- dipterum*, Lin., in *Ephemera*; Leach, E. Enc. ix. 137; Curt. Phil. Mag. 1834, p. 121; ! Ste. Ill. vi. 68, pl. xxix. 3; Hag. Brit. Syn. 29; *diptera*, Walk. Cat. 575.
- discolor*, Burm., in *Cloe*; Walk. Cat. 577 = *Cænis*.
- dubium*, Walsh; in *Cloe* (C), Walsh.
- fasciata*, Pict., in *Cloe*; Walk. Cat. 575 = *Baetis* ?.
- fusca*, Walk. Cat. 573 = *Leptophlebia cincta*.
- halterata*, Burm., in *Cloe*; Walk. Cat. 577 = *Centroptilum luteolum*, ♂ im.
- horaria*, Lin., in *Ephemera*, Lin.; Walk. Cat. 576; vide *Ephemera*.

CLOEON (continued).

- hyalinatum*, ! Ste. III. vi. 68; *hyalinata*, Walk. Cat. 579 = *Centroptilum luteolum*, ♀ im.
- litura*, Pict., in *Cloe*; Walk. Cat. 574 = *Centroptilum marmoratum*, Curt. Phil. Mag. 1834, p. 121 = *dipterum*, ♀ im.
- melanonyx*, Pict., in *Cloe*; Walk. Cat. 574 = *Baetis mendax*, Walsh; in *Cloe* (C), Walsh.
- obscurum*, Curt. Phil. Mag. 1834, p. 121 = *dipterum*, subim.
- || *obscurum*, ! Ramb.; in *Cloe*, Ramb.; ♀ subim.
- ochraceum*, ! Ste. III. vi. 68; *ochracea*, Walk. Cat. 578 = *Centroptilum luteolum*, ♀ im.
- pallida*, Leach, E. Enc. ix. 137; Sam. E. Comp. 259 = *dipterum*.
- posticata*, Say, W. Q. B. ii. 162; Le Conte, repr. i. 172 = *Baetis*, ♂ im.
- pumila*, Burm., in *Cloe*; Walk. Cat. 573 = *Baetis*.
- † *pumilum*, Hag. Brit. Syn. 33; ! Etn. An. & Mag. Nat. Hist. 1866, p. 147 = *Baetis binoculatus*.
- Rhodani*, Pict., in *Cloe*; Walk. Cat. 573; Hag. Brit. Syn. 31; ! Etn. An. & Mag. Nat. Hist. 1866, p. 147 = *Baetis*.
- russulum*, Mül.; in *Ephemera*, Mül.
- simile*, ! Etn. Trans. Ent. Soc. 1870, p. 2.
- striata*, Lin., in *Ephemera*; Walk. Cat. 576 = *Baetis pumilus* ?
- subinfuscatum*, ! Ramb.; in *Cloe*, Ramb.; ♀ subim.
- translucida*, Pict., in *Cloe*; Walk. Cat. 574 = *Centroptilum luteolum*.
- undata*, Pict., in *Cloe*; Walk. Cat. 575 = *Baetis*.
- unicolor*, Curt. Phil. Mag. 1834, p. 121; ! Ste. III. vi. 69; *unicolor*, Walk. Cat. 579 = sp. anceps.
- terna*, Curt. Phil. Mag. 1834, p. 121; ! Ste. III. vi. 69; ! Walk. Cat. 578 = *Baetis phæops*, ♂ im.
- vicinum*, Hag.; in *Cloe*, Hag.
- virgo*, ! Ste. III. vi. 70; Walk. Cat. 580 = *dipterum*, ♂ im.
- vitripennis*, Blanch.; in *Ephemera* (*Cloe*), Blanch.
- CLOEOPSIS, Etn. (1866) = *Cloeon*, Leach.
- diptera*, Etn. An. & Mag. Nat. Hist. 1866, p. 146 = *Cloeon dipterum*.
- diptera*, var., Etn. op. cit. 1867, p. 401 = *Cloeon russulum*.
- XXIV. COLOBURUS, Etn. (1868); in *Palingenia*, Walk. Typ. C. *humeralis*.
- halouticus*, ! nov. sp., ♂ im.
- humeralis*, ! Walk.; in *Palingenia*, Walk.
- XXV. CRONICUS, nov. gen.
- anomalus*, Pict.; in *Baetis*, Pict.
- EDYURUS, Etn. (1868); [mis-spelt *Ecdyonurus*] = *Heptagenia venosus*, Fab., in *Ephemera*, Fab.; Etn. Trans. Ent. Soc. 1868, p. 141, n.
- X. EPHEMERA, Lin. 1735; Sam. 1819; Pict. 1843-5; Hag.; Brau.; Walsh; Houghton, 1865; Etn. = *Ephemera*, Lin. c. 3-set. p. Typ. E. *vulgata*.

EPHEMERA (continued).

- albicans*, Perch. vi. pl. iv. 1 = *Campsurus*, ♀ im.
albipennis, Retz. n. 181 = *Leptophlebia vespertina*.
 || *albipennis*, Atk. Zool. i. 272-5 = *Cænis dimidiata*.
 || *albipennis*, Fab. E. S. III. i. 70 = *Leptophlebia cincta*.
 † *albipennis*, Voigt, v. 310; Blanch. H. N. iii. 54, pl. iii. 1; Ramb. Névr. 296 = *Polymitarcys virgo*.
 † *albipennis*, Walck. ii. 9; Lat. H. N. xiii. 98? = *Baetis culiciformis*.
albipes, Scop. E. Carn. 264; Vill. iii. 22; Ol. Enc. Meth. vi. 421 = *Centroptilum luteolum*, ♂ subim.?
angustipennis, † Ramb. Névr. 295; Walk. Cat. 571 = *Heptagenia*, subim. ♀.
annulata, Müll. Pr. 143 = *Clocon dipterum*.
 || *annulata*, Pz. Explic. Schæf. Ic. clvi. = *Baetis*, sp. anceps.
apicalis, † Ste. III. vi. 59 = *Ephemerella ignita*, ♂ im.
atrostoma, Web. 99 = *Hevagenia*?, subim.
australis, † Walk. Cat. 538 = *Leptophlebia*.
berolinensis, Müll. Pr. 143, n. = *Heptagenia venosa*?
bioculata, Lin. (Act. Ups. 27); (i. F. S. 751); x. S. N. i. 547; ii. F. S. 1473; (Geof. ii. 239. 5, pl. xiii. 4); Müll. F. Frid. 556; Lin. xii. S. N. 906; Georg. Bem. i. 190; Fab. S. E. 304 & Sp. In. i. 384; Thunb. 81; Fab. Mant. i. 244; Vill. iii. 18; Gmel. 2629; Ol. Enc. Meth. vi. 419; Fab. E. S. III. i. 70; Schr. F. B. II. ii. 199; Céd. 134; Walck. ii. 9; Lat. H. N. xiii. 97; Shaw, pl. lxxxi.; Lam. ed. 1, iv. 221; Stew. Elem. II. ii. 225; Guer. Ic. ii. pl. lx. 9; Grif. ii. pl. xciv. 9; Zet. 1046; Westw. Intr. ii. 25; Blanch. H. N. iii. 54 = *Baetis binocularis*.
 † *bioculata*, Fourc. E. Par. ii. 352 = *Baetis phaeops*, subim.?
 † *bioculata*, Pz. Explic. Schæf. Ic. cccix. = *Heptagenia fluminum*.
 † *bioculata*, var., Pz. Explic. Schæf. Ic. cccix. & F. Germ. heft. xciv. 17 = *Heptagenia elegans*?
 † *bioculata*, Röm. 23, pl. xxiv. 7 = præc.?
brevicauda, Fab. E. S. III. i. 69; Walck. ii. 9; Lat. H. N. xiii. 96; Zet. 1045 = *Cænis macrura*, ♀ subim.?
 † *brevicauda*, Blanch. H. N. iii. 54 = *Cænis luctuosa*.
 [cellulosa, Hag. = *Dictyonoura*.]
chlorotica, † Ramb. Névr. 296; Walk. Cat. 540 = *Potamanthus luteus*, ♂ subim.
cincta, Retz. n. 182; (De G. Mem. ii. 650, pl. xvii. 17-18) = *Leptophlebia cognata*, † Ste. III. vi. 56; Curt. B. E. xv. 708 = *danica*.
Colombica, † Walk. Cat. 537 = *Leptophlebia*, ♀ subim.
communis, Retz. n. 180 = *vulgata*.
culiciformis, Lin. (i. F. S. 753); x. S. N. i. 547; ii. F. S. 1475; (Pod. Mus. Gr. 98, pl. i. 10, ?; or is this *Leptophlebia marginata*?); Scop. E. Carn. 264; (Geof. ii. 240. 6); Lin. xii. S. N. 907; Fab. S. E. 304; Müll. Pr. 143; Fab. Sp. In. 385; Thunb. 81; Fourc. E. Par. ii. 352; Fab. Mant. i. 244; Berk. Syn. i. 160; Vill. iii. 20; Gmel. 2630; Ol. Enc. Meth. vi. 420 (excl. note); Fab. E. S. III. i. 71; Lat. H. N. xiii. 98, ?; Stew. Elem. II. ii. 225; Zet. 1046; Schi. Berl. E. Zeit. iii. 143 = *Baetis*, sp. anceps.

EPHEMERA (continued).

- [† *culiciformis*, Hill, Dec. pl. vii. = *Perla*.]
 † *culiciformis*, Ol. Enc. Meth. vi. 420, n.; Lat. H. N. xiii. 98? = *Baetis binoculatus*.
 † *culiciformis*, Blanch. H. N. iii. 55 = *Closon russulum*.
 † *culiciformis*, Fonscol. An. Soc. Ent. Fr. 1846, p. 49 = *Closon dipterum*.
 † *culiciformis*, Scop. E. Carn. 264 = *Centroptilum lituratum*.
cupida, Say, W. Q. R. ii. 163; Le Conte, rep. i. 172 = *Leptophlebia*.
danica, Müll. F. Frid. 63, & Pr. 142; Vill. iii. 18; (Bonalds I., pl. xiii. 28-29); Walk. Cat. 535; Hag. Brit. Syn. 15.
 † *danica*, Piet. Ephem. 130, pl. vii.; Oul. 1867, p. 26 = *lineata*.
 † *danica*, Bonalds V., No. 81 = *vulgata*.
decora, † Walk. Cat. 537; Hag. Am. Syn. 38; Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 376, & Proc. Ent. Soc. Philad. ii. 177 = *guttulata*.
diaphana, Müll. Fr. 143 = *Baetis binoculatus*, ♂.
dilatata, Ste. Ill. vi. 58 = *Ephemerella ignita*.
diptera, Lin. ii. F. S. 1477; (Reaum. vi. pl. xlv.); (Pontop. Nat. Dan. 223, pl. xvii. ?); Lin. xii. S. N. 907, diag., nec obs.; (De G. Mem. ii. 656, pl. xviii. 1-9); Fab. S. E. 304, & Sp. In. i. 385; Retz., n. 184; Thunb. 81; Fab. Mant. I. 244; Raz. 210; Vill. iii. 20; (Zsch. i. 51, No. 19); Gmel. 2630; Bos. F. Etr. ii. 9; Ol. Enc. Meth. vi. 420; Fab. E. S. III. i. 71; Schr. F. B. II. ii. 199; Lat. H. N. xiii. 99; Shaw, 253; Lat. Gen. iii. 184; Leach, E. Enc. ix. 137, inter syn.; Cuv. R. A. ed. i., iii. 430; Lamarck, ed. i., iv. 221; Sam. E. Comp. 259; Cuv. R. A. ed. ii., 244; Blanch. R. A. (ed. Crochard) xiii. 92; Zet. 1046; Voigt, v. 311; Blanch. H. N. iii. 55; Duf. Rech. 580, note; Lat. Nouv. Dict. H. N. x. 349; Verl. Mem. 49, pl. i. = *Closon dipterum*.
dislocans, † Walk. Trans. Ent. Soc. N. S. v. 198 = *Leptophlebia*, ♀ im.
dispar, † Ste. Ill. vi. 58 = *Leptophlebia helvipes*, im. & subim.
dubia, † Ste. Ill. vi. 59 = *Baetis phæops*, ♂ im.
erythroptalma, Schr. F. B. II. ii. 197 = *Ephemerella ignita*, ♂ im.
expectans, † Walk.; in *Potamanthus*, Walk.; ♀ subim.
familiaris, Schr. F. B. II. ii. 200, indeterminate.
fasciata, † Hag.; in *Potamanthus*, Hag.
ferruginea; (Zsch. i. 50, No. 18); Gmel. 2630; Ol. Enc. Meth. vi. 422 = *Heptagenia elegans* ?
 [*imbriata*, Bremi, MS.; Hag. Stet. Ent. Zeit. xxvi. 229; not described.]
lava, Schr. Beyt. 82, & En. n. 606; Vill. iii. 22; Ol. Enc. Meth. vi. 421; Schr. F. B. II. ii. 200 = *Baetis binoculatus*.
laveola, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 377, & Proc. Ent. Soc. Philad. ii. 178.
lavicans, † Ramb. Névr. 296; Walk. Cat. 536, ? var. = *Potamanthus luteus*, ♀ im.
lavipennis, Duf. Réch. 580, n. = *Heptagenia*, ♀ subim.
losaquæ, Illig. Mag. i. 187; Triepke, Stet. Ent. Zeit. i. 54-8 = *Palængenia longicauda*.
fuliginosa, Georg. (1802), p. 324 = *Palængenia longicauda*.

EPHEMERA (continued).

- fusca*, Curt. Phil. Mag. 1834, p. 120 = *Leptophlebia*.
 † *fusca*, ! Ste. Ill. vi. 58 = *Ephemorella ignita*, ♂ im.
- fuscata*, Lin. ii. F. S. 1474; Müll. F. Frid. 557; Lin. xii. S. N. 907;
 Thunb. 81; Vill. iii. 19; Gmel. 2629; Ol. Enc. Meth. vi. 419; Fab. E.
 S. III. i. 70; Walck. ii. 9; Lat. H. N. xiii. 97 = *Baetis binoculatus*.
- fusco-grisea*, Retz. n. 183 = *Heptagenia venosa*, subim.
- fuscula*, Schr. F. B. II. ii. 199 = *Heptagenia semicolorata*, subim. ?
- gemmata*, Scop. E. Carn. 264; Müll. Pr. 143; Vill. iii. 22; Ol. Enc. Meth.
 vi. 421 = *Heptagenia*, ♀ incert. sp.
- [*gigantea*, Illig. Mag. i. 188; not described.]
- glaucops*, ! Pict. Ephem. 132, pl. viii. 1-3; Walk. Cat. 536; Bran. N.
 Aust. 25; Hag. Brit. Syn. 16 (excl. Brit. subim.); Meyer,
 Mitt. Schw. Ent. Ges. i. 221; Oul. 1867, p. 26; Ausser. Neur.
 Tirol. 132.
- guttata*, Blanch. Chili, vi. 106, Atl. Névr. ii. 2; in § *Baetis*, Blanch. =
Heptagenia, ♀ im.
- guttulata*, Pict. Ephem. 135, pl. viii. 4; Walk. Cat. 536.
- halterata*, Fab. Gen. 244, & Sp. In. 384, & Mant. i. 243; Vill. iii. 18;
 Gmel. 2629; Ol. Enc. Meth. vi. 418; Fab. E. S. III. i. 69;
 Schr. F. B. II. ii. 198; Lat. H. N. xiii. 95; Shaw, pl. lxxxii;
 Zet. 1045 = *Leptophlebia cincta*? (supposing Fabricius' speci-
 men to have been mutilated).
- Hebes*, Walk. Cat. 538; Hag. Am. Syn. 39 = *Leptophlebia cupida* ?
- helvipes*, ! Ste. Ill. vi. 59 = *Leptophlebia*, ♀ im.
- helvola*, Sulz. Gesch. 171, pl. xxiv. 7; Rœm. Gen. pl. xxiv. 7 = *Heptagenia*
elegans ?
- hilaris*, Say, Journ. Acad. Nat. Sc. Philad. viii. 43; Le Conte, repr. ii. 418
 = *Cenis*.
- hispanica*, ! Ramb. Névr. 294; Walk. Cat. 535 (*vulgata*, var. ?); E. Pict.
 Névr. d'Esp. 23 = *danica*, ♂ im.
- horaria*, Lin. (Act. Ups. 27; i. F. S. 754); x. S. N. i. 547; ii. F. S.
 1477; (Geof. ii. 240.8); Pontop. Nat. Dan. 223; Lin. xii. S. N.
 907; Fab. S. E. 304; Müll. Pr. 143; Fab. Sp. In. i. 858;
 Fourc. E. Par. ii. 352; Fab. Mant. i. 244; Berk. Synop. i. 150;
 Vill. iii. 20; Gmel. 2630; Ros. F. Etr. 9; Ol. Enc. Meth. vi. 419;
 Fisch. Vers. 566; Fab. E. S. III. i. 71; Schr. F. B. II. ii. 199;
 Cœd. 135; Walck. ii. 10; Lat. H. N. xiii. 98; Stew. Elem. II. ii.
 226 ?, = *Cenis dimidiata* ?
- hyalina*, Ps. Expl. Schœf. Ic. xlii. = *Potamanthus luteus*.
- hyalinata*, Zet. 1044 = *Leptophlebia cincta*.
- ignita*, Pod. Mus. Gr. 97 = *Ephemorella*, ♂ im.
- immaculata*, ! nov. sp., ♂ im.
- inanis* (Zsch. i. 50, No. 15); Gmel. 2629; Ol. Enc. Meth. vi. 421 = *Lepto-*
phlebia cincta, ♂ im. (the abdominal segments being counted from
 behind forwards).
- limbata*, ! Guer. Ic. ii. pl. lx. 7, & iii. 384; Gray, Grif. Cl. Ins. ii. pl. xciv.
 7; ! Ramb. Névr. 295, pl. viii. 2 = *Hexagenia*, ♂ im.
- [*limbata* and *limosa*, Zet. MS., for *E. vespertina*, Zet.]
- lineata*, ! Etn. Trans. Ent. Soc. 1870, p. 1.

EPHEMERA (continued).

- longicauda*, Ol. Enc. Meth. vi. 418; Lat. H. N. xiii. 96; Lamarck, ed. i., iv. 221; ! Ramb. Nevr. 295 = *Palingenia*.
- lutea*, Lin.; (Geof. ii. 233.2); Lin. xii. S. N. 906; Fab. S. E. 303; (? Schæf. Ic. i. pl. xiii. 7); Schr. En. 608; Fab. Sp. In. i. 383, & Mant. i. 243; Vill. iii. 17; Rcem. 23; (Zsch. i. 50, No. 14); Gmel. 2628; Ros. F. Etr. ii. 8; Ol. Enc. Meth. vi. 417; Fisch. Vers. 565; Fab. E. S. III. i. 63; Seetzen (1794); Schr. F. B. II. ii. 197; Walek. ii. 8; Lat. H. N. xiii. 95; Blanch. H. N. iii. 54; Duf. Rech. 580, n. = *Potamanthus luteus*.
- ‡ *lutea*, Pz. Expl. Schæf. Ic. clxxv. = *Polymitarceys virgo*.
- ‡ *lutea*, Fourc. E. Par. ii. 352 = *Baetis binoculatus*.
- ‡ *lutea*, Suls. Gesch. 171, pl. xxiv. 6; Rcem. xxiv. 6; Burm. Handb. ii. 804; ! Ramb. Nevr. 294; Her.-Schæf. 346; Sieb. Beit. xii. 3 = *glaucops*, ♀ im. ?
- ‡ *lutea*, ! Ste. Ill. vi. 55 = *Heptagenia elegans*, ♂ im.
- luteola*, Müll. Pr. 143 = *Centroptilum luteolum*, ♀ im.
- maculata*, Lin. v. S. N. 62 = *vulgata*.
- || *maculata*, Pod. Mus. Gr. 97 = *Heptagenia* (? *venosa*), subim.
- ‡ *maculata*, Vill. iii. 22 = *E. danica*, ♂ im.
- [*madritensis*, ! Ramb. MS. = *Heptagenia angustipennis*, ♀ im. ?]
- marginata*, Lin. xii. S. N. 906; Fab. S. E. 303, & Sp. In. i. 384, & Mant. i. 243; Vill. iii. 17; Gmel. 2628; Ol. Enc. Meth. vi. 417; Fab. E. S. III. i. 69; Schr. F. B. II. ii. 198; Ced. 134; Walek. ii. 8; Lat. H. N. xiii. 95; Shaw, pl. lxxxi.; Stew. Elem. II. ii. 225, pl. xvii. 14, 15; ! Ste. Ill. vi. 57; Zet. 1044; Blanch. H. N. iii. 54 = *Leptophlebia*, ♂ im.
- ‡ *marginata*, Müll. Pr. 142 = *Potamanthus luteus* ?
- ‡ *marginata*, Gor. & Prit. 61-9, pl. ii. 4-6; Bowerb. E. M. i. 239-44, pl. ii. 1-6; Lacord. ii. 77; Brullé, Blanch. H. N. i. pl. xxiv. = *Closon dipterum* (aquat.).
- marocana*, Fab. E. S. III. i. 69 = *Polymitarceys* (? *virgo*).
- minima*, Lin. v. S. N. 63; Müll. Pr. 142; Schr. F. B. II. ii. 198 = *Cænis dimidiata* ?
- minor*, ! Ste. Ill. vi. 60 = *Leptophlebia fusca*, ♀ im.
- mutica*, Lin. (i. F. S. 53); x. S. N. i. 547; ii. F. S. 1479; (Geof. ii. 240.7) = *Baetis pumilus*, ♂ subim. ?
- myops*, Walsh, Proc. Ent. Soc. Philad. ii. 207, note 20; ♂ im.
- natata*, ! Walk.; in *Palingenia*, Walk.; Hag. Am. Syn. 39; Walsh, Proc. Ent. Soc. Philad. ii. 177 = *guttulata*, ♀ subim.
- nervosa*, Vill. iii. 22 = *Heptagenia venosa*.
- nigra*, Lin. ii. F. S. 1478; xii. S. N. 907; Fab. S. E. 304; (Schæf. Ic. ii. pl. cliv. 1, 2 ?); Schr. En. 606; Fab. Sp. In. 385, & Mant. i. 244; Vill. iii. 19; Gmel. 2629; Ros. F. Etr. ii. 8; Ol. Enc. Meth. vi. 419; Fab. E. S. III. i. 70; Ced. 135; Walek. ii. 9; Lat. H. N. xiii. 96; Pz. Expl. Schæf. Ic. cliv.; Stew. Elem. II. ii. 225; Ste. Ill. vi. 67; Blanch. H. N. iii. 54 = *Baetis niger*, subim.
- ‡ *nigra*, Fourc. E. Par. ii. 352 = *Leptophlebia cincta*, subim.
- nigrimana*, Duf. Rech. 580, n. = *Heptagenia* (♀, sp. ?) im.

Ephemera (continued).

- notata* (Zsch. i. 50, No. 16); Gmel. 2630; Ol. Enc. Meth. vi. 422 = *Baetis binoculatus*, ♀ im.
- novboracana*, Licht. Cat. Mus. Holth. iii. 198 = *Heptagenia luridipennis*? *parvula*, Scop. E. Carn. 264; Vill. iii. 22; Ol. Enc. Meth. vi. 421 = *Centroptilum luteolum*?
- plumosa*, Müll. Pr. 142 = *Canis* (sp. ?).
- procellaria*, Schwarz, Nomencl. Roes. Ins. Bel. pl. xii. 1-3 = *Leptophlebia marginata*?
- [*procera*, Hag. = *Dictyonura*.]
- pudica*, Hag. Am. Syn. 39; Walsh, Proc. Ent. Soc. Philad. ii. 177; ♀ subim.; incertæ sedis.
- [*pusilla*, Zet. MS. = *Canis macrura*, ♀ subim. ?]
- reticulata*, Fourc. E. Par. ii. 350 = *Potamanthus luteus*.
- rosea*, ! Ste. Ill. vi. 59 = *Ephemerella ignita*, im.
- rufa*, ! Ramb. Nevr. 296 = *Heptagenia venosa*, ♀ im. ?
- rufescens*, ! Ste. Ill. vi. 59 = *Ephemerella ignita*, im.
- [*rupestris*, Hill, Dec. 8; a *Trichopteron*.]
- russula*, Müll. Pr. 143 = *Closon*, ♂ im.
- serica*, ! nov. sp.
- simulans*, ! Walk. Cat. 536; Hag. Am. Syn. 38 = *guttulata*, ♂ subim.
- speciosa*, Pod. Mus. Gr. 98; Schr. En. 604; Vill. iii. 22; Ol. Enc. Meth. vi. 418; Lat. H. N. xiii. 97 = *Baetis*, sp. incert.
- stigma* (Zsch. i. 50, No. 20); Gmel. 2630; Ol. Enc. Meth. vi. 422 = *Heptagenia lateralis* or *semicolorata*, subim. ?
- || *stigma*, ! Ste. Ill. vi. 56 = *Leptophlebia marginata*, ♂ im.
- striata*, Lin. xii. S. N. 907; Fab. S. E. 804, & Sp. In. i. 385, & Mant. i. 244; Berk. Syn. i. 150; Vill. iii. 20; Gmel. 2630; Ol. Enc. Meth. vi. 420; Fab. E. S. III. i. 71; Ced. 135; Lat. H. N. xiii. 99; Stew. Elem. II. ii. 226 = *Baetis pumilus*, ♂ im. ?
- ‡ *striata*, Müll. Pr. 143 = *Closon dipterum*, ♀ im.
- ‡ *striata*, Blanch. H. N. iii. 55 = *Closon russulum*, im. ?
- ‡ *striata*, Walck. ii. 10 = *Baetis binoculatus*, subim. ?
- submarginata*, ! Ste. Ill. vi. 58 = *Leptophlebia helvipes*, ♀ im.
- sulphurea*, Müll. Pr. 142 = *Heptagenia elegans*, ?
- Swammerdamiana*, Shaw, vi. pl. lxxiii. = seq.
- Swammerdiana*, ! Lat. H. N. xiii. 96, & Gen. iii. 184; Cuv. R. A. ed. 1, iii. 430; ed. ii. 244; Lamarck, ed. 1, iv. 221; Blanch. R. A. ed. Crochard, xiii. 91, & H. N. iii. 54 = *Palingenia longicauda*.
- talcosa*, ! Ste. Ill. vi. 57 = *Leptophlebia marginata*, ♀ im.
- testacea* (Zsch. i. 50, No. 17); Gmel. 2630; Ol. Enc. Meth. vi. 422 = *Baetis phaeops* ?
- venosa*, (De G. Mem. ii. 625, pl. xviii. 1-4), Fab. S. E. 804, & Sp. In. i. 384; Thunb. 81; Fab. Mant. i. 243; Gmel. 2629; Ol. Enc. Meth. vi. 418; Fab. E. S. III. i. 70; Lat. H. N. xiii. 97 = *Heptagenia*.
- ‡ *venosa*, Zet. 1045, ♂ = *Siphurus*, sp. incert.
- vespertina*, Lin. (It. Œl. 21; i. F. S. 755); x. S. N. i. 547; ii. F. S. 1480; (Geof. ii. 239. 4); Lin. xii. S. N. 906; (De G. Mem. ii.

EPHEMERA (continued).

- 648, pl. xvii. 11-16); Fab. S. E. 308, & Sp. In. i. 384, & Mant. i. 243; Berk. Synop. i. 150?; Vill. iii. 17; Gmel. 2628; Ros. F. Etr. ii. 8; Ol. Enc. Meth. vi. 417; Fab. E. S. III. i. 69; Schr. F. B. II. ii. 197; Ced. 134; Walck. ii. 9; Lat. H. N. xiii. 95; Stew. Elem. II. ii. 225; Zet. 1045; Westw. Introd. ii. fig. 61, 19 (gill) = *Leptophlebia* (aquat. ? ?), im.
- virgo*, Ol., (Clut. title p. fig. & pp. 61, 87, 90?; Mey. 197?; Targ. 1741, figs. 1, 4?; Reaum. vi. pls. xlii.-xliv; Schaf. 1757, 1779, Ic. ii. pl. clxxv. 1-3; Abh. iii. 30 pgs. pl. 1.); Ol. Enc. Meth. vi. 419; Lat. H. N. xiii. 98, & Nouv. Dict. H. N. x. pl. xix. 6 = *Polymitarcoys*.
- viridescens*, Fourc. E. Par. ii. 351 = *Leptophlebia marginata*, subim.
- virtea*, Zet. 1045 = *Leptophlebia cincta*, im.
- vitripennis*, Blanch. Chili, vi. 107, Atl. Nevr. ii. 3; in *Ephemerida* (Cloe), Blanch. = *Cloeon*.
- vulgata*, Lín. (i. F. S. 750; De G. Obs. 463, pl. xvii. 2); Lín. x. S. N. i. 546; Kr. (1760) 26; Lín. ii. F. S. 1472; Sulz. (1761) 43, pl. xvii. 103; Scop. E. Carn. 263 (diagn.), pl. xxxviii. 683; (Geof. ii. 238. 1); Müll. F. Frid. 63; Pont. Nat. Dan. 223; Schaf. Elem. pl. lxii. 1-3; Lín. xii. S. N. 906; Hout. (1766-9); (De G. Mem. ii. 691, pls. xvi.-xvii. 1-10); Georg. Bem. i. 190; Fab. S. E. 303; (Schaf. Ic. i. pl. ix. 5-6); Müll. Pr. 142; Schr. En. 602; Fab. Sp. In. i. 383; Thunb. 81; Fourc. E. Par. ii. 351; Fab. Mant. i. 243; Berk. Syn. i. 150; Vill. iii. 16; (Zsch. i. 50, No. 13); Gmel. 2628; Ros. F. Etr. ii. 7; Ol. Enc. Meth. vi. 417; Fisch. Vers. 564; Fab. E. S. III. i. 68; Schr. F. B. II. ii. 196; Ced. 134; Walck. ii. 8; Lat. H. N. xiii. 94; Pz. Expl. Schaf. Ic. ix. 5-6, & F. Germ. heft. xciv. 16; Shaw, vi. pl. lxxxi.; Lat. Gen. iii. 184; Leach, E. Enc. ix. 187; Cuv. R. A. ed. 1, iii. 430; Lamarck, ed. 1, iv. 221; Stew. Elem. II. ii. 225; Cuv. R. A. ed. 2, v. 244; Guer. Ic. ii. pl. lx. 8 (aquat.); Gray, Grif. Cl. Ins. ii. pl. xciv. 8 (aquat.); Ste. III. vi. 55; (Ronalds L., pl. xiv. 30-31); Dalhomb, 226; Perch. vi. pl. iv. 1m.; Burm. Handb. ii. 804; Zet. 1044; Voigt, v. 311; Her.-Schaf. 346; Blanch. H. N. iii. 53; Duf. Rech. 580, n.; Lat. Nouv. Dict. H. N. x. 348; Sieb. Beit. xii. 8; Walk. Cat. 534; Hag. Brit. Syn. 14; Stein, Berl. Ent. Zeit. vii. 414; Hag. Stet. Ent. Zeit. xxvi. 229.
- † *vulgata*, Don. B. I. iv. 53, pl. cxxviii.; Sam. E. Comp. 260, pl. vii. 2; Wood, ii. 21-3, pl. xlvii.; Dum. Cons. Gen. 204, pl. xxviii. 4, 5; Blanch. R. A. ed. Crochard, xiii. 91, xiv. pl. cii. 1-c; Newport, Tod's Cyc. ii. 864, fig. 345; Westw. Introd. ii. fig. 61, 1 (the abdominal spots being reversed)-15; Blanch. H. N. iii. 53; † Ramb. Nevr. 293; Pict. Ephem. 126, pls. i-vi.; Ronalds V. no. 28; Brau. N. Aust. 25; E. Pict. Névr. d'Esp. 22; Oul. 1867, p. 25; Ansser. Neur. Tirol. 131 = *danica*.
- † *vulgata*, Wagner, Isis, 1832, p. 332, pl. ii. 1 = *Bastis* (aquat.).
- XVI. EPHEMERELLA, Walsh (1862); in *Ephemerida*, c. 3-set., Pod.; *Potamanthus*, Pict.; *Bastis*, Walker. Typ. *E. invaria*.
- anea*, Pict.; in *Potamanthus*, Pict.
- consimilis*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 378; ♂ im.
- escrucians*, † Walsh, *ib. cit.*, p. 377, & Proc. Ent. Soc. Philad. ii. 178 = *invaria*.
- gibba*, Pict.; in *Potamanthus*, Pict.
- ignita*, Pod.; in *Ephemerida*, Pod.
- invaria*, † Walk.; in *Bastis*, Walk.

EPHOBON, Will.

leukon, Will. Trans. Am. Soc. Philad. v. 71-3=*Baetis* ?

IX. EUTHYPLOGIA, nov. gen. Typ. *E. Hecuba*.

Hecuba, 1 Hag.; in *Palingenia*, Hag.; ♀ im.

HEMEROBIUS, Clut. cap. viii. fig. & p. 100=*Palingenia longicauda*.

XXVI. HEPTAGENIA, Walsh (1863); in *Ephemera*, Poda; *Baetis*, Say;
Palingenia, Walk. Typ. *H. flavescens*.

alpicola, 1 nov. sp.

angustipennis, 1 Ramb.; in *Ephemera*, Ramb.; *Baetis*, Ed. Pict.

annulifera, 1 Walk.; in *Palingenia*, Walk.

basalis, 1 Walk.; in *Baetis*, Walk.

Bellieri, 1 Hag.; in *Baetis*, Hag.

borealis, 1 nov. sp., ♂ im.

canadensis, 1 Walk.; in *Baetis*, Walk.

cruentata, Walsh, Proc. Ent. Soc. Philad. ii. 205, note 19.

cupulata, 1 nov. sp.

determinata, 1 Walk.; in *Baetis*, Walk.

elegans, Curt.; in *Baetis*, Curt.

flaveola, Pict.; in *Baetis*, Pict.

flavescens, 1 Walsh; in *Palingenia* (C), Walsh.

flavipennis, Duf.; in *Ephemera*, Duf.

fuminum, Pict.; in *Baetis*, Pict.

fusca, 1 Walk.; in *Baetis*, Walk.

guttata, Pict.; in *Baetis*, Pict.

insignis, 1 (Ronalds I. pl. xi. 22); Etn. Trans. Ent. Soc. 1870, p. 7.

interpunctata, Say; in *Baetis*, Say; *Palingenia* (C), Walsh (1862).

iridana, Kolen.; in *Baetis*, Kolen.

lateralis, Curt.; in *Baetis*, Curt.

longicauda, 1 Ste.; in *Baetis*, Ste.

luridipennis, Burm.; in *Baetis*, Burm.

maculipennis, Walsh, Proc. Ent. Soc. Philad. ii. 206, note 19.

montana, Pict.; in *Baetis*, Pict.

nigrimana, Duf.; in *Ephemera*, Duf.; sp. dub.

nivata, 1 nov. sp.

Picteti, Meyer-Dür; in *Baetis*, Meyer-Dür.

pulchella, Walsh; in *Palingenia* (C), Walsh.

semicolorata, Curt.; in *Baetis*, Curt.

simplex, Walsh, Proc. Ent. Soc. Philad. ii. 204, note 19.

sylvicola, 1 Ed. Pict.; in *Baetis*, Ed. Pict.

tessellata, Hag.; in *Baetis*, Hag.; incertæ sedis (perhaps a *Leptophlebia*).

torrida, 1 Walk.; in *Baetis*, Walk.

venosa, Fab.; in *Ephemera*, Fab.; *Baetis*, Ste.

vicaria, 1 Walk.; in *Baetis*, Walk.

vitrea, 1 Walk.; in *Palingenia*, Walk.

HEPTAGENIA (continued).

colitans, ! Etn. Trans. Ent. Soc. 1870, p. 7, ♂ im.

sebrata, ! Hag.; in *Baetis*, Hag.

VIII. HEXAGENIA, Walsh (1863); in *Ephemera*, Web.; *Baetis*, Say;
Palingenia, Pict.

albivitta, ! Walk.; in *Baetis*, Walk.

? *atrostoma*, Web.; in *Ephemera*, Web.

bilineata, Say; in *Baetis*, Say; *Palingenia*, Walsh, 1862.

decolorata, Hag.; in *Palingenia*, Hag.

limbata, ! Guer.; in *Ephemera*, Guer.; *Palingenia*, Pict.

XXIII. ISONYCHIA, nov. gen. Typ. *I. manca*.

manca, ! nov. sp.

ignota, ! Walk.; in *Baetis*, Walk.

II. LACHLANIA, Hag. (1868). Typ. *L. abnormis*.

abnormis, Hag. Proc. Bost. Soc. Nat. Hist. 1868, p. 372-4, fig.; ♀ im.

XII. LEPTOPHLEBIA, Westw. (1840); in *Ephemera*, Reaumur; *Baetis*,
Ste.; *Potamanthus*, Pict.; *Palingenia*, Walk.

annulata, ! Hag.; in *Potamanthus*, Hag.

auriculata, ! nov. sp.; ♂ im.

australasica, Pict.; in *Baetis*, Pict.

australis, ! Walk.; in *Ephemera*, Walk.

castanea, Pict.; in *Potamanthus*, Pict.

cincta, Retz.; in *Ephemera*, Retz.

Colombiæ, ! Walk.; in *Ephemera*, Walk.; *Palingenia*, Hag.

costalis, Burm.; in *Baetis*, Burm.

cupida, Say; in *Ephemera*, Say; *Potamanthus*, Hag.

dentata, ! nov. sp.; ♂ im.

dislocans, ! Walk.; in *Ephemera*, Walk.

femorialis, Hag.; in *Potamanthus*, Hag.

fusca, Curt.; in *Ephemera*, Curt.; *Potamanthus*, Pict.

furcifera, ! nov. sp.; ♂ im.

helvipes, ! Ste.; in *Ephemera*, Ste.

inconspicua, ! nov. sp.; ♂ im.

Kruoperi, Stein; in *Potamanthus*, Stein.

marginata, Lin.; in *Ephemera*, Lin.; *Potamanthus*, Hag.

modesta, ! Hag.; in *Potamanthus*, Hag.

mollis, ! Hag.; in *Cloe*, Hag. [not described].

nebulosa, ! Walk.; in *Palingenia*, Walk.

nodularis, ! nov. sp.; ♂ im.

Picteti, Etn.; for *Potamanthus* † *marginatus*, Pict.

prisca, Pict.; in *Potamanthus*, Hag. & Pict.

scita, ! Walk.; in *Baetis*, Walk.

strigata, ! nov. sp.; ♀ im.

HERZEGIA (continued).

vittata, 1 Elm. Trans. Ent. Soc. 1870, p. 7, ♂ im.

zobrata, 1 Hag.; in Baetis, Hag.

VIII. HERZEGIA, Walsh (1863); in Ephemera, Web.; Baetis, Say;

Palingenia, Pict.

albivitta, 1 Walk.; in Baetis, Walk.

? atrostoma, Web.; in Ephemera, Web.

bilineata, Say; in Baetis, Say; Palingenia, Walsh, 1863.

decolorata, Hag.; in Palingenia, Hag.

limbata, 1 Guér.; in Ephemera, Guér.; Palingenia, Pict.

XXIII. ISOZYCHIA, nov. gen. Typ. I. manca.

manca, 1 nov. sp.

ignota, 1 Walk.; in Baetis, Walk.

II. LACHLIA, Hag. (1863). Typ. L. abnormis.

abnormis, Hag. Proc. Bost. Soc. Nat. Hist. 1868, p. 372-4, fig.; ♀ im.

XII. LEYTONIUM, Westw. (1840); in Ephemera, Reanum; Baetis,

Ste.; Potamanthus, Pict.; Palingenia, Walk.

annulata, 1 Hag.; in Potamanthus, Hag.

auriculata, 1 nov. sp.; ♂ im.

australatica, Pict.; in Baetis, Pict.

australis, 1 Walk.; in Ephemera, Walk.

castanea, Pict.; in Potamanthus, Pict.

cineta, Reitz; in Ephemera, Reitz.

Colombica, 1 Walk.; in Ephemera, Walk.; Palingenia, Hag.

costalis, Burm.; in Baetis, Burm.

cupida, Say; in Ephemera, Say; Potamanthus, Hag.

denticata, 1 nov. sp.; ♂ im.

discoloris, 1 Walk.; in Ephemera, Walk.

femoralis, Hag.; in Potamanthus, Hag.

fascia, Curt.; in Ephemera, Curt.; Potamanthus, Pict.

furefura, 1 nov. sp.; ♂ im.

holotypes, 1 Ste.; in Ephemera, Ste.

inconspicua, 1 nov. sp.; ♂ im.

Krueperi, Stein; in Potamanthus, Stein.

marginata, Lin.; in Ephemera, Lin.; Potamanthus, Hag.

snodgrassi, 1 Hag.; in Potamanthus, Hag.

mollis, 1 Hag.; in Cloc, Hag. [not described].

nebulosa, 1 Walk.; in Palingenia, Walk.

nodularis, 1 nov. sp.; ♂ im.

Picteti, Elm.; for Potamanthus; marginatus, Pict.

prisca, Pict.; in Potamanthus, Hag. & Pict.

scita, 1 Walk.; in Baetis, Walk.

strigata, 1 nov. sp.; ♀ im.

LEPTOPLEURIA (continued).

Tyrobanes, Walk.; in Baetis, Walk.

vespertina, Lin.; in Ephemera, Lin.; Cloc, Oul.

Macroceres, Westw. Partingt. Cyc. Nat. Hist. (1839) ii. 439=Ceris.

I. OLIGOZYCHIA, Pict. (1843-5).

anomala, Pict. Ephem. 260, pl. xvii.; Walk. Cat. 585; Hag. Stet. Ent. Zeit. xvi. 269, pl. i.; Am. Syn. list, 301; ♀ im.

† anomala, Pict. Ephem. pl. xvi.; Kirsch. Jalrb. Naturk. Nassau, heft ix. 41-5=rhena.

palpida, ♂ Costa, Faun. Asprom. pl. i. 2; O. rhena, var. pallida, Hag. Stet. Ent. Zeit. xvi. 268, pl. i.

rhena, Imh. Bericht x. 180; Hag. Stet. Ent. Zeit. xvi. 267, pl. i.; Burm. N. Aust. 25; Mrl. Ent. Mo. Mag. i. 262, ii. 182; 1 Elm. Ent. Mo. Mag. v. 83.

Trimeniana, 1 Ml. Arch. Ent. Mo. Mag. iv. 177-8; Elm. op. cit. v. 83; ♀ im.

Oxyceph, Burm. (1839) [misprinted Oxyceph, Ramb. Nerv.] = Ceris.

risolor, Durm. Handb. ii. 797=Ceris.

lactea, Burm. Handb. ii. 796; Her. Schel. 349; Sieb. Ent. xii. 3=Ceris chloromyfernis.

luctuosa, Burm. Handb. ii. 797; Her. Schel. 316; Sieb. Ent. xii. 3=Ceris, ♂ im.

VI. PALZGESSIA, Durm. (1839); in Ephemera, Ol. Typ. P. longicauda.

alba, Say, in Baetis, Say; Hag. Am. Syn. 40=Baetis, ♀.

albicans, Burm. Handb. ii. 803; Pict. Ephem. 149, pl. xiii. 1-3; 1 Walk. Cat. 548 (excl. ♀ ?); Hag. Am. Syn. list, 301=Campisura.

albiflora, 1 Walk. Cat. 554 (excl. var.); Hag. Am. Syn. list, 304=Campisura.

† albiflora var., 1 Walk. loc. cit.=Asthonopus curtus, ♂ im.

annulifera, 1 Walk. Trans. Ent. Soc. N. S. v. 159=Heptagenia, ♀ im.

atrostoma, Web.; in Ephemera, Web.; Pict. Ephem. 187; Walk. Cat. 550; Hag. Am. Syn. list 304=Heptagenia?

bicolor, 1 Walk. Cat. 552; Hag. Am. Syn. 43=Siphurus, ♀ subim.

bitineata, Say in Baetis, Say; Walsh. Proc. Acad. Nat. Se. Philad. 1862, p. 373, & Proc. Ent. Soc. Philad. ii. 174-5, 189, 199=Heptagenia.

† bilineata, Hag. Am. Syn. 41=Heptagenia limbata.

Colombica, 1 Walk.; Hag. Am. Syn. list, 304=Leptoplebia, ♀ subim.

concinna, 1 Walk. Cat. 553=Leptoplebia cupida, ♂ im.

continua, 1 Walk. Trans. Ent. Soc. N. S. v. 159=Heptagenia albivitta, ♂ im.

curtia, 1 Hag. Am. Syn. list, 301; for albiflora, var., Walk.=Asthonopus.

decolorata, Hag. Am. Syn. 43=Heptagenia, ♀ subim.

borstalis, Durm. Handb. ii. 803, 1015; Pict. Ephem. 163, pl. xiii. 5; Walk. Cat. 649; Hag. Am. Syn. list, 304=Asthonopus, ♀.

[borstiger, Hag. Am. Syn. list; not described.]

fuscens, 1 Walsh, Proc. Acad. Nat. Se. Philad. 1862, p. 373, & Proc. Ent. Soc. Philad. ii. 177=Heptagenia.

† fuscens, 1 Walsh, Proc. Acad. Nat. Se. Philad. 1862, p. 373, & Proc. Ent. Soc. Philad. ii. 177=Heptagenia.

PARASAXIA (continued).

fuliginosa, Georg. in *Ephemera*, Georg. = *longicauda*.

grisea, Hag. Zool.-bot. Ver. Wien, 1854, p. 227; insecta sedis.

lucida, 1 Hag. Ann. Syn. 40 = *Euphylocia*, ♀ im.

horaria, Burm. Handb. ii. 803; Her. Scherf. 345; Stob. Det. xi. 3; Hag. Stet. Ent. Zeit. xxvi. 229; Loew, Verh. zool.-bot. Ges. Wien, xvi. 947 = *Polymeris virgo*.

humeralis, 1 Walk. Cat. 552 = *Coloburra*, ♀ subim.

indica, Piet. Ephem. 151, pl. xiii. 4; Walk. Cat. 519 = *Polymeris*, ♀ im.

interjuncta, Say, in *Boettl.*, Say; Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 374, & Proc. Ent. Soc. Philad. ii. 177, 190 = *Hypogentia*.

lata, 1 Walk. Cat. 550, ♂.

leptogentia; 1 Walk. Cat. 554 (excl. var.); Hag. Ann. Syn. list, 304 = *Compurra*, im., subim.

limbata, 1 Piet. Ephem. 146, pl. xiii.; Walk. Cat. 548; 1 Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 373, & Proc. Ent. Soc. Philad. ii. 166, 166, with No. 2 = *Herogenia*.

† *limbata*, Hag. Ann. Syn. 42 = *Herogenia bifurcata*.

longicauda, Ol. in *Ephemera*, Ol. (Swann, 1675; ed. Tyson, p. 44, pl. i. v. 2 [quod] pl. v. 1. 3 et seq. viii. fac. 3; Blegny, 1689; Scherf. loc. cit. pl. ecir. 3); Burm. Handb. ii. 803; Her. Scherf. 345; Piet. Ephem. 155, pl. xiv. xiv bis, xvi.; Germ. (1848); Walk. Cat. 553; Hag. Stet. Ent. Zeit. xv. 316-9, xx. 431; Loew, Verh. zool.-bot. Ges. Wien, xi. 409-10.

macrops, Piet. Trait. d. Paleont. II. ii. 371; Hag. Verh. zool.-bot. Ver. Wien, 1854, p. 227; Piet. & Hag. Orig. Rest. im. Derris. ii. 74, pl. vi. 2 b., pl. viii. 5 = *Polymeris*.

nudata, 1 Walk. Cat. 551 = *Ephemera guttulata*, ♀ subim.

obscurosa, 1 Walk. Cat. 553 = *Leptophlebia*, ♂ im.

occidentalis, 1 Walk. Cat. 551; Hag. Ann. Syn. 43 = *Herogenia bifurcata*, ♀ subim.

patiens, 1 Walk. Cat. 553 = *Leptophlebia cupida*, ♀.

pellata, Piet. Ephem. 145, pl. xi. 4-5; Walk. Cat. 548; Hag. Ann. Syn. 40 = *Compurra*, ♀ im.

puticella, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 375, & Proc. Ent. Soc. Philad. ii. 177, 203 = *Herogenia*.

Sarigny, Piet. Ephem. 157; Walk. Cat. 550 [not described] = *Polymeris*.

terminata, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 376, & Proc. Ent. Soc. Philad. ii. 177 = *Herogenia puticella*?

[*umbata*, Hag. Ann. Syn. list, 304; not described.]

virgo, Ol. in *Ephemera*, Ol.; Piet. Ephem. 141, pl. ix-xi. 3; Villa, 1647, 1-6; Walk. Cat. 547; Letzner, 1851; Burm. N. Anst. 25; Oul. 1867, p. 26; Auser. Neur. Tirol. 132 = *Polymeris*.

viridescens, 1 Walk. Cat. 550 = *Herogenia bifurcata*, ♀ subim.

vittigera, 1 Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 373, & Proc. Ent. Soc. Philad. ii. 174 = *Pentogenia*.

vitrea, 1 Walk. Cat. 555 = *Herogenia*, ♀ subim.

VII. PARASAXIA, Walsh (1863); in *Palingenia* (A), Walsh (1862).

Typ. *P. vittigera*.

quadrijunctata, Walsh, Proc. Ent. Soc. Philad. ii. 198, note 16; subim., ♀ im.

vittigera, 1 Walsh; in *Palingenia*, Walsh.

V. PARASAXIA, Elm. (1868); in *Ephemera*, Ol.; *Palingenia*, Burm. Typ. *P. virgo*.

indicus, Piet.; in *Palingenia*, Piet.; ♀ im.

macrops, Hag.; in *Palingenia*, Hag.

Sarigny, 1 nov. sp. (*Sarigny*, pl. ii. 5, *Ephemera*; in *Palingenia*, Piet.; not described).

virgo, Ol.; in *Ephemera*, Ol.; *Palingenia*, Piet.

XI. PARASAXIA, Piet. (1843-5); restricted, Elm. (1868); in *Ephemera*, aut.—Typ. *P. luteus*.

conicus, Piet. Ephem. 229, pl. xxxiii.; Walk. Cat. 545 = *Ephemerella*, ♀ im.

annulatus, Hag. Ceyl. Syn. i. 476 = *Leptophlebia*, ♂.

opicalis, Ste., in *Ephemera*, Ste.; Piet. Ephem. 236; Walk. Cat. 544 = *Ephemerella ignita*, ♂ im.

brunneus, Piet. Ephem. 217, pl. xxvii.; Walk. Cat. 542 = *Leptophlebia fusca*.

castaneus, Piet. Ephem. 215, pl. xxvi. 4, 5; Walk. Cat. 542 = *Leptophlebia*, ♀ im.

cinclus, Reitz, in *Ephemera*, Reitz; Piet. Ephem. 219, pl. xxviii. (excl. 5); Walk. Cat. 543; Burm. N. Anst. 27; Hag. Brit. Syn. 20; Auser. Neur. Tirol. 137 = *Leptophlebia*.

concinuus, 1 Walk., in *Palingenia*, Walk.; Hag. Ann. Syn. 51 = *Leptophlebia cupida*, ♂ im.

costalis, Burm., in *Boettl.*, Burm.; Piet. Ephem. 207; Walk. Cat. 546 = *Leptophlebia*, subim.

cupida, Say, in *Ephemera*, Say; Hag. Ann. Syn. 51; Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 372, & Proc. Ent. Soc. Philad. ii. 172, 189, 194, notes 14, 15 = *Leptophlebia*.

dilatatus, Ste., in *Ephemera*, Ste.; Walk. Cat. 545; Hag. Brit. Syn. 19; [misprinted *dilatatus*, Piet. Ephem. 236] = *Ephemerella ignita*.

dispar, 1 Ste., in *Ephemera*, Ste.; Piet. Ephem. 234; Walk. Cat. 542 = *Leptophlebia heteripes*, ♂ im.

erythrothlaxinus, Schr., in *Ephemera*, Schr.; Piet. Ephem. 222, pl. xxix. (misprinted *erythrothlaxinus*) aquat., pl. xxx.; Walk. Cat. 544; Hag. Brit. Syn. 21 = *Ephemerella ignita*.

espectans, 1 Walk. Trans. Ent. Soc. N. S. v. 198 = *Ephemera*, ♀ subim.

fasciatus, 1 Hag. Ceyl. Syn. i. 476 = *Ephemera*.

femoratus, Hag. loc. cit. = *Leptophlebia*.

horrent, Piet. Ephem. 203, pl. xxv. 1; Walk. Cat. 539; ♂ im.

fuscus, Curt., in *Ephemera*, Curt.; Piet. Ephem. 235; Walk. Cat. 543; Hag. Brit. Syn. 19 = *Leptophlebia*.

Geortii, Piet. Ephem. 211, pl. xxvi. 1-3; Walk. Cat. 541; Burm. N. Anst. 27; Hag. Brit. Syn. 18; Auser. Neur. Tirol. 136 = *Leptophlebia heteripes*.

globus, Piet. Ephem. 226, pl. xxxi.-xxxii. (aer.); Walk. Cat. 544 = *Ephemerella*.

hatteratus, Feb., in *Ephemera*, Feb.; Piet. Ephem. 236; Walk. Cat. 540 = *Leptophlebia cinclus*, ♂ im.

VII. PENTAGENIA, Walsh (1863); in *Palingenia* (A), Walsh (1862).Typ. *P. vittigera*.*quadripunctata*, Walsh, Proc. Ent. Soc. Philad. ii. 198, note 16; subim., ♀ im.*vittigera*, ! Walsh; in *Palingenia*, Walsh.V. POLYMITARCYIS, Etn. (1868); in *Ephemera*, Ol.; *Palingenia*, Burm.Typ. *P. virgo*.*indicus*, Pict.; in *Palingenia*, Pict.; ♀ im.*macrops*, Hag.; in *Palingenia*, Hag.*Savignii*, ! nov. sp. (Savigny, pl. ii. 5, *Ephemera*; in *Palingenia*, Pict.; not described).*virgo*, Ol.; in *Ephemera*, Ol.; *Palingenia*, Pict.XI. POTAMANTHUS, Pict. (1843-5); restricted, Etn. (1868); in *Ephemera*, auct.—Typ. *P. luteus*.*æneus*, Pict. Ephem. 229, pl. xxxiii.; Walk. Cat. 545 = *Ephemerella*, ♀ im.*annulatus*, Hag. Ceyl. Syn. i. 476 = *Leptophlebia*, ♂.*apicalis*, Ste., in *Ephemera*, Ste.; Pict. Ephem. 236; Walk. Cat. 544 = *Ephemerella ignita*, ♂ im.*brunneus*, Pict. Ephem. 217, pl. xxvii.; Walk. Cat. 542 = *Leptophlebia fusca*.*castaneus*, Pict. Ephem. 215, pl. xxvi. 4, 5; Walk. Cat. 542 = *Leptophlebia*, ♀ im.*cinctus*, Retz., in *Ephemera*, Retz.; Pict. Ephem. 219, pl. xxviii. (excl. 5); Walk. Cat. 543; Brau. N. Aust. 27; Hag. Brit. Syn. 20; Ausser. Neur. Tirol. 137 = *Leptophlebia*.*concinus*, ! Walk., in *Palingenia*, Walk.; Hag. Am. Syn. 51 = *Leptophlebia cupida*, ♂ im.*costalis*, Burm., in *Baetis*, Burm.; Pict. Ephem. 237; Walk. Cat. 546 = *Leptophlebia*, subim.*cupidus*, Say, in *Ephemera*, Say; Hag. Am. Syn. 51; Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 372, & Proc. Ent. Soc. Philad. ii. 172, 189, 194, notes 14, 15 = *Leptophlebia*.*dilutus*, Ste., in *Ephemera*, Ste.; Walk. Cat. 545; Hag. Brit. Syn. 19; [misprinted *dilectus*, Pict. Ephem. 236] = *Ephemerella ignita*.*dispar*, ! Ste., in *Ephemera*, Ste.; Pict. Ephem. 234; Walk. Cat. 542 = *Leptophlebia helvipes*, ♂ im.*erythrophthalmus*, Schr., in *Ephemera*, Schr.; Pict. Ephem. 222, pl. xxix. (misprinted *erythrocephalus*) aquat., pl. xxx.; Walk. Cat. 544; Hag. Brit. Syn. 21 = *Ephemerella ignita*.*expectans*, ! Walk. Trans. Ent. Soc. N. S. v. 198 = *Ephemera*, ♀ subim.*fasciatus*, ! Hag. Ceyl. Syn. i. 476 = *Ephemera*.*femoralis*, Hag. loc. cit. = *Leptophlebia*.*Ferreri*, Pict. Ephem. 203, pl. xxv. 1; Walk. Cat. 539; ♂ im.*fuscus*, Curt., in *Ephemera*, Curt.; Pict. Ephem. 235; Walk. Cat. 543; Hag. Brit. Syn. 19 = *Leptophlebia*.*Geerii*, Pict. Ephem. 211, pl. xxvi. 1-3; Walk. Cat. 541; Brau. N. Aust. 27; Hag. Brit. Syn. 18; Ausser. Neur. Tirol. 136 = *Leptophlebia helvipes*.*gibbus*, Pict. Ephem. 226, pl. xxxi.-xxxii. (ser.); Walk. Cat. 544 = *Ephemerella*.*halteratus*, Fab., in *Ephemera*, Fab.; Pict. Ephem. 236; Walk. Cat. 546 = *Leptophlebia cincta*, ♂ im.

POTAMANTHUS (continued).

- helvipes*, ! Ste., in *Ephemera*, Ste.; Pict. Ephem. 235; Walk. Cat. 543 = *Leptophlebia*, ♀ im.
- hyalinus*, Zet., in *Ephemera* [*hyalinata*], Zet.; Pict. Ephem. 237 = *Leptophlebia cincta*.
- inavis*, Gmel., in *Ephemera*, Gmel.; Pict. Ephem. 235; Walk. Cat. 544 = *Leptophlebia cincta*, ♂ im.
- || *inavis*, Pict. Ephem. 232, pl. xxiv. 4; Walk. Cat. 547; incertæ sedis (allied to *Tricorythus*); Gen. XIII.
- Krusopori*, Stein, Berl. Ent. Zeit. vii. 414 = *Leptophlebia*?, im.
- luteus*, Lin., in *Ephemera*, Lin.; Pict. Ephem. 206, pl. xxv. 2, 3; Walk. Cat. 539; Hag. Stet. Ent. Zeit. xxvi. 229.
- marginatus*, Lin., in *Ephemera*, Lin.; Hag. Brit. Syn. 17, & Stet. Ent. Zeit. xxvi. 229 = *Leptophlebia*.
- ‡ *marginatus*, Pict. Ephem. 208, pl. xxv. 4, 5; Walk. Cat. 540; ? Oul. 1867, p. 27 = *Leptophlebia Picteti*.
- minor*, ! Ste., in *Ephemera*, Ste.; Pict. Ephem. 237; Walk. Cat. 546 = *Leptophlebia fusca*, ♀ im.
- modestus*, ! Hag. An. Soc. Ent. Fr. 1864, p. 39 = *Leptophlebia*.
- nebulosus*, ! Walk., in *Palingenia*, Walk.; Hag. Am. Syn. 52; Walsh, Proc. Ent. Soc. Philad. ii. 193, note 13, 194, note 15 = *Leptophlebia*, ♂ im.
- odonatus*, Walsh, Proc. Acad. Nat. Sc. Philad. 1862, p. 372, & Proc. Ent. Soc. Philad. ii. 171 = *nebulosus*, ♂ im.
- priscus*, Pict. Trait. d. Paleont. II. ii. 371; Hag. Verh. zool.-bot. Ver. Wien, 1854, p. 227; Pict. & Hag. Org. Reste im Bernst. ii. 77, pl. vi. 3, b = *Leptophlebia*.
- roseus*, Ste., in *Ephemera*, Ste.; Pict. Ephem. 236; Walk. Cat. 545 = *Ephemereilla ignita*, im.
- stigma*, ! Ste., in *Ephemera*, Ste.; Pict. Ephem. 235; Walk. Cat. 541 = *Leptophlebia marginata*, ♂ im.
- submarginatus*, ! Ste., in *Ephemera*, Ste.; Pict. Ephem. 236; Walk. Cat. 545 = *Leptophlebia helvipes*, ♀ im.
- talcosus*, ! Ste., in *Ephemera*, Ste.; Pict. Ephem. 234; Walk. Cat. 541 = *Leptophlebia marginata*, ♀ im.
- ‡ SEMBLIS, Pz. Expl. Schæf. Ic.
- ‡ *marginata*, Pz. op. cit. Ic. cciv. = *Palingenia longicauda*.
- XXI. SIPHLURUS, Etn. (1868) [mis-spelt *Siphonurus*]; in *Baetis*, Say; *Ephemera*, Zet.; *Palingenia*, Walk. Typ. *S. flavidus*.
- alternatus*, ! Walk.; in *Baetis*, Say; *Baetis* (A), Walsh.
- annulatus*, ! Walk.; in *Baetis*, Walk.
- ? *aridus*, Say; in *Baetis*, Say; *Baetis* (B), Walsh.
- armatus*, ! Etn. Trans. Ent. Soc. 1870, p. 6; ♂ im.
- bicolor*, ! Walk.; in *Palingenia*, Walk.
- ? *debilis*, Walsh; in *Baetis* (C), Walsh.
- femoratus*, Say; in *Baetis*, Say; *Baetis* (A), Walsh.
- flavidus*, ! Ed. Pict.; in *Baetis*, Ed. Pict.
- lacustris*, ! Etn. Trans. Ent. Soc. 1870, p. 7.
- Linnaeanus*, ! nov. sp.; ♂ im.
- ? *siccus*, Walsh; in *Baetis* (B), Walsh.
- XIV. TRICORYTHUS, Etn. (1869); in *Ephemera*, Savigny; *Cænis*, Pict. *varicauda*, Pict., (Savigny, pl. ii. 6, 7); in *Cænis*, Pict.

Fossil Ephemeriðæ.

The oldest known fossil of this Family has been discovered in the Solenhofen slate. It is a fragment of a wing [Pl. I. fig. 10] and is in the British Museum. The best preserved of the extinct *Ephemeriðæ* are those found in Stettin Amber. These species are such as would be likely to occur in a large river. They differ but slightly from extant species, and some of them are referable to recent European genera.

Many remains of insects from formations older than the Tertiary have been referred to the *Ephemeriðæ*, but with doubtful accuracy. The following works contain notices of such fossils.

1845. Brodie's History of Fossil Insects, p. 127, pl. x. 4. [The actual specimen is in the British Museum; it exhibits an affinity to the *Planipennia*.]

1856. F. Goldenburg, in Dunker & Meyer's Paleontographica, iv. 33-5, pl. iii. 5 & vi. 5, 6, described and figured three species of a genus *Dictyoneura*.

[I consider this genus not to belong to the *Ephemeriðæ*, because the subcosta ends abruptly at the nodus in the anterior wing; and because the thickened basal veinlet is absent. Dr. Dohrn ranks it with *Eugereon*.]

1861. H. A. Hagen, in Meyer's Paleontogr. x. 115-118, pl. xv. 2, 3, 5, described and figured *Ephemera cellulosa*, *E. ? procera*, and *E. mortua*, together with *E. prisca* (Syn. *Sciaria prisca*, Germar, Nov. Act. Leopold. xix. 211-212, pl. xxxiii. 11; *Id.*, Giebel, Insect. d. Vorwelt, p. 230; Deutschl. Petrefakt, p. 640). [*Cellulosa* and *procera* have since been referred to *Dictyoneura*. It is impossible to determine the nature of the others, from the figures.]

1864. J. D. Dana, in Silliman's American Journal of Science, xxxvii. 34, described the genera *Miamia* and *Hemeristia*.

[In 1866, Mr. S. H. Scudder erected a Family *Paleopterina* for these. Dr. Brauer, in 1866, cited them amongst the *Ephemeriðæ*. Perhaps these genera are related to the *Planipennia*, as Mr. M'Lachlan suggests, or perhaps (but this is hardly probable) to *Dictyoneura*.]

1868. Dr. A. Dohrn, in Meyer's Paleontogr., gave a figure and description of *Eugereon Bæckingii*. [He referred it to the same group as *Dictyoneura*. Dr. Brauer, in the same year, ranked it amongst the *Ephemeriðæ*. The condition of the mouth-organs clearly separates it from the *Ephemeriðæ*; and the neuration of the wings favours Dr. Dohrn's determination of its relationship.]

1867. J. W. Dawson, in the Geological Magazine, iv. 385-388, pl. xvii. 1-5, described and figured *Haplophlebium Barnesii*, *Platphemera antiqua*, *Homothetus fossilis*, and *Xenoneura antiquorum*. [They have all been regarded as allies of the *Ephemeriðæ*. *Haplophlebium*, however, on account of the well-marked nodus in the fore-wing, and the character of the reticulation between the principal longitudinal nervures is, I think, related to *Dictyoneura* and *Eugereon*: *Platphemera* and *Homothetus* may possibly be of the *Ephemeriðæ*, but there is nothing in the figures to make this certain: and there is no reason for considering that *Xenoneura* belongs to this Family.]

1868. S. H. Scudder, in Geol. Mag. v. 175-7, and 218-19, catalogued three genera in addition to those of Prof. Dawson's paper. [*Gerephmera simplex* is represented by a slight fragment of the tip of a wing; the wing must have been large and broad; the veins distant, weak and simple. It is apparently a member of the family *Ephemerina*.] *Platophemera antiqua* is referred to the same family, although the base of the wing is wanting, as well as a piece of the tip. A fragment of what is "probably" a portion from the middle of a wing is named *Dyscritius vetustus*, notwithstanding that "it is impossible to determine" from it "either the approximate size of the insect, or the family to which it belongs." *Lithentomum Hartii* is also described. Mr. Scudder correctly observes at p. 218, that *Palephemera medicæva*, Hitchcock (previously named *Mormolucoides antiquorum*, Hitchcock) is not a nymph of an Ephemerid].

1868. S. H. Scudder described, in the Paleontology of Illinois, p. 571-2, figs. 8-10, a genus *Euphemerites* with two species, *E. gigas* and *affinis*, which he ranks among the *Ephemeridæ*.

Palæontologists have adopted a ridiculous course with regard to some insect fossils. Whenever an obscure fragment of a well-reticulate insect's wing is found in a rock, a genus is straightway set up, and the fossil named as a new *species*. The species is then referred to the *Ephemeridæ*, and is immediately pronounced to be a synthetic type of insects at present distantly related to one another in organization. This enunciation of synthetic types is often nothing less than a resort to random conjecture respecting the affinities of animals which the writer is at a loss to classify. An insect allied to the *Ephemeridæ* which chirped like a Locust (such as *Xenoneura* is imagined to have been), is a tolerable sample of these synthetic types.

When a fossil comprises only a fragment, or even a complete wing of an Ephemerid, it is hardly possible to determine the *genus*, and impossible to assert the *species*. The utmost that can be learned from such a specimen is the approximate relations of the insect. Neuration by itself is not sufficient to define the species or even the genera of recent *Ephemeridæ*.

The following list contains the names of the fossils hitherto reputed *Ephemeridæ* upon questionable grounds. I shall take no further notice of them.

GENUS *DICTYONEURA*, Goldenb. 1856.

- anthracophila*, Goldenb. 1856.
- cellulosa*, Hag. 1861.
- Humboldtiana*, Goldenb. 1856.
- libelluloides*, Goldenb. 1856.
- procera*, Hag. 1861.

Genus *DYSCRITIUS*, Scud. 1868.*vetustus*, Scud. 1868.Genus *EPHEMERA*, Hag. 1861; (*nec* Lin.).*cellulosa*, Hag. 1861 = *Dictyonoura*.? *mortua*, Hag. 1861; *incertæ sedis*.*prisca*, Germar, Hag. 1861; *vide Sciaria*.*procera*, Hag. 1861 = *Dictyonoura*.Genus *EUGEREON*, Dohrn.*Bæckingii*, Dohrn, 1868.Genus *EPHEMERITES*, Geinitz, Hag. 1865; in Leonhard & Geinitz, *Jahrb. f. Mineral. &c.*, 1865, p. 385 [Brauer].Genus *EUPHEMERITES*, Scud. 1868.*affinis*, Scud. 1868.*gigas*, Scud. 1868.Genus *GEREPEMERA*, Scud. 1868.*simplex*, Scud. 1868.Genus *HAPLOPHLEBIUM*, Dawson, 1867.*Barnesii*, Dawson, 1867.Genus *HEMERISTIA*, Scud. 1864.*Brownsoni*, Scud. 1864.Genus *HOMOTHETUS*, Dawson, 1867.*fossilis*, Dawson, 1867.Genus *LITHENTOMUM*, Scud. 1868.*Hartii*, Scud. 1868.Genus *MIAMIA*, Scud. 1864.*Brownsoni*, Scud. 1864.Genus *MORMOLUCOIDES*, Hitchcock.*antiquorum*, Hitchcock.Genus *PALEPHEMERA*, Hitchcock = *Mormolucoides*.*mediava*, Hitchcock = *M. antiquorum*.Genus *PLATEPHEMERA*, Dawson, 1867.*antiqua*, Dawson, 1867.Genus *SCIARIA*, Germar.*prisca*, Germar; cf. *Ephemera*, Hag.; *incertæ sedis*.Genus *XENONEURA*, Dawson, 1867.*antiquorum*, Dawson, 1867.

Family EPHEMERIDÆ.

(ARKIPTERA, Brullè ; ANISOPTERA, Stephens).

The *Ephemeridæ* are hexapod insects which have many-jointed caudal setæ ; which carry their fore-wings erect and unfolded ; and which in the imago have abortive mouth organs.

Antennæ aristate ; the basal two joints the largest, the bristle many-jointed. Ocelli three. Oculi compound or complex. Legs slender, the anterior pair the longest ; tarsi distinctly jointed, terminated by claws. Anterior wings large, creased lengthwise, but never folded together ; costa united by a stout cross-veinlet to the radius near the base of the wing ; subcosta uninterrupted at the nodus. Posterior wings sometimes absent, sometimes rudimentary, at the utmost small. Abdomen ten-jointed : the first abdominal segment joined immoveably to the metathorax ; the ninth provided in the male with a pair of abdominal legs in the form of claspers (forceps) ; the tenth bearing (two at the fewest, three at the most) multiarticulate caudal setæ, which are used as balancers ; the alimentary canal straight, apparently destitute of salivary glands, and inflated with gas ; many short excretory tubules are appended to the large intestine ; the penis is situate at the apex of the ninth segment, and is either hidden or exposed ; the oviducts terminate in the joining of the eighth and seventh segments.

In coition, the male flies under the female and seizes her prothorax with his elongate anterior legs, simultaneously bending the tip of his abdomen upwards and forwards, and clasping the proper segment of her body with his forceps. During their connexion, which is of brief duration, the pair are chiefly supported by the female, and they gradually descend slowly in the air, sometimes even to the ground. When they separate, the male rejoins his companions. The female retires to the water, and deposits the eggs impregnated, settling again and again upon the surface of the water with extended setæ, until the extruded eggs become detached from the rest. This done, she, in some genera, returns to the general assembly, and pairs again, and then again deposits eggs ; and so on, until all the eggs are disposed of : thus the same female may be served by several males ; and likewise the same male may frequently serve several females,

not being exhausted by one union. But in other genera, the coitus once consummated, the eggs are deposited in one mass altogether.

The egg laid in the water, after some time develops into a nymph, which at first has only the two outer caudal setæ, and respire through the integument at large. But, subsequently, when the nymph increases in bulk, special breathing organs grow out from the postero-lateral region of some of the abdominal segments, as well as from the hinder segments of the thorax. These are usually lamellar in form, and nearly always external. The thoracic out-growths persist as the wings; those belonging to the abdominal segments are deciduous with the integument, and they are not reproduced after the insect emerges from the water as the sub-imago.* A cloaca at the end of the intestine is a supplementary breathing organ. From the tenth segment, between the two setæ first formed, a third seta grows, which in some genera is afterwards cast off at the same time as the mouth-organs, and the gills. The tarsi are jointless, and end in a moveable claw. The food of the insect is obtained from the large quantities of mud which it swallows.

The adult nymph sometimes floats on the surface of the water, with the dorsum of the thorax exposed to the air, buoyed up by gas which at that time accumulates between the old and the young integuments, and in the emptied alimentary canal: and sometimes it crawls a short distance out of the water. In either case, the thorax opens along the middle dorsal suture. Through this opening the subimago extricates its head and fore-legs from the old skin: the wings suddenly expand fully; the hinder legs are freed, and then the insect creeps out, and flies heavily to some convenient resting place, where on alighting it assumes the posture characteristic of its genus. In some genera, the subimago is the permanent aerial state of the female; in most cases, however, the subimaginal pellicle is cast sooner or later, according to the temperature of the air and the habit of the genus. The dingy appearance of the subimago, the comparative shortness of its setæ and tarsi, and the ciliate terminal border of the wings, nearly always distinguish it from the imago.

* The term "pseudimago" used by some authors is spurious, and "subimago" has precedence over "pro-imago."

It is well known that, in some genera, differences between the sexes are apparent in the oculi, setæ, and tarsi. The oculi are always smallest in the female, and in the male are sometimes divided into two parts. The female usually has shorter setæ than the male. The middle seta is often shorter than the two outer setæ, or altogether absent. Sometimes the male wants the middle seta, whilst the female has it equal to, or only shorter than, the others; frequently neither sex possesses the central seta. The proportions of the tarsal joints of the male are not the same as those of the female; and his anterior legs exceed hers in length.

The composition of the abdomen of *Ephemeridæ* has been the subject of much dispute. Some consider it to be ten-jointed, others reckon nine joints. The "tenth joint" throughout this paper means the dorsal arcus immediately above the setæ, the part from which the setæ proceed, and the ventral arc often formed of two valve-like pieces under the anus—the intermediate appendices of M. Pictet. The ninth joint is that which bears the forceps in the male, and which, in the female, is sometimes prolonged behind into a broad lobe beneath, concealing the tenth joint. This lamina has been mistaken for the egg-valve in some species. The eighth joint is the first posterior to the opening of the oviducts. From the apical edge of the seventh joint, beneath, the egg-valve grows out. The next five segments are not peculiar in point of structure. The first joint is immoveably united with the metathorax, and often resembles it in colour. Hence certain Entomologists have reckoned this joint a part of the thoracic region. That this joint belongs to the abdomen may, however, be demonstrated in the nymphs of some genera, in which it is furnished with a moveable pair of branchial plates. Now the branchial out-growths of the thorax are always fixtures in the nymph. In certain four-winged genera, those branchial plates of the first segment are present, and may be contrasted with the rudimentary hind-wings.

In drying, the colour and form of *Ephemeridæ* soon change. Colour is of little importance, even in fresh examples; but form is necessary to the distinguishing of the species. They are, therefore, best preserved in a liquid. It is sufficient for ordinary purposes, to dip the freshly-killed specimen into dilute spirits, and then

transfer it to a tube, or homœopathic globule bottle, partly filled with water. Next, Price's glycerine is added to the water,—one or two drops a day,—until the bottle is gradually filled. A small drop of acetic acid may be added finally, to prevent the growth of mould. The name of the species may be written on the disk of the cork, the date and locality of capture round its side. Hind-wings of the species of *Baetis* and *Centroptilum* should be mounted on slips of glass, for microscopical examination. Pinned specimens are often difficult to determine, in consequence of their shrinking; to card them is to render them fit for nothing.

GENERUM DISTRIBUTIO GEOGRAPHICA.

Symbo'la () species fossiles, [] nondescriptas, claudunt.

	Europa.	America.	Asia.	Africa.	Austral- asia.	Oceania.
Oligoneuria	2 ?	1	0	1	0	0
Lachlania	0	1	0	0	0	0
Campsurus	0	6	0	0	0	0
Asthenopus	0	2+[1]	0	0	0	0
Polymitarcoys	1 +(1)	0	1+[2]	1+[1]	0	0
Falingenia	1	0	1	0	0	0
Pentagenia	0	2	0	0	0	0
Hexagenia	0	5	[1]	0	0	0
Euthyplocia	0	1	0	0	0	0
Ephemera	4	3+[1]	4	0	0	0
Potamanthus	2	0	0	0	0	0
Leptophlebia I ...	0	0	3	2	9	0
" II ...	0	1	0	0	0	0
" III ...	7+(1)	2	0	0	0	0
" IV ...	0	2	0	0	0	0
" V ...	2	0	0	0	0	0
Genus [XIII]	0	1	0	0	0	0
Tricorythus	0	0	0	1	0	0
Cænis	6	2	1	1	0	0
Ephemerella	3	2	0	0	0	0
Bætisca	0	1	0	0	0	0
Cloeon	5	4	1+[1]	1	[1]	0
Centroptilum	4	1	0	0	0	0
Baetis	16	13+[2]	1+[1]	[1]	[2]	0
Siphurus	3+[2]	7 ?	0	0	0	0
Genus [XXII]	0	0	5	0	0	0
Isomychia	0	1+? 1	0	0	0	0
Coloburus	0	0	0	0	2	0
(Cronicus)	(1)	0	0	0	0	0
Heptagenia	20	18	2	0	0	2

SPECIERUM DISTRIBUTIO GEOGRAPHICA.

Symbola () species fossiles, [] ambigue definitas, claudunt.

<i>Oligoneuria anomala</i>	. . .	Bio Janeiro.
„ <i>rhenana</i>	. . .	Germany; Turin.
„ [<i>pallida</i>]	. . .	Hungary.
„ <i>Trimeniana</i>	. . .	Umroti District, Natal.
<i>Lechlania abnormis</i>	. . .	Cuba.
<i>Campsurus latipennis</i>	. . .	Para.
„ <i>albiflum</i>	. . .	Para.
„ <i>albicans</i>	. . .	Brazil.
„ <i>cuspidatus</i>	. . .	Guatemala.
„ <i>quadridentatus</i>	. . .	Santarem, Brazil.
„ ? [<i>puella</i>]	. . .	New Orleans.
<i>Asthenopus curtus</i>	. . .	Para.
„ <i>dorsalis</i>	. . .	Brazil.
<i>Polymitaereys virgo</i>	. . .	France; Germany; Madrid.
„ <i>Savignii</i>	. . .	The Nile.
„ <i>indicus</i>	. . .	Hindustan.
„ (<i>macrops</i>)	. . .	Fossil in Amber.
<i>Palingenia longicauda</i>	. . .	Central Europe; Caucasus.
„ <i>lata</i>	. . .	Silhet; Sarawak.
<i>Pentagenia vittigera</i>	. . .	Illinois; Texas.
„ <i>quadripunctata</i>	. . .	Illinois.
<i>Hexagenia albivitta</i>	. . .	The Amazons; Texas.
„ ? [<i>atrostoma</i>]	. . .	Brazil.
„ [<i>decolorata</i>]	. . .	Matamoras; Tamaulipas.
„ <i>limbata</i>	. . .	Texas; Illinois; Maryland.
„ <i>bilineata</i>	. . .	Hudson's Bay Ter.; Canada; Texas; Mexico; Illinois.
<i>Euthyplocia Hecuba</i>	. . .	Vera Cruz; Mexico; Veragua.
<i>Ephemera vulgata</i>	. . .	Northern & Central Europe.
„ <i>guttulata</i>	. . .	Albany River; Canada; Northern United States.
„ <i>flaveola</i>	. . .	Illinois; New York.
„ [<i>myops</i>]	. . .	Illinois.
„ <i>lineata</i>	. . .	S. England; France; Switzerland.
„ <i>danica</i>	. . .	Northern & Central Europe & Spain.
„ <i>glaucoops</i>	. . .	Moscow; Germany; Switzerland; North Italy.
„ <i>immaculata</i>	. . .	Cuna, Hindostan.
„ <i>exspectans</i>	. . .	Hindostan.
„ <i>fasciata</i>	. . .	Ceylon; Masuri, North India.
„ <i>serica</i>	. . .	North China.
<i>Potamanthus luteus</i>	. . .	England; France; Germany.
„ <i>Ferreri</i>	. . .	Turin.

<i>Leptophlebia australis</i>	.	.	Tasmania.
"	<i>australasica</i>	.	Sidney; (Moreton Bay?).
"	<i>furcifera</i>	.	Melbourne?
"	<i>inconspicua</i>	.	Adelaide.
"	<i>dentata</i>	.	New Zealand.
"	<i>strigata</i>	.	North Australia.
"	[<i>costalis</i>]	.	New Holland.
"	<i>nodularis</i>	.	Christ Church, New Zealand.
"	<i>scita</i>	.	New Zealand.
"	<i>Taprobanes</i>	.	Ceylon.
"	<i>annulata</i>	.	Rainbodde, Ceylon.
"	<i>femoralis</i>	.	Rainbodde, Ceylon.
"	<i>dislocans</i>	.	Cape of Good Hope.
"	<i>auriculata</i>	.	Cape of Good Hope.
"	<i>Colombiæ</i>	.	British Colombia.
"	<i>marginata</i>	.	Temperate & Arctic Europe & America.
"	<i>helvipes</i>	.	Gt. Britain; Germany; Switzerland.
"	<i>castanea</i>	.	Villeneuve, Vaud.
"	<i>Krueperi</i>	.	Greece.
"	<i>Picteti</i>	.	Geneva.
"	(<i>prisca</i>)	.	Fossil in Amber.
"	<i>cinota</i>	.	Northern & Temperate Europe.
"	<i>vespertina</i>	.	Scandinavia.
"	<i>mollis</i>	.	West Farms, New York.
"	<i>cupida</i>	.	Nova Scotia; Cincinnati; Washington.
"	<i>nebulosa</i>	.	Albany River; Illinois.
"	<i>fusca</i>	.	Gt. Britain; Switzerland.
"	<i>modesta</i>	.	Carinthia; Corsica.
Gen. XIII.	<i>inanis</i>	.	Brazil.
<i>Tricorythus</i>	<i>varicauda</i>	.	Upper Egypt.
<i>Cœnis</i>	<i>macrura</i>	.	Temperate Europe.
"	<i>chironomiformis</i>	.	England; Prussia; Geneva.
"	<i>dimidiata</i>	.	Temperate Europe.
"	<i>diminuta</i>	.	E. Florida.
"	<i>hilaris</i>	.	Indiana.
"	<i>perpusilla</i>	.	Ceylon.
"	[<i>discolor</i>]	.	Cape of Good Hope.
"	[<i>argentata</i>]	.	Sicily.
"	[<i>oophora</i>]	.	Sardinia.
"	<i>luctuosa</i>	.	England; Berlin; L. of Thun.
<i>Ephemerella</i>	<i>ignita</i>	.	Temperate Europe; Madrid.
"	<i>gibba</i>	.	Villeneuve, Vaud.
"	<i>ænea</i>	.	Mt. Salève, Geneva.
"	<i>invaria</i>	.	Nova Scotia; Illinois.
"	[<i>consimilis</i>]	.	Illinois.
<i>Bætisca</i>	<i>obesa</i>	.	Illinois; Indiana; Upper California.
<i>Cloeon</i>	<i>dipterum</i>	.	Europe; the Madeiras; Egypt.
"	<i>simile</i>	.	England.
"	[<i>subinfuscatum</i>]	.	Provence.

Cloeon	[obscurum]	.	France; near Paris?
"	russulum	.	Europe; North China.
"	mendax	.	Illinois.
"	dubium	.	Illinois.
"	vicinum	.	Washington.
"	vitripennis	.	Chili.
Centroptilum	luteolum	.	Alten; Temperate Europe.
"	pennulatum	.	England.
"	lituratum	.	Mt. Salève, Geneva.
"	stenopteryx	.	Carinthia.
Baetis	binoculatus	.	Temperate & Arctic Europe; Hudson's Bay Territory.
"	debilis	.	Hindustan.
"	scambus	.	England.
"	finitimus	.	Val Montjoie.
"	atrebatinus	.	England.
"	Rhodani	.	Temperate Europe; the Madeiras.
"	phæops	.	England.
"	tenax	.	England.
"	buceratus	.	England.
"	amnicus	.	Mt. Blanc District.
"	alpinus	.	Mt. Brevent, Val de Chamounix.
"	melanonyx	.	Val d'Entremont; Faucigny.
"	pumilus	.	Temperate Europe; Madrid; Corsica.
"	niger	.	England; ? Sweden.
"	[culciformis]	.	Sweden.
"	[speciosus]	.	incog. (Europe).
"?	fuscus	.	Messina.
"	posticatus	.	Shippingport.
"	unicolor	.	Illinois; Washington; ? Porto Rico.
"	propinquus	.	Illinois.
"?	[verticis]	.	Indiana.
"	pygmaeus	.	The S. Lawrence.
"	fluctuans	.	Illinois.
"	pictus	.	Texas.
"	undatus	.	Red River; New York; Mexico.
"	fasciatus	.	Brazil.
"?	ferrugineus	.	Illinois.
"?	[albus]	.	Winnepeek River.
"?	[Ephoron leukon]	.	Belville on the Passaic.
Siphurus	flavidus	.	Spain.
"	armatus	.	Ireland; England.
"	lacustris	.	Wales.
"	Linnaeanus	.	incog.
"	annulatus	.	Trenton Falls, New York.
"	[bicolor]	.	Albany River.
"	femoratus	.	Illinois; Ohio.
"	alternatus	.	Illinois; S. Peter's River; Washington.
"?	aridus	.	Illinois; Indiana.

Siphylurus ?	siccus . . .	Illinois.
" ?	debilis . . .	Illinois.
Gen. XXII.	[tristis] . . .	Rainbodde, Ceylon.
"	[consueta] . . .	Rainbodde.
"	[solida] . . .	Rainbodde.
"	[signata] . . .	Rainbodde.
"	[marginalis] . . .	Rainbodde.
Isonychia	manca . . .	Texas.
" ?	[ignota] . . .	? United States.
Coloburus	humeralis . . .	Otago, New Zealand.
"	halenticus . . .	? Melbourne.
(Cronicus	anomalus) . . .	Fossil in Amber.
Heptagenia	semicolorata . . .	Gt. Britain; Switzerland; Austria.
"	[semitincta] . . .	Versoix, Lake Leman.
"	nivata . . .	Mt. Blanc District.
"	borealis . . .	Finmark.
"	canadensis . . .	Canada.
"	fusca . . .	Albany River.
"	cupulata . . .	N. China.
"	basalis . . .	Lake Winnipeg.
"	maculipennis . . .	Illinois; New York.
"	cruentata . . .	Illinois.
"	simplex . . .	Illinois.
"	pulchella . . .	Illinois.
"	[terminata] . . .	Illinois.
"	interpunctata . . .	Illinois; Indiana.
"	flavescens . . .	Illinois.
"	vitrea . . .	Albany River.
"	[nigrimana] . . .	France.
"	flavipennis . . .	England; France; Switzerland.
"	elegans . . .	Temperate Europe; Hammerfest.
"	fluminum . . .	Germany; Lake Leman.
"	sylvicola . . .	Spain.
"	volitans . . .	England.
"	alpicola . . .	Mt. Blanc District; Carinthia.
"	iridana . . .	Altwater.
"	[annulifera] . . .	Hindustan.
"	luridipennis . . .	Albany River; S. Lawrence.
"	flaveola . . .	Tennessee; West Farms, New York.
"	vicaria . . .	Canada.
" ?	[tessellata, Hag.] . . .	Puget Sound; Washington.
"	venosa . . .	Scandinavia; Corsica; and Temperate Europe.
"	longicauda . . .	Gt. Britain.
"	[angustipennis] . . .	Madrid.
"	Picteti . . .	Tessin; Ober Engadine.
"	insignis . . .	England.
"	montana . . .	Mt. Brevent; Austria.
"	lateralis . . .	England, Wales; Carinthia; ? L. Leman; Spain.
"	[Bellieri] . . .	Sicily.

Heptagenia	zebrata	.	.	Corsica.
"	[gemmata]	.	.	" Circa aquæductum Fodinarum Idren- sium."
"	guttata	.	.	Valdivia, Chili.
"	torrida	.	.	Philippine Isles.
"	determinata	.	.	Java.

Thus, the number of described recent species of *Ephemeridæ* is about 178, exclusive of ten which are either hardly determinable, or probably mere conditions of well-characterised forms which have been otherwise named. There are three fossil species determinable.

EPHEMERIDARUM GENERUM RECENTIUM SUMMA ANALYTICA.

1	{	Metathoracic wings present	4
		Metathoracic wings wanting	2
2	{	3 long subequal caudal setæ	3
		2 long caudal setæ; the third rejected; Gen. XXII. ♀ ?; <i>Closon</i> , Pl. II. f. 7.	
3	{	Cross-veinlets of wings numerous towards the anterior margin; Gen. XIII; <i>Tricorythus</i> , Pl. II. f. 3.	
		Cross-veinlets of wings disposed in very few transverse rows; <i>Cænis</i> , Pl. II. f. 4.	
4	{	Longitudinal neuration of posterior wings considerably complex	7
		Longitudinal neuration of posterior wings sparse (2-3 principal nervures only)	5
5	{	Lateral margins of the hinder abdominal segments simple	6
		Lateral margins of the hinder abdominal segments produced into a slender subulate process on each side; <i>Lachlania</i> , Pl. I. f. 1; <i>Oligoneuria</i> , Pl. I. f. 2.	
6	{	Posterior wings very narrow; <i>Centroptilum</i> , Pl. II. f. 8.	
		Posterior wings oblong, obtuse; Gen. XXII. ♀ ?; <i>Baetis</i> , Pl. II. f. 9, Pl. III. f. 1.	
7	{	Posterior pairs of legs well developed	10
		Posterior pairs of legs very short and feeble	8
8	{	Cross-veinlets in the marginal area before the nodus of the an- terior wing, few and indistinct	9
		Cross-veinlets in marginal area before the nodus of anterior wing, numerous and well defined; <i>Polymitarcys</i> , Pl. I. f. 5.	
9	{	Terminal margin of anterior wing free from cross-veinlets; <i>Campsurus</i> , Pl. I. f. 4.	
		Terminal margin of anterior wing here and there met by cross- veinlets; <i>Asthenopus</i> , Pl. I. f. 3.	

10	{	Oculi even in both sexes	14
	{	Oculi in ♂ ascalaphoid; i. e., intersected by a slightly im-	11
		pressed line	
11	{	Penultimate segment in ♀ beneath prolonged into a short	12
		lamellar process	
	{	Penultimate segment in ♀ beneath simple; <i>Potamanthus</i> ,	
		Pl. II. f. 1.	
12	{	Proximal joint of leg of forceps of ♂ short	13
	{	Proximal joint of leg of forceps of ♂ the longest; Gen. XXII.	
		♂ ?; <i>Leptophlebia</i> , Pl. II. f. 2-2c.	
13	{	Hinder tarsi 4-jointed; <i>Ephemerella</i> , Pl. II. f. 5.	
	{	Hinder tarsi 5-jointed; <i>Coloburus</i> , Pl. III. f. 3.	
14	{	Penultimate segment in ♀ beneath prolonged into a short	15
		lamellar process	
	{	Penultimate segment in ♀ beneath simple	16
15	{	Cross-veinlets crowded, indistinct; <i>Batisca</i> , Pl. II. f. 6.	
	{	Cross-veinlets regular, well-defined; <i>Isonychia</i> , Pl. III. f. 4;	
		<i>Heptagenia</i> , Pl. III. f. 5.	
16	{	3 long caudal setæ	17
	{	2 long caudal setæ	18
17	{	Cross-veinlets crowded, well-defined; <i>Euthyplocia</i> , ♀, Pl. I. f. 8.	
	{	Cross-veinlets regular, well-defined; <i>Pentagenia</i> , ♀, Pl. I. f. 6;	
		<i>Ephemera</i> , Pl. I. f. 9.	
18	{	Hinder tarsi 5-jointed; <i>Siphurur</i> , Pl. III. f. 2.	
	{	Hinder tarsi 4-jointed	19
19	{	Middle seta very short; <i>Pentagenia</i> , ♂, Pl. I. f. 6; <i>Hesagenia</i> ,	
		Pl. I. f. 7.	
	{	Middle seta rejected; <i>Palingenia</i> .	

Materials for a complete analysis of the genera of the *Ephemeridæ* are not at hand. Of some, only one sex is at present known: of others, only mutilated specimens deprived of legs, or examples with the legs shrivelled up in drying, so as to prevent their proportions being made out, are in European collections. Our grounds for establishing comparisons between the genera are consequently very limited.

In determining from the imago the affinities of a genus, the principal points to be noted are,—First, the neuration of the anterior wing; Secondly, the structure of the hinder pairs of legs; and, Thirdly, sexual peculiarities.

In the neuration of the anterior wing, the most important features are the disposition of the nervures dis-

tributed to the *inner* and *terminal margins*. It should be noted whether the *longitudinal neuration* is sparse and simple, or plentiful and complex: next, whether the *cross-veinlets* are scanty or numerous (especially in the *costal* and *subcostal areas* before the *nodæ*): and then, whether the *interneural veinlets* of the terminal margin (if there be any of them) are derived from the longitudinal nervures, or from the cross-veinlets, or from the terminal margin only; and if they are only from the margin, it should be ascertained whether they are solitary or in pairs. Minute details of neuration are valueless; only the general aspect or style of the neuration need be studied.

In the hinder pairs of legs, the length of the *tibiæ*, as compared with the *femora*, should be noted; then the number of the *tarsal joints*, and the form of the *ungues*. If a fifth joint is present in the *tarsus*, its joining with the *tibia* may be obliterated, or indistinct, or clearly defined.

As to the sexual peculiarities, it is important to examine first the *oculi*. Do the *oculi* of the male differ from those of the female in size only? or are they also divided into two parts? If they are divided, it must be ascertained whether the divisions are only ascalaphoid (as in *Leptophlebia*), or whether the upper part is elevated into a turbinate protuberance (as in *Baetis*). Next the *forceps* should be examined. Are the legs of the forceps sessile (as in *Baetis*)? or are they inserted upon a lamellar extension of the penultimate segment (as in *Siphylurus*)? What are the relative proportions of their joints? It is also very important to note whether the female has or has not a lamellar extension of the ventral margin of the apex of the penultimate segment. Next the *setæ* should be examined. Are their joints long, or short? Have they long or short pubescence towards their tips? Is the middle seta as long as the others in both sexes? or abbreviated in both, or rejected in both? Or is it rejected by, or abbreviated in, the male only? Then it should be noted whether the *anterior legs* of the male have the *femora* unusually short, or not; and whether the anterior legs of the female are well developed or rudimentary. It should be ascertained also whether the *eggs* are extruded all at once, or not.

Last of all, the form and neuration of the posterior wings (if there be any) should be taken into consideration.

The abdomen may further be examined as to the mode in which the last segment is finished off beneath; whether by a simple membrane, or by plate-like folds of the integument beneath the insertion of the setæ (as in *Ephemera* and *Baetis*). In *Lachlania*, *Oligoneuria*, and *Cænis*, the posterior segments are furnished at the tip with slender lateral processes; on account of this and other reasons (*e. g.*, the structure of the setæ), I am inclined to consider the first two genera to be allied to *Cænis* more closely than might be inferred from the arrangement of the genera adopted by me. *Heptagenia* is the only genus known which possesses a true egg-valve.

In the immature insect, the attitude assumed by the subimago during repose is of value in classification. The points to be noted are whether it elevates the anterior legs, or not. If it does, are they held together, or separated? Are the wings spread abroad, or held upright? Are the caudal setæ laid together, or separated? The average duration of the subimago stage should also be taken into consideration. Does it last only a few minutes, or an hour or two, or a whole day, or longer? or is it the permanent state of the female?

In the nymph, *the habit of the insect* is of first importance. Does it burrow, or creep? or does it run and swim actively? These points can be inferred from the structure of its mandibles, legs (especially the anterior legs), setæ, and antennæ. Next in importance is *the structure of the branchial organs*. Are they *laminæ fringed* with short slender processes? and, if so, are they simple (as in *Cænis*), or compound laminæ (as in *Ephemera*)? Or are the *laminæ fringedless*? If so, are the laminæ simple (as in *Baetis*), or compound (as in *Cloeon*), or complex (as in *Ephemerella*)? or are they furnished at the base with a fascicle of branchial filaments (as in *Heptagenia*)? *Bætisca* has the branchiæ concealed under an extension of the dorsum of the thorax. The *labium*, with *the two pairs of maxillæ and their palpi*, have next to be considered. Are the palpi of the lower maxillæ two-jointed, or three-jointed? Last of all, the *number and position of the branchial organs* must be noted,

and their relative sizes. In some genera there is a minute pair of branchial processes on the first abdominal segment, which is very liable to be overlooked. Sometimes the anterior pairs of plates differ in texture and form from those of the segments behind them. These last items have more to do with the determination of the order of succession of genera closely allied to one another, than with the determination of the position of a genus in the family at large.

Arrangements of genera founded upon the structure of the imago, or of the nymph, alone, can be only temporary. The relations of genera can be definitely ascertained, only by taking into consideration all the peculiarities presented by the structure of representative species at the principal epochs in the course of their development from the egg.

NOTANDA.

long. al.=longitudo costæ alæ antiçæ.

exp. al.=explicatio alarum anticarum.

set.=longitudo setarum caudalium; e. g., sub *Ephemera vulgata* legitur "set. 33 & 34—32 & 36 mm." i. e., longitudo setarum exterioris 33—32 mm., interioris 34—36 mm.

mm.=millimetres; mensurâ Gallicâ adhibitâ.

im. & subim.=imago et subimago.

Symbola descriptionibus præposita significant,—

v. s.=vivum specimen.

v. v. s.=vidi specimen vivum.

s. s.=specimen siccum.

v. s. s.=vidi specimen siccum.

!=vidi specimen genuinum siccum.

Cum terminologiâ doctoris Julii Müller,* terminologia colorum una et eadem est, præter in locis sequentibus:—

Testaceus et luridus concolores putantur.

Isabellinus, Mül.=furfurosus (*Anglice*, bran-colour).

Fuscus et umbrinus, Mül., similiterque olivaceus et pistazinus, Mül., concolores esse putantur.

Ferrugineus=*Anglice*, steel-blue.

Rubiginosus=*Anglice*, rust-red.

* Terminologia Entomologica. J. Müller. Brünn, 1860.

Genus *LACHLANIA*.

(Ala, Pl. I. fig. 1.)

Lachlania, Hag. 1868.

Imago ♀. Caput transversum, ocellis subæqualibus; prothorax etiam transversus. Alæ quatuor. Setæ duæ. In dentibus segmentorum abdominis latera producuntur.

Lachlania abnormis.*L. abnormis*, Hag. 1868.

Imago ♀, s. s. "Fusca, subtus pallida, capite, prothorace atque pedibus nigris. Alæ griseæ, pellucidæ, crassioribus nervorum griseo-fuscis: in anticis prima, secunda, et quarta venarum longitudinalium furcatæ sunt, et serie unâ transversalium intersecantur; in posticis venarum trium longitudinalium media furcata est, et nervi transversales absunt. Setæ albidæ." (Hag. abstract.)

Long. corp. ♀ 6-7, set. 5, exp. al. 18-19 mm.

Hab.—Cuba.

Dr. Hagen gives "ovivalvula transversa" as a character: but as he called the ventral process of the penultimate segment of *Leptophlebia* an egg-valve, it is uncertain whether *Lachlania* has a true egg-valve or not.

Genus *OLIGONEURIA*.*Oligoneuria*, Pict. 1843-5.

Neuratio alarum, in hoc genere, pro singulâ specie diversa est.

Imago. Oculi integri; prothorax transversus. Alæ quatuor; anticæ nervis longitudinalibus robustis parum divisis, et nervis transversalibus marginem costalem solum et alæ apicem versus: in processû tenui libero basis alæ anticæ supra singulariter excurrit. Pedes debiles, tibiis anticis femoribus multo longioribus; tarsi præcipue infirmi, quadri-articulati, unguibus obtusis. Abdominis segmenta singula intermedia lateribus in processû tenui utrinque producta. Setæ tres æquales. Pedes forcipis maris quadri-articulati, proximo articulorum longissimo. Ovivalvula femina caret.

The curious species comprised in this genus appear in considerable numbers towards evening. The males of the extra-European species being at present unknown, I have not separated the group, in spite of the differences of their wings. My divisions of the genus may be tabulated as follows:—

Alæ anticæ radius et subcosta confluentes : nervorum longitudinalium sequentium primus—

et tertius bifidi; secundus obsolescens bipartitus:—
O. Trimentiana :

bipartitus; secundus simplex; tertius—

bifidus:—*O. rhenana* et *pallida*, (Pl. I. fig. 2).

simplex:—*O. anomala*.

Oligoneuria anomala.

O. anomala, Pict. 1843-5.

Imago ♀, s. s. "Corpus fuscum vel brunneum. Alæ pallide griseæ; anticæ nervis transversalibus circa sex. Setæ longæ pubescentes, pube sparsâ bases versus." (Hag.)

Long. corp. ♀ 13, set. 8, exp. al. 32 mm.

Hab.—Rio Janeiro (Koll. MS.).

Oligoneuria rhenana.

(Genitalia maris, Pl. III. fig. 7; caput, fig. 7a.)

O. rhenana, Imh. 1852. *O. anomala*, pars, Pict. 1843-5.

Subimago, v. v. s. Alæ fumatæ, costas versus saturatiores. Setarum bases glabræ, apices pilosi.

Imago, v. v. s. Oculi atrii; caput et thorax lutescentes. "Abdomen albicans, segmentorum apices versus ochraceo tinctum," juncturis obscuris, et setis albis. Pedum antici fuliginosi; posteriores albi, femoribus cretaceis et unguibus obscuris. Alarum crassiores nervorum saturate fumati.

♀. "Corpore lutescenti, setis glabris; et nervis alarum albicantium lutescentibus." (Hag.)

Long. corp. ♂ 9-12, ♀ 7-9; set. ♂ im. 15, subim. 10; set. ♀ im. circa 4, subim. circa 3; exp. al. ♂ 23, ♀ 28 mm.

Hab.—The large rivers of Germany; and at Turin (Hag.). July and August. I have taken specimens between Cologne and Bonn, in the evening, at the end

of July, on a Rhine steamer; but, unfortunately, I neglected to make a memorandum of the posture of the subimago; they were blown along the deck of the steamboat helplessly, being unable to maintain their footing.

Oligoneuria pallida.

(Genitalia, Pl. III. fig. 8. a-c; caput, fig. 8.)

O. rhenana, var. *pallida*, Hag. 1855.

Imago, s. s. *O. rhenanæ* similis esse videtur. Dr. Hagen forcipem delineavit; sed figura a forcipe *O. rhenanæ* longe discrepat.

Long. corp. ♂ 9, ♀ 7; set. ♂ 10, ♀ 4; exp. al. ♂ 20, ♀ 24 mm.

Hab.—Hungary.

I have some doubt about the correctness of Dr. Hagen's figure of the forceps; for the relative proportions of the joints resemble those of the forceps of *Baetis* or *Ephemera*. There is great danger of misrepresentation being the utmost that one can extort from dried specimens.

Oligoneuria Trimeniana.

(Processus ventralis penultimi segmentorum, ♀, Pl. III. fig. 9, 9a.)

O. Trimeniana, McLach. 1868.

Imago, v. s. s. ♀. Caput et thorax lutei, pectore lutescenti. Alæ pellucidæ, venis fumato-albis. Pedes albicantes, femoribus furfurosis. Setæ cretaceæ, ad juncturas apices versus sub-pilosæ. Ovæ virides.

Long. corp. ♀ 12, exp. al. 41½ mm.

Hab.—Mapulnulo Mission Station, Umroti District, Natal. March.

The wings have a satiny lustre.

Genus *CAMPSURUS*.

(Ala antica, Pl. I. fig. 4.)

Ephemera, Perch. 1836; *Palingenia*, pars, Pict. 1843-5; *Campeurus*, Etn. 1868.

Imago. Oculi integri. Alæ quatuor, anticæ reticulo subtili. Pedes debillimi, unguibus longis tenuibus obtusis

conformibus. ♂ seta media caret; pedum posteriores brevissimi, antici longi femoribus imprimis brevissimis; ultimi segmentorum latera breviter producuntur. ♀ setæ tres æquales; pedes breves debillimi (etiam antici); ovivalvula caret.

The genus *Campsurus* occupies in America the position of *Polymitarcys* in the Old World. Many species of this genus are so alike in colour that it is difficult to discover the females. Their habitat is probably limited to large rivers of a tolerably high temperature.

Campsurus latipennis.

(Genitalia maris, Pl. III. fig. 10, 10a.)

Palingenia latipennis, Walk. 1853 (non var.).

Imago, v. s. s. ♂ ♀. Thorax fusco-luteus; prothorax tumescens, a fronte angustus, sulco longitudinali medio, et foveis lateralibus, alterâ pone oculos subtriangulari, alterâque apud coxam utrinque. Alarum anticarum area marginalis usque ad tertiam partem ab apice fuscescens, nervis transversalibus tenuibus subrectis simplicibus paucis claudentibus. Pedes antici fuscis. Abdomen supra lineâ elevatâ longitudinali mediâ, et posterioribus segmentorum fuscis; infra testaceum. Setæ cretaceæ.

Long. corp. ♂ ♀ 7; al. ♂ 8, ♀ 9; set. ♂ 22 mm.

Hab.—Pará.

Campsurus albifilum.

(Genitalia maris, Pl. III. fig. 11.)

Palingenia albifilum, Walk. 1853.

Imago, v. s. s. ♂. Thorax fusco-testaceus; prothorax veluti in sp. præcedente. Alæ pellucidæ, anteriores nervorum cretacei; transversales apicales areæ marginalis anticæ pauci subrecti. Pedes antici fuscis, coxis testaceis. Abdomen ochraceum, setis albis; segmentorum apicalium quatuor, cæterum juncturæ, et lineæ longitudinalis elevatæ dorsalis margines, cinereo tinctæ. Forceps et penis pallide lutescentes. Setæ albæ.

Long. corp. ♂ 12, al. 13, set. 47 mm.

Hab.—Pará.

Campsurus albicans.

Ephemera albicans, Perch. 1836; *Palingenia albicans*,
Burm. 1839.

Imago, s. s. Prothorax lutescens, latera versus violaceus; meso- et meta-thoraces fulvi. Alæ anticæ albicantes, crassioribus nervorum et bases versus violaceo tinctæ; alæ posticæ fere in toto albæ. Pedes albicantes, tibiis et femoribus anticis solum violaceis. Caput nigrum. Abdomen pallidum, apicem versus fulvum.

Femina in Cat. Brit. Mus. descripta a mare *C. albicantis* longe discrepat. Pro specie innominatâ optime habebitur.

Long. corp. ♂ 10, exp. al. 30 mm.

Hab.—Brazil. (Perch.)

Campsurus cuspidatus, n. sp.

(Genitalia maris, Pl. III. fig. 12.)

Imago, v. s. s. ♂. Prothorax gibbus, virescenti-murinus. Alæ albæ, vitrinæ, invariæ. Abdomen supra fumato-albidum, infra fere cretaceum.

Long. corp. ♂ 10·5, al. 11 mm.

Hab.—Guatemala. (De Selys Longchamps.)

The name *cuspidatus* indicates the form of the last ventral plate.

Campsurus quadridentatus, n. sp.

(Genitalia maris, Pl. III. fig. 13.)

Imago, v. s. s. ♂. Thorax et pedes pallide testacei. Alæ opacæ; anticæ subcostis et radiis nigricantibus. Abdomen ochraceum, atrescenti-umbratum, præcipue apicem versus, et lineâ longitudinali mediâ atrâ in segmentorum primis sex.

Long. corp. ♂ 12, al. 13 mm.

Hab.—Santarem, Brazil. (Bates.) June.

Named from the form of the last ventral plate.

Campsurus puella.

Palingenia puella, Pict. 1843-5.

Imago, ♀ s. s. "Caput et thorax lutescentes: pedes fuscescentes, apicibus femorum pallidis. Prothorax

tumescens, margine antico in angulo prominente producto." (Pict.)

Exp. al. ♀ 26 mm.

Hab.—New Orleans.

It is doubtful whether this species can be re-determined.

Genus *ASTHENOPUS*, nov. gen.

(Ala antica, Pl. I. fig. 3.)

Palingenia, p., Walk. 1853; *Campsurus* (B), Etn. 1868.

Imago. Oculi integri. Alæ quatuor. Pedes debiles veluti in *Campsuro*. ♂ Setæ duæ longæ; pedes forcipis tri-articulati; prothorax transversus. ♀ Seta intermedia brevissima, vel obsoleta.

The wing figured belongs to an undescribed species from Texas, specimens of which are in Mr. M'Lachlan's collection.

Asthenopus curtus, n. sp.

(Genitalia maris, Pl. III. fig. 14, 14 a b.)

Palingenia albiflum, var., Walk. 1853; *P. curta*, Hag. MS. 1861; *Campsurus curtus*, Etn. 1868.

Imago ♂, v. s. s. Prothorax transversus piceus; meso- et meta-thoraces lutei. Alæ anticæ obscuratæ costas versus, nervis transversalibus areæ marginalis apicis paucis, simplicibus et subrectis. Pedum anticæ fuscæ; posteriores lutei. Abdomen supra nigricans, subtus ochraceum, immaculatum; segmentum singulum supra lineâ longitudinali mediâ, punctoque rotundato utrinque, pallidioribus. Setæ albæ.

Long. corp. ♂ 8, al. 10, set. 35 mm.

Hab.—Pará.

Asthenopus dorsalis.

Palingenia dorsalis, Burm. 1839.

Imago ♀, s. s. Prothorax transversus, tumescens, lutescens, maculâ in medio violaceâ. Caput nigricans. Ala antica nervis fuscescentibus, et margine costali vio-

laceo-fusco. Pedes antichi nigricantes. Abdomen fulvo-griseum, strigâ supra fuscâ in medio, postice quam antice latiori. Setæ albicantes. (Pict.)

Long. corp. ♀ 11, exp. al. 38 mm.

Hab.—Brazil. (Burm.)

GENUS POLYMITARCYS.

(Ala antica, Pl. I. fig. 5.)

Ephemera, p., Ol. 1791; *Palingenia*, p., Burm. 1839; *Polymitarcys*, Etn. 1868.

Imago. Oculi integri; alæ quatuor; pedes debillimi, femoribus brevissimis. ♂ Forcipis pes vel quadri- vel tri-articulatus, secundo articulorum longissimo. Setarum media est brevissima. Ungues antichi tenues, obtusi et impares. ♀ caret ovivalvulâ, et setas tres æquales habet.

Polymitarcys virgo.

(Genitalia maris, Pl. III. fig. 15, 15 a b.)

Ephemera virgo, Ol. 1791. *E. marocana*?, Fab. 1793. *E. lutea*, Pz. 1804. *Palingenia horaria*, Burm. 1839. *E. albipennis*, Voigt, 1840. *Palin. virgo*, Pict. 1843-5.

Subimago, v. s. s. Imagine pallidior, setis pubescentibus.

Imago, v. s. s. ♂. "Oculi atrii; caput infra in fronte atrum." Prothorax testaceus; meso- et meta-thoraces lutescentes. Alæ albæ; nervi transversales apicales areæ marginalis simplices et subrecti. "Pedes albicantes, femoribus anticis infra cum tibiis suis fere in toto atris." Abdomen cretaceum, griseo-nebulosum apicem versus. Setæ et forfex albæ.

Long. corp. ♂ ♀ 16-17; exp. al. ♀ 33; set. ♂ im. 23, subim. 18; set. ♀ im. 13 mm.

Hab.—Central Europe, in large rivers (e. g., Paris, Cologne, and Mannheim); Madrid.

The subimagines rise from the rivers in immense numbers late in the evening, in August, and soon moult. The species from Morocco is possibly distinct from *P. virgo*.

Polymitarcys Savignii, n. sp.

(Genitalia maris, Pl. III. fig. 16, 16 a.)

(*Ephemera*, Sav. 1817; *Palingenia Savignyi*, Pict. 1843-5.)

Imago ♂, v. s. s. Capitis vertex cinereus. Prothorax murinus, linea longitudinali in medio atra; meso- et meta-thoraces lutescentes. Alæ albæ; anticæ costis et subcostis in majore parte nigricantibus. Pedum antici griseo-tincti, posteriores cretacei. Abdomen cinerascens, juncturis, lateribus, ventreque sub-ochraceis, et setis albis. Nervi transversales apicales areæ marginalis anticæ simplices et subrecti.

Long. corp. 10, al. 11 mm.

Hab.—The Nile.

M. E. Pictet has several specimens of this species.

Polymitarcys indicus.

Palingenia indica, Pict. 1843-5.

Subimago ♀, s. s. "Caput parvum, nigricans. Prothorax brevis, gibbosus, et fulvus, in medio fuscus. Mesothorax fulvus, strigis longitudinalibus tribus, quarum duæ alarum radices versus prodeunt. Area marginalis antica violaceo-tincta. Pedes antici fulvi, tibiis strigisque in femoribus singulis nigricantibus. Setæ parum ciliatæ, fulvæ." (Pict.)

Long. corp. ♀ 12, exp. al. 30 mm.

Hab.—The East Indies.

Mr. M'Lachlan possesses specimens of two other species, undescribed, from N. W. India and Bombay.

Polymitarcys macrops.

Palingenia macrops, Hag. 1856.

Apex areæ marginalis anticæ nervis reticulatis.

Species in electro.

Long. corp. ♂ subim. 11, exp. al. 23 mm.

Genus PALINGENIA.

Ephemera, p., Ol. 1791; *Palingenia*, p., Burm. 1839; restricted, Westw. 1840.

Nympha fodiens. Segmentorum abdominis 2-7 branchiifera; laminæ branchiales duplices, et bene fimbriatæ.

Palpi maxillares tri-articulati; inferiores ultimis articulo-
rum late expansis. Mandibulæ antice longe prolongatæ,
per-robustæ, extrinsecus serratæ. Frons bicornuta, cor-
nibus dentatis, dentibusque lateralibus. Labrum subro-
tundatum, apice acuto. Tibiæ anticæ intus dentatæ.
(Corn.)

Inter ultimam metamorphosem exuvias alarum mas
sæpe evertit; feminæ tamen subimago sæpissime status
adultus est, pelle retenta. (Swam.)

Imago. Oculi integri. Setarum media est brevissima.
Alæ quatuor. Tarsi postici quadri-articulati. Ovival-
vula femina caret. Forcipis pedes pedicillati, quadri- vel
forsan quinque-articulati, proximis articulo- rum longissi-
mis.

The nymphs live in burrows which they excavate a little
below the water-mark, in the clayey banks of large and
tranquil rivers.

Palingenia longicauda.

(Genitalia maris, Pl. III. fig. 17, 17a.)

Hemerobius, Clut. 1634. *Ephemera longicauda*, Ol. 1791.
E. fuliginosa, Georgi, 1802. *E. flosaquæ*, Illig. 1802.
Semblis marginata, Pz. 1804. *E. Swammerdiana*, Lat.
1805; *E. Swammerdamiana*, Shaw, 1806.

Pedes postici bi-unguiculati.

Imago, v. s. s. ♂. Alæ cervinæ, nervis luridis. "Tho-
rax luteus; prothorax longitudinaliter quinque-striatus,"
(Pict.). Tarsorum posteriorum primus, secundus et
tertius articulo- rum subæquales, quarto paulo breviores.
Ungues tenues conformes. Abdomen supra saturate um-
brinum. Pedes, venter, setæque, pallide lurido-ochracei.

Long. corp. ♂ 23, al. 24, set. 70 mm. (Pict.)

Hab.—The large rivers of Central Europe (*e. g.* in Ger-
many, Hungary, Austria, and the Netherlands); also in
the Caucasus. About Midsummer.

Swammerdam's supposition, that the aquatic stages of
development occupy three years, seems merely a gratuitous
surmise; for he reared no specimens, and founded his
conjecture upon the differences of size presented by the
nymphs alone. But though in this instance Swammer-
dam was inaccurate, his famous treatise will remain a
monument of his perseverance, and his extraordinary
powers of research.

Palingenia lata.

(Genitalia maris, Pl. III. fig. 18, 18 a b.)

Palingenia lata, Walk. 1853.

Tarsi postici uni-unguiculati.

Adult. ♂, v. s. s. Alæ et thorax fuliginosi. Prothorax lineis longitudinalibus fuscis impressis quinque, viz.: in medio unâ, latero-dorsalibus duabus, alterisque intermediis duabus. Pedes sub-fuliginosi, vel testaceo-cervini; tarsorum posteriores uni-unguiculati, proximis articularum paulo cæteris longioribus. Abdomen supra fuscum. Setæ lutescentes pilosæ.

Long. corp. ♂ 20, set. supra 70, exp. al. 43 mm.

Hab.—Silhet and Sarawak.

The specimens from Borneo have paler legs than those from India.

GENUS PENTAGENIA.

(Ala antica, Pl. I. fig. 6.)

Palingenia (A), Walsh, 1862; *Pentagenia*, Walsh, 1863.

Imago. Alæ quatuor. Oculi integri. Setarum media in ♂ brevissima, in ♀ cæteris parum brevior. Tarsus posticus quadri-articulatus; articularum tres priores æquales, et quarto breviores; ungues dissimiles. Femina caret ovivalvulâ. Pedes forcipis quadri-articulati, secundo articularum longissimo.

Pentagenia vittigera.

(Genitalia maris, Pl. IV. fig. 1.)

Pal. vittigera, Walsh, 1862; *Pent. vittigera*, Walsh, 1863.

Subimago. "Alæ opacæ, flavescentes."

Imago, v. s. s. ♂. "Oculorum partes superiores exemplaris viventis flavescentes, inferiores rubiginosæ." (Walsh.) Medium dorsi fuliginosum; latera venterque testacea, paucis segmentorum apicalium flavis exceptis. Nervi alarum pallidissime testacei, vel electro colorati; plurimis nervorum transversalium in areâ marginali, puncto nodali subcostæ, lineâque infra eundem in quoque nervorum (præter unum) sequentium duorum, atris. Pedes

subtestacei; antici apicibus femorum juncturisque tarsorum fuscis. Apud segmentorum abdominis juncturas dorsales, lineæ flavescens duæ breves divergentes sunt. Setæ albæ pubescentes.

♀ simillima, pedibus sub-gambosis. Alæ, bases versus, et in areis marginalibus imprimis, lurido tinctæ.

Long. corp. ♂ 17-19, ♀ 17-20; al. 18-19; set. ♂ 40-50 & 5, subim. 18 & 4·5; set. ♀ 13 & 10·5-20 & 15 mm.

Hab.—Illinois and Texas.

Pentagenia quadripunctata.

P. 4-punctata, Walsh, 1863.

Subimago. "Alæ opacæ albicantes."

Imago ♀. "Striga dorsalis picea in segmento singulo abdominis hexagonum symmetricum format. Ala antica in medio serie curvata punctorum fuscorum nebulis parvis cinctorum; viz.—in costa uno, noque in nervorum sequentium quarto, sexto, et nono.

Long. corp. 19·5; exp. alar. 40; set. ♀ 22·5 & 19·5, subim. 17 & 14; set. ♂ subim. 15 & 3 mm.

Hab.—Illinois.

Genus HEXAGENIA.

(Ala antica, Pl. I. fig. 7.)

Baetis, p., Say, 1824; *Ephemera*, Guér. 1829-43; *Palingenia*, p., Pict. 1843-5; *Palingenia* (B), Walsh, 1862; *Hexagenia*, Walsh, 1863.

Nympha fodiens a Dom. Walsh, in "The American Naturalist, Oct. 1868," figuratur.

Imago. Oculi integri. Setarum media brevissima. Alæ quatuor. Tarsus posticus quadri-articulatus, primo articulorum vix secundo longiore; ungues dissimiles. Ovivalvula femina caret. Pedes forcipis quadri-articulati; articulorum secundus est longissimus.

Hexagenia albivitta.

(Forceps, Pl. IV. fig. 2, 2 a.)

Baetis albivitta, Walk. 1853. *Palingenia continua*, Walsh, 1860.

Subimago paulo imagine obscurior.

Imago ♂, v. s. s. Dorsum atrum, strigâ longitudinali latâ mediâ niveâ, in prothorace oblongâ; in

meso- et meta-thoracibus mitriformi, et in abdomine marginibus serratis, claudente in segmentis singulis apicalibus lineas duas breves divergentes atras. Venter sub-hepaticoloratus, striga longitudinali testacea, atque apicibus segmentorum obscuratis. Alæ vitrinæ, pallide fuliginoso tinctæ, nervis piceis; anticarum costæ fuscæ; posticarum nervi transversales obscure marginati. Pedes testacei; antici fuscescentes, tarsis atris, ultimis articulorum fuscis. Setæ cervinæ, fusco cinctæ.

Long. corp. ♂ 15, al. 15; set. im. 35, subim. 23 mm.

Hab.—The Amazons and Texas.

Mr. M'Lachlan has a specimen of an undescribed Indian species, in some respects closely related to this.

Hexagenia (?) *atrostoma*.

Ephemera atrostoma, Weber, 1801; *Palingenia atrostoma*, Pict. 1843-5.

“*E. flava*, dorso alisque fuscis, ore oculisque atris. Thorax marginatus canaliculatusque. Abdomen caudâ bisetâ, setis longissimis flavis.” (Weber.)

Hab.—Brazil (Weber).

Hexagenia decolorata.

Palingenia decolorata, Hag. 1861.

Imago in spiritû ætheris conservata. “Lutea; caput fusco-nigrum; pedum antici nigricantes, posteriores lutei; abdomen luteum, strigis lateralibus obscure fuscis, et setis luteis; alæ vitrinæ, flavescenti tinctæ, nervis luteis, subcostis fuscis exceptis.” (Hag.)

Long. corp. 16, set. 30 (?); exp. al. 30 mm.

Hab.—Mexico; Matamoras; Tamaulipas. Common. (Hag.)

Perhaps this is only a colour variety of the following species, but I am unable to decide the point.

Hexagenia limbata.

(Forceps, Pl. IV. fig. 3, 3a.)

Ephemera limbata, Guer. 1829-43; *Palingenia limbata*, Pict. 1843-5. *Palingenia bilineata*, Hag. 1861.

Subimago, v. s. s. Alæ pallide flavicantes, plurimis nervorum transversalium corvinis. Setæ pilosæ.

Imago, v. s. s. ♂ “Oculorum partes superiores acute virescenti-flavæ, partes inferiores nigræ. Setæ fuscæ, proximis dimidiorum articularum pallidis.” (Walsh, v. s.) Strigæ laterales dorsi prothoracis nigræ retro producuntur, et findentes juxta bases alarum, circa mesothoracis apicem desinunt. Alarum nervi plerumque picei, bases versus pallidi; interdum vero longitudinales lutei, et transversales solum picei sunt. “Pedes antici fuscii, basibus plerumque articularum tarsalium 2, 3, 4, albicantibus vel flavescensibus; posteriores acute flavescens, paucis articularum tarsalium cum apicibus, quinque in toto, fuscis. Abdomen supra striga in medio fusca, lineisque lateralibus obliquis ab apicibus segmentorum “quibus in trigonis paribus flavicantibus vel fulvescentibus latera dorsi finduntur.”

♀. A ♂ in nervis alarum vitrinis (“hyaline” Walsh) vel flavescensibus discrepat. Setæ flavæ.

Long. corp. ♂ 20-21, ♀ 22; set. ♂ 40, ♀ subim. 20; exp. al. ♂ 38, ♀ 30 mm. (Pict.)

Hab.—Arctic America, Texas and Mexico; in large rivers. Mr. M'Lachlan has many specimens.

Hexagenia bilineata.

(Forceps, Pl. IV. fig. 4.)

Baetis bilineata, Say, 1824. *Palingenia viridescens & occultata*, Walk. 1853. *Baetis angulata*, Walk. 1853. *Palingenia limbata*, Hag. 1861. *Palingenia bilineata*, Walsh, 1863.

Subimago, v. s. s. Alæ grisæ, nervis piceis, bases versus lutescentes. Alarum posteriores apud margines terminales atro limbatae.

Imago, v. s. s. ♂ “Oculorum dimidiorum superiora cinamomeo-fusca, inferiora atra” (Walsh, v. s.). Pedum antici picei, apicibus tibiæ et proximis articularum tarsorum atris; “interdum 2, 3 et 4tus articularum bases versus pallidiores sunt: posteriores in s. s. ochracei; vel (veluti in v. s.) femoribus obscure virescentibus, cum genibus, tibiis, tarsisque fuscis. Nervii alarum picei; harum anterior areis marginali et submarginali, atque posterior margine terminali, fuscis.

♀ s. s. “Dorsum prothoracis in fronte et ad latera nigrum. Abdominis striga dorsalis maculam cretaceam

oblongam vel triangulam apud latera segmenti singuli utrinque relinquit; striga ipsa segmentorumque apicibus fuscis." (Walsh.)

Long. corp. ♂ 17-21, ♀ 21-29; set. ♂ 42-51, subim. 18; set. ♀ 20, subim. 18-19; al. ♂ 17-20, ♀ 21-23 mm.

Hab.—Arctic America, to New Orleans; in lakes and rivers.

The *Hexageniæ* are said to appear in suitable localities in astounding profusion. The late Mr. Walsh says he has seen shrubs broken down by the accumulated masses of one species upon them! The name of the shrub, and how many thousand specimens of the *Hexagenia* in question go to the pound, are unfortunately omitted from his observations.

Genus EUTHYLOCIA, nov. gen.

(Alæ anticæ partes, Pl. I. fig. 8, 8a.)

Palingenia, p., Hag. 1861.

Imago ♀. Alæ quatuor. Setæ tres, longæ, subsequales.

Euthyplocia Hecuba.

Palingenia Hecuba, Hag. 1861.

Imago, v. s. s. ♀. "Capite nigro-fusco; prothorace fusco, polito; coxis luteis; alis magnis opacis, cervinotinctis, costas versus obscuratioribus, nervis griseis. Abdomen supra nigro-fuscum, subtus lutescens; setis saturate fumatis." (Hag.)

Long. corp. 22, exp. al. 78 mm.

Hab.—Vera Cruz (Sallé); Veragua.

There is a specimen of this insect in Mr. M'Lachlan's collection, and another (the type) in that of Baron De Selys Longchamps. The legs are lost, and the colours are so faded, that I have preferred citing the old description to redescribing the species. In what Dr. Hagen suspects to be the male, the undivided eyes are almost contiguous, the median seta is very long, and the anterior legs are long and feeble.

Genus EPHEMERA.

(Ala antica, in parte, Pl. I. fig. 9.)

Ephemera, Lin. 1735.*

Nympha fodiens. Segmentorum abdominis 1-7 brachiifera: laminarum primæ minutissimæ, bipartitæ, dimidiis linearibus marginibus integris; posteriores quoque duplices, sed dimidiis acute lanceolatis, marginibus bene fimbriatis. Palpi maxillares bi-articulati: superiores longi, hirsuti, secundo articulorum primo longiore: inferiores apicibus articulorum ultimarum dilatis, obliquis. Mandibulæ latus externum in cornu prorecto longissimo valde prorsus producitur. Frons breviter bicornuta, cornibus simplicibus.

Alis conniventibus erectis, pedibus anticis elevatis et prorectis, setisque caudalibus subparallelis, subimago quiescit. Setarum laterales inter se approximantur vel subtus vel supra mediam.

Imago. Oculi integri; alæ quatuor; setæ tres longæ, subæquales. Tarsi postici quadri-articulati; articulorum tres priores subæquales; ungues dissimiles. Pedes forcipis quadri-articulati, secundo articulorum longissimo. Ovivalvulâ femina caret.

Species of this genus usually appear in moderate numbers. The apical cross-veinlets of the marginal area of the fore-wing are variable in the same species. The pale spots of the thorax of the subimago, mentioned in the description of *E. vulgata*, are found in the other European species.

Ephemera vulgata.

(Genitalia maris, Pl. IV. fig. 5, 5a. Maculæ abdominales, fig. 5b.)

Ephemera maculata, Lin. 1747. *E. vulgata* [De G. 1755]; Lin. 1758. *E. communis*, Retz. 1783. *E. danica*, Ronalds, 1856.

Subimago, v. v. s. Alæ vel flavo-virentes, vel virescenti-griseæ, vel cineræ, nervis fuscis; anticæ in medio fusco vel piceo maculatæ; nervi transversales maris corvino marginati: margines terminales late griseo tincti.

* *Ephemerum*, Hampe (1844), is a genus of the *Phascei*, an Order of the Acrocarpous Mosses.

Vertex capitis maculâ luteâ: prothorax lineis longitudinalibus duabus atris; mesothorax supra maculâ magnâ lutescente, ex quâ in fronte et a posteriore strigæ curvatæ duæ producuntur; metathorax luteus, maculis L-formatis nigris duabus.

Imago, v. v. s. ♂. Caput atrum, oculis supra fuliginosis, infra vel paulo saturatioribus vel nigris. Thoracis tergum aterrimum nitens. Alæ virescenti-griseæ vel pallidissime flavo-virentes, maculis piceis et nervis atris: posteriores marginibus terminalibus late, et nervis transversalibus anguste, griseo tinctis. Pedes olivacei; antici femoribus atro-piceis, et tarsis fuscis; posteriores tibiis tarsisque fulvis, apicibus articulorum ultimorum et unguibus fuscis. Abdomen umbrino-olivaceum, juncturis et apicibus segmentorum plus aut minus ochraceis: triangulos acutos duos, lineasque interpositas breves duas, segmentorum posteriorum supra quidque habet, infraque lineas longitudinales atras quatuor, viz., duas longas sub-parallelas, et duas breves divergentes: in anterioribus segmentorum trianguli in strigis curvatis se convertunt, et notulæ interpositæ obsolescunt. Setæ fuscae, juncturis fuliginosis, atque pubescentes, præcipue apices versus. Forceps fuscus.

♀ plane omnino mari similis, alis pallidioribus exceptis.

Var. ♂ et ♀, v. v. s. Pro maculis trigonalibus, lineæ curvatæ segmentis singulis sunt.

Long. corp. 14-22; al. ♂ 16-17, ♀ 18-24; set. ♂ im. 33 & 34-32 & 36, subim. 16 & 17-19.5 & 21; set. ♀ im. 22 & 24-26, subim. 17 & 16-18 & 19 mm.

Hab.—Moscow (Oul.); Scandinavia (Zet.); England, Germany, France, and Switzerland. May and June.

This species is plentiful in warm rivers and tranquil streams in England, and in some of the Swiss lakes (*e. g.*, near Brunnig).

Ephemera guttulata.

(Genitalia maris, Pl. IV. fig. 6, 6a. Maculæ abdominales, fig. 6b.)

Ephemera guttulata, Pict. 1843-5. *Ephemera decora*, *E. simulans* & *Palingenia natata*, Walk. 1853. *Ephemera natata*, Hag. 1861.

Subimago, v. s. s. ♂ ♀. Alæ vix nigricantes, maculis et marginibus nervorum transversalium piceis. Pedes purpureo-brunnei. Setæ fuliginosæ, juncturis obscuris.

Imago, v. s. s. ♂. Alæ vitrinæ, in nervis transversalibus piceo crebre maculatæ. Pedes et setæ lutei, juncturis fuscescentibus. Maculæ magnæ dorsi abdominis transversæ, subquadratæ, angulis posticis retro productis, et lateribus emarginatis: venter bilineatus.

♀ simillima, alis sparse maculatis.

Long. corp. ♂ 11, ♀ 13-15; al. ♂ 13-15, ♀ 15-19; set. ♂ im. 25, subim. 14; set. ♀ subim. 15 mm.

Hab.—From Northern Illinois and from Connecticut northwards; in rivers.

This species resembles *E. vulgata* in having the back of the abdomen spotted instead of being merely streaked, and also in the general formation of the male genital organs. M. Pictet's specimen seems, from the figure, to have been a male imago.

Ephemera flaveola.

E. flaveola, Walsh, 1862.

Subimago, v. s. s. "Alæ fumatæ. Setæ obscure et pallide virescentes."

Imago, v. s. ♂. "Vertex capitis rubiginosus; tergum thoracis pallidius. Alæ vitrinæ; anticæ apud costas flavescenti-tinctæ, et tribus prioribus nervorum longitudinalium flavescens. Pedes flavescens; antici apicibus femorum et tiliarum, proximis articularum tarsalium et apicibus juncturisque cæterum, rubiginosis. Abdomen flavescens, strigâ pallidâ utrinque segmentorum 3-7. Setæ albicantes, juncturis fuscis."

♀ v. s. "Abdomen vitelli-coloratum. Nervi transversales alarum fusci, eis ad apices et apud margines terminales exceptis."

Long. corp. ♂ 7.5-9.5, ♀ 9-10.5; set. ♂ im. 20 & 14, subim. 12 & 10; set. ♀ im. 12 & 10; exp. al. ♂ 17-19, ♀ 19-20. (Walsh.)

Hab.—Rock Island, Illinois (Walsh); and New York.

Ephemera myops.

E. myops, Walsh, 1863.

“*Ephemerâ flaveolâ* major; oculi eis speciei illius minores, et ab ipsis remoti. Segmentorum abdominis 1-5 rubiginosa, sextum et nonum pallidiora, septimum et octavum flavescencia: vel omnia segmentorum flavescencia sunt.

Long. corp. ♂ 12-13; exp. al. 26-27; set. 27 & 19-29 & 21 mm.

Hab.—Rock Island, Illinois.” (Walsh.)

Dr. Hagen ad paginam 177 operis supra citati (Walsh 1863) diagnosem quam forsitan ad *E. myopsis* varietatem pertineat donavit:—

“Alæ vitrinæ, maculosæ. Abdomen flavum, immaculatum. *E. danicæ* subsimilis.”

Long. corp. 19, exp. al. 42 mm.

Hab.—New York. (Hag.)

Ephemera lineata.

(Genitalia maris, Pl. IV. fig. 7, 7a. Notæ abdominales, fig. 7b.)

E. danica, Pict. 1843-5 (*nec* Müll.). *E. lineata*, Etn. 1870.

Subimago, v. v. s. Alæ virescenti-griseæ, marginibus terminalibus pallido griseo late tinctis, et nervis transversalibus atris. Horum pauci in medio alæ anticæ atrobrunneo marginati sunt, ideoque seriem macularum formant.

Imago, v. v. s. ♂. Thorax supra fusco-piceus. Alæ vitrinæ, nervis et maculis atris; anticæ in areis marginali submarginali, atque late marginem terminalem versus, corvino tinctæ. Pedum anteriores femoribus piceis, tibiis tarsisque atris: posteriores virescenti-grisei, coxis, maculis utrinque femorum, et apicibus juncturisque tarsorum, atris. Abdomen fusco-virescenti-griseum, apicem versus lutescens: segmentorum posteriora singula strigis atris dorsalibus sex, infraque lineis longitudinalibus atris duabus; illarum duæ longæ unaque brevis utrinque supra medium dorsi sunt. Setæ fuscæ, juncturis atris; forceps lutescens. Strigarum duæ breves ab anterioribus segmentorum absunt.

♀. *Simillima mari*. Prothoracis tergum virescenti griseum, strigis lateralibus atris duabus. Meso- et metathoraces lutei, strigis obscuris inter alas duabus. Alæ vitrinæ, nervis transversalibus atris, et nervis longitudinalibus cum areis marginalibus et submarginalibus, virescenti-griseis. Pedes antici fusci, apicibus femoris, tibiæ, articulorumque tarsalium, atque tibiæ basi, atris. Caput ochraceum, circa ocellos luteum, oculis (veluti in ♂) fuligineo-umbrinis.

Long. corp. ♂ 15-20, ♀ 21-25; al. ♂ 16, ♀ 20-21; set. ♂ 30 & 35-6; set. ♀ im. 24 & 26-25 & 24, subim. 15 mm.

Hab.—The Thames, and the Kennet, near Reading; near Paris; and Genthod, near Geneva. June and July. It frequents rivers or tranquil waters.

I have no doubt that the two females referred by Dr. Hagen to *E. glaucops*, Pict. subim. (Hag. 1863), were specimens of *E. lineata*. The *E. danica* of M. Pictet's collection is *E. vulgata*, Lin.

Ephemera danica.

(Genitalia maris, Pl. IV. fig. 8. Maculæ abdominalis, fig. 8a.)

E. danica, Müll. 1764. *E. maculata*, Vill. 1789. *E. vulgata*, Don. 1795. *E. cognata*, Stæ. 1835-6. *E. hispanica*, Rbr. 1842.

Subimago, v. v. s. Alæ fumatæ, nervis atris, lutescentibus bases versus; vel flavo-virentes. Pedes lutei, tibiis et tarsis posteriorum flavo-virescentibus, apicibus articulorum nigricantibus. Abdomen flavicans, maculis corvinis, et setis piceis.

Imago, v. v. s. ♂. Caput et tergum thoracis aterrima vel picea; os et prosternum straminea; oculi fuliginosi. Alæ vix corvinæ; anticæ areis marginalibus et submarginalibus anthracinis, maculis fuscis, et nervis atris. Pedum antici atri; posteriores atro-fusci, juncturis saturatoribus. Abdomen cretaceum, posticæ sæpe fusco suffusum; posteriora segmentorum strigas quatuor supra habent, infraque lineas longas, atras vel fuscas, duas; anteriora lineis intermediis supra carent, vel etiam omnibus. Setæ piceæ.

♀ abdomine pallide ochraceo, lineis et strigis fuscis. Alæ vitrinæ: anticæ in areis marginalibus et submarginalibus, posticæ margines terminales versus, nigricanti tinctæ. Pedum posteriores saturate virescente grisei, juncturis atris.

Long. corp. ♂ 16, ♀ 16-23; al. ♂ 16, ♀ 14-22; set. ♂ 35 & 30, ♀ 14-25, subim. 17 mm.

Hab.—Spain (Rbr.); France (Blanch.); England; Lapland (Pict.); Moscow (Oul.); Belgium and Germany. In brooks, streams, and cold swift rivers; from May to July.

This is the May-fly of anglers. Fishermen apply various names to it, according to the state and sex; thus the "Green Drake" (♀ subim.), "Bastard Drake" (♂ subim.), and the "May-fly" (♀ im.). It frequents colder and more rapid streams than *E. vulgata*. Mr. E. Brown, of Burton-on-Trent, tells me that on one occasion he saw the River Dove almost covered with the subimago, at a part where it is upwards of twenty or thirty feet broad.

Ephemera glaucops.

(Forceps, Pl. IV. fig. 9.)

E. lutea, Sulz. 1776: (*nec* Lin.). *E. glaucops*, Pict. 1843-5.

Subimago, v. s. s. Alæ pallide cervino tinctæ, nervis transversalibus atris rufo-cervino marginatis, ideoque in medio alæ anticæ et prope basin maculas formantibus; margines terminales, vel griseo vel rufo-cervino late tincti; nervi longitudinales flavescentes. Oculi saturate cæsi.

Imago ♂, v. v. s. Oculi supra vel olivacei vel rubigineo-lutescentes, infra saturate olivacei vel purpureo-rubiginei: os flavescens. Corpus rubigineo-luteum vel luteum; "prothorax maculis fuscis duabus" (Pict.). Alæ vitrinæ, maculis paucis, et margines terminales versus tinctæ, longitudinalibus nervorum (transversalibus ipsis atris) et marginibus transversalium, atque areis marginalibus et submarginalibus, plus aut minus lutescentibus. Pedum antici lutescentes, apud juncturas atris: posteriores testacei, juncturis saturatoribus vel virescenti-grisei. Segmentorum abdominis posteriora singula strigas atras

quatuor supra habent, infraque lineas duas; strigis intermediis duabus anteriora segmentorum carent. Forfex lutea, juncturis atris vel piceis. Setæ fuliginosæ, juncturis obscuris.

♀ v. s. s. Simillima, sed mari pallidior.

Long. corp. ♂ 16-17, ♀ 16; al. ♂ 14-15, ♀ 16; set. ♂ 23, subim. 17, ♀ im. 14 mm.

Hab.—Moscow (Oul.); Germany (Burm.); Switzerland and North Italy. In lakes; the end of July, and August.

Ephemera immaculata, n. sp.

(Forceps, Pl. IV. fig. 10.)

Imago, v. s. s. ♂. Thoracis tergum brunneo-luteum. Pedum antici picei, femoribus bases versus pallidioribus; posteriores brunneo-testacei. Alæ vitrinæ, immaculatæ; anticæ areis submarginalibus, posticæ apud margines terminales, fuliginoso tinctæ; nervi obscuri. Abdomen fuscum, apicibus segmentorum lineisque spiracularibus saturatoribus. Setæ umbrinæ, invariæ.

Long. corp. ♂ 10·5, al. 11 mm.

Hab.—Cuna, Hindostan.

In the Oxford Museum.

Ephemera exspectans.

Potamanthus exspectans, Walk. 1860.

Subimago, v. s. s. Alæ pallide furfurosæ, nervis transversalibus purpureo-brunneis. Tergum thoracis fulvescens, strigâ utrinque fuscâ. Abdomen lineis longitudinalibus tenuibus atris, supra quatuor, infra duabus. Setæ olivaceo-lutæ, juncturis fuscis. Pedes lurido-ochracei.

Long. corp. ♀ subim. 11, al. 14 mm.

Hab.—Hindostan.

Ephemera fasciata.

(Genitalia maris, Pl. IV. fig. 11, 11a.)

Potamanthus fasciatus, Hag. 1858.

Subimago, v. s. s. ♀. Alæ cervinæ; anticæ nervis transversalibus atris, paucis in areâ marginali juxta sub-

costam obscure marginatis, et areis submarginalibus cum crassioribus nervorum longitudinalium lutescentibus. Pedes pubescentes.

Imago, v. s. s. ♂. Thoracis tergum testaceum. Alæ vitrinæ; anticæ apud costas et apices versus pallide luteo tinctæ; nervorum longitudinales furfurosi, transversales atri, puncto nodali subcostæ subfuliginoso. Pedes pallide testacei; antici tarsis nigricantibus (prioribus articularum fuscis exceptis) et tibiis fuscis. Abdomen sub-ochraceum vel stramineum, supra lineis longitudinalibus duabus, et maculâ parvâ trigonali ad apicem cujusque segmentorum posteriorum utrinque, atris: prioribus segmentorum trianguli absunt. Setæ furfurosæ, juncturis saturatioribus.

Long. corp. ♂ 13-14, al. 14-15, set. ♂ im. 32-40, ♀ 15 mm.

Hab.—Rainbodde, Ceylon; Masuri, North India.

Ephemera serica, n. sp.

(Genitalia maris, Pl. IV. fig. 12, 12a.)

Subimago, v. s. s. Alæ pallide testaceæ; feminae plures nervorum transversalium, qui tres priores nervorum longitudinalium alæ anticæ interjacent, et pauci cæterorum, atri; in mari quidem plures etiam cæterorum atri sunt.

Imago, v. s. s. ♂. Caput lutescens, circa ocellos rufobrunneum. Tergum thoracis furfurosum vel brunneo-ochraceum, macula elongata utrinque prothoracis atra. Alæ vitrinæ, nervis veluti in subimagine; punctum rotundatum apud punctum nodale, et alia in mediis nervorum transversalium circa medium alæ picea; alæ posticæ immaculatæ. Pedes ochracei, coxis singulis maculis, apicibus femorum et tibiarum anticarum, atque basibus harum, atris. Abdomen pallide ochraceum, lineis longitudinalibus atris tribus infra et supra. Setæ ochraceæ, irregulariter atro annulatæ.

♀ simillima.

Long. corp. ♂ 11, ♀ 14; al. ♂ 13, ♀ 18; set. ♀ subim. 17 mm.

Hab.—Northern China.

Genus POTAMANTHUS.

(Ala antica, in parte, Pl. II. fig. 1.)

Ephemera, p., Lin. 1767. *Baetis*, p., Curt. 1834. *Potamanthus*, p., Pict. 1843-5; Etn. 1868.

Imago. Oculi maris subpartiti. Alæ quatuor. Setæ tres subæquales. Artus forcipis tri-articulati, proximo articularum longissimo. Tarsi postici quinque-articulati: articularum primus brevissimus, tibiæ adnatus, vix obsoletus; secundus tertio vel quarto multo longior: ungues dissimiles. Ovivalvulâ femina caret.

Potamanthus luteus.

(Genitalia maris, Pl. IV. fig. 13, 13a.)

Ephemera lutea, Lin. 1767. *E. marginata*, ? Mül. 1776. *E. reticulata*, Fourc. 1785. *E. hyalina*, Pz. 1804. *Baetis mellea*, Curt. 1834. *B. marginalis*, Burm. 1839. *E. flavicans* & *E. chlorotica*, Ramb. 1842. *P. luteus*, Pict. 1843-5.

Subimago, v. s. s. ♂. Alæ flavæ, costas versus paulo saturatiores, nervis transversalibus nigris.

♀. Alæ virescenti-griseo tinctæ, apud bases flavescentes, nervis flavescentibus.

Imago, v. s. s. ♂. Thoracis tergum luteum vel ochraceo-furfurosum. Alæ vitrinæ, flavescentes costas versus; nervorum longitudinales flavæ, transversales atræ. Pedum antici sub-furfurosi, tarsi pallidis, sed apicibus tibiæ, juncturis et proximis articularum tarsalium fuscis; posteriores straminei, unguibus juncturisq; tarsorum obscuris. Abdominis dorsum furfurosum, juncturis saturatioribus: segmentum singulum puncto sub-laterali apicali fusco, et puncto basali in lineâ spiraculari nigro, utrinque. Forceps flavus vel stramineus. Setæ sub-furfurosæ, juncturis piceis, breviterque pubescentes.

♀. "Clarior mari, macula fusca super prothoracem, et juncturis tarsorum anticorum obscure fuscis." (Pict.)

Long. corp. ♂ 10-11, ♀ 9; al. ♂ 12-13; exp. al. ♀ 29; set. ♂ im. 15-19, ♀ 12 mm.

Hab.—England (Curt. & M'Lach.); France (Geof.); Germany (Sulz., Pict.).

Potamanthus Ferreri.*P. Ferreri*, Pict. 1843-5.

Imago, ♂. "Thorax pallide furfurosus, maculâ dorsali pone prothoracem fuscâ. Alæ vitrinæ, nervis pallidissime flavescens, et pluribus transversalium indiscretis. Pedum antici pallide fusci, femoribus coxisque saturatioribus, et juncturis flavis; posteriores pallide furfurosi, invari. Abdominis dorsum fuscum, latera versus fulvum, maculâ mediâ trigonali super singula segmenta; venter fulvus. Setæ et forceps pallide flavæ."

Long. corp. ♂ 13, set. 18, exp. al. 30 mm.

Hab.—Turin (Pict.).

GENUS LEPTOPHLEBIA.

(Ala antica, Pl. II. fig. 2a.)

Ephemera, p., Lin. 1746. *Baetis*, p., Burm. 1839. *Leptophlebia*, p., Westw. 1840. *Potamanthus*, p., Pict. 1843-5. *Palingenia*, p., Walk. 1853. *Leptophlebia* (restricted), Etn. 1868.

Imago. Alæ quatuor. Setarum media est longa vel abbreviata. Oculi maris sub-partiti.

It is with very great hesitation that I venture provisionally to retain in this genus the majority of the species placed in it. Ignorance of their preparatory stages of development compels one to class them all together, for the present. The group to which *L. fusca* belongs seems at first sight to be clearly distinct from the rest; but the nymph of *L. fusca* resembles that figured by Professor Pictet as the nymph of *L. cincta*; and besides this, in the closely allied genus *Baetis*, it is found that considerable differences in the form and neuriation of the posterior wings of species are compatible with their being in the same genus: therefore *L. fusca*, in spite of appearances, can hardly be separated from the group of which *L. marginata* is the type, with safety. On the other hand, the differences between the group last mentioned, and that of which *L. cupida* is the type, are, upon the whole, equivalent to those between *Ephemera* and *Hexagenia*; therefore it may be a mistake to consider them as sections merely of one genus. When the nymphs are known, all doubts will be set at rest; but not until then. Most likely

differences will be detected between the maxillæ and maxillary palpi of the typical species of the several series, sufficiently marked to require their generic separation.

Series 1. Sp. typica, *L. australis*.

Imago. Tarsus posticus veluti in *Potamantho*, sed unguibus conformibus uncinatis. Setarum trium media quidem est longa, et cæteris subæqualis: plerumque tamen abrumpitur, igiturque cauda biseta esse videtur. Forcipis artus tri-articulati, proximo articulorum longissimo. Costæ alarum posticarum haud excisæ sunt (nisi in *L. auriculata*).

Occurrunt species in Australia, et circa litora Oceani Indici usque ad Promontorium Spei Bonæ.

Leptophlebia australis.

(Genitalia maris, Pl. IV. fig. 14, 14a. Alæ anticæ areæ marg. apex, fig. 14b.)

Ephemera australis, Walk. 1853.

Subimago, v. s. s. Alarum anticarum nervi transversales fusco vel virescenti-griseo marginati, marginibus plus aut minus confluentibus: paucitas illorum spatium lambda-forme clarum relinquit, quod apicem angulumque analem oblique interjacet, atque ad basin alæ crus breve emittit.

Imago, v. s. s. ♂. Tergum thoracis piceum, politum. Alæ vitrinæ, nervis luteo-piceis, et apice areæ marginalis anticæ sub-virescenti-griseo, nervulis transversalibus numerosis obliquis et subrectis. Pedum antici fusco-picei, posteriores flavescens, femoribus obscure nigro bicinctis, et tarsis testaceis. Abdomen luteo-fuscum vel luteo-castaneum. Setæ piceæ.

Long. corp. ♂ 7-10, al. 9-11, set. 23 & 22 mm.

Hab.—Tasmania. (Brit. Mus.)

Leptophlebia australasica.

(Ala antica, Pl. II. fig. 2. Genitalia maris, Pl. IV. fig. 15, 15 a, b.)

Baetis australasica, Pict. 1843-5.

Subimago, s. s. "Alæ nigricantes, nervis saturatioribus." (Pict. e figura.)

Imago, v. s. s. ♂. Thoracis tergum atro-piceum. Alæ vitrinæ, lurido sub-tinctæ, nervis atro-piceis; margines virescenti-grisei nervorum simplicium transversalium in areis marginalibus et submarginalibus, in apicibus illarum confluent. Pedum antici atro-picei; posteriores rufo-lutei, femoribus atro bicinctis. Abdominis dorsum rufo-fuscum, venter rufo-luteus; segmentorum 2-8 singula maculis apicalibus utrinque juxta media rotundatis atris, lineisque obscuris obliquis ex apicibus retrorsum fere ad bases productis.

♀. Simillima. Processus ventralis e segmentorum penultimo excisus.

Long. corp. ♂ 9-10; al. ♂ ♀ 11; set. ♂ 32 mm.

Hab.—Sidney and (?) Melbourne.

Leptophlebia furcifera, nov. sp.

(Genitalia maris, Pl. IV. fig. 16, 16b. Areæ marginalis apex, fig. 16a.)

Imago, v. s. s. ♂. Tergum mesothoracis brunneo-luteum: metathorax aterrimo-sanguineus. Pedum posteriores (exemplar anticis caruit) testacei, femoribus fusco bicinctis, at trochanteribus juxta bases obscure fuscis. Alæ vitrinæ, iridi-coloratæ, nervis piceis: anticæ apex areæ marginalis rufo-fusco tinctus, nervis transversalibus simplicibus numerosis subrectis et obliquis; cæteri nervorum transversalium inter costam, subcostam, duosque nervorum longitudinalium sequentium rufo-fusco marginati: puncta nodalia subcostæ nervique sequentis nebulis parvis fuliginosis, veluti etiam punctum bifurcationis quarti nervorum pone costam, circumfunduntur. Abdomen sanguineo-atrum, lineâ in medio longitudinali, lineis spiracularibus, maculisque trigonalibus latero-apicalibus segmentorum 2-6, pallidis. Setæ cretaceæ, juncturis in vices atris.

Long. corp. ♂, et al. 11, set. 13 & 16 mm.

Hab.—Melbourne. (M'Coy.)

Leptophlebia inconspicua, nov. sp.

(Genitalia maris, Pl. IV. fig. 17, 17b. Areæ marginalis apex, fig. 17a.)

Imago, v. s. s. ♂. Thoracis tergum politum. Alæ vix lacteo tinctæ, nervis piceis. Pedes picei; interdum

tarsi antici et posteriores pedum pallidiores sunt. Abdomen apicem versus piceum, segmentis intermediis pallidioribus, maculis parvis ovalibus ad latera dorsi flavescentibus. Setæ fuscæ, juncturis saturatoribus.

Long. corp. ♂ 5-6, al. 6-7 mm.

Hab.—Adelaide.

Leptophlebia dentata, nov. sp.

(Genitalia maris, Pl. IV. fig. 18, 18a, b; feminæ, fig. 18c. Areæ marginalis apex, fig. 18d.)

Imago, v. s. s. ♂. Thoracis tergum furfurosum. Alæ cano tinctæ, nervis transversalibus anguste marginatis: juxta punctum nodale subcostæ, atque in areæ marginalis apice, sunt laberculæ atræ: areæ marginalis et submarginalis obscure luteæ. Pedes lutei, juncturis tarsorum piceis, et apicibus tibiæ antillarum atris. Abdomen adusto-umbrinum, apicibus segmentorum saturatoribus. Setæ pilosæ, ochraceæ, juncturis obscuris.

♀ simillima. Processus ventralis penultimi segmentorum emarginatus.

Long. corp. ♂ 8, ♀ 7-9; al. ♂ 11, ♀ 7-13; set. ♂ 18, ♀ 15-16 mm.

Hab.—New Zealand.

Leptophlebia strigata, nov. sp.

(Lamina penult. segment., Pl. IV. fig. 19.)

Imago, v. s. s. ♀. Thoracis tergum fusco-fulvum, lineis longitudinalibus duabus utrinque prothoracis atris, quarum exteriores ad bases alarum antillarum prodeunt. Alæ vitrinæ, nervis piceis, juxta bases luridæ; anteriores prope costas umbrino-fulvæ. Pedes saturate furfurosi, femoribus obscure bicinctis, cingulis anticorum plus aut minus confluentibus; tibiæ tarsique pallidi, juncturis saturatoribus. Abdomen aureum, strigis duabus longitudinalibus atris (e triangulis truncatis continuis constructis), lineâque utrinque singulo segmento apicali obliquâ nigrâ: subtus lineâ longitudinali simplici in medio aterrimâ. Setæ pallide rubiginosæ, juncturis obscuris.

Long. corp. ♀ 22, al. 16, set. 23 & 19 mm.

Hab.—North Australia.

Leptophlebia costalis.

Baetis costalis, Burm. 1839; *Potamanthus costalis*, Pict. 1843-5.

Subimago, s. s. ♂. "Nigra, linea thoracis ante alas albida, abdomine pedibusque rufo-cingulatis; alis subfumatis, venis omnibus areæ marginalis primæ et secundæ infuscatis." (Burm.)

Long. corp. ♂ 6."

Hab.—New Holland. Perhaps allied to *L. dentata*.

Leptophlebia nodularis, nov. sp.

(Genitalia maris, Pl. IV. fig. 20, 20 b, c. Ala postica, fig. 20a.)

Subimago, v. s. s. Alæ vix nigricantes; anticæ nervis transversalibus anguste nigricanti marginatis, marginibus plus minusve apud medium alæ et inter medium apicemque confluentibus; posticæ unicolores.

Imago, v. s. s. ♂. Thorax supra atro-piceus. Alæ vitrinæ, nervis atris; nervi transversales areæ marginalis areæque submarginalis anguste et obscure marginati, atque inter se apud medium costæ iterumque paulo ante apicem approximantes, ita ut pæne maculas fingant; areæ pars basalis fusca. Pedum antici obscure lutescentes, femore in medio, genu, tibiæque apice nigro circumdatis; posteriores furfurosi, femoribus solum nigro cinctis. Abdomen decoloratum. Setæ albicantes, bene nigro annulatæ.

Long. corp. ♂ 9; al. 10-12; set. 16 mm.

Hab.—Christchurch, New Zealand (Fereday). The penis has no appendages.

Leptophlebia scita.

(Genitalia maris, Pl. IV. fig. 21, 21a.)

Baetis scita, Walk. 1853.

Subimago, v. s. s. Alæ vel nigricantes, vel fuliginosæ, nervis atris (transversalibus marginibus saturatioribus); antica maculâ pallidâ in medio: apud punctum nodale subcostæ hujus, et in apice quoque areæ marginalis, tres vel quatuor nervorum transversalium ferme inter se approximant, ita ut maculas saturatiores duas faciant.

Imago, v. s. s. ♂. Thoracis tergum fuliginosum. Alæ vitrinæ, cano tinctæ, nervis fuscis: antica maculâ basali, marginibus angustis nervorum areæ marginalis, maculisque super costam duabus quasi in subimagine, fuscis. Posteriores pedum lutei, femoribus in mediis obscure punctatis, tarsisque fuscescentibus. Abdomen saturate fuscum, apicibus segmentorum saturatoribus; segmentorum intermedia singula maculis brevibus trigonalibus duabus juxta bases, flavescentibus. Setæ albæ, vel cervinæ, juncturis subinde saturatis. Forceps luteus.

♀ mari simillima.

Long. corp. ♂ 6, al. 7-8 mm.

Hab.—New Zealand.

Leptophlebia Taprobanes.

(Genitalia maris, Pl. IV. fig. 22, 22a.)

Baetis Taprobanes, Walk. 1853.

Imago, v. s. s. ♂. Corpus atrum. Pedum antici atri, posteriores picei. Alæ vitrinæ, pallidissime fusco tinctæ, nervis fuscis: antica areis marginali atque submarginali fuscis, apicibus saturatoribus, nervis transversalibus in apice illius simplicibus rectisque. Abdominis juncturæ pallidæ. Setæ fuscæ.

Long. al. ♂ 12, set. super 30 mm.

Hab.—Ceylon.

Leptophlebia annulata.

(Genitalia maris, Pl. IV. fig. 23, 23 a, b.)

Potamanthus annulatus, Hag. 1858.

Subimago, s. s. ♂. "Alis nigro fumosis." (Hag.)

Imago, v. s. s. ♂. Tergum thoracis fuscum. Alæ vitrinæ, nervis atris: anticæ juxta costas fusco tinctæ, nervis transversalibus numerosis curvatis simplicibusque in areis marginalibus apices versus. Pedes saturate fuscis. Abdomen testaceum, apicibus segmentorum fuscis. Setæ fuliginosæ.

Long. corp. ♂ 9, al. 10, set. 35 & 37 mm.

Hab.—Rainbodde, Ceylon.

Leptophlebia femoralis.

Potamanthus femoralis, Hag. 1858.

Subimago, s. s. "Alis griseo fumatis."

Imago, s. s. "Capite thoraceque fusco-æneis, pedibus pallidis, femoribus cingulo medio nigro, setis brunneis, abdomine albido, apice fusco, segmentis omnibus apice fusco marginatis; alis vitreis, venis fuscis." (Hag.)

Long. set. ♂ 33, ♀ 15; exp. al. ♂ ♀ 18 mm.

Hab.—Rainbodde.

Leptophlebia dislocans.

Ephemera dislocans, Walk. 1860.

Imago, v. s. s. ♀. Alæ vitrinæ, vix lacteo tinctæ, nervis umbrinis: horum transversales in medio atque apud costam alæ anticæ fusco marginati, et apicem areæ marginalis versus recti, obliqui et fere simplices. Pedes luteo-picei, femoribus annulis in mediis piceis. Abdomen luteo-castaneum, apicibus segmentorum piceis: segmentum singulum strigâ obliquâ indiscretâ laterali. Setæ piceæ.

Long. al. ♀ 6, set. 18 mm.

Hab.—The Cape of Good Hope.

Leptophlebia auriculata, nov. sp.

(Genitalia maris, Pl. IV. fig. 24, 24a. Ala postica, fig. 24b.)

Imago, v. s. s. ♂. Picea, thorace atro. Alæ vitrinæ, nervis atro-piceis; nervi transversales in apice areæ marginalis simplices; alæ posticæ piceo tinctæ, spatio subcostali incolorato. Pedum antici picei; posteriores rufo-picei: femora omnia atro-bicincta (vel? bimaculata). Abdomen juncturis saturatioribus, et setis vel atro-piceis, vel corvino-atris.

Long. corp. ♂ et al. 9, set. 20 mm.

Hab.—Graham's Town.

The form of the hind-wing rather closely resembles that of one of the less oblique species of *Avicula* or *Perna*. The name has reference to the excessive dilatation of the marginal area, which reminds one of the "ears" of such shells.

Series 2. Sp. typica, *L. Colombiæ*.

Subimago, ♀. Tarsorum antici quinque-articulati, posteriores quadri-articulati: articularum penultimus cæteris brevior, duo priores æquales. Alæ posticæ minimæ. Setæ tres æquales.

Leptophlebia Colombiæ.

Ephemera Colombiæ, Walk. 1853; *Palingenia Colombiæ*, Hag. 1861.

Subimago, v. s. s. ♀. Thoracis tergum luteum. Alæ semi-opacæ, sub-testacæ; nervi transversales apicales aræ marginalis anticæ numerosi, simplices, obliqui, et curvati. Penum antici saturate caryophyllei, tarsi luteis; posteriores lutei. Abdomen supra castaneum, infra lutescens; segmenta intermedia singula apicibus strigisque lateralibus obliquis atris. Setæ fuliginosæ, juncturis et mediis articularum saturatioribus.

Long. corp. ♀ 10, al. 15, set. 9 mm.

Hab.—British Colombia.

Perhaps *Baetis tessellata*, Hag., is to be referred to this species (see *Heptagenia tessellata*).

Series 3. Sp. typica, *L. marginata*.

Nympha reptans, laminis branchialibus pinnati-partitis pæne filiforme-dissectis. (Pict.)

Alis erectis, setisque lateralibus a media varis, stans super pedes omnes, subimago quiescit.

Imago. Pedibus anticis elevatis et divergentibus mas dormit. ♀ Tarsi ferme quadri-articulati (rarissime articulus quintus tibiæ adnatus obscure indicatur): articularum penultimus cæteris brevior, duo priores subæquales; ungues postici dissimiles. Setæ tres æquales vel subæquales. Penum forcipis numerus articularum a duobus ad quatuor pro specie variat, primus tamen semper longissimus est. Costæ alarum posticarum haud excisæ.

Leptophlebia marginata.

(Genitalia maris, Pl. IV. fig. 25, 25 a, b. Alæ anticæ pars, Pl. II. fig. 2a.)

Ephemera marginata, Lin. 1767. *E. viridescens*, Fourc. 1785. *E. procellaria*, Schwarz, Nomencl. Rösels. Insect.

Belust. *E. stigma & talcosa*, Ste. 1835-6; *Potamanthus stigma & talcosus*, Pict. 1843-5. *P. marginatus*, Hag. 1863.

Subimago, v. v. s. Alæ fuliginosæ vel corvinæ, venis flavescens, transversalibus anguste nigricante marginatis; posticæ bases versus vel in toto pallidiores, nervis transversalibus apud margines terminales nigricantibus.

Imago, v. v. s. ♂. Oculi piceo-hepaticolores, vel rufifuliginosi. Tergum thoracis fuscum vel aterrimum, politum. Alæ vitrinæ, nervis fuscis: antica apicibus areæ marginalis et areæ submarginalis fuscis vel subfuliginosis. Pedum antici nigro-picei, tarsis cinereis: posteriores picei vel fusco-lutei, tibiis interdum brunneis, tarsisque plus minusve fuliginosis. Abdomen ferre supra fuscum vel fusco-piceum, juncturis flavescens, infra fuliginosum, juncturis pallidis, et maculis saturatoribus sub plexus nervorum: interdum tamen segmentorum 2-7 cinerea sunt, lineis spiracularibus saturatis, maculisque sub plexus nervorum luteis, atque cætera sunt fusco-picea. Setæ atræ, vel cinereæ, juncturis vix obscuratis. Forceps fuliginosus vel testaceus.

♀ vel mari similis; vel abdomine supra piceo, apicibus segmentorum saturatoribus, et subtus atro-fuliginoso, tibiis anticis testaceis. Processus ventralis penultimi segmentorum incisus est.

Long. corp. ♂ 6-12, ♀ 6-11; al. ♂ 7-11, ♀ 7-12; set. ♂ im. 12-20, subim. 9; set. ♀ im. 8-16 mm.

Hab.—Temperate and Arctic Europe and America. In England it appears in April, May, July, September and October, and frequents rivers.

Leptophlebia helvipes.

(Genitalia maris, Pl. IV. fig. 26, 26 a-c. Ala postica, fig 26d.)

Ephemera helvipes, dispar & submarginata, Ste. 1835-6. *Potamanthus Geeris, helvipes, dispar, & submarginatus*, Pict. 1843-5. *Baetis reticulata*, ? Burm. 1839. *Oleoculiciformis*, Walk. 1853.

Subimago, v. v. s. Alæ cervinæ vel nigricantes, nervis transversalibus late nigro-marginatis; paucitas horum in medio alæ anticæ maculam transversalem circa costæ medium pellucidam facit.

Imago, v. v. s. Oculi supra saturate purpureo-brunnei, subtus fuscii. Tergum thoracis aterrimum, politum. Alæ vitrinæ, crassioribus nervorum furfurosis. Pedum antici atri, tarsi corvinis; posteriores picei, tibiis tarsisque fuliginosis. Abdomen supra fusco-piceum, juncturis intermediis pallidis; subtus fusco-fuliginosum, maculis obscuris sub plexus nervorum. Forceps furfurosus. Setæ testaceæ, juncturis saturatis.

♀ simillima mari, processu ventrali penultimi segmentorum acute exciso.

Long. corp. ♂ 10-11, ♀ 9-11; al. ♂ 10-11, ♀ 10-13; set. ♂ im. 12 & 13-14 & 16, subim. 7; set. ♀ im. 9-13, subim. 9 & 10-10 & 12 mm.

Hab.—Great Britain; Germany; and Switzerland (Pict. Mus.). In May, June, July, and August, frequenting streams, rivers and lakes. The name is applicable to dried specimens.

Leptophlebia castanea.

Potamanthus castaneus, Pict. 1843-5.

Subimago, v. s. "Præcedenti similis, macula tamen cordiformi super mesothoracis apicem, et juncturis thoracis, pallidis."

Imago, ♂ v. s. "Oculi latericio-rubentes; aliter feminæ similis."

♀. "Tergum thoracis striga pallida longitudinali. Pedes setæque pallide fuscii." (Pict.)

Long. corp., al., et set. ♀ circa 8 mm.

Hab.—A small stream near the marsh of Villeneuve, at the upper end of the Lake of Geneva, in July. The body of this species is of a maroon-brown colour. (Pict.)

Leptophlebia (?) *Krueperi*.

Potamanthus Krueperi, Stein, 1864.

Imago, s. s. ♂. "Picea, pleuris pedibus abdomineque aurantiacis, alis posticis læte fuscis, setis caudalibus flavescentibus obscure annulatis. Alæ anticæ apud costas vix flavescentes."

Long. corp. ♂ 10·5, exp. al. 12 mm.

Hab.—Greece. In the collection of the Berlin Museum.

Leptophlebia Picteti.*Potamanthus marginatus*, Pict. 1845-5 (*nec* Lin.).

Subimago. "Alæ obscure griseæ; antica areâ marginali pallide fuscâ."

Imago, ♂. "Oculi obscuri. Tergum thoracis atrum, prothorace fusco. Alæ vitrinæ, nervis longitudinalibus rufescentibus; anticæ areis marginalibus et submarginalibus fuscis. Pedes rufescentes; tibiæ singulæ basibus lineisque ex eis productis, et punctis prope apices, atris. Abdomen acute fuscum supra, apicibus segmentorum saturatoribus, præcipue latera versus. Forfex setæque fuscæ."

♀ "mare saturator." (Pict).

Long. corp. ♂ 8, ♀ 7; set. ♂ 10, ♀ subim. 9; al. exp. ♂ 18, ♀ 20 mm.

Hab.—Near Geneva, principally in October.

Leptophlebia prisca.*Potamanthus priscus*, Pict. 1854.

Exp. al. 13 mm.

Species in electro.

Leptophlebia cincta.

(Genitalia maris, Pl. IV. fig. 27.)

Ephemera halterata (?), Fab. 1777. *E. cincta*, Retz. 1783. *E. nigra*, Fourc. 1785. *E. inanis*, Gmel. 1790-3. *E. albipennis*, Fab. 1793. *E. hyalinata & vitrea*, Zet. 1840. *Potamanthus cinctus, inanis, halteratus, hyalinus, & Cloe fuscata*, Pict. 1843-5. *Cloeon fuscata*, Walk. 1853.

Subimago, v. v. s. Alæ atræ, nervis obscure flavescentibus. Thorax piceus vel atro-piceus. Abdomen (♂) cinereum, apicem versus fuscum, apicibus segmentorum obscure canis.

Imago, v. v. s. ♂. Oculi supra fuliginosi, infra atris. Tergum thoracis aterrimum, politum. Alæ vitrinæ, crassioribus nervorum vix electro-coloratis. Pedes albi vel cretacei, femoribus anticis saturatoribus, et tibiis tarsisque sub-testaceis. Abdomen rarissime in toto fuscum; plerumque tamen segmentorum 2-7 vitrea sunt,

apicibus interdum lutescenti suffusis, lineis spiracularibus in parte atris, et plexibus nervorum rubiginosis; atque apicalia sunt fusca vel picea, juncturis vel flavescentibus vel rufescentibus. Setæ forfexque albicantes; hæc vel tri- vel quadri-articulata, et basin versus nigricana.

♀. Nervi crassi alarum picei. Pedes setæque testacei, posterioribus tarsorum albicantibus. Abdomen saturate fusco-piceum, juncturis flavescentibus, et processû penultimi segmentorum late exciso.

Long. corp. ♂ ♀ 7-8; al. ♂ ♀ 7-9; set. ♂ im. 8 & 9 -8 & 11, subim. 9 & 7; set. ♀ im. 7 & 10-8 & 11 mm.

Hab.—Northern and Temperate Europe, in streams and rivers. June, July, and August.

Leptophlebia vespertina.

Ephemera vespertina, Lin. 1758. *E. albipennis*, Retz. 1783. *Baetis fusca*, Burm. 1839. *Cloe vespertina*, Qul. 1867.

Subimago, s. s. "Nigra, alis posticis albis. Est inter minores generis sui, toto corpore et alis anticis nigris; solæ alæ posticæ albæ, quibus ab omnibus generis sui speciebus manifeste differt.

Hab.—Copiose in Smolandia ad fluvium Sathaella." (Lin. abstract.)

Leptophlebia mollis, n. sp.

(Forceps maris, Pl. IV. fig. 28.)

Cloe mollis, Hag. 1861; not described.

Subimago, v. s. s. Alæ pallidissime brunnescenti-albæ. Abdomen feminæ fuscum.

Imago, v. s. s. ♂. Tergum thoracis vel luteo-piceum, vel saturate fuscum. Pedum antici testacei, tarsis albis; posteriores pallidissime testacei. Alæ vitreæ. Segmentorum abdominis 2-7 alba, juncturis obscuris; cætera luteo-picea.

Long. corp. ♂ 6, ♀ 5; al. ♂ 7, ♀ 7.5 mm.

Hab.—West Farm, New York.

Series 4. Sp. typica, *L. cupida*.

Imago. Alæ posticæ, et genitalia, eis specierum in serie præcedenti similes. Setarum media manifeste

brevissima. Tarsorum posteriores quinque-articulati; articularum primus obsolescens, tibiæ adnatus, secundus tertio subæqualis, quartus cæteris brevior; itaque sæpe quadri-articulati esse videntur.

Leptophlebia cupida.

(Genitalia maris, Pl. IV. fig. 29, 29a; feminæ, fig. 29b. Alæ anticæ pars, Pl. II. fig. 2b.)

Ephemera cupida, Say, 1823. *Palingenia concinna*, *palipes*, *Baetis debilis* & (?) *E. hebes*, Walk. 1853. *Potamanthus cupidus*, *concinus*, & *Baetis ignava*, Hag. 1861.

Subimago, v. s. s. Alæ pallide nigricantes; "posteriores apices versus vix saturatiores." (Say.)

Imago, v. s. s. ♂. "Oculi supra fusciscentes, infra atrii" (Say, v. s.). Tergum thoracis piceum vel fuscum. Alæ vitrinæ, nervis et apice areæ marginalis anticæ pallide fusco-piceis. Pedum antici fusciscentes vel vix rufescentes, tarsis atris; posteriores testacei, tarsis nigricantibus. Abdomen piceum, "supra juncturis, linea longitudinali in medio strigisque brevibus duabus apud basin segmenti singuli, pallidis" (Say, v. s.). Setæ fuscae, juncturis obscuris.

♀. Alæ vitrinæ, vix lurido tinctæ. Processus ventralis penultimi segmentorum emarginatus.

Long. corp. ♂ 8, ♀ 10; al. ♂ 8, ♀ 11; set. ♂ subim. 14, ♀ 15 mm.

Hab.—Nova Scotia (Walk.); the Ohio River near Cincinnati (Say); Washington (Hag.), &c.

Leptophlebia nebulosa.

(Genitalia maris, Pl. V. fig. 1, 1a.)

Palingenia nebulosa, Walk. 1853; *Potamanthus nebulosus*, Hag. 1861. *Pot. odonatus*, Walsh, 1862.

Imago ♂, v. s. s. Thoracis tergum piceum. Alæ vitrinæ, nervis piceis; anticæ singulæ nebulis magnis rotundatis apices versus subfusciscentibus. Pedum antici fusci, posteriores testacei. Abdomen supra piceum, subtus subttestaceum. Setæ testacæ, juncturis piceis.

Long. corp. ♂ 10, al. 10-11, set. 30 & 6 mm.

Hab.—S. Martin's Falls, River Albany, Hudson's Bay (Walk.); Illinois (Walsh).

Series 5. Sp. typica, *L. fusca*.

Nympha reptans. Segmentorum abdominis 1-7 brauchiifera; laminæ branchiales simplices, pinnati-partitæ quidem, sed pæne filiforme-dissectæ. Palpi maxillares tri-articulati; superioris primus articularum largus cæterisque conjunctim longior, secundus tertio subæqualis; inferioris ultimus articularum penultimo longior.

Imago. Posteriorum alarum margo costalis valde excisus. Tarsorum posteriores quinque-articulati; articularum primus obsolescens, tibiæ adnatus, brevis, secundus longior, tertius et quartus secundo sensim breviores; ungues dissimiles. Artus forcipis primus articularum aliis longitudine subæqualis.

Leptophlebia fusca.

(Ala antica, Pl. II. fig. 2 c. Genitalia maris, Pl. V. fig. 2, 2 a. Ala postica, fig. 2 b.)

Ephemera fusca, Curt. 1834. *E. minor* & *Baetis cingulata*, Ste. 1835-6. *Potamanthus brunneus, fuscus, minor* & *Cloe cingulata*, Pict. 1843-5. *Cloeon cingulata*, Walk. 1853.

Subimago, v. v. s. Alæ cineræ, nervis piceis. Thorax piceus: tibiæ anticæ subfuliginosæ, posteriores cervinæ.

Imago, v. v. s. ♂. Oculi saturate fuliginosi. Tergum thoracis aterrimum politum. Alæ vitrinæ, nervis fuscis. Pedes brunneo-olivacei, femoribus et tibiis anticis piceis. Abdomen fusco-piceum, juncturis flavescentibus, setis et forcipe fuscis (in s. s. saturate fulvis).

♀ mari similis, tarsis anticis pallidis. Setæ fuliginosæ, juncturis vix saturatoribus. Processus ventralis penultimi segmentorum late excisus.

Long. corp. ♂ 5-7, ♀ 6-7; al. ♂ ♀ 6-7; set. ♂ 8 & 12-11 & 12, ♀ 8-9, subim. 6 mm.

Hab.—Great Britain; Interlaken; Mt. Saleve (Pict.). In brooks and rivers. The end of May to August.

A pair of branchial plates is omitted from Professor Pictet's figure of the nymph, which is, in other respects, a good representation of it.

Leptophlebia modesta.

(Genitalia maris, Pl. V. fig. 3, 3 a, b.)

Potamanthus modestus, Hag. 1864.

Subimago, v. s. s. Alarum anticæ murinæ, posticæ cervinæ.

Imago, v. s. s. ♂. Thoracis tergum piceum vel aterrimum. Alæ vitrinæ, venis testaceis vel fuscis; posticæ vix lacteo tinctæ. Pedum antici picei; posteriores saturate fusci. Abdomen fusco-piceum. Setæ virescentigrisæ vel fuliginosæ, juncturis atris.

♀. "Processus ventralis penultimi segmentorum bifidus." (Hag.)

Long. corp. ♂ 6-7; al. ♂ ♀ 8-9; set. ♂ circa 10 mm.

Hab.—Carinthia (Zeller MS.); Corsica (Hag.).

Dr. Hagen's diagnosis of the subimago seems to suit *L. modesta*; but the specimen associated with the types of the imago in M. de Selys Longchamps' collection is *Baetis Rhodani*, ♀ subim.

Genus [—————].

Imago diptera, caudâ trisetâ; *Leptophlebia* approxime affinis.

[—————] *inanis*.

Potamanthus inanis ||, Pict. 1843-5.

Imago, s. s. "Caput nigrum; thorax acute fuscus. Alæ vitræ, nervis tenuibus, fuscis; vix griseo tinctæ, sed apud costas obscuriores, et ad bases flavescentes. Pedes fusci. Abdomen albidum, apice fusco; segmenta pallida, singula maculâ magnâ fuscâ utrinque. Setæ grisæ, nigro-punctatæ." (Pict.)

Hab.—Brazil. (Pict.)

In the Vienna Museum.

Professor Pictet thought that the forceps had little lamellar limbs: but he was not sure that the shape of these might not have become changed after death.

Genus TRICORYTHUS.

(Ala mesothoracica, Pl. II. fig. 3.)

Ephemera, Sav. 1817. *Cænis*, Pict. 1843-5. *Tricorythus*, Etn. 1868.Imago. Alæ duæ; setæ tres æquales; oculi maris integri. A nervis alarum facillime e *Cæni* distinguitur.*Tricorythus varicauda*.*Cænis varicauda*, Pict. 1843-5.

Imago, s. s. "Pallide luteus, vel ochraceus; oculis maculaque in vertice atris: suturis (?) mesothoracis dorsi quoque atris; alis vix flavescentibus, costis subcostisque paulo saturatoribus; et pedibus luteis vel ochraceis griseo variis. Segmentorum abdominis quinque apicalia punctis singulis ventralibus nigris. Setæ albæ, anguste nigro annulatæ." (Pict.)

Long. corp. ♂ 4, set. 9; exp. al. 10 mm.

Hab.—Upper Egypt.

Genus CÆNIS.

Cænis, Ste. 1835-6. *Brachycercus*, Curt. 1834. *Macrocercus*, Westw. 1836. *Ozycypha*, Burm. 1839. *Cæneus*, Agassiz, Nomenclat. *

(Ala antica, Pl. II. fig. 4.)

Nympha fodiens. Segmentorum abdominis 1, 3, 4, 5, 6, 7 branchiifera: laminarum anticæ minutæ, erectæ; secundæ magnæ, crassæ, cæteras tegentes; reliquæ tenuissimæ, semiovatæ, bene fimbriatæ, imbricatæ, graduatim minores a fronte retrorsum; omnes simplices. Pedes femoribus vel compressis vel gracilibus secundum speciem. Caput vel inerme, vel cornibus tribus frontallibus armatum. Palpi maxillares tri-articulati: superioris proximus articularum largus, tertio longitudine

* *Brachycercus* being a sexual name gives place to *Cænis*. *Cænia*, Newman, 1838, is a genus of *Diptera*. *Cænis* was changed by Poseidon into an invulnerable man named *Cæneus*, one of the *Lapithæ*. He being buried alive by the Centaurs in the course of the famous battle, was thereupon transformed into a bird. She somehow seems to have regained her original form; for Virgil narrates the meeting of *Æneas* with *Cænis* in Hades, in *Æn.* vi. 448.

æqualis; secundus brevior: inferioris primus articulo-
rum multo largissimus, cæteris conjunctim longitudine
subæqualis; tertius conicus, secundo semi-æqualis.

Pedibus anticis depressis, alis duabus late expansis
(fere nunquam erectis), et setis tribus subæqualibus
pubescentibus parallelis, subimago quiescit.

Imago. Caput et prothorax transversus; oculi remoti,
integri. Alæ duæ magnæ, in longitudinem marginum
terminalium ciliatæ. Tarsi quinque-articulati (intermedii
interdum tamen quadri-articulati): posticus proximo ar-
ticulorum brevissimo, tibiæque adnato, secundo tertio
et quarto brevibus subæqualibus, quinto cæteris lon-
giore: anticorum unguis brevis, obtusi, conformes;
posteriorum unguis dissimiles. Setæ tres subæquales,
internodis (in ♂) longis. Forcipis pedes inarticulati.
Ovivalvulâ femina caret. Latera segmentorum abdominis
plus minusve retro producta.

These insects live a very short time in their adult state.
They fly in dense crowds over gentle streams, rivers and
lakes, early in the morning and late in the day, at the
beginning and end of summer. Dr. Hagen says that, in
Prussia, the English species sometimes appear "in such
quantities that objects near the water are covered an
inch thick, and in the *Curische Nehrung* they are used
to feed the pigs." With us, they are less abundant.

Cœnis macrura.

(Genitalia maris, Pl. V. fig. 4.)

Ephmera brevicauda, Fab. (♀ sub. ?) 1793. *C. ma-*
crura & interrupta, Ste. 1835-6. [*E. pusilla*, Zet. MS.,
1840.] *C. grisea*, Pict. 1843-5.

Subimago, v. v. s. Alæ griseo vel nigricanti tinctæ,
præcipue costas versus. Setæ nigricantes.

Imago, v. v. s. Caput nigrum, articulis antennarum
proximis duobus, et juncturâ capiti-thoracicâ, cervinis.
Prothorax corvinus: meso- et meta-thoraces aterrimi
nitentes. Pedes ♂ femoribus atris, tibiis tarsisque pal-
lide nigricantibus: ♀ femoribus anticis griseis, posticis
cretaceis. Abdomen ♂ griseum, latera versus corvi-
num; segmentorum intermedia singula supra lineis in
mediis longitudinalibus, punctis duobus apud bases duo-

busque subtus circa media, pellucidis: ♀ abdomine nigricante, latera juncturasque versus ochraceo, et subtus virescenti-griseo tincto. E lateribus segmentorum apicalium setulæ tenues pallidæ breves producuntur. Setæ obscuræ, juncturis nigricantibus.

Long. corp. ♂ 4-5, ♀ 6; al. ♂ 4-5, ♀ 7; set. ♂ im. 14 & 15-15 & 16, subim. 3; set. ♀ im. 3·5 & 2, subim. 3 mm.

Hab.—England; Switzerland; Voalau (Brauer); Lapland (Zet.). May to September.

Spiders' webs and painted surfaces have provided me with dried specimens in widely distant localities. They fly at Reading from about 4·45 until 8 or 9 a.m., and again in the cool of the afternoon and evening, in June. I have seen subimagines with the dew thick upon their wings, resting on a flood-gate of the canal at 5.30 a.m. in June; and when the sunlight reached them, they immediately began to moult.

Cænis (?) *chironomiformis*.

(?) *Brachycercus chironomiformis*, Curt. 1834; (?) *Cænis chironomiformis*, Ste. 1835-6. *Oxycypha lactea*, Burm. 1839; *Cænis lactea*, Pict. 1843-5. (?) *C. halterata*, Hag. 1863.

(*Margine membranæ subgenitalis* ♂ anguste furfuroso, haud nigro veluti in præcedente.)

Imago, v. s. s. Caput et thorax brunneo-lutescentes, nervis alarum obscuris. Pedes albicantes, femoribus anticis brunneis. Abdomen supra griseum, apicibus segmentorum et linea longitudinali media albicantibus, "strigisque indistinctis e spiraculis atris; venter flavescens" (Hag.). Setæ sub-fuscescentes; forceps et margo membranæ subgenitalis anguste furfurosi absque macula basali obscura.

Long. corp. ♀ 4; exp. al. ♀ 7; set. ♀ 11 mm (Pict.).

Hab.—England (Curt.); Prussia (Burm., Hag.); Lake of Geneva (Pict.). In May.

The only specimens I have seen of this insect are in M. Pictet's collection: one (or more) of them is in spirits. The penis of this specimen was very similar in form to that of a dried specimen of *C. macrura*.

Cœnis dimidiata.

(Genitalia maris, Pl. V. fig. 5. Ala antica, Pl. II. fig. 4.)

Ephemera minima, (?) Lin. 1747. *E. horaria*, (?) Lin. 1758. *Brachycercus minima*, (?) Curt. 1834. *Cœnis dimidiata*, *brevicauda* & *pennata*, Ste. 1835-6. *Oloë horaria*, (?) Ramb. 1842. *E. albipennis*, Atk. 1843. *Oloëon horaria*, (?) Walk. 1853.

Subimago, v. v. s. Alæ canæ, areis et marginali et submarginali fuliginosis pæne usque ad apices. Setæ albæ, pubescentes.

Imago, v. v. s. Caput et prothorax fusci, obscuri, antennis albis, oculis atris. Meso- et meta-thoraces picei. Pedum antici sub-fuliginosi, femoribus griseis; posteriores cani, puncto atro ante femoris apicem. Abdomen vel in toto album vel cretaceum; sæpissime tribus segmentorum apicalium tantum cretaceis, et cæteris griseis, juncturis lineaque longitudinali media cretaceis. Ventris segmenta sæpe griseo bi-punctata sunt. Genitalia et setæ albæ.

Long. corp. ♂ 3-5, ♀ 4; al. ♂ 4, ♀ 3; set. ♂ 18 & 13, subim. 3 & 2·5-3 & 3·5; set. ♀ 3, subim. 2·25 mm.

Hab.—England; Visp in the Valais; Belgium (De Selys Mus.); Prussia (Hag.); Moscow (Oul.). From June to August.

Cœnis diminuta.

C. diminuta, Walk. 1853. *C. amica*, (?) Hag. 1861.

(Genitalia maris eis præcedentis parum similia.)

Imago, v. s. s. Thorax luteus: alis vitreis, costas versus nigrificantibus; pedibus albis, femoribus anticis cinerascensibus. Segmentorum abdominis anteriora subvirescenti-grisea, posteriora cretacea; segmentis singulis ad latera lineis obscuris longitudinalibus. Genitalia et setæ albæ.

Long. corp. ♂ 2·5, al. 3, set. 10·5 mm.

Hab.—S. John's Bluff, East Florida (E. Doubleday); Pennsylvania (Hag.).

The posterior femora of *C. amica*, Hag., have each a superior subapical black spot; but I suspect it will be found to be identical with *C. diminuta*, Walk.

Cœnis hilaris.

Ephemera hilaris, Say, 1839; *C. hilaris*, Walk. 1853.

Imago, v. s. ?. "Thorax pallide fulvus, alis costas versus obscuris. Abdomen album, segmentis apicalibus singulis utrinque punctis tribus fuscis." (Say, abstract.)

Long. corp. 2 mm.

Hab.—Indiana. September. (Say.)

Cœnis perpusilla.

C. perpusilla, Walk. 1853.

Imago, v. s. s. ♂. "Testacea; alæ antice sub-cinereæ: pedes setæque albi."

Long. corp. 2.5, set. 12, exp. al. 6 mm.

Hab.—Ceylon. (Walk.)

Cœnis discolor.

Oecocypha discolor, Burm. 1839; *Cœnis discolor*, Pict. 1843-5; *Cloeon discolor*, Walk. 1853.

Subimago, ? s. s. "Supra cinerea, subtus pallida; alis infuscatis, costa obscuratiori; his filamentisque analibus longius pilosis."

Long. corp. ♀ 2.5 lin.

Hab.—Cape of Good Hope. (Burm.)

Cœnis argentata.

C. argentata, Pict. 1843-5.

(Confer cum *C. macrurâ* et *C. dimidiatâ*.)

Subimago, s. s. "Caput et thorax grisei, fulgore argenteo; prothorax vix clarior. Alæ griseæ, costis subcostis nigris. Pedum antici grisei; posteriores albi. Abdomen basin versus griseum, apice albo. Setæ albæ, vix nigro annulatis." (Pict.)

Long. corp. ♀ 4, exp. al. 8, set. 3 mm.

Hab.—Sicily. (Pict.)

Cænis oophora.*C. oophora*, Pict. 1843-5.

Fusca; alis albicantibus, pedibus flavescentibus. (Pict.)

Long. corp. ♀ im. 4, exp. al. 11 mm.

Hab.—Sardinia. (Kollar.)

It is just possible that this species may be rediscovered, and determined by comparison with Pictet's figure; but the chances are small.

Cænis luctuosa.

(Forceps maris, Pl. V. fig. 6.)

(?) *Brachycercus Harrisella*, Curt. 1834; (?) *C. Harrisella*, Ste. 1835-6. *Oxycypha luctuosa*, Burm. 1839. *Ephemerella brevicauda*, Blanch. 1840. *Cænis luctuosa*, Pict. 1843-5. *C. halterata* (nymphæ), Etn. 1868.

Subimago, v. v. s. Caput et prothorax corvini; meso- et meta-thoraces atris. Alæ nigricantes, nervis obscuris. Pedes albi, interdum vix fumati; antici tibiis tarsis et femorum apicibus anthracinis. Abdomen pallide fulvum, setis atris.

Imago, v. v. s. ♂ & ♀. Caput et thorax picei, suturis et lateribus fuliginosis; tarsis anticis fuliginosis, et pedibus posticis nigricantibus juncturis atris. Abdomen rufo-fuliginosum, lineâ obscurâ brevi ad latera utrinque in singulis juncturis: forcipe setisque griseis vel nigricantibus.

Long. corp. ♂ 6·5, ♀ 5·7; al. ♂ 6, ♀ 5·5; set. ♂ im. 25, subim. 4; set. ♀ subim. 3 & 4 mm.

Hab.—Somersetshire and Berkshire; Berlin (Burm.); Lake of Thun (Pict.).

The name of this species probably has reference to the pale oblong spots near the bases of the long bristle-like processes from the lateral edges of segments 7, 8 & 9. These bristles are found in all the English species, and are longer in the imago than in any other stage of development.

Genus EPHEMERELLA.

(Ala antica, Pl. II. fig. 5.)

Ephemera, p., Pod. 1761; *Potamanthus*, p., Pict. 1843-5; *Potamanthus*, restrict., Hag. 1849; *Ephemerella*, Walsh, 1862.*

Nympha reptans, laminis branchialibus complexis quatuor. Segmentorum branchiifera sunt 4, 5, 6 et septimum. Palpi maxillares tri-articulati: superiores brevissimi, ultimis articularum penultimis longioribus; inferiores duobus prioribus articularum subæqualibus, ultimis brevissimis.

Ei *Leptophlebice* subimaginis habitus similis est.

Imago. Alæ quatuor; setæ tres, subæquales; oculi maris sub-partiti. Tarsi quinque-articulati; articularum proximus obsolescens, tibiæ adnatus, secundus tertio subæqualis, quartus brevior: unguis dissimilis. Pes forcipis tri-articulatus, secundo articularum longissimo. Lamina ♀ ventralis e penultimo segmentorum; sed ovalvulâ caret.

Ephemerella ignita.

(Genitalia maris, Pl. V. fig. 7. Ala postica, fig. 7a.)

Ephemera ignita, Pod. 1761. *E. erythrothalma*, Schr. 1798. *E. fusca*, *diluta*, *apicalis*, *rufescens*, *rosea* & *Baetis obscura*, Ste. 1835-6; *Potamanthus erythrothalmus*, *apicalis*, *dilectus*, *roseus* & *erythrocephalus*, Pict. 1843-5.

Subimago, v. v. s. Alarum anticæ saturate cinereæ, posticæ albo-cervinæ.

Imago, v. v. s. ♂. Oculi supra brunneo-carnei, vel carnei; partes inferiores olivaceæ vel flavo-olivaceæ. Thoracis tergum fuscum. Alæ vitrinæ, crassioribus nervorum longitudinalium cum punctis nodalibus vix piceis, vel electro-coloratis. Pedes pæne sulphurei: antici tibiis lutescentibus, et tarsis obscure testaceis; posteriores tarsis testaceis. Abdomen supra saturate fuscum, lateribus juncturisque ochraceis; subtus hepaticoloratum, interdum fuliginoso tinctum, lineis brevibus divergentibus

* *Ephemerella*, Schimp (1850, or 1860), is a genus of the *Phascei*, an order of the Acrocarpus section of the Mosses.

duabus punctisque sequentibus duobus apud basin singuli segmenti obscure indicatis. Setæ fuliginosæ, juncturis saturatoribus; forceps testaceus.

♀. Oculi flavo-olivacei. Tibiæ anticæ testaceæ. Puncta nodalia alarum eis maris distinctiora. Processus ventralis penultimi segmentorum retusus.

Long. corp. ♂ 8-9; al. ♂ 9, ♀ 10-11; set. ♂ 10 & 11-12 & 11, subim. 8 & 7; set. ♀ 8 & 9, subim. 7 & 9 mm.

Hab.—Great Britain, Germany, Switzerland; also Madrid (E. Pict. Mus.). Frequents streams and rivers. June to September.

Ephemerella gibba.

Potamanthus gibbus, Pict. 1843-5.

Subimago. "Alæ saturate grisæ, apud bases lutescentes."

Imago, v. s. ♂. "Oculi acute rubri. Corpus fusco-rubiginosum; alis vitreis; pedibus fulvis, anticis femoribus tarsisque fuscis; setis fulvis, juncturis atris."

♀. "Pallidior mare; capite thoraceque fulvis, illo atro-punctato, punctis super verticem confluentibus, hoc punctis parvis fuscis in medio prothoracis tergi, et pluribus commissurarum dorsalium mesothoracis fuscis. Abdomen rufescens, supra punctis obscuris duobus in medio segmenti singuli." (Pict.)

Long. corp. ♂ 6-7, ♀ 7; set. ♂ 9, subim. 7; set. ♀ 8, subim. 7; exp. al. ♂ 15-16, ♀ 21 mm.

Hab.—A streamlet near Villeneuve, at the head of the Lake of Geneva; in July (Pict.).

Ephemerella ænea.

Potamanthus æneus, Pict. 1843-5.

Subimago. "Alæ grisæ; antica basi subcostæ fulvâ."

Imago, ♀. "Caput et oculi fulvi, maculâ supra fuscâ. Prothorax maculâ utrinque fuscâ; mesothorax æneus, politus. Alæ vitreæ, iridicolaratæ; nervorum longitudinales fulvi, transversales grisei. Pedes fulvi, juncturis tarsisque nigricantibus. Abdomen olivaceo-fuscum; setæ testaceæ, juncturis atris." (Pict.)

Long. corp. ♀ 6, set. 8; exp. al. 18 mm.

Hab.—Mt. Saleve. (Pict.)

Professor Pictet's figure of the nymph of *E. cenea* closely resembles a dark variety of the nymph of *E. ignita*.

Ephemerella invaria.

(Genitalia maris, Pl. V. fig. 8, 8a.)

Baetis invaria & *fuscata*, Walk. 1853. *Ephemerella excrucians*, Walsh, 1862.

Subimago, v. s. s. Alæ setæque pallide nigricantes.

Imago, v. s. s. ♂. "Oculi supra flavi, infra fuscii" (Walsh, v. s.). Tergum thoracis saturate luteum, vel fuscum. Alæ vitreæ, vix flavæ apud costas; crassioribus nervorum lutescentibus vel fuscis. Pedum antichi picei; posteriores testacei, tarsi subtetaceis, apicibus juncturisque fuscis vel rubiginoso-luteis. Abdomen supra piceum vel fuscum, vel rubiginosum, apicibus segmentorum saturatioribus; subtus testaceum. "Setæ albicantes, juncturis fuscis." (Walsh.)

♀ mari simillima.

Long. ♂ 5·5-7·5, ♀ 5·5-6·5; set. ♂ 11-13, ♀ 10-12·5; exp. al. ♂ 14·5-20, ♀ 15-19 mm.

Hab.—Nova Scotia (Walker); Illinois (Walsh).

Ephemerella consimilis.

E. consimilis, Walsh, 1862.

Imago, ♂. "Pedes immaculati; antichi apicibus tibiarum et proximis articulorum tarsalium fuscis." (Walsh.)

Mr. Walsh describes the prescutum of the mesothorax as being "half as long again as wide," and the mesothorax itself as "being 4-5 times as long as wide:" whereas, in the preceding species, the one "is scarcely longer than wide," the other is "scarcely three times longer than broad."

Long. corp. ♂ 5, set. circa 5; exp. al. 14 mm.

Hab.—Rock Island, Illinois (Walsh).

Genus *BÆTISCA*.

(Ala antica, Pl. II. fig. 6.)

Baetis, p., Say, 1839; *Bætisca*, Walsh, 1862.

Nympha reptans: "adulta laminis branchialibus externis caret; primum tamen segmentorum laminam duplicem obtectam utrinque habet. A thorace segmentorum abdominis quinque priorum dorsa obteguntur, elementis tergi thoracis confluentibus et retrorsum productis; itaque ne quidem alæ, nedum thoracis commissuræ, videri possint" (Walsh). Caput a fronte bicornè; labium integrum; maxillarum inferioris palpus bi-articulatus, ultimo articulorum singulariter bifido, et pæne cheliformi.

Imago. Alæ quatuor; setarum media abortiva; oculi maris integri. Tarsi quinque-articulati; articulorum primus longus, tibiæ adnatus, secundus primo brevior sed tertio æqualis, quartus paulo brevior; ungues dissimiles. Pes forcipis tri-articulatus; articulorum primus longus, secundus longissimus, et tertius brevissimus. Femina ovalvulâ caret; processus ventralis penultimo segmentorum excurrit.

Bætisca obesa.

(Genitalia maris, Pl. V. fig. 9.)

Baetis obesa, Say, 1839; *Bætisca obesa*, Walsh, 1862.

Subimago, v. s. s. Alæ corvinæ, lineolis brevibus transversalibus numerosis pellucidis; antica semifasciis transversalibus pellucidis duabus, una e costa prope apicem, alteraque basi proprio. (Say & Walsh.)

Imago, v. s. s. ♂. Rufo-fusca. Alæ vitræ, nervis tenuissimis; "anticarum costæ subcostæque lutescentes." Pedes testacei; antici gamboso tincti, juncturis et ultimo articulorum tarsalium obscuris; posteriores ultimis articulorum quoque obscuris. Prosternum prominens, bidentatum. Abdomen subtus, præcipue apicem versus, rubido-albo tinctum: segmentorum penultimum linea longitudinali in medio ventris fusca. Setæ pubescentes, albæ, juncturis obscuris.

♀ simillima mari, processu ventrali segmentorum penultimi breviter inciso.

Long. corp. ♂ 7-8, ♀ 6-8; set. ♂ ♀ im. 6-7, ♀ subim. 4-5; exp. al. ♂ 20-22, ♀ 22-25 mm.

Hab.—Illinois (Walsh), Indiana (Say); and California.

Genus CLOEON.

(Ala mesothoracica, Pl. II. fig. 7.)

Ephemera, p., Lin. 1761; *Cloeon*, Leach, 1815; *Cloe*, p., Burm. 1839; *Cænis*, p., Walk. 1853; *Chloeon*, Lubbock, 1863; *Cloeopsis*, Etn. 1866.

Nympha natans, laminis branchialibus utrinque septem: laminarum septima simplex, cæteræ bilamellares, omnes marginibus integris. Palpi biarticulati, articulis longitudine æqualibus; inferiores depressi, apicibus obliquis; superiores tenuissimi, filiformes.

Alis erectis setisque divergentibus subimago quiescit stans in pedes omnes.

Imago. Alæ setæque duæ. Oculi maris bipartiti, parte superiori sub-turbinata. Tarsorum posteriores quadri-articulati; articulorum primus multo longissimus, tibiæ adnatus, secundus brevis, tertius brevissimus; unguis dissimiles. Pes forcipis tri-articulatus, secundo articulorum longissimo: penis occultus. Ovivalvula femina caret.

Cloeon dipterum.

(Forceps, Pl. V. fig. 10.)

Ephemera diptera, Lin. 1761. *E. striata* & *annulata*, Müll. 1776. *Cloeon pallida*, Leach, MS., 1815. *E. marginata*, Gor. & Pritch. 1829. *C. marmoratum* & *obscurum*, Curt. 1834. *C. cognatum*, *dimidiatum*, *virgo* & *consobrinum*, Ste. 1835-6. *Cloe diptera*, Burm. 1839. *Cloe affinis*, Ramb. 1842. *Cloe virgo* & *cognata*, Pict. 1843-5. *E. culiciformis*, Fonscol. 1846. *C. diptera* & *cognata*, Walk. 1853. *Chloeon dipterum*, Lubbock, 1863-5; *Cloeopsis diptera*, p., Etn. 1866.

Subimago, v. s. s. Alæ pallide cervino tinctæ.

Imago, v. v. s. ♂. Oculi turbinati sub-carnei, vel rufo-hepaticolorati; inferi atro-picei. Tergum tho-

racis aterrimum, politum. Alæ vitrinæ, nervis quasi atris; horum tres priores incolorati: nervulæ apicales areæ marginalis rectæ, paucæ (3-5), atque vix obliquæ. Pedum antici femoribus vel albidis apicibus cretaceis, vel virescenti-cinerascentibus, singulis maculis præ-apicalibus rufescentibus, et tibiis tarsisque vel cinereis vel carbonariis: posteriores albicantes vel cretacei, macula femoribus sæpe indiscreta, atque juncturis et articulis terminalibus tarsorum (proxima juncturarum excepta) atris. Abdomen supra atro-piceum, juncturis ochraceis; infra saturate cinereum, maculis rubiginosis duabus in juncturis albidis singulis. Setæ albæ, juncturis in vices late atris. Forceps cinerascens, proximis articularum fuscis.

Var. ♂. v. s. s. Parvum. Segmentorum abdominis 2-7 grisea, apicibus strigaeque trigonali ex eis utrinque producta rubiginosis: tria apicalia picea.

Hab.—Belgium.

♀. Corpus luteum. Oculi olivacei, obscure bicincti. Capitis vertex rufescente bi-strigatus. Alæ vitrinæ, areis et marginalibus et submarginalibus tribusque prioribus nervorum longitudinalium electro-coloratis, nervis transversalibus inclausis albis; cæteri nervorum atri: horum plures transversalium incrassati. Pedum antici gambosi, tibiis tarsisque testaceis juncturis obscuris: posteriores femoribus fere electro-coloratis, cingulis et præapicali et apicali rufescentibus, tibiis tarsisque testaceis, unguibus et 2-4 juncturarum obscuris. Setæ rubido-albæ, juncturis in vices late atris.

Long. corp. ♂ 5-10, ♀ 11; al. ♂ 6-11, ♀ 10; set. ♂ 13-20, subim. 14; set. ♀ 12-15, subim. 12 mm.

Hab.—Europe, and the Madeiras. In tranquil waters: May to July.

I have seen female specimens of two species of *Olocon* very closely related to *C. dipterum*; one inhabits N. W. India, the other Knysna, S. Africa.

Olocon simile.

(Forceps, Pl. V. fig. 11.)

C. simile, Etn. 1870.

Subimago, v. v. s. Alæ murinæ, apud costas et bases vix subflavescentes, nervis furfurosis. Setæ fusco-atræ. Oculi turbinati maris subolivacei.

Imago, v. v. s. ♂. Oculi turbinati olivacei, vel saturate virescenti-sulphurei; inferiores atro-picei, vel atrovirentes. Thoracis tergum vel aterrimum, vel fuscum, politum. Alæ vitrinæ; subcosta tertiusque nervorum longitudinalium substraminei; nervulæ apicales areæ marginalis multæ, sparsim conjunctæ. Pedes olivacei; posteriores tarsi saturatoribus; antici tibiis viridigriseis vel atrovirentibus, et tarsi griseis vel atris. Abdominis dorsum piceo-fuscum; venter cinereus, apice vix fulvescenti. Forceps virescenti-albus. Setæ rubidoalbæ, juncturis rubescentibus.

♀ mari simillima. Oculi atrii. Caput circa ocellos castaneum, lineis vel strigis duabus concoloribus super verticem: carina facialis tuberculos duos parvos piceos utrinque habet. Abdomen supra luteo-fuscum, juncturis luridis, et tracheis subcutaneis obscuris; subtus olivaceum, ultimo segmentorum penultimoque stramineis. Pedes viridi-olivacei, tibiis tarsisque saturatoribus.

Long. corp. ♂ 9, ♀ 10; al. ♂ 8, ♀ 10-11; set. ♂ 14-15, subim. 9; set. ♀ 10-14, subim. 7-9 mm.

Hab.—Near Retford, in Nottinghamshire, and at Quy Fen, near Cambridge. September and October; in still water.

The name *simile* has reference to the similarity between the sexes.

Oleon subinfusatum.

Ole subinfusata, Ramb. 1842.

Subimago, v. s. s. ♀. Alæ saturate corvinæ, nervis longitudinalibus luteis: nervulæ apicales areæ marginalis multæ (circa 12) sparsimque divisæ. Thorax lutescens, pedibus luteo-luridis. Setæ juncturis obscuris.

Long. corp. ♀ 9, al. 11 mm.

Hab.—Provence. (Rambur.)

Oleon obscurum.

Ole obscura, Ramb. 1842: nec Curt.

Subimago, ♀, v. s. s. Alæ murinæ, nervis luteis: nervulæ apicales areæ marginalis simplices (circa 8 in numero), et irregulariter flexuosæ. Thorax rufo-testaceus: pedes testacei.

Long. al. 9, corp. 6 mm.

Hab.—France; probably near Paris.

The name will not obtain, Curtis having previously applied "*C. obscurum*" to *C. dipterum*, subim.

Cloeon russulum.

(Forceps, Pl. V. fig. 12.)

Ephemera russula, Müll. 1776. *Cloeon dimidiatum*, Curt. 1834. *E. culiciformis* & *striata* (?), Blanch. 1840. *Cloe pumila*, Ramb. 1842. *Cloe dimidiata*, Pict. 1843-5; *Cloeon dimidiata* & *Cænis sinensis*, Walk. 1853; *Chloeon dimidiatum*, Lubbock, 1863 & -5. *Cloeoopsis diptera*, var., Etn. 1866 & -7.

Subimago, v. v. s. Alæ canæ; apud crassiores nervorum sæpe gramineo tinctæ. Setæ cinerascens.

Imago, v. v. s. Variabilissima colore: ♂ maribus *Cloeonis similis*, *Baetis binoculati* atque varietatum hujus, ♀ uxoribus *Centroptili luteoli* et *Baetis binoculati* colore similis.

Var. 1. ♂. *Cloeonis simili* similis. Oculi turbinati fuliginosi. Tergum thoracis aterrimum politum. Pedes pallide virescenti-flavescentes, tarsis nigricantibus. Abdomen saturate fuscum, juncturis flavescentibus, tracheisque subcutaneis atris. Setæ albæ, juncturis rufescentibus. Forceps albus, apices versus nigricans.

Hab.—Reading (Berkshire), and near Cambridge; as well as in the Valais Canton, near Visp.

Var. 2. ♂. *Baeti binoculato* similis. Oculi turbinati sulphurei vel flavi; inferiores fuliginosi, vel virescenti-cinerei, vel etiam glauci. Tergum thoracis fuscum, vel fusco-luteum, vel saturate furfurosum vel testaceo-furfurosum. Alæ vitrinæ; nervulæ apicales areæ marginalis (6-8) obliquæ, interdum sparse furcatæ prope subcostam. Pedum antici virescenti-grisei, tibiis tarsisque griseis vel canis; posteriores cretacei vel sulphurei, tibiis tarsisque obscure albis. Segmentorum abdominis 3-6 vel 7 alba, vix aut ne vix quidem lurido suffusa; cætera supra furfurosa vel fusca, juncturis ochraceis, et subtus plus aut minus ochracea. Setæ albæ, juncturis interdum anguste obscuris.

Hab.—Temperate Europe, and North China. This is the normal form.

Var. 3. ♂ *feminæ similis, oculis thoraceque eis*
♂ var. 2 *similibus.*

♀. *Oculi cæsii, vel atro-fuliginosi. Capitis vertex strigis longitudinalibus rufescentibus duabus. Thoracis tergum furfurosum, vel pallidissime sub-flavum, interdum sterillum, politum: mesothoracis apex nonnunquam gramineus. Alæ vitrinæ, bases versus sæpe gramineo tinctæ. Femora gramineo-alba, tibiæ tarsique albi, ultimis articulorum cinereis. Abdomen supra vel pallide sub-olivaceum, vel furfuroso-album: segmentorum 2-7 singula macula parva in medio dorsi, duabus apud juncturam apicalem, et linea curvata indiscreta utrinque, furfurosis; striga juxta spiracula cum tracheis subcutaneis atris. Interdum abdomen est fuscum. Setæ albæ.*

Hab.—Temperate Europe.

Long. corp. ♂ 5-9, ♀ 7-8; al. ♂ ♀ 7-8; set. ♂ 13-15, subim. 9; ♀ 10-12, subim. 6-8 mm.

Hab.—Temperate Europe and Northern China.

Oleon mendax.

Ole (C) *mendax*, Walsh, 1862.

Subimago. “Alæ sub-opacæ, vix nigricanti tinctæ.”

Imago, ♂. “Pallide rubiginosum, alis vitreis. Pedes pallidi, apicibus tarsorum obscuris. Abdomen subtus pallide virescens, pellucidum, apicem versus opacum.”

♀. “Supra pallidior; interdum thorace sub-virescenti.” (Walsh.)

Long. corp. ♂ 4, ♀ 4-5; set. ♀ 9, ♂ subim. 8; exp. al. ♂ ♀ 14 mm.

Hab.—Rock Island, Illinois. (Walsh.)

Oleon dubium.

Ole (C) *dubia*, Walsh, 1862.

Subimago. “Alæ fumatæ, nervis longitudinalibus saturatioribus.”

Imago, ♂. *Bæti propinquo similis (q. cf.) sed minor. Maculæ laterales in abdominis medio pellu-*

cidæ. Inter nervos longitudinales, super marginem terminalem, nervulæ forsan duplices sint."

♀. "Caput, thorax et abdomen pallide rubiginosi: horum primum et ultimum interdum obfuscata. Femur anticum plus aut minus rubiginosum. Venter pallide flavus vel virescens." (Walsh.)

Long. corp. ♂ 2·5-4, ♀ 2·5-3; set. ♂ 4·5-5·5, ♀ 3-4·5; exp. al. ♂ ♀ 8-10·5 mm.

Hab.—Rock Island, Illinois. (Walsh.)

Oloeon vicinum.

Cloe vicina, Hag. 1861.

Imago. ♂. Oculi rufi. Thorax fulvus, alis vitreis. Pedes albicantes; antici bases versus fulvi. Abdomen album, pellucidum, tribus segmentorum apicalium supra fuscis, et setis albidis."

♀. "Corpus cretaceum, alis vitreis, pedibus et setis albicantibus." (Hag.)

Long. corp. ♂ 4; set. ♂ 10, ♀ 6; exp. al. 10 mm.

Hab.—Washington. (Hag.)

Oloeon vitripenne.

Ephemera (Cloe) vitripennis, Blanch. 1851.

Imago. "Fusco-virescens; capite supra flavo-rufo; alis vitreis, iridicoloratis; pedibus pallide testaceis, mediis et apicibus femorum plus aut minus fuscis." (Blanch.)

Hab.—Chili. (Blanch.)

GENUS CENTROPTILUM.

(Ala antica, Pl. II. fig. 8.)

Ephemera, p., Müll. 1776; *Oloeon*, p., Ste. 1835-6; *Cloe*, p., Burm. 1839; *Baetis* (A), Etn. 1868; *Centroptilum*, Etn. 1869.

Nympha agilis; segmentorum abdominis 1-7 laminis branchialibus simplicibus et integris, ovatis vel obovatis. Maxillarum superiores palpis quadri-articulatis; articularum primus brevissimus, secundus longus et cæteris conjunctim æqualis. Maxillarum inferiores dimidiis labii

subæquales, acute subtrigonales, angustæ, palpis biarticulatis, depressis, articulis longitudine subæqualibus; articularum ultimus apice late expanso subtruncato.

Ei *Cloeonis* subimagine habitus admodum similis est.

Imago. *Cloeonis* simillima; nisi alis posticis binervatis, et per-angustis.

Centroptilum luteolum.

(Forceps et ala postica, Pl. V. fig. 13, 13a.)

Ephemera luteola, Müll. 1776. (?) *E. albipes* & *parvula*, Scop. 1763. *Cloeon ochraceum*, *hyalinatum* & *albipenne*, Ste. 1835-6. *Cloe halterata*, Burm. 1839. *Cloe translucida*, *ochracea*, *hyalinata* & *albipennis*, Pict. 1843-5; *Cloeon translucida*, *halterata*, *hyalinata*, *albipennis* & *ochracea*, Walk. 1853. *Cloeon bioculatum*, Hag. 1863. *Baetis luteolus*, Etn. 1868; *Centroptilum luteolum*, Etn. 1869.

Subimago, v. v. s. Alæ vix fumatæ, vel pallidissime flavescentes. Femora ochracea, tibiæ cineræ, tarsi nigricantes; setæ fumatæ vel cineræ.

Imago, v. v. s. ♂. Oculi turbinati acute vel saturate carnei, inferiores sub-olivacei. Tergum thoracis fuscum, vel piceum, vel atrum. Alæ vitreæ, nervis longitudinalibus vix flavescentibus. Pedes cretacei, tibiis tarsisque plus aut minus canis vel fumatis. Segmentorum abdominis sex priora vitrina, alba, maculis apud apices utrinque furfurosis, aut apicibus in toto furfurosis; cætera furfurosa vel fusca, juncturis ochraceis; venter pallidus, apice testaceo. Setæ forcepsque albæ.

♀. Dorsum furfurosum, vel testaceum, vel fusco-olivaceum; venter pallidus. Oculi olivacei, vel atrovirentes, vel atrii. Thoracis tergum umbrinum, vel fusco-olivaceum. Pedes vel virescenti-flavi, tibiis tarsisque pallide virescenti-griseis, vel flavescentes, tibiis tarsisque canis. Abdomen interdum ochraceo-furfurosum; trachæ subcutaneæ saturatiores.

Long. corp. ♂ 6-7, ♀ 5-6; al. ♂ ♀ 6-7; set. ♂ 10-14, subim. 7; set. ♀ subim. 6-9 mm.

Hab.—Switzerland, Germany, Great Britain and Norway (Alten); also Hudson's Bay territory. April to November.

Centroptilum pennulatum.

(Forceps et ala postica, Pl. V. fig. 14, 14a.)

C. pennulatum, Etn. 1870.

Imago, v. v. s. ♂. Oculi turbinati carnei, inferiores olivacei vel atrii. Prothorax supra nigricanus vel furfurosus; meso- et meta-thoraces fusci vel furfurosi. Alæ vitrinæ. Femora alba, apicibus cretaceis; tibiæ tarsi-que albi, ultimis articulorum vix cervinis. Segmentorum abdominis 2-6 vitrina, alba, juncturis vix castaneis; cætera supra castaneo-rubiginosa, infra ochro-leuca. Setæ forfexque albæ.

♀. Oculi virescenti-grisei: vertex capitis flavus, striga lata longitudinali saturate rubiginosa. Tergum thoracis furfurosus. Pedes cani, femoribus subcretaceis, vel gamboso-albidis. Abdomen supra pallide virescenti-griseum, juncturis pallidioribus; infra pallidum immaculatum: striga dorsalis longitudinalis in medio, apices segmentorum, et maculæ trigonales ex his ad latera pro-rectæ, lutescentes. Setæ pedesque eis maris similes.

Long. corp. ♂ 8-9, ♀ 8; al. ♂ ♀ 8; set. ♂ 14-17, ♀ 11 mm.

Hab.—The Manifold, Ilam, Staffordshire, and Grazely, near Reading. August to October.

Centroptilum lituratum.

Ephemera culiciformis, Scop. 1763 (*nec* Lin.). *Cloe litura*, Pict. 1843-5; *Cloeon litura*, Walk. 1853.

Subimago. "Alæ pallide fusciscenti-griseæ. Setæ fuscæ."

Imago, ♂. "Oculi turbinati sulphurei. Tergum thoracis fuscum, strigâ atrâ in medio a fronte retrorsum sed non metathorace tenuis attinente: metathorax punctis atris duobus. Alæ vitrinæ; pedes flavescentes. Abdomen rufosulvum, apicem versus obscurius, maculis lateralibus. Setæ flavescentes, juncturis atris."

♀. "Flava, oculis nigris, lineis rufescentibus parvis duabus super mesothoracem, et maculis paucis lateralibus super abdomen." (Pict.)

Long. corp. ♂ 8, set. 12, exp. al. 17 mm.

Hab.—Mt. Saleve (Pict.); in the autumn.

Centroptilum stenopteryx, n. sp.

(Ala postica et forceps, Pl. V. fig. 15, 15a.)

Subimago, v. s. s. ♀. Alæ vix fumatæ. Thorax ochraceus, pedibus testaceis, tarsis pallidis.

Imago, v. s. s. ♂ uxori simillimus, corpore furfuroso, setis albis. [Oculi turbinati olim rufescentes?].

Long. corp. ♂ 4, ♀ 4.5; al. ♂ 4, ♀ 5.5; set. ♂ ♀ 5-6 mm.

Hab.—Carinthia (Zeller's MS.).

GENUS BAETIS.

(Ala antica, Pl. II. fig. 9.)

Ephemera, p., Lin. 1746; *Baetis*, Leach, 1815; *Oloe*, p., Burm. 1839; *Brachyphlebia*, Westw. 1840; *Oloeon*, p., Walk. 1853.

Nympha agilis, laminis branchialibus simplicibus, integris, ovatis vel obovatis, septem utrinque. Palpi maxillares biarticulati, articulis longitudine subæqualibus; superiores teretes; inferiores proximis articulorum subcylindricis, apicalibus depressis et spathulatis atque lateraliter incisus. Dimidia labii acuta, subulata, maxillis angustiora.

Subimago inter quem *Oloeon* vel *Centroptilo* simulat.

Imago. Oculi maris partiti, superioribus dimidiorum sub-turbinatis. Alæ quatuor; posteriores minimæ, oblongæ, costâ unidentatâ, atque tribus vel duobus nervorum longitudinalium, quorum secundus vel simplex vel divisus sit. Setæ duæ (*B. ferrugineus* tamen tertiam mediam brevissimam habet). Forcipis artus quadriarticulati, penultimis articulorum plerumque longissimis. Femina ovivalvulâ caret; nisi fugax sit.

The species mostly inhabit rivers and streamlets. They appear principally in spring and early in the autumn; but the exact period depends upon climate. Monstrous specimens seem to be more frequently met with in the autumn than in the spring; they throw much light upon the morphology of insects in general.

Baetis binoculatus.

(Forceps et ala postica, Pl. V. fig. 16, 16a.)

Ephemera binoculata, Lin. 1758. *E. fuscata*, Lin. 1761. *E. diaphana*, Müll. 1776. *E. flava*, Schr. 1776. *E. lutea*, Fourc. 1785. *E. notata*, Gmel. 1790-3. *E. culiciformis*, p., Ol. 1791. *E. striata*, (?) Walck. 1802. *Baetis binoculatus*, Leach, 1815; *B. binoculata*, Sam. 1819. *B. flavescens* (subim.) & *autumnalis* (monstr. ♂), Curt. 1834. *B. fuscata*, (?) Stø. 1835-6. *Brachyphlebia binoculata*, Westw. 1840; *Cloe binoculata* & *autumnalis*, Pict. 1843-5; *Cloeon binoculata* (excl. g.), *autumnalis* & *striata*, (?) Walk. 1853. *Cloeon pumilum*, Hag. 1863; *Cloe pumila*, Oul. 1867.

Subimago, v. v. s. Alarum anticæ fumatæ, posteriores cretaceæ. Pedes maris femoribus virescenti-albis, tibiis fumatis, et tarsis nigricantibus; femina femoribus anticis viridi-olivaceis, maculis obscuris singulis apices versus, atque posterioribus femorum et tibiæ stramineis, tarsis omnibus corvinis. Setæ fumatæ.

Imago, v. v. s. ♂. Oculi turbinati citrini, vel acute flavi; inferiores flavo-, vel atro-virentes.

Var. 1. ♂. Thoracis tergum fufurosum, vel fuscum, vel atro-piceum. Alæ vitrinæ, fulgore aureo, et nervis albicantibus. Pedes cretacei; tibiæ tarsique antici atque ungues fumati; posteriores tibiæ albæ. Segmentorum abdominis 2-6 vel 7 cretacea vel flavo-alba, spiraculis rubiginosis vel atris; cætera supra vel fufurosa, vel fusca, vel fusco-olivacea, juncturis sulphureis; subtus ochracea vel saturate olivacea. Setæ albæ.

♀ et Var. 2 ♂. Corpus pallide fuscum, vel fusco-olivaceum: subtus olivaceum. Oculi feminæ atrii, vel atro-picei. Alæ vitrinæ, nervis fuscis, vel piceis. Pedum antici femoribus fusco-olivaceis, tibiis et tarsis fuliginosis, vel tibiis corvinis et tarsis anthracinis: posteriores femoribus prasino-olivaceis, obscure apud apices maculatis, vel annulatis atque tarsis griseis. Abdomen supra apicibus segmentorum anguste fuscis, et tracheis subcutaneis vel atris vel fuliginosis: segmentum singulum subtus apud basin punctis obscuris duobus. Setæ vel virescenti-albæ, vel albæ atque bases versus nigricantes, vel cineræ atque bases versus corvinæ vel atræ.

Long. corp. ♂ 6-8, ♀ 4-7; al. ♂ 6-8, ♀ 6-7; set. ♂ 12-14, subim. 7-10, ♀ 10-12, subim. 8-10 mm.

Hab.—Great Britain, France, Switzerland (Pict.), Germany, Moscow (Oul.), Scandinavia, and Hudson's Bay (Dale Mus.). May to October. In rivers.

Mr. Walker's specimen from N. America (g., Brit. Mus. Cat.) represents a distinct and undescribed species.

Baetis debilis.

Cloeon debilis, Walk. 1860.

Imago ♀, v. s. s. "Fulva, capite nigro, abdomine testaceo; setis pedibusque albis, alis vitreis, venis albis."

Long. corp. 5, exp. al. 12 mm.

Hab.—Hindostan. (Walk.)

This species can only be identified by the type.

Baetis scambus.

(Forceps et ala postica, Pl. V. fig. 17, 17a.)

B. scambus, Etn. 1870.

Subimago, v. v. s. ♂. Alæ setæque cineræ. Pedes cretacei vel virescenti-albi, tibiis tarsisque cinereis. Forceps cretaceus.

♀. Femora maculis vix discretis, subapicalibus cinereis.

Imago, v. v. s. ♂. Oculi turbinati caryophyllacei, vel caryophyllaceo-fuliginosi: inferiores nigri. Tergum thoracis aterrimum vel piceum: alæ vitrinæ. Pedes cretacei vel virescenti-grisei; tarsiis anticis fumosis, posterioribusque tibiarum et tarsorum virescenti-albis, juncturis et unguibus vix obscuris. Abdominis segmentorum quatuor apicalia fusca, cætera alba vel virescenti-alba, fusco vix suffusa. Setæ albæ, prioribus juncturarum vix obscuris.

♀. Corpus olivaceo-fuscum. Alæ vitrinæ, nervis atropiceis. Oculi saturate olivacei. Femora olivacea; tibiis tarsisque saturate fumosi. Setæ quoque fumosæ, juncturis vix obscuris.

Long. corp. ♂ 6, ♀ 6.5; al. ♂ 6, ♀ 7; set. ♂ 12, subim. 7; set. ♀ 9-10, subim. 5 mm.

Hab.—Ashbourne and Norbury, Derbyshire. June and September.

Baetis finitimus, nov. sp.

(Forceps et ala postica, Pl. V. fig. 18, 18a.)

Imago, v. v. s. ♂. Oculi turbinati fuliginosi. Thoracis tergum aterrimum politum. Alæ vitrinæ, nervis pellucidis. Pedes albi; antici femoribus cretaceis. Abdomen album, tribus segmentorum apicalium fuscis. Setæ forcepsque albæ.

Var. v. v. s. Abdomen fuscum. Pedes virescentigrisei, femoribus apices versus punctis singulis paulo obscuris, et tarsis anticis fere griseis.

♀, v. v. s. Oculi atro-fuliginosi. Pedes virescentinigri, tibiis et tarsis saturate albis. Abdomen piceum, apicibus segmentorum obscuratis. Setæ albæ.

Long. corp. ♂ ♀ 5; al. ♂ ♀ 6; set. ♂ 12-16, ♀ 7 mm.

Hab.—The streamlet by the Oratory, on the right-hand side of the Val Montjoie, between Contamines and Notre Dame de la Gorge. July.

Baetis atrebatinus.

(Forceps et ala postica, Pl. V. fig. 19, 19a.)

B. atrebatinus, Etn. 1870.

Subimago, v. v. s. Alæ ♂ cineræ: ♀ saturate fumatæ. Pedes ♂ olivacei vel saturate virescentigrisei, posterioribus tibiæ cinereis et lineis singulis brevibus externo-basalibus atris: tarsorum antici atris, posteriores saturate nigricantes juncturis atris, omnes ultimis articulorum piceis: ♀ tarsis rufo-piceis, juncturis atris. Setæ ♂ corvinæ, ♀ atro-piceæ.

Imago, v. v. s. ♂. Oculorum turbinati rufo-hepaticolorati, inferiores fuliginosi. Tergum thoracis aterrimum politum. Alæ vitrinæ; anticæ tribus prioribus nervorum longitudinalium virescentigriseis. Pedum antici femoribus atro-virentibus, tibiis atris singulis maculis pallidis sub-apicalibus, et tarsis saturatissime cinereis; posteriores saturate olivacei, apicibus tibiæ tarsorumque virescentigriseis. Segmentorum abdominis 2-7 fumata, singula lineis brevibus punctisque obscuris duo-

bus dorsalibus, subtus strigis atris duabus, atque juncturis virescenti-albis; cætera fusco-picea, juncturis flavis. Setæ rubido-albæ, juncturis obscuris. Forceps fumatus.

♀ mari simillima; secundo articularum antennalium fere omnino rubiginoso, vertice capitis inter ocellos piceo; abdomine vel luteo-vel rufo-piceo, juncturis ochraceis, setisque fuliginosis.

Long. corp. ♂ 7, ♀ 8; al. ♂ 6-7, ♀ 8; set. ♂ 11-13, subim. 8·5; set. ♀ 8-10, subim. 7·5 mm.

Hab.—The river Kennet near Reading, Berkshire; in October.

Baetis Rhodani.

(Forceps et ala postica, Pl. V. fig. 20, 20a.)

Cloe Rhodani, Pict. 1843-5; *Cloeon Rhodani*, Walk. 1853. *Cloe maderensis*, Hag. 1865.

Imago, v. v. s. ♂. Oculi turbinati lateritio-fuliginosi. Thoracis tergum aterrimum politum. Alæ vitreæ, nervis vix fuscis. Pedum antici tibiis tarsisque nigricantibus; posteriores pallidiores, femoribus saturate virescenti-griseis vel pallide olivaceis, et tarsis vel atris vel nigricantibus. Dorsum abdominis fusco-virescenti-griseum, juncturis ochraceis vel canis, et tribus segmentorum apicalium saturatoribus; subtus saturate virescenti-griseum, segmentis singulis sæpe strigis brevibus divergentibus prope bases, punctisque sequentibus duobus, nigricantibus. Setæ virescenti-griseæ, juncturis fuliginosis vel rubiginosis.

Var. ♂ im. v. v. s. Oculi turbinati carneo-hepaticolorati; inferiores saturate virescenti-grisei. Thoracis tergum luteum, postice nigro maculatum. Pedes cretacei, unguibus atris; antici gamboso tincti, tarsis fumatis. Alæ vitrinæ, nervis virescenti-griseis, subcostis radiisque bases versus atris. Abdomen album, quatuor segmentorum apicalium luteis; segmenta pallida, apicibus luteo marginatis, marginibus ad latera antice productis. Forceps albus. Setæ albæ, juncturis rubiginosis.

Hab.—In the same stream as *B. finitimus* (p. 113).

♀ im. mari simillima. Tergum thoracis interdum brunneo-fuscum. Abdomen opacum.

Subimago, v. v. s. ♂. Alæ cineræ. Pedum antici virescenti-grisei, maculis singulis crescentiformibus femorum apices versus obscuris, tibiis nigrificantibus, et tarsis atris; posteriores cretacei, tibiis fumatis, et tarsis atris. Setæ atro-corvinæ.

Long. corp. ♂ 5·5-9, ♀ 6·5; al. ♂ 5·5-9, ♀ 12; set. ♂ 13-19, subim. 10·5; set. ♀ 16 mm.

Hab.—Dovedale, Derbyshire, and Dorset; Geneva and Contamines; Corsica (Bellier); and Madeira (Wollaston). April to October.

The Wollastonian specimens ticketed 69 & 70 appear to me the same species as the others.

Baetis phæops.

(Forceps et ala postica, Pl. V. fig. 21, 21a.)

Ephemera bioculata (?), Fourc. 1785. *E. testacea* (?), Gmel. 1790-3. *Baetis vernus* (?), Curt. 1834. *B. culiciformis*, (*phæopa*), *striata*, *verna*, & *E. dubia*, Stø. 1835-6. *Cloe verna*, Pict. 1843-5; *Cloeon verna*, Walk. 1853. *Baetis phæops*, Etn. 1870.

Subimago, v. v. s. Alæ fumatæ vel murinæ. Femora testaceo- vel prasino-grisea, vel etiam virescenti-alba, maculis singulis obscuris v-formatis prope apices; tibie fumatæ, apicibus anticarum atris; tarsorum antici atri, posteriores cinerei juncturis atris. Setæ forfexque fumatæ.

Imago, v. v. s. ♂. Oculorum turbinati fuliginosi, inferiores corvini. Tergum thoracis aterrimum vel piceum, politum, in exemplari recens nato fuscum. Alæ vitrinæ, nervis longitudinalibus sub-fuscis, et fulgore hyacinthino. Pedum antici femoribus sub-olivaceis, tibiis tarsisque canis, maculâ rotundatâ obscurâ prope apicem cujusque illarum; posteriores femoribus vel virescenti-griseis vel prasino-cretaceis, tibiis albis, et tarsis canis. Abdomen vel dorso fusco et ventre cinereo; vel dorso piceo-fusco, juncturis canis; vel virescenti-griseo, tribus segmentorum apicalium saturate fuscis. Setæ albæ vel fumatæ. Pes forcipis duobus prioribus articulorum canis, et cæteris albis.

♀ mari simillima. Oculi atro-fuliginosi, vel atri. Tergum thoracis vel atrum, vel piceum, vel piceo-fuscum.

Pedes femoribus olivaceis; crura cana vel anthracina juncturis atris, sed antica saturatiora. Setæ albæ, corvinæ bases versus.

Long. corp. ♂ ♀ 6-8; al. ♂ 6-7, ♀ 7-9; set. ♂ 14-16, subim. 5; set. ♀ 10-12, subim. 7 mm.

Hab.—Great Britain, and Norway (Hammerfest and Alten). It mostly inhabits streams and rivulets, and appears in England in May, June, September and October.

Baetis tenax.

(Forceps et ala postica, Pl. V. fig. 22, 22a.)

B. tenax, Etn. 1870.

Imago, v. v. s. ♂. Oculorum turbinati saturate fuliginosi, inferiores nigro-fuliginosi. Tergum thoracis aterimum, politum. Alæ vitrinæ, nervis albido-pellucidis. Pedes femoribus olivaceis, anticis crurum cinereis, et posterioribus fumosis juncturis vix obscuris. Abdomen fusco-olivaceum, juncturis pallidis, et setis albis. Pes forcipis albicans, proximo articulorum interdum obscuriori.

♀ mari simillima.

Long. corp. ♂ 6-8, al. 7, set. 14-16 mm.

Hab.—Ashbourne Green, Derbyshire; in rills and streamlets. June.

Baetis buceratus.

(Forceps et ala postica. Pl. V. fig. 23, 23a.)

B. buceratus, Etn. 1870.

Subimago, v. v. s. Alarum anticæ fumatæ, posticæ pallidiores. Pedum antici femoribus olivaceis, tibiis nigricantibus, et tarsis atris; posteriores vel olivacei tarsis et maculis præ-apicalibus femorum crescentiformibus atris, vel femoribus saturate cretaceis, tibiis fumosis, et tarsis atris. Setæ piceæ. Pes forcipis primo et secundo articulorum pallidis, reliquis fumosis.

Imago, v. v. s. ♂. Oculi turbinati saturate fuliginosi, vel fuliginoso-hepaticolorati. Tergum thoracis

aterrimum. Alæ vitrinæ, tribus prioribus nervorum longitudinalium vix obscuris. Penum antici saturate olivacei, cruribus atro-corvinis, vel nigricantibus maculis præ-apicalibus tibiarum atris, et juncturis tibio-tarsalibus albicantibus: posteriores vel femoribus et tibiis olivaceis atque tarsis fumosis, vel tarsis atro-corvinis juncturis atris; vel cruribus pallide nigricantibus, juncturis vix obscuris; vel cruribus albis, juncturis atris. Abdomen supra vel fusco-piceum, juncturis pallidis; vel cum 2-6 segmentorum virescenti-griseis, et interdum apicibus, lineolis divergentibus duabus dorsalibus, atque strigis e spiraculis, obscuris: infra nigricans, juncturis albidis, sæpe duobus segmentorum apicalium ochraceis. Pes forcipis primo et secundo articulorum olivaceis, et cæteris plus aut minus nigricantibus; aut primo solum olivaceo. Setæ nigricantes, sæpe albicantes apices versus.

I neglected to describe the female.

Long. corp. ♂ 8-9, al. 8, set. 10-16 mm.

Hab.—The Holybrook and Kennet, near Reading. April and May.

Baetis amnicus, nov. sp.

(Forceps et ala postica, Pl. V. fig. 24, 24a.)

Imago, v. v. s. ♂. Oculi turbinati saturate fuliginosi; inferiores atro-fuliginosi. Thoracis tergum aterrimum, suturis pallidis. Alæ vitrinæ, lurido tinctæ, nervis atro-olivaceis; anticæ areis marginalibus apices versus paulo obscurioribus. Penum antici saturate virescenti-grisei, tibiis tarsisque fumatis vel nigricantibus; posteriores femoribus interdum vix ochraceo-tinctis, genubus rufo-virescenti strigatis, tibiis fere cervinis, et tarsis obscuris juncturis nigris. Abdomen supra fuscum, juncturis vix pallidis; subtus in majore parte cinereum. Setæ albæ vel cineræ, bases versus juncturis obscuris. Forceps ater, apices versus saturate fuliginosus.

♀. Alæ vitrinæ, nervis virescenti-griseis. Pedes virescenti-grisei vel olivacei, tibiis tarsisque nigricantibus. Setæ nigricantes.

Long. corp. ♂ 9-10, ♀ 7; al. ♂ 10, ♀ 8; set. ♂ 26, ♀ 13 mm.

Hab.—Barberine, Nant Bourant, and Mottet, at an altitude of some 4560 feet. July. In mountain torrents, whence the specific name.

Baetis alpinus.

Cloe alpina, Pict. 1843-5; *Cloeon alpina*, Walk. 1853.

Imago, ♂. "Oculi rufi. Tergum thoracis saturate fuscum. Alæ vitreæ, nervis fulvis, paucis distinctioribus in areæ marginalis apice. Abdomen fuscum, juncturis albidis; setæ albæ, juncturis fuscis." (Pict.)

Long. corp. ♂ 10, set. 11, exp. al. 23 mm.

Hab.—A stream from Mt. Brevent in the valley of Chamounix, in August. (Pict.)

Baetis melanonyx.

Cloe melanonyx, Pict. 1843-5; *Cloeon melanonyx*, Walk. 1853.

Imago, ♂. "Corpus saturate fuscum, ventre pallidiore. Oculi turbinati rufi. Pedum antici fusci; posteriores cretacei, unguibus atris. Alæ vitreæ, nervis fuscis, transversalibus subtilissimis. Setæ flavescens, juncturis fuscis." (Pict.)

Long. corp. ♂ 7, set. 9, exp. al. 18 mm.

Hab.—La Valle d'Entremont, Faucigny; at the end of June. (Were the eyes reddened in alcohol?).

Baetis pumilus.

(Forceps et ala postica, Pl. V. fig. 25, 25a.)

Ephemera mutica (?), Lin. 1758 = *E. striata*, Lin. 1761.
Cloe pumila, Burm. 1839. *O. striata* (?), Pict. 1843-5.
Cloeon pumila, Walk. 1853. *B. pumilus*, Etn. 1870.

Subimago, v. v. s. Alæ anthracinæ: pedes virescenti-grisei, tarsi nigricantibus; setæ nigricantes.

Imago, v. v. s. ♂. Oculi turbinati atro-fuliginosi. Tergum thoracis aterrimum, politum. Alæ vitrinæ, fulgore talcoso. Pedes albi, tarsi, apicibus tibiarum, femoribusque anticis, nigricantibus. Segmentorum abdominis 2-7 alba, pellucida; cætera supra furfuroso-fusca vel fusco-castanea, subtus fusca. Forceps et setæ albæ.

♀. Capitis vertex strigis duabus piceo-rufescentibus. Tergum thoracis atrum. Pedes virescenti-grisei, tarsi fuscis. Abdomen supra fusco-furfurosum, juncturis, et

sæpe lineâ longitudinali in medio, strigisque curvatis duabus ad bases segmentorum singulorum intermediorum, ochraceis; subtus serie notularum L-formatarum hepaticoloratarum utrinque. Setæ vix cervinæ. Oculi olivacei.

Long. corp. ♂ ♀ 5-7; al. ♂ 4-6, ♀ 6-8; set. ♂ 11-13, subim. 10; set. ♀ 7·5-10, subim. 10 mm.

Hab.—Wales, England, Belgium, Germany, Austria, Switzerland and Corsica. It frequents rivers, from May to October.

Baetis niger.

(Forceps et ala postica, Pl. V. fig. 26, 26a.)

Ephemerâ nigra, Lin. 1761. *Cloe diptera*, Ronalds, 1856. *B. niger*, Etn. 1870.

Subimago, v. v. s. Alæ atrescentes. Pedes ♂ pallide fumati; ♀ femoribus prasinis, strigis singulis brevibus obscuris ab apicibus anticorum, tibiis fumatis, et tarsis cervinis ultimis articularum fumatis. Setæ ♂ griseæ, ♀ cinereæ.

Imago, v. v. s. ♂. Oculi turbinati fuliginosi. Tegum thoracis aterrimum, politum. Alæ vitrinæ. Pedes vel fumati, vel saturate virescenti-albi, vel prasini; posterioribus crurum fumatis, anticis cinereis cum apicibus tibiarum obscuris. Segmentorum abdominis 2-7 fumata; cætera supra vel rubigineo-fusca, vel piceo-fusca, subtus virescenti-grisea. Setæ albæ vel canæ, sæpe juncturis vix obscuris.

♀. Oculi fusco-fuliginosi. Pedes virescenti-testacei, juncturis tarsorum nigricantibus. Abdomen supra castaneo-piceum, juncturis et sæpe strigis brevibus tribus ad bases paucorum intermediorum ochraceis; subtus fuliginosum vel hepaticoloratum, pallidum, sæpe notulis lateralibus L-formatis obscuris. Setæ fumatæ, vel canæ, vel canæ juncturis rufescentibus.

Long. corp. ♂ ♀ 6-7·5; al. ♂ ♀ 6-7; set. ♂ 10-11, subim. 9; set. ♀ 6-8·5, subim. 7 mm.

Hab.—England, and perhaps Sweden. May and June, and also September.

I have seen an undescribed Australian species, which is allied to some of the foregoing European species.

*Baetis (?) fuscus.**Cloe fusca*, Schn. 1845.

Imago, ♀. "Tergum thoracis fuscum; alæ vitrinæ, nervis fuscis, antica area costali apicem versus fulvescente, et nervis transversalibus pluribus. Pedes saturate testacei. Abdomen supra rufescens, apicibus segmentorum brunneis; subtus testaceum. Setæ saturate testacæ, fusco annulatæ."

Long. corp. ♀ 2·75," set. 6·25."

Hab.—Messina. April. (Schn.)**Baetis posticatus.**Oleon posticata*, Say, 1823; *Cloe posticata*, Hag. 1861.

Imago, v. s. ♂. "Oculi turbinati saturate rufo-fusci. Tergum thoracis aterrimum. Alæ vitrinæ. Pedes albi; antici vix obscuriores bases (femorum ?) versus. Segmentorum abdominis 2-7 pallide cærulescenti-hyalina, cætera saturate fusca. Setæ albæ." (Say.)

Long. corp. 8, set. 19 mm.

Hab.—"Shippingsport. End of May."*Baetis unicolor.**Cloe unicolor*, Hag. 1861 (*nec* Curt., Burm.).

Imago, s. s. ♂. "Corpus saturate piceum. Alæ vitrinæ, interdum nervis longitudinalibus obscuris; pos-

* The following European species are of uncertain position, and hardly recognizable.

1. *Baetis culiciformis.**Ephemera culiciformis*, Lin. 1758. *E. albipennis*, Walck. 1802. *Cloe culiciformis*, Pict. 1843-5.

Imago. "Eph. cauda biseta, alis albis, corpore fusco." (Lin. 1758.)

"*Culices* paulo major. Thorax nigricans. Abdomen fuscum. Setæ caudales longitudine corporis. Tubercula duo supra oculos, crassa, magna, livida." (Lin. 1761.)

Hab.—Sweden.2. *Baetis speciosus.**Ephemera speciosa*, Pod. 1761.

Imago. "E. speciosa, pedibus anticis longissimis cyaneis, alis albis, corpore fusco." (Pod.)

Long. corp. 8 lin.

Hab.—Incoog.

ticæ inter nervos duos sub-opacæ. Pedes pallide flavescentes, apicibus tarsorum obscuris. Setæ pallidæ, apices versus obscuræ.

♀. "Vertex capitis strigis longitudinalibus latis duabus. Abdomen acute rubiginosum, juncturis et maculis lateralibus pallidis." (Walsh.)

♀. s. s. "Æneo-fuscescens, alis vitreis, pedibus pallide flavescens, et setis albis." (Hag.)

Long. corp. ♂ 2·5, ♀ 4-5; set. ♂ 5, ♀ 6-10; exp. al. ♂ 9, ♀ 10-13 mm.

Hab.—Washington, and (?) Porto Rico (Hag.); Rock Island, Illinois (Walsh).

Baetis propinquus.

Cloe vicina, Walsh, 1862 (nec Hag. 1861). *C. propinqua*, Walsh, 1863.

Subimago. "Alæ fumatæ, nervis longitudinalibus saturatoribus."

Imago. ♂. "Piceus. Alæ vitrinæ; posticæ inter nervos duos opacæ. Pedes pallidi, femoribus anticis pallide rubiginosis et apicibus tarsorum obscuris. Segmentorum abdominis 2-7 alba, pellucida, punctis lateralibus (ad spiracula?) obscuris; cætera supra picea, subtus opace albicantia. Setæ albicantes, interdum annulatæ."

♀. "Corpus supra vel rubiginoso-piceum, vel rubiginosum. Abdomen subtus rubido-album. Femora antica fere nunquam maculata." (Walsh.)

Long. corp. ♂ 3-5, ♀ 3·5-4·5; set. ♂ 7·5-10, subim. 5; set. ♀ 5-9, subim. 4; exp. al. ♂ 9-11, ♀ 8·5-14 mm.

Hab.—Rock Island, Illinois. (Walsh.)

Mr. Walsh considers it to be very closely related to *B. posticatus*.*

* The same author supposes that the following may be a *Baetis*.

Baetis verticis.

B. verticis, Say, 1839.

"Corpus ochroleucum vel cretaceum. Thorax strigis rubiginosis duabus, antice confluentibus et postice obsolescentibus; plurimi nervorum alarum stri; pedes albi, antici apicibus femorum rubiginosis, et apicibus tibiarum juncturisque tarsorum fuscis."

Long. corp. et set. supra 6 mm.

Hab.—Indiana (Say).

*Baetis pygmaeus.**Cloe pygmaea*, Hag. 1861.

Imago, s. s. ♀. "Corpus fusco-griseum, alis vitreis, pedibus setis albis." (Hag.)

Long. corp. 3, exp. al. 6 mm. .

Hab.—The St. Lawrence. (Hag.)

*Baetis fluctuans.**Cloe (B) fluctuans*, Walsh, 1862.

Imago, ♀. "Corpus brunneo-album. Thorax supra strigis longitudinalibus brunneis duabus, postice confluentibus. Alæ vitrinæ, nervis longitudinalibus plerumque brunneis, interdum quoque brunneo marginatis bases versus: area marginalis anterioris maculis parvis brunneis quindecim vel sedecim, paucis confluentibus; striga pallida brunnea pone subcostam, cujus margo posticus variabilis et irregularis, interdum sex- vel septem-dentatus, maculas rotundas pellucidas (circa xiv.), paucis confluentibus, inclaudit. Abdomen plerumque brunneo-album, interdum brunneo varium, interdum etiam pallide brunneum, sexto segmentorum brunneo. Tarsorum apices juncturæque fusi." (Walsh.)

Long. corp. ♀ 6-7, set. 10·5-12, exp. al. 13·5-17 mm.

Hab.—Rock Island, Illinois.

Baetis pictus, nov. sp.

(Ala postica, Pl. V. fig. 27.)

Subimago, v. s. s. ♂ ♀. Alæ nigricantes, nervis transversalibus marginibus anguste obscuris. Pedes pallidi, juncturis tarsorum obscuris. Corpus subpiceum.

Imago, v. s. s. ♂. Thorax supra fusco-piceus. Alæ vitrinæ, invariæ, nervis pellucidis. Pedes veluti in ♀. Abdomen olivaceo-fuscum, in medio paulo pallidius; subtus saturate rubido-album, rubido creberrime punctatum. Setæ albæ, juncturis obscuris.

♀. Tergum thoracis saturate lutescens. Alæ vitrinæ, nervis longitudinalibus piceis, et transversalibus opace

albis : area marginalis anticæ fusco variegata ; area submarginalis plus aut minus fusca, interdum maculis rotundis pellucidis inclausis, apice fusco nebuloso ; margo terminalis peranguste fuscus et albo invicem marginatus : ala postica sæpe apud basin et usque ad costæ medium fuscescens. Pedes testacei, vel cervino-albicantes, femoribus punctis rotundis fuliginosis irroratis, paucis confluentibus, atque tarsis albicantibus juncturis et ultimis articularum fuliginosis. (Abdomen decoloratum.) Setæ albæ, juncturis atris.

Long. corp. ♂ 5·6·5 ; al. ♂ 6·5·7, ♀ 7 ; set. ♂ circa 14, ♀ circa 15 mm.

Hab.—Texas.

Baetis (?) *undatus*.

Cloe undata, Pict. 1843-5 ; *Oloeon undata*, Walk. 1853.

Imago, ♀. s. s. "Pallide flavescens. Alæ vitrinæ ; antica apud marginem costalem fusca, maculis rotundis pellucidis variata, fasciâ transversali in medio nebulosâ, et nebulâ magnâ super marginem terminalem, fusciscentibus. Setæ albidæ, juncturis in ♂ atris, in ♀ fuscis" (Pict.). "Pedes flavescentes ; tarsorum apices obscuri" (♂, Hag.).

Long. corp. ♀ 7, set. 10, exp. al. 15-19 mm.

Hab.—Red River, and New York (Hag.) ; Mexico (Pict.).

Baetis fasciatus.

Cloe fasciata, Pict. 1843-5 ; *Oloeon fasciata*, Walk. 1853.

Imago, ♀. s. s. "Tergum thoracis pallide fuscum. Alæ vitreæ : antica margine costali, fasciis transversalibus obliquis duabus, strigis transversali obliquâ prope marginem terminalem alterâque brevi super marginem terminalem ita conjunctis ut maculas pellucidas claudunt, et maculâ trigonali e costa inter strigam et ultimam fasciarum fasciæ ipsi conjunctâ, et denique maculâ conspicuâ in medio inter basin et primam fasciarum, fuscis. Abdomen saturate fuscum, setis lutescentibus fusco annulatis." (Pict.)

Long. corp. ♀ 7, set. 8, exp. al. 19 mm.

Hab.—Brazil. (Pict.)

Some undescribed Australian species, which have the anterior wings more or less coloured along the costa, have been submitted to my inspection. I have seen, besides these, a Californian undescribed species, with the wings very distinctly marked with fuscous blotches along the costa, and with an unusual number of cross-veinlets in the wing. Their wings are figured in Pl. V. fig. 28, 29; Pl. III. fig. 1.

Baetis ferrugineus.

Cloe (A) *ferruginea*, Walsh, 1862.

Subimago. "Alæ fumatæ; posteriores et anticarum postcostæ pallidiores. Ala antica crassioribus nervorum et paucis aliis, bases versus, fuscis, atque nervis transversalibus cum horum marginibus albedo-pellucidis."

Imago, s. s. ♂. Corpus ferrugineum (rubiginosum). Alæ vitrinæ; anticæ apud costas vix flavescentes, tribus prioribus nervorum longitudinalium flavescens, sed paucis aliis fuscis. Pedes pallide flavescens, apicibus tibiæ et tarsorum, juncturis tarsorum, et proximo articulorum tarsi antici, fuscis. Abdomen supra rufescenti-brunneo irroratum, interdum pæne piceum; subtus pallide rubido-album. Setæ forcepsque albicantes; illarum intermedia brevissima." (Walsh.)

Long. corp. ♂ 6.5-9.5; set. 15-17; al. exp. 15-18 mm.

Hab.—Rock Island, Illinois (Walsh).*

* Mr. Walsh thinks that the following species may be allied to *B. ferrugineus*.

Baetis albus.

B. alba, Say, 1824; *Palingenia alba*, Hag. 1861.

♀. Album; vertice fusco. Thorax vix flavescens-brunneo tinctus; "prothorax quadratus, cretaceus" (Hag.). Alæ albidæ, nervulis apud costas obscuris. Pedes albi; antici breves, obscuri.

Long. corp. 11, exp. al. 22 mm. (Hag.)

Hab.—The North Red River (Hag.); Winnipeg River (Say).

Ephoron leukon, Williamson, 1802.

"Oculi nigri. Thorax fuscus. Alæ, abdomen, et pedes albi. Alæ patentæ, reticulatæ; setæ duæ."

Long. corp. 12 mm.

Hab.—The River Passaic, in the immediate vicinity of Belville; from the end of July to the middle of August. They begin to rise about forty minutes after sunset, moult about half a minute afterwards, and fly nearly as fast as dragon-flies. (Williamson.)

I have reasons for supposing that *Tipulæ* are called dragon-flies in some parts of England; and if the *Ephoron leukon* flies as fast as these, its habits conform, thus far, to those of British species of *Heptagenia*.

Genus SIPHLURUS.

(Ala antica, Pl. III. fig. 2.)

Baetis, p., Say, 1823; *Ephemera*, p., Zet. 1840; *Paltingenia*, p., Walk. 1853; *Siphonurus* (err.), Etn. 1868.

Nympha agilis, laminis branchialibus utrinque septem: laminarum duæ priores duplices, cæteræ simplices, omnes integræ. Palpi tri-articulati, superiores proximo articularum cæteris subæquali, et ultimo penultimo breviori; inferiores proximo articularum quoque cæteris subæquali et valde depresso, secundo fere obconico apice obliquo, et vix tertio longiori.

Super pedes omnes, alis erectis, setisque divergentibus subimago stat.

Imago. Oculi ♂ integri; setæ duæ longæ (residuum intermediæ interdum articulatæ); alæ quatuor; tarsi quinque-articulati, proximo articularum interdum tibiæ adnato. Forcipis pedes quadri-articulati (nisi articulus quintus basalis laminâ ventrali penultimi segmentorum obtegatur); articularum primus largus, secundus longissimus. Femina caret ovivalvulâ; neque laminam ventralem penultimi segmentorum habet.

The species inhabit lakes and rivers, in the Palæarctic and Nearctic Regions.

From having omitted to note down the tarsal characters of all the species examined by me, I am, unfortunately, unable to adopt Mr. Walsh's convenient sections of the genus; which are founded upon the structure of the tarsus.

Siphonurus flavidus.

(Apex abdominis supra, Pl. V. fig. 30.)

Baetis flavida, Ed. Pict. 1865.

Imago, v. s. s. ♂. "Oculi cæruleo-atrî. Corpus furosum vel lutescens. Alæ vix opacæ, nervis fuscis; anticæ juxta bases, et in areis marginali et submarginali apices versus, pallide flavicantes. Pedes fulvi, juncturis fuscis. Abdomen juncturis, et maculis longitudinalibus apicem versus, fuscis;" subtus maculâ U-formatâ in segmento singulo: "processum depressum

acutum, penultimum segmentorum utrinque habet. Setæ flavescentes, juncturis vix obscuris."

"♀ pallidior." (E. Pict.)

Long. corp. ♂ ♀ 12, exp. al. ♂ 27, ♀ 31 mm.

Hab.—San Ildefonso. July.

Siphylurus armatus.

(Forceps, Pl. VI. fig. 1, 1a.)

S. armatus, Etn. 1870.

Imago, v. s. s. ♂. Tergum thoracis luteo-piceum. Alæ virescenti-griseo suffusæ, nervis piceis. Pedum antici picei; posteriores lutei vel furfurosi. Abdomen supra fuscum, juncturis latera versus pallidis; subtus lutescens vel ochraceum, strigis U-formatis in posterioribus segmentorum. Setæ cervino-albidæ, vel subfulvæ, juncturis fuscis, pubescentes. Forceps piceus.

Long. corp. ♂ 14-15, al. 16, set. 24-25 mm.

Hab.—Killarney (M'Lach.), and Bishop's Wood, Middlesex (Wormald). In July.

Mr. McLachlan has an undescribed foreign species closely allied to *S. armatus*, probably from Germany.

Siphylurus lacustris.

(Forceps maris, Pl. VI. fig. 2.)

S. lacustris, Etn. 1870.

Subimago, v. v. s. ♂. Alæ cinereæ vel nigricantes.

Imago, v. v. s. ♂. Oculi supra saturate fuliginosi, subtus saturate virescenti-grisei. Tergum thoracis aterimum, politum. Alæ vitrinæ, nervis piceis, fulgore hyacinthino; apex areæ marginalis et areæ submarginalis anticæ pallide virescenti-albus. Pedum antici atrovirentes, cruribus saturate corvinis; posteriores saturate virescenti-grisei, tarsis infra spinulosis.* Abdomen supra piceo-fuscum, juncturis ochraceis; subtus saturate virescenti-griseum, tribus segmentorum apicalium fulvescentibus, singulis strigis U-formatis obscuris; sub prioribus segmentorum strigæ duæ, antice convergentes, obscuræ. Setæ virescenti-griseæ, bases versus fuliginosæ, juncturis vix obscuris.

Long. corp. ♂ 15, al. 14, set. 20, subim. 11 mm.

Hab.—Llyn Llydaw, Snowdon. August.

* Several other species likewise have the tarsi spinulose beneath.

Anglers in Wales, mistaking this for *Ephemera danica*, are greatly astonished at seeing the subimago rise out of the cold tranquil "llyns." One of my specimens remained a subimago during the greater part of two days.

There are some specimens of a small undescribed (probably German) species in Mr. M'Lachlan's possession, which is very similar to *S. lacustris*.

Siphylurus Linnæanus, nov. sp.

(Forceps maris, Pl. VI. fig. 3. Notulæ ventrales, fig. 3a.)

Imago, v. s. s. ♂. Tergum thoracis fusco-rubiginosum. Alæ vitrinæ, vix fusco suffusæ, nervis longitudinalibus piceis, bases versus testaceis. Pedes ochracei, femoribus singulis cingulis mediis obscuris. Dorsum abdominis fuscum, apicibus segmentorum saturatoribus, et triangulis pallidis ad latera segmentorum intermediorum: subtus 2-8 segmentorum pallide ochracea, singula signis obscuris bicornutis punctisque atris duobus eleganter notata; cætera subtus saturate rubiginosa. Setæ ochro-leucæ, juncturis fuscis.

Long. corp. ♂ 15, set. 26, al. exp. 26 mm.

Hab.—Incog. There is a specimen in the Linnæan cabinet, and the abdomen of a male in Mr. Dale's collection.

Siphylurus annulatus.

(Forceps maris, Pl. VI. fig. 4a. Notulæ ventrales, fig. 4.)

Baetis annulata, Walk. 1853.

Imago, v. s. s. ♂. Tergum thoracis brunneo-luteum. Alæ vitrinæ, vix lactescentes, nervis piceis: apex areæ marginalis anticæ nebulâ pallidissimâ fuscâ. Pedes ochracei, juncturis et femorum cingulis mediis piceis. Dorsum abdominis pallide fuscum, latera versus ochraceum: venter ochraceus, segmento singulo intermedio strigis longitudinalibus duabus punctisque tribus fuscis. Setæ ochraceæ, juncturis piceis.

Long. corp. ♂ 13, al. 15, set. 18 mm.

Hab.—Trenton Falls, New York.

*Siphylurus bicolor.**Palingenia bicolor*, Walk. 1853.

Subimago, ♀. v. s. s. Alæ fuscæ, nervis transversalibus marginibus saturatoribus, iis in apice areæ marginalis anticæ subrectis. Tergum thoracis luteum. Pedum antici luteo-fusci, tarsis pallidioribus; posteriores ochracei. Setæ luteæ.

Long. corp. ♀ 11, al. 14 mm.

Hab.—St. Martin's Falls, River Albany, Hudson's Bay (Barnston).

Siphylurus femoratus.

Baetis femorata, Say, 1823; *B. femorata*, (?) Walsh; vel (?) *Baetis* (A) *interlineata*, Walsh, 1863.

Subimago. "Alæ ♂ niveæ, nervis cum marginibus suis fuscis; ♀ alæ albicantes, nervis fuscis fusco marginatis." (Say.)

Imago, v. s. ♂. "Piceus. Oculi supra margaritacei, singuli maculâ mobili atrâ; subtus pallide fusci. Alæ vitrinæ: anticæ tribus prioribus nervorum longitudinalium et paucis sequentium, atque nervis transversalibus areæ submarginalis cum paucis aliis bases alarum versus, fuscis; macula brunnea in disco, lineaque atra in costæ medio, interdum quoque areis marginalibus apices versus, obscuratis: posticæ seriebus singulis brevibus nervorum transversalium fuscorum ad bases costarum brunneo nebulosis. Pedum antici pallide brunnei, interdum proximis dimidiorum saturatoribus; posteriores pallidiores; omnes femoribus brunneo bi-cinctis, tibiis ad bases et apices tarsisque ad juncturas brunneis. Segmentorum abdominis 4-5 alba, pellucida, singula fasciis apicalibus angustis piceis, maculis dorsalibus in mediis utrinque obscuris, maculisque lateralibus pallidis; venter albicans, pellucidus. Setæ albæ, annulatæ."

♀. "Segmentorum abdominis 1-5 supra piceo-brunnea, bases versus pallidiora. Alæ posticæ in toto vitrinæ." (Walsh.)

Long. corp. ♂ 12-13.5, ♀ 12.5-14; set. ♂ 20-24, ♀ 13-16; exp. al. ♂ 25-28, ♀ 28-29 mm.

Hab.—Cincinnati (Say); Rock Island, Illinois (Walsh).

Siphylurus alternatus.*Baetis alternata*, Say, 1824; in sect. A, Walsh.

Subimago. "Alæ fumatæ, apicibus posticarum pallide virescentibus."

Imago, s. s. ♂. "Piceo-brunneus. Alæ vitrinæ, nervis fuscis. Pedum antici pallide brunnei, coxâ, cingulo præapicali femoris, juncturisq̄ tarsorum, brunneis: posteriores pallidiores. Segmentorum abdominis 2-9 vel 4-9 singula maculis trigonalibus lateralibus flavescentibus duabus supra juxta bases, plus aut minus confluentibus; subtus pallida, singula maculis parvis basalibus in mediis, punctis transversalibus in mediis duobus, lineisque utrinque obliquis sub-abbreviatis, brunneis. Setæ albicantes, juncturis brunneis."

♀. "Caput carinis divergentibus inter ocellos duabus, marginibus antico et laterali verticis (vel etiam interdum carina in medio hujus), strigisque brevibus utrinque duabus, flavescentibus." (Walsh.)

Long. corp. ♂ 10·5-12·5, ♀ 10-12; set. ♂ 19-31, subim. 13; set. ♀ 18-19, subim. 14-15; exp. al. ♂ 23-30, ♀ 26-32 mm.

Hab.—Rock Island, Illinois, and the River Des Plaines near Chicago (Walsh); Washington (Hag.); St. Peter's River (Say).

Siphylurus aridus.*Baetis arida*, Say, 1839; in sect. B, Walsh.

Subimago. "Alæ nigricante suffusæ, præcipue apices versus, et nervis transversalibus fusco marginatis."

Imago. ♂. "Caput pallidum, maculâ magnâ intra posteriores ocellorum orbitas utrinque atrâ. Thorax piceus. Alæ vitrinæ, nervis pallidissime hyalinis, interdum bases costarum versus fuscis. Pedum antici vel apicibus tarsorum, tibiis, et femoribus usque ad media, obscure virescenti-fuscis; vel pallide virescentibus, vix ad apices versus obfuscatis; vel in toto fuscis vel piceis: posteriores virescenti-albi, apicibus tarsorum vix obscuris. Segmentorum abdominis 1-8 supra picea, singula maculis

lateralibus trigonalibus vel semi-orbicularibus pallide rubiginosis ad bases; ultimum pallide rubiginosum. Setæ virescenti-albæ."

♀. "Nervi alarum pallide fuscis. Segmentorum abdominis 1-8 supra saturate rubiginosa et maculata veluti in ♂." (Walsh.)

Long. corp. ♂ 8-12, ♀ 9-13; set. ♂ 18-23, subim. 12-14; set. ♀ 17-26, subim. 10-14; exp. al. ♂ 20-25.5, ♀ 23.5-32 mm.

Hab.—Rock Island, Illinois (Walsh); Indiana, about the middle of June (Say).

Siphylurus siccus.

Baetis (B) *siccus*, Walsh, 1862.

Imago, ♂. "A præcedente discrepat in orbitis ocellorum posticorum intus haud plane obscuris; in nervis alarum fuscis; in pedibus anticis piceis, apicibus tibiaram atris, et proximis articularum tarsalium pallidis (juncturis suis exceptis); in dorso abdominis piceo, immaculato; et in setis virescenti-albis, juncturis anguste fuscis."

♀. "Tarsus anticus fuscus, proximo articularum pallido. Dorsum abdominis saturate rubiginosum, immaculatum." (Walsh.)

Long. corp. ♂ 8.5-10, ♀ 8.5-11.5; set. ♂ 19, ♀ 15; exp. al. ♂ 19-22, ♀ 23-27 mm.

Hab.—Rock Island, Illinois (Walsh).

Siphylurus debilis.

Baetis (C) *debilis*, Walsh, 1862; (*nec* Walk. 1853).

Subimago. "Alæ fumatæ, nervis fuscis."

Imago, v. s. ♂. "Oculi supra brunnei, subtus fuscis. Thorax piceus. Alæ vitrinæ, nervis pallide hyalinis, tribus prioribus nervorum longitudinalium, bases (et interdum quoque apices) versus, fuscis. Pedes pallide virescentes, genubus cingulisque femorum fuscis; antici apicibus tibiaram, juncturis, et ultimis articularum tarsalium, fuscis; posteriores apicibus articularum tarsalium fuscis. Abdomen rubiginosum, apicibus segmentorum piceis. Setæ albicantes."

♀. "Pallidior. Thorace flavescens. Nervi alarum costas et apices versus nigricantes." (Walsh.)

Long. corp. ♂ 4-5.5, ♀ 5-7; set. ♂ 13-14, subim. circa 5; set. ♀ 8-12; exp. al. ♂ 13-15, ♀ 15-16 mm.

Hab.—Rock Island, Illinois (Walsh).

At this point is resumed the series of genera which have a short ventral lamina, produced from the tip of the penultimate segment of the female; which series comprises *Leptophlebia*, *Ephemerella*, *Bætisca*, *Isonychia*, *Coloburus* and *Heptagenia*.*

* Species generis incerti.

The following Cingalese species have been classed in *Cloe* by Dr. Hagen; but most likely a new genus will have to be erected for them. I have seen only one female subimago of what I suppose to be *C. tristis*, Hag.; and therefore I am not in a position to describe the genus. This female has hind-wings unconformable to those of *Bætisca*, and a ventral plate produced from the apex of the penultimate segment; but no egg-valve. According to Dr. Hagen, the male has three long setæ. The name *Cloe* cannot be retained for them. Some of them may belong to *Leptophlebia*.

Sectio I. Alæ quatuor.

No. 1. ——— *tristis*.

Cloe tristis, Hag. 1858.

Subimago ♀, s. s. "Nigra, pedibus luteis, femoribus anticis nigris; setis griseis, incisuris nigris; alis nigris, opacis."

Long. set. ♀ subim. 15, exp. al. 13 mm.

Hab.—Rainbodde. (Hag.)

No. 2. ——— *consueta*.

Cloe consueta, Hag. 1858.

Subimago. "Alis paulo griseis opacis."

Imago. "Capite nigro, thorace brunneo, pedibus pallidis, abdomine pallido, apicibus segmentorum anguste brunneo marginatis, setis pallidis incisuris basalibus nigris; alis vitreis (hyalinis), venis pallidis; ♀ (?) thorace medio luteo, abdomine brunneo."

Long. set. ♀ 10, exp. al. 12 mm.

Hab.—Rainbodde. (Hag.)

No. 3. ——— *solida*.

Cloe solida, Hag. 1858.

Subimago (?). "Alis griseis opacis, thorace abdomineque luteis."

Imago ♀. "Fusco-ænea, abdomine subtus pallido, pedibus luteis, setis griseis incisuris nigris, alis vitrinis."

Long. set. 7, exp. al. 10 mm.

Hab.—Rainbodde. (Hag.)

Genus *COLOBURUS*.

(Ala antica, Pl. III. fig. 3.)

Palingenia, p., et *Baetis* p., Walk. 1853; *Coloburus*, Etn. 1868.

Imago. Oculi ♂ sub-partiti; alæ quatuor; setarum media brevissima, articulata. Tarsi postici quinque-articulati: articulorum primus tibiæ adnatus, vix discretus, secundo longior; secundus in ♀ tertio æqualis; secundus, tertius et quartus in ♂ primo graduatim minores. Femina caret ovalvulâ; processus ventralis tamen brevis laminaris e penultimi segmentorum apice producitur. Pedes forcipis quadri-articulati; articulorum proximus largus, secundus brevior; secundus reliquis longitudine subæqualis.

Coloburus humeralis.

(Genitalia maris, Pl. VI. fig. 6, 6a; feminae, 6b.)

Palingenia humeralis & *Baetis remota*, Walk. 1853; *Coloburus humeralis*, Etn. 1868.

Subimago, v. s. s. ♀. Alæ anticæ canæ, juxta bases ochraceæ, apices versus fuscescentes, nervis transversalibus murino marginatis, præcipue costas versus. Setæ rubiginosæ, juncturis obscuris.

Imago, v. s. s. ♂. Thorax supra fuscus, politus. Alæ cano tinctæ, pellucidæ, nervis atris, juxta bases ochraceæ; antica area submarginali et areæ marginalis apice sub-fuscis, atque pluribus nervorum transversalium inter

No. 4. ——— *signata*.*Clos signata*, Hag. 1858.

Imago. "Capite nigro, thorace fusco-æneo, abdomine fusco, subtus basibus segmentorum pallidis; pedibus albidis, femoribus in mediis, cum genu, nigro annulatis; setis albidis, incisuris nigris."

Long. set. 8, exp. al. 12 mm.

Hab.—Rainbodde. (Hag.)

Sectio II. Alæ duæ.

No. 5. ——— *marginalis*.*Clos marginalis*, Hag. 1858.

Subimago. "Luteo-fusca, abdomine fusco, pedibus luteis, setis griseis; alis griseis, margine costali fusco."

Imago, ♀. "Nigra, pedibus anticis nigris, posticis luteis; setis albis, nigro articulatis; alis vitrinis, margine costali vix obscuriori."

Long. set. ♀ 16, subim. 7; exp. al. 10-14 mm.

Hab.—Rainbodde. (Hag.)

costam duosque nervorum sequentium fusco marginatis. Pedum antici fuscis; posteriores fulvo-lutei, apicibus tibiæ et articularum tarsalium fuscis. Abdomen supra fuscescens.

♀. Alæ eis maris simillimæ, sed juxta bases luteæ. Pedum antici brunneo-lutei; posteriores lutei, apicibus tibiæ et articularum tarsalium subfuscis.

Long. corp. ♂ 10, ♀ 7-10; al. ♂ 15, ♀ 13-17; set. ♂ 20 & 2, ♀ 15 & 1, subim. 12-13 & 1 mm.

Hab.—Otago, New Zealand.

Coloburus haleuticus, nov. sp.

(Forceps maris, Pl. VI. fig. 7, 7a.)

Imago, v. s. s. ♂. Thorax supra furfurosus. Alæ vitrinæ, lacteo tinctæ, juxta bases subfuscæ, nervis atropiceis; apices areæ marginalis et areæ submarginalis virescenti-grisei. Pedum antici rufo-piceis; posteriores brunneo-lutescentes. Abdomen supra rufo-fuscum, juncturis paulo obscuris, lineis spiracularibus testaceis, ventre rufo-lutescenti. Setæ fuscæ, pubescentes: forceps testaceus, apices versus piceo tinctus.

Long. corp. ♂ 11, al. 15, set. 20 & 5 mm.

Hab.—Melbourne (?) [M'Coy].

Genus CRONICUS, nov. gen.*

Baetis, p., Pict. 1854.

Imago. *Heptageniæ* affinis. Forcipis maris pedes quadri-articulati; articularum penultimus longus, secundo vix brevior, primus et ultimus brevissimi. Setarum media brevissima.

Cronicus anomalus.

(Forceps, Pl. VI. fig. 8.)

Baetis anomala, Pict. 1854.

Long. corp. ♂ 10, exp. al. 20 mm.

Species in electro.

* Derivation.—*Kρονικός*, old-fashioned, out of date.

Whether the *Baetis gigantea*, *grossa*, and *longipes* of MM. Pictet and Hagen (1856) belong to this genus or not, I am unable to say, because they are not figured, and I have not seen the types.

Genus *ISONYCHIA*, nov. gen.

(*Ala antica*, Pl. III. fig. 4.)

Baetis, p., Walk. 1853.

Imago, ♀. Alæ quatuor: setarum media sæpissime rejicitur, interdum tamen rudimentum brevissimum retinetur. Tarsi quinque-articulati; articulorum posteriorum primus secundo subæqualis, et tertius etiam quarto subæqualis, sed secundus tertio paulo longior: ungues uncinati, conformes. Ovivalvula caret; sed processus laminaris ventralis e penultimi segmentorum apice producitur. Oculi ♂ integri.

Forsan ad *Isonychiam* species *Siphyluri* in *Baetis* serie B (Walsh), et *Ephemera pudica* (Hag.), pertinere inveniantur.

Isonychia manca, nov. sp.

(Genitalia, Pl. VI. fig. 5, 5a.)

Subimago, ♂ ♀ v. s. s. Alæ nigricantes, venis saturate et anguste marginatis; post-costas versus pallidiores.

Imago, v. s. s. ♂. Thoracis tergum luteo-furfurosum. Alæ vix lurido tinctæ, nervis vix luridis. Pedum antici femoribus olivaceo-piceis, apicibus saturate piceis, tibiis atro-piceis, tarsis testaceis juncturis atris; posteriores stramineo-gambosi, unguibus vix obscuris. Abdomen decoloratum. Setæ pallidissime ochraceæ, proximis juncturarum obscuris.

♀. Thoracis tergum et caput furfurosa; apud latera interdum fusco-picea. Alæ vitrinæ, vix lacteo vel lurido tinctæ; nervorum longitudinales picei, transversales atrii. Pedum antici apicibus femorum piceis, tibiis atris, duobus proximis articulorum tarsalium albicantibus, cæteris nigricantibus; posteriores ochracei, unguibus obscuris. Abdomen rufo-piceum, setis cretaceis, breviter pubescentibus. Interdum pedes antici sunt picei, tarsi murinis.

Long. corp. ♂ 10, ♀ 7-12, al. ♂ 10, ♀ 11·5-13, set. ♂ 18, ♀ 20-22 mm.

Hab.—Texas (M'Lach.).

Isonychia ignota.

(Genitalia maris, Pl. VI. fig. 29.)

Baetis ignota, Walk. 1853.

Imago, v. s. s. ♂. Thoracis tergum brunneo-piceum. Alæ vitrinæ, nervis testaceis. Pedum antici fusco-picei, juncturis pallidis; posteriores lurido-straminei. Abdomen supra piceum, apicibus segmentorum obscuris: "venter rubiginosus" (Walk.). Setæ bases versus sub-fuliginosæ.

Long. corp. ♂ 10.5, al. 12 mm.

Hab.—Incog. (? United States.)Genus **HEPTAGENIA**.

(Ala antica, Pl. III. fig. 5.)

Ephemera, p., Pod. 1761; *Baetis* (A), Curt. 1834 (*nec* Leach, 1815); *Heptagenia*, Walsh, 1863; *Ecdyurus*, Etn. 1868.

Nympha agile reptans, laminis branchialibus utrinque septem; laminæ simplices integræ, fasciculis e radicibus singulis filamentorum branchialium. Femora late compressa, ciliata. Caput late depressum: labrum induplicatum, transversum, obtuse triangulare, apice emarginato. Palpi maxillares bi-articulati: maxillarum superiores laminares, intus ciliatæ, antice (*i. e.*, apud apices) pectinatæ, palpis tenuibus; inferiores palpis robustis ultimis articulorum bifidis, dimidiis imbricatis. Labium ovale minutum, palpis inarticulatis, brevissimis, ob-ovatis.

Subimago in habitu *Siphuro* admodum similis est.

Imago. Alæ quatuor: setarum media caret: oculi maris simplices. Tarsorum posteriores quinque-articulati; articulorum secundus, tertius, et quartus graduatim decrescentes: ungues dissimiles. Forcipis maris artus triarticulati, proximis articulorum longissimis, ex apice processus ventralis procedentes. Ovivalvulam et processum ventralem penultimi segmentorum femina habet.

The species frequent streams and rivers in the Palæarctic and Nearctic regions, the Andes, and the Malay Archipelago.

Heptagenia semicolorata.

(Genitalia maris, Pl. VI. fig. 9.)

Ephemera stigma (?), Gmel. 1790-3. *E. fuscula* (?), Schr. 1798 (subim.). *Baetis semicolorata*, Curt. 1834. *B. semitincta* (?), Pict. 1843-5.*

Subimago, v. v. s. Alæ anticæ griseæ; posticæ pallide cervinæ vel fumatæ. Pedes virescenti-grisei, femoribus in mediis obscure punctatis, tarsisque corvinis vel atro-virescentibus. Setæ nigricantes. Oculi maris saturate olivacei, cingulis atris in mediis.

Imago, v. v. s. ♂. Oculi supra saturate picei, cingulis subtus atris marginibus cærulescenti-griseis. Tergum thoracis fusco-luteum. Alæ vitrinæ, nervis et basibus rubiginosis. Pedes virescenti-grisei, strigis abbreviatis longitudinalibus in mediis femorum, cruribus anticis nigricantibus, sed posterioribus tarsorum vel ochraceo-fumosis, vel stramineis plus aut minus corvino tinctis, vel fulvis unguibus obscuris. Abdomen supra fuscum, apicibus segmentorum obscuris et juncturis pallidis; subtus saturate murinum. Setæ fuliginosæ, vel nigricantes.

♀. Alæ vitrinæ, crassioribus nervorum longitudinalium testaceis, tenuioribus atro-fuscis, et transversalibus atris; vel omnibus testaceis. Oculi atro-olivacei. Abdomen supra ochraceo-furfurosum, juncturis pallidissimis; subtus testaceum. Processus ventralis penultimi segmentorum emarginatus.

Long. corp. ♂ 7·5-10, ♀ 7·5-9; al. ♂ 10, ♀ 10·5; set. ♂ 23-25, subim. 8-9; set. ♀ 14, subim. 10 mm.

Hab.—Great Britain, Switzerland, and Austria; in cold streams and the rapids of rivers. June to September.

* The specimens labelled *semitincta* in M. Ed. Pictet's collection, are indistinguishable from a pale variety of *semicolorata*, which occurs in the Lake District of England. It seems advisable, notwithstanding, to state M. Pictet's criteria of *semitincta*, in case the species should be really distinct from one another.

Subimago. "Alæ pallide flavescenti-griseæ. Corpus virescenti-flavescens."

Imago. "Thorax striga dorsali pallida. Femora antica acute fulva."

Hab.—A small stream at Versoix, on the Lake of Geneva, in the middle of June. (Pict.)

One can hardly doubt that it is a species distinct from *semicolorata*.

Heptagenia nivata, nov. sp.

(Genitalia maris, Pl. VI. fig. 10.)

Subimago, v. v. s. ♂ ♀. Alarum anticæ saturate cineræ; posteriores pallidiores. Pedes olivacei, tarsis nigricantibus; antici obscuriores. Setæ nigræ.

Imago, v. v. s. ♂. Oculi atro-fuliginei, infra paulo olivaceo tincti. Tergum thoracis aterrimum, politum. Alæ vitrinæ, invariæ; nervi virescenti-grisei, post-cubitales recti. Pedum antici atro-olivacei, tibiis et tarsis atris; posteriores olivacei, tibiis saturate virescenti-albis vel cretaceis, atque tarsis olivaceo tinctis. Abdomen supra fuscum, juncturis paulo pallidioribus; subtus olivaceum. Setæ nigricantes, juncturis anguste obscuris.

♀. Post-cubitales vix irregulares. Pedum antici tibiis tarsisque saturate nigricantibus; posteriores tibiis cretaceis, et tarsis nigricantibus unguibus pallidis. Abdomen subtus olivaceum, maculis ganglialibus paulo obscurioribus. Lamina ventralis penultimi segmentorum apice lente emarginato.

Long. corp. ♂ ♀ 11; al. ♂ 12, ♀ 17; set. ♂ 27, subim. 8; set. ♀ 12-15 mm.

Hab.—The stream at Barberine; and Lac de Combal. July. It is named *nivata* from its haunts being chilled with snow.

Heptagenia borealis, nov. sp.

(Genitalia maris, Pl. VI. fig. 11.)

Imago, v. s. s. ♂. Thoracis tergum piceum. Alæ vitrinæ; nervorum longitudinales pallide fuscis. Pedes pallide fuscis. Abdomen ochraceum, pellucidum; supra apicibus et paucis segmentorum apicalium fuscis. Setæ cervinæ, juncturis fuscis.

Long. corp. & al. ♂ 10 mm.

Hab.—Finmark, between Kautokeino and Karaswando. (Walk. MS.) July or August.*

* An account of Messrs. Walker and Christy's journey is given in the Entomological Magazine (1837) iv. 462-88.

Heptagenia canadensis.

(Genitalia maris, Pl. VI. fig. 12, 12a.)

Baetis canadensis, Walk. 1853.

Imago, v. s. s. ♂. Thorax supra saturate luteus. Alæ vitrinæ, nervis fuscis; areæ marginalis et submarginalis vix fuscescentes, nebulâ apicali breviter apud marginem terminalem productâ, et duobus nervorum transversalium prope punctum nodale nebulis singulis rotundatis obscuris, nebulis interdum tamen confluentibus. Pedes pallide testacei, juncturis tarsorum fuscis, apicibus tibiærum atris, et femoribus obscure bicingulatis. Abdomen supra sub-ochraceum, apicibus segmentorum strigisque lateralibus obliquis fuscis; subtus stramineum. Setæ pallidæ, juncturis fuscis.

Long. corp. ♂ 9, al. 10, set. supra 18 mm.

Hab.—Canada.*Heptagenia fusca.*

(Genitalia maris, Pl. VI. fig. 13, 13a, b.)

Baetis fusca, Walk. 1853.

Imago, v. s. s. ♂ ♀. Tergum thoracis castaneo-piceum. Alæ vitrinæ, nervis pallide fuscis, et apice areæ marginalis anticæ vix fuscescente. Pedum antici fusci: posteriores saturate testacei: femora strigis singulis brevibus in mediis longitudinalibus atris. Abdomen fuscum, apicibus segmentorum saturatoribus.

Long. corp. ♂ ♀ 6-7, al. 9-10 mm.

Hab.—St. Martin's Falls, Albany R., Hudson's Bay.*Heptagenia cupulata*, nov. sp.

(Genitalia maris, Pl. VI. fig. 14, 14a.)

Subimago, v. s. s. Alæ testaceæ, nervis fuscis.

Imago, v. s. s. ♂. Thoracis tergum luteum. Alæ vitrinæ: anticæ areis marginalibus et submarginalibus apices versus fuscescentibus, longitudinalibus nervorum piceis et transversalibus atris, (basi subcostæ et nervo transversali crasso juxta basin areæ marginalis aurantiacis

exceptis); posticæ nervis bases versus testaceis, et apud margines terminales anguste corvino tinctæ. Pedes saturatissime lutei. Abdomen supra furfurosum, strigâ longitudinali mediâ, apicibus segmentorum, strigisque lateralibus obliquis, fuliginosis. Setæ saturate hepaticoloratæ.

♀ ovivalvulâ acutâ, processuque ventrali penultimi segmentorum integro, sinu longitudinali.

Long. corp. ♂ 18, ♀ 16, set. ♂ 48, ♀ 54 mm.

Hab.—Northern China.

The neuration of the fore-wing is peculiar.

Heptagenia basalis.

(Genitalia maris, Pl. VI. fig. 15, 15a.)

Baetis basalis, Walk. 1853; *nec* Steph. MS.

Imago, v. s. s. ♂. Tergum thoracis piceum. Alæ vitreæ, nervis piceis: anticæ vix fusco tinctæ marginem interiorem versus, nervis transversalibus in areis marginalibus et submarginalibus plus aut minus obscure marginatis, marginibus nonnunquam confluentibus, itaque maculam formantibus ad punctum nodale alteramque inter hoc et alæ apicem; posteriores bases versus vix fusco-piceo tinctæ. (Exemplar pedibus caret). Abdomen piceum, juncturis pallidis. Setæ cervinæ, juncturis fuscis.

Long. corp. ♂ 15, al. 13, set. 21 mm.

Hab.—Lake Winnipeg.

Heptagenia maculipennis.

H. maculipennis, Walsh, 1863.

Subimago. "Alæ griseo tinctæ, nervis transversalibus obscure marginatis."

Imago. ♂. "Pallide flavicans. Capitis vertex rubiginosus; orbitæ ocellorum griseæ. Tergum thoracis rubiginosum. Alæ vitrinæ, nervis longitudinalibus tenuibus obscuris, et pluribus transversalium atris: horum ii super interiorem submarginem alæ anticæ, atque omnes alæ posticæ, vitrei sunt. Nervi transversales anthracini in area marginali alæ anticæ adeo collocantur ut quasi maculas forment; viz., nervi circa quatuor prope basin,

quorum primus aream submarginalem quoque transit, marginibus late anthracinis; deinde spatium; postea tres ad punctum nodale, paucis sequentibus; deinde circa medium spatii sequentis alii quatuor vel quinque; denique nervi ad spatia solita positi usque ad apicem. Pedes albicantes, femoribus flavescens, sæpissime strigis tenuibus singulis brevibus subtus apices; ungues apices que tibiæ antice fuscæ. Dorsum abdominis apicem versus piceum; setæ forcepsque albidæ."

♀. "Pallidior. Abdominis segmenta apicalia supra albicantia, plus aut minus rubiginoso tincta. In posterioribus tarsorum primus articulorum tarsalium secundo æqualis: tibia antica apice fere nunquam fusco. Maculæ costales alæ anticæ eis maris paulo pallidiores" (Walsh). Penultimi segmentorum processus ventralis integer esse mihi videtur.

Long. corp. ♂ 4.5-6, ♀ 5-6; set. ♂ 12-15, subim. 7.5; set. ♀ 9-12, subim. 8; exp. al. ♂ 14-17, ♀ 15-17 mm.

Hab.—Rock Island, Illinois (Walsh); New York (M'Lach. Mus.).

Heptagenia cruentata.

H. cruentata, Walsh, 1863.

Subimago. "Alæ opace flavescens. Setæ nigricantes (vel griseæ?), juncturis vix fuscis."

Imago, v. s. ♂. Flavescens. Oculi cærulescenti-grisei, lineis singulis atris intersectis. Tergum thoracis sanguineum. Alæ vitrinæ, nervis fuscis, bases versus vitreis, costisque in majore parte flavescens; subcosta apud punctum nodale incrassata atque obfuscata. Femorum dimidia apicalia annulis confluentibus pallide sanguineis bicincta; tibiæ quoque bases et apices versus pallide sanguineæ; tarsorum juncturæ atque ungues obscuri. Abdomen supra sanguineum, juncturis saturatioribus. Forceps pallidus, apicibus fuscis. Setæ albidæ, juncturis in vices anguste lateque obscuris."

♀. "Plerumque mari pallidior. Venter interdum sanguineus." (Walsh.)

Long. corp. ♂ 7-8, ♀ 8-9; set. ♂ 25-27, subim. 12-15; set. ♀ 17-20; exp. al. ♂ 19-20, ♀ 22-23.5 mm.

Hab.—Rock Island, Illinois (Walsh).

Heptagenia simplex.*H. simplex*, Walsh, 1863.

Subimago. "Alæ flavescentes; costa feminæ unius fusca."

Imago, v. s. ♂. "Ab acute flavo ad albidum varians. Oculi virescenti-sulphurei; orbitæ ocellorum nigricantes. Tergum thoracis carneum. Alæ vitrinæ, nervis apicalibus, et interdum quoque eis in areis marginalibus, fuscis. Pedes albi, femoribus flavis vel cretaceis, apicibusque tarsorum fuscis: antici apicibus tibiæ atque interdum juncturis tarsorum fuscis. Abdomen vitreum, segmentis apicalibus (2-3) flavescentibus vel albidis. Setæ albæ, nigricantes apices versus. Forceps albus."

♀. "Abdomen flavum, nisi vacuum sit, setis albis. Nervis apicibus tarsorum solum fuscis. Nervi alarum anticarum vitrei, costis subcostisque flavescentibus, paucisque nervorum transversalium inter horum apices obscuris, exceptis." (Walsh.)

Long. corp. ♂ 6-8, ♀ 6·5-9; set. ♂ 14-18·5, subim. 10·5; set. ♀ 14-16, subim. 10-15; exp. al. ♂ 16-20·5, ♀ 19-25·5 mm.

Hab.—Rock Island, Illinois (Walsh).

Heptagenia pulchella.

Palingenia (C) *pulchella*, Walsh, 1862. (?) *Pal.* (C) *terminata*, Walsh, 1862.*

Subimago. "Alæ sub-opacæ, fusco nebulosæ, nervis transversalibus fuscis, obscure marginatis. Setæ vix pilosæ, nisi juxta bases."

Imago, v. s. ♂ "Oculi margaritacei, vel atrescentes. Thoracis tergum rubigineo-piceum, meso- et meta-thoracis scutellis albidis. Alæ vitreæ: anticæ areis marginalibus apices versus pallide brunneo nebulosis, et nervis transversalibus fuscis, eis prope basin areæ marginalis lutescentibus exceptis; posticæ pluribus nervorum pelucidis. Pedum antici pallide flavescentes, femoribus fusco bicinctis, apicibus tibiæ tarsorumque cum junc-

* Utrum *H. terminata* sit varietas *H. pulchella*, an species vera, Dominus Walsh dubitat. In *H. terminata* sex priora segmentorum abdominis immaculata, pedumque posteriores pallide flavescentes sunt. Forsan quoque oculi maris flavescentes fuerint.

turis horum fuscis; posteriores albidi, similiterque signati. Segmentorum abdominis 1-6 albida, punctis singulis lateralibus prope apices magnis fuscis; cætera rubiginoso-picea: venter albicans. Setæ fuscæ, pallidiores apices versus."

♀. "Vertex capitis et tergum thoracis albicantes: ille luteo, hoc vel luteo vel rubiginoso variat. Abdomen flavum, maculis veluti in mari." (Walsh.)

Long. corp. ♂ 5-8, ♀ 5.5-8; set. ♂ 17-21, subim. 10-13; set. ♀ 15-16, subim. 8-13; exp. al. ♂ 15-21, ♀ 17-23 mm.

Hab.—Rock Island, Illinois (Walsh).

Heptagenia interpunctata.

Baetis interpunctata, Say, 1839; *Palingenia* (C) *interpunctata*, Walsh, 1862.

Subimago. "Alæ primo flavescenti tinctæ; denique fuscæ, opacæ."

Imago, v. s. ♂. "Flavescens. Oculi pallide virescenti-sulphurei; macula atra inter oculos, alteraque infra antennis; orbitæ ocellorum fuscæ. Tergum thoracis piceum, triangula basali lineisque singulis lateralibus prothoracis atris. Alæ vitrinæ; anticæ prope costas, præcipue apices versus, lutescenti-brunneo nebulosæ; in medio alæ, inter tertium atque quartum nervorum longitudinalium, striga brevis crassa atra jacet; nervi fusci, costa in majore parte flavescenti excepta: posticæ apud apices brunneæ. Pedum antici pallide virescenti-flavi (sulphurei?), femoribus fusco bicinctis, apicibus juncturisque tibiaram et tarsorum quoque fuscis; posteriores pallidiores. Abdomen pallide opacè viridescens, strigâ dorsali et dimidiis apicalibus segmentorum piceis; subtus apicibus segmentorum obscuris. Setæ pallidæ, virescentes, juncturis fuscis."

♀. "Tergum thoracis luteum, plerumque puncto tantum super prothoracem nigro. Abdomen supra flavum, notis angustioribus, et subtus notis ♂ pallidioribus. Setæ albidæ. Alæ anticæ apud costas flavescentes, nervis transversalibus e postcostâ (sicut nervi alarum posticarum) pellucidis et flavescentibus" (Walsh).

Long. corp. ♂ 7-10, ♀ 5-10; set. ♂ 20-25, subim. 9-15; set. ♀ 14-24, subim. 7-14; exp. al. ♂ 17-25, ♀ 18.5-30 mm.

Hab.—Rock Island, Illinois (Walsh); Indiana (Say).

Heptagenia flavescens.

(Genitalia maris, Pl. VI. fig. 16.)

Palingenia (C) *flavescens*, Walsh, 1862.

Subimago. ♂. "Alæ vel subfuscescentes, colore nervorum indistinctiori quam in imagine; vel subflavescentes, sub-opacæ, nervis flavescentibus, transversalibus in mediis apicesque versus exceptis. Segmentorum abdominis sex priora flava, strigis carentia. Setæ invariæ."

Imago, v. s. s. ♂. Thoracis tergum luteum, vel "rubiginosum vel piceum." Alæ vitrinæ, fulgore lacteo; nervi picei, costis et subcostis majore parte flavescentibus exceptis; punctum nodale indistinctum; areæ marginalis apex virescenti-griseo vel "pallide rubiginoso" nebulosus. Pedum antici sub-gambosi, vel "pallide rubiginosi," femoribus bicinctis, apicibus juncturisque tibiæ et tarsorum fuscis; posteriores testacei, "apicibus femorum" juncturisque tarsorum obscuris. Abdomen supra rufo-fuscum vel "rubiginosum," juncturis obscuris; sex priora segmentorum strigis pallidis duabus sub-distinctis, cætera lutescentia: subtus testaceum, apicem versus lutescens. Setæ albicantes, juncturis fuscis. "Venter in v. s. pallide virescens, apice excepto."

♀. "Pallidior, abdomine supra pallide fusco vel rubiginoso, carens vittis. Plurimi nervorum transversalium areæ marginalis pellucidi." (Walsh.)

Long. corp. ♂ 9-13, ♀ 10-13; set. ♂ ♀ 27-38, subim. ♂ 17, ♀ 13; exp. al. ♂ 24-29, ♀ 27-34 mm.

Hab.—Rock Island, Illinois (Walsh).*

* *Heptagenia vitrea.*

Palingenia vitrea, Walk. 1858.

Subimago, v. s. s. ♀. "Testacea; femora fusco sub-notata; alæ albidæ, sub-opacæ, nervis testaceis" (Walker).

Long. corp. 6, exp. al. 13 mm.

Hab.—St. Martin's Falls, Albany River, Hudson's Bay.

This species can be recognized in no other way, than by comparing specimens with the original type in the British Museum.

*Heptagenia nigrimana.**Ephemera nigrimana*, Duf. 1841.

Imago, v. s. ♂. "Subtestacea, oculis fusco-æneis flavo circumdatis; alis diaphanis, costa subflavescenti, venis obscuris: abdomine testaceo, segmentis utrinque lineola obscura obliqua; pedibus pallidis, anticis nigris; setis nigris." (Duf.)

Long. corp. 5 lin. Gallic.

Hab.—Incog.; probably France.

Heptagenia flavipennis.

(Genitalia ♂, Pl. VI. fig. 17, 17a; ♀ 17b, c.)

Ephemera flavipennis, Duf. 1841. *Baetis cerea*, Pict. 1843-5. *B. longicauda*, Hag. 1863; (*nec* Steph. 1835-6).

Subimago, v. v. s. ♂. Oculi graminei. Alæ acute virescenti-flavæ, marginibus terminalibus viridi-nigricanti anguste limbatis, atque strigis transversalibus duabus interdum abruptis anticarum apices versus ejusdem coloris; puncta nodalia costæ subcostæque, atque nervi transversales in areæ marginalis apice, atri. Pedes furfurosi, femoribus obscure carneo bicinctis, et tarsis apicibusque tibiærum anticarum corvinis. Setæ furfurosæ, juncturis vix obscuris.

♀. Caput maculâ trigonali utrinque apud oculos supra et infra obscurâ.

Imago, v. v. s. ♂. Oculi flavo-prasini, vel viridi-olivacei. Thoracis tergum furfurosum. Alæ vitrinæ, flavo-virenti suffusæ, præcipue costas versus; nervorum longitudinales saturate virentes, transversales punctaque nodalia atri. Pedes veluti in subimagine; tarsi antichi tamen brunneo-fuliginosi, apicibus articularum obscuris. Abdomen supra vel virescenti-griseum, vel flavo-virens, vel sulphureum, apicibus segmentorum anguste corvinis, atque tribus segmentorum apicalium furfurosis; subtus immaculatum. Setæ luteæ, juncturis obscuris.

♀. Pallidior. Alæ anticæ vitrinæ, fulgore pruinoso, areis marginalibus et submarginalibus virescenti-griseo tinctis. Abdomen supra pallidissime virescenti-flavum, apicibus segmentorum anguste corvinis. Ovivalvula processusque ventralis penultimi segmentorum integri.

Long. corp. ♂ 12-13, ♀ 14; al. ♂ 14-15, ♀ 17; set. ♂ 20-33, subim. 24, ♀ 21 mm.

Hab.—The Kennet and Holybrook, near Reading; and the Lake of Geneva (Pict.). June and July. The subimago rises mostly in the evening after sunset.

Heptagenia elegans.

(Genitalia ♂, Pl. VI. fig. 18; ♀ 18a, b.)

(?) *Ephemera sulphurea*, Mül. 1776 = *E. helvola*, Sulz. 1776 = *E. bioculata*, Röm. 1789 (nec Lin.). (?) *E. ferruginea*, Gmel. 1790-3. *E. bioculata*, var. (?), Pz. 1804 (nec Lin.). *Baetis elegans, costalis & straminea*, Curt. 1834. *E. lutea*, Ste. 1835-6 (nec Lin.). (?) *B. marginalis*, Burm. 1839. *B. cyanops & (?) sulphurea*, Pict. 1843-5. *B. lutea*, Hag. 1863.

Subimago, v. v. s. Oculi saturate olivacei, vel graminei; caput maculâ parvâ utrinque infra oculos atrâ, atque aliâ rhombicâ supra juxta oculos luteâ. Lineola pone coxas anticas, et punctum ante poneque coxas intermedias utrinque, atra. Alæ primo unicolores, sulphureæ; tum striga transversalis vix distincta nascitur apud angulum interno-terminalem alæ anticæ, alteraque inter hanc et alæ apicem, atque limbus griseus mediocris super marginem terminalem; denique nervi transversales atri fiunt. Pedes pallidissime ochracei, tarsis pallide nigricantibus. Setæ nigricantes.

Imago, v. v. s. ♂. Oculi supra saturate virescenti-cæsi, et subtus subgraminei, maculis singulis rotundis mobilibus lineolis curvatis concentricis circumjectis; vel atri. Caput maculatum veluti in subimagine. Thoracis tergum furfurosum. Alæ vitrinæ, fulgore pruinoso, nervis plerumque corvinis vel atris; anticæ areis marginalibus et submarginalibus flavicantibus, apicibus virescenti-griseo tinctis. Pedes parum gambosi, vel flavovirescentes; antici furfuroso tincti, tarsis fumatis, et juncturis tarsorum apicibusque femorum atris; posteriores apicibus tibiarum et tarsis fumatis, juncturis atris. Segmentorum abdominis sex priora supra pallide fusciscentia, vel virescenti-olivacea, juncturis atro-piceis, sæpe

vasi dorsali, lineisque curvatis ex basi cujusque duabus, indistincte pallidioribus, atque lateribus ventreque pallidissime olivaceis; cætera supra furfurosa, subtus ochracea. Setæ albo-fumatæ, juncturis fuscis.

♀. Oculi prasini, vel glauci, vel etiam atris. Alæ vitrinæ, parum sulphureo vel gamboso tinctæ apud areas marginales et submarginales, nisi in toto vix sulphuræ; nervis atris, crassioribus longitudinalium gambosis exceptis. Pedes gambosi, tarsi famatis, juncturis atris. Dorsum abdominis flavo-virens vel flavo-ochraceum, juncturis obscuris, et tribus segmentorum apicalium flavis vel ochraceis; venter immaculatus. Setæ albæ, vel fumato-albæ, juncturis obscuris. Ovivalvula obtusa; processus ventralis penultimi segmentorum paulo retusus.

Long. corp. ♂ 9-10, ♀ 9-11; al. ♂ 10-12, ♀ 11-13; set. ♂ 19-23, ♀ 14-19, subim. ♂ & ♀ 13-15 mm.

Hab.—Switzerland, Germany, Belgium, Great Britain, and Norway (Hammerfest). May to September; in streams and rivers.

Heptagenia fluminum.

Ephemera bioculata, Pz. 1804 (nec Lin.). *Baetis fluminum*, Pict. 1843-5.

Subimago (e figurâ Pict.). ♂. “Alæ cervinæ; anterior striga transversali abbreviata ex angulo interno-terminali, alteraque paulo postea e costa, deinde lineis transversalibus e costa tribus apicem versus, atque nebula transversali inter strigas et basin, atrescentibus.”

♀. “Alæ virescenti-grisæ, invariæ.”

Imago, ♂. “Oculi cyanei (Pict.) vel graminei (Lab. & Imh.). Thoracis tergum lutescens vel saturate furfurosum. Alæ vitrinæ, nervis tenuibus atris, et areis marginalibus anticarum flavescenti tinctis. Pedes lutescentes, tarsi fuscescentibus. Abdomen lutescens, apicibus segmentorum et maculis trigonalibus latero-apicalibus fuscis. Setæ lutescentes vel furfurosæ, juncturis pallide fuscis.”

♀. “Simillima mari; abdominis segmenta singula lineolis dorsalibus abbreviatis atris in mediis longitudinalibus.”

Long. corp. ♂ 12-13, ♀ 12; set. ♂ 30, subim. 13, ♀ 20, subim. 13; exp. al. ♂ 25-27, ♀ 30 mm.

Hab.—Germany (Panzer); the Rhone about Geneva, to the further extremity of the Lake. (Pict.)

Heptagenia sylvicola.

Baetis sylvicola, Ed. Pict. 1865.

Imago, v. s. s. ♂. "Tergum thoracis luteum, metathorace flavescens. Alæ vitrinæ, nervis lutescentibus; apex areæ marginalis flavescens. Pedes lutei; antici nigricantes. Abdomen luteum, juncturis nigricantibus, ultimoque segmentorum flavo. Setæ fulvæ, juncturis nigricantibus. Forceps nigricans." (Ed. Pict.) Venter serie macularum trigonalium, quarum apices ante diriguntur.

♀. "Simillima mari. Processus ventralis penultimi segmentorum abdominis integer." (Ed. Pict. & e fig.)

Long. corp. ♂ 12, ♀ 13; exp. al. ♂ 31, ♀ 33 mm.

Hab.—San Ildefonso, in July (Ed. Pict.).

Heptagenia volitans.

(Genitalia maris, Pl. VI. fig. 20.)

H. volitans, Etn. 1870.

Imago, v. v. s. ♂. Oculi supra fusco-picei, subtus testacei. Thoracis tergum atro-fuscum. Alæ vitrinæ, nervis atris, tribus prioribus longitudinalium nigricantibus exceptis; apex areæ marginalis vix virescenti-griseo tinctus. Pedum antici tibiis tarsisque fuscis, et femoribus obscure bicinctis; posteriores fumato-luridi, femoribus saturate carneo bicinctis, tarsis fuscis, et interdum tibiis testaceis. Abdomen supra fuscum, apicibus segmentorum fuliginoso-fuscis, maculisque trigonalibus lateralibus saturate virescenti-griseis: subtus saturate virescenti-griseum, immaculatum, vel perraro locis plexorum nervorum strigisque sequentibus duabus vix obscure indicatis; interdum quoque infra penultimum segmentorum notæ L-formatæ duæ fuscae sunt. Setæ pallide virescenti-griseæ, juncturis atris vel atro-fuscis.

Long. corp. ♂ 12-15; al. 13-14; set. 25-28 mm.

Hab.—The Thames above Pangbourne, and the Holybrook near Reading; in May. The name has reference to a habit of the *Heptagenie* of hovering steadily when there is a gentle breeze.

Heptagenia alpicola, nov. sp.

(Genitalia maris, Pl. VI. fig. 19.)

Imago, v. v. s. ♂. Oculi fuliginosi. Thoracis tergum fusco-luteum. Alæ vitrinæ, nervis piceis, interdum areæ marginalis apice nigricante. Pedes rufo-picei: antici tarsi corvinis, vel tibiis et tarsi atris; posteriores tarsi paulo obscuratis, vel saturate piceis. Abdomen supra luteum vel saturate griseum, marginibus latis segmentorum apicalibus, strigaeque in medio longitudinali, subfuscis vel fuscis. Venter pallidus, striga longitudinali angulatim in medio segmenti singuli dilatata subfusca; segmentorum penultimum luteum. Setæ fuliginosæ. Forceps fumatus, proximis articularum fuliginosis.

Long. corp. ♂ 13-14; al. 15-16; set. 41-44 mm.

Hab.—Near Contamines, Val Montjoie; Carinthia.

Heptagenia iridana.

(?) *Baetis aurantiaca*, Burm. 1839.* *B. iridana*, Kolen. 1860.

Imago. "Corpore rufo-brunneo, segmentis abdominis dorsalibus postice late brunneo marginatis; alis iridinis, tribus nervorum anteriorum flavis, reliquis brunneis, pterostigmate [i. e., apice areæ marginalis] infumato vel flavescenti. Venter luteo-brunneus, setis obscurior." (Kolen.)

Long. corp. 3.5; al. 5; set. 12."

Hab.—Altwater, in August and September, at an altitude of 4000 feet. The type is in the Royal Polytechnic, Brunn.

Heptagenia annulifera.*Palingenia annulifera*, Walk. 1860.

Imago, v. s. s. ♀. Thorax furfurosus, lateribus proet meta-thoracis dorsi pallidioribus. Alæ vitrinæ, nervis

* Burmeister's diagnosis of *B. aurantiaca* is as follows:—

Imago. "Rufo-testacea, segmentis abdominalibus utrinque linea obliqua nigra; alis gracilibus hyalinis."

Long. corp. 3.5 lin.

Hab.—Halle.

piceis, et horum transversalibus fusco marginatis. "Pedes albidi, [femoribus] nigro-fasciatis." Abdomen testaceum, strigis singulis trigonalibus obliquis utrinque segmentorum, punctisque dorsalibus atris. Setæ cervinæ, juncturis atris. Processus ventralis penultimi segmentorum integer.

Long. corp. ♀ 6; al. 8; set. supra 10 mm.

Hab.—Hindostan.

Heptagenia luridipennis.

(Genitalia maris, Pl. VI. fig. 21, 21a.)

(?) *Ephemera noveboracana*, Licht. 1796. *Baetis luridipennis*, Burm. 1839. (?) *B. noveboracana*, Hag. 1861.

Subimago, v. s. s. Alæ pallide fusco tinctæ, nervis obscuris.

Imago, v. s. s. ♂. Thoracis tergum brunneo-luteum; abdomen paulo obscurius. Alæ vitrinæ, crassioribus nervorum longitudinalium brunneis vel testaceis, et transversalibus piceis; apices areæ marginalis et areæ submarginalis paulo infuscati. Pedum antici sub-testacei vel gambosi, femoribus obscure bicinctis, apicibus tibiarum fuscis, et tarsis pallidis; posteriores pallidiores. Abdomen supra brunneo-luteum, vel fuscum, apicibus segmentorum strigisque lateralibus obliquis obscuris. Setæ pallidissime cervinæ, juncturis obscuris.

♀. Simillima mari. Venter immaculatus. Processus ventralis penultimi segmentorum emarginatus esse videtur.

Long. corp. ♂ 11, ♀ 10; al. ♂ 13, ♀ 15; set. ♂ circa 25, ♀ subim. circa 15 mm.

Hab.—St. Martin's Falls, Albany River, Hudson's Bay (Barnston); the St. Lawrence, Canada (De Selys).

Heptagenia flaveola.

(Genitalia maris, Pl. VI. fig. 22, 22a.)

Baetis flaveola, Pict. 1843-5.

Subimago, v. s. s. Alæ cervino-albæ; nervorum longitudinales testacei, transversales in mari nigricantes, in femina atris.

Imago, v. s. s. ♂. Thoracis tergum rufo-luteum. Alæ vitrinæ; anticæ nervis atris, tribus prioribus longitudinalium testaceis exceptis; posticæ nervis pellucidis. Pedes lividi vel straminei, femoribus fusco bicinctis, juncturisque obscuris; tarsi antici albicantes, juncturis obscuris. Abdomen tribus segmentorum apicalium rufo-luteis, et cæteris ochroleucis juncturis fuscis; venter immaculatus. Setæ albo-cervinæ, juncturis vix obscuris.

♀. Corpus ochraceum, juncturis abdominalibus anguste nigricantibus. Processus ventralis penultimi segmentorum vix emarginatus. Alæ fulgore fere talcoso.

Long. corp. ♂ 9, ♀ 8-10; al. ♂ 10, ♀ 11-13; set. ♂ 20, ♀ subim. 16 mm.

Hab.—St. Martin's Falls (Barnston); Tennessee (Pœp-pig); West Farms, New York (Angus, MS.).

Heptagenia vicaria.

(Genitalia maris, Pl. VI. fig. 23, 23a.)

Baetis vicaria, Walk. 1853 (imago). (?) *B. tessellata*, Walk. 1853 (subimago, ♀).*

Subimago ? (*tessellata*, Walk.), v. s. s. Alæ pallidissime fusco suffusæ, nervis testaceo-brunneis, et horum transversalibus fuliginoso marginatis.

Imago, v. s. s. ♂. Thoracis tergum brunneo-luteum. Alæ vitrinæ, nervis fuscescentibus; apex areæ marginalis anticæ pallidissime fuscescente vel virescenti-griseo tinctus. Abdomen supra pallide fuscum: dorsum venterque utrinque serie signorum 6-formatorum fulvorum,

* From one or two particulars in the description, I am inclined to think that *Baetis tessellata*, Hag., may be a *Leptophlebia*. It may be *L. colombica*, Walk., on the point of casting the submarginal pellicle.

Baetis tessellata, Hag. 1861; (nec. Walk. 1853).

Subimago. ♀. "Alæ griseæ, nervis luridis, et maculis quadratis pellucidis numerosis; posticæ minimæ. Thorax luteus; mesothorax linea fusca utrinque. Pedes lutei, apicibus tarsorum fuscis. Abdominis segmenta lutea, maculis trigonalibus latero-dorsalibus utrinque fuscis duabus." (Hag.)

Long. corp. ♀ 16, exp. al. 26 mm.

Hab.—Puget Sound, Washington Territory (Hag.).

As the type is in alcohol (in the Berlin Museum) its affinities can be easily determined.

et apud basin segmenti singuli supra lineolæ pallidæ longitudinales duæ sunt. Setæ fuscæ, juncturis obscuris. Pedes saturate rubiginosi, femoribus bicinctis.

♀. Processus ventralis penultimi segmentorum integer.

Long. corp. ♂ 12; al. ♂ 13, ♀ 14.5; set. ♂ 35 mm.

Hab.—The St. Lawrence; Chicago; Washington (Hagen); Savannah (Osten Sacken).

Heptagenia venosa.

(Genitalia maris, Pl. VI. fig. 24.)

(?) *Ephemera maculata*, Pod. 1761. *E. venosa*, Fab. 1775. (?) *E. berolinensis*, Müll. 1776. *E. fusco-grisea*, Retz. 1783. *E. nervosa*,* Vill. 1789. *Baetis dispar*, Curt. 1834. *B. venosa*, Ste. 1835-6. *E. rufa*, Ramb. 1842. (?) *B. purpurascens* & *forcipula*, Pict. 1843-5. *B. longicauda*, Ron. 1856 (*nec* Ste.). *Ecdyurus venosus*, Etn. 1868.

Subimago, v. v. s. Alæ pallidissime cervinæ, nervis transversalibus fuscis nigricanti marginatis, fasciis transversalibus pallidis indistinctis duabus trajectis; area submarginalis areæque marginalis apex flavescenti tincti, fasciis obscuris interrupti. Pedes cinereo-olivacei, tarsis cinereis. Setæ fuscæ.

Imago, v. v. s. ♂. Oculi supra atro-picei, vel picei; subtus apud orbitas ochracei, linea grisea interposita. Thoracis tergum fuscum. Alæ vitrinæ, nervis corvinis; apex areæ marginalis nigricanti tinctus. Pedum antici fusco-corvini, tarsis corvinis; posteriores saturate virescentigrisei, genubus tarsisque corvinis. Abdomen supra fuscum, vel fuliginoso-hepaticoloratum, latera versus pallide testaceum, strigis lateralibus fuscis obliquis; subtus saturate brunneo-hepaticoloratum. Setæ fuscæ.

♀. Mari simillima. Processus ventralis penultimi segmentorum integer.

Long. corp. ♂ 12-14, ♀ 12-18; al. ♂ 13, ♀ 15-17; set. ♂ 30-48, ♀ 15, subim. 17 mm.

Hab.—Scandinavia (Zet.); England; Belgium (De Selys); France; Switzerland; Dalmatia (Pict.); Corsica (Hag.). In streams. June.

* M. Pictet (1843-5) unfortunately cited this synonyme as one originated by Fabricius.

Var. (?) *forcipula*.*(Baetis forcipula, Pict. 1843-5.)**Hab.*—Germany, Austria, Bohemia, Bavaria, and Piedmont (Pict.). Undescribed.

Specimens probably exist in the Vienna Museum.

*Heptagenia longicauda.**(Genitalia maris, Pl. VI. fig. 25.)**Baetis longicauda & subfusca, Ste. 1835-6.*

Subimago, v. v. s. ♀. Alæ pallide fumato-nigricantes, nervis sub-furfurosis, transversalibus anguste cinereo marginatis. Pedum antici picei, tibiis nigricanti tinctis, et tarsis anthracinis; posteriores femoribus olivaceis, tibiis nigricantibus, et tarsis corvinis.

Imago, v. v. s. ♂. Oculi atro-fuliginosi. Thoracis tergum aterrimum, vel atro-fuscum, politum. Alæ vel vitrinæ, vel vix virescenti-griseo tinctæ, nervis atropiceis: apex areæ marginalis anticæ vix virescenti-griseus. Pedum antici atro-picei, femoribus apud bases pallidioribus; posteriores femoribus fuscis, vel fuscoluteis, tibiis testaceis, et tarsis vel corvinis vel saturate hepaticoloratis. Abdomen supra umbrinum vel rubidofuscum, juncturis pallidis, et apicibus segmentorum fuscis; latera dorsi bases segmentorum versus flavescencia, strigis singulis saturate fuscis obliquis ex horum apicibus; venter fuliginoso-hepaticoloratus. Setæ et forceps atropiceæ.

♀. Simillima mari sed pallidior. Alæ vitrinæ, nervis fusco-piceis: areæ marginalis et submarginalis anticæ tantum apices versus vix virescenti-griseo tinctæ. Processus ventralis penultimi segmentorum integer.

Long. corp. ♂ 11-12, ♀ 9; al. ♂ 11, ♀ 11-15; set. ♂ 27, ♀ 15, subim. 12 mm.

Hab.—Great Britain. July to September. In cold streams and rivers.

Heptagenia angustipennis.

Ephemera angustipennis, Ramb. 1842; Baetis angustipennis, Ed. Pict. 1865.

Subimago, v. s. s. ♀. Alæ cervinæ; nervorum longitudinales testacei, transversales nigricantes, anguste mar-

ginati. Pedes lutescentes, femoribus obscure annulatis, anticis tibiæ luteis, posterioribus testaceis, et tarsis fuscis. Setæ fuliginosæ.

Imago, (?) (*Ephmera madritensis*, Ramb. MS.) v. s. s. ♀. Thoracis tergum luteum. Alæ vitrinæ; nervorum longitudinales testacei, transversales picei. Pedes postici femoribus luteis, singulis cingulis nigris, tibiis testaceis, et tarsis luteis. Processus ventralis penultimi segmentorum vix retusus.

Long. al. im. 14, subim. 11 mm.

Hab.—Madrid (Ramb.).

Heptagenia Picteti.

Baetis Picteti, Meyer-Dür, 1864.

Subimago, s. s. “Alæ albicantes, nervis longitudinalibus atro-fuliginosis, et cæteris atris; antica parte tertia basali, fasciisque transversalibus quatuor (quarum prima atque tertia abbreviatæ sunt), et vestigio quoque quintæ apud apicem, griseis. Tergum thoracis fuscum, politum. Pedes fusciscentes, cruribus pallidioribus. Abdomen fuscum, juncturis pallidis. Setæ albicantes, annulis pallidis.”

Long. corp. 5·5, al. 7, set. 5-6 lin.

Hab.—Tessin and Ober Engadine (Meyer-Dür).

Heptagenia insignis.

(Genitalia maris, Pl. VI. fig. 26, 26a; notæ ventrales abdominis, fig. 26b.)

Baetis montana, Hag. 1863; (*nec Pict.*). *H. insignis*, Etn. 1870.

Subimago, v. v. s. Alæ pallide cervinæ, apud bases et costas vix sulphureo tinctæ, nervis ipsis sulphureis vel olivaceis; antica apud marginem terminalem cinerea, marginibus nervorum transversalium atris.

Imago, v. v. s. ♂ & ♀. Oculi sub-olivacei, strigis singulis fuscis intersectis. Thoracis tergum fuscum vel sub-olivaceum [piceum in s. s.]. Alæ vitrinæ, nervis piceis, costis et subcostis plus aut minus fuscis: areæ anterioris marginalis et submarginalis vix virescentigriseo bases versus tinctæ, apicibus nigricantibus. Pedum antici atro-picei vel corvini, juncturis apicalibus tarsorum

pallidioribus; posteriores sub-olivacei, vel virescenti-olivacei, tarsi atrescentibus. Abdomen sub-olivaceum, vel pallide virescenti-griseum, apice lutescenti; segmentorum apices, strigæque laterales ex his oblique productæ, atræ; sæpe quoque series centralis est feminæ strigarum brevium nigricantium: venter maculatus similiter ac in Tab. VI., fig. 26b, effingitur. Setæ atræ, piceæ apices versus. Forceps corvinus. Processus ventralis penultimi segmentorum integer.

Long. corp. ♂ 11-12, ♀ 12-14; exp. al. ♂ 13-17, ♀ 13-15; set. ♂ 22-23, subim. 14-20, ♀ 20, subim. 15 mm.

Hab.—England. . May, June, and July or August. In rivers.

Heptagenia montana.

Baetis montana, Pict. 1843-5.

Imago, v. s. ♂. "Caput nigrum, oculis cyaneis. Prothorax supra rufescens, maculâ in medio nigrâ: meso- et meta-thoraces supra atræ. Alæ vitrinæ, nervis tenuibus nigris; apex areæ marginalis anticæ fuscescens. Pedum antici nigri: posteriores fulvi. Abdomen supra griseofuscum (in figurâ ochraceo-olivaceum, juncturis et strigis lateralibus obliquis obscuris), setis fuscis" (Pict.).

Long. corp. ♂ 13, set. 30, exp. al. 28 mm.

Hab.—Near a small stream from Brevent, above Chamounix (Pict.); and on the Austrian mountains (Brauer).

Heptagenia Bellieri.

Baetis Bellieri, Hag. 1860.

Imago, v. s. s. ♀. Alæ vitrinæ, lacteo tinctæ, nervis piceis; apex areæ marginalis paulo infuscatus. Pedum antici picei; posteriores testacei, tarsi fuscis. Setæ piceæ. Processus ventralis penultimi segmentorum integer.

Long. al. 14 mm.

Hab.—Sicily (Hag.). According to Dr. Hagen, this species somewhat resembles the preceding one in colour.

Heptagenia zabrata.

(Genitalia maris, Pl. VI. fig. 28.)

Baetis zabrata (♂ subim., ♀ im.), *fallax* (♂ subim.), *fluminum* [nec Pict.] (♂ im.), Hag. 1864.

Subimago, v. s. s. ♂. Alæ cervinæ; nervorum longitudinales testacei, transversales per-anguste nigro marginati.

Imago, v. s. s. ♂. Thoracis tergum fuscum. Alæ vitrinæ, nervis piceis. Pedum antici femoribus fusciscentibus, cingulis et apicibus atro-piceis, tibiis atro-piceis, et tarsis fuliginosis; posteriores femoribus fusco-testaceis, cingulis in mediis et apicibus sub-piceis, cruribusque fuliginosis. Abdomen supra pallide olivaceo-fuscum, latera versus flavescens, apicibus segmentorum anguste piceis. Setæ fuliginosæ.

♀. Thoracis tergum fufurosum. Alæ vitrinæ, crassioribus nervorum longitudinalium testaceis, et transversalibus atris. Pedes lutescenti-electrini, cingulis et apicibus femorum nigris. Abdomen supra fuscum, apicibus segmentorum obscuris; strigæ laterales obliquæ e basibus segmentorum utrinque atræ; subtus segmentum singulum maculis trigonalibus basalibus duabus atris. Setæ albicantes, juncturis nigris. Processus ventralis penultimi segmentorum integer.

Long. al. ♂ 9-10, ♀ 12; set. ♂ 20, subim. 12, ♀ 15 mm.

Hab.—Corsica (Hag.).

Heptagenia lateralis.

(Genitalia maris, Pl. VI. fig. 27.)

(?) *Ephemera stigma*, Gmel. 1790-3. *Baetis lateralis*, Curt. 1834. *Cloe brunnea*, Ramb. 1842. *B. obscura*, Hag. 1863; (?) Pict. 1843-5; (nec Ste.).

Subimago, v. s. s. Alæ saturate cervinæ, invariæ; interdum tamen tribus prioribus nervorum longitudinalium ochraceis.

Imago, v. v. s. ♂. Oculi atro-fuliginosi. Pedum antici atro-fusci, cruribus atro-piceis; posteriores sub-

fusci, tarsi piceis. Nervi alarum fusci. Venter virescenti-fuliginosus; forceps ater; setæ saturate fuliginosæ. Reliqua veluti in femina.

♀. Oculi atro-fuliginosi. Thoracis tergum aterrimum, politum. Alæ vitrinæ, nervis piceis. Pedum antici atropicei, tarsi atris; posteriores saturate picei, femoribus vix annulatis, et tarsi atris. Abdomen supra hepaticofuscum, apicibus segmentorum vix obscuris, nisi maculis trigonalibus apud latera obscuris: venter fuscus, juncturis virescenti-griseis, et interdum plexu nervorum ventralium penultimi segmentorum vix hepaticolorato. Setæ corvinæ. Processus ventralis penultimi segmentorum integer.

Long. corp. ♂ 5-9, ♀ 7; exp. al. ♂ ♀ 6-9; set. ♂ 19, subim. 10, ♀ 8 mm.

Hab.—England and Wales; Carinthia; Switzerland (Pict.); the South of Spain (Ramb.). July and August. In mountain torrents, and cold streams.

M. Pictet's description of *B. obscura* was probably drawn up from a dried specimen.

Heptagenia guttata.

Baetis guttata, Pict. 1843-5; *Ephemera (Baetis) guttata*, Blanch. 1851.

Imago, s. s. ♀. Caput et thorax fusci, flavo variegati ("punctati," Pict.). Alæ vitreæ, nervis atris; area marginalis pallidissime fuscescens. Pedes flavescentes; femora apicibus maculisque singulis in mediis, tibiæque apicibus, nigris. Abdomen flavum (in figurâ fuscum), apicibus segmentorum strigisque lateralibus ex his oblique productis, atque seriebus strigarum longitudinalium supra subtusque duabus, atris. Setæ flavescentes, juncturis in vices late et anguste nigro annulatis." (Pict. & Blanch.)

Long. corp. ♀ 12, set. 18, exp. al. 29 mm.

Hab.—Valdivia, Chili (Blanch.).

The following is probably an indeterminable species of *Heptagenia*.

Ephemera gemmata, Scop. 1763.

Imago, s. s. ♀. "E. gemmata. Tubercula tria frontalia, diaphana, crystallina, nigra, punctulata [ocelli]. Corpus rufum. Incisuræ abdominis marginibus flavicantibus. Setæ caudales unciales."

Long. 7.5."

Hab.—Circa aquæductum Fodinarum Idrensium (Scop.).

Heptagenia torrida.*Baetis torrida*, Walk. 1853.

Imago, v. s. s. ♀. Thoracis tergum castaneo-piceum. Alæ vix fusco suffusæ: antica areis marginali submarginalique saturatoribus. Pedum antici rufo-picei; posteriores saturate furfurosi, apicibus femorum rufo-piceis. Abdomen (decoloratum) apicibus segmentorum obscuris; setis carens. Processus ventralis penultimi segmentorum integer.

Long. corp. ♀ 8, exp. al. circa 20 mm.

Hab.—The Philippine Islands.

Heptagenia determinata.*Baetis determinata*, Walk. 1853.

Imago, v. s. s. ♂. (reliquiæ typi). Picea. Thorax strigâ dorsali longitudinali fulvâ. Alæ vitrinæ: antica costâ apud basin saturate ochraceâ, nervis fuscis, atque areis marginali submarginalique quasi incrassatis et fuscis. Pedes furfurosi, tarsi et apicibus femorum fuscis. "Abdomen strigâ latâ flavescenti, notis paucis piceis inclausis." (Walk.)

Long. corp. ♂ 11, al. 24 mm.

Hab.—Java.

In this genus the cross-veinlets in the apex of the marginal area of the anterior wing vary in character in the same species, so much so, that they may be simple and free, or divided and conjoined, in either sex of a species, indifferently. Sometimes, however, they are of slight service. *H. elegans* and some other yellowish species have two evanescent dark triangular dorsal dashes between the wings of the subimago, which I have purposely omitted to mention in the descriptions.



Rev. A. E. Eaton's *Monograph*

EXPLICATIO TABULARUM.

Signum asterisci * iis figuris appositum est quas ex aliis operibus recepimus; omnes reliquæ icones sunt originales, a nobis secundum naturam operose camera lucida delineatæ, et magnitudine auctæ.

Tab. I. Venæ alarum anticarum.

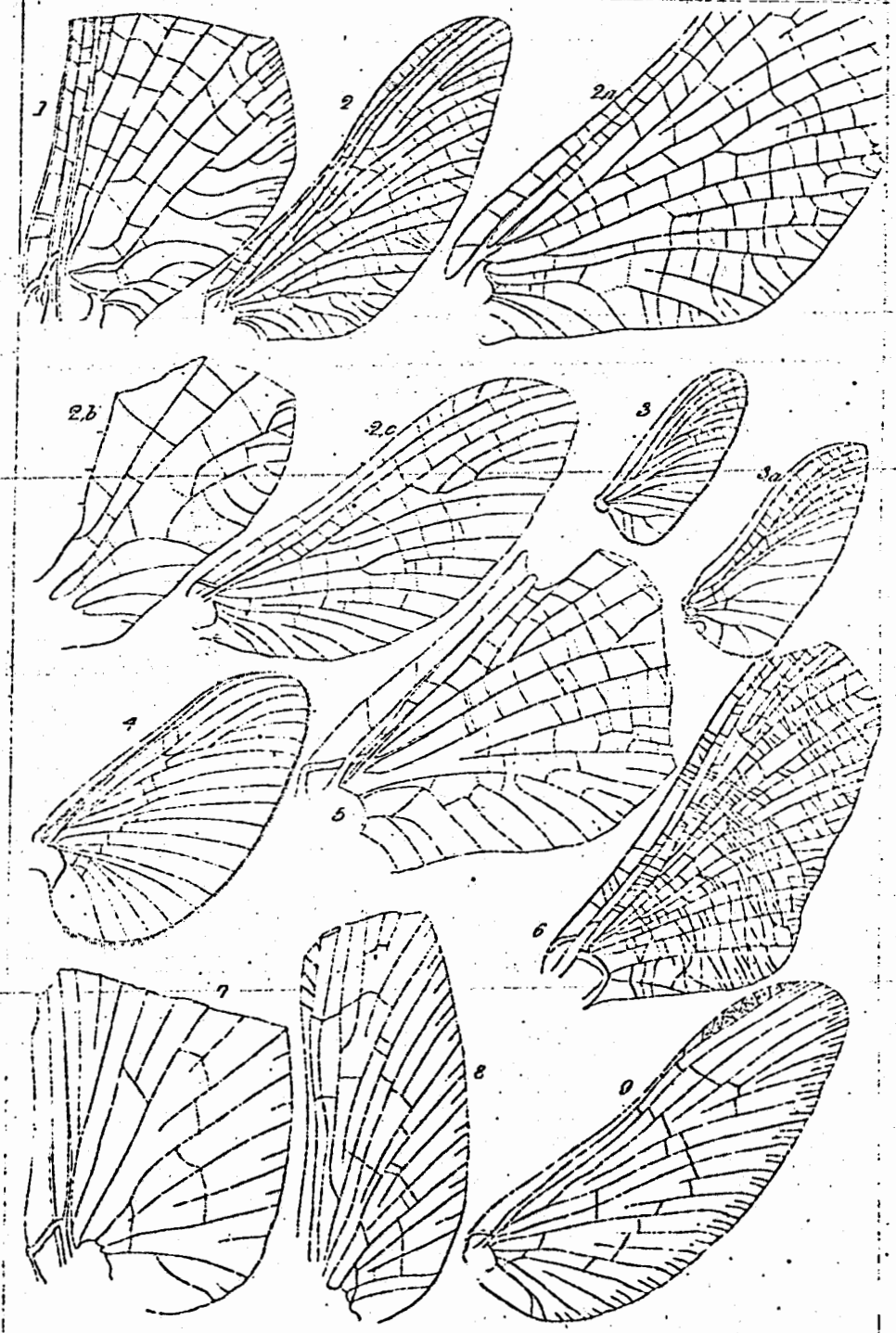
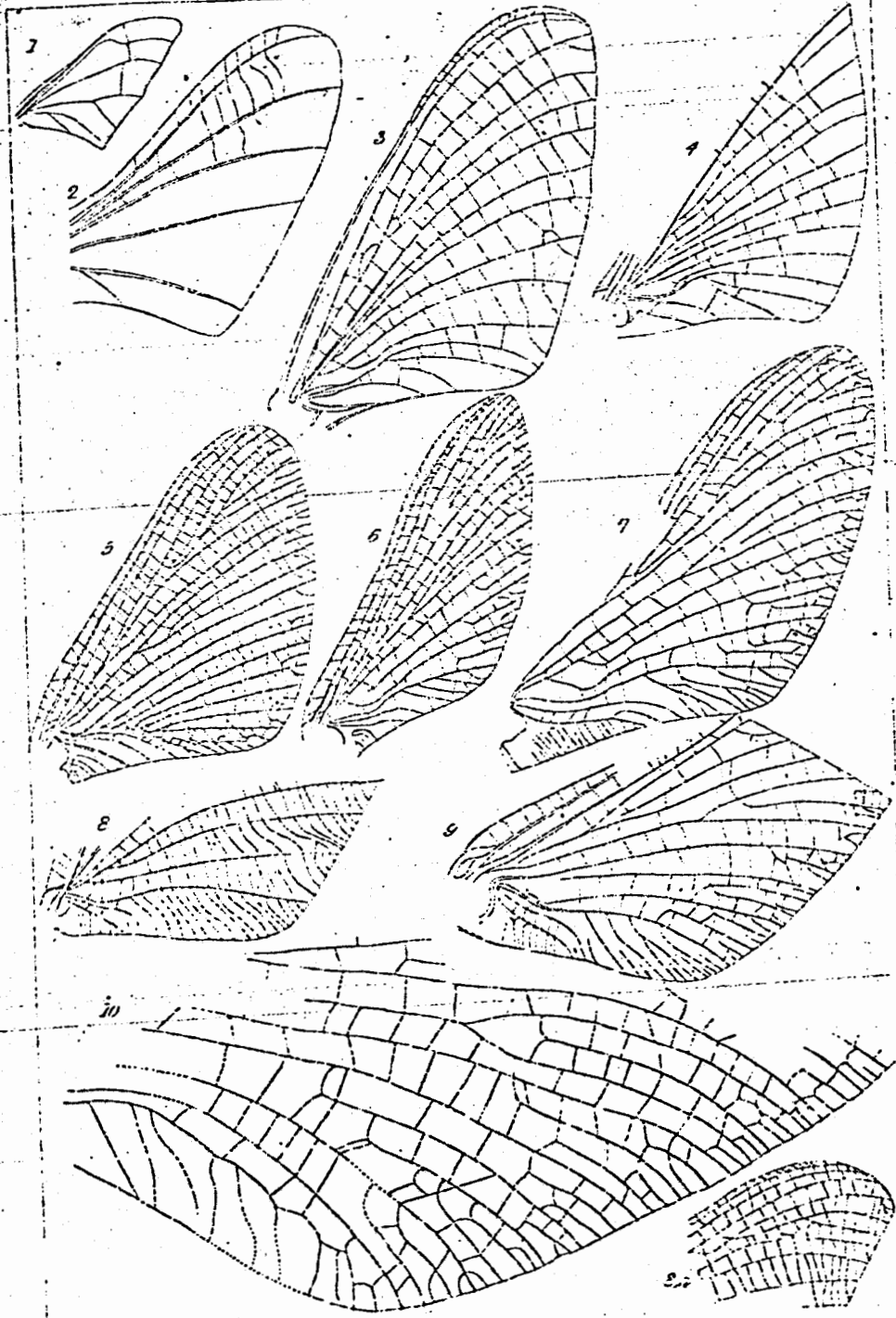
- Fig. *1. *Lachlania abnormis*.
2. *Oligoneuria rhenana*.
3. *Asthenopi* (sp. nondescript.); in Mus. M'Lach.; de Texas.
4. *Campsuri latipennis* (in parte).
5. *Polymitarcyos virginis*.
6. *Pentagenia vittigeræ*. *
7. *Hexagenia limbata* (in parte).
8. *Euthyplocia Hecubæ* (in parte); 8a, apex alæ.
9. *Ephemeræ vulgata* (in parte).
10. Fragmentum fossile Oolithicum, speciei generis incerti *Ephemeræ* affinis, de Solenhofen. Ex exemplari in Museo Britannico; magnitud. auct. (7×7).

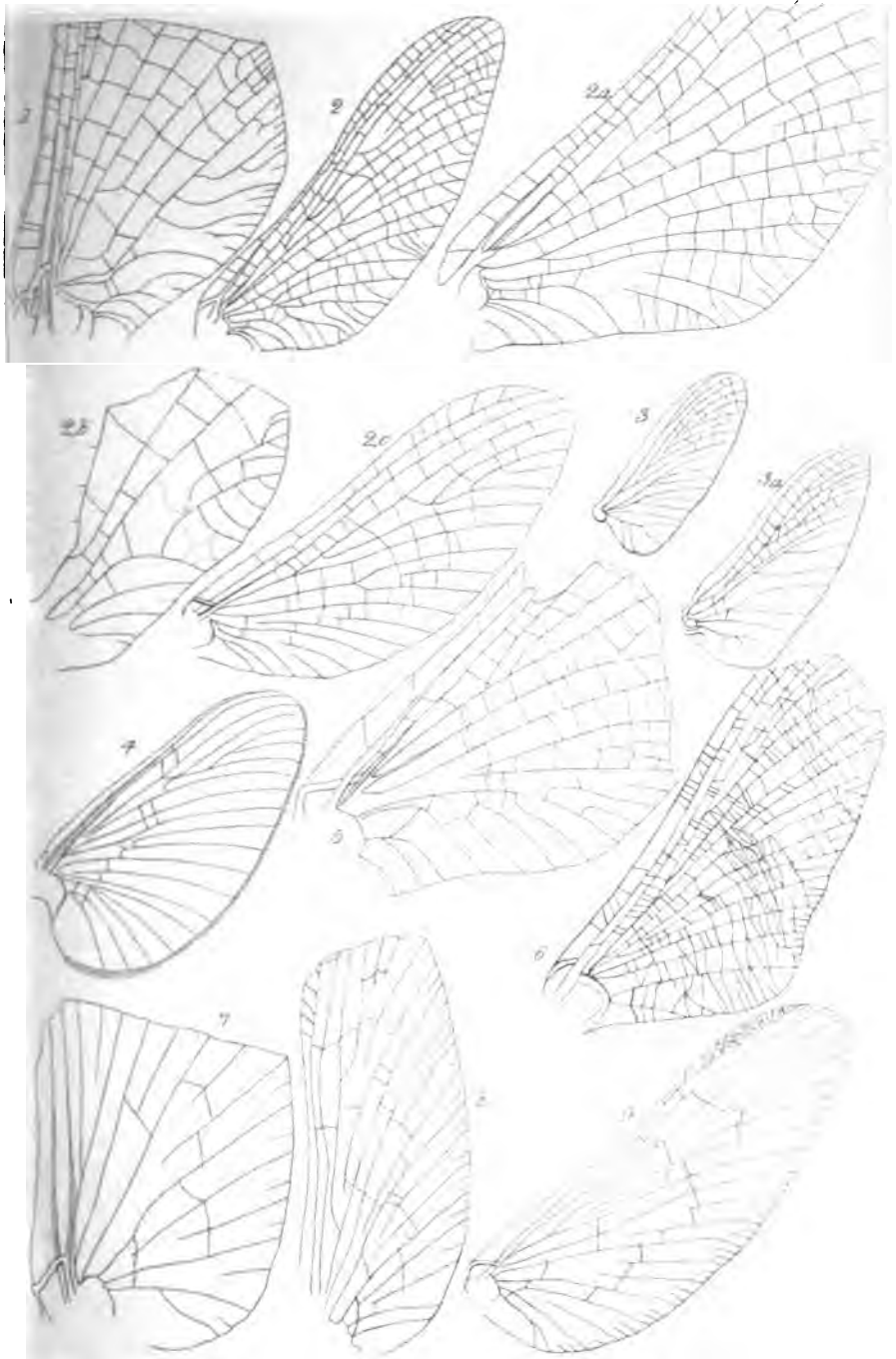
Tab. II. Venæ alarum anticarum.

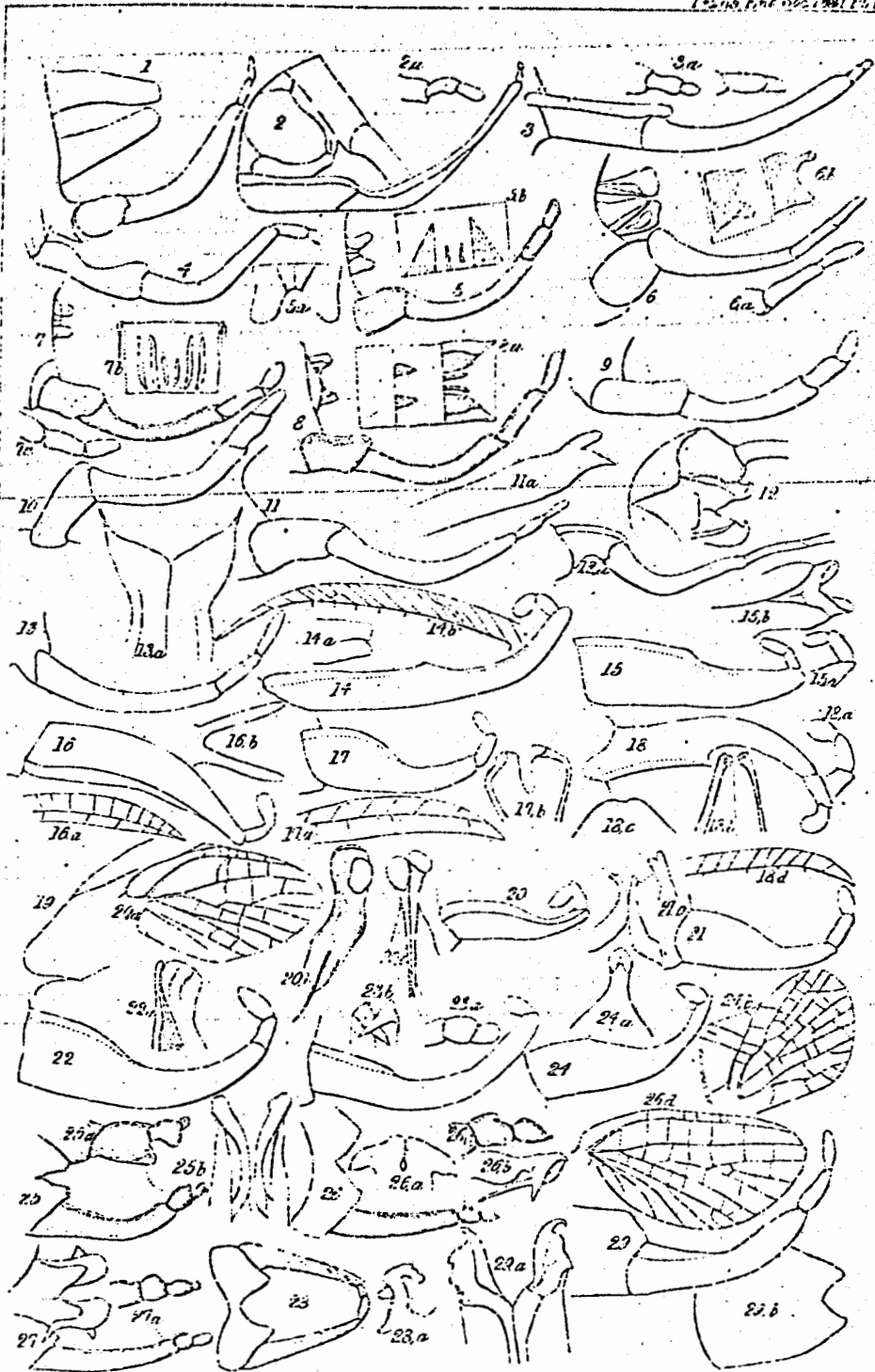
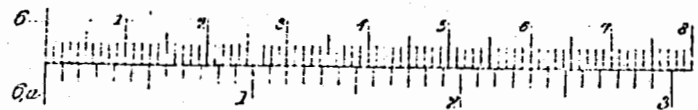
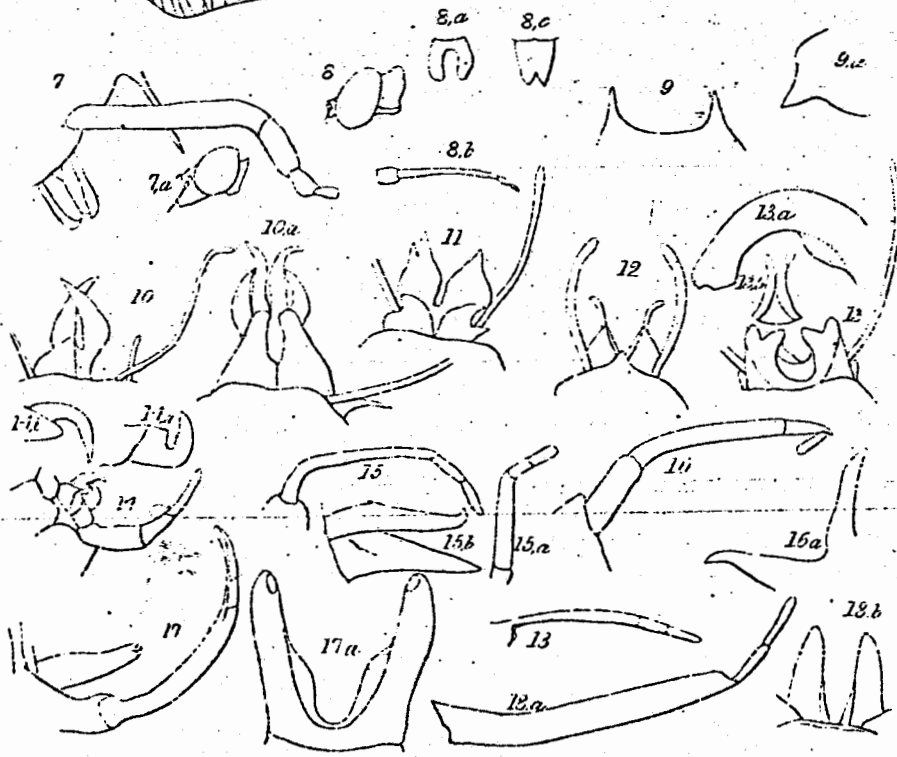
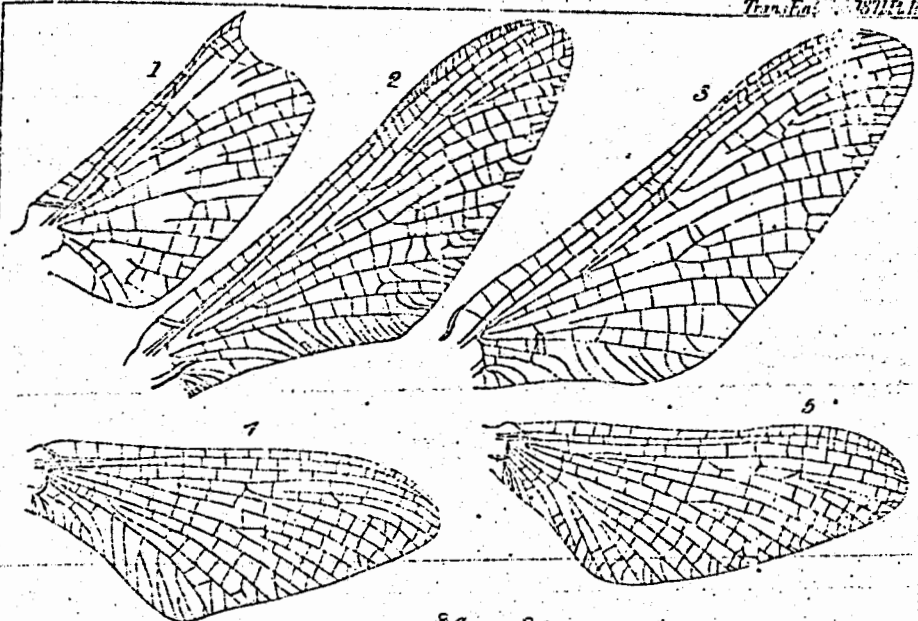
- Fig. 1. *Potamanthi lutei* (in parte).
2. *Leptophlebia australasica*.
2a. *Leptophlebia marginata* (in parte).
2b. *Leptophlebia cupida* (in parte).
2c. *Leptophlebia fusca*.
*3. *Tricorythi varicauda*, ♀. *3a ♂.
4. *Camis dimidiata*.
5. *Ephemerella ignita* (in parte).
6. *Botisca obesæ* (in parte).
7. *Closonis similis* (in parte).
8. *Centroptili luteoli* (in parte).
9. *Baetis binoculati*.

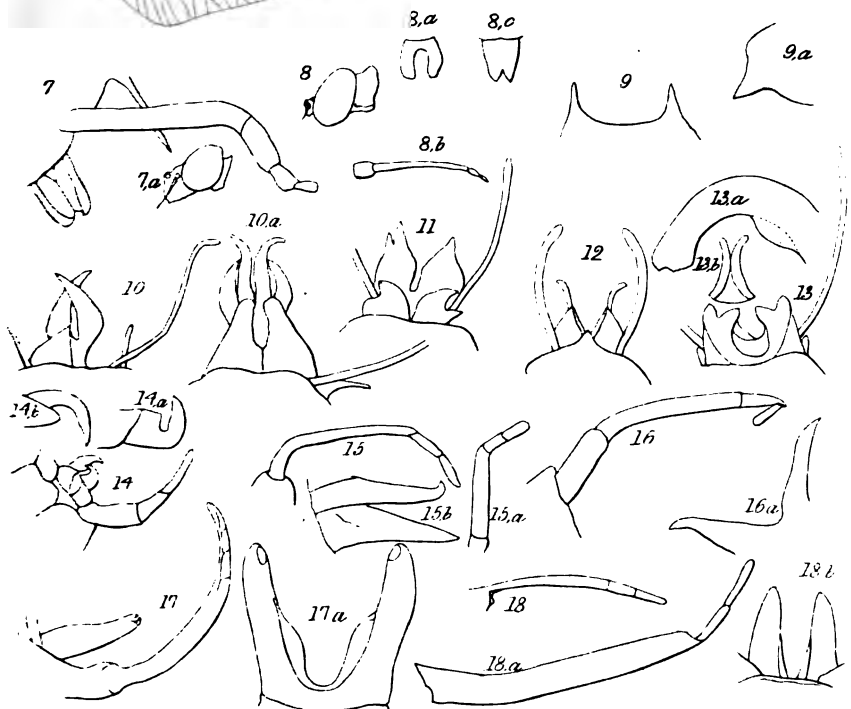
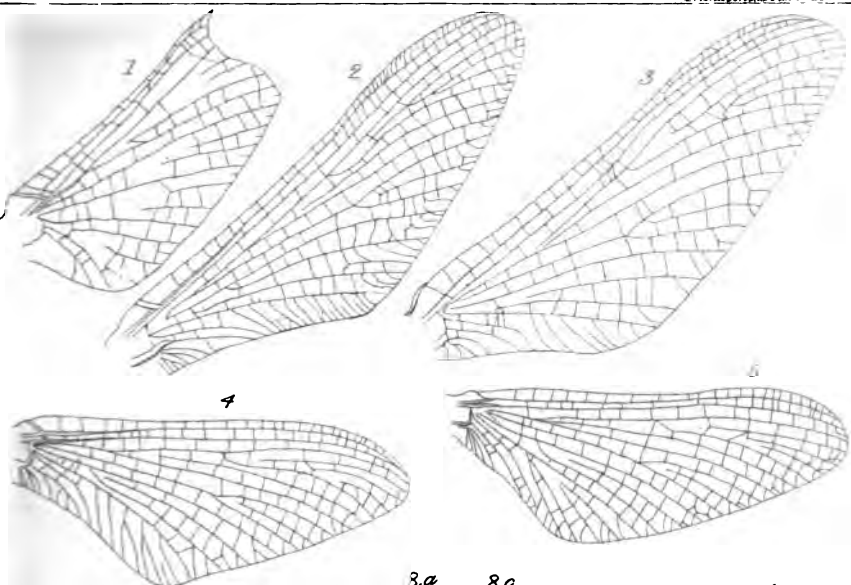
* Note :—

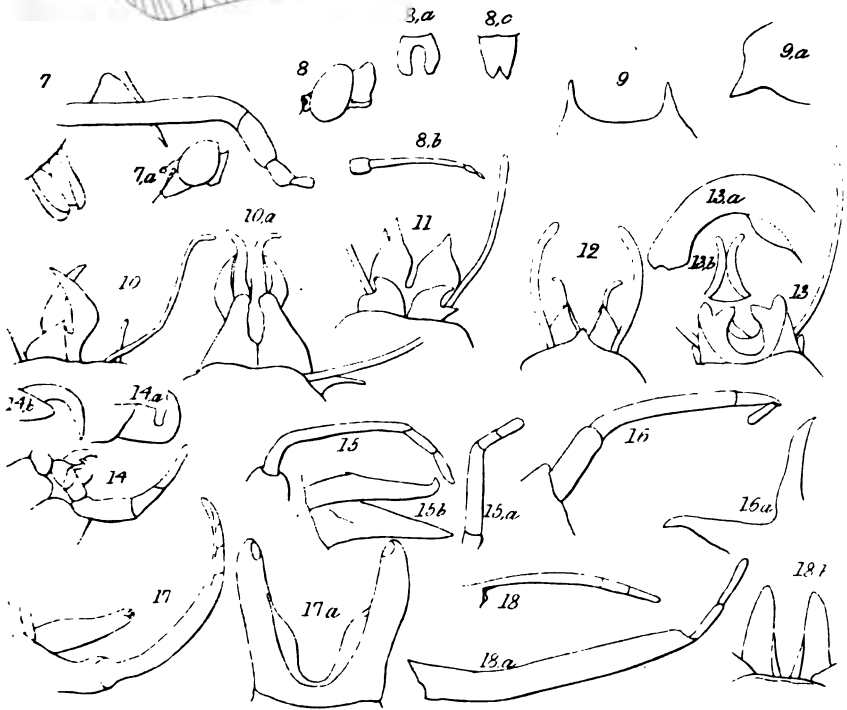
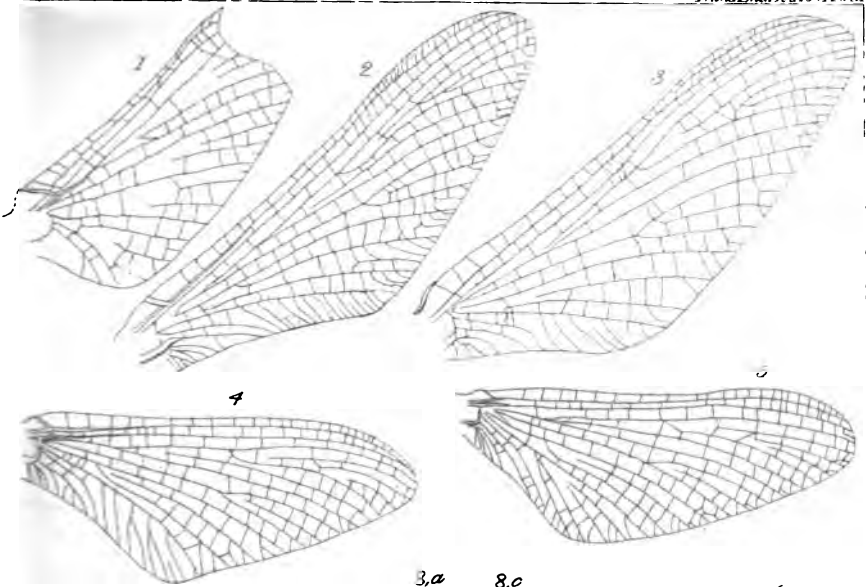
- Tab. I. fig. 1 is from..... Packard's Guide to the Study of Insects.
Fig. 578.
Tab. II. fig. 3, 3a " Savigny's Description de l'Égypte (1817),
Tab. II. fig. 6, 7.
Tab. III. fig. 7a-8c " Dr. Hagen, in Stet. Ent. Zeit. (1855), Tab. I.
Tab. III. fig. 17a " C. Cornelius (1848).
Tab. V. fig. 30 " Ed. Pictet, in Synopsis des Névroptères
d'Espagne, Tab. III. fig. 1.
Tab. VI. fig. 8 " Hagen, in Berendt's Organische Reste im
Bernstein (1856) Bd. II. Tab. VI. fig. 1.

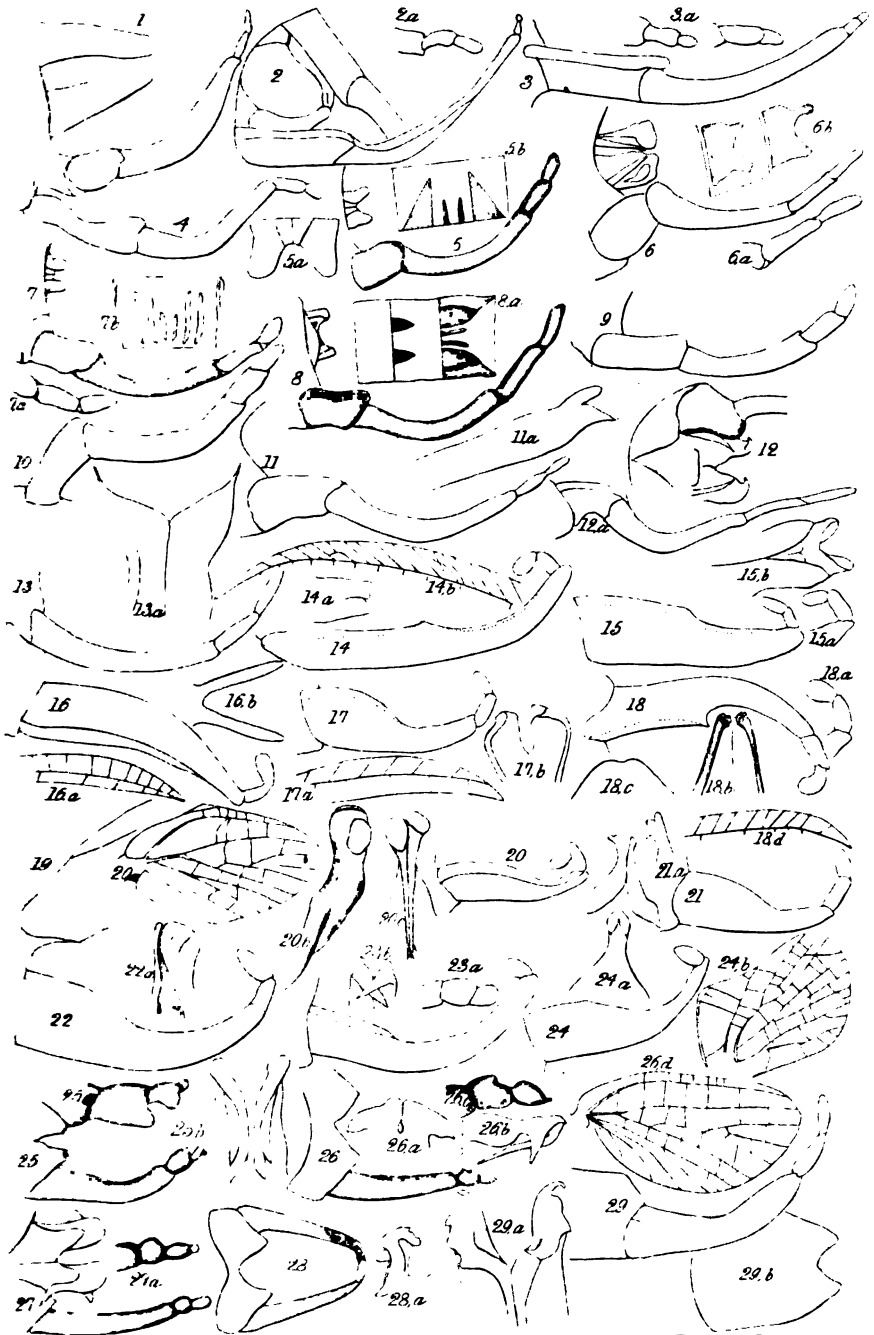


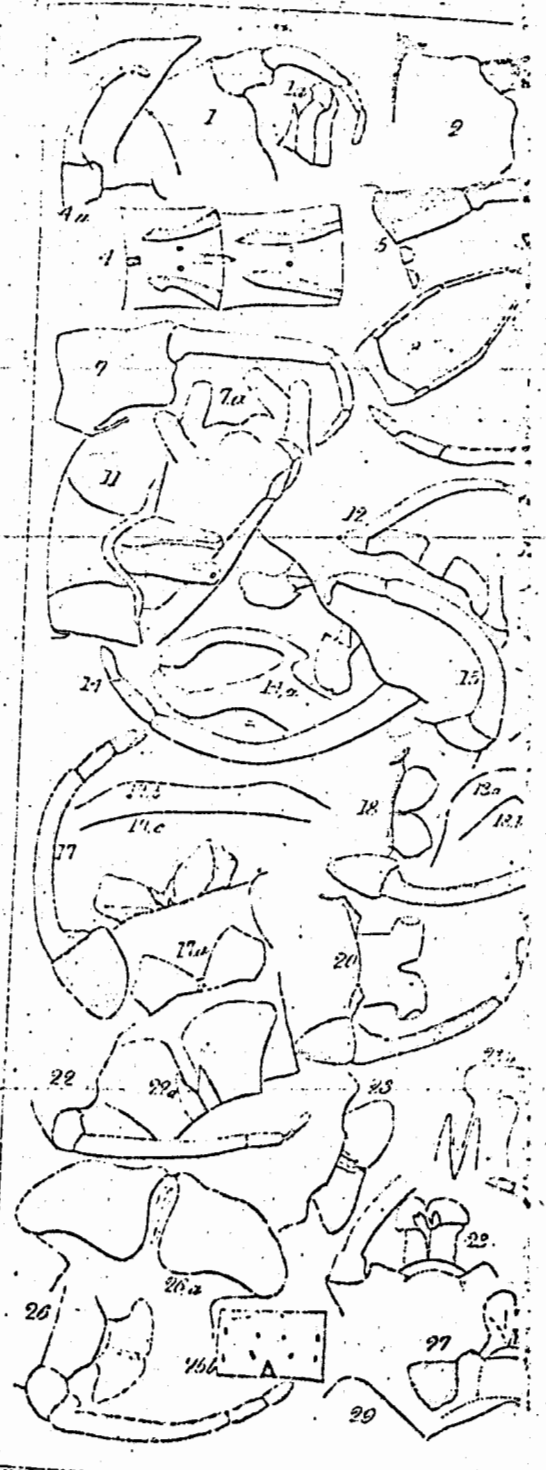
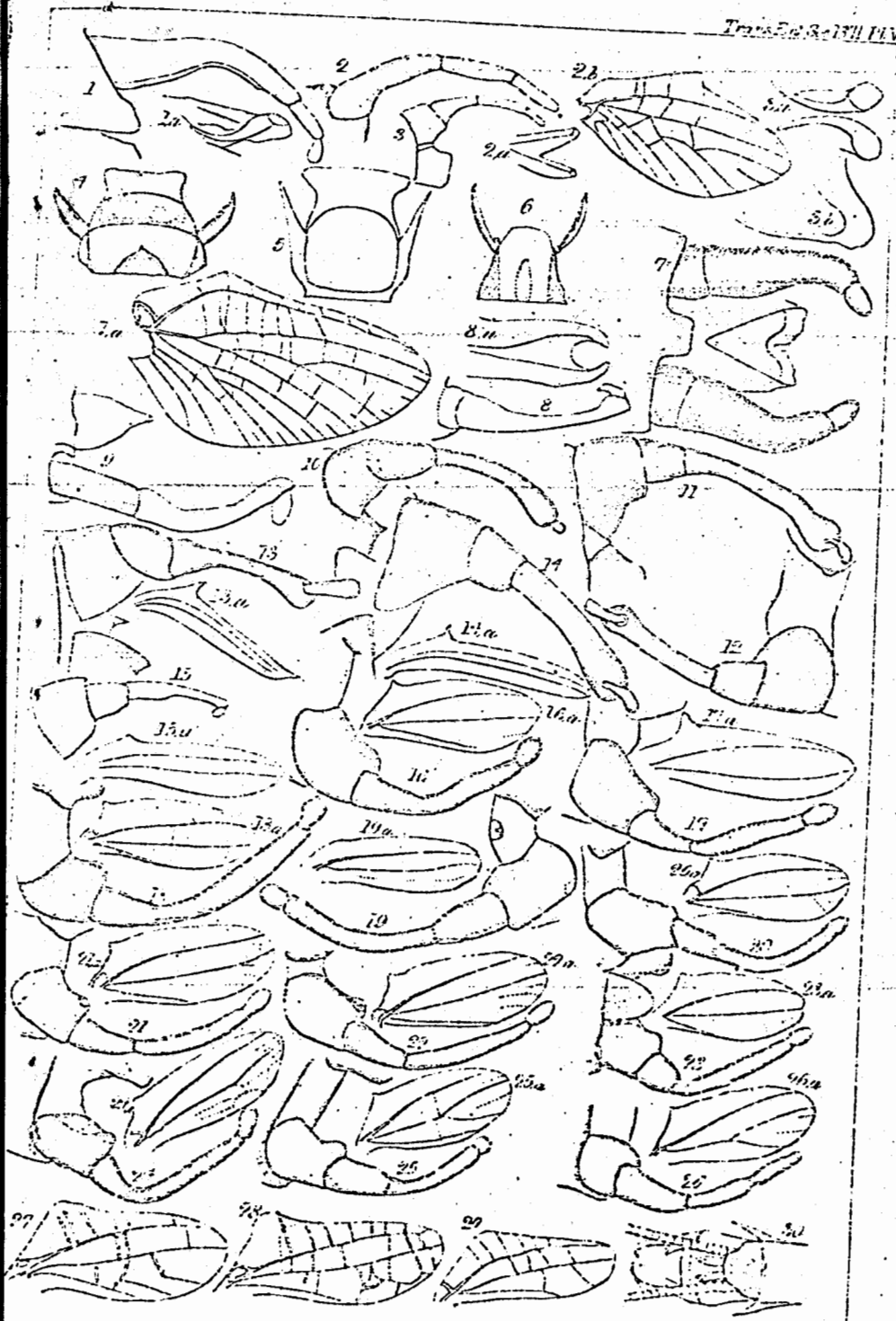


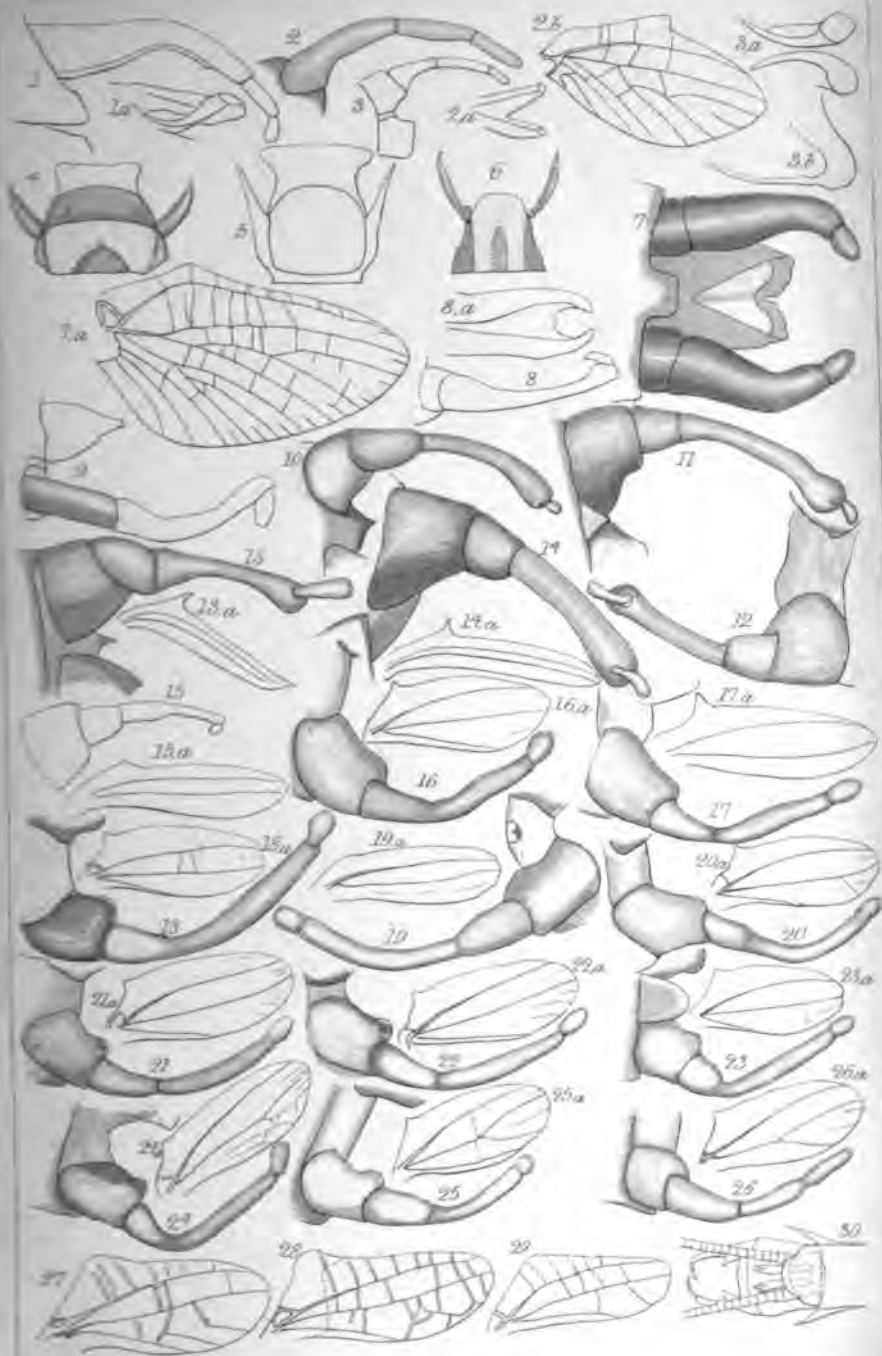




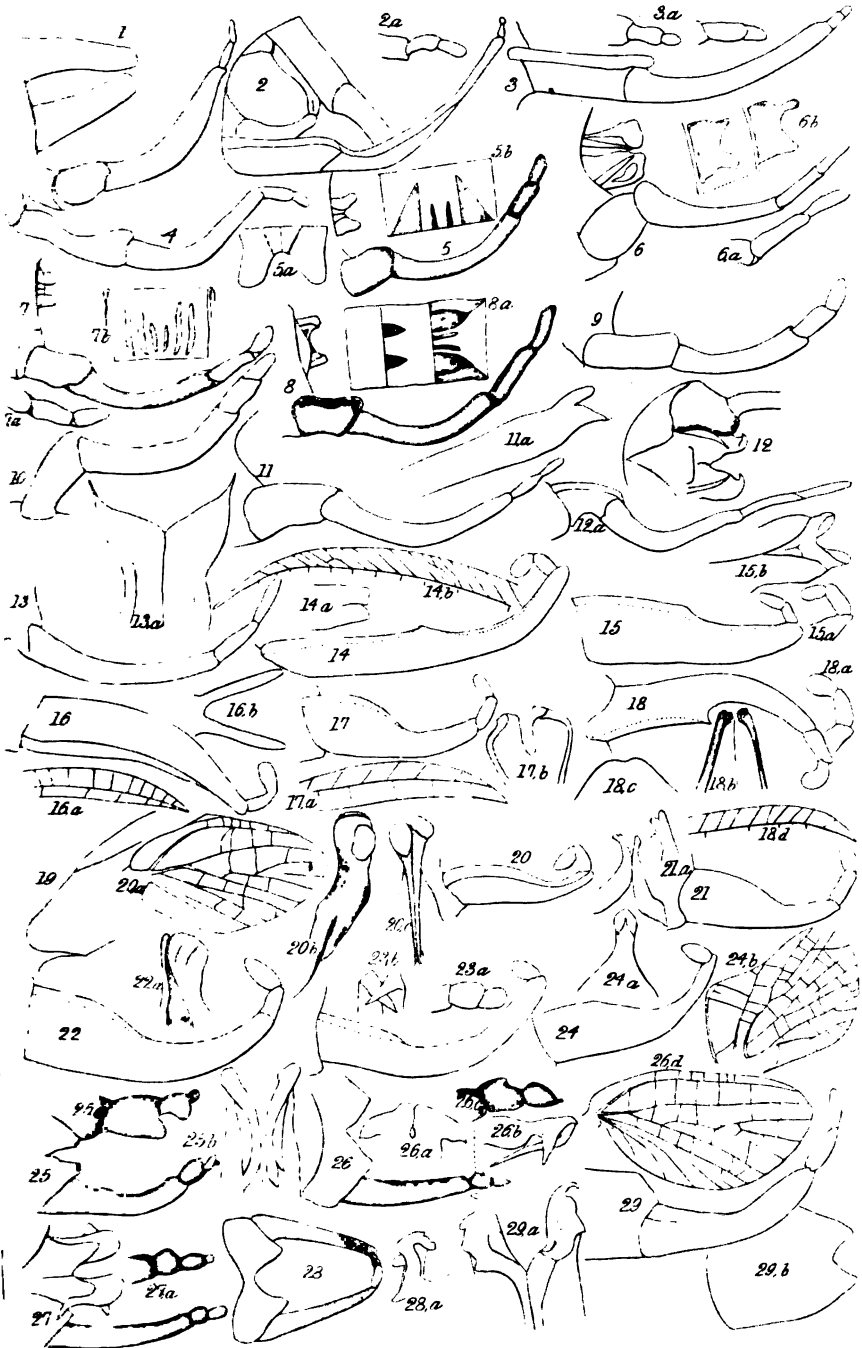


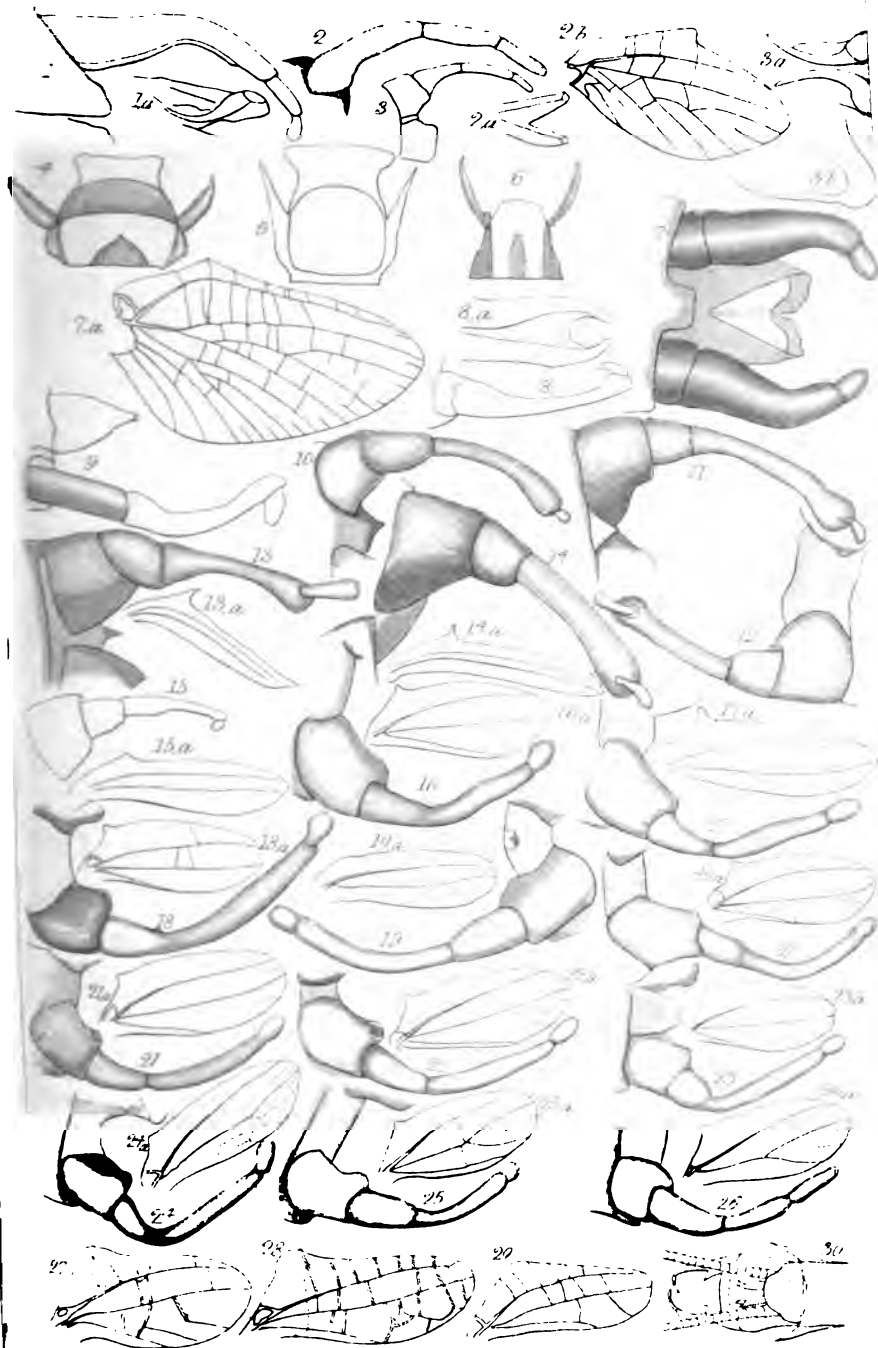












TAB. III.

Figs. 1-5. Vena alarum anticarum.

- Fig. 1. *Baetis* (sp. nondescript.) in parte; de California.
2. *Siphuri lacustris*.
 3. *Coloburi humeralis*.
 4. *Isonychia manca*.
 5. *Heptagenia elegantis*.
 6. *Mensura gallica* (centimetres and millimetres).
 - 6a. „ „ *anglicana* (inches and lines).
 7. *Oligoneuria rhenana*, ♂ im. genitalia infra.
 - 7a. „ „ „ caput oblique.
 - 8. „ „ *pallida*, „ „
 - 8a. „ „ „ penis.
 - 8b. „ „ „ pes forcipis.
 - 8c. „ „ „ ♀ im. processus ventralis penultimi segmentorum.
 9. „ „ *Trimoniana*, „ processus ventralis penult. segm. infra.
 - 9a. „ „ „ „ processus ventralis penult. segm. oblique.
 10. *Campsuri latipennis*, ♂ im. genitalia infra.
 - 10a. „ „ „ „
 11. „ „ *albifili*, „ „
 12. „ „ *cuspidati*, „ „
 13. „ „ *quadridentati*, „ „
 14. *Athenopi curti*, „ „
 - 14a, b. „ „ „ partes apicales penis.
 15. *Polymitarcoyas virginis*, „ pes forcipis.
 - 15a. „ „ „ subim. „
 - 15b. „ „ „ im. penis.
 16. „ „ *Sacignii*, „ pes forcipis.
 - 16a. „ „ „ „ penis.
 17. *Palingenia longicauda*, „ pes forcipis.
 - 17a. „ „ „ „ penis.
 - 18-18a. „ „ *lata*, „ pes forcipis; subim. & im.
 - 18b. „ „ „ „ penis infra.

TAB. IV.

- Fig. 1. *Pentagenia vittigera*, ♂ im. genitalia infra.
2. *Hesagenia albivittata*, „ „
 - 2a. „ „ „ pedis forcipis articuli apicales.
 3. „ „ *limbata*, „ pes forcipis.
 - 3a. „ „ „ „ pedis forcipis articuli apicales.

TAB. VI.—*contin.*

- Fig. 27. *Heptagenia lateralis*, ♂ im. genitalia infra.
 28. „ *sebrata*, „ genitalia infra.
 29. *Isonychia ignota*, „ apex penis infra.

ADDENDA.

- Page 47. To *Centroptilum luteolum*, add Hudson's Bay Territory.
 To *Centroptilum phæops*, add Norway (Hammerfest and Alten).
- Page 68, note.* Add—*Ephemerum*, Tournefort (1694-1700) = *Tradescantia*, Lin., is the typical genus of *Ephemera*, Batsch (1802) = *Commelynaceæ*, an Order of Endogens. *Ephemerum*, Dodon (Ersch & Grüber) or Reichenbach (Lindley) = *Lysimachia*, Lin., a genus of *Primulaceæ*.
- Page 134. In *Isonychia*, the termination *-onychia* is adopted on account of *-onyx* being used as a generic termination in the names of some *Cheloni*. *Ephemera pudica*, Hag., is almost certain to be identical with *I. manca*; this species often has a close reticulation contiguous to the veins of the inner margin of the fore-wing, somewhat like that in the wing of *Polymitarcys*.

TAB. IV.—*contin.*

Fig. 4. <i>Hexagenia bilineata</i> , ♂ im. pes forcipis.		
5.	<i>Ephemera vulgata</i> ,	genitalia infra.
5a.	" "	penis.
5b.	" "	maculæ dorsales abdominis.
6.	" <i>guttulata</i> ,	genitalia infra.
6a.	" "	pedis forcipis articuli apicales.
6b.	" "	maculæ dorsales abdominis.
7.	" <i>lineata</i> ,	genitalia infra.
7a.	" "	pedis forcipis articuli apicales.
7b.	" "	notæ dorsales abdominis.
8.	" <i>danica</i> ,	genitalia infra.
8a.	" "	maculæ dorsales abdominis.
9.	" <i>glaucoptis</i> ,	pes forcipis.
10.	" <i>immaculata</i> ,	" "
11.	" <i>fasciata</i> ,	" "
11a.	" "	penis oblique.
12.	" <i>serica</i> ,	genitalia infra.
12a.	" "	pes forcipis.
13.	<i>Potamanthi lutei</i> ,	" "
13a.	" "	penis infra.
14.	<i>Leptophlebia australis</i> ,	pes forcipis.
14a.	" "	penis.
14b.	" "	apex areæ marginalis al. ant.
15.	" <i>australasica</i> ,	pes forcipis.
15a.	" "	pedis forcipis articuli apicales.
15b.	" "	penis infra.
16.	" <i>furcifera</i> ,	pes forcipis.
16a.	" "	apex areæ marginalis.
16b.	" "	penis infra.
17.	" <i>inconspicua</i> ,	pes forcipis.
17a.	" "	apex areæ marginalis.
17b.	" "	penis infra.
18.	" <i>dentata</i> ,	pes forcipis.
18a.	" "	pedis forcipis articuli apicales.
18b.	" "	penis infra.
18c.	" "	♀ im. apex processus ventralis penult. segment.
18d.	" "	apex areæ marginalis.
19.	" <i>strigata</i> ,	latus processus ventralis penult. segment.
20.	" <i>nodularis</i> ,	♂ im. pes forcipis.
20a.	" "	ala postica.
20b.	" "	penis oblique.
20c.	" "	penis infra (haud appendiculatus).

TAB. IV.—*contin.*

Fig. 21. *Leptophlebia scita*, ♂ im. pes forcipis.

21a.	"	"	"	penis infra.
22.	"	<i>Taprobanae</i> ,	"	pes forcipis.
22a.	"	"	"	penis oblique.
23.	"	<i>annulata</i> ,	"	pes forcipis.
23a.	"	"	"	pedis forcipis apex.
23b.	"	"	"	penis infra.
24.	"	<i>auriculata</i> ,	"	pes forcipis.
24a.	"	"	"	penis infra.
24b.	"	"	"	ala postica.
25.	"	<i>marginata</i> ,	"	pes forcipis.
25a.	"	"	"	pedis forcipis apex.
25b.	"	"	"	penis infra appendiculatus.
26.	"	<i>helvipedis</i> ,	"	pes forcipis.
26a.	"	"	"	penis supra.
26b.	"	"	"	penis oblique.
26c.	"	"	"	pedis forcipis apex.
26d.	"	"	"	ala postica.
27.	"	<i>cincta</i> ,	"	genitalia infra.
27a.	"	"	"	pedis forcipis apex.
28.	"	<i>mollis</i> ,	"	forceps infra.
28a.	"	"	"	latus penis infra.
29.	"	<i>cupida</i> ,	"	pes forcipis.
29a.	"	"	"	penis infra.
29b.	"	"	♀ im.	processus ventralis penult. segment.

TAB. V.

Fig. 1. *Leptophlebia nebulosa*, ♂ im. pes forcipis infra.

1a.	"	"	"	latis penis infra.
2.	"	<i>fusca</i> ,	"	pes forcipis.
2a.	"	"	"	penis infra.
2b.	"	"	"	ala postica.
3.	"	<i>modesta</i> ,	"	pes forcipis infra.
3a.	"	"	"	penis infra.
3b.	"	"	"	penis oblique.
4.	<i>Canis macrura</i> ,	"	"	genitalia infra.
5.	"	<i>dimidiata</i> ,	"	genitalia infra.
6.	"	<i>luctuosa</i> ,	"	forceps et membrana infra genitalia.

TAB. V.—*contin.*

Fig. 7. *Ephemerella ignita*, ♂ im. genitalia infra.

- 7a. " " " ala postica.
 8. " *invaria*, " pes forcipis.
 8a. " " " penis infra.
 9. *Baetisca obesa*, " genitalia infra.
 10. *Cloeonis dipteri*, " pes forcipis.
 11. " *similis*, " pes forcipis.
 12. " *russuli*, " pes forcipis.

[13-26, pedes forcipium; 13a-26a, alæ posticæ:]—

- 13, 13a. *Centroptili luteoli*, ♂ im.
 14, 14a. " *pennulati*, "
 15, 15a. " *stenoptyrgis*, ♂ im.
 16, 16a. *Baetis binoculati*, ♂ im.
 17, 17a. " *scambi*, "
 18, 18a. " *fnitimi*, "
 19, 19a. " *atrebatini*, "
 20, 20a. " *Rhodani*, "
 21, 21a. " *phaeopsis*, "
 22, 22a. " *tenacis*, "
 23, 23a. " *bucerati*, "
 24, 24a. " *annici*, "
 25, 25a. " *pumili*, "
 26, 26a. " *nigri*, "
 27. " *picti*, "
 28. " sp. nondescript. de California, ala postica. (Pro alâ anticâ vide Tab. III. fig. 1.)
 29. " sp. nondescript. ex Australia, ala postica.
 *30. *Siphyluri flavidi*, ♂ im. apex abdominis supra.

TAB. VI.

Fig. 1. *Siphyluri armati*, ♂ im. pes forcipis infra.

- 1a. " " " latus penis infra.
 2. " *lacustris*, " pes forcipis infra.
 3. " *Linnaeani*, " pes forcipis infra.
 3a. " " " notæ ventrales abdominis.
 4. " *annulati*, " notæ ventrales abdominis.
 4a. " " " pes forcipis infra.
 5. *Isonychia manca*, " pes forcipis infra.
 5a. " " ♀ " processus ventralis penult. segment.

TAB. VI.—*contin.*

Fig. 6.	<i>Coloburi humeralis</i> ,	♂ im.	pes forcipis oblique.
6a.	" "	"	penis infra.
6b.	" "	♀ "	processus ventralis penult. segment.
7.	" <i>haleutici</i> ,	♂ "	pes forcipis oblique.
7a.	" "	"	penis apex infra.
*8.	<i>Cronici anomali</i> ,	"	forceps infra.
9.	<i>Heptagenia semicolorata</i> ,	"	genitalia infra.
10.	" <i>nicata</i> ,	"	genitalia infra.
11.	" <i>borealis</i> ,	"	genitalia infra.
12.	" <i>canadensis</i> ,	"	genitalia infra.
12a.	" "	"	latus penis supra.
13.	" <i>fusca</i> ,	"	penis supra.
13a.	" "	"	penis infra.
13b.	" "	"	pedis forcipis apex.
14.	" <i>cupulata</i> ,	"	genitalia infra.
14a.	" "	"	latus penis supra.
15.	" <i>basalis</i> ,	"	pes forcipis infra.
15a.	" "	"	penis supra.
16.	" <i>flavescentis</i> ,	"	genitalia infra.
17.	" <i>flavipennis</i> ,	"	genitalia infra.
17a.	" "	♂ subim.	penis infra.
17b.	" "	♀ im.	processus ventralis apex.
17c.	" "	"	ovivalvulæ apex.
18.	" <i>elegantis</i> ,	♂ im.	genitalia infra.
18a.	" "	♀ im.	processus ventralis apex.
18b.	" "	"	ovivalvula apex.
19.	" <i>alpicola</i> ,	♂ im.	genitalia infra.
20.	" <i>volitantis</i> ,	"	genitalia infra.
21.	" <i>luridipennis</i> ,	"	penis.
21a.	" "	"	penis infra.
22.	" <i>flavole</i> ,	"	pes forcipis.
22a.	" "	"	penis infra.
23.	" <i>vicaria</i> ,	"	penis infra.
23a.	" "	"	latus penis supra.
24.	" <i>venosa</i> ,	"	genitalia infra.
25.	" <i>longicauda</i> ,	"	genitalia infra.
26.	" <i>insignis</i> ,	"	genitalia infra.
26a.	" "	"	penis.
26b.	" "	"	notæ ventrales abdominis.