

Studies on Tipulidae.

Part. II. Review of the published genera of the Tipulidae brevipalpi,

by

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Preface.

In publishing this second instalment of my „Studies etc.“, I repeat what I said in the preface to the first: that unable to fulfil my original plan of bringing out a Genera of the Tipulidae I publish the material I had collected for its execution. As the classification of the Tipulidae brevipalpi and the description of all their genera known at that time has been given in considerable detail in the fourth volume of the Monographs of North-American Diptera, the present paper is merely intended as a Supplement to it, bringing the subject up to date; hence the constant references to that volume¹⁾. Like the first part of these Studies, the present one is, in a great measure, composed from notes, taken by me in different collections. This mode of composition, besides being very laborious, involves considerable risks of error and confusion. If, instead of my notes, I had the specimens themselves before me, I might perhaps have obtained more satisfactory results and avoided some blunders (like that about *Ctedonia*). As it is, what I can offer, is often an exposition of my doubts and hesitations, much more than of positive results. But even in this shape I hope that my work will spare some amount of labor to those who will come after me.

To these successors I am free to give a piece of advice, as the result of more than 30 years experience with Tipulidae, and this is, not to introduce new genera prematurely: Large accessions of new forms, or of variations of already well-know forms must be expected from as yet unexplored, principally tropical regions; but these acces-

1) The fourth volume of the „Monographs“ besides being often advertised in the Catalogues of booksellers, may be found in most of the larger public libraries under the heading of: „Smithsonian Miscellaneous Collections, Vol. VIII“. I insist upon this detail, because the Monographs have often been missed in libraries for not being catalogued as a separate work.

sions, although large, will be slow in coming. Do not introduce new genera for every slight deviation from a well-known type, because you would soon have no end of new genera, and a growing difficulty in discriminating between them. But do not hesitate to establish a new genus for a form which cannot be forced into any of the existing genera, and which shows distinctive characters in more than one organ of its body. Such forms are not very common. I had to give up several of the subdivisions too hastily adopted by me in 1868; but since that year, having grown in experience, I found necessary to establish only four new genera of Tipulidae brevipalpi (only one in the present paper).

An explanation is necessary about some terms I have used in stating the synonymy of the genera. I distinguish the exact synonym, covering the same group of species, and being another name for the same thing, from the ex parte synonym, covering a number of species, either larger or smaller, than the generic group of species under which the synonym is quoted. This disparity may be due to various causes; the synonym may represent a larger genus from which the other has been separated (as when *Limnobia* is quoted as a synonym of *Dicranomyia*); or it may be a subdivision, proposed, but, for the present, not adopted (as when *Ormosia* is quoted as a synonym of *Rhypholophus*); or it may be an ill-conceived genus, based upon what Erichson called an illusory character (scheinbarer Character), that is a character, which does not afford a basis for a natural subdivision, but, on the contrary, separates naturally allied species, and brings together distant ones (like the genus *Tricyphona* Zett., based upon the very secondary character of an open discal cell, which unnaturally separates it from the genus *Amalopsis*, formed later, but upon a better basis). A third kind of synonymy is formed by what I call the spurious genera, generic groups based upon the misapprehension of a fact; for instance, when a genus is formed for one sex only (like the Acanthomerid *Megalemyia* Bigot); or for the sexes of two different genera (like *Limnobiorkhynchus*); or when it is based on some character which has no existence in reality (like the genus *Synapha* Meig., based on an accidental abnormality of the venation in a specimen; or the Bombylid genus *Heterostylum* Macq. that owes its existence to some dust on the antennae of the type specimen, which Macquart mistook for a pubescence; or the genus *Ceroctena* Rond. which, to all appearances, is based upon a specimen to which the head of another species had been glued). Spurious genera should be entirely eliminated and have no claim to priority.

In preparing the present paper I have largely used the materials I found in the collections of the Berlin Museum. To the authorities of that Museum I express herewith my sincere gratitude for their liberality and courtesy.

Introduction.

The characters upon which, in 1859, was founded my primary subdivision of the Tipulidae brevipalpi in sections (empodia, spurs on the tibiae, number of submarginal cells, number of joints of the antennae and structure of the male forceps) have, upon the whole, proved remarkably trustworthy. The system based upon them has absorbed without difficulty all the additions since made to it. Exceptions are rare. Abnormal forms, like *Chionea*, found their right place when tried by the test of these characters; forms very dissimilar to the eye like *Libnotes* and *Peripheroptera*, owing to the same test, proved to be close relatives. — In three instances only has the number of submarginal cells failed to determine the natural position of a genus, and even these exceptions are only apparent, and easily explained. *Goniomyia manca* O. S. (N. America), has only one submarginal cell, instead of two; but this is owing to the obliteration of the anterior branch of the second vein, which is usually very short in that genus. A precisely similar case is that of *Cloniophora* Loew, an *Anisomera* with a single submarginal cell. In *Paratropesa*, on the contrary, there are two submarginal cells, although this genus being closely related to *Teucholabis* should have only one; I explain this anomaly in assuming that the vein which encloses this pretended second submarginal cell is not a branch of the second vein, but only a supernumerary crossvein, inserted at its place in order to strengthen the interval between the second vein and the costa, which is unusually broad in this genus. In the genus *Cerozodia* the somewhat aberrant course of the auxiliary vein, which ends in the first, is due to the weakness or total obliteration of the crossvein, which ought to connect it with the costa, and to represent its real end.

The empodia are distinct in *Dicranomyia morio*, while they are wanting in the other species of the same section; on the contrary they are wanting in some *Goniomyiae*, while they are present in others; they are wanting in *Lipsothrix*, where they should have been present, if it be true that this genus belongs to the *Eriopleurina*. Similar anomalies in the presence or absence of pulvilli occur in other families (Asilidae, Bombyliidae).

The absence of spurs at the end of the tibiae becomes misleading in some genera which have the appearance of *Limnophilina*, but which being deprived of spurs, are artificially placed among the *Eriopterina* (*Cladura*, *Lecteria*, *Conosia*, *Sigmatomera*, perhaps also *Polymoria* Phil.); the true location of these genera is therefore still problematic. A remarkable vindication of the tibial spurs, as a valuable systematic character, is afforded by *Dolichopeza*. All the *Tipulidae* longipalpi are provided with spurs; *Dolichopeza* alone formed an apparent exception; but an examination under the microscope proved to me that they are present, although rudimentary.

The number of joints of the antennae, thirteen in the longipalpi, fourteen in the *Limnobina*, sixteen in the *Limnophilina*, *Eriopterina*, *Anomala*, and in most of the *Amalopina*, holds good with rare exceptions.

The characters borrowed from the structure of the forceps of the male have been observed by me, as far as possible, on living specimens. Their study can of course be pushed much further, as Mr. Westhoff has done it for the longipalpi. The method of dissection applied by Dr. Dziedzicki to the *Mycetophilidae*, might in many cases be useful here; but this is as yet a desideratum.

In looking over the Introduction to my Monograph of the *Tipulidae* (Monographs of N. Am. Diptera, Vol. IV, p. 1—43, 1869) I find very little to change; not that there is nothing to correct and to improve, but because, as I must humbly acknowledge, in the matter of generalities I have gained very little in knowledge since.

In § 1 Characters of the family *Tipulidae*, some changes are required; they will be found in a new edition of this paragraph, placed at the end of this Introduction.

In § 2 On the larvae of *Tipulidae*, p. 7, line 16 from top, the words "I do not know the use of these singular organs," must be replaced by: "They are branchial appendages." The additions made to our knowledge of the larvae since 1868 will be found in the present paper under the head of the different genera. Mr. A. Hammond published an excellent paper: "The Anatomy of the larva of the Crane-fly" in *Hardwicke's Science-Gossip*, January, August and September 1875.

In § 3 Historical account of the classification of the *Tipulidae* I did not make any mention of Mr. Bigot's systematic arrangement. A detailed notice of his as well as of Rondani's

systems of Tipulidae will be found at the end of the present paper. To the chronological list of all the published genera of Tipulidae (l. c. p. 13—17) Mr. Bigot's genera (*Philydorea*, *Trentepohlia*, *Octavia*, *Rondania*, *Dohrnia*, *Numantia*, *Variptera*, *Variegata*, *Goureaudia*, all of the year 1854), must be added. Since 1868 twenty eight new genera have been introduced. In Appendix II to the present Introduction the list of genera given in the Monographs etc. Vol. IV has been brought down to date.

The § 4 Division of the Tipulidae in longipalpi and brevipalpi has been produced in part, and in a somewhat corrected form, in there Studies, Part I, p. 153—154.

In § 5 Distribution of the Tipulidae brevipalpi in sections I expressed my views on the necessity of bringing before the eye, in a systematic arrangement, the contrast between the large and small groups of species, as they exist in nature (the monotypical and polytypical genera), and I insisted, for this reason, on the usefulness of subgenera. I have not changed my views on this subject since.

In § 6 General remarks on the structure of the Tipulidae brevipalpi, p. 28, line 6 from bottom should read: „The spurs, whenever present, are two in number on each of the four posterior tibiae and a single one on the front tibiae etc.

The § 7, Comparison of the North-American and European Tipulidae brevipalpi requires remodelling on account of the discoveries made since it was written. Thus *Elephantomyia* has been found in Europe and Africa, *Elliptera* in America, *Teucholabis* in Asia etc. These facts will be mentioned under the proper headings in the course of this paper. Strike out the remark (l. c. p. 36, line 7, from bottom): „*Gnophomyia* is represented" etc.; and on p. 39, line 15 from bottom strike out the words: „and *Acyphona* O. S."

Appendix to the Introduction.

I. Characters of the Tipulidae¹⁾.

The Tipulidae belong in the number of those large families of Diptera, the limits of which are equally well defined on all sides:

¹⁾ See above, page 166. This is a somewhat modified reprint of the first paragraph of the Introduction to the 4th volume of the Monographs of the North-American Diptera, 1869, p. 1—4.

In the Dolichopodidae and Asilidae we have instances of families of the same kind, and the words of Mr. Loew about the latter „that not a single dipteron has yet been found, the position of which as belonging or not belonging to this family is questionable“ — these words may, with almost equal propriety, be applied to the Tipulidae¹⁾.

The presence of a V-shaped transverse suture across the mesonotum would alone be sufficient to distinguish the Tipulidae from the neighbouring families. The completeness of the venation and the structure of the ovipositor of the female are of equally general application. Through the whole family, and all the modifications of the other organs notwithstanding, the venation is arranged according to the same plan, the characteristic features of which are, the great length of the two basal cells, the development of the auxiliary vein, and the presence, in the majority of cases, of a discal cell. The veins, in their last subdivisions along the margin of the wing, are from ten to twelve in number (if *Cladolipes* and *Toxorrhina* have only nine veins, the obliteration of a vein in both cases is evident). The Culicidae and Psychodidae come next to the Tipulidae with regard to the completeness of the venation; but they have no discal cell; among all the other Diptera nemocera this cell occurs only in *Rhyphus*.

The size and structure of the ovipositor, with its two pairs of horny, pointed valves, is common with very rare exceptions to all the Tipulidae (the ovipositor of the other Diptera nemocera generally consists of two hardly projecting inconspicuous valvules). The only genera exceptional in this respect are *Cryptolabis* and some of the *Ptychopterina* (*Bittacomorpha*, *Tanyderus*, *Idioplasta*); their ovipositors do not show any horny appendages, but a pair of coriaceous valvules instead.

The three leading characters of the Tipulidae — thoracic suture, venation and the structure of the ovipositor —, sufficiently isolate this family among the other Diptera nemocera; but we render the contrast still more striking, if we direct our attention to

¹⁾ At the time when Loew wrote these words (1847), *Apiocera* Westw. 1835, was very little known and *Raphiomidas* O. S. 1877 was not discovered. Later (in litteris) he acknowledged their relationship, but took them both for Midaidae. At that time the Chaetotaxy was not worked out and Loew does not seem to have noticed that Midaidae never have any macrochaetae. Had he been alive now he would not have hesitated to recognize both genera for Asilidae.

the different parts of the organization of the Tipulidae, and compare them with the corresponding parts in other families.

The eyes of the Tipulidae are rounded or oval, and never excised on the inside (reniform or lunate) like those of most *Culicidae*, *Chironomidae*, *Psychodidae*, *Simulidae* and some *Mycetophilidae*. They are never contiguous in either sex; the facets upon them are never divided into two groups of larger upper and smaller lower facets (as is the case in the *Bibionidae*, *Simulidae*, *Blepharoceridae*).

The ocelli are, with rare exceptions (*Trichocera*), wanting; and this character the Tipulidae share with the *Culicidae*, *Chironomidae*, *Psychodidae*, *Simulidae* and most *Cecidomyiidae*.

The mouthparts of the Tipulidae (labrum, hypopharynx, underlip and hardly developed maxillae) never have the development attained by the bloodsucking genera in the neighbouring families (*Culex*, *Ceratopogon*, *Simulium*, *Blepharocera*, *Phlebotomus*).

The usual type of the antennal flagellum of the Tipulidae is composed of joints that are obturbinate, verticillate, gradually diminishing in size towards the tip; the divisions between the joints are well-marked by a deep constriction; but the joints are very seldom, and then only apparently, pedicelled (in *Rhipidia* and certain species of *Rhypholophus*). I say apparently, because in such cases there is no real pedicel, but an elongation of the joint in front, which produces the appearance of a pedicel for the next joint. The joints here are never absolutely cylindrical and, at the same time, sessile, as in some *Cecidomyiae* (*Asphondylia*, *Spaniocera*), or of the compressed, disciform shape, so common among *Mycetophilidae*; nor do they have the bushy hairs, so common among the males of the *Culicidae* and *Chironomidae*. The typical obturbinate and verticillate shape of the antennal joints is obliterated when the antennae are pectinate (*Ctenophora*, *Gynoplistia* etc.) or serrate (*Ctenophora* ♀; the females of *Gynoplistia* often return to the typical obturbinate type); or when the antennae become abnormally long, and therefore filiform, as in *Megistocera*, *Macromastix*, some *Eriocerae*, *Anisomerae*, *Limnophilae* etc. With regard to the number of antennal joints, the Tipulidae do not differ much from the other *Nemocera*; the great majority of them have 2 + 11, 2 + 12 or 2 + 14 joints; the great majority of the *Mycetophilidae* have 2 + 14, the *Culicidae* 2 + 12, the *Chironomidae* from 2 + 10 to 2 + 13 (in the male; much less in the female); the *Cecidomyiidae* 2 + 12, or double this number 2 + 24.

The legs of the Tipulidae are comparatively much longer than those of the other families of Diptera nemocera (except perhaps the *Blepharoceridae*); but the coxae are never so long as in the *Mycetophilidae*, the femora never dentate, as in some *Ceratopogons*; the tibiae and tarsi never bearded as in some *Chironomi*; nor do the last tarsal joints and the unguis offer those structural modifications which distinguish many *Ceratopogons*. In general, apart from the presence or absence of spurs, of empodia, of denticulations of the unguis, and from the proportions between the length of the whole limb and its different parts, the legs of the Tipulidae offer but little to make use of in a generic or specific description.

In size, the majority of the Tipulidae are considerably larger than the other Diptera nemocera, and the contrast in this respect is very striking.

The only genus which gave rise to discussion as to its being a Tipulid or not, is *Dixa*. It was referred to the *Mycetophilidae* by Meigen and Zetterstedt; to the Tipulidae by Macquart and Westwood; Ropdani connected it with *Trichocera* and Haliday placed it provisionally, together with *Orphnephila*, in the artificial group *Heteroclitae*. *Dixa* has no thoracic suture; the ovipositor of the female, according to Haliday, is different from that of the Tipulidae, consisting of two short, broad, round lamellae; the presence of only six longitudinal veins, the shortness of the auxiliary vein, the absence of both subcostal and marginal crossveins, the absence of the discal cell etc., constitute a type of venation which separates *Dixa* from all the known Tipulidae. The rather extraordinary larva of *Dixa* is one ground more for separating this genus. Altogether I incline to the opinion of Haliday in leaving *Dixa* in an isolated position.

II. Chronological list of the genera of Tipulidae published since 1867.

(Supplement to the List in Monogr. N. Am. Dipt. Vol. IV, p. 13—17)

Furina Jaennicke 1867 (Eriopterina); preocc. Dumer. Rept. 1853.

Liogma O. Sacken 1869 (Cylindrotomina).

Longurio Lw. (Tipulina) 1869.

Lipsothrix Lw. (Eriopterina) 1873.

Eutonia v. d. W. (Limnophilina) 1874.

Semnotes Westw. (Tipulina) 1876.

Libnotes Westw. (Limnobina) 1876.

Phyllolabis O. S. (Limnophilina) 1877.

Diotrepha O. S. (Limnobina anomala) 1878.

- Idioplasta** O. S. (Ptychopterina) 1878, new name for *Protoplasta*.
Conosia v. d. W. (Eriopterina?) 1880.
Trichoptera Strobl (Limnophilina) 1880; preocc. Neuropt., Dipt.
Nasiterna Wallengr. (Amalopina) 1881; syn. *Amalopis* Halid. 1856.
Diazoma Wallengr. (Limnophilina) 1881; preocc. Lamarck, Moll. 1816.
Ninguis Wallengr. (Limnobina anomala) 1881; syn. *Orimarga* O. S. 1869.
Vernina Wallengr. (?) 1881.
Dapanoptera O. S. (Limnobina) 1881.
Mongoma Westw. (Eriopterina?) 1881.
Scamboneura O. S. (Dolichopezina) 1882.
Orimargula Mik. (Limnobina anomala) 1883; syn. of *Antocha* O. S.
Prionota v. d. W. (Tipulina) 1884.
Brachypremna O. S. (Dolichopezina) 1886.
Tanypremna O. S. (Dolichopezina) 1886.
Macromastix O. S. (Tipulina) 1886.
Pselliophora O. S. (Tipulina) 1886.
Symplectomorpha Mik. (Eriopterina) 1886 = *Symplecta*.
Oreomyza Pokorný (Tipulina) 1887 = *Tipula*.
Lecteria O. S. (Eriopterina) 1887.

Tipulidae brevialpi.

Section I. Limnobina.

O. Sacken, Monographs etc. IV. p. 51—53.

Compactness is what characterizes this section in comparison with most of the others; the dividing-line between the two principal genera: *Dicranomyia* and *Limnobia* is so slight, that Schiner would not admit it. I have a *Dicranomyia* from New Zealand whose elongate proboscis seems to foreshadow *Geranomyia*; from the same country I have another *Dicranomyia*, whose moniliform antennae come near those of *Rhipidia*. The genera *Dicranomyia*, *Geranomyia*, *Rhipidia* and *Limnobia* are cosmopolitan, or very nearly so. *Dicranomyia* exists in amber; I have seen *Geranomyia* in slabs of the eocene tertiary formation (from Aix in the south of France).

Very interesting are the purely local tropical forms (*Dapanoptera*, *Peripheroptera*, *Libnotes*) distinguished by an excessive development of secondary characters, without any change in the essential ones; glaring instances of local adaptation to as yet unknown conditions of life.

Dicranomyia.

Stephens, Catal. of Brit. Ins. 1829; O. Sacken, Monogr. of N. Am.

Dipt. IV, p. 53, Tab. 1, f. 1—3, wing; tab. 3, f. 1—4, forceps.
(?) *Ataracta* Loew, Bernstein u. Bernsteinfauna 1850; O. S. l. c.
p. 57.

Spurious genus (?): *Glochina* Meigen, Syst. Besch. VI, p. 280,
Tab. 65, f. 7, 1830; *Siagona* on the plate.

The empodia of this genus are described by me as indistinct or none; in some species however, for instance in *D. morio* they acquire some development. This character is more easy to study in living specimens than in dry ones.

Dicranomyia seems to be more numerously represented in Europe than in North-America, probably owing to the greater moisture of the climate (as its larvae seem to live in the water). Many European species are as yet undescribed. The structure of the male forceps of most of them is characteristic, but must be studied on fresh specimens. I have figured some of these organs in Mon. etc. IV, Tab. 3, f. 1—4; and still earlier in the Stett. Ent. Z. 1854, Tab. 1 f. 3, 5, 6, 7; some of the latter have a very peculiar structure, and at that time, I took these species for *Glochina* Meig. Mr. Mik figured the forceps of the species from the Auckland Islands, described by him as well as of two European species, *D. trinotata* M. and *dumetorum* M. (Verh. Z. B. Ges. 1881, Tab. 13, fig. 2, 3, 5, 6, 7).

Very few exotic *Dicranomyiæ* have been described. Those from temperate climates generally reproduce the characters of European species (for instance the species from New-Zealand, or those from the Auckland Islands). However I possess an undescribed species from New-Zealand (*D. monilicornis* of my collection) which in the male sex, has distinctly moniliform antennae, like a female *Rhipidia*; the rostrum and proboscis are a little longer than the head, somewhat like those of the north-american *D. rostrifera*. Moreover it has scattered erect hairs on the legs, quite unusual among *Dicranomyiæ*.

Of exotic *Dicranomyiæ* from tropical regions only a single one has been described, *D. saltans* Dolesch. from Java, which I have also received from the Philippine Islands (O. S. Berl. Ent. Z.

1882, p. 88). It is remarkable for the unusual shortness of the cells in the apical portion of the wing and the slenderness of the legs. —

Limnobia morionella Schiner (R. d. Novara), from South America, is not a *Dicranomyia* as I thought (O. S. Monogr. etc. IV, p. 57) but a *Teucholabis*.

In discussing *Glochina* (l. c. p. 59) I have omitted to draw attention to Meigen's (Vol. VI, Tab. 65, f. 7) dissection of the parts of the mouth of *Glochina sericata* M., which shows a structure different from that of all the known Tipulidae, with a pair of horny maxillae (?) etc. I do not know what to make of it.

It is very singular that not a single species of *Dicranomyia* has been observed in the larval state; there is none even among the numerous Tipulidae bred by Mr. Beling. I only find the development of a species, doubtfully referred to *Limnobia fusca* Meig., described by Mr. T. D. Schubart (Handel. der Nederl. Entom. Vereeniging, 40, I Deel, 1 Stuck, Leiden 1854, p. 10) in the following words: "I found the full-grown larvae in ditch-water, on July 12; they are inclosed in an elongate sheath of a transparent, bluish-green jelly; they leave it in passing into the pupa-state, when they move about near the surface of the water, with a pair of bulb-shaped appendages, their breathing-holes." (?)

Geranomyia.

Haliday, Entomol. Mag. I, p, 154 1833; O. Sacken, Monogr. etc. IV, p. 78.

Aporosa Macq. D. E. I, 1. p 62, 1838.

Plettusa Philippi, Verh. Z. B. Gesell, 1865, p. 597, Tab. 23, f. 1

Spurious genus: *Limnobiorrhynchus* Westwood, Ann. S. E. Fr. 1835, p. 683 (the male is *Geranomyia*; the female *Toxorhina braziliensis*.)

To the references given in my Monograph may be added: v. d. Wulp, Dipt. Neerl. p. 396, Tab. 12, f. 5, 6; Mik, Verh. Z. B. Ges, 1864, Tab. 21; also Westwood, Trans. Ent. Soc. London 1881, Tab. 19, f. 10, details of head and rostrum of *G. braziliensis*.

The genus is cosmopolitan and occurs even within the tropics; I have seen a *Geranomyia*, n. sp. from Ceylon in the Berlin Museum; *L. sorbillans* Wied. A. Z. I, p. 551 from Sumatra is a *Geranomyia*; In California near S. Francisco I caught a *Geranomyia* with almost moniliform antennae and very small fleshy lobes of the forceps.

In the Museum at Marseilles, I saw a fossil *Geranomyia*, among the slabs marked: terrains éocènes d'Aix. A sufficiently distinct proboscis, about twice the length of the head; spurless tibiae and

the perfectly distinct venation render, in my opinion, the identification certain. There were two specimens, showing the same proboscis.

Rhipidia.

Meigen, Syst. Besch. I, p. 153, Tab. 5, f. 9—11; 1818.

O. Sacken, Monogr. etc. IV, p. 81¹⁾; Tab. 3, f. 5 (forceps).

Is probably cosmopolitan; species from Europe (4). North-America (3), South-America (1) and Africa (1) are known. The early stages of two european species have been described by Mr. Beling (Verh. Z. B. G. 1873, p. 18 and 1878, p. 52).

Peripheroptera.

Peripheriptera Schiner, Verh. Zool. Bot. Ges. 1866, p. 933.

Peripheroptera Schiner, Reise d. Novara, Dipt. p. 47, Tab. 2, f. 3; 1868.

In introducing this genus, Schiner did not grasp its peculiarities fully, because in the same volume of the *Reise der Novara* (p. 43) he describes a *Rhamphidia aberrans* ♀, which is a *Peripheroptera*.

Peripheroptera is a tropical form of *Dicranomyia*; it has all the essential characters of that genus; but they are very much disguised under the disproportionate development of certain parts, and principally of the venation.

The distinctive character of the genus consists in the unusual development of the portion of the wing between the root and the proximal end of the basal cells. This interval, generally very short among Tipulidae as well as in other diptera, has not yet been used for purposes of classification, and its parts, for their smallness, have not been distinguished by particular names. In *Peripheroptera Schineri* ♂ however, that interval occupies one third, in *P. incommoda* ♂ nearly one half of the length of the wing, and contains several distinct cells, the principal of which, a triangular cell, is separated from the two basal cells by a stout crossvein. The consequence of this excessive elongation of the proximal portion of the wings, is a change in their general outline; their proximal half is unusually narrow, the anal angle almost reduced to nothing and the interval between the seventh vein and the posterior margin (the spurious cell) narrow, linear.

Another character, peculiar to *Peripheroptera* is the large size of the stigma of the male, which nearly fills out the whole space between the costa and the second longitudinal vein; in the female,

¹⁾ On that page, line 16 from bottom read movable for immovable.

the stigma is much smaller. The auxiliary vein ends not far from the base of the praefurca; the subcostal crossvein is rather far removed from its tip, and placed nearly opposite the middle of the first basal cell. In *P. Schineri*, *nitens* and *aberrans*, the interval between the auxiliary and first vein is unusually broad, and hence, the subcostal crossvein remarkably conspicuous. In *P. incommoda*, on the contrary, I could hardly discriminate the auxiliary from the first vein (at least in those specimens which I saw). In *P. Schineri* and *nitens* the costal vein (in the male only) is remarkably incrasate near the point of junction of the auxiliary vein; this character is less marked in *P. incommoda*; of *P. aberrans* I have seen only the female.

The first longitudinal vein ends abruptly nearly opposite the middle of the submarginal cell and has the crossvein not far from its tip: but the position of the crossvein is variable; in *P. nitens* the same structure occurs as in some *Dicranomyia*, where the first vein ends into the second, and the crossvein appears to be between it and the costa (see Novara, Tab. II. f. 3); in other cases a little stump of a vein projects beyond the terminal curvature of the first vein, (*P. Schineri*, *aberrans*). The proximal ends of the discal, first posterior and submarginal cells are in one line in *P. Schineri* and *aberrans*; in *P. nitens* the submarginal cell is a little, in *P. incommoda* much longer. The discal cell is open in *P. incommoda*, closed in the other species.

The praefurca is rather short and more or less curved (shortest and most curved in *P. nitens*; less so in *P. aberrans*); the remainder of the second vein runs in a line with the praefurca and is nearly straight.

In the females, the outline of the wing, peculiar to the males of this genus, is less marked; the spurious cell is a little broader; the swelling of the costa round the tip of the auxiliary vein does not exist; the stigma has the usual proportions; the ovipositor is very small. The females of *P. Schineri*, *nitens* and *aberrans*, the only ones I have seen, differ but little from *Dicranomyia*, except in the position of the crossvein at the proximal end of the basal cells and in the course of the seventh vein, which is very near the margin of the wing.

The forceps of the male, as far as I could judge from dry specimens, has the same structure as in *Dicranomyia*. There are no empodia, and the unguis has a little tooth on the underside, as in *Dicranomyia* (it has been noticed and figured by Schiner, l. c. fig. 3 e). —

All the described species belong to the tropical regions of South-America.

I have seen in the Vienna Museum a *Limnobia* from South-America which combines the development of the proximal portion of the wing of *Peripheroptera* with an elongation and curvature of the apical veins somewhat approaching *Libnotes*, and I merely mention this in order to prove the variety of modifications of which the original type of *Limnobia* is susceptible.

1. *P. nitens* Schiner, R. der Novara, p. 47, Tab. 2, f. 3, ♂ ♀.
— Colombia, S. Am.

The auxiliary vein ends a little before the origin of the praefurca; subcostal crossvein nearly opposite the middle of the first basal cell, very distinct, as in *P. Schineri*; first longitudinal vein incurved towards the second; the crossvein long before its tip, connecting it with the costa; praefurca very short, curved; proximal ends of the submarginal, first posterior and discal cells not in a line; distance from the root to the distal end of the triangular cell not much shorter than the first basal cell; the fifth and sixth veins anastomose near the stout crossvein. — These characters exist also in the female; but the thickening of the costa at and beyond the end of the first posterior cell does not exist here; the stigma is much smaller; the distance between the seventh vein and the posterior margin is a little broader in the male, but the difference is not very marked; ovipositor very small (Note taken from the types in Vienna).

2. *P. aberrans* ♀.

Rhamphidia aberrans Schiner, Reise d. Novara etc. p. 43.
South America.

The triangular cell here is comparatively a little shorter; the praefurca a little longer and more straight; the proximal ends of the submarginal, first posterior and discal cells are in one line; the first longitudinal ends in the second, but the crossvein connecting it with the costa is nearer its end than in the preceding species; the course of the auxiliary vein and the position of the subcostal crossvein are the same. (Note taken from the type.)

3. *P. incommoda* n. sp. ♂. Black, thorax shining; discal cell open; proximal end of the submarginal cell much before that of the first posterior. Long. corp. 4 mm.

Head altogether black (brown in old specimens); antennae of the same color; front whitish, hoary. Thorax black, shining, hoary on the pleurae; abdomen, including genitals, brown; halteres yellow

at base, knob brown; legs brown, base of femora and trochanters paler. Wings hyaline, rather narrow; stigma pale brownish, filling out the marginal cell, except at both ends; apex of the wing slightly clouded with brown; crossvein at the tip of the first longitudinal vein in one line with that tip; praefurea nearly of the same length as the first section of the third vein; great crossvein anterior to the discal cell, the distance being but little shorter than its own length; the stout crossvein at the proximal end of the basal cells is not far from the middle of the distance between the root of the wing and the tip of the first longitudinal vein.

Hab. Brazil. Two males. (Vienna Museum; Coll. v. Winthem).

The specimens being old and faded, I have described the coloring of the body in general terms only; I am not sure whether the pale brown, or tawny tints which I perceive on some parts of the thorax, especially on and around the scutellum, exist in fresh specimens.

4. *P. Schineri* n. sp. ♂ ♀. Thorax yellowish-red, shining; discal cell closed; proximal end of the submarginal cell on the same line with that of the first posterior. Long. corp. 5 mm.

Head, antennae and rostrum brown; thorax shining, yellowish-ferruginous, with a black stripe in front; abdomen yellowish-brown, dark-brown towards the tip; halteres with dark-brown knobs. Legs brownish-yellow, tips of femora darker; tarsi brownish. Wings slightly tinged with yellowish, which becomes more intense in the region of the stigma; apex slightly clouded with brownish; crossveins near the root of the wing, as well as those in the middle, clouded with brown. A short stump of a vein on the curvature of the tip of the first vein; the marginal crossvein immediately behind it; first basal cell unusually broad; proximal ends of the submarginal, first posterior and discal cells nearly in a line.

Hab. Brasil (Sello; Berl. Mus.), three ♂, one ♀. I also refer here a male in the Museum in Vienna (Coll. v. Winthem).

Limnobia.

Meigen, Syst. Besch. etc. Vol. I; 1818; O. Sacken, Monogr. etc. IV, p. 84.

Limonia Meig. Illiger's Mag. 1803. (Rejected by Meigen himself.)
Ex parte: *Limnomyza* Rondani, Prod. Vol. I, 1856.

The sexual differentiation of the structure of the last tarsal joint is less marked here than in *Dicranomyia*. It seems to be variable in different species; I do not perceive it in *quadrinotata* M.; there is a trace of it in *tripunctata*; it is rather distinct in *nigropunctata*.

Hardly any *Limnobiae* are found in collections, besides those from Europe and North-America. *L. infixa* Walk. from New-Guinea reproduces the european type. The South-American species *Limnobia diva* Schiner and a mexican species in the Berlin Museum have a supernumerary crossvein in the submarginal cell.

Mr. Beling (Verh. Z. B. Ges. 1873, p. 590—591 and 1878, p. 53—56) has described the early stages of five european species.

Limnomyza Rond. Was proposed for the group of species in which the marginal crossvein is at some distance from the tip of the first vein (like *L. tripunctata*.)

Trochobola.

O. Sacken, Monogr. etc. IV, p. 97; 1868.

Discobola (preoccupied) O. Sacken, Proc. Ent. Soc. Phil. 1865, p. 226.

Professor Mik has discovered both *T. annulata* and *caesarea* O. S. in Upper Austria and has confirmed the specific rights of the latter species. In an article entitled: Ueb. die Artrechte von *T. caesarea* (Verh. Z. B. Ges. 1878, p. 617—626, Tab. 10, f. 7—12) he gave an exhaustive survey of the literature of *Trochobola*, with figures of the wings and of the male forceps of the two species. Later, he described the pupa of *T. caesarea* (Wien. Ent. Z. 1884). This species has also been found near Moscow (Fedchenko, List of Dipt. of the environs of Moscow, 1868, p. 44). The North-American *T. argus* is very like the european species.

Trochobola also occurs in S. E. Australia and especially in New-Zealand. I know now at last three easily distinguishable species from these regions.

Dapanoptera.

O. Sacken manuscript name, apud

Westwood, Trans. Ent. Soc. London 1881, p. 365, Tab. 17, f. 2.

A true *Limnobia*, in the sense of my Monograph, (Monogr. N. Am. Dipt. Vol. IV, p. 84) with 14-jointed antennae, a male forceps with a distinct style (adminiculum) on the underside, dentate claws, the auxiliary vein ending about the middle of the distance between the origin of the praefurca and the end of the first vein. The peculiar, although only secondary character, upon which this genus is established, is found in the wings, which being deeply colored, have a conspicuous hyaline spot at the end of the first longitudinal vein; upon reaching this spot, the first vein becomes abruptly evanescent; both of its ends (that is, the crossvein, running towards the costa,

and the real end of the first vein, turned towards the second) are placed within that hyaline spot and are colorless and very weakly marked, sometimes (in the specimen of *P. perdecora*, which I have seen) imperceptible. The known species have a supernumerary cross-vein in the first posterior cell, beyond the discal (a great deal beyond in *P. plenipennis*, and only a little in the three other species). *P. plenipennis* also differs from the other species in having the second and third veins, as well as the first vein issuing from the discal cell, strongly wavy, which gives the venation a peculiar appearance (Westw., l. c. fig. 2).

The wings of the four species hitherto described are more handsomely colored than those of any other Tipulidae. They are the birds of paradise in this family, the more so as they come from New Guinea and the adjacent islands, the home of the true birds of paradise.

Wings with a single hyaline spot at the end of the first vein.

Wings brown at base and apex, and fulvous in the middle.

The hyaline spot is enclosed within the brown at the apex of the wing; abdomen black

auroatra Walk. J. Proc. Lin. Soc. VII, 202.

The hyaline spot is on the edge of the brown at the apex of the wing; abdomen yellow in the middle

latifascia Walk. l. c. VIII, 104.

Wings (excepting the hyaline spot) uniformly brown, with various spots in darker brown

perdecora Walk. l. c. V. 230.

Wings with other hyaline spots, besides the one at the end of the first vein

plenipennis Walk. l. c. VIII. 103.

Libnotes.

Westwood, Trans. Ent. Soc. 1876, p. 505, Tab. III. f. 6b.

This genus was introduced for *L. Thwaitesiana* n. sp. from Ceylon, on account of its peculiar venation. Mr. v. d. Wulp added a new species, *L. notata* from Sumatra (Tidschr. v. Ent. Vol. XXI, p. 194). I found five *Libnotes* among the *Limnobiae* described by Mr. Walker from Mr. Wallace's collections; moreover I described six new ones, so that the whole number now reaches thirteen. The geographical range of *Libnotes* extends from Ceylon (*Thwaitesiana*) and the Philippines (*Semperi*, *termitina*) to N. Guinea (*quadrifurca*).

As some doubts have arisen concerning the systematic position

of this genus (see Westwood l. c. and v. d. Wulp Tijdschr. XXI, p. 196) the following remarks will not be out of place.

Libnotes agrees in all the primary characters with *Limnobia* (sensu stricto): antennae 14-jointed, the last-joint with an elongation sometimes simulating a 15th joint; structure of rostrum and lips similar to that in *Limnobia*; rather broad collare; genitals with the characteristic style on the underside; unguis dentate on the underside; no spurs; no empodia; venation of the type of *Limnobia*, that is, a single submarginal cell; the end of the auxiliary vein far beyond the origin of the praefurca; four posterior cells etc.

The peculiarity of this venation consists in an extraordinary elongation and curvature of the cells in the distal half of the wing, and in a corresponding shortness and obliquity of the praefurca; but these are characters of only secondary value, sufficient for the establishment of a genus, but not sufficient for involving a corresponding modification of the primary characters with it. Thus *Libnotes* is nothing but a *Limnobia* with a venation, not modified at all in the groundplan, but strongly exaggerated in its details, which gives the insect a peculiar and somewhat deceptive aspect.

Another peculiarity of *Libnotes* consists in the form and position of the stigma; it is shapeless, spread over the whole interval between the costa and the first vein, up to the tip of the auxiliary vein, but encroaching very little beyond the first vein; (usually among the Tipulidae brevipalpi, the stigma is cut in two by the first vein). *L. familiaris* alone has a small, rounded stigmatic spot at the end of the first vein.

The venation, in its details, shows slight differences in different species. The bases of the 2^d and 3^d posterior cells are sometimes nearly on the same line (*simplex*, *aurantiaca*, *Thwaitesiana*, *innotabilis*, *impressa*, *Semperi*, *termitina*); sometimes the proximal end of the 2^d p. c. is nearer the root of the wing than that of the 3^d; (*poeciloptera*, *notata*, *strigivena*, *imponens*; *quadrifurca* and *familiaris* hold the middle between the two forms). The relative position of the end of the first vein and of the marginal crossvein also varies in different species. In *L. Thwaitesiana* the tip of the first vein is represented as incurved towards the second, the crossvein (not visible in the figure), probably being between it and the costa. The same structure exists in *L. simplex*, *innotabilis*, *impressa*, *termitina*, *Semperi*. In the other species, the first vein takes the usual course, the crossvein being more or less near its tip (at the tip in *notata*, *strigivena* and *familiaris*; not far from it in

aurantiaca and *quadrifurca*; a little farther in *poeciloptera*). All these differences also occur among the species of true *Limnobia*.

The forceps of the male, as I have said above, shows the same structure as that of *Limnobia*; I perceive in the different species some modifications of detail, which I am unable to study in the dry specimens. The ovipositor of the female (*poeciloptera*, *quadrifurca*, *Semper*, *termitina* are the only species of which I have seen females) has comparatively short and narrow valves.

I supply the description of *L. aurantica* Dol. very imperfectly described by the author.

Libnotes aurantiaca.

Limnobia aurantiaca Dolesch. Natuurk. Tijdschr. vor Nederlandsch Indie, Deel XVII, 1858, p. 78.

Yellow, thorax with stripes; abdomen with four brown bands; wings hyaline with four pale brown marks along the anterior margin. Long. corp. 9—10 mm. Male.

Head yellow; antennae brownish-yellow. Thorax yellow with dark-brown spots or stripes; metanotum brown, with yellow median line and tip. Halteres yellow, knob brown. Abdomen reddish yellow; on each of the segments 3—6 a brown band not touching the posterior margin. Legs yellow, tip of femora brown. Wings almost hyaline, very slightly tinged with brownish-yellow; costal and first longitudinal veins yellow, the other veins yellowish-brown; more brown around the discal cell. A pale brown spot at the base of the basal cells reaches from the costa to the posterior margin and tinges the intervening veins in dark brown; a second smaller spot on the costa covers the root of the praefurca; a third one, still smaller, at the tip of the auxiliary vein; and a fourth occupies a part of the stigma, on both sides of the marginal crossvein. Praefurca very short, oblique, thus looking almost like a crossvein; 2^d and 3^d posterior cells nearly of the same length at the proximal ends; the first longitudinal vein turns at a nearly right angle towards the costa; the marginal crossvein is less than a millimeter before its tip. All the veins ending in the apex of the wing are very much curved backwards.

Hab. Amboina (Doleschall, 1859); a single male in the Museum in Vienna.

The head and thorax being mouldy could not be described more in detail. But a beautiful unpublished figure in my possession (a copy of Doleschalls original drawing), represents the head as yellow; on the thorax, in front of the suture, there are four brown spots, connected at their inner ends; two smaller spots behinds the suture.

The venation resembles that of *L. Thwaitesiana* Westw. (Tr. Ent. Soc. Lond. 1876, Tab. III, fig. 6b), except that, in the latter, the tip of the first vein is represented as incurved towards the second and ending in it; the cells in the apical portion of the wing are not quite as long as in *L. aurantiaca*.

Analytical Table of the species.

End of the first vein incurved towards the second¹⁾.

Wings uniformly brown

Abdomen deep black *Semper* O. S.

Abdomen red, black at tip *termitina* O. S.

Wings subhyaline, without spots.

Inner end of the 2^d post. c. much more proximal than the inner end of the 3^d p. c.; marginal crossvein at the tip of the first longit. vein *imponens* Walk.

Inner end of the 2^d post. c. but little more proximal than the inner end of the 3^d p. c., or on the same line with it

Thorax yellowish-brown with brown stripes

impressa Wk.

Thorax reddish-yellow without stripes

Great crossvein before the middle of the discal cell; costal cell infuscated

Thwaitesiana

Westw.

Great crossvein opposite the middle of the discal cell; inner ends of the 2^d and 3^d p. c. in a line *simplex* O. S.

Great crossvein beyond the middle of the discal cell *innotabilis* Wk.

End of the first vein incurved towards the costa; marginal crossvein either very near its tip or removed from it.

Wings with numerous brown spots

Brown spots on the veins small and delicate, not numerous enough to affect the general color of the wing; inner end of the second posterior cell much more proximal than that of the third.

¹⁾ When the marginal crossvein is at the tip of the first vein (*L. imponens*, *strigivena*), a doubt may arise which alternative to take; in such a case both must be tried.

Marginal crossvein remote from tip of first vein
poeciloptera O. S.

Marginal crossvein at the tip of the first vein
strigivena Wk.

Spots and small clouds along the veins very numerous, imparting to the wings a brownish and very checkered appearance; inner ends of the 2^d and 3^d post. cells nearly equally proximal *quadrifurca* Wk.

Wings unicolorous, except some spots along the costa.

Inner end of the 2^d post. cell considerably more proximal than that of the 3^d p. c. . . . *notata* v. d. W.

Inner end of the 2^d p. c. very little more proximal than that of the third

Three brownish spots along the costa

aurantiaca Dol.

No brownish spots near the costa, except the brown stigma *familiaris* O. S.

Section II. *Limnobina anomala*.

O. Sacken, Monogr. etc. IV, p. 100—102.

Mr. v. d. Wulp, Dipt. Neerl. I, p. 338, calls this section *Antochina* and Mr. Verrall, Ent. M. Mag. XXIII, p. 117 *Rhamphidiinae*. I retain the name which I originally gave to this group, because it defines its artificial character. *Antochina* and *Rhamphidiina* means relatives of *Antocha* and *Rhamphidia* which the majority of the genera of this section by no means are.

Rhamphidia.

Meigen, Syst. Besch. etc. VI, p. 281, 1830; O. Sacken, Monogr. etc. IV, p. 103.

Leptorhina Stephens, Catal. etc. 1829.

Megarhina St. Fargeau, Encycl. Méth. Ins. X, p. 585; 1825.

Helius St. Fargeau, l. c. Index, p. 831.

The larva of *R. longirostris* has been found by Mr. Gercke in the stems of *Rumex aquaticus*; he believes that it lives under water (Verh. d. Ver. f. naturw. Unterhaltung in Hamburg, Bd. VI, 1880). Mr. Verrall (Ent. M. Mag. 1887, Vol. 23, p. 205) thinks that the European *Rhamphidiac*, published under three names, represent the same species. I have shown (Monogr. etc. IV, p. 104) that the N. American species is very variable in its coloring.

I describe the south-american species which I have mentioned in my Monograph:

Rhamphidia albitarsis n. sp.

Reddish-brown, abdomen darker; a darker line in the middle of the thoracic dorsum; legs pale-brown, distal half of the tarsi white; wings subhyaline, with a slight brownish shade in the apical portion; stigma distinct, pale brown, rather narrow. The rostrum is a little longer than the head, infuscated at tip; antennae and palpi brown (I cannot see the color of the base of the antennae). Length about 6—7 mm.

Hab. Porto Rico (Moritz); a single male in the Berlin Museum.

This species faithfully reproduces the characters of the european *Rhamphidia*. The venation is the same; the marginal crossvein absent; the submarginal cell is in contact with the discal, so that the small crossvein is wanting; this last character, however, is probably variable (comp. Monogr. etc. p. 104).

I abstain from describing another species in the Berlin Museum (a single female; Brazil) because it seems to me that the end of the rostrum is broken off. The venation is somewhat different from that of the preceding species; the discal cell larger, the second vein shorter, the small crossvein present etc. The color is yellow, the tips of the femora are brown. —

Elephantomyia.

O. Sacken, Proc. Acad. Nat. Sc. Phil. 1859, p. 220; id. Monogr. etc. IV, p. 106, Tab. 1, f. 5 (wing); 3, f. 8 (forceps).

At the time of the publication of my monograph a single north-american species and three species, included in the prussian amber, were known. Since then a species, apparently identical with the N. American *E. Westwoodi*, has been discovered in Europe (near Munich: compare my article: A relic of the tertiary period in Europe; in the Mittheil. d. Münchener Entom. Ver. 1881, p. 152—154).

Among the specimens from Caffraria, brought home by Wahlberg, and which I saw in the Museum in Stockholm, there is an *Elephantomyia*, which as far as I saw, agrees in all the generic characters with the N. American species, even in the characteristic absence of the marginal crossvein. In the British Museum I saw a piece of copal from the eastern coast of Africa, which contains half a dozen specimens of *Elephantomyia*.

At present therefore *Elephantomyia* is known to occur in Europe (apparently very rare), N. America, Southern Africa (both alive and semi-fossil in copal) and in the prussian amber.

I have seen in the British Museum three species from the Indo-Malay Archipelago (*Limnobia delectata* Wk., North Ceram; *L. filiformis* Wk., Salwatty, and *L. argentocincta* Wk., Borneo) which may be provisionally considered as Elephantomyia, until an opportunity is afforded to study them more in detail. (The type specimens are in a very indifferent condition.) They have the same long, filiform rostrum, with the palpi at the end, and when Walker, in the description of his *L. filiformis* speaks of the „antenna being curved upwards, filiform, very slender etc.“ he describes the rostrum, which he mistook for an antenna. The wings of *L. filiformis* are broken off in the type specimen. Of those of *argentocincta* I drew a rough sketch, which represents the proximal end of the marginal cell as broader than in *Elephantomyia Westwoodi*; that is, the praefurca, at its basis, describes a much greater curve; it is in one line with the third vein, so that the section of the second vein, posterior to the origin of the third, is arcuated at its base; the submarginal cell is considerably longer than the first posterior; the posterior cells are comparatively shorter than in *E. Westwoodi*; the discal has nearly the same shape, and the posterior crossvein is inserted near its middle. — The venation of *L. delectata* Wk. is nearly the same, only the bases of the submarginal and first posterior cells are in one line. I failed to notice whether the marginal crossvein was present in those specimens, or not.

Toxorrhina.

Loew, Linn. Entom. V, p. 400, Tab. 2, f. 17, 1851; O. Sacken, Monogr. etc. IV, p. 109.

Spurious genus: *Limnobiorkhynchus* Westwood, Annales Soc. Ent. Fr. 1835, p. 683 (the male belongs here; the female is a *Geranomyia*; see above, p. 173).

Professor Westwood (Trans. Ent. Soc. London 1881, p. 385) published figures of the head, the antennae, and the wings of *Toxorrhina (Limnobiorkhynchus) braziliensis* West. — *Toxorrhinae* have been found in North and South America only.

For the solution of the *imbroglio* between *Limnobiorkhynchus*, *Toxorrhina* and *Geranomyia* see Monogr. etc. IV, p. 113—14, written after I had seen Prof. Westwood's original types.

Styngomyia.

Loew, Dipterol. Beiträge I, p. 6, w. figure (1847); O. Sacken, Monogr. etc. IV, p. 102; and Additions in Vol. III, at the end.

This singular genus originally described from specimens included in copal from Zanzibar and also in amber, has been discovered since

as still living in South-Africa. In the Museum in Stockholm I have seen recent specimens brought from Caffraria by Wahlberg.

Dicranoptycha.

O. Sacken, Proc. Acad. Nat. Sc. Phil. 1859; Monogr. etc. IV, p. 116; Tab. 1, f. 8, wings.

A small number of species in Europe and North-America.

Orimarga.

O. Sacken, Monogr. etc. IV, p. 120; Tab. 1, f. 9, wing; 1869.

Ninguis Wallengren, Entom. Tidskr. Stockholm 1881. (Synonymy by Mik, Wien. Ent. Ztg. 1882, p. 99.)

Two or three species have been found in different parts of Europe (Sweden, Austria, Germany, North of Italy, England). *O. anomala* Mik, Wien. Ent. Z. 1883, p. 201 shows some peculiarities in the venation, especially in the position of the anterior crossvein; the characteristic length of the praefurca and the position of the great crossvein are the same.

Diotrepha.

O. Sacken, Catal. of the N. Am. Dipt. 1878, p. 27 and p. 219, note 28.

This, as yet imperfectly known genus occurs in the southern United States and in Cuba; a single species has been described.

Elliptera.

Schiner, Wiener Entom. Monatschr. VII, pag. 222, 1863; O. Sacken, Monogr. etc. IV, p. 122. Tab. 1, f. 10.

Besides the single European species, described by Schiner and Egger (Verh. Z. B. Ges. 1863, p. 1108), there is a Californian species, which differs from the former by a closed discal cell (*Elliptera clausa* O. S. Western Diptera, p. 198). The forceps of the male, which I observed in life, resembles that of a *Limnophila*, and not all that of a *Dicranomyia*. In my Monograph I alluded to a second, undescribed European species in Loew's collection; it may perhaps be the same as the *E. hungarica*, described since by Mr. Madarassy (in Termeszeträjzi füsetek etc. Vol. V, p. 27; Buda Pest 1881).

Prof. Mik (Wien. Ent. Z. V, p. 337—344, Tab. 6; 1886) gave a detailed description, with figures, of the larva and pupa of *Elliptera*, as well as of the male forceps and of the ovipositor of the imago. The larva lives in the sheets of water running over stone or wooden walls, and is enclosed in a cocon-like sheath.

Teucholabis.

O. Sacken, Proc. Ac. N. Sc. Phil. 1859; Monogr. etc. IV, p. 129;

Tab. 1, f. 12, wing; Tab. 3, f. 9, forceps.

Since my article on this genus in the Monographs, where only american species are mentioned, its area has been extended to southern Asia (*T. bicolor* O. S., Ann. Mus. Civ. Genoa XVI, p. 404; Sumatra) and New Guinea (*Limnobia exclusa* Walk. J. Proc. Linn. Soc. VIII, p. 105). With the three species described below, the total number is now thirteen.

A rather characteristic feature of *Teucholabis*, not mentioned by me before, is a slight expansion of the subcostal cell near the stigma, visible in most species; it also occurs in the closely allied genus *Paratropesa*.

Teucholabis fenestrata n. sp. Dark brown, thorax ferruginous-red, shining, striped with black; wings brownish. subhyaline on the proximal half. Length 5—6 mm.

Head, antennae and palpi black, front shining. Thorax ferruginous-red shining, with black stripes; the intermediate stops before the collar, the lateral ones sometimes are indistinct; hind part of metanotum, and sides of pectus blackish. Abdomen, including the ♂ genitals, dark brown; ovipositor reddish-yellow; halteres brown; legs, including coxae, dark brown or black, hairy, rather stout. Wings tinged with brown, except a large subhyaline space on the proximal half, between the first vein and the hind margin; this hyaline space does not quite reach the central crossveins; and it touches the hind margin only between the root and the anal angle; a second, much smaller, hyaline spot, ill defined in outline, on the distal half of the wing, between the second and fourth veins, usually covering the crossveins at the end of the discal cell.

Hab. Ceylon; a ♂ and a ♀ in Mr. Bigot's collection; also specimens in the Museum in Leiden.

Undoubtedly a *Teucholabis*, although of a somewhat different type than *T. bicolor*. The discal cell is comparatively smaller here, and much shorter than the 2^d post. c., while in *T. bicolor* it is a little longer; the collar is a little less developed; the first longitudinal vein extends a little beyond the marginal crossvein; and the slight enlargement of the costal cell, near that crossvein, which exists in the typical species, is not visible here.

Teucholabis determinata n. sp. ♂. Thorax yellow, variegated with black; wings with a faint brown crossband and brown

apex, legs yellow; tips of the femora and of the tarsi brownish. Long. corp. about 7 mm.

Head reddish-brown; proboscis rather long; antennae brown, yellowish at the base. Collare bright reddish-yellow; thoracic dorsum of the same color, shining, with three large black spots, two of which on the sides, immediately in front of the suture; the third smaller, triangular, just behind the collare (the thoracic dorsum might as well be described as black, with a yellow stripe in the middle, forming a fork in front); behind the suture, the color is partly yellow, partly black (somewhat indistinct in the described specimen, on account of the pin inserted here); scutellum and metathorax dark brown or black. Halteres with yellow knobs; stem brown. The abdomen (very much contracted in drying) seems to have been brown. Legs yellow, including the front coxae; hind coxae brownish. Tips of all the femora brownish; front tibiae and tarsi and tips of the other tibiae and tarsi, likewise brownish. Wings with a pale brown crossband reaching from the darker brown stigma, across the central crossveins, to the sixth vein; apex also brownish.

Hab. Sula (Indo-Malay Archipelago); a single male. I preserve the name under which I found it in the British Museum.

Teucholabis polita n. sp. ♂. Black, thorax shining, wings with two brown crossbands and a brown apex. Long. corp. 2.5—3 mm.

Head, rostrum and palpi black; antennae brown. Thorax black, dorsum shining; halteres brown, knobs yellow; abdomen, including genitals, blackish brown. Legs light brown, except coxae and proximal two thirds of the femora, which are yellowish-tawny. Wings hyaline, with brown crossbands; the first between the base of the praefurca and the end of the seventh vein; the next between the stigma and the end of the sixth vein, covering the central crossveins; apex of the wing, as far as the distal end of the discal cell, brown; a faint pale brown spot in the proximal angle of the basal cells.

Hab. Brazil (Coll. Winth. Vienna Mus.). A single male.

Paratropesa.

Schiner, Verh. Zool. Bot. Ges. 1866, p. 932; Reise der Novara, Dipt. p. 44, Tab. 2, f. 2; O. Sacken, Monographs etc. IV, p. 132 and 333.

I have shown (l. c.) that this genus is a close relative to *Teucholabis*, the presence of two submarginal cells notwithstanding. In fact the usual single submarginal cell is divided in two by a supernumerary crossvein, which, being sometimes placed obliquely,

looks like a branch of the second vein. This structure probably serves to strengthen the interval between the second vein and the margin, unusually broad here. A similar supernumerary crossvein occurs in some *Trypetae*, like *T. gibba* Loew and a Brazilian *Trypeta*, wrongly taken for an Ortalid by Mr. Bigot¹).

The contact of the submarginal cell with the discal is not a necessary generic character, although it occurs in the typical species, as well as in the two species described by me since (*P. praeusta* O. S. Biol. Centr. Am. Dipt. p. 8 and *P. collaris* described below). For this reason I consider the *Limnobia fasciolaris* Wied. A. Z. I, p. 552, Tab. 6b, f. 11 (Brazil) as a *Paratropesa*, although it is figured with an open discal cell. Schiner suspected this relationship (l. c.), but overlooked the difference in the structure of the first posterior cell. I find in my notes that I saw the type in Frankfurt.

The four species at present known belong to tropical America.

Paratropesa collaris n. sp. ♂. Black, with metallic blue and purple lustre; collare yellow; abdomen with the hind margins of the segments yellow; wings with crossband and apex brown. Long. corp. 6—7 mm.

Upper part of the head metallic, purple; the elongate rostrum and front between the eyes yellow; palpi and antennae brownish; the latter pale yellow at base. Collare elongate yellow: thorax black, shining, with purple metallic reflections; these are bluish behind the suture; halteres with a yellow knob, stem brownish. Abdomen black, with metallic purplish reflections, hind margins of the segments pale yellow. Front legs black, except the coxae and the extreme base of the femora, which are yellow; femora incrassate and very hairy on the distal half; middle femora yellow, not incrassate; tibiae and tarsi dark brown; hind femora infuscate at base and tip, so that a broad pale ring is left in the middle, incrassate and hairy towards the tip; tibiae and tarsi blackish, with dense, dark pile. — Wings hyaline; a brown cloud at the root of the basal cells, reaching the costa; a pale brownish crossband runs from the darker brown stigma to the hind margin; apex of the wing brown, which color is limited posteriorly by the short branch of the second vein and by the crossvein at the base of the second posterior cell. The discal and submarginal cells are in contact, as in the typical *P. singularis*.

Hab. Upper Amazon River (British Museum, coll. Bates; also in the collection of M. v. Roeder in Hoym).

¹) *Mikimyia furcifera* Bigot, Bullet. Soc. Ent. Fr. 13. févr. 1884.

Thaumastoptera.

Mik, Verh. Zool. Bot. Ges. 1866, p. 302; O. Sacken, Monogr. etc. IV, p. 133, fig.

Besides Illyria, where it was discovered first, the typical species *T. calceata* Mik has been found in Westphalia (Westhoff) and in England (Verrall).

Section III. Eriopterina.

O. Sacken, Monographs etc. IV, p. 135¹⁾.

Of all the sections of Tipulina this is, next to the *Limnobina anomala*, the least homogeneous; it contains the largest number of forms doubtfully or artificially referred to it. But even the typical Eriopterina offer great difficulties in their generic distribution, owing to the importance of the structural peculiarities which distinguish many species. It is easy here to introduce a large number of genera, but it is very difficult to distribute among them the new species discovered afterwards. The difficulty seems to be greater here than in any other group of Tipulidae. The genera *Trimicra*, *Symplecta*, *Psiloconopa* seem to pass into each other; the same is the case with *Goniomyia* and *Gnophomyia*. Some of the subgenera established by me, within the genus *Erioptera* Meigen, seemed good enough for the north-american species, for which I introduced them; but they proved insufficient when new accessions in species had to be distributed among them. The study of freshly caught specimens, but especially a larger material in species may perhaps gradually solve these difficulties. We must remember that exotic Eriopterina are almost unknown! Except the three species from Chili, published by Philippi, none whatever have been described. But in the mean time we must be very cautious in establishing new genera of Eriopterina.

To the genera, artificially referred to the Eriopterina, I can add now, besides *Cladura* (N. America) and *Sigmatomera* (South and Central-America), two new ones: *Lecteria* (S. America) and *Conosia* (Asia). They have the appearance of Limnophilae rather than of *Eriopterae*. But they have no spurs at the end of the tibiae, which compels me to place them at the end of the Eriopterina, until their true affinities are recognized. Except *Sigma-*

¹⁾ On page 135, at the bottom, strike out the passage, beginning with „I believe now etc.“ and ending, on the next page, with „typical Eriopterina.“ On p. 137, line 11 from top for *Psiloconopa*, read *Goniomyia*.

tomera they all have five posterior cells, while all the other *Erioptera* have only four.

About *Lachnocera* Philippi, Verh. Z. B. Ges. 1865, p. 615, Tab. 23, fig. 5 I am not better informed than before (comp. O. S. Monogr. etc. IV, p. 137 and 192).

Polymoria Philippi (Verh. Z. B. Ges. 1865, p. 608, Tab. 23 f. 3) should be placed among the anomalous *Eriopterae* with five posterior cells, if the statement that it has no spurs on the tibiae be correct. Compare about it my Monogr. etc. Vol. IV, p. 334—335. The name *Polymoria* is preoccupied by Förster, Chalcididae 1856.

Rhypholophus.

Kolenati, Wiener Entom. Mon. 1863, p. 393; O. Sacken, Monogr. etc. IV, p. 139, Tab. 1, fig. 14, 15 (wings).

Ex parte synonyms:

Ilisomyia Rondani, Prodr. Vol. I, 1856 (insufficient definition).

Dasyptera Schiner, Wien. Ent. Mon. 1863. p. 221 (compare O. S. Monogr., l. c.).

Ormosia Rondani, Prodr. Vol. I, 1856.

Besides Europe and North-America *Rhypholophus* occurs in New Zealand. The pupa of *R. (Dasyptera) haemorrhoidalis* has been described by Mr. Beling (Verh. Z. B. Ges. 1878. p. 48); a mention of the pupae of *D. lineata* M. and *nodulosa* Macq. by the same, will be found l. c. 1886, p. 202.

I do not understand what induced Loew to declare that *Rhypholophus phryganopterus* Kolenati is the same as *Eriopt. fascipennis* Zett. (Loew, Besch. Eur. Dipt. III, p. 43). Dr. F. Stein (Stett. Ent. Z. 1873, p. 241) and Mr. v. d. Wulp (Dipt. Neerl. I, p. 426) adopt this synonymy. But Zetterstedt's description does not mention the four thoracic stripes described by Kolenati, he speaks of the scutellum as „testaceous“ etc. I have a ♂ and ♀ taken on the S. Gothard before me, which answer Kolenati's, but not Zetterstedt's description; they agree with Kolenati's types in Loew's collection (Berl. Mus.).

Molophilus.

Curtis, Brit. Ent. 444, 1833; O. Sacken, Monogr. etc. IV, p. 143, Tab. 1, fig. 16—19, wings; Tab. 4, f. 14—16, forceps.

Erioptera sensu str. Schiner, W. Ent. Mon. 1863, p. 221; Fauna Austr. II, p. 541; Rondani Prodr. etc. 1856,

This is a well-defined group which can be definitively separated from *Erioptera* Meig. Besides Europe and North-America I have

specimens from New Zealand. The larva and pupa of *M. ochraceus* are described by Beling, Verh. Z. B. Ges. 1886, p. 193; the larva of *M. obscurus* is merely mentioned by him, l. c. 1878, p. 56.

In the Monogr. etc. IV, p. 149—150 I have given my reasons why the generic name *Erioptera* should be retained for Meigen's first and principal division (Div. A.) in his principal work. The reason alleged by Schiner for his nomenclature in this case (Wien. Ent. Z. l. c.) implies an oversight on his part. He says: „I have retained for there species *E. atra*, *murina* etc.) the name *Erioptera*, because *Tipula erioptera* Fabr. (Syn. *E. atra*) may have given occasion for the formation of that generic name.“ Schiner overlooks that the name *T. erioptera* appeared in Syst. Antl. 1805, two years later than *Erioptera atra* Meig. Illig. Mag. 1803 its synonym. It was therefore Fabricius who borrowed the name from Meigen and not vice-versa.

Erioptera.

Meigen, in Illiger's Magaz. 1883; O. Sacken, Monogr. etc. IV, p. 146, Tab. 1, f. 16—19, wings; Tab. 4, fig. 14—16, forceps.

I still prefer, as I did in 1868, to maintain as subdivisions of this genus the groups which I formed in it. Further accessions of european and exotic material should be waited for, before the definitions of these groups can be settled. *Molophilus* alone can, I think, be finally accepted.

1. *Acyphona* O. Sack. l. c. p. 151, Tab. 1, f. 17, wing; Tab. 4, f. 16, forceps.

This well-characterized group contains four north-american and one european species (*E. maculata*). Besides the venation, it is characterized by a more simple structure of the forceps, the movable appendages of which fastened to the basal pieces, are rather short and stout (see the figure in the Monograph; the european species has them more slender). In my Catal. N. Am. Dipt. 1878, p. 220 I have pointed out that Loew (Besch. Eur. Dipt. III, p. 50) was mistaken about *Acyphona*, and based its interpretation on my statements in Monogr. Vol. IV, p. 158 only, overlooking the detailed character, as given l. c. p. 151—52. The pupa of *A. maculata* is described by Beling, Verh. Z. B. Ver. 1878, p. 49.

NB. *Erioptera bipartita* O. S. from California is erroneously placed in the subgenus *Hoplolabis* in my Catal. N. Am. Dipt. 1878, p. 29. It is an *Acyphona*.

2. *Hoplolabis* O. Sack. l. c. p. 152, Tab. 1, fig. 18 wing; Tab. 4, fig. 14 forceps. Has not been found outside of North-America.

3. *Mesocyphona* O. Sack. l. c. p. 152, Tab. 4, f. 15, forceps; Western Diptera, p. 199. Represented by three north-american species. The discovery of the californian species proved that in my definition of this group I had laid too much stress on the forking of the third or fourth vein in the formation of the discal cell. *Mesocyphona fossarum* Loew, Besch. Eur. Dipt. III, p. 51 (from Meseritz, Prussia) does not seem to belong here but I am not prepared at present to assign it any other place.

4. *Erioptera* sensu stricto; O. Sack., l. c. p. 151, Tab. 1, f. 16, wing, Tab. 4, fig. 20, forceps. (Syn. *Chemalida* Rondani, Prodr. 1, p. 180, 1856; *Trichosticha*, Schiner, Wien. Ent. Mon. 1863, p. 221; Fauna Austr. II, p. 538 (ex parte).

Europe and North-America; contains the bulk of the species of *Erioptera* Meigen. The early stages of *E. lutea* and *flavescens* have been described by Beling, Verh. Zool. Bot. Ges. 1878, pag. 50 and 1886, p. 192.

Chemalida Rond. as far as I can judge from his very brief indications, coincides with *Erioptera* in the narrower sense; the description of the seventh vein settles this point: „undulata et longa ut areolae basillares“ (Prodr. etc. I, p. 180, line 3 from top).

Trichosticha Schiner is not a well conceived genus, containing besides the true *Eriopterae*, species of *Acyphona*, *Lipsothrix* and *Cheilotrichia*.

5. *Cheilotrichia* Rossi, Syst. Verz. Oesterr. Dipt., Wien 1848. Mr. Verral (Ent. M. Mag. Oct. 1886, p. 118) places the european *Erioptera imbuta* (Synon. *E. cothurnata* Macq. Dipt. du Nord etc. I, p. 161) in the subgenus *Acyphona*, and he is right in so far as the venation shows some relationship to that group. But *E. imbuta* differs from all *Eriopterae*, even in Meigen's sense, in the position of the subcostal crossvein, which is placed at the end of the auxiliary vein, and not at a considerable distance from that end, as is the case in all *Eriopterae* in Meigen's sense. I may be mistaken, but I consider this character as important. Other differences from *Acyphona* are found in the structure of the forceps, which has very long basal pieces and proportionally developed, long, slender horny appendages; the origin of the second vein is much less near the root of the wing; the very short submarginal cell, and the marginal crossvein, inserted before its proximal end, remind of the venation of *Empeda*.

These differences induce me to revive the name *Cheilotrichia*, proposed by the austrian dipterologist Rossi for *E. imbuta* together

with *E. cinerascens*. No definition was given, but the association of these two species proves that the presence of a discal cell was the principal character. *E. cinerascens*, as I shall presently show, belongs in another division; the subgeneric name may remain for *E. imbuta*, with the definition just given by me. The question whether *Cheilotrichia* on account of the peculiarities of its venation, should not be entirely separated from *Erioptera* in the sense of my Monograph I do not attempt to solve here.

6. Among the doubtful forms referred to *Erioptera* there is the *E. trivialis* M. (*cinerascens* M.), whose synonymy with *L. ciliaris* Schum., proposed by me in the Stett. Ent. Z. 1854. p. 209, although adopted by Schiner, still requires confirmation. *E. trivialis* seems to have some affinity to *Trimicra* and *Psiloconopa* in its general habit and in the character of its venation; it has very little pubescence on the wingveins. Should a new generic name become necessary, *Platytoma* Lioy (I Ditteri etc. 1864, p. 42) might be available; it was introduced for *E. cinerascens* and defined „second joint of the antennae elongate and stout; wings with a discal cell.“ But this latter character is variable in this species.

Trimicra.

O. Sacken, Proc. Ac. Nat. Sc. Philad. 1861, pag. 290; Monographs etc. IV, p. 165; Tab. 2. f. 1, wing.

This genus is cosmopolitan and occurs in all Europe, North-America (atlantic and pacific States, Mexico); South-America (Brazil, Argentine Republic, Chili); Africa (Egypt, Southern Africa, Madeira, Canary-Islands); Australia (Sidney, Swan River), New Zealand; the Island of St. Paul in the Southern Pacific. All the specimens which I have seen look more or less alike, as if they were more or less developed or degenerate forms of the same species. In New Zealand a species occurs with paler colored wings and an open discal cell. The european *T. pilipes* has been found in Sweden, Finland, Russia (in Moscow by Fedchenko), France, Germany, Holland, Switzerland etc. It is generally considered as rare, but in some localities it occurs more abundantly. Mr. Marquet, entomologist in Toulouse, told me that it was quite common there, resting on housewalls, especially above gutters. A few days after meeting Mr. Marquet (July 1882) I found several specimens in that position in the town of Arreau, in the Pyrénées. Imhoff (Insecten der Schweiz) says that, although rare elsewhere, *T. pilipes* is common in Bale, on housewalls.

Limnobia brunnipennis Macq., Suites à Buffon I, p. 106

(Lorraine) is the same as *T. pilipes*. I saw a type-specimen in Mr. E. Perris's collection, now preserved in the Agricultural college in Montpellier.

The larva and pupa of *T. pilipes* were described by Mr. Beling, Verh. Z. B. Ges. 1878, p. 48. The larvae were found in the sand of a half dried brook.

The character of this genus from which the name is derived, the abrupt diminution in size of the three last joints of the antennae is not always perceptible in dried specimens; it also remains to be proved that it occurs in the numerous exotic *Trimicrae*.

Chionea.

Dalman, K. vetensk. Acad. handl. 1816, p. 102, Tab. 2, fig. 2; id. Analecta etc. 1823.

O. Sacken, Monographs etc. IV, p. 168.

Both european species (*C. araneoides* and *crassipes*) occur very far north in Sweden (compare Zett. Dipt. Scand. XI, p. 4256), as well as in central Europe (for instance near Vienna; compare Loew, Jahrb. d. k. k. Krakauer Gel. Ges. Vol. 41, Ueber die auf d. galizischen Seite des Tatra-Gebirges beob. Dipteren, Note 3). One of them has been found in the Appenines in Italy. The usual abode of *Chionea* is under moss and stones; they have been found late in autumn (near Würzburg, Leydig, üb. die Verbr. d. Thiere im Rhöngesbirge und Maintal, in the Verh. d. Nat. Ver. d. Preuss. Rheinl. u. Westphalen, Jahrgang XXXVIII) and also as late as April (Girschner, Entomol. Nachr. 1887, p. 131). *Chionea* is chiefly nocturnal; Gravenhorst (Uebers. d. Arb. d. Schl. Ges. 1848, p. 90) observed the copula; he merely says that the female seems to take the initiative. Prof. Mik (in litt.) gave me an interesting account on the same subject: „the upper valves of the ovipositor prevent the male from getting on the back of the female; it lies on its own back, in the direction of the longitudinal axis of the body of the female; when the latter is walking it drags the male, who raises himself on his hind legs to an almost perpendicular position; this serves to explain the unusual incrassation of these legs.“

Psilonocopa.

Zetterstedt, Fauna Lapponica, 1840, p. 847; Dipt. Scand. X, p. 4007.

In the Monogr. etc. Vol. IV *Psiloconopa* should have been inserted after *Chionea*, as Gen. XX; strike it out on page 177.

It is closely allied to *Trimicra* and has the same venation; a more exact definition of the difference between the two genera is

a desideratum yet; the presence in *Trimicra* of the three abruptly smaller terminal joints of the antennae is not a sufficient criterium. The desideratum notwithstanding I believe both to be well-established genera. Originally found in Sweden, the typical *P. Meigenii* has been since discovered in Bohemia by Mr. Kowarz, and in Switzerland (v. d. Wulp, Tijdschr. etc. XXVI, p. 179). — The *P. pusilla* Schiner, in Nowicki, Beitr. z. Kenntn. d. Dipterenfauna Galiziens, 1873, p. 17, is the *Gnophomyia pusilla* Schin. Verh. Z. B. Ges. 1865, p. 995 (Austria).

Finally Prof. Mik (Wien. Ent. Z. 1886, p. 318) considers as a *Psiloconopa* the *Symplecta grata* Loew, Beschr. Eur. Dipt. III, p. 53, 1873; Neusiedler-Sec.

Symplecta.

Meigen, Syst. Beschr. etc. VI, p. 282, 1830; O. Sacken, Monogr. etc. IV, p. 170; Tab. 1, f. 20, wing; IV, 21, forceps.

Idioneura Philippi, Verh. Z. B. Ges. 1865, p. 615, Tab. 23, f. 4 (preocc. Selys, Neuropt. 1860).

Helobia S. Fargeau, Encycl. Méth. Vol. X, p. 585; 1825.

Larva and pupa were described by Mr. Beling, Verh. Z. B. Ges. 1878, p. 50.

In the Monographs etc. IV, p. 171 I showed that the species of this group hitherto described form two groups, in the second of which the anterior and not the posterior branch of the fourth vein is forked. For this second group, which would include three species *S. stictica*, *similis* and *elongata* Lw. (from Persia), Prof. Mik recently (Wien. Ent. Zeit. 1886, p. 318) introduced a new genus *Symplectomorpha*, reducing *Symplecta* to the single species *S. punctipennis*. It seems to me that this is carrying subdivision too far: all these species have a common habitus which betrays a very close relationship; the presence of a crossvein in the first submarginal cell of *S. punctipennis* cannot be considered as a generic character; the presence of supernumerary crossveins in the submarginal, the first posterior and even the basal cells among the *Limnobina* are generally specific characters only, and cannot be compared in importance with the occasional absence of the marginal crossvein. And finally, in a group which requires the formation of as many small genera as the present, the unnecessary separation of evidently related forms should be more than ever avoided.

Symplecta has not been found outside of Europe and North and South-America yet.

Gnophomyia.

O. Sacken, Proc. Acad. N. Sc. Philad. 1859; Monographs etc. IV, p. 172, Tab. 2, f. 5, wing; Tab. 4, f. 19 and 19a, forceps and ovipositor¹⁾.

In my above-quoted publications *Gnophomyia* is represented by two species, belonging to two slightly different types of structure.

I. *G. luctuosa* from North-America, together with *Limnobia nigrina* Wied. A. Z. I, p. 37 and *Limnobia rufithorax* Wied. l. c. I, p. 548, both from Brazil, belong to the first group, distinguished by a more robust stature, short, almost subglobular joints of the flagellum, with short verticils, stouter legs etc. For *L. rufithorax* Mr. Jaennicke (Neue Exot. Dipt. p. 10, Tab. 1, f. 1, 1867) introduced the new genus *Furina* (preocc. Dumér. Rept. 1853), principally based on the presence of a supernumerary crossvein in the second submarginal cell, which is a character of very inferior value. The number of joints of the antennae is not mentioned in the description, but they are represented as eleven-jointed on the plate. The type-specimen, which I have seen in Frankfort, has the tip of the antennae broken off; specimens which I saw in the British Museum have the normal number of 16 joints. A species from Australia, which I describe below, may be referred to this group. *Limnobia elegans* Wied. A. Z. II, p. 617 from the Cape likewise belongs here; perhaps also *L. stupens* Walk. Trans. Ent. Soc. Lond. N. Ser. V, p. 332 (Mexico), the type of which in the Brit. Mus. is a mere fragment.

II. The second group is represented by *G. tristissima* O. S. from North-America, the type of structure of which is exactly reproduced in the following species:

1. *Limnobia sylvatica* Meigen, Syst. Besch. I, p. 132 (Germany). I have seen a specimen from Loew's collection, now in the Berlin Museum; it has the same venation as *G. tristissima* (marginal crossvein present), and the same structure of forceps and ovipositor.

2. *Limnobia viridipennis* Gimmerthal, Bullet. etc. de Moscou, 1847 (from Curland). Mr. Bigot showed me a specimen from France, which very probably belongs to this species. It differs from *L. syl-*

¹⁾ At the time when I wrote my Monograph, I had never seen a *Psiloconopa* and misunderstood its systematic position; hence, my statements about it in that work must be struck out: on page 173 the paragraph beginning with the words: A genus closely allied etc. and ending near the bottom of p. 174 before the words: Description of the species.

vatica in having a yellow line on each side of the thorax. Whether other differences exist I cannot tell, not having had an opportunity for comparing specimens.

3. *Gnophomyia fascipennis* n. sp. and *G. caloptera* n. sp. from Brazil, described below.

These three species are more slender, less robust than those of the preceding group, the joints of the antennae are more elongate, the legs more slender etc. They come remarkably near one of the groups of *Gonomyia*, as will be shown below; they seem to differ however, as far as observed, in the constant presence of the marginal crossvein, and in the structure of the forceps.

Gnophomyia cordialis n. sp. ♂. Yellowish-ferruginous; a spot in front of thorax, two stripes upon it, and hind part of metanotum, are deep-black; wings tinged with brownish. Long. corp. 5—6 mm.

Head black above, yellowish below; rostrum somewhat prolonged, yellow, palpi brown; antennae: scapus yellow, except the tip of 2^d joint, which is brown; flagellum brown. Thorax reddish-yellow; dorsum shining; a spot on the mesonotum (where the median thoracic stripe usually begins), and two lateral stripes, deep black; the latter reach the scutellum and send out a short branch towards the root for the wings; posterior part of the metathorax with a large, black, truncate-cordiform spot. Halteres yellow, with a brown knob; legs reddish-yellow, tips of femora and tibiae faintly brownish; tarsi brownish towards the tip. Abdomen, including genitals, reddish-yellow. Wings with a brownish tinge, and with two ill-defined and faint spots of a paler color; the one precedes the central crossveins; the other, in the shape of a crossband, begins at the tip of the second vein.

Hab. Australia (Lotz, 1834, Vienna Mus.), 3 male specimens.

NB. The venation of this species is exactly like that of *Gnophomyia* (see Monogr. of N. Am. Dipt., Vol. IV, Tab. II. f. 5); all the characters are those of the Eriopterina. Legs comparatively stout, with sparse, short, stiff bristlelike hairs. The male forceps, small and difficult to study in dry specimens, seems to resemble that of *Gnophomyia*. Altogether, I do not know, at present, a better place for this species than this genus.

Gnophomyia fascipennis n. sp. ♂ ♀. Body, halteres and legs altogether black, except a whitish-yellow spot on each side, on the humerus. Wings grayish-subhyaline, with a brown crossband; its breadth near the costa is limited by the tip of the first and the

origin of the second vein; it covers the central crossveins, but does not reach beyond the fifth vein; the extreme proximal end of the two basal cells and their immediate environment, are likewise brown. The venation is like that of the N. American *G. tristissima* (Monogr. etc. IV, Tab. 2, fig. 5), only the praefurca is shorter and the marginal crossvein a little beyond the origin of the third vein. Length about 7 mm.

Hab. Amazon River (Bates); male and female in the Museum at Oxford.

Gnophomyia caloptera n. sp. ♀. Head dark-brown; antennae brown, basal joints pale. Thorax reddish-yellow, with three black dorsal stripes; the intermediate one is very short, in the shape of an oblong black spot; the lateral ones reach backwards beyond the suture; halteres with brown knobs. Abdomen dark-brown above; ovipositor and the segment preceding it, reddish yellow; venter brown, posterior margins of the segments reddish. Wings brown, with two subhyaline crossbands, which, in front and behind, do not reach the margins of the wing; one runs along the central crossveins, the other across the submarginal and posterior cells; there are some other subhyaline spots nearer to the root of the wings; venation like Monogr. etc. IV, Tab. 2, f. 5. Legs (broken). Length about 7 mm.

Hab. A single female in the Berlin Museum from Brazil (with a query; collected by Schneider).

Gonomyia.

Gonomyia Megerle, apud Meig. Syst. Besch. I, p. 146, 1818;

O. Sacken, Monogr. etc. IV, p. 177—179¹⁾.

(Unnecessarily amended in *Goniomyia* by O. Sack. l. c.)

Taphrosia Rondani, Prodr. Vol. I, 1856.

Although the species of this genus hitherto discovered in Europe and North America may be arranged in several tolerably well-defined groups, these groups have characters in common which justify their being united in the same genus. This course is strengthened by the consideration that in all probability intermediate forms will be discovered which will obliterate the now recognizable differences between these group. The last of these groups (*G. lateralis* Macq., *scutellata* and *cincta*) seems to form the passage between *Gonomyia* and the *Gnophomyia* of the second group (compare above).

1) On page 177, line 13 from bottom, strike out the passage, beginning with the words: „The majority etc.“, down to: „among the Eriopterina“, at the bottom of the page.

The species resemble *Gonomyia* in the constant (or nearly constant?) absence of the marginal crossvein, but they are very like some *Gnophomyia* in their darker coloring. They seem to differ from both in the structure of the male forceps. I have already alluded to these affinities in the Monographs etc. Vol. III, Additions and Corrections, and Loew has referred to them in the Besch. Eur. Dipt. Vol. III, p. 62. The groups of *Gonomyia* may be defined as follows:

1. The european *G. tenella* and the north-american species *G. sulphurella* and *cognatella*, are typical *Gonomyia*. They have a short auxiliary vein, are distinguished by sulphur-yellow shades in their coloring, and have the male forceps of a peculiar, complicated structure. Loew (Besch. Eur. Dipt. III, p. 58) describes a *G. abbreviata* from Germany, which he refers to the same group.

2. *G. schistacea* Schummel, *lacta* Loew, and *lurida* Lw. (l. c. III, p. 60—62), european species, have a much longer praefurca, beginning at an acute angle before the middle of the wing; the tip of the auxiliary vein is far beyond the origin of the praefurca; the anterior branch of the second vein is almost perpendicular or very little oblique; the forceps has a simple structure of an elongate basal piece, with a double falciform appendage (somewhat like Monogr. etc. IV, Tab. 4, f. 24). In other respects these species seem to be related to those of the preceding group. The North American *G. subcinerea* seems to hold the middle between the two groups.

I refer to *G. schistacea* some specimens which I took near Heidelberg (May 22, 1882) dancing up and down in a swarm not very high above the ground. Mr. Westhoff found this species in the same month „running on the wet sand on the banks of the river Ems“ (Westhoff, Ueb. d. Bau des Hypopygiums etc. p. 55). — Specimens which I took in the Pyrenees in July I refer to *G. lacta*. Loew says of this species: empodia very small; I cannot perceive any empodia at all in my two specimens, while I see them distinctly in *G. schistacea*.

3. *G. scarguttata* Dale (*pulchripennis* Loew), *jucunda* Lw., and *conneva* Lw. and, to all appearances, the North-American *G. blanda* O. S. form a separate group characterized as follows: the tip of the auxiliary vein considerably beyond the origin of the praefurca; subcostal crossvein opposite the origin of the praefurca and some distance from the tip of the auxiliary vein; great crossvein inserted before the discal cell, and hence the second basal cell shorter than the first; marginal cell broad at the proximal end, because the praefurca is not at an acute angle at its origin, but, on the contrary,

forms a broad curve, sometimes with a stump of a vein. (Compare Loew, *Beschr. Eur. Dipt. III*, p. 57.) Loew adds that there is a conformity in the structure of the male forceps of these species; that of *G. blanda* I have figured l. c. Tab. 4, f. 17. — With all these differences, the relationship with the typical *Gonomyia* is evident; the most striking proof of it may be found in the structure of the forceps (compare l. c. Tab. 4, f. 17 and 18, the forceps of *G. cognatella* and *blanda*).

4. A remarkable deviation from the normal type of *Gonomyia* is the *G. manca* O. S. l. c. IV, p. 178 from the United States. It seems to be a *Gonomyia* the anterior branch of the second vein of which is entirely obliterated, so that there is only one submarginal cell. I have seen two specimens of *G. manca* and a single specimen of another species of a similar description. The male forceps resembles those in *Gonomyia*.

5. The last group of *Gonomyia* consists of *G. scutellata* Egger, *G. cincta* Egger (comp. Schiner, *Fauna etc. II*, p. 544) and *G. lateralis* Macq. (S. à B. II, p. 653). They have a long auxiliary vein and no marginal crossvein; their color is black, with a few yellow spots only. Here are some notes about these species taken by me in collections:

G. scutellata Egger. Discal cell closed. The venation is not unlike that of the N. American *Gnophomyia tristissima* figured in *Monogr. etc. IV*, Tab. 2, f. 5 with the following principal differences: no marginal crossvein; auxiliary vein hardly reaching the proximal end of the second submarginal cell (at any rate not reaching beyond it, as in the figure); anterior branch of the fork of the second vein almost straight, not curved downwards; great crossvein, in some specimens a little before the discal cell. — This species is remarkable for its large ferruginous-red forceps; the basal part swollen on the underside. Ovipositor very small, reddish, with nearly straight valves. On the pleurae, above the coxae, the male has much more yellow than the female; in other respects the distribution of the yellow spots is not unlike that in *G. lateralis* Macq. — The statement of Loew (*Beschr. Eur. Dipt. III*, p. 62) that in this species the marginal crossvein is very often (sehr häufig) present seems exaggerated: I have seen half a dozen specimens in Bellardi's collection, all without that crossvein. Loew's own collection in Berlin contains four specimens; one of them has a marginal crossvein, but on one wing only.

G. lateralis Macq. (Syn. *flavolimbata* Halid. apud Walk. *Ins. Brit. Dipt. III*, p. 304; *manifesta* Walk. *List etc. I*, p. 53, teste

Walker, l. c. and Verrall, Ent. M. Mag. Oct. 1886, p. 118). Usually an open discal cell, coalescent with the third posterior cell. The venation resembles Monogr. etc. IV, Tab. 2, f. 4 (*Gonomyia subcinerea*) but the praefurca is longer; the tip of the auxiliary vein reaches about the middle of the praefurca; its crossvein a short distance from the tip; the second submarginal cell reaches a little more proximad; the great crossvein a little before the discal cell; the second section of the second vein is shorter, less curved; no marginal crossvein. Yellow stripe on pleurae, above the coxae; the membrans in front, between the collar and the mesonotum, yellowish; scutellum and praescutellar callosities yellowish; sides of the abdomen more or less distinctly yellowish. The scutellum seems to be variable in its coloring, sometimes yellowish, and in other specimens with a more distinct yellow edge. Macquart (l. c.) notices this in his description; he also had a specimen with a closed discal cell. — I have seen and determined this species in Prof. Bellardi's collection. The forceps of *G. lateralis* is accurately described by Mr. Haliday (l. c.); it is very different from that of *G. scutellata*.

G. cincta Egger seems to be closely allied to *G. lateralis* and to have a forceps of a similar structure; the scutellum is described as black or gray; the sides of the abdomen not yellow.

Larva and pupa of *G. schistacea* are described by Mr. Beling in the Verh. Z. B. Ges. 1886, p. 195. The larva of *G. tenella* was found by the same in the sand of a half-dried brook (l. c. 1878, p. 56); no description given.

Empeda.

O. Sacken, Monographs etc. IV, p. 183, 1869; wings are represented in Schummel, Beiträge, Tab. 2, f. 4 and 5.

(?) *Ilisophila* Rondani, Prodr. Vol. I. 1856 (unrecognizable).

Occurs in Europe (four species) and North America (one described and an undescribed species from California).

Ilisophila Rondani of which I saw a specimen in Mr. Bigot's collection, labelled by Rondani, is unrecognizable in his Prodrôme, the more so as the typical species is called *Erioptera lutea* Meig. which is not an *Empeda* at all (compare the Note etc. below).

Mongoma.

Westwood, Trans. Ent. Soc. Lond. 1881, p. 364, Tab. 17, f. 1.

O. Sacken, Berl. Ent. Z. 1882, p. 89.

First submarginal cell short (as in *Gonomyia*) and the anterior branch of the second vein oblique; marginal crossvein anterior to

the bifurcation of the second vein (as in *Empeda*); second submarginal cell in full contact with the discal, so that there is no anterior crossvein and that the first posterior cell is not much longer than the second (as in *Paratropesa* Schin.); anal cell closed; auxiliary vein very long, its tip but a very short distance before the tip of the first vein. No empodia and no spurs.

Prof. Westwood's *M. fragillima* (tropical Africa) and the two species described by me (*M. tenera* from the Philippine Islands, and *M. pennipes* from Borneo, described below) show a perfect generic agreement. Among the peculiarities of the venation, the length of the auxiliary vein and the proximity of its tip to that of the tip of the first vein are specially remarkable. I have shown (l. c.) the resemblance of the venation of *Mongoma* to that of *Cylindrotoma* (?) *albitarsis* Dolesch. II Bijdr. p. 15, Tab. 4, f. 1, and of *Limnobia Trentepohlii* Wied., p. 551, Tab. 6, b, f. 12 (Sumatra); but whether these two species have the auxiliary vein of the same structure remains uncertain. The resemblance of the venation to that of *Paratropesa* Schin. Novara, Tab. 2, f. 2, b (S. Amer.) is merely superficial; *Paratropesa* has not the length of legs, nor the light aerial structure of *Mongoma*; it has distinct empodia, which *Mongoma* has not. The absence of empodia induced me (l. c. in the Berl. Ent. Z.) to place *Mongoma* among the *Limnobia anomala*. But the vicinity of *Gonomyia* is perhaps a better place, on account of the shortness of the first submarginal cell, the more so as in some *Gonomyia* as well as in *Lipsothrix* the empodia are wanting.

Mongoma pennipes n. sp. ♂.

Brownish-yellow, thoracic stripes brownish; head, rostrum and the base of the antennae pale yellow; flagellum brown; abdomen brownish; halteres pale brownish; legs brown, tips of the tibiae white; on the middle tibiae the white portion is slightly thickened and provided on each side with a short fringe of white hair; tarsi white. Wings hyaline; stigma pale; venation as figured by Westwood, l. c. Length about 7 mm.

Hab. Tumbong Hiong, Borneo. A single male (Berlin Museum).

Mongoma spec.

A male and a female from Madagascar (Hildebrandt) in the Berlin Museum, may perhaps belong to *M. fragillima* Westw. They are a little larger than Westwood's measurements; the white of the knees („geniculis albis“ Westw.) extends two millimeters on the femur and a little more on the tibia; the whole distal third of the tibiae

is white; tarsi white. Body pale brown, underside of the thorax and the venter paler; antennae brown, basal joints yellow, halteres pale brown. Wings subhyaline.

Cryptolabis.

O. Sacken, Proc. Ac. N. Sc. Phil. 1859; Monographs etc. IV, p. 185, Tab. 2, f. 11, wing, Tab. 3, f. 13, a, b; forceps and ovipositor.

I am not aware that the type of the genus, *C. paradoxa*, has ever been found, since I discovered numerous specimens of it in Virginia.

Lipsothrix.

Loew, Beschr. Eur. Dipt. III, p. 67; 1873.

Lipsothrix icterica Egger, Verh. Z. B. Ges. 1863, p. 1105 (*Trichosticha*; Syn. *L. errans* Wk., according to Verrall, l. c.) and *L. nobilis* Loew, l. c. both from central Europe, are the present representatives of the genus. To Loew's characterization must be added that *Lipsothrix* has no empodia, contrary to the great majority of the Eriopterina. I noticed this character in a specimen which I took in the Pyrenées. Upon my request Prof. Mik kindly sent me a magnified drawing of the last tarsal joint of an Austrian specimen; it has no empodia and distinctly bidentate claws. The genus has very little of the Eriopterina in its general appearance. Larva and pupa have been described by Beling, Verh. Zool. Bot. Ges. 1886, p. 192.

Sigmatomera.

O. Sacken, Monographs etc. IV, p. 137, 1869; compare also the additions at the end of Vol. III.

Tibiae without spurs, small empodia, wings with four posterior cells and, in the male, long, nodose, 16-jointed antennae, not unlike those of *Nephrotoma*, distinguish this genus. The female is as yet unknown. The typical species is *S. flavipennis* from Mexico (Monogr. etc. Vol. III, Additions).

A second species, *S. amazonica* Westw., Trans. Ent. Soc. Lond. 1881, p. 366, Tab. 17, f. 3, from Brazil, has been added since. It differs in having an open discal cell and in some other points of minor importance.

Cladura.

O. Sacken, Proc. Ac. N. Sc. Philad. 1859; Mongr. etc. IV, p. 187; the wing is figured l. c. p. 34; Tab. 4, f. 22, forceps.

Two species from North-America have been described. The *Cladura fuscula* Loew, Beschr. Europ. Dipt. III, p. 65 (Austria, Ba-

varia) is certainly not a *Cladura*; I rather take it for a *Limnophila*. There are two specimens from Loew's collection in the Berlin Museum, a well preserved female and a fragment of uncertain sex. I am sure I perceive spurs at the end of the prosterior tibiae. The pubescence of the wings resembles that of *Ulomorpha*, but there are five prosterior cells; the second being very small.

Lecteria

nov. gen.

A new genus, proposed for *Limnobia armillaris* (Fab.), Wied. Auss. Zw. I, p. 25, from Brazil.

This is one of the forms of uncertain position between the *Limnophilina* and *Eriopterina*. It resembles the former in general appearance and in the venation, but like the latter, it has no spurs on the tibiae. On account of its five posterior cells *Lecteria* may temporarily be placed near *Cladura*. The auxiliary vein runs very near the first vein and ends a very short distance before the tip of the latter; subcostal crossvein indistinct (I believe it must be found in a brown spot a short distance before the tip of the first vein, opposite the base of the first submarginal cell); marginal crossvein a very short distance before the tip of the first vein; the latter nearly opposite the base of the first posterior cell; there is a supernumerary crossvein about the middle of the second submarginal cell, and in some specimens another one in the first posterior cell; five posterior cells; the second with a moderately long petiole; great crossvein at the base of the discal cell; antennae sixteen-jointed, *Limnophila* like; empodia almost rudimentary; unguis small, smooth; no spurs at the tip of the tibiae; male forceps of the type of those of *Limnophila*; ovipositor long, slender.

The legs are rather stout, and very hairy; I have repeatedly examined with a strong lens the tips of the tibiae of several specimens of both sexes without detecting any spurs. — The approximation of the tips of the auxiliary and first vein (as in *Mongoma*), is a very peculiar character, which isolates this form from the *Limnophilina*, even independently of the absence of spurs. —

Conosia..

Van der Wulp, Tijdschr. etc. XXIII, p. 159, Tab. 10, f. 5—7; 1880.

This genus seems likewise to belong to the *Limnophila*-like forms with five posterior cells, but without spurs at the tip of the tibiae. The typical species is *Limnobia irrorata* Wied. A. Z. I, p. 574 (Syn. *L. crux* Dolesch.) from Java, remarkable in both sexes

for its gibbose thorax, projecting over the head. The same, or a very similar species, exists in Borneo (Berl. Mus.), in Ceylon, in China, in the Arabian desert (Ehrenberg, Berlin Mus.). The most striking characters which distinguish this genus are found in the venation. The anterior crossvein is placed at the distal end of the discal cell, or even beyond; a character unique among the Tipulidae; the structure of the marginal and submarginal cells is peculiar; the marginal crossvein (or the vein which occupies its place) is singularly oblique. Thirteen or fourteen joints of the antennae may be counted, instead of sixteen, which the genus should have, on account of its two submarginal cells.

Altogether I am in doubt about the position of this singular genus, which requires a closer study than I have been able to give to the few scattered specimens which I have seen in different Museums.

Section IV. *Limnophilina*.

I have nothing to add to the generalities in Monogr. etc. IV, p. 190—193, except to amend, with regard to the genus *Polymera* what I stated on p. 191, lines 17—32 from top about the structure of the penultimate posterior cell. *Polymera* is an exceptional instance of a genus of *Limnophilina* with a normally open discal cell, and in which the penultimate posterior cell is formed by a fork of the posterior branch of the fourth vein.

About the fossil genera *Tanymera*, *Tanysphyra*, *Trichoneura* a notice will be found, l. c. p. 192.

Calobamon Loew, Bernstein und Bernsteinfauna, p. 36. — Last joint of tarsi short, rostrum shorter than the head, antennae 16-jointed, joints not cylindrical, not attenuate towards the end of the antenna two submarginal and four (?) posterior cells, no marginal crossvein. — Represented in the prussian amber by one, rather rare species. These scanty data are not sufficient for determining the relationship of this genus. I must have seen the type, when I examined the amber-diptera in Loew's house, because I find the datum of the 16-jointed antennae, not mentioned by Loew, in a Mss. note of mine. Still this examination must not have satisfied me, because I did not say anything about *Calobamon* in my Monograph. I place this paragraph here on account of the apparent relationship of *Calobamon* to the *Limnophilina*.

For want of a better place I also mention the following genus:

Nervina Wallengr. Entom. Tidskr. Stockholm 1881, p. 180 and 197, is based on *Limnobia bifurcata* Zett. Dipt. Scand. X, p. 3894.

Zetterstedt had only one specimen, taken in Lapland in August. He asks himself: „an proprii generis?“ and this remark apparently gave occasion to Mr. Wallengren for the formation of the new genus. Whether he ever saw Zetterstedt's type seems doubtful; but it is evident that he had no specimen of his own, because all his data are borrowed from Zetterstedt's letterpress. From these meagre data it is impossible to guess to what section of the *Limnobina* the genus belongs. Zetterstedt gives the number of antennal joints as 19 with a query; Wallengren has nothing about the antennae. The wings have a discal cell, emitting two veins only, the anterior one of which is bifurcate, as in *Dolichopeza* (Meig. Vol. 6, Tab. 65, f. 10) quoted by Zetterstedt. The basis of the praefurca is square and appendiculate. Is *Limnobia bifurcata* really a species, or merely an aberrant specimen?

Epiphragma.

O. Sacken, Proc. Acad. Nat. Sc. Phil. 1859; Monogr. etc. IV, p. 193; Tab. I, f. 8.

The incrassate third joint of the antennae and the fornicate structure of the ventral segment, preceding the forceps, seem to be characteristic.

The South-American *E. circinata* O. Sack. has, in the male, long, filiform, pubescent antennae, as they sometimes occur in the genus *Limnophila* (compare Monogr. l. c. p. 197). This genus also occurs in Asia; *E. insignis* from Sumatra (v. d. Wulp, Tijdschr. etc. XXI, 1878, Tab. 12, f. 6) seems to resemble the american *E. solatrix*, only the first submarginal cell is represented as much shorter and the third longitudinal vein is in a line with the praefurca. — The larva and pupa of *E. picta* have been described by Mr. Beling, Verh. Z. B. Ges. 1873. — One european, six american and one asiatic species are known.

Epiphragma delicatula n. sp. ♂ (Berl. Mus.)

Yellowish red; antennae yellow at base, brownish towards the tip; thorax with a grayish triangle in the middle of the mesonotum, its sides being yellowish red; halteres pale, knob slightly darker; coxae yellowish white, legs pale yellow. Wings subhyaline, with a slight yellowish tinge and with ocellate pale brown spots arranged almost exactly like those of the european *Trochobola annulata* (comp. Monogr. etc. IV, Tab. 1, f. 4).

Hab. Colombia, S. America (Moritz); a single male in the Berlin Museum. I preserve the name I found in the Museum.

Limnophila.

Macq. H. N. Dipt. I, p. 95, 1834; O. Saacken, Monogr. IV. p. 196-202; Tab. 2, f. 6, 7, 9, 10, wings; Tab. 4, f. 23-27 forceps.

Limnomya Rondani, Prodr. etc. Vol. IV, Corrigenda; 1861 (proposed for *Limnophila*, preoccupied in the Mollusca).

About the genera carved out of *Limnophila* I still hold the opinion which I entertained in 1868, that it is more expedient to consider them as subgenera only, until they are better defined.

These genera or subgenera are: *Prionolabis* O. S. (N. Am.); *Dactylolabis* O. S. (Europe and N. Am.); *Rhienoptila* Now., which is only a *Dactylolabis* with abortive wings¹⁾; *Lasiomastix* O. S. (N. Am.); *Dicranophragma* O. S. (N. Am.), *Idioptera* Macq. (Europe and N. Am.); *Ephelia* Macq. (Synon. *Elaeophila* Rondani, Prodr. Vol. I, 1856, Europe and N. Am.), *Pociclostola* Schiner (Europe). Since 1868 *Eutonia* v. d. Wulp. (Tijdschr. etc., XVII, 147 and Dipt. Neerl. I, 411, Tab. 12, t. 16) introduced for the european *L. barbipes*, has been added to them. About the european species of *Ephelia* and *Idioptera* compare Loew, Besch. Eur. Dipt. II, p. 10—16.

Pociclostola is not a well-formed genus; Mr. van der Wulp was right in separating *L. barbipes* from it; it seems even doubtful whether *P. punctipennis* and *punctata* may be considered as belonging to the same natural group (I have alluded to this before, see Monogr. etc. IV, p. 200; remarks on the other subgenera will be found l. c. p. 197—201). Loew described a *Pociclostola gentilis* from Silesia, Besch. Eur. Dipt. I, 5. He does not explain why he considers it a *Pociclostola*.

Dicranophragma O. S., based merely on the presence of a supernumerary crossvein in the first submarginal cell, is not sufficiently defined.

To the notices on the metamorphoses of *Limnophilae* already referred to in my Monogr. etc. IV, p. 201, may be added now the

1) In comparing my statement on *Rhienoptila* in Monogr. etc. IV, p. 199 at the top, with Nowicki's description (Verh. Z. B. Ges. 1867, p. 338) I discover in the former inaccuracies which make me believe that I drew that statement from the specimen sent to me by Schiner, without comparing the description. I say: „the discal cell is open“; the description has: „the fourth vein encloses a discal cell, which is usually closed“ etc., „sometimes the discal cell remains open etc.“ I say: „there is a supernumerary crossvein in the first submarginal cell“; in the description this crossvein is said not to be of constant occurrence. In general the venation is described as variable.

observations on seven species of *Limnophila* and two *Poecilostolae* published by Mr. Beling in the Verh. Z. B. Ges. 1873, 1878 and 1886.

Rondani proposes the name *Limnomya* for *Limnophila* which is preoccupied (Mollusca 1828). The lesser evil between the two will be, I think, to retain *Limnophila* which has been in use for more than half a century.

Gynoplistia.

Westwood, London and Edinb. Philos. Magaz. Vol. VI, 1835, p. 280; Trans. Entom. Soc. London 1881, p. 369, Tab. 18, f. 5, 6.

Anoplites Westw. Zool. Journ. No. 20; ined.

Gynoplistes Westw. ibid 1)

Caenarthria Thomson, Eugenie's Resa, Dipt. p. 445, Tab. 9, f. 1.

Ex parte: (?) *Cloniophora* Schiner, Wien. Ent. Monatschr. 1866.

Gynoplistia is a *Limnophila* with pectinate antennae, peculiar to Australia, New Zealand, New Guinea and the adjacent islands (Salwatty, Arn, Mysol) and Celebes. The genus has not been found west of Wallace's line of division between the Austro-Malayan and Indo-Malayan Archipelago's.

The species of *Gynoplistia* seem to be numerous, but are poorly represented in collections and, for this reason, have been but little studied. The original definitions by Westwood and Macquart must be modified, so as to admit within the genus several newly discovered species, differing in characters that are not essentially generic.

The number of joints of the antennae varies; usually there are between 16 and 20. The joints of the flagellum emit a single branch each; the number of branched joints, in the species which I have seen, varies from twelve to seventeen, beginning with the first joint of the flagellum; the terminal joints (three, four or five in number) have no branches. The branches in the female are generally shorter, sometimes also they are less in number than in the male. *G. jucunda* O. S. from Celebes has only the joints from three to eight (3—8) branched in both sexes. The three first branches in all the species are inserted more sideways, and hence are pointing in a direction different from that of the others.

1) *Anoplites* Zool. Journ. No. 20, quoted in London and Edinb. Phil. Mag. as a synonym of *Gynoplistia*, is not found at the place referred to in the Zool. Journ. It was altered in the proof to *Gynoplistes*, but the alteration was not noticed in the Lond. and Edinb. article. The latter must have appeared earlier, although dated later.

The venation of the species which I have seen comes nearest to those of *Poecilostola* and *Dactylolabis* (comp. Monogr. etc. IV, Tab. 2, f. 7); that is, the proximal ends of the first and second submarginal and of the first posterior cells are almost in a line, the second submarginal but slightly exceeding the others; the tip of the auxiliary vein is more or less opposite the proximal end of the second submarginal cell, and has the crossvein at its tip; the tip of the first longitudinal vein is nearly opposite the middle of the anterior branch of the second vein; the marginal crossvein is at the tip of the first longitudinal, or very near it; there are five posterior cells; the petiole of the second rather long (*G. jucunda* from Celebes has only four posterior cells); the discal cell closed, comparatively small, with the great crossvein nearly opposite its middle; seventh vein more or less distinctly sinuated. Legs comparatively strong, especially the last pair; tibiae with spurs; empodia distinct. Male forceps *Limnophila*-like; the abdominal segments preceding it seem to offer, in different species, some characteristic structures.

I possess a species from New Zealand in which the wings in both sexes are rudimentary.

Caenarthria Thomson is a *Gynoplistia*; I do not see any difference. Patria: Australia.

Cloniophora Schin. Wien. Ent. Mon. 1866; Reise d. Novara etc. Dipt. p. 40, is said to differ from *Gynoplistia* principally in the structure of the antennae, but it is not said in what the difference consists. If *G. subfasciata* Walk. (type of this genus) and perhaps some other New Zealand species really constitute a separate group, deserving to be separated from *Gynoplistia*, this group should be more distinctly defined. For the present it is better, I think to take those species for *Gynoplistiae*.

I have expressed my doubts about *Gynopl. annulata* Westw. (Lond. and Edinb. Phil. Mag. 1835, p. 280; Tr. Ent. Soc. Lond. 1881, p. 371, Tab. 18, f. 7, antenna) said to be North American; compare Monogr. N. Am. Dipt. Vol. I, 1862, p. 13. This species has not turned up in North America yet.

Cerozodia.

Westwood, Lond. and Edinb. Phil. Mag. 1835, p. 281; Trans. Ent. Soc. Lond. 1881, p. 379, Tab. 19, f. 13.

Ozocera Westwood, Zool. Journ. Vol. V, Tab. 22, f. 5, antenna (nec *Ozodicera* Macq.)

The originally described species is from Swan River, Western Australia.

I have seen the two original specimens (males) in the Museum in Oxford. According to Westwood the antennae have 32 joints joints 3 to 31 each emit a long branch, beset with a delicate pubescence. I find in my notes that the subcostal crossvein is almost obsolete, and thus the auxiliary vein has the appearance of ending in the first longitudinal.

A species occurring in New Zealand may be referred to the same genus. I have seen a male specimen in the Museum in Berlin, and have recently received one myself. In both the auxiliary vein ends in the first vein; the crossvein which connects it with the costa is some distance from the tip, very thin, almost obsolete.

In my specimen I count 39 joints of the antennae: two basal ones, three ramose joints, the branches of which are directed downwards, thirty two joints with the branches directed upwards (the branch of the 32^d is a mere stump); the two last joints have no branches, the last being rather elongate. In the Berlin specimen I counted 36 joints; joints 1—5 are like the corresponding joints in my specimen; thirty joints (instead of 32) have the branches directed upwards; on the two last joints these branches are mere stumps or projections; joint 36 is elongated. The long branches are filiform, pilose; the longest, if their curled-up ends were stretched out, would be equal to one third of the antenna at least.

Rostrum not longer than the head; palpi rather long (Westwood says: palpi perbreves?); as far as I can see, the last joint is not longer than the others. Thorax small compared to the length of the abdomen; the latter narrow, of equal breadth, very slightly broader at the forceps; the forceps seems to have the same structure as in *Gynoplistia*. Legs comparatively stout; tibiae with spurs; empodia present. Wings: venation like that of *Gynoplistia*, with the exception already stated in the course of the auxiliary vein; first submarginal cell rather long, its proximal end but little distad of the proximal end of the second submarginal; the second posterior with a long petiole; the great crossvein near the middle of the discal cell.

The close relationship between *Cerozodia* and *Gynoplistia* cannot be called in doubt; the generic rights of the former are based on the general habit of the body, on the structure of the antennae, which are longer, have more numerous joints and much longer, pubescent branches, and on in the peculiar course of the auxiliary vein.

Nothing is known about the females of *Cerozodia*.

The two species of this genus at present known, are:

1. *Cerozodia interrupta* Westw., Lond. and Ed. Phil. Mag. 1835, p. 281; Zool. Journ. V, p. 449, Tab. 22, f. 5, antenna; Trans. Ent. Soc. Lond. 1881, p. 379, Tab. 19. f. 13 (the whole insect, with details).

„Pallide ochracea, thorace subobscuriore; oculis nigris; antennarum ramulis pallide fuscis; alis pallidis, venis subfuscis, linea gracili interrupta cinerea per areolam elongatam subcostalem currente“ (this means the first basal cell).

Hab. Australia, Swan River.

NB. Length 21 mm.; the number of antennal joints is 32.

2. *Cerozodia plumosa* n. sp.

General coloring of the body (head, thorax, abdomen, legs) reddish brown; I do not perceive any distinct thoracic stripes; but on each side of the abdomen, along the suture, there is a distinct, narrow, black stripe. Antennae yellowish-red, but the branches brown. On the wings the subcostal cell and the stigma are infuscated; a large pale brown cloud between the stigma and the discal cell; a smaller one at the origin of the praefurca; yellowish brown clouds along all the veins. Thirty nine antennal joints. Length 25—26 mm.

Hab. New Zealand; a single male in my collection.

It is imperfectly preserved and mouldy, which prevents me from giving a more complete description. The specimen in the Berlin Museum is apparently the same species, although the number of joints of the antennae seems to be different.

Ctedonia.

Philippi, Verh. Z. B. Ges. 1865, p. 602, Tab. 23, f. 2.

The opportunity for a thorough examination of the type specimen of *Gynoplistia fusca* Jaenn. (the male only; the type of the female seems to be lost) which I owe to the kindness of D. von Heyden in Frankfort, convinces me that it is a true *Ctedonia*, probably *C. flavipennis* Phil.

The comparison of this (rather defective) specimen with my specimen of *Cerozodia* proves that they are closely related, and that both belong to the Limnophilina, in the vicinity of *Gynoplistia*. When, several years ago, I was examining the specimen of *Ctedonia flavipennis* in Mr. Bigot's collection, the course of the auxiliary vein in that specimen induced me to believe that the species belonged to the Tip. longipalpi and I was confirmed in my error by Philippi's own statements („alae fere omnino ut in Tipula“, „pedes ut in Ti-

pulis"). The study of specimens of *Cerozodia* has now rendered my error apparent, and hence the whole paragraph on *Ctedonia* published by me in my Studies on Tipulidae, Part I, Berl. Ent. Zeit. 1886, p. 178—180) must be cancelled.

The general habit of the body, the spurred tibiae, the rostrum without nasus, the structure of the antennae with their long, pubescent, single branches on each joint, and the venation prove the close relationship between the specimens of *Cerozodia* and *Ctedonia*, which I had an opportunity to study. The differences which I perceive consist: 1°. In the number of antennal joints; the Francfort specimen of *Ctedonia* has, as far as I can see 22 joints; two for the scapus; two joints with a long branch each, inserted on the underside; ten branches inserted on the upper and inner side; eight joints without branches. The Bigot specimen described by me (l. c.) has the same structure of the antennae. Philippi counts 22 joints in *Ct. flavipennis* and *pictipennis* of which he describes the females only; his *Ct. bicolor* ♂ has 24 joints; his *Ct. bipunctata* ♂ only 15 joints. He agrees with me in counting only two basal joints of the flagellum with a branch inserted on the underside. In *Cerozodia* there are three such joints, and the whole antenna counts more joints (from 32 to 39), more branches, and less branch-less terminal joints (compare *Cerozodia*).

2°. In the venation: the Francfort specimen of *Ctedonia*, compared with my *Cerozodia plumosa*, has the discal cell much larger, the proximal end of the first posterior much broader, and therefore the anterior crossvein longer; the first submarginal cell has the same attenuate proximal end, but little distant from the end of the second submarginal; the second posterior cell has the same long petiole. The course of the auxiliary vein I cannot see, the wing being somewhat crumpled, but judge from my own statement about Bigot's specimen of *Ct. flavipennis* (l. c.) that it is the same as in *Cerozodia*, that is that it ends in the first vein, and has no distinct subcostal crossvein alongside of it. The Bigot specimen has a stump at the root of the praefurca, which is wanting in the Francfort specimen. Altogether, the differences in the venation between *Ctedonia* and *Cerozodia* seem to be unimportant. It remains to be seen whether the auxiliary vein of *C. bicolor* Phil., is correctly represented in his Tab. 23, f. 2; it runs into the costa and differs in this from the same vein in *Ct. flavipennis*. Although the described specimen of *C. bicolor* is a male, it has remarkably short branches of the antennae, compared to those of *C. flavipennis* ♂; it may therefore belong to a different genus.

30. In the structure of the thorax and the abdomen; the peculiar pits on the humeral part of the mesonotum and the impressed crosslines on the anterior half of the abdominal segments, are very distinct in the Francfort specimen of *Ctedonia*; the pits are also mentioned by Philippi in the descriptions of *Ct. pictipennis* and *bipunctata*. Similar pits and lines occur in the subgenus *Poecilostola*, which, as I have shown above, comes nearest to *Gynoplistia* in its venation; they also occur in some other Limnophilina and I have drawn attention to them in my Monograph etc. IV, p. 200. (The thoracic pits are also very distinct in the genus *Rhypholophus*.) I do not know their anatomical meaning, but I believe that Philippi is mistaken when he takes them for tracheal openings (in the description of *Ct. bipunctata*). I do not perceive such pits and lines in my specimen of *Cerzodia*; in the Berlin specimen there is something like the appearance of pits, but no abdominal lines.

Whether the four species, described by Philippi as *Ctedoniae* really belong to the same genus, still requires confirmation (as I have shown above).

Philippi also describes a species with rudimentary wings, which he supposes may be the female of his *Ct. bipunctata*. There is a similar female in Dr. v. Heyden's collection, which agrees tolerably well with Philippi's short description; but the antennae have 20 joints (and not 15); joints 3 and 4 have short, joints 5—14 longer stumps, which give the antenna a serrate or subpectinate appearance. The pits on the humeral portion of the mesothorax are present. The ovipositor is as Philippi describes it. Ordinary females of *Ctedonia* seem to have pectinate antennae, but with shorter branches than the male; I infer it from Philippi's data and find a positive statement in Jaenicke, who adds that in the female the two lower branches are wanting.

The close affinity between *Cerzodia* and *Ctedonia* affords a new instance of the curious relationship between the Australian and New Zealand fauna and that of Chili; a relationship exemplified in abnormal forms, apparently survivals of past ages and of which we already have two remarkable instances in the genera *Apiocera* and *Tanyderus*.

Polymera.

Wied. Dipt. Exot., p. 40; 1821; Auss. Zw. I, p. 57, Tab. 6, b, fig. 3—4.

O. Sacken, Monogr. etc. IV, p. 335; 1868; and ibid. Vol. III, 1873: Additions to Vol. IV.

My statements in the Monographs were based on descriptions only; I was uncertain whether *Polymera* belonged to the Limnophilina or perhaps to the Amalopina. Since then Loew had an opportunity to examine well-preserved specimens and has settled the question in favor of the Limnophilina. (Loew, Zeitschr. f. d. ges. Naturw. Vol. XXXVII, 1871, p. 253—267.) He showed at the same time that the antennae are only apparently 28-jointed, but in reality have the normal number of 16 joints; the joints of the flagellum have each two knots or swellings which are easily mistaken for separate joints. The open discal cell and its coalescence with the third posterior cell, are exceptional characters among the Limnophilina (compare O. S., l. c. IV, p. 191). The known species are South American.

Phyllolabis.

O. Sacken, Western Diptera, p. 202—204; 1877.

Belongs to the Limnophilina with four posterior cells, and is remarkable for the unusual structure of the male forceps and the total absence of the marginal crossvein; its immediate relationship with the other genera of the group, for this reason, not being apparent. I reproduce the description from my above-quoted paper:

Two submarginal cells; four posterior cells; discal cell closed; subcostal crossvein a very short distance before the tip of the auxiliary vein, which is immediately before the stigma; no marginal crossvein; first submarginal cell about half as long as the second, its slightly arcuated petiole occupying the length of the other half; the second vein and both of its branches are pubescent; the other veins are somewhat pubescent before their ends; eyes glabrous; antennae 16-jointed; tibiae with exceedingly small but distinct spurs at the tip; empodia small but distinct; ungues smooth. The abdominal segment bearing the genitals is unusually swollen in both sexes, bearing in the male a large forceps with horny appendages on the inner, and a long foliaceous whitish appendage on the under side.

The stature and general appearance are those of a *Limnophila*.

Antennae, when bent backward, nearly reach the root of the wings; the joints of the scapus have the usual structure; the flagellum is not perceptibly stouter at the base than at the end; the joints have that subcylindrical shape, attenuated at the point of insertion and verticil-bearing about the middle, which is quite common among the Limnophilina; they gradually decrease in length toward the end and become more oval; verticils short; front moderately broad. Vertex but moderately convex.

The legs are long and slender, with an almost imperceptible pubescence; the spurs at the end of the tibiae are very distinctly seen under a magnifying power of 100 to 150. The unguis and empodia are exceedingly small.

The wings are of a moderate length and breadth; the venation has been partly described above; the stigma is well defined, oval, placed at the end of the first vein. The praefurca has very little curvature at the base, and is not much longer than the petiole of the fork of the second vein; the second submarginal and first posterior cells are of equal length, their bases being nearly on the same line; the sides of the first posterior are almost parallel; the structure of the discal cell shows that it is formed by the forking of the posterior branch of the fourth vein, connected by a crossvein with the anterior branch; the great crossvein is at the bifurcation of that posterior branch, and thus a little beyond the middle of the discal cell.

The genitals of the male are very large and club-shaped, resembling those of a *Tipula* more than those of a *Limnophila*. The following is the description of the forceps of *P. claviger*, as I do not possess the male of the other species:

The last upper abdominal half-segment is uncommonly large and convex; two large basal pieces of the usual shape, bearing a small, curved, pointed rostriform appendage at the end, and some branched and hairy inner appendages; on the under side of the forceps, and entirely detached from it, is a very characteristic yellowish-white elongated foliaceous appendage, folded lengthwise and bifid at the tip.

The two species described by me are from California.

Ulomorpha.

O. Sacken, Monographs etc. IV, p. 232; 1868.

A Limnophilid with four posterior cells and finely pubescent wings. A north-american and perhaps a european species (*Limnophila pilicornis* Zett. Dipt. Scand. X, p. 3885) are known.

Trichocera.

Meigen, in Illiger's Magaz. 1803; O. Sacken, Monogr. etc. IV, p. 233; Tab. 2, f. 13, wing.

Most of the *Trichocerae* hitherto recorded belong to arctic and temperate regions. Mr. Mik (Verh. Z. B. Ges. 1881, p. 200) described a species from Auckland Islands in the Southern Pacific. The genus seems to be rare in California; during my whole residence there, from December till July, I came across a single specimen only (*T. trichoptera* O. S. West. Dipt. p. 205). However *T. ocellata* Walk.

from the East Indies, is a true *Trichocera*, as I have ascertained in the British Museum. The genus has also been found in amber.

Mr. Eaton („Nature“, April 14 1881) observes that *Trichocerae* principally fly at a temperature between 40 and 45 Fahrenheit, not lower than 36 (+ 2 Cels.). Dr. Simony, Wien. Ent. Z. 1886, p. 57, saw them crawl on walls at a temperature of — 1 Cels. — I am doubtful of the statements that *Trichocera* can fly at a temperature below freezing, as stated in A. Fitch's Winter Insects, p. 10; in such cases the general temperature of the air must not be confounded with the temperature of the sunny spot in which the *Trichocerae* are flying. In arctic regions (lat. 82°) *Trichocerae* occur in July and August; comp. Journ. Proc. Linn. Soc. XIV, p. 117. I saw an abundance of them at the same season during the cold summer 1879 in the Engadine. *T. regelationis* often occurs in mines at a depth of 100 fathoms (Klaftern); Boheman, Ofv. Vet. Ak. Förh. 1849, p. 228. *Trichocerae* hide under damp stones, flowerpots, pieces of wood (Eaton, l. c.). I found the larvae in winter under moss, growing on stone walls,

Prof. Mik (Wien. Ent. Z. 1886, p. 58) recently described an alpine species, with an ovipositor of a somewhat different structure.

The formation of a new genus was proposed for *T. hirtipennis* Siebke, first discovered in Norway and found afterwards in different parts of Austria (in Seitenstetten in Lower Austria by Prof. Strobl and in Bohemia by Mr. Kowarz). Compare about it Prof. Mik's paper in the Wien. Ent. Z. 1882, p. 140. In the essential characters which distinguish *Trichocera* from the other Limnophilina *T. hirtipennis* does not differ from the typical species (position of the subcostal crossvein, shortness of the seventh vein, presence of ocelli, pubescent eyes, position of the great crossvein at the end of the discal cell). The alleged differences consist 1° in the distinct pubescence of the wing-veins; but *T. trichoptera* O. S. Western Dipt. p. 204, from California, as far as I remember a true *Trichocera*, has pubescent veins; 2° in a slightly different shape of the discal cell, owing to a different position of the crossvein at the base of the fourth posterior cell; this is not a generic character, and some similar structure occurs in *T. trichoptera*; 3° in a somewhat different course of the seventh vein, which is concave instead of convex; 4° in an apparently different structure of the male forceps, the data about which, however are not very positively given. Whether the characteristic shape of the ovipositor of *Trichocera* is also found in *T. hirtipennis* is not mentioned in the description.

Two names were proposed for the new genus: *Trichoptera*

Strobl, XIV, Progr. des k. k. Obergymn. in Seitenstetten 1880 (preocc. Neuropt., Dipt.), and *Diazoma* Wallengren, Entom. Tidskrift, Stockh. 1881, p. 180 (preocc. Lamark, Mollusca 1816). The true characters of the new genus being as yet doubtful, I abstain from inventing a new name for it.

Section V. *Anisomerina*.

To the general remarks about this section in Monogr. etc. IV, p. 238—239 I have nothing to add. About the genus *Berteia* Rond. (ibid.) I am not better informed than I was before,

Anisomera.

Meigen, Syst. Besch. etc. Vol. I, 1818; O. Sacken, Monogr. etc.

IV, p. 239—243, Tab. 2. f. 12, wing.

Hexatoma Latr. Genera Crust. etc. IV, p. 260; 1809.

Nematocera Meigen, Syst. Besch. Vol. I, 1818.

Ex parte: *Peronecera* Curtis, Brit. Entom. 539; 1836.

I do not think that the genus *Peronecera* Curtis, based merely on the number of joints of the antennae, should be maintained, the more so as the number of these joints differs very little from that in *Anisomera*, and, moreover, as it does not seem to be constant. *Anisomera*, male, has six joints, but sometimes seven (I counted distinctly seven joints on fresh specimens caught by me; the last of them was very short). *Peronecera* male has seven joints. I do not know whether female specimens of *Anisomera* sometimes have seven joints, nor do I find any positive statement about it; in such specimens the joints are difficult to count, as the last of them shows several indistinct subdivisions (comp. Mon. etc. IV, p. 240, footnote). *Peronecera* ♀ is said to have eight joints by Curtis, nine by Loew. A female *Peronecera* from Portugal, which I have before me, shows distinctly eight joints. This specimen (collected by Mr. Eaton June 1880) is larger than *P. fuscipennis* Curtis, the first submarginal cell is longer, the great crossvein is a little distad of the proximal end of the second posterior cell. It is probably a new species.

Cladolipes.

Loew, Zeitschr. f. d. ges. Naturw. Vol. XXVI, 1865, p. 425; O. Sacken, Monogr. etc. IV, p. 244.

A single species from Greece.

Eriocera.

Macq. Dipt. Exot. I, 1, p. 74, Tab. 10, f. 2; 1838; O. Sacken, Monogr. etc. IV, p. 244.

Evanioptera Guérin, Voy. de la Coquille, Zool. II, 2, p. 287, Tab. 20, f. 2; 1838.

Caloptera Guérin, l. c. (on the plate).

Pterocosmus Walker, List etc. I, p. 78; 1848.

Allarithmia Loew, Bernstein u. Bernsteinfauna 1850, p. 38.

Oligomera Doleschall, Natuurk. Tijdschr. voor Nederl. Indie, Vol. XIV, p. 387, Tab. 7, f. 3; 1857.

Physecrania Bigot, Ann. Soc. Ent. Fr. 1859, p. 123, Tab. 3, f. 1; 1859.

Ex parte: *Arrhenica* O. Sacken, Proc. Ac. N. Sc. Philad. 1859, p. 243.

This genus principally occurs in the tropical regions of Asia and America; in the United States it extends farther north and reaches the White Mountains; in Asia it does not extend East of Wallace's dividing-line between the Indo-Malayan and Austro-Malayan Archipelago (except one species which occurs in Celebes); it has not been found in New Guinea or Australia. From Africa two species are known (Madagascar and Mozambique). Three species have been found fossil in prussian amber. The number of known american species is twenty five; that of asiatic species about thirty.

The ordinary number of posterior cells of *Eriocerae* is four; but some species have five cells; the distribution of these latter species is somewhat remarkable: eight species from South-Eastern Asia, one from Madagascar and two from the United States have five posterior cells, but not a single one from South-America and Mexico. Some *Eriocerae* have very long antennae in the male sex; early writers mistook such species for *Megistocerae*; they occur in the Indo-Malayan Archipelago (three species), in the United States (four species) and fossil in amber (two species); but not a single one is found among the numerous species from South-America and Mexico. Two *Eriocerae* from the United States have five posterior cells and long antennae in the male sex at the same time. (These remarks are intended to complete and correct those given by me on the same subject — l. c. p. 251). I do not think that it is worth while to maintain the subgenus *Arrhenica*, which I introduced as a genus in my earlier paper for certain species with a peculiar structure of the antennae.

I give the description of four new species from Ceylon which

form a distinct group, hitherto not found outside of that island, and distinguished by the shortness of the auxiliary vein, which does not reach beyond the proximal end of the second submarginal cell, the smaller size, and the coloring of the wings, which is clearer, and has a handsome blue opalescence, either spread all over the surface, or distributed in spots. A fifth species, likewise from Ceylon, seems to be identical with an african species.

Eriocera Humberti n. sp. ♀. Wings brownish, with two broad, hyaline, bluish-opalescent, crossbands; thorax red; abdomen velvet-black, with gray crossbands. Length: 9—10 mm. (without ovipositor).

Head and first joint of antennae ferruginous-red; the rest of the antennae brown; thorax ferruginous-red, with a faint darker stripe in the middle; scutellum and metathorax blackish. Halteres black. Abdomen velvet-black; each segment, beginning with the second, with a bluish-gray plumbeous crossband at the base; the last segment ferruginous red; ovipositor reddish-brown. Legs (only the right hind leg is left) brownish-red; tibiae and tarsi darker. Wings: pale brownish at the extreme base; a broad brown crossband in the middle; it occupies, on the anterior margin, the interval between the origin of the second vein and the tip of the auxiliary; on the posterior, between the tips of the sixth and seventh veins; the last quarter of the wing is pale brown. The two hyaline spaces (or crossbands) thus remaining between the brown portions of the wing have a beautiful bluish opalescence; four posterior cells.

Hab. Ceylon (Pundel Oya Valley; 3800—3900 feet altitude; 26. Nov. — 27. Dec. 1859; Mr. Aloïs Humbert, from Geneva).

A single female in the Museum in Geneva.

NB. The tip of the auxiliary vein a little anterior to the proximal end of the 2^d submarg. c.; the 1st subm. c. and the 1st post. c. are of equal length; the great crossvein at the very base of the discal cell.

Eriocera meleagris n. sp. ♀. Thorax orange-red, with black stripes; wings subhyaline, with a crossband formed by four opalescent spots; two similar spots near the basis. Length: 7—8 mm. (without the ovip.).

Head reddish brown, more brown on the vertex; antennae and palpi brown. Thorax yellowish-orange; the usual dorsal stripes well-defined, brownish-black, with narrow orange lines between them; a black stripe on each side between the root of the wings and the

humerus. Halteres black. Abdomen black, last segment orange (the color of the abdomen is somewhat obliterated, perhaps by mould or moisture; I believe there are plumbeous crossbands at the base of the segments). Legs (including coxae) brown. Wings subhyaline, with a slight yellowish tinge; four bluish-opalescent spots form a crossband in the middle: the first about the middle of the inner marginal cell, the second and third, at the end of the two basal cells; the fourth in the fourth posterior cell; two similar spots near the base of the wings (one in the proximal end of the first basal cell; the second in the proximal end of the spurious cell); four posterior cells.

Hab. Ceylon (between N. Ellia and Gampola. Dec. 13 and 14 1859; A. Humbert). Museum in Geneva. A single female.

NB. The tip of the auxiliary vein is slightly anterior to the proximal and of the 2^d subm. c.; the 1st subm. c. is a trifle shorter than the first post. c.; the great crossvein is a trifle before the discal cell.

Eriocera pachyrrhina n. sp. ♂ ♀. Yellowish-orange; hind borders of abdominal segments black, or brownish; wings subhyaline, with a slight bluish opalescence. Length ♂ about 6 mm.; ♀ 7—8 mm. (without ovip.).

Yellowish-orange; antennae, except the scapus, brown. Halteres with a brown knob; abdomen with rather narrow black or brown hind borders of the segments; the segment preceding the genitals, is almost altogether black or brown. Legs brownish-yellow, ends of tibiae and the tarsi darker. Wings subhyaline, with a slight yellowish tinge and a bluish opalescence; four posterior cells.

Hab. Ceylon (Kaduganawa, Oct. 8; Mr. A. Humbert). Male and female, found in copula. Museum in Geneva.

NB. The tip of the auxiliary vein is nearly on the same line with the proximal end of the 2^d subm. c.; the first subm. c. is a little shorter than the first post. c.; the great crossvein a little anterior to the middle of the discal cell.

Eriocera crystalloptera n. sp. ♂. Velvet black, frontal tubercle and humeral callosities reddish; antennae brown; abdominal segments, beginning with the third with broad, shining, steel-blue crossbands occupying nearly the whole basal half of the segments. Wings of a crystalline clearness, with black veins. Legs brown. Length about 6 mm.

Hab. Rambodde, Ceylon (Nietner); Berlin Museum. A single imperfect male specimen.

*Eriocera albonotata**Limnobia albonotata* Loew, Peters' Reise etc. 1, Tab. I, f. 1.

A specimen from Ceylon in the Geneva Museum agrees almost exactly with Loew's species, brought from Mozambique. After drawing the following description of the former, I compared it with Loew's original type in Berlin, and the only difference I found was that the two yellow abdominal segments of the type specimen had no perceptible lateral black borders. But two other specimens from Ceylon in the Berlin Museum have the abdomen unicolorous, and seem nevertheless to belong to the same species. I do not hesitate therefore to consider the Geneva specimen as specifically identical with the african one.

Head black; rostrum, palpi and antennal scapus brown; flagellum yellowish; thorax black or deep brown (in the ♀ specimen); halteres brown. Legs brownish-yellow; coxae black; tip of femora, extreme tip of tibiae and the tarsi (especially at the tip of the joints) brown. Abdomen: first segment black or brown; the two (♀) or three (♂) following segments yellow, with a more or less black line along the lateral edge of the segments; the rest black; in the ♀ the ovipositor and the segment bearing it, are ferruginous. Wings of a rather uniform brown, slightly paler in the axillary and spurious cells; (in ♂ specimen the centre of nearly all the cells is a little paler); a small white drop near the margin of the wing, between the tips of the first and second veins; a similar drop, but much smaller, between the tips of the two branches of the second vein; an almost semicircular spot, just below the apex of the wing, on the margin at the discal end of the second submarginal and of the first posterior cell; four posterior cells. Length 19—20 mm.

Hab. Ceylon (♀ from Cannia, near Trincomalie, July 30; ♂ Peradenia, Oct. 10; Mr. A. Humbert). Two specimens, ♂ ♀. Museum of Geneva.

Two specimens from Ceylon in the Berlin Museum (Nietner) agree with the above description exactly, except that the abdomen is of a uniform color, deep black in one specimen, brown in the other; I suppose it is merely a variety.

Penthoptera.

Schiner, Wiener Ent. Mon. VII, 1863. p. 220.

O. Sacken, Monogr. etc. IV, p. 256.

I have attempted, in the Monographs, to give a closer definition of this genus than Schiner's. In my sense, *Penthoptera* would contain two european and one north-american species. A note which

I took in the Vienna Museum some years ago concerning *P. fuliginosa* Schiner from South-America makes me suspect that it is an *Eriocera*, rather than a *Pentoptera*.

Section VI. *Amalopina*.

Since the discovery of the true position of *Polymera* the passage in my Monogr. etc. IV, p. 260 concerning that genus must be struck out.

Amalopis.

Halid. in Walker's Ins. Brit. Dipt. III, p. XV, 1856; O. Sacken, Monogr. etc. IV, p. 260, Tab. 2, f. 15; Tab. 4, f. 30, forceps.

Crunobia Kolenati, Wien. Ent. Mon. IV, p. 391, 1860.

Ex parte { *Tricyphona* Zett., Ins. Lapp. 1840.
synonyms: { *Bophrosia* Rondani, Prodr. Vol. I, 1856; p. 183 and
 ibid. Errata.

Doubtful: *Nasiterna* Wallengren, Ent. Tidskr. Stockh. 1881, p. 179 and 191.

Amalopis has been found in Europe, North America and Australia. I have shown (l. c. p. 265) that *Tricyphona* Zett. (syn. *Bophrosia* Rond.) should not be separated from *Amalopis*. *Tricyphona* was established on a character of an altogether secondary importance, an open discal cell, which does not occur in most species of the same relationship. It was Haliday who pointed out one of the leading characters of this generic group and the generic name proposed by him must prevail. *Tricyphona* (syn. *Bophrosia* Rond.) has no claim to priority because its definition is applicable to *T. immaculata* only, and not to the majority of the species of *Amalopis*. The larvae of *A. Schineri* and *A. (Tricyphona) immaculata* are almost undistinguishable, according to Beling, Verh. Z. B. Ges. 1878, p. 47. The synonymy of *Nasiterna* Wallengr. is based on the fact that the typical species *L. varinervis* Zett., which I have never seen, I judge from Zetterstedt's description to be an *Amalopis* (compare what I said about it in Monogr. etc. IV, p. 264). Unfortunately Mr. Wallengren, in describing the venation, uses a terminology of his own, which renders his definitions very obscure.

Pedicia.

Latreille, Genera Crust. et Ins. IV, p. 255, 1809.

O. Sacken, Monogr. etc. IV, p. 271.

To the two species already known (Europe and North-America), I have added a third from California, *P. obtusa*, O. S. Western

Diptera etc., p. 205. Since publishing my description of this species, based upon a single specimen, I have received a pair taken in Siskiyou Co., Cal. by Mr. James Behrens. The three species are remarkably alike in the coloring of their body and wings, and yet very easily distinguishable. A description of the larva and pupa of the European species is given by Beling, Verh. Z. B. Ges. 1878, p. 45.

Ula.

Haliday, Entomol. Mag. I, p. 153, 1833; O. Sacken, Monogr. etc. IV, p. 274.

Haploneura Loew, Bernstein und Bernsteinfauna 1850; O. S. l. c. p. 275.

Macroptera Lioy, Atti Inst. Ven. 3^d ser. 1863, Vol. IX, p. 224.

Europe (four spec.), North-America (two spec.) and one in amber.

Dicranota.

Zetterstedt, Ins. Lapp. p. 351, 1840; O. Sacken, Monogr. etc. IV, p. 278, Tab. 2, fig. 15, wing.

Europe (six spec.) and North-America (two spec.).

Plectromyia.

O. Sacken, Monogr. etc. IV, p. 282, 1868; Tab. 2, f. 18, wing.

Astrolabis O. Sacken, olim Proc. Ent. Soc. Phil. 1865, p. 225 (name given up).

North-America (one spec.).

Raphidolabis.

O. Sacken, Proc. Ent. Soc. Philad. 1865, p. 225; Monogr. etc. IV, p. 284; Tab. 2, f. 17, wing.

North-America (two spec.).

Section VII. *Cylindrotomina*.

O. Sacken, Monographs etc. IV, p. 289—296.

Cylindrotoma.

Macq. H. N. Dipt. I, p. 107, 1834; ex parte; O. Sacken, Monogr. etc. IV, p. 297.

Occurs in Europe (three species) and North-America (one species). The *Cylindrotomae* from other parts of the world (mentioned by me l. c. p. 295) belong into other sections. *C. albitarsis* Dolesch., from Java, is probably a *Mongoma* (see above, p. 204) and *C. ornatis-*

*sim*a Dolesch., from Amboina, is a *Tanyderus* (compare this genus). *C. hyaloptera* Philippi from Chili is uncertain yet. Mr. Verrall (Ent. M. M. Oct. 1886, p. 119) takes *C. diversa* Walk. for a true *Cylindrotoma*; *C. nigriventris* Loew, with its five posterior cells etc. certainly belongs here.

Liogma.

O. Sacken, Monogr. etc. IV, p. 298; 1868.

Proposed by me for the north-american *Cylindr. nodicornis* and the european *C. glabrata*; Mr. Verrall l. c. agrees with me in adopting it.

Triogma.

Schiner, Wien. Ent. Monatschr. VII, p. 223, 1863; O. Sacken, Monogr. etc. IV, p. 303.

Europe (one spec.) and North-America (one spec.).

A larva, possibly that of *Triogma*, is described by de Rossi, in the Entom. Nachr. 1876, p. 31; compare also my remarks l. c. 1878, p. 5.

Phalacrocera.

Schiner, Wien. Ent. Monatschr. VII, p. 224, 1863; O. Sacken, Monogr. etc. IV, p. 305.

Europe (one spec.) and North-America (one spec.).

Mr. Engel (Entomol. Nachr. 1884, p. 260) announced the rediscovery of the larva of *P. replicata* by him. I pointed out (l. c. p. 311) that Dr. Grube (Jahresb. d. Schles. Ges. f. Vaterl. Kultur für 1867, p. 59) had given a detailed description of a larva which is apparently identical with that described by de Geer.

Section VIII. Ptychopterina.

O. Sacken, Monogr. etc. IV, p. 309.

I retain this group in its old place, and merely repeat what I have said in my Catal. N. Am. Dipt. 1878, p. 221, Note 36: „The „parts of the mouth of the larvae of this genus do not differ materially from those of the other Tipulidae; the characteristic dentate mentum is present. For this reason I am not inclined to follow „Dr. Brauer in attaching to the fact that the head of these larvae „is not imbedded in the thoracic skin (as is the case in the other „Tipulidae) such a radical importance as to justify the separation „of the group as a distinct family“ (compare Brauer, Verh. Z. B. Ges. 1869, p. 844 and 847).

Moreover the existing classification of insects is primarily based on the characters of the perfect insect, and not of the larva, and from this point of view the Ptychopterina must be considered as Tipulidae. The only character which Dr. Brauer adduces in support of his view (Die Zweifl. d. Kais. Mus. in Wien I, p. 8 nota, or Denkschr. d. Math.-naturw. Kl. d. Kais. Acad. d. Wiss. Vol. 42 p. 112, 1880) is based upon an erroneus interpretation of the thoracic furrows of *Ptychoptera*. The thoracic suture, characteristic of the Tipulidae, is present in *Ptychoptera*, and is in its usual place, but it is overshadowed by the presence of deep longitudinal thoracic furrows, peculiar to this genus. Had Dr. Brauer examined other genera of Ptychopterina, as *Tanyderus* or *Idioplasta*, he would never have advanced his argument.

For these reasons it is impossible to admit the location of the Ptychopteridae among Dr. Brauer's *Orthorrhapha eucephala* (Culicidae in the broader sense; compare Brauer, Zweifl. d. Kais. Mus. etc. II, p. 10—11, 1883).

Ptychoptera.

Meigen, in Illiger's Magaz. 1803, Vol. 2, p. 262; O. Sacken Monogr. etc. IV, p. 309, Tab. 2, f. 19, wing.

Five european and two or three north-american species are known. Dr. Weyenbergh mentions the occurence of this genus in the Argentine Republic in Napp, La Republica Argentina 1876, p. 167; compare Arribalzaga, Bolet. Acad. etc. Vol. IV, p. 123. The larva of *P. contaminata* is described by Grobben, Sitzungs. d. K. Ac. d. Wiss. Vol. LXXII, 1875 (w. plate) from the anatomical point of view principally. The larva of *P. lacustris* is described by Beling, Verh. Z. B. Ges. 1886, p. 171. A new figure of the larva of *Ptychoptera* is given by Brauer, Denkschr. d. Mat. Naturw. Kl. d. Kais. Acad. d. Wiss. Vol. 47, Tab. 1, f. 18, Tab. 2, f. 19. About the mythical *P. pectinata* Macq. H. N. Dipt. I, p. 177 compare below, under *Ctenoceria* Rond. It was probably a *Ptychoptera* with the head of a *Ctenophora* glued on.

The *Tychoptera* Latr. Hist. Nat. des Crust. et des Ins. Vol. XIV, 1804 is a compound of *Tipula* and *Ptychoptera*; the name has been abandoned afterwards (comp. Monogr. etc. IV, p. 9).

Bittacomorpha.

Westwood, Lond. and Edinb. Philos. Mag. VI, p. 281; 1835.

O. Sacken, Monogr. etc. IV, p. 313, Tab. 2, f. 20, wing; Tab. 4, f. 31, forceps.

B. clavipes occurs all over North-America, north of Mexico, from Newfoundland to California and from Florida to Oregon. The occurrence in Brazil (two specimens so labelled in the Vienna Museum) requires confirmation; compare O. S. Catal. N. Am. Dipt. 1878, p. 36¹).

Tanyderus.

Philippi, Verh. Z. B. Ges. 1865, p. 780, Tab. 29, f. 57.

In the Verh. Z. Bool. Bot. Ges. 1879, p. 517—522 I have given a detailed description of this genus and of its next relatives, and have added a new species from New Zealand to it. I am able now to add a third species, as well as some details concerning the species from New Zealand.

1. *Tanyderus pictus* Philippi, l. c. — Chili.

2. *Tanyderus forcipatus* O. Sack. l. c. Male, — New Zealand.

A male and a female from Otago, N. Z. kindly communicated by Capt. F. W. Hutton show very little difference from my description. They are smaller (about 9—10 mm. long) and the brown spots on the wings are more intense, especially in the female; those along the apex are confluent and form a continuous brown border. The female, as I anticipated (l. c. p. 518 at the bottom), does not have the horny, pointed ovipositor, characteristic of the Tipulidae; the ovipositor, like that of *Bittacomorpha*, consists of a pair of small coriaceous valvules. The heads of my specimens are injured, so that I cannot complete my former statements about the antennae and the palpi. I have also seen male and female specimens in the Museum in Oxford.

3. *Tanyderus ornatissimus*. — Amboina.

Cylindrotoma ornatissima Doleschall, Natuurk. Tijdschr. Nederl. v. Indie, Deel XVII, p. 80, 1858.

I have been able to examine a female of this species in the Vienna Museum, and thus to ascertain its true systematic position. I possess besides a copy of an original colored figure of a male drawn by Doleschall, but never published. From these data I am able to complete his insufficient description.

As to the generic characters, the agreement with the two preceding species is very great; difference in the venation is unimportant.

1) In my description of *B. clavipes*, Monogr. IV, p. 316, line two from top, for brown read white.

Antennae: 2 + 20 joints; last joint rudimentary; flagellum finely and equally pubescent on both sides; the hairs, composing this pubescence, are about as long as the joints themselves (the pubescence here is a little longer than in *T. forcipatus*).

Wings (compare the figure of the venation of *T. forcipatus* in the Verh. Z. B. Ges. 1879, p. 521): broader than those of *T. forcipatus* and anal angle more square and projecting; the venation is the same, except that the crossveins in the second submarginal and first posterior cells are wanting; a stump of a vein near the origin of the praefurca; the bifurcation of the 2^d and 3^d veins is on the same line with the small crossvein (and not anterior to it, as it is in the figure); the bifurcation of the 3^d vein is nearer to the tip of the auxiliary vein, than in the figure, and other slight differences. The vein bordering the hind margin is not as stout as in *T. forcipatus*.

Legs: the proportion between the joints of the hindmost pair of tarsi is like 7. 3. 2. 1. 1.

Male forceps: as far as I can judge from the figure of the male in my possession, it looks like that of *T. forcipatus*, the prongs being directed downwards.

Ovipositor: two minute coriaceous valvules, oblong, rounded at tip.

The specific characters are as follows:

Tanyderus ornatissimus.

Antennae pale yellowish, scapus darker; rostrum and palpi brownish; the intermediate joints seem to be paler; the neck is nearly as long as head and rostrum together; thorax brownish-yellow, variegated with darker brown on the pleurae; three brown, almost contiguous stripes on the dorsum, the intermediate geminate, although the line of division is hardly perceptible; halteres yellow, with brown knob. Abdomen brown, variegated with paler brown; on each side of the intermediate joints a white spot, in the shape of a comma, which is truncate at the big end; coxae brownish; legs finely hairy, yellow, faintly infuscated about the knees and also on the latter half of the hind tibiae. Wings with a handsome pale brown picture, resembling that of *T. pictus* (Verh. Zool. Bot. Ges. 1865, Tab. XXIX, f. 57) in its general outline, but differing in the greater extent of the brown portions at the expense of the hyaline ones; there are four small hyaline spots along the costa, and a large hyaline space on the costa immediately before the apex; in it, a small brown dot at the tip of the first vein; a hyaline crossband begins at the hind

margin, in the axillary cell, and runs obliquely towards the end of the auxilliary vein, where it stops short without reaching the costa.

Hab. Amboina (Doleschall).

NB. In the author's description the antennae are called 16-jointed, while in his own drawing 22 joints are distinctly visible, in conformity with the type-specimen in Vienna.

Idioplasta.

O. Sacken, Catal. N. Am. Dipt. 1878, p. 36 and 322, note 38.

Protoplasa O. Sacken, Proc. Ac. N. Sc. Phil. 1859, amended in

Protoplasta O. Sacken, Western Diptera etc. 1877 (preocc. Leidy, Rhizop.)^{1]}.

(?) *Macrochile* Loew, in Behrendt, Bernstein etc. p. 57, 1845; Loew, Ueb. Bernst. u. Bernsteinfauna, 1850, p. 36; Linn. Ent. V, p. 402, 1851; Tab. 2, f. 24, wing; O. Sacken, Monogr. etc. IV, p. 318 (preocc. Lepidopt. *Macrochilo*, 1816; *Macrochila* 1829).

The male of *Idioplasta* is described for the first time in my Western Diptera, p. 208, and in my Catal. N. Am. Diptera 1878, p. 202. For further details, comparisons with the allied genera etc. see my paper: Die Tanyderina etc. (Verhandlungen Zool. Bot. Ges. Wien 1879, p. 517).

Two species are described, one from the eastern United States the other from California (*I. vipio* O. S. Western Diptera, p. 517). *Macrochile* Loew is represented by *M. spectrum* of which, as far as I know, a single specimen has been found in prussian amber. The generic name being preoccupied, there is no sufficient reason for not placing the species in the genus *Idioplasta*.

Note on Prof. Rondani's new genera of Tipulidae, proposed in his Prodrömus Dipterol. Italicae, Vol. I, p. 179—188; 1856.

Although Prof. Rondani, in his work on the italian fauna, did not reach the Tipulidae, and, although, if he had reached them, he would have probably abandoned the sketch of an arrangement of that family which he published in 1856, in the first volume of the Pro-

^{1]} Scudder gives 1879 as the date of *Protoplasta* Leidy, Rhizop.; but it must be earlier, as in my Catal. N. Am. Dipt. the Preface of which is dated June 1878 I say on p. 222 that „*Protoplasta* has in the mean time been used in the Protozoa.“ Where did I find this statement?

drome, I deemed it worth while, as a matter of historical interest, to investigate the synonymy of the genera provisionally proposed by him in that sketch. My investigation was based upon the scanty data furnished by himself in his publications, as well on a few types which I found in Mr. Bigot's collection in Paris, and in Prof. Rondani's own collection, now in Florence. The latter, unfortunately, proved most disappointing in regard to the Tipulidae, as they seem to have been long ago destroyed by mould and insects. Only insignificant fragments have been preserved.

I shall examine Mr. Rondani's genera one by one, in the order in which they are found in the first volume of his Prodrôme.

I. Limnobina.

1. *Erioptera* (Meig.) Rondani. The type *Erioptera obscura* Meigen proves that it is our *Molophilus*.

2. *Chemalida* Rond. is the *Erioptera* sensu stricto of my Monograph; it is well defined by the mention of the length of the seventh vein.

3. *Ilisomyia* Rond., with *I. nubipennis* n. sp. which has never been described. I found in Florence an *I. nebulosa* Rond. which I believe to be meant for *nubipennis*. It is a *Rhypholophus* the open discal cell of which coalesces with the second posterior cell.

4. *Ilisophila* Rond. The type is *Erioptera lutea* M., which is an *Erioptera* sensu stricto, that is a *Chemalida* Rond. There is evidently an error in the identification of the type-specimen. The specimen in Mr. Bigot's collection is an *Empeda*, and this latter genus agrees with Rondani's wording: *venula transversaria adest quae conjungit secundam longitudinalem quartae ante connectionem ejus cum tertia*.

5. *Ormosia* Rond. is a *Rhypholophus* with nodulose antennae, and has been so understood by Schiner, who introduced it as a subdivision of his genus *Dasyptera* (Fauna Austr. II, p. 537).

6. *Spyloptera* Rond. type *S. meridionalis* n. sp. indescr. I cannot make out this genus; nor did I find any trace of it in the florentine or Mr. Bigot's collections. The statement „areola basilaris postica satis brevior antica” describes a structure like *Ori-marga*; but the name *Spyloptera* (it ought to be *Spiloptera*) indicates a species with spotted wings.

7. *Limnaea* (*Limnoica* in Corrigendis, Vol. IV); type *Erioptera flavescens* Lin. There must again be an error in the determination here, because *E. flavescens* is an *Erioptera* s. s., that is a *Chemalida* Rond.

8—10. *Symplecta*, *Rhamphidia* and *Cylindrotoma* do not require any particular remarks.

11. *Taphrosia* Rond. = *Gonomyia* (Megerl.) O. S.

12. *Orosmya* Rond., type *O. appennina* n. sp. indescr. I cannot make out what it is, and did not find the type.

13. *Ilisia* Rond. Type *Eriopt. maculata* Meig. The untenable character of this genus becomes apparent from the development which it receives from the author himself in his Dipt. Exot. (Archivio Canest. III, fasc. 1) where he says: „Species typicae europeae *Erioptera maculata* et *Limnobia fimbriata*." Now *E. maculata* belongs to my subgenus *Acyphona*; while *L. fimbriata* is the same as *L. pilipes* Fab., which is a *Trimicra*, two very distinct and distant forms. In the same article, Rondani places in the genus *Ilisia* the *Limnob. hirsutipes* Macq. (Canary Isl.), which is likewise a *Trimicra*.

14. *Elaeophila* Rond. = *Ephelia* Schiner.

15. *Limnomyia* Rond. (see corrigenda Vol- IV) is proposed as a substitute for *Limnophila* Macq., preoccupied in the Mollusca.

16. *Bophrosia* Rond. = *Tricyphona* Zett. (see Rondani, in Erratis).

17—22. These are well known genera that give no occasion for any remark.

23. *Pelosia* Rond. (preocc. Hübner Lepidopt.), type *P. albifrons* n. sp. indescr.; I cannot make it out; it may be a *Dicranomyia* with an open discal cell, or else *Orimargula* Mik. Lioy's statement (I ditteri etc. p. 431) that it is allied to *Dixa* cannot be accepted, because Rondani distinctly says that the antennae are verticillate which is not the case with *Dixa*.

24. *Glochina* Meig. in Rondani's sense answers *Dicranomyia*, but it does not appear why he separates it from his *Limnobia*, which also answers *Dicranomyia*.

25. *Taphrophila* Rond.; type *Limnobia inusta* M. Again a case of erroneous determination of the type-specimen, because, *Taphrophila* is said to have no marginal crossvein, while *L. inusta* has one. In Florence I found a label, bearing *T. inusta* M. but the specimen was destroyed. In Mr. Bigot's collection *Taphrophila* was represented by a specimen of *Antocha*. And indeed the characters given in Rondani's analytical table, the absence of the marginal crossvein and the coalescence of the auxiliary and first veins answer *Antocha*.

26. *Limnomyza* Rond., type *L. tripunctata* M., is a *Limnobia* sensu stricto of O. S.

27. *Limnobia* (Meig). Rond., type *L. chorea* M., is *Dicranomyia* O. S.

II. Tipulina.

1. *Ceroctena* Rond. = *Dictenidia* Brullé.

2—3. *Xiphura* Brullé, *Ctenophora* Meig.

4. *Ctenoceria* Rond. is based on the mythical *Ptychoptera* with pectinate antennae (*P. pectinata* Macq. Hist. Nat. Dipt. I, p. 77), an insect which neither Rondani nor anybody else has ever seen since it was first described, and which was perhaps a *Ptychoptera* with the head of a *Ctenophora* glued on.

5—7. *Ptychoptera*, *Pedicia* (!) *Nephrotoma*.

8. *Alophroida* Rond., type *A. cinerea* n. sp. indescr. must be some *Tipula* with an open discal cell.

9—10. *Tipula*, *Pachyrrhina*.

11. *Pterelachisus* Rond. is based on one of the female *Tipulae* with abortive wings and does not require the formation of a new genus, an opinion which Dr. Loew has expressed in the Wien. Entom. Mon. VIII, pag. 124 (1864), and with which I fully concur.

Chionea is treated as a separate family, and placed at the end of the Tipulidae.

I cannot but repeat that if Prof. Rondani had reached the Tipulidae, in the prosecution of his work on Italian diptera, he would have abandoned their distribution, as sketched by him in 1856; a distribution in which the fundamental subdivisions of the family are not grasped, and in which *Dolichopeza* and *Dixa* stand among the *Limnobia*, while *Pedicia* is placed with the Tipulina.

Most of the genera, proposed in that sketch are merely indicated, not defined, because the designation of a type cannot pass for a definition, especially when that type is erroneously determined. That the author's own conception of some of these genera was a confused one, is proved for instance by the genus *Ilisia* (No. 13), to which he added subsequently a second species, that belongs, not only to a different genus, but to an entirely different group. Schiner, in preparing his Fauna, and myself while working at my Monograph of 1868, had Rondani's Prodrôme before us, and yet neither Schiner nor I could make anything of most of Rondani's genera. It was the accidental discovery of some specimens named by Rondani which enabled me to interpret some of them; some of the others are a mystery still. Any claim of priority under such circumstances is out of the question.

Note on Mr. Bigot's classification of the Tipulidae.

In order to complete the survey of all the genera of the Tipulidae, it remains for me to give in account of Mr. Bigot's „Synoptic table“ of these genera published in the Annales de la Soc. Entom. de France 1854, p. 447—482. Such an account is the more necessary, as these tables contain several new generic names, which have not been mentioned anywhere since their publication. As I am well aware that Mr. Bigot himself does not hold now the opinions he expressed in that paper, my remarks will have no other than an historical interest.

Mr. Bigot selects the presence or absence of the discal cell as the basis of his first subdivision of the Nemocera; the result is as follows (l. c. p. 465):

Wings with a discal cell.

Head of an ordinary structure; no rostrum; proboscis more or less prominent **Rhyphidae.**

Head prolonged in a more or less prominent rostrum

Tipulidae.

Wings without discal cell etc. **Limnophilidae, Psychodidae, Mycetophilidae, Bibionidae.**

The reader who knows that the genus *Limnophila* Macq. with its numerous species has a discal cell, will naturally ask himself how it comes to be placed in a „Curia“ without that cell? We find the answer on p. 456: „the species of *Limnophila* Macq. provided with a discal cell are my true Tipulidae (mes vraies Tipulides) and receive the new generic name *Phylidorea* Bigot.“ Now what are the Limnophilidae Bigot (without discal cell)?

The answer is found on p. 473, in the analytical table of the genera of Limnophilidae; as follows:

A. Head prolonged in a rostrum:

Macrochile Loew, *Polymera*, *Ula*, *Ptychoptera*, *Apeilesis*, *Trentepohlia* n. gen., *Limnophila*, *Dolichopeza*, *Octavia* n. gen., *Anisomera*.

AA. Head without rostrum:

Dixa, *Zygoneura* (!).

Among this heterogeneous group, two genera do not belong here at all, even according to Mr. Bigot's own system: *Macrochile* and *Ula* have a discal cell.

The new genus *Octavia* is intended to receive all the *Eriopterae* without a discal cell (l. c. p. 456). *Trentepohlia* nov. gen.

is proposed for *Limnobia Trentepohlii* Wied. which, according to Mr. Bigot, must be called *Trentepohlia limnobioides* Bigot. I have shown in my Diptera from the Philippine Islands (Berl. Ent. Z. 1882, p. 90) that Wiedemann's species is very probably related to *Mongoma* Westw., which has nothing to do with *Limnophila*.

What species Mr. Bigot places in his genus *Limnophila* without discal cell is not explained in his paper and I am not aware of the existence of any such species. To sum up: the group Limnophilidae Bigot does not contain a single Limnophilid in Macquart's or in my sense, with the single exception of *Polymera*.

The genus *Limnobia* Bigot is subdivided as follows (p. 470):

Wings with four posterior cells, the second sessile.

Wings with two submarginal cells.

Antennae 16-jointed *Limnobia*.

Antennae 15-jointed *Rondania* nov. gen.

Wings with a single submarginal cell.

Antennae 16-jointed *Dohrnia* nov. gen.

Antennae 14-jointed *Numantia* nov. gen.

Beyond this table, none of these genera are in any way defined; no types or examples of species belonging to them are named. Judging from the characters given in the table, their interpretation would be as follows:

Limnobia Bigot answers those *Limnophilae* (O.S.) which have only four posterior cells; among the European species *Limnophila platyptera* Macq. (*hospes* Egger) belongs here.

Numantia Bigot corresponds to *Limnobia* O. S. and *Dicranomyia* O. S. combined.

Dohrnia Bigot (preocc. Newman, Col. 1851) would include all the *Limnobina* anomala.

Rondania Bigot (preocc. Desv. Dipt. 1850) remains doubtful, as 15-jointed antennae, as far as I know, do not occur among *Limnobina*.

The other new genera proposed by Mr. Bigot in the same paper are:

Variegata (p. 456; on p. 471 however it is called *Variptera*) for *Gynoplistia variegata*, which is to be called *Variegata gynoplistioides* Bigot.

Goureaudia for *Cylindrotomae* with four posterior cells; which would therefore include the now adopted genera *Liogma*, *Triogma* and *Phalacrocer*. No other description is given, nor is any type or example named.

Some other peculiarities of Mr. Bigot's system may be noticed here: *Glochina* is put among the *Rhyphidae*, because Macquart (in the Hist. Nat. Dipt. I, p. 172) placed it there.

Limnobia rhynchus Westw. (which is now *Toxorhina* Loew ex parte) is placed among the Culicidae, because it has a long proboscis (l. c. p. 459).

Geranomyia and *Aporosa*, which are synonymous, are included in the analytical table as two different genera, the first being characterized by a proboscis which reaches far beyond the rostrum, while in the second the proboscis is said to be hidden, or to reach very little beyond the rostrum.

For any one acquainted with the structural affinities of the different groups of Tipulidae this statement will be sufficient, without any further commentary.

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Addenda and corrigenda to the Studies on Tipulidae, Part. I.

(Berl. Ent. Zeitschr. 1886, p. 153—188.)

Page 157, line 6 from bottom. Add the following note:

Dolichopeza malagasya Karsch, which I have examined in Berlin since the publication of my Studies, Part I, shows important differences from the European species. The anterior branch of the second vein, whose absence is characteristic of the typical *Dolicho-pezae*, is present here in a rudiment that does not reach the costa, and thus an incomplete rhomboid cell is formed (compare Berl. Ent. Z. 1886, p. 157); in other respects the venation is like that of *Dolicho-peza*. The rostrum is longer, with a distinct nasus, and therefore more like that of *Tipula*. The antennae likewise are more like those of *Tipula*, as the bases of the joints of the flagellum are more distinctly incrassate, than they are in *Dolicho-peza*. The same may be said of the legs; the tarsi are comparatively shorter and less slender, and therefore more like those of *Tipula*; there are very distinct spurs on the tibiae. Altogether this species seems to form the transition between *Dolicho-peza* and *Tipula*. The specimen in Berlin is a female.

P. 161, line 13 from bottom, strike out the word not. A rather important oversight of mine.

P. 162. *Brachypremna*.

A renewed visit to Berlin enabled me to describe the new *Brachypremnae*, mentioned by me in the Berl. Ent. Z. 1886, p. 161. — The generic characters, as given by me, answer very well for all these species; only in *B. unicolor* the praefurca is a little longer than usual and it is the third, rather than the second vein, which is in a line with it. The species from Surinam is undoubtedly *B. dispellens*, which occurs in the United States. The four species hitherto described may be grouped as follows:

Legs brownish (without any white) . . . *unicolor* O. S.

Legs brown, the root of the tibiae white . . . *breviventris* Wied.

Femora brown, tibiae and tarsi white . . . *dispellens* Wk.

Femora brown, white at the tip, tibiae and tarsi white, but tibiae with a broad brown ring . . . *pictipes* O. S.

Brachypremna pictipes n. sp. ♂.

Front and vertex brownish, paler in the middle; antennae brownish, two basal joints yellow; rostrum yellowish above, brown below; palpi brown at base and tip, but yellow in the middle. Ground color of the thorax brownish-yellow; collar with a short double longitudinal streak in the middle and a lateral brown spot in each side; mesonotum with a double brown intermediate stripe and short broad lateral stripes; metanotum pale, with three brown stripes; some brown spots on the pleurae. Abdomen brown above, with a very faint longitudinal stripe on the basal segments; venter yellowish, with a brown streak in the middle of each segment, forming an interrupted longitudinal stripe; male genitals small, yellowish. Halteres brownish, paler at base. Femora brownish, the tip yellowish-white for about 1½ mm.; tibiae and tarsi yellowish-white, except a brown ring on the tibiae, about 3 mm. broad, placed at about 1½ mm. from the knee, the interval being white. Wings with a uniform pale brownish tinge, the stigma but slightly darker; venation like that of *B. breviventris* Wied. Length 16—18 mm.

Hab. Cassapava, Brazil (Sellow). A single male in the Berlin Museum. Resembles *B. dispellens*, but will be easily distinguished by the white tip of the femora, the different shape of the intermediate thoracic stripes etc.

Brachypremna unicolor n. sp. ♂.

Reddish-yellow; front and vertex with traces of golden-sericeousness; nasus and tip of the palpi brownish; antennae yellowish, but

basal and upper part of the joints of the flagellum brownish. The brownish thoracic stripes are indistinctly marked by the darker lines bounding them; these lines are more distinct on the lateral stripes; metathorax pale yellow, with a distinct intermediate and indistinct lateral brownish stripes. Halteres brownish yellow, knobs very little darker. Abdomen brownish mixed with yellow; lateral margins paler; venter pale yellow, with a longitudinal brown stripe. Legs yellowish brown, femora more yellowish, with a brown ring before the tip. Wings subhyaline, with a pale brownish tinge; costal cell yellowish; the small stigma pale brown; small brown clouds on the knee of the praefurea and at the end of it, also at the tip of the second and third veins. The praefurea is a little longer here, than in the related species; it has a small stump of vein on its knee; the third vein is its linear prolongation (and not the second, as in the other *Brachypremnae*); the submarginal and posterior cells are longer here than in the other *Brachypremnae*; the discal cell smaller, the second posterior subsessile. Length 16—18 mm.; wing 23 mm.

Hab. Portorico (Moritz); three males in the Berlin Museum.

P. 164. At the end of *Tanypremna* add the following description

Tanypremna manicata n. sp.

Yellowish-brown, thoracic dorsum with three almost confluent brown stripes; brown spots on the metanotum. Antennae pale yellow, darker towards the tip; halteres brownish-yellow; abdomen yellowish-brown (tip broken). Legs dark brown, but femora paler; a small white ring before the tip of the tibiae; three successive white rings at the end of the tarsal joints 1, 2, 3. Wings with a pale brownish tinge; stigma brown.

Hab. Brazil (discoverer: Sellow); a single specimen in the Berlin Museum; sex uncertain, as the tip of the abdomen is broken off. The length, when the abdomen is entire, must be about 14 mm. The number of joints of the antennae is certainly more than eleven (this number I counted in *T. opilio*).

P. 165. I should have spoken of Latreille's treatment of the genus *Ctenophora* in his Hist. Nat. Cr. et Ins. Vol. XIV, but as this work is not within my reach at present, I can only refer to Monogr. etc. IV, p. 9, where I have made a statement about it. The genus *Tanyptera*, in this arrangement, was proposed for *Cten. atrata* Meig. It should be introduced in the Alphabetical Index of the genera of Tipulidae longipalpi in the Berl. Ent. Zeitschr. 1886,

p. 188. As to the whole arrangement, it has been entirely superseded by Latreille himself in his later works.

P. 167, at the bottom, the following species of *Ctenophora* has been accidentally omitted:

ornata Meig. — Triest; Greece (collect. von Roeder); England (Curtis); Vienna, in the Prater (Rossi).

P. 168. After *Ct. vittata* M., add

amoena Loew (the descr. of the male only) Besch. eur. Dipt. III, p. 3.

To the localities add: Eastern Prussia, Königsberg (Bachmann).

P. 178, line 14, from bottom, for three read two.

P. 178, line 7 from bottom should read thus:

The other form is *Ozodicera*.

P. 178, 179, 180 strike out the whole paragraph about *Ctedonia*, as well as this name in the Alphabetical Index, on p. 188.

P. 185. *Macromastix*.

Some south-american *Tipulae* with very long filiform antennae come very near the genus *Macromastix*, but must not be confounded with it.

One of these forms is the species described by Wiedemann as *Megistocera braziliensis* (A. Z. I, 554). I have already alluded to it (Berl. Ent. Z. 1886, p. 184) as being perhaps a *Pachyrrhina* with an unusual development of the antennae. I find several specimens in the Berlin Museum, which belong to that, or a closely allied species. The male forceps is slightly club-shaped, apparently *Pachyrrhina*-like. The antennae of the female are much shorter than those of the male. not longer than the thorax; the ovipositor has a peculiar structure, quite different from the usual type of a *Tipula*; the usual valves are replaced by coriaceous, hairy organs, difficult to study in dry specimens.

The other form approaches *Macromastix* much more than the first. The long filiform antennae of the male are beset with a dense, delicate erect pubescence on both sides, and not on the underside only, as is the case with the species of *Macromastix*. The tubercle of the front is much less conspicuous, the rostrum much shorter; nasus distinct; the male forceps is of a simple structure: it consists of rather long basal pieces, with appendages folding like the blade of a penknife; the forceps protrudes here much more than in *Macromastix*. The number of the joints of the antennae is very difficult to count; the venation is like that of a *Tipula*; the rhomboid cell

small, narrow, but distinctly formed; the submarginal and first posterior cells of about the same length. I note these data from three male specimens from Brazil (Beske) in the Berlin Museum. It may be necessary by and by to introduce a new genus for them.

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E r r a t a.

- P. 164, line 4 from bottom for *Ceroctena* read *Otenoceria*.
P. 207, line 2 from bottom for *Neruina* read *Veruina*.
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