X. ANNOTATED CATALOGUE OF ORIENTAL CULICIDAE—SUPPLEMENT

By E. BRUNETTI.

Almost immediately after the publication of my "Annotated Catalogue of Oriental Culicidae" [1] I obtained access to a copy of the fourth volume of Mr. Theobald's Monograph on this family, and to Mons. Blanchard's copious work, "Les Moustiques." Subsequent to these is a very lengthy and valuable paper on the Culicidae of the Malay States by Dr. G. F. Leicester (with a preface by Mr. C. W Daniels, Director of the Institute for Medical Research) published by that Institution.[2] Also a long paper by Mr. Theobald ("2nd Report on the Indian Museum Culicidae").[3]

I have also received a copy from Miss Ludlow of her thesis on the mosquitoes of the Philippines. The very considerable list of additions and corrections of importance relating to Oriental species gleaned even from these five works alone render a supplement to my catalogue imperative, and the information contained in the present paper is mainly derived from these sources with the inclusion of the 5th volume of Theobald's Monograph recently issued.

The splitting of genera and species still continues to such extremes as to invoke the severe deprecation of more than one systematic dipterologist, more especially in the case of groups higher than genera, of which, none of those recently erected in this family approach in zoological value groups of similar rank in the other families of Diptera.

I have dealt elsewhere [4] with the question of taxonomic values in Culicidae, and therefore need not recapitulate here any observations that apply only to nomenclature. In that paper was mentioned that in addition to the vast accessions in generic rank proposed by the new school of culicid students, new methods were adopted in presenting to others the results of their labours, and though I feel ill fitted to condemn or criticize, it does not seem entirely out of place to suggest that, in as many particulars as possible, the generally accepted rules of zoological literature should be adhered to.

Mr. Theobald's method in his Monograph of placing the author's name *after* the quotation instead of *before* it, renders it rather awkward to follow the data presented in this unusual

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[1] Rec Ind. Mus., i, 297—377 (1907).

[2] Studies from the Institute for Medical Research, Federated Malay States, vol. iii.

[3] Rec Ind Mus., iv, 1—33 (1910).

[4] "Taxonomic values in Culicidae," Rec. Ind. Mus., iv, 53 (1910).

manner. Another serious inconvenience in referring to this author's work is the index, where the genera themselves are alphabetically arranged, all the species of each genus forming a separate alphabetical list under each generic name This plan is still retained even in the fifth volume. So, unless the student knows to which genus this author refers each species, he has to search the whole index. A single alphabetical list of specific names as is given in the valuable Catalogue of Diptera by Kertesz would have much facilitated reference, and the genus of each could have been entered in a second column.

In Blanchard's otherwise admirable work he adopts a very laborious method of quoting merely a reference date and letter (1901a, 1902a, 1902b, etc.) for each paper of each author, thus necessitating an examination of his list of papers (given at the end of the book) *every* time a quotation is desired. The amount of additional and unnecessary labour entailed by this double reference is enormous.

The habit of authors on Culicidae of allowing the female to take precedence of the male is in absolute defiance of zoological rule, and it is to be regretted that Dr. Leicester in his great paper on the Malay species, has continued this practice, even though he had before him males of the greater number of the species dealt with.

In connection with this question it is well to mention the case of the Anopheline mosquito known as *culicifacies*, Giles.

Giles originally described under that name, what afterwards proved to be two distinct species (namely, his ♂ is now known as *turkhudi*, Liston, and his ♀ as *culicifacies*, Giles).

Now, in accordance with the strict rules of zoological literature, as I have always understood them, in such a case the name of the species is invariably retained for the ♂, and a new name provided for the ♀ This being so, the name *culicifacies* should have been retained for the male (now called *turkhudi*), and the *female* (still known as *culicifacies*) renamed. However, to avoid further confusion the synonymy was not altered in my catalogue nor in the present supplement, but it seems advisable to call attention to the fact and to protest against the ♀ taking precedence of the ♂ in such cases.

A brief review of the recently published works on Culicidae may now be made.

Mr. Theobald's 4th volume (Monog. Culicidae World) contains notes (p. 1) on the growing of *Lemna minor*, *L. arrhiza* and other duckweeds, on the surface of all unavoidable collections of water as a preventive against the breeding of mosquitoes. Mr. Green notes that they breed freely in the flowers of *Heliconia brasiliensis*.

On p. 3 Mr. Theobald gives a list of the species that are known to be agents of infection. On p 6 he gives Prof. Felt's table for the identification of culicid larvae; on p. 11, Dr. Dyar's grouping and formation of genera by ♂ genitalia. As a criticism on the classification by larvae, Mr. Theobald remarks (referring to

Messrs. Dyar and Knab's paper, in which only 3 sub-families are recognized,—Anophelinae, Culicinae and Sabethinae), "all other genera of Anophelinae are sunk as synonyms of *Anopheles*, but the authors raise one species—*barberi* of Coquillett, a species so close to *bifurcatus* that it is hardly separable—to generic rank, calling it *Coelodiazesis*."

Mr. Theobald mentions their plates of portions of the larvae as being valuable for future work. On p. 14 Theobald mentions Coquillett's classification of the family on adult characters, on p. 15 the proposed separation of *Corethra* and *Mochlonyx* from Culicidae, to form a separate family. Dr. Lutz's classification is given on p. 15 followed by a modification of it by Theobald on p. 17; the latter writer being in favour of the separation of *Corethra*. The further notes of interest in Mr. Theobald's work are mentioned under the genera and species to which they apply.

In the 5th volume of his Monograph of the Culicidae Mr. Theobald reviews all the species included in the previous volumes. It is a huge work of over 600 pages, illustrated by 261 text-figures and six plates of wings, and contains descriptions of 21 new genera and 392 new species.

It contains apparently lists of all known species in each genus (except those purposely excluded for given reasons) and presents them in tabular form.

It is satisfactory to see the author deploring the brief nature of some authors' description of their species, "wholly inadequate for correct diagnosis," and as certainly leading to much confusion and increased synonymy. He also, rightly enough, objects to new genera and species being created on larvae of which the adult forms are unknown, and he emphasizes this objection by ignoring the species thus erected by Messrs. Dyar and Knab on American and West Indian forms.

It is curious that Theobald makes no reference either to the voluminous monograph on the Malayan Culicidae published by Dr. Leicester, nor does he apparently notice any of that author's very numerous new species, mostly described from bred specimens.

In one or two cases he quotes verbatim descriptions of species by other authors without notifying from which region of the globe they come.

Blanchard in his "Moustiques" (1905) devotes chap. i to the position of the Culicidae, chap. ii to the morphology and anatomy of the family, and chap. iii to their metamorphoses and habits. Notes on mosquito parasites occur on pp 132-135. A long chapter of nearly 300 pages, illustrated by 120 figures, is devoted to the systematic description of genera and species Chapter v treats of the medical aspect, chap. vi of methods of prevention of attack and of extermination, and chap. vii of their collection, preservation, breeding and mounting. An appendix giving recently described species a very complete bibliographical catalogue, and a copious index to the whole work completes the volume, which totals 673 pages. On p. 390 he gives a key to the new genera

contained in the 3rd volume of Theobald's Monograph which appeared whilst Blanchard's work was in the press.

Miss Ludlow's paper on the connection between malaria and the occurrence of various species of mosquitoes in the Philippines contains very extensive information respecting their distribution.

Many of the species appear widely distributed, *Myzomyia ludlowii* being reported from no less than 42 different localities in these Islands, *M indefinita* from 26, *M rossii*, *vanus*, *pseudobarbirostris*, *funestus* and *barbirostris* from ten or more localities each, besides other species from a lesser number of localities each.

She notes that it is probable that some species may pass through the dry season as adults, hibernating amongst the dry vegetation, and also notes that in localities where the rainy season advances gradually, the Anophelinae are more numerous and exist in considerable numbers throughout a good part of the dry season, whereas in localities where the rainy season is introduced by very excessive and constant deluges they are markedly less in numbers, presumably by the breeding places of the insects in their earlier stages being washed away.

"Four Anophelinae, *funesta*, *barbirostris*, *fuliginosus*, and *ludlowii* seem likely to be acting as hosts for the malarial parasite in the Philippines, and concerning *Stegomyia calopus* Mg.(= *S. fasciata* F.), *Culex fatigans* W., and *Mansonia uniformis* Theob., there are too few data to judge if they be carriers of disease" (Ludlow). Regarding *Stegomyia fasciata*, the acknowledged sole carrier of yellow fever, this author significantly remarks: "Yellow fever has so far never been present in the Philippines. The wide distribution of *S. calopus* (= *S. fasciata* F.) is, however, very suggestive taken in connection with the building of the Panama Canal, as to the result likely to follow, should yellow-fever-infected mosquitoes or patients in the proper stage of the disease reach the Islands."

Mr. G. F. Leicester in his important and extensive paper on The Culicidae of Malaya" devotes over 250 pages to fully redescribing the mosquitoes of this region, including nearly a hundred new species. In his preface he notes that the 3rd volume of Theobald's Monograph appeared just before the publication of his own work and that an appendix will be necessary, involving some changes of nomenclature, and that a further paper on the larval characters may eventually follow.

In this paper he devotes 14 pages to the breeding grounds of mosquitoes with some notes on collecting and preserving them, but although he seems to have bred a great number of the species and fully described numbers of them from long series of fresh specimens he gives no definite dates of appearance.

A further report by Theobald on the Indian Museum Culicidae (the 2nd) has recently been issued [1] in which four new genera and twenty-one new species are described. It has appeared

[1] Rec. Ind. Mus., iv, 1—33 (1910).

unnecessary to copy the whole of the data supplied in this author's paper (which is easily accessible) in cases of very common or widely distributed species, especially if the localities therein given are already in my Catalogue.

In such cases the species are reported in this paper as "common throughout India," etc., as easy reference can be made to exact details.

Major S. P. James in "A new arrangement of the Indian Anophelinae" (Rec. Ind. Mus., iv, 95—109) criticizes the evanescent nature of Anopheline genera, noting that if *maculipennis*, Mg., be the type of *Anopheles*, s. s., there is no Indian species of the genus. He divides the Indian Anophelina into two groups, those with and those without abdominal scales. Of the 1st group he admits 4 genera—*Neostethopheles*, gen. nov. (pl. i), with *aitkeni*, James, as type; *Myzomyia*, Blanch. (pl. i), with *culicifacies*, Giles, as type; *Patagiamyia*, gen. nov. (pl. i), type *gigas*, Giles; and *Pyretophorus*, Blanch. (pl. i), with *palestinensis*, Theob., as "type example."[1]

In the 2nd group he gives these genera: *Nyssorhynchus*, Blanch. (pl. ii), type *maculatus*, Theob.; *Myzorhynchus*, Blanch. (pl iv), type *barbirostris*, V Wulp; *Cellia*, Theob (pl. iii), type *pulcherrima*. Theob.; *Neocellia*, Theob. (pl. iii), type *indica*, Theob.; *Aldrichia*, Theob., type *error*, Theob.; *Nyssomyzomyia*, gen. nov. (pl. ii), type *rossii*, Giles; *Christophersia*, gen. nov. (pl. iv), type *hallii*.

The two new genera proposed, *Neostethopheles* and *Patagiamyia*, are not admitted in the present Catalogue, as my manuscript was practically completed when these genera were set up, and also because it is quite evident that the workers in mosquitoes are further off than ever from any definite agreement amongst themselves as to either the number or the limits of the genera to be recognized.[2] The third genus proposed by James—*Christophersia*—is acknowledged here as it comprises one species only, which has not previously been located in any other genus.

In the 2nd edition of Messrs. James and Liston's "A Monograph of the Anopheline Mosquitoes of India" a good deal of additional matter is introduced. Their classification into Megarhinae, Limatinae, Anophelinae, Aedinae and Culicinae need not be criticised here. Their suggestion (p. 15) to make use of the botanical terms to describe the different shapes of the scales seems an excellent one, as the terms now used are ambiguous and have not the same meaning for every author. Collecting and mounting are detailed, but it is certainly time that the method of using

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[1] The true generic type is *costalis* but has not been seen by James, and, as he remarks, the thoracic scales may be different. In any case however *costalis* must still remain the type of the genus.

[2] In the "Bulletin of Entomological Research" for May 1911 Mr. J. W. W. Stephens calmly announces that "A careful examination with a pocket lens (!) should enable you to state almost with certainty whether or no all the Anophelines you have caught are of the same species." Yet those who have studied them for years are, as stated, still very much at variance as to specific limits.

cardboard discs should be abolished and neatly cut blocks of pith be substituted.[1]

The authors' suggestion (p. 17) to ignore the legitimate claims of priority, cannot, of course, be sustained. One feature of this work is that the descriptions are drawn up without reference to sex, applying presumably to both, except where, here and there, a character is noted as present in one sex only.

It is extraordinary how specialists in mosquitoes continue to wrongly name the veins, and especially what they call "cross-veins."

In James and Liston's work, the longitudinal veins are correctly designated, but they speak of the short basal section of the 2nd longitudinal vein (before it takes its longitudinal course) as a cross-vein (the "marginal"). It is nothing of the sort, the marginal cross-vein not being present in the Culicidae at all: and in those families in which it does occur it is always in the distal half of the wing.

Again, James and Liston's "supernumerary cross vein" is merely the basal section of the 3rd longitudinal vein, and certainly not a cross-vein at all.

Their "mid cross-vein" may be thus called though "anterior" cross-vein is the more correct term; and the posterior cross-vein they have happily correctly recognized.

The subcostal cross-vein of James and Liston is not this vein at all, but the *humeral* cross-vein, the subcostal cross-vein not being present in the Culicidae, and in those families in which it does occur it joins the auxiliary and 1st longitudinal veins. There are only three cross-veins in Culicidae—the humeral, anterior and posterior.

In speaking of the cells, James and Liston say that the "areas enclosed between these branches" (*i.e.*, of the forked longitudinal veins, the 2nd and 4th) "have received names" (mentioning only the 1st submarginal, 2nd posterior and "anal" cells) but continue by cheerfully ignoring all the other cells as "for our present purpose they need not be mentioned"!

Moreover, they are wrong again in their "anal" cell, which is really the "4th posterior" cell. The anal cell is always *behind* or *posterior* to the 5th longitudinal vein, or the hinder branch of it when this vein is forked.

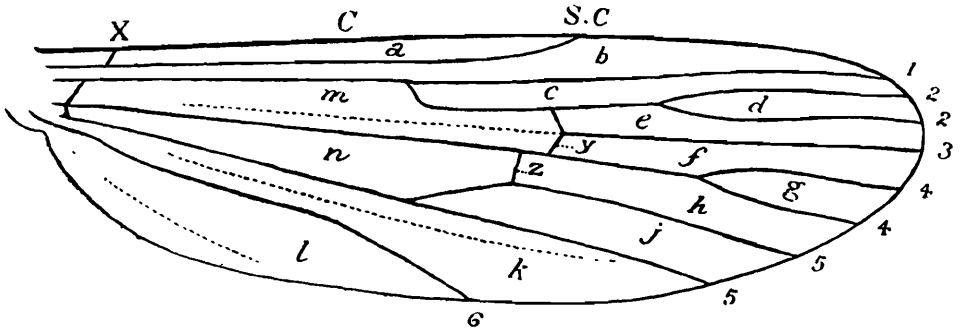
Perhaps Theobald is most to blame for these errors, as being the pioneer of a false terminology. This author's "supernumerary cross-vein" is merely the basal section of the 3rd longitudinal vein. He also figures the somewhat similar section of the 2nd longitudinal vein as a cross-vein, but gives it no title, either in

[1] The method I adopt for mounting all very small Diptera is to thrust the minute pin through the right side of the thorax, immediately below the dorsum, at such an angle that the point emerges from the left side immediately above or between the legs. It is then possible to view the greater part of both the dorsal and side surfaces without removing the specimen from the cabinet.

the explanation of the figure (Monog., i, p. 18) or in the accompanying letter-press.

In the hope that it may be of service to those who have not sufficiently mastered the terminology of the veins in Diptera the present figure is offered, with the correct names of the veins appended.

Colonel A. Alcock has recently published a paper on the classification of the Culicidae,[1] in which he deplores the undue rank apportioned to mere groups of species in this family, and recognizes Corethrinae as certainly belonging here, but follows



Terminology of venation in Culicidae.

C	costa.	a	costal cell.
S.C	sub-costal or auxiliary vein.	b	sub-costal cell.
1	1st longitudinal vein.	c	marginal cell.
2	2nd do.	d	1st sub-marginal cell.
	The two branches are termed the anterior (or upper) and posterior (or lower) branch respectively.	e	2nd do.
		f	1st posterior cell.
		g	2nd do.
3	3rd longitudinal vein.	h	3rd do.
4	4th do.	j	4th do.
	(The branches named as in the 2nd vein.)	k	anal cell.
		l	axillary cell.
5	5th longitudinal vein.	m	1st basal cell.
	(The branches named as in the 2nd and 4th veins.)	n	2nd do.
6	6th longitudinal vein.		
x	humeral cross-vein.		
y	anterior (or "mid," or "small") cross-vein.[2]		
z	posterior (or "hinder" or "large") cross-vein.[2]		

the practice of other authors in instituting new terms by proposing the establishment of four sections: (1) Megalorhini (=the Megarhinae of Theobald), (2) *Epialurgi* (evolved from "ague fever" and "work," this group representing the Anophelinae of authors), (3) Culicales (= Culicinae, Heptaphlebomyinae, Dinoceratinae, Aedinae and Uranotaeniinae of Theobald), (4) Metanototricha

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[1] "Remarks on the classification of the Culicidae, with particular reference to the constitution of the genus *Anopheles*," Ann. Mag. Nat. Hist. (8), viii, No. 44, p. 24 (August 1911).

[2] All three sets of terms have been used by good dipterologists but anterior and posterior are eminently the best fitted for permanent adoption since these relative positions are constant in all wings in which both cross-veins are present, whereas the other terms are sometimes inappropriate.

(= Trichoprosoponinae, Dendromyinae, Limatinae of Theobald), "this group being entirely conventional." [1]

One of the most valuable points in the paper is the recognition of most of the so-called "genera" as sub-genera only.

I have endeavoured to retain the sequence of genera as near as possible to that followed in my Catalogue, for there is as yet, apparently no uniform agreement as to the disposition of many of the genera, even into the so-called sub-families.

Several genera admittedly hold intermediate positions, which clearly supports the contention that the less the number of genera in Culicidae, the more zoologically correct the classification. Respecting the value of the so-called species the present writer offers no opinion, but as authors are already speaking of "*Culex* so-and-so, and its allies," it is reasonable to conclude that considerable doubt exists still as to specific limits, and that the opinion expressed four years ago in the introduction to my Catalogue that "a few more years careful study of the family is more likely to result in the reduction than otherwise of the total number of what today are regarded as distinct species' seems within possibility of realization.

Four new "generic" names are proposed in the present paper for names already preoccupied, and it is significant as showing how little culicidologists concern themselves with dipterological literature, that three out of these five names should have been previously used in the order Diptera itself! [2]

Other names are so similar to long previously established ones that confusion is at least probable. Such are *Popea*, Ludlow, closely resembling *Poppea*, Stal. (1867), in Hemiptera; whilst two other recently established genera (non-Oriental) bear names remarkably similar to others long established in other divisions of the animal kingdom. These are *Carrollia*, Lutz, practically preoccupied by *Carollia*, Gray (1838), in Mammalia, and by *Carolia*, Cantr. (1837), in Mollusca; also *Ankylorhynchus*, Lutz, preoccupied by *Ancylorhynchus*, Schonh. (1836), in Coleoptera.

Miss Ludlow has emended her generic name *Calvertia* to *Calvertina* (Can. Ent., xli, 234), it being preoccupied by Warren in Lepidoptera.

There also exist two other very similarly named genera *Calvertius*, Sharp, in Coleoptera and *Calveria*, Carp., in Echinodermata.

During two tours made by me, one round the Punjab and north-western part of India in 1905 and one round the far east in 1906, I collected a certain number of Culicidae, but paid no especial attention to their capture or preservation, with the result that the condition of the specimens renders them practically

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[1] Col. Alcock now accepts for these groups the more appropriate names "Megalorhinina," "Anophelina," "Culicina" and "Metanototrichina" (Bull Ent. Res., ii, p. 241, 1911).

[2] A fifth instance was included in the original MS of this paper—*Aldrichia*, Theob. (preoccupied in Bombylidae by Coquillett)—but in his last volume Theobald alters it to *Aldrichinella*. This genus (*Aldrichia*) made another instance of ignored preoccupation in Diptera!

valueless for the cabinet. Mr. Theobald, however, most generously looked through them and suggested the identity of a certain number of the more easily recognized species, and the data referring to these are included in the present paper, mainly for the sake of recording the localities. These species are *Myzomyia rossii*, Giles; *Myzorhynchus sinensis*, Wied.; *Desvoidya obturbans*, Wlk.; *Theobaldiomyia* (nom. nov. for *Leucomyia*) *gelidus*, Theob.; *Culex fatigans*, Wied.; *concolor*, R. Des.; *tigripes*, Grandpré; *impellens*, Wlk.; *microannulatus*, Theob.; *sericeus*, Theob.; *Mansonia annulipes*, Wlk.; and *Stegomyia fasciata*, Fab.

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N.B.—To my catalogue, the following addition should be made on p. 302, line 13, after the word "sufficient":—

"Coquillett in 1906 (Tech. Sc., ii, Bureau of Entom. U. S. Dept. Agric.) sinks Aedeomyinae and Haemagoginae in Culicinae, retaining Anophelinae, Megarhininae, Psorophorinae, Culicinae, Deinoceratinae, Uranotaeniinae and Trichoprosoponinae."

ADDITIONS TO LIST OF LOCALITIES.

Berars	Central India.
Bukit Kutu	3,400 ft., Federated Malay States.
Chittagong	Eastern Bengal.
Cochin State	South India.
Deccan	India.
Deesa	West Central India.
Dehra Dun	Foot of Mussoorie Hills (W. Himalayas).
Jugra	On the Langat River, on a solitary hill (1,000 ft.), Federated Malay States.
Kangra Valley	4,500—4,800 ft., Punjab (W. Himalayas).

[1] Not relating to Oriental species, but a severe criticism of present-day taxonomy in this family.

Kawkareik	Base of Dawna Hills, Tenasserim, Lower Burma.
Klang .	On the Klang River, Federated Malay States.
Kumaon .	In Western Himalayas, embracing Naini Tal and Bhim Tal.
Laguna .	One of the Philippines.
Lake Chilka	Orissa, east coast India.
Luzon	The principal island in the Philippines, containing Manila.
Maddathorai	Travancore State, South India.
Mandalay	Upper Burma.
Manipur	6,400 ft., Assam.
Mindanao	One of the Philippines.
Moulmein	Tenasserim, Lower Burma.
Pallode	Travancore State, South India.
Pangkor Laut .	Malay Peninsula.
Phagu	9,000 ft., near Simla.
Port Swettenham	Selangor, Federated Malay States.
Puri ..	Coast town in Orissa.
Raub	Federated Malay States (Pahang).
Rizal	One of the Philippines.
Shasthancotta	Travancore State, South India.
Shencotta	Travancore State, South India.
Soerabaya	City at eastern extremity of Java.
Sukwani ..	Nepal near Bengal frontier.
Tayabas ..	One of the Philippines.
Thaumaspur .	Nepal (Terai, base of Himalayas).
"The Gap" .	Pass between Selangor and Pahang, Federated Malay States.
Theog	Near Simla.
Travancore	State in South India.
Trivandrum .	Capital of Travancore State, South India.
Ukhrul .	6,400 ft., Manipur State, Assam.
Ulu Gombak .	13 miles from Kuala Lumpur, Selangor.
Ulu Klang .	Near Kuala Lumpur.

CATALOGUE.

CULICIDAE.

ADDITIONAL REFERENCES.—Blanch., Moust., 151 (tab. gen. in Culicidae).

Sub-Family *ANOPHELINAE.*

ADD. REF.—Blanch., Moust., 157 (sub-fam. chars.)
Theob., Monog. Culic., iv, 22 (tab. genera), 24 (list of known spp.—16+11 uncertain), 25 (tab. known spp.).
Leices., Culic. Malaya, 18 (tab. genera).

ANOPHELES, Meig.

ADD. REF.—Leices., Culic. Malaya, 19.
James and Liston, Monog. Anoph. Mosq. Ind., 2nd Ed., 40.

N.B.—Col. Alcock recognizes seven groups—which he regards as sub-genera only—covering all the species of the Anophelinae, which according to him should all be comprised in a single genus. These sub-genera are, *Christya, Arribalzagia, Myzomyia, Anopheles, Myzorhynchus, Nyssorhynchus* and *Chagasia.* Two quotations *verbatim* appear advisable: "For the sake of convenience the species that compose the genus may be grouped in sub-genera according to the following table; but the groups, though they can be defined with sufficient precision, grade into one another."

"All these considerations justify the conclusion that the so-called 'genera' of the proposed 'sub-family' Anophelinae cannot be separately focussed as distinct generic conceptions, but must all be merged in one generalization." In the sub-genus *Anopheles,* Alcock includes *Stethomyia*, Theob., *Neostethopheles*, James, *Patagiamyia*, James, and *Cyclolepidopteron grabhamii*, Theob.

A. aconita, Don. (*aconitus*).

Removed here from *Myzomyia* by Theobold (Monog., v) saying that Donitz says (Zeits. fur Hygiene, xliii, 233) that *A. formosaensis*, Tsuzuki, from North Formosa is only a variety of *aconita*, and proposes to change the name (unnecessarily) to *cohaesa.* It transmits malaria. James and Liston put it in their new genus *Neostethopheles.*

A. aitkenii, James in Theob.

ADDITIONAL LOCALITY.—Meenglas, Dooars, Jalpaiguri, 9-viii-07 [*Wallich*], a ♂ and ♀ in Indian Museum the only specimens seen by Theobald since describing the species.

A. barianensis, James, 1911.

Monog. Anoph. Mosq. Ind., 2nd Ed., 76.

LOC.—Murree Hills, Punjab (7,000 ft.). Taken by Assistant Surgeon J L. Wredden.

A. dthali, Patton.

Now referred by Theobald to *Myzomyia.*

A. formosaensis, Tsuzuki, 1902.

Archiv. f. Schiffs u. Tropen Hygiene, vi, 289.

I am still in doubt as to what is meant by this specific name, not being able to consult the original descriptions. Apparently

there are two species of the same name by the same author from North and South Formosa respectivelv, the former being synonymous with *aconita*, Don. (according to Donitz himself, who suggests renaming it var. *cohaesa*), and the latter being apparently specifically distinct, as Theobald (Monog., v, 84) quotes it as "*formosaensis* II," though he is unable to place it generically.

A. formosus, Ludl., 1909.

Can. Ent., xli, 22, ♀

Theob., Monog., Culic., v, 8, ♀.

Miss Ludlow notes (Mosq. Phil. Is., 10) the above species as shortly to be described, the description appearing in due course as quoted above. She says it is the only species in the Philippines belonging to *Anopheles* (*s. str.*). Theobald has not seen it and suggests it may *not* be *Anopheles*.

From Benguet, Ph. Is., March 1908.

A. gigas, Giles.

ADD. REF —Blanch., Moust., 184 (*Myzomyia id.*).

ADD. LOC.—Ceylon [*E. E. Green*]; Deesa, W. Centr. India [*Maj. Nurse*].

N.B. –This is made the type of James and Liston's new genus *Patagiamyia*.

A. immaculatus, Theob.

Type in British Museum.

A. lindsayi, Giles.

ADD. REF.—Blanch., Moust., 169.

ADD. LOC.—Dehra Dun (Mussoorie Hills, foot) [*Thomson*]; Ferozepore (Punjab) [*Maj. Nurse*].

Type in British Museum.

var. **maculata**, Theob., 1910.

Rec. Ind. Mus., iv, 1.

"A very distinct variety." Kurseong (5,000 ft.), 5-vii-08, a perfect ♀ [*Annandale*]. *Type* in Indian Museum.

A. simlensis, James and Liston, 1911.

Monog. Anoph. Mosq. India, 2nd Ed., 41.

This species, with *gigas*, Giles, and *lindesavi*, Giles, is placed by the authors in their new genus *Patagiamyia*, but as this genus is not admitted in this Catalogue, *simlensis* is referred to *Anopheles*.

A. treacherii, Leices., 1908.

Culic. Malaya, 19, ♂ ♀

N.B.—Described from a series bred from larvae taken in hill-side streams in jungle. Amongst the notes the author says: "This species is widely distributed in the Peninsula. It is a blood sucker; it will not breed in captivity, and the larvae, unless mature, usually die."

A. wellcomei, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 33 ♀
Described from several ♀ ♀, all slightly damaged.
Type in British Museum.

PATAGIAMYIA, James, 1910.

Rec. Ind. Mus., iv, 98.

James and Liston, Monog. Anoph. Mosq. India, 2nd Ed., 41.

This genus is not adopted in the present Catalogue. James and Liston make *gigas*, Giles, the type species, the other Indian species being *lindsayi*, Giles, and *simlensis*, James. all herein referred to *Anopheles*.

NEOMYZOMYIA, Theob., 1910.

Monog. Culic., v, 29.

N. elegans, James in Theob.

Anopheles elegans, James and Liston, Anoph. Mosq. Ind., 82.
Myzomyia id., Theob., Monog. Culic., iii, 51.
Pyretophorus id., *id.*, *op. cit.*, iv, 77.

Theobald redescribes the species in vol. v, 30, ♂ ♀ with two figs. of the ♀ wing, giving other details.

LOCS.—Karwar (Bombay Presid.) [*Coghill*]; Andaman Is. [*Ray White*]; Meenglas, Jalpaiguri [*Wallich*].

N. leucophyrus, Don.

Nyssorhynchus id, Blanch., Moust., 213, ♀
Myzomyia id., Leices., Culic. Malaya, 28, ♂ ♀

N.B.—The latter author describes both sexes (the ♂ for the first time) from a large series bred from larvae from water in open bamboos in jungle. The species is wholly sylvan, and is removed to this genus by Theobald (Monog., v, 44).

MYZOMYIA, Blanch.

ADD. REFS.—Theob., Monog. Culic., iv, 41 (list of known species—20), 42 (table of spp.).

Leices., Culic. Malaya, 23, ♂ ♀
James and Liston, Monog. Anoph. Mosq. India, 2nd Ed., 40.

N.B.—Col. Alcock sinks *Neomyzomyia*, Theob., *Pyretophorus*, Blanch., and *Nyssomyzomyia*, James, in *Myzomyia*.

M. albirostris, Theob.

ADD. REF.—Leices., Culic. Malaya, 23, ♂ ♀
Type in British Museum.

N.B.—Leicester says that the larva occurs in small running streams with grassy edges. It is a blood sucker, and is easily identified when fresh by the parti-coloured proboscis.
In bungalows, Kuala Lumpur.

M. annularis, Wulp.

I can glean no further information about this species, the type of which, described from Java, should be in the Leyden Museum.
Theobald does not mention it in his 5th volume.

M. azriki, Patton.

ADD. REF.—Theob., Monog. Culic., v, 27, ♂ ♀ , figs. ♂ ♀ palpi and palmate hair.

M. christophersi, Theob.

Admitted as a good species by this author (Monog., v) who adds the following localities: Sylhet, 2-v-5 [*Hall*]; Kangra Valley; Meenglas, Jalpaiguri, 13-vii-07 [*Wallich*]; Calcutta, 2 ♀ ♀ [*Alcock*].

M. culicifacies, Giles.

ADD. REF.—Blanch., Moust., 182, ♀
Theob., Monog. Culic., ii, 309; iii, 39; iv, 51; v, 25.

ADD. LOCS.—Mandalay, ♂ ♀ in bathroom, 13—14-iii-08 [*Annandale*]; Lucknow, 21-i-08 [*Hodgart*]; Deesa [*Nurse*]; Ennur, Goa, Bombay, Secunderabad, Aurangabad (Hyderabad State), Deccan (all in India and all *t. Theobald*).
Type in British Museum.

N.B.—This varies greatly in size. I do not know what Blanchard's ♂ of this species is. In the introduction to this paper some remarks are made as to the name of this species.

M. deceptor, Don.

Theobald removes it here from its vague position in "*Anopheles*" (Monog. Culic., v) and adds Trincomalee, Ceylon [*Green*], as a locality.

M. dthali, Patton.

Also referred here from "*Anopheles*" by Theobald (Monog., v).

M. elegans, James.

Referred to *Neomyzomyia*.

M. funesta, Giles.

ADD. REF.—Blanch., Moust., 180, ♂ ♀.

N.B.—In his 4th volume Mr. Theobald definitely confirms *kumasii*, Chalmers, as synonymous with *M. funesta*, Giles, and remarks that it has not yet been found in India.

Miss Ludlow records this species from Samar, Laguna, Pangasinan, Pampanga, Tayabas, Mindanao, Sciassi, Rizal, and other localities in the Philippine Islands, where it appears to occur all the year round except during March and April.

"A proven host of the malarial parasite in Africa, with a moderate distribution in the Philippines; is always taken where malaria is present or prevalent" (Ludlow).

The *types* of the varieties *umbrosa* and *sub-umbrosa* are in the British Museum.

M. indefinita, Ludl., 1904.

M. rossii var. *indefinita*, Ludl., Can. Ent., xxxvi, 299.

ADD. REF.—Theob., Monog. Culic., iv, 47.

N.B.—Now accepted as a good species, although at one time considered intermediate between *rossii* and *ludlowii*. Miss Ludlow records it from all parts (26 different localities) of the Philippines, where it occurs all the year round. This author says, "Never the subject of experiment, though widely distributed, taken in large numbers, and present during malarial outbreaks; does not occur alone in a sufficient number of stations to be indicative, and its ability as host must be left in doubt."

Type in Army Medical Museum, Washington.

M. jehafi, Patton.

ADD. REF.—Theob., Monog. Culic., v, 22, figs. of ♂ ♀ palpi and palmate hair.

M. leptomeres, Theob.

Giles, in his "Revision of the Anophelina" (1904) thinks this = *Anopheles pictus*, Lw. (1845), but Theobald (Monog., iv, 124, and v, 29) says that his (Theobald's) species is nothing like Loew's description.

Type in British Museum.

M. leucophyrus, Don.

Removed to *Neomyzomyia.*

M. listoni, Liston.

ADD. REF.—*Myzomyia christophersi*, Theob. Blanch., Moust., 183.

ADD. LOC.—Kangra Valley (Punjab, 4,800 ft.), May, June, July [*Dudgeon*]; Berars (Centr. India); Ceylon [*Green*].

Under the name *christophersi*, Theob., Mr. Theobald (Rec. Ind. Mus., iv, 2) gives the localities Sylhet, 2-v-05 [*Hall*]; and Jalpaiguri, 13-viii-07 [*Wallich*].

N.B.—Mr. Theobald (Monog., iv, 51) sinks this name for his own *christophersi*, and remarks, "The name *listoni* was used by Giles for a large variety of *culicifacies*, so Liston's name cannot stand."

Even if the *variety* referred to is sufficiently distinct to be considered as such, and constant enough to be accorded a name (and Mr. Theobald does not rank it as such), there is no reason why the name should not be given elsewhere to a distinct species.

Liston's description holds priority. In describing the species, I take it that he considered he was describing the species named after him by Giles (*listoni*, Giles, 1901, Ent. Month. Mag., xxxvii, 197); therefore now that the error is discovered, and it is known to be a different species, the name should surely be retained, Capt. Liston's mistake absolving him from being considered to have purposely named the species after himself.

M. ludlowi, Theob.

Apparently occurs all the year round all over the Philippines from the long list of dates and localities afforded by Miss Ludlow, who records it from forty different places in these Islands. Also found in the Malay States. "Never a subject of experiment, appears coincident with malaria in the Philippines, and seems likely to be connected with its transmission" (Ludlow).

However, in a footnote (Mosq. Phil. Is., p. 30) she adds that since writing her paper, two articles have appeared, by Capt. Ashburn and Lieut. Craig, and by C. S. Banks, the results of the investigation of the first authors being against the probability of malaria being actually spread by this insect; whilst the last author proves at least its capability by actual experiments of transmitting the disease.

James and Liston desire to place this species in their new genus *Nyssomyzomyia.*

Type in British Museum.

M. punctulata, Don.

Removed by Theobald to *Cellia.*

M. punctulata, James and List.

This is not claimed to be a new species, and the only inference is that it is Donitz's species redescribed, though why these authors relegate the name to themselves is certainly not obvious.

M. rosisi, Giles.

ADD. REF.—Blanch., Moust., 178, ♂ ♀, fig. 162, wing; 163, transverse veins.
Leices., Culic. Malaya, 25, ♂ ♀

N.B.—In Monog., iv, *errata*, Mr. Theobald says "This species has been found on recent microscopic examination to belong to a distinct genus from *Myzomyia*, owing to the peculiar squamose characters of the thorax. The genus is being described by Mr. Rothnell as *Pseudomyzomyia.*"

I have seen no description anywhere of this proposed genus *Pseudomyzomyia* and Theobald does not mention it in his Monog., vol. v. James and Liston (Monog. Anoph. Mosq. India, 2nd Ed., 44) propose to erect the name *Nyssomyzomyia* in its place, for the reception of *rossii*, *ludlowi*, Theob., and *punctulata*, "James and List.," but for reasons previously stated the genus is not recognized here. Anyway, should *Pseudomyzomyia* actually have been published anywhere and cover the same set of species it is impossible to throw out the genus at James and Liston's desire for the purpose of adopting a new name of their own.

Theobald, in his "1st Rep. Ind. Mus. Coll. Culic." (Rec. Ind. Mus., ii, 287), retains the species in *Myzomyia* without comment and in his 2nd Report does so also.

Leicester (Culic. Malaya) says the larvae occur in any small collections of stagnant water near houses, giving as localities, Kuala Lumpur, Singapore, Penang, Klang, and notes that its only affinity in Malaya is *albirostris*.

Miss Ludlow records it from the Philippines nearly all the year round, saying "Doubted as a host in India; has a moderate distribution, is taken infrequently and in small numbers in the Philippines, and its connection with malaria is not indicated."

ADD. LOCS.—Laguna, Mindanao, Albay, Pangasinan, Tayabas, Pampanga, Batangas, Bulacan, Bataan, Cavite, Rizal [all Phil. Is. *t. Ludlow*]. Calcutta apparently all the year round; I have taken it there in April, June, July and August.

In the Indian Museum collection [*t.* Theob.] from Puri, Ganjam lake district, Travancore State (several localities, taken by Dr. Annandale, 5—25-xi-08); Ferozepore, Chittagong [*Hall*], and on board ship ten miles off Coconada, Madras coast, 17-iv-08 [*Paiva*]; Lucknow, 4-ix-05 [*Brunetti*].

Theobald adds "one example from Calcutta, quite typical. was labelled stating that it was determined by Giles as *Anopheles costalis*, he does not mention this in his handbook."

Mr. Green says this species is probably the malaria carrier in parts of Ceylon, especially the Batticaloa district.

In his last volume Mr. Theobald gives a long list of localities from Indian Museum specimens, showing it to be found in India practically all the year round, rarest in February and March, occurring frequently in houses and public conveyances.

He adds as localities: Trincomalee, Ceylon, 14—28-i-07; 1-ii-07; 1-x-07 [all *Green*]; Phrapatoon, Siam, 18—29-i-07; 19—29-iii-07; viii and ix-06 [all *Dr. P. G. Woolley*]; Chittagong, 19-ix-08; 21-ix-08; 5-vii; 8-viii [all *Hall*].

Type in British Museum.

M. tessellata, Theob.

Type in British Museum.

M. thorntoni, Ludlow.

Add. Loc.—Philippines (August, *t. Theob.*); Mindanao, Pangasinan, Tayabas, Pampanga, Samar, Rizal (all Phil. Is., Feb. and May to November, *t. Ludlow*).

M. turkhudi, Liston.

Add. Ref.—Blanch., Moust., 183.

Add. Loc.—Aurangabad (Hyderabad State, India).

N.B.—Type in British Museum.

Mr. Theobald's description of the ♂ was drawn up from Giles's type, which at that time was considered to be the ♂ of *culicifacies*, Giles, and which was first described as such by both Giles and by Theobald.

Vide note in introduction on *Myzomyia culicifacies*.

NYSSOMYZOMYIA, James.

Rec. Ind. Mus., iv, 101.

James and Liston, Anoph. Mosq. India, 2nd Ed., 43.

Proposed by the above authors for the three species *rossii*, Giles, *ludlowi*, Theob., and *punctulata*, "James and List.," and their suggestion is that it takes the place of the genus *Pseudomyzomyia*, a genus spoken of by Mr. Theobald, but apparently never described.

The three species in question are retained here under *Myzomyia* (I presume their *punctulata* is identical with Donitz's species).

NEOSTETHOPHELES, James, 1910.

Rec. Ind. Mus., iv, 98.

James and Liston, Monog. Anoph. Mosq. India, 2nd Ed., 40.

I have not adopted this genus, with others erected in the above work, but these authors place two species only in it, *aitkeni*, James, and *culiciformis*, James and Liston.

STETHOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic , iv, 59, and v, 35 (tab. of 4 known spp.).

N.B.—Messrs. James and Liston in their latest work suggest the abolition of this genus.[1]

S. culiciformis, James and Liston.

ADD. REF.—Theob., Monog. Culic., iv, 62 (J and L.'s descr. copied).

N.B.—He doubtfully retains (even in vol. v) the species in this genus. The ♂ is mentioned once or twice in the description, but it is not definitely stated that this description applies to both sexes.

Placed in their new genus *Neostethopheles* by James and Liston.

S. fragilis, Theob.

Type in British Museum.

S. pallida, Ludlow.

Recorded by this author from Pampanga (Phil. Is.), Sept. 1905.

PYRETOPHORUS, Blanch.

ADD. REF.—Theob., Monog. Culic., iv, 63 (list of species), 64 (tab. of spp.).
Leices., Culic. Malaya, 37.
James and Liston, Monog. Anoph. Mosq. India, 2nd Ed., 41.

N.B.—In vol. v Theobald quotes *Howardina*, not *Howardia*, as his reference in Journ. Trop. Med., v, 181. I cannot say which is correct.

P. elegans, James.

Removed to *Neomyzomyia.*

P. freerae, Banks.

Theobald (Monog., v, 43) thinks from the description that this may be a *Nyssorhynchus*. Only the imperfect type specimen seems known.

P. minimus, Theob.

ADD. REF.—Blanch., Moust., 188, ♀ , fig. 169 (wing and transverse veins).

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1 Monog. Anoph. Mosq. India, 2nd Ed., p. 39.

N.B.—Its place in this genus is uncertain, owing to the bad condition of the type. Giles places it here; Blanchard says, "near *Myzomyia funesta*."

P. nigrifasciatus, Theob., 1907.

Monog. Culic., iv, 65, ♀.

From India, taken by Major Nurse at Peshin in April.
Resembles *Myzomyia turkhudi*, Liston. Also occurs in Cyprus.
Type in British Museum.

P. nursei, Theob., 1907.

Monog. Culic., iv, 66, ♀

Taken by Major Nurse at Quetta in November, a unique specimen resembling *nigrifasciatus*.
Type in British Museum.

P. watsonii, Leices., 1908.

Culic. Malaya, 38, ♀.

A single ♀ taken by Dr. Watson in jungle a few miles from Klang.

MYZORHYNCHUS, Blanch.

ADD. REF.—Theob., Monog. Culic., iv, 81 (list and table of the 16 known species).

Leices., Culic. Malaya, 29.

N.B.—Theobald thinks it probable that malaria contracted in the open is generally accountable to species of this genus.
One Japanese species (*sinensis*) has been shown by Tsuzuki to carry malarial parasites in Japan. Col. Alcock embodies *Lophoscelomyia*, Theob., in *Myzorhynchus*.

M. albotaeniatus, Theob.

ADD. REF.—*alboannulatus*, James and Liston, Anoph. Mosq. Ind., 81.
ADD. SYN.—Leices., Culic. Malaya, 34, ♀

N.B.—Larvae in pools near Kuala Lumpur, and in pools at Port Swettenham within tidal influence, and with a salinity of 2·8 per 1,000.
Type in British Museum.

M. barbirostris, V Wulp.

ADD. REF.—Blanch., Moust., 197.

Leices., Culic. Malaya, 33, ♂ ♀

ADD. LOCS.—Calcutta, December, 1 ♀ [Ind. Mus. coll.]; Pampasinan, Daraga, Tayabas, Mindanao, Bataan, Nueva Ecija, Rizal, Siassi, Pampanga (all Phil Is., Feb., March, June to December) [*t. Ludlow*]; Kuala Lumpur (in bungalows), Klang (in jungle) [*t. Leicester*]; Phrapatoon, Siam, 24-iii-07 [*Dr. Woolley*]; Nedumangad, 10 miles N.E. of Trivandrum, S. India, 14-xi-08 [*Annandale*]; Assam, 15-i-07 [*Hall*]; Chittagong, 15-viii-08 [*Hall*]; Andaman Is. (1908) [*Ray White*]; Digoel (in Amsterdam Museum), and taken on the New Guinea Expedition [all *t. Theob.*].

Type in Leyden Museum.

N.B.—Dr. Leicester says the larva can be found in any large open water, and adds, "The larva described by Theobald in vol. iii is, in my opinion, the larva *sinensis* and not *barbirostris*." Theobald says malarial parasites can develop in this species but rarely do so in nature. The larvae of the true form live in dark pools of all depths, with or without vegetation.

M. minutus, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 87.

ADD. SYN.—*Anoph. nigerrimus*, Giles, in James and Liston's (1900) Anoph. Mosq. India, 79, ♀, col. pl. iii (full insect).

ADD. LOC.—Kuala Lumpur [*Durham*].

Type in British Museum according to Theobald's 5th volume, but he previously informed me that it was lost.

N.B.—"The larvae are usually found in deep shady pools, containing grass and water-weed, at some distance from habitations, and the adults are seldom met with in houses" (James and Liston).

The larval characters given by these authors (*loc. cit.*, p. 81) refer to the present species and not to the true *nigerrimus*, Giles, a species which is quite distinct, but which has been confused with *minutus*.

The embryos of *Filaria bancrofti* can develop in this species.

M. nigerrimus, Giles.

ADD. REF.—Blanch., Moust., 197.

Type in British Museum.

M. peditaeniatus, Leices., 1908.

Culic. Malaya, 31, ♂ ♀

Described from a large series bred from larvae, which occur in any large collection of water, if not very stagnant, in the Malay Peninsula.

M. philippinensis, Ludl.

Removed to *Nyssorhynchus*.

M. pseudobarbirostris, Ludlow.

ADD. REF.—Theob., Monog. Culic., iv, 83, ♀

N.B.—*Type* in Army Medical Museum, Washington.

Closely allied to *barbirostris*, Wulp.

Miss Ludlow records it from Marinduque, Mindanao, Ambos Camarines, Pangasinan, Bulacan, Tayabas, Cavite and Rizal, all in the Philippines, appearing apparently from May to October.

M. separatus, Leices., 1908.

Culic. Malaya, 36 (sex not mentioned).

Bred by the author from larvae from large collections of water in the open near Kuala Lumpur. "It may be a variety of *sinensis*."

M. sinensis, W

ADD. REF.—Blanch., Moust., 190, ♀, fig. 170 (wing scales).
Leices., Culic. Malaya, 30, ♂ ♀

ADD. SYN.—*Anoph. plumiger*, Don., Ins. Borse, Jan. 1901.

Anoph. jesoensis, Tsuzuki, 1902, Centr. für Bakteriol., xxxi, 763.

ADD. LOCS.—Hong-Kong, Malacca, Java, Sumatra [all *t. Blanchard*]; Calcutta, vi, vii, viii, 1908, in bathrooms at Museum [*Annandale*]; at light on board steamers at Damukdia Ghat, R. Ganges [*Annandale*]; Sylhet, i, ii, v, vi, vii [*Hall*]; Manipur (6,400 ft.), viii-08 [*Pettigrew*]; Ferozepore [*Adie*]; Maddathorai, 18-ix-09 [*Annandale*] (all in Ind. Mus. coll., identified by Theobald); Jolò (September) and Rizal (August), Phil. Is. [*t. Ludlow*]; Shanghai, 8—10-v-06, in ditch [*Brunetti*].

Theobald adds the following localities in his vol. v: Phrapatoon, Siam, viii, ix [*Dr. Woolley*]; Pampanga, Angeles, Ph. Is. [*Whitmore*]; West Lake, Hankow [*Cornford*]; Ukhrul, Manipur (6,400 ft.), viii-08, 20—26-i-03, 23-ii-05, 27-v-00, 4—7-vi-05 [*Pettigrew*]; Sylhet, 13-i-03, 13-i-04, 24-vii-08 [*Hall*]; Ferozepore [*Adie*]; Calcutta, 9-vi-08, viii-08, 28-vii and 9-vi-08 [*Annandale*]; Maddathorai, S. India, 18-ix-08 [*Annandale*].

N.B.—Dr. Leicester says, "larvae taken in ponds and roadside ditches, both in town and country."

Miss Ludlow reports, "a proven host in India; has been taken at too few stations to show that it affects markedly the malarial conditions of the Islands" (Philippines). Dr. Leicester includes under this specific name, *vanus*, Wlk.

Respecting *pseudopictus*, Grassi (a European species), Theobald still (Monog., iv, 87) considered it distinct from *sinensis*, W.,

with *pictus*, Ficalbi, for a synonym, but in vol. v he suppresses this synonym. Amongst the uncertain species ranked under "Anopheles" he places "*pictus*, Lw." He gives no further information about his *Myzomyia indiensis*.

M. sinensis has been studied in Japan, where it has been found to transmit malaria. It is very variable.

M. umbrosus, Theob.

ADD. REF.—Leices., Culic. Malaya, 35, ♀

He notes only one example, from jungle near Kuala Lumpur, "very like *barbirostris*."

Type in British Museum.

M. vanus, Wlk.

ADD. REF.—Blanch., Moust., 196, ♂ ♀

ADD. LOCS.—China [*t. Theobald*]; Celebes [*t. Walker*]; Java, Malacca [*t. Blanchard*]; Calcutta, Oct., Nov., Dec., common in last two months; Port Canning [*t. Theob.*, Ind. Mus. coll.]; Albay, Laguna, Pangasinan, Bulacan, Tayabas, Manila, Cavite, Bataan, Nueva Ecija, Rizal (all Phil. Is., April, and from June to January) [*t. Ludlow*]; Dondra, Ceylon, 4-xii-07 [*Green*]; Galle, Ceylon, 8 xii-07 [*Green*].

Type in British Museum.

N.B.—Dr. Leicester considers *vanus* synonymous with *sinensis*, W., but Theobald in his latest volume keeps them distinct.

LOPHOSCELOMYIA, Theob.

ADD. REF.—Giles, 1904, Journ. Trop. Med., vii, 366 (*Lophomyia*).
Blanch., 1905, Moust., 635.
Theob., 1907, Monog., iv, 91, ♂ ♀
Leices., 1908, Culic. Malaya, 21.

N.B.—In his monograph (iv, 92) Mr. Theobald redescribes, and says that the name was spelt correctly at the erection of the genus (Entom., Jan., 1904). In the Genera Insectorum (Fasc. 26) he spells it *Lophocelomyia*.

L. asiatica, Leices.

ADD. REF.—Theob., Monog. Culic., iv, 92, ♂ ♀

Leices., Culic. Malaya, 21, ♂ ♀

"*Lophomyia asiatica* Theob. MS.," in Giles (1904), Jour. Trop. Med., vii, 366.

ADD. LOCS.—Malaysia, according to Leicester, who says it breeds exclusively in pools of water in bamboo, adding that those bred in captivity will not bite.

NYSSORHYNCHUS, Blanch.

ADD. REF.—Blanch., Moust., 202.
Leices., Culic. Malaya, 39.
James and List., Monog. Anoph. Mosq. India, 2nd Ed., 43.
Laverania, Theob., 1902 Journ. Trop. Med., ii, 181.

N.B.—In this genus Col. Alcock sinks *Neocellia*, Theob., *Cellia*, Theob., *Calvertina*, Ludl., and *Christophersia*, James.

N. fuliginosus, Giles.

ADD. REF.—Blanch., Moust., 205, fig. 179*a*, normal wing, 179*b*, wing of var. *pallida*.

ADD. LOCS.—Calcutta, 15-vii-08, 12-viii-08, at light in house [*Annandale*]; Balighai, near Puri, 23—24-x-08, "numerous in old wells, resting by day" [*Annandale*]; Ferozepore, numerous [*Adie*]; Deesa [*Nurse*]; Ceylon [*Green, Major Manders, Chalmers*]; Ellichpur in April, Calcutta, December, at light; Bombay, Java, Sumatra [all *t. Blanchard*]; Pangasinan, Tayabas, Guimaris Is., Albay, Rizal, Cavite, all Phil. Is. [*t. Ludlow*].

N.B.—Capt. James has found that tertian, quartan and malignant tertian parasites will develop in this species artificially, but says it has not yet been found naturally infected (*v.* James, Sci. Mem. Ind., new. ser., No. 2, p. 39).

Major Adie has found the sporozoits in wild *fuliginosus* (Ind. Med. Gaz., xxxviii, July 7, 1903).

Theobald (Monog., iv, 99) notes a variety from Chingelput (S. India).

Miss Ludlow says, "Questioned as a host in India; has a moderate distribution taken infrequently in small numbers in the Philippines, and its connection with malaria is not indicated."

This species appears to have several varieties, a form occurring in the Punjab all the winter (Adie, Ind. Med. Gaz., xxxviii, July 7, 1903 and Jan. 4, 1905); this variety flourishing from the middle of November till the end of April, whereas in that part of India, the typical form flourishes from the middle of March to the beginning of June.

Theobald's variety *pallida* has been considered a good species by Giles, but the former author states that it is not so (Monog., iv, 100).

N. indiensis, Theob., 1903.

Monog. Culic., iii, 99.

Anoph. id., James and Liston (*non* Giles), Anoph. Mosq. Ind., 95, plate 2, figs.

This form, previously regarded as a variety of *maculipalpis*, Giles, is raised by Theobald (Monog. Culic., iv, 98) to the rank of a species (*vide N. maculipalpis, post.*).

Type in British Museum.

N.B.—Theobald (Monog., v) restricts the localities of this form to the Central Provinces of India, Nagpur, Goa, Karwar, Travancore.

N. jamesii, Theob.

ADD. REF.—Blanch., Moust., 206.

ADD. LOCS.—Calcutta, 5-viii-08 [*Annandale*]; Shamnagar, Bengal, 3-viii-05 [*Gourlay*].

Type in British Museum.

N. karwari, James in Theob.

ADD. REF.—Leices., Culic. Malaya, 39, ♂ ♀

N.B.—Larvae taken at Jugra and near Kuala Lumpur, in the grassy edges of slowly flowing streams.

Type in British Museum.

N. maculatus, Theob.

ADD. REF.—Blanch., Moust., 207, ♂ ♀ , fig. 180 (wing).
Leices., Culic. Malaya, 41, ♂ ♀ (copies Theobald's description, not having seen the species).

ADD. LOCS.—Nara Ghat, Nepal, near Bengal frontier, 25—26-ii-08; Thamaspur, Bengal frontier, 18 and 20-ii-08, ♂ ♀

N.B.—This species is the type of the genus and the type was described as in Dr. Rees's collection, but Mr. Theobald informs me that it is in the British Museum.

N. maculipalpis, Theob.

N.B.—The variety *indiensis* is now raised to the rank of a species (*vide supra*). In my catalogue, therefore, *delete* the localities Nagpur, Karwar, Goa and Travancore, all of which relate to *indiensis*.

N. nivipes, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 101, ♀
Leices., Culic. Malaya, 44, ♂ ♀

N B.—Bred from larvae in small collections of water in the open near Kuala Lumpur, Klang, etc. Dr. Leicester describes the species from a long series of both sexes.

Type in British Museum.

N philippinensis, Ludl.

ADD. REF.—Theob., Monog. Culic., iv, 103, ♀.

ADD. LOCS.—Pangasinan, Tayabas, Abra, Rizal, Pampanga (all Phil. Is.), where it occurs all the year round except from February to May.

Type in Army Medical Museum, Washington.

N.B.—Theobald says (Monog., iv, 104), allied to *nivipes*, Theob., may be a variety of it. The species has been referred by Giles to *Pyretophorus* but Theobald (*loc. cit.*, v, 63) retains it here.

N pseudowillmori, Theob., 1910.

Monog. Culic., v, 65, ♀

From Meenglas, Jalpaiguri, 13-vii-07 [*Wallich*].

Type in Indian Museum. Perhaps a var. of *willmori*.

N. stephensi, Liston.

ADD. REF.—Blanch., Moust., 210.

ADD. LOCS.—Calcutta (Museum gardens), 15-vii-08 [*Annandale*]; Phil. Is. (*t.* Miss Ludlow in Can. Ent , xli, 234).

This was removed to *Neocellia* but Theobald replaces it here in his vol. v, where see p. 20 for notes.

N. theobaldi, Giles.

Erratum.—Correct p. 300 to 299 in my reference to Giles' Handb., 2nd Ed.

ADD. REF.—Blanch., Moust., 210.

ADD. LOCS.—Benguet (Phil. Is.), March, April, November.

N.B.—Miss Ludlow says "a proven host in India; has been taken at only one station (referring to the Philippines), and cannot be held responsible for much of the transmission of malaria."

N. willmori, James.

ADD. REF.—Leices., Culic. Malaya, 42, ♂ ♀

Has been placed in *Neocellia* but Theobald (Monog., v) again refers it here, and adds Ceylon, Pundaluoya, July—"known as the instep-biting mosquito" [*Green*]; Malay States and Meenglas, Jalpaiguri, 13-vii-07 [*Wallich*], to the localities.

N.B.—Dr. Leicester says the larvae live in hill streams in jungle near Kuala Lumpur, Jugra and elsewhere, and only records the adult from a hut in Ula Gombak.

Type in the Central Research Institute, Kasauli, India.

KERTESZIA, Theob., 1905.

Ann. Mus. Hung., iii, 66.

Monog. Culic., iv, 117.

Intermediate between *Nyssorhynchus* and *Cellia*.

N.B.—Col. Alcock sinks *Kerteszia* in *Arribalzagia*, Theob.

K. mcgregori, Banks, 1910.

Phil. Journ. Sci., iv, 548, ♂

LOC.—Basilan, Ph. Is. (Type No. 6666), Entomological Collection, Bureau of Science, Manila.

CHRISTOPHERSIA, James.

Paludism, vol. i, 33 (July 1910) (*nom. nud.*). Rec. Ind. Mus., iv, 103 (descr.).

C. halli, James, 1910.

Paludism, vol. i, 33. Plate: figs. of palpi, thorax (dorsal and lateral), abdomen (dorsal, lateral and ventral) and hind leg.

James and List., Monog. Anoph. Mosq. India, 2nd Ed., 123.

LOC.—Sylhet (Assam), February, June, July and December [*Lt.-Col. Hall*].

Type in Indian Museum.

CELLIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 104, 105 (list and tab. known spp.).
Blanch., Moust., 214.
Leices., Culic. Malaya, 46.

C. flava, Ludlow, 1908.

Can. Ent., xl, 32, ♂ ♀

Described from four examples from Tayabas (Phil. Is.), September 1907; incorrectly quoted Tayubar in original description, corrected by author, *loc. cit.*, 52.

Type in Army Medical Museum, Washington.

C. kochi, Don.

ADD. REF.—Blanch., Moust. 208 (*Nyssorhynchus*).
Leices., Culic. Malaya, 46, ♂ ♀

ADD. LOCS.—Kuala Lumpur, xii, 1902 [*Durham*]; Singapore.

N.B.—Widely distributed in the Malay Peninsula, more abundant in the vicinity of houses, breeding in roadside puddles or any pool of water in the open.

C. pulcherrima, Theob.

ADD. REF.—Blanch., Moust., 215, ♀

ADD. LOC.—Kokand (Turkestan) [*t. Univ. Coll. Helsingfors*]; Lahore.

Type ♀ in British Museum, ♂ apparently still unknown.

C. punctulata, Don.

Anopheles id.; *Myzomyia id.*; auct.

Nyssorhynchus id, Blanch., Moust., 208.

Anoph. tessellatum, Theob., Monog. Culic., 1, 175 (*nom. nud*).

ADD. REF.—Leices., Culic. Malaya, 27, ♂ ♀

ADD. LOCS.—Kuala Lumpur, Klang (at both places in bungalow) [*t. Leicester*]; Sumatra, Borneo, Taiping, Papua.

N.B.—"It proves to be a *Cellia* and not a *Myzomyia*, as it appeared from Donitz's description. Blanchard erroneously placed it in *Nyssorhynchus*" (Theob., Monog., iv, 109).

James and Liston (Monog. Anoph. Mosq. India, 2nd Ed.) describe and figure parts of a "*punctulata* James and Liston," under their proposed new genus *Nyssomyzomyia* without any reference to Donitz's species of this name. The species cannot be taken from Donitz's credit if the two are identical, and, if not, two species with the same name cannot co-exist in the same genus.

NEOCELLIA, Theob.

Monog. Culic., iv, 111, ♂ ♀.

N. dudgeoni, Theob., 1907.

Monog. Culic., iv, 112, ♀.

LOC.—Kangra Valley (4,500 ft.), June, July [*Dudgeon*].
Described from several ♀ ♀
Type in British Museum.

N. indica, Theob., 1907.

Monog. Culic., iv, 111, ♂ ♀

LOC.—Dehra Dun (foot of Mussoorie Hills), February, March.
Described from 1 ♂ and 3 ♀ ♀
Type in British Museum.

N. intermedia, Rothwell, 1907.

Entomologist, Feb. 1907, ♀.

Theob., Monog. Culic., iv, 115, ♀; v, 73, ♂ ♀, fig. 29, wing ♂
LOC.—Deesa (W Centr. India), January, August.
Type in British Museum.

The ♂ described by Theobald (v, 73) from Ferozepore, India (18 ♂ ♂ and 109 ♀ ♀ taken by Adie).

ALDRICHINELLA, Theob., 1910.

Monog. Culic., v, 77, nom. nov. for *Aldrichia*, Theob., 1903.

Aldrichia has been preoccupied by Coquillett in *Bombylidae* since 1894 (Trans. Amer. Ent. Soc., xxi, 93), so Theobald has just forestalled me in renaming it by proposing *Aldrichinella*.

In James and Liston's new edition the correction is not made.

The type (*A. error*, a unique specimen) was in the British Museum, but has subsequently been broken. Col. Alcock, however, says it is not a good species at all, being a *Myzomyia rossii*, Giles, with the abdomen of some different species attached.

BIRONELLA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 120, ♂; fig. ♂ wing, p. 122.

B. gracilis, Theob.

N.B.—The ♂ being unknown, Mr. Theobald judges this genus to belong to the Anophelina, but some details of its characteristics make him uncertain as to which subfamily should really include it.

Type in Hungarian Museum.

CALVERTINA, Ludlow, 1909.

Can. Ent., xli, 234, emen. from *Calvertia*, Ludl., *loc. cit.*, 22.

C. lineata, Ludlow, 1908.

Can. Ent., xl, 50 (*Chagasia id.*).

Calvertia lineata, Ludl.
Calvertina id., Theob., Monog. Culic., v, 77.

N.B.—Described first under *Chagasia*, *Calvertia* was erected for it, but this is preoccupied by Warren in Lepidoptera and by *Calvertius*, Sharp, in Coleoptera; there is also a *Calveria*, Carp., in Echinoderma.

The species described from a single perfect specimen of which the author does not state the sex. From Pangasinan (Phil. Is.) in August. Its position here is uncertain, and it may be better placed near *Pyretophorus*.

"ANOPHELES," *sensu lato.*

"Anopheles" arabiensis, Patton.

ADD. REF.—Theob., Monog. Culic., v, 81, ♂ ♀, fig. 34, ♂ ♀ palpi.

N.B.—Theobald seems vague in his opinion on this. From damaged ♀ ♀ sent him by the author of the species, he considered them identical with *A. wellcomei*, Theob., but Patton had already sent the species to Dr. Stephens, who compared it with the type of *wellcomei* and pronounced them distinct. In vol. v, 82, Theobald says: "it is certainly not an *Anopheles*," and immediately after he says a damaged specimen sent him by Patton could not be separated from *wellcomei*, Theob. In his last volume he puts the species under "*Anopheles*."

"Anopheles" culiciformis, Cogill.

Theobald confesses inability to trace this species.

"Anopheles" deceptor, Don.

Removed to *Myzomyia*.

"Anopheles" pictus, Lw., 1845.

Dipt. Beit., Posen, p. 4.

Theobald still (Monog. Culic., iv) thinks this the same as Grassi's *pseudopictus*, but defers a definite opinion until he can compare specimens from Rhodes (Asia Minor). Dr. Thin records it from Haut Tonkin and Harioi. "In both cases *M. sinensis* is evidently referred to as an allied species" (Theob., Monog. Culic., iv, 124). Theobald also says here that Giles is wrong in considering *Myzomyia leptomeres*, Theob., as a synonym of *pictus*.

"Anopheles" subpictus, Grassi.

This species cannot be traced.

"Anopheles" vincenti, Laveran.

Erratum.—My "correction" of Theobald's quotation of date and volume (1901 and liii) is an error, as both his references are correct; yet in vol. v, 84, he perpetuates my previous error as regards the volume by quoting xxiii.

"Sub-Family *MEGARHININAE*."

ADD. REF.—Blanch., Moust., 218, figs. 184-185.

Dr. Leicester (Culic. Malaya, 48) is averse to the subdivision of this "sub-family" of Theobald, and observes that though

the Culicidae may be divided into four sub-families, principally on the comparative length of the palpi in the sexes, the division is an arbitrary and not a natural one, and from his observations I entirely agree with him. Blanchard (Moust., 218-219, figs. 184-185) gives an extensive account of the characters of this group.

MEGARHINUS, Rob. Desv.

ADD. REF.—Blanch., Moust., 220, 221 (tab. of all spp.).
Theob., Monog. Culic., iv, 128 (tab. of spp.)
v, 96 (tab. of spp.).

N.B.—Theobald says (*loc. cit.*, v, 95) the genus is not Oriental, being only found in North and South America and the West Indies.

M. amboinensis, Dol.

M. lewaldii, Ludlow.

M. minimus, Theob.

M. splendens, W

The first two are definitely referred to *Toxorhynchites*, the last two probably belong there also.

TOXORHYNCHITES, Theob.

Type of genus. T brevipalpis, Theob., from Natal.
ADD. REF.—Leices., Culic. Malaya, 59.

T amboinensis, Dol. (*Megarhinus*).

ADD. REF.—Blanch., Moust., 266, ♂ ♀

T argenteotarsis, Ludlow, 1906.

Can. Ent., xxxviii, 367, ♀

Theob., Monog. Culic., v, 100, ♀
Type in Army Medical Museum, Washington.
Described from 5 ♀ ♀ from Margosatubig, Mindanao, Phil. Is., June and July. Is near *speciosus*, Skuse, and *marshalli*, Theob.

T gilesii, Theob.

Monog. Culic., i, 227, ♂ ♀; note *op. cit.*, v, 99.
Described originally as distinct, it was relegated to a synonym of *immisericors*, but is reinstated.
LOCS.—Sikhim, Sylhet, 7-vi-05; 13-vii-05 [*Hall*]; Calcutta Ceylon, Upper Burma, Singapore [*Finlayson*].

T. immisericors, Wlk.

ADD. REF.—Theob., Monog. Culic., iv, 4, ♀ ; v, 97.
Blanch., Moust., 230, ♂

ADD. LOCS.—Calcutta (Museum gardens and zoological gardens), i, vi, vii, viii; Bhim Tal (W. Himal.), 19—22-x-06 [all *Annandale*] ; Aijal (3,600 ft.), Lushai Hills, 24-iv-04 ; Sylhet, 5-v-05 ; Chittagong, 3-ix-08 ; Peradeniya, Ceylon (1,600 ft.), 24-xii-07, botanical gardens, not uncommon, and Pundaluoya, Ceylon (4,000 ft.) [*Green* and *Bainbrigge Fletcher*] ; Andaman Is., 19-vi-08, 8-vii-08 [*Ray White*].

Also from Sikhim, Burma, Malacca, Trincomalee Hot Wells, Macassar, Mysore, North Ceram, Waigiou.

N.B.—Theobald says that his figure of the pupa (Monog. Culic., iii, 123, fig. 67) is not quite correct. He also describes the ♀ (Rec. Ind. Mus., iv, 4), and says that the type (♂) in the British Mus. is in bad condition.

Mr. E. E. Green gives the life-history (with a plate) of this species (Spol. Zeyl., ii, pt. viii, 159 to 164) (1905). He says the larvae prey first on those of their own race before proceeding to devour those of other species, and that he does not know of the adult biting. Females were kept alive for eleven days on sliced bananas.

Mr. C. A. Paiva gives a very interesting account of the habits of the larva (Rec. Ind. Mus., v, 187) from personal observations and experiments. It is common in the outskirts of Calcutta during June and July in earthen pots. He finds that the larva will devour that of any other species if present before attacking those of its own kind, whereas Mr. E. E. Green thought it ate its own species first. They are sluggish and remain at the surface of the water, seizing other larvae as they come within reach. A curious thing is that the larvae of other species actually attack the *immisericors* larvae, seizing their abdominal bristles from behind. *Stegomyia fasciata* the carrier of yellow fever is greedily devoured by *T immisericors* larva, which renders it a valuable ally in destroying the former in the event of that disease being introduced into India, the more so as the adult is not known to bite man.

N.B.—Megarhinus gilesii, Theob., and *subulifer*, Dol., to be eliminated from synonymy, as both are now regarded as good species belonging to *Toxorhynchites*.

T. inornatus, Wlk.

ADD. REF.—Blanch., Moust., 223, ♂ ♀
Type ♂ ♀ in British Museum.
LOC.—Papua.

T. javaensis, Theob., 1911.

Tijd. v. Ent. liv, 233 ♀ .

Java, a unique ♀ *Type* in Amsterdam Museum.

T leicesteri, Theob.

Erratum.—1804 is given for 1904 in my catalogue, p. 325.
ADD. REF.—Theob., Monog. Culic., iv, 142, ♂ ♀
Leices., Culic. Malaya, 59, ♂ ♀
ADD. LOCS.—Papua.

N.B.—Leicester says that the colours fade so much after death as to make identification very difficult, and says the larvae are found in bamboos.

T. lewaldii, Ludlow (*Megarhinus*).

ADD. REF.—Theob., Monog. Culic., iv, 139, ♂ (Miss Ludlow's description copied), adding "may be a *Toxorhynchites.*"
Type in Army Medical Museum, Washington.

N.B.—Larvae taken on April 1st hatched on the 10th.

T. metallicus, Leices.

Erratum.—In my catalogue correct *metallica* to *metallicus.*
ADD. REF.—Leices., Culic. Malaya, 61, ♂ ♀

N.B.—Leicester says it is bred from bamboo and also that in the adult the colours fade quickly. "I have not taken the adult of this mosquito; it is entirely sylvan and fairly widely distributed in the Peninsula" (Leicester).
Theobald also notes the rapid fading of colours after death, especially in the abdominal bands of the ♀

T. minimus, Theob. (*Megarhinus*).

ADD. REF.—Theob., Monog. Culic., iv, 138, ♂ (full description).
The author originally suggested it might be a *Toxorhynchites*, and noted its small size.
Type in British Museum.

T. splendens, W. (*Megarhinus*).

ADD. REF.—Blanch., Moust., 225 (*Megarhinus*).

N.B.—I expect one of the more recently described species will eventually prove to be synonymous with this.

T. subulifer, Dol., 1857.

Nat. Tijd. Ned. Ind., xiv, 382 (*Megarhinus*).

Theob., Monog. Culic., i, 242.
Amboina. For a time considered synonymous with *immisericors*, in which case Doleschall's name has the priority over Walker's.

TEROMYIA, Leices., 1908.

Culic. Malaya, 49.

Leicester says in the above reference " nov. gen.," yet adds " In Theobald's Monograph it is stated that in members of this genus there are no upright scales on the head."

He adds, " Five species are here described, and they are all apparently new species, though *quasiferox* may prove to be merely a variety of *M. ferox*, or *immisericors*."

T. acaudata, Leices., 1908.

Loc. cit., 49, ♂ ♀.

The examples from which this species was described were obtained by Dr. Finlayson of Singapore, all of them being bred from larvae found in pitcher plants in the neighbourhood of Singapore. The author notes that the colours fade very considerably after death.

T. ater, Daniels, 1908.

Studies from Instit for Medic. Research (Fed. Malay States), iii, 265, ♂ ♀

" Notes on the Mosquitoes on the river and coast district of the Eastern side of the Peninsula."

N.B.—This is issued as a succeeding paper to Dr. Leicester's elaborate Monograph on the " Culicidae of Malaya," with continuous pagination.

Bred from larvae found in the pitcher plant *Nepenthes rafflesiana*, on the east coast of Pahang.

T. funestus, Leices., 1908.

Culic. Malaya, 58, ♂.

" Described from one ♂ bred from a pupa taken in a bamboo jungle 6 miles from Kuala Lumpur. A very funereal looking mosquito; some of the more beautiful colours are only seen with a lens " (Leicester).

T. magnificus, Leices., 1908.

Culic. Malaya, 54, ♂ ♀

" Bred from larvae obtained from the water collected in living bamboos, which had been pierced by an insect borer, the only entrance to the water being through the small hole thus made." Leicester compares his new species with *splendens* and notes minor differences, but it must be remembered that at the time Wiedemann wrote, the limited number of known species made unnecessary the lengthy and detailed descriptions required in the present state of our knowledge.

T. quasiferox, Leices., 1908.

Culic. Malaya, 51, ♂ ♀

It seems advisable here to quote the author.

"Mr. Theobald, to whom a specimen of this mosquito was sent, suggests that it is probably *Megarhinus immisericors*, first described by Walker, and in his recently published vol. iii, he has placed *M. immisericors* in the genus *Toxorhynchites*.

"He does not seem to have described the female.

"If this is *immisericors*, I am at a loss to understand how it can be placed in the genus *Toxorhynchites*, as the palpi are distinctly five-jointed. As mentioned in the remarks on the generic characters, I do not think the separation of *Toxorhynchites* from *Megarhinus* is based merely on the palpi, though this is the only character given by Theobald, but even on that ground alone, this mosquito would be excluded. It now comes in *Teromyia*."

Leicester adds that it probably breeds in the pitcher plant.

T raris, Leices., 1908.

Culic. Malaya, 56, ♂.

"Described from a ♂ bred from a white larva taken in water collected in a bamboo in the jungle at Ula Klang. It is a very distinct species" (Leicester).

Apparently rare and very near *magnificus*.

WORCESTERIA, Banks.

Theobald (Monog. Culic., v, 110) says this genus, erected on minute difference in the palpi, is not valid and comes within reach of *Toxorhynchites*.

Sub-Family *CULICINAE*.

ADD. REFS.—Mr. Theobald (Monog. Culic., iv, 147) tabulates 63 genera, mentioning that others have been subsequently described.

Blanchard (Moust., 231) gives the sub-family characteristics.

Leicester (Culic. Malaya, 64) includes, after his notes on the sub-family, a table of all the known genera up to 1905, though many of them had not then been found in Malaya.

Col. Alcock divides this sub-family, which he designates *Culicales*, into groups of genera (sub-genera, presumably) as follows: the *Culex*, *Stegomyia*, *Aedes*, *Uranotaenia*, *Psorophora* and *Mucidus* groups. Under these respective headings are given in this catalogue the so-called "genera" embodied in each.

MUCIDUS, Theob.

ADD. REF.—Leices., Culic. Malaya, 69.

Col. Alcock includes under his "genera of the *Mucidus* type" *Mansonia*, Blanch., *Mansonioides*, Theob., *Etorilepidomyia*, Theob. (is this the same as *Etorleptiomyia* ?), *Orthopodomyia*, Theob., *Aedimyia*, Theob., *Finlayia*, Theob. He considers this group of sub-genera or species links the *Culicinae* with the *Anophelinae*.

M. laniger, Wied. (*Culex id.*).

ADD. REF.—Blanch., Moust., 244, ♀

Type in Wiedemann's collection.

M. mucidus, Karsch.

ADD. REF.—Leices., Culic. Malaya, 69, ♂ ♀

Redescribed by Leicester from a ♂ and ♀ bred from larva taken in marshy ground near a patch of jungle near Kuala Lumpur.

Banks has recorded it from the Philippines.

M. scatophagoides, Theob.

ADD. REF.—Blanch., Moust., 245, ♀

ADD. LOC.—Bauria, Bengal, 17-viii-07 [*Tyrie*]; Damukdia Ghat, E. Bengal, 22-viii-07; Purnea, 5-viii-07 [*Paiva*]; all in Indian Museum.

Type in British Museum.

EKRINOMYIA, Leices., 1908.

Culic. Malaya, 71.

The author says, "between *Culex* and *Mucidus*, the larva very near *Megarhinus*."

E. aureostriata, Leices., 1908.

Culic. Malaya, 71, ♂ ♀

Described from 4 ♂ ♂ and 3 ♀ ♀ taken as pupae in a small hole in marshy ground at Klang.

BLANCHARDIOMYIA, mihi, nom. nov.

Syn.—*Desvoidya*, Blanch., preoccupied.

ADD. REF.—Theob., Monog. Culic., iv, 163 (table of the 4 known species).

Blanch., Moust., 265.

Leices., Culic. Malaya, 74.

N.B.—" Desvoidya " was a nom. nov. for *Armigeres*, Theob., practically preoccupied by Hartmann in 1840—1842 (*Armiger*) in Mollusca.

Moreover *Desvoidia*, Meade, Ent. Month. Mag., xxviii, 179 (1892), in *Tachinidae* antedates Blanchard's genus, for which I propose the title *Blanchardiomyia*. I should consider it, with other " genera " in this family, at most a sub-genus.

B. apicalis, Theob., 1910.

Rec. Ind. Mus., iv, 5, ♀

Theob., Monog. Culic., v, 143, ♀

Described from a single perfect ♀ from Balighai near Puri, Orissa, taken by Dr. Annandale, 24-x-08. In the Indian Museum.

B. aureolineata, Leices., 1908.

Culic. Malaya, 79, ♀

" A very distinct *Desvoidya*; described from a series bred from larvae found in water collected in the shells of a fruit in jungle at Ampang." Leicester in a footnote says " The description of the ♂ will be found on the slip at the end under *Addenda*." However, in my copy of his work there is no such slip.

B. fusca, Theob.

ADD. REF.—Leices., Culic. Malaya, 78, ♂ ♀, near " *obturbans* and *panalectros*."

ADD. LOCS—Sylhet, March to June [*Lt.-Col. Hall*]; Lushai Hills, Assam, August [*Macleod*]; Calcutta, May, and August to December [all Indian Museum *t. Theobald*].

Type in British Museum.

N.B.—In vol. v Theobald says that he previously erroneously placed this species as a variety of *obturbans*: in that volume he considers it a good species.

He previously stated, " all variations in colour between the true *obturbans* of Walker, and the *fusca* of Theobald, seen in these specimens, and hence the latter species is sunk as a variety."

B. joloensis, Ludlow.

Mr. Theobald (Monog. Culic., iv, 165) admits this as a good species.

Type in Army Medical Museum, Washington.

B. jugraensis, Leices., 1908.

Culic. Malaya, 77, ♂ ♀

" Larvae in bamboo in Ampang jungle, and water collected in a fallen leaf in jungle at Jugra; also on the East Coast and

elsewhere. I have received specimens from Borneo " (Leicester). Near *obturbans*, Wlk.

B. obturbans, Wlk.

Erratum.—The reference to Walker's *Culex ventralis* (synonymous with *obturbans*) should be Jour. Linn. Soc., iv, 91 (1860).

ADD. REF.—Blanch., Moust., 266, ♂ ♀

Leices., Culic. Malaya, 75, ♂ ♀ (with notes on varietal forms).

LOCS.—Naini Tal [*Giles*]; Sylhet [*Hall*]; Lushai Hills, Assam; Madras [*Cornwall*]; Travancore [*James*]; Behar, Bengal [*Green*]; Mozufferpur, India; Selangor, 28-x-99 [*Butler*]; Singapore, 25-viii-99; Perak [*Wray*]; Madulsima, Ceylon, 26-ix-07 [*Green*]; Semarang, Java, i, ii, iii, 1904 and viii-05 [*Jacobson*]; Waria Riv., Brit., Papua [*Dr. Fleming Jones*]; Amboina; Celebes; Mysol; Waigiou; North Ceram; Tinghai, Formosa; West lake, Hankow, China, 28-viii-07 [*Cornford*]; Foochow [*Rennie*].

Theobald (Rec. Ind. Mus., iv, 4) gives the following data for this species and " varieties " from specimens in the Indian Museum.

Sukna, 1-viii-08, in deep jungle, Kurseong, 5-vii-08 [both *Annandale*]; Calcutta, i, iii, vii, x, xii, Rajmahal, Bengal, 31-vii-07 [*Hodgart*]; Trivandrum, 14-xi-08 [*Annandale*].

Taken by me in Calcutta, 11—25-iii-08; 12-iv-08; 8-viii-07; all in bedrooms; Meerut, 25-iv-05; Batavia, 27-vi-06 to 9-vii-06.

Type in the British Museum.

N.B.—Mr. Theobald mentions this species being bred in a tumbler of water in the Indian Museum by Mr. Tipper of the Geological Survey of India. Miss Ludlow has recorded it from the Philippines. It breeds freely in the flowers of *Heliconia brasiliensis*. " Bred from large larvae from under overhanging rock, in a deep pool of a clear running stream."

B. panalectros, Giles.

(*Armigeres panalectoros*, Giles, in Theob., Monog., ii, 317.)

ADD. REF.—Blanch., Moust., 266, ♂ (*panalectros*).

ADD. LOC.—Semarang, Java, viii-05.

N.B.—Theobald (Rec. Ind. Mus., iv, 5) notes that the cotype " is nothing but an immature, large *Culex fatigans*, Wied., with distinct abdominal banding."

BREVIRHYNCHUS, Theob., 1908.

Rec. Ind. Mus., ii, 293. Monog. Culic., v, 144.

B. annulipalpis, Theob., 1910.

Rec. Ind. Mus., iv, 6, ♀ Monog. Culic., v, 148.

ADD. LOC.—Maddathorai, 16-xi-08 [*Annandale*].

Described from a single perfect ♀ in the Indian Museum. Theobald erroneously quotes 1903 as date of capture.

B. apicalis, Theob., 1910.

Rec. Ind. Mus., iv, 7, ♀ Monog. Culic., v, 149.

Described from a single ♀ in the Indian Museum collection from Sylhet, 26-vii-05 [*Lt.-Col. Hall*].

B. magnus, Theob., 1908.

Rec. Ind. Mus., ii, 293, ♂ ♀ : iv, pl. i, wing, pl. iii, wing scales.

Theob., Monog. Culic., v, 145, ♂ ♀, fig. 51 wing, 52 hea side view of abdominal segments.

Types (one ♂ and one ♀ only) in Indian Museum collection. "A most marked and beautiful species; easily told by the quaint proboscis and abdominal markings" (Theobald).

LOCS.—Sylhet, May [*Lt.-Col. Hall*]; Sukna, 1-vii-08, in thick jungle [*Annandale*]; Maddathorai, S. India, 17-xi-08 [*Annandale.*]

QUASISTEGOMYIA, Theob., 1906.

2nd Rep. Gordon Coll. Well. Labs., p. 69.

Theob., Monog. Culic., iv, 165.

Q. gardneri, Ludlow.

Removed here from *Stegomyia* by Theobald (Monog. Culic., iv, 170).

ADD. LOCS.—Pampanga (Phil Is.) [*Whitmore*]; Mindoro, Bulacao, Phil. Is.

N.B.—Miss Ludlow (Mosq. Phil. Is., 10) put this species in *Pseudostegomyia*, admitting subsequently to Theobald that it was a purely clerical error, intending it for *Quasistegomyia*.

Type in Army Medical Museum, Washington.

KINGIA, Theob., 1910.

Monog. Culic., v, 135.

K. annandalei, Theob., 1910.

Rec. Ind. Mus., iv, 10 (*Stegomyia id.*).

One ♀ from Sukna (500 ft.), vii-08 [*Annandale*].

Type in Indian Museum.

STEGOMYIA, Theob.

Theob., Monog. Culic., iv, 170 (list known spp. 19),—171 (table of spp.).

ADD. REF.—Blanch., Moust., 247 (generic characters), fig. 194 (larva), p. 248 (table of species).
Leices., Culic. Malaya, 81, with table of Malayan species.

N.B.—Col. Alcock includes *Brevirhynchus*, Theob., and *Harpagomyia*, Theob., in his " genera of the *Stegomyia* type."

S. albipes, Theob., 1910.

Rec. Ind. Mus., iv, 11, ♀
Monog. Culic., v, 169, ♀
Described from a perfect ♀ in the Indian Museum taken by Dr. Annandale at Maddathorai, 17-xi-08.

S. albolateralis, Theob.

Rec. Ind. Mus., ii, 289, ♀ ; iv, pl. i, wing, pl. iii, wing scales.
Theob., Monog. Culic., v, 179, fig. 67, wing.
LOC.—Sylhet, September [*Hall*] ; Lushai Hills, Assam, in July.
Both in the Indian Museum, from five ♀ ♀ in which collection the description was drawn up.
Type in Indian Museum.

S. amesii, Ludlow.

ADD. REF.—Theob., Monog. Culic., iv, 191 (Miss Ludlow's description copied).
ADD. LOCS.—Oras, Samar, Tacloban, Leyte, Twin Peaks, Banquet Luzon [all t. *Theobald*].
N.B.—*Type* in Army Medical Museum, Washington.

S. annandalei, Theob., 1910.

Rec. Ind. Mus., iv, 10, ♀

Described from a single perfect ♀ taken by Dr. Annandale at Sukna, vii-08. In Indian Museum. Near *minutissima*.

S. annulirostris, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 173.
Type in British Museum. From Peradeniya, Ceylon.

S. argenteomaculata, Theob., 1907.

Monog. Culic., iv, 184, ♀.

Described from two ♀ ♀ (not in good condition). An easily recognized species.

LOC.—Narcondam Isles (Bay of Bengal), 80 miles from Andamans and Nicobars; taken by G. Rogers.

Type in the British Museum.

S. assamensis, Theob., 1908.

Rec. Ind. Mus., ii, 290, ♀

Monog. Culic., v, 174, ♀

Theobald says "described from a single ♀," in the Indian Museum collection, but gives two localities, Sylhet [*Hall*] and Pallode, South India. The former is dated 13-iv-05, the other one 15-xi-08 [*Annandale*].

Type in Indian Museum.

S. aurostriata, Banks, 1906.

Phil. Jour. Sci., i, 995.

No sex is given, either by Banks or Theobald, who (Monog., v, 181) recopies the description with the note that it is clearly a distinct species.

LOC.—Negros Occidental, Phil. Is., Mt. Siya Siya, Canlaon Volcano (760 metres), 24-vi-06.

Type in the entomological collection, Bureau of Science Manila.

S. brevipalpis, Giles.

ADD. REF.—Blanch., Moust., 264, ♂ ♀

N.B.—This author says the species is "Like a *Simulium*;" which does not agree with Theobald's expression "a typical *Culex*."

S. crassipes, V. Wulp.

ADD. REF.—Blanch., Moust., 250, ♀

S. desmotes, Giles, 1904.

Journ. Trop. Med., vii, 367, ♀

Received by Giles from the Philippines: Theobald places it doubtfully here.

Type in British Museum.

S. dissimilis, Leices, 1908.

Culic. Malaya, 91, ♂ ♀

Described from a series bred from water in the hollow of a tree in Ampang jungle. Distinct from all other Stegomyias by the gold-scaled mesonotum in the ♂

S. fasciata, F.

ADD. REF.—Leices., Culic. Malaya, 85, ♂ ♀

ADD. LOCS.—Ceylon [*Green*]; Garvet, Java [*Prof. Marlett*], Soekaboemi, Java; Celebes, Siam, Perak, Malay Ports, Papua, Batavia.

It occurs in Calcutta in January, and from May to October (not so common as *scutellaris*); Lucknow, November; Purnea, August [*Paiva*]; Lushai Hills [*Macleod*]; Puri, 18—19-i-09; Mandalay, 12-iii-08; Rangoon, 25-ii-08, in house, biting by day; common on board ship, Bay of Bengal, between mouth of Hooghly River and Rangoon, 22—23-ii-08. I have taken it in Calcutta, i, vi, vii, viii, ix, in bedrooms and other places and in the hotel at Lucknow, 7-viii-05; Madras Town, 31-x-08 [*Hodgart*]; on board ship off Coconada, 15-iv-08 [*Paiva*], and Bhim Tal (4,500 ft.) in September.

Miss Ludlow records it under the name *calopus*, M. (Mosq. Phil. Is., 33), from a very long series of localities in the Philippines where it occurs all the year round.

N.B.—Although Blanchard and Coquillett assume the synonymy of *calopus*, Mg., Mr. Theobald doubts its identity with *fasciata*, F. (Monog., iv, 177).

Owing to Villiers in 1789 adopting the specific name *fasciata* for a *Culex*, Mr. Theobald fears a change in the name of this well-known species may be necessary. Meigen described a *fasciata* in 1805, which Theobald adds as a synonym.

Meigen's *calopus* (1818) is next on the list, but its identity with *fasciata*, F., appears uncertain. The next name identified with the species is *frater*, Rob. Desv., and Theobald thinks that this is the name that may have to be adopted.

However, as Villiers's description is unintelligible, and the type has long ago ceased to exist, he proposes to abolish Villier's species and retain the name *fasciata*, F., for this species. This, as he says, will save endless confusion.

Anyway if Villiers's description is useless and his type destroyed, there is no reason to assume the species was not a true *Culex*, in which case the question of synonymy drops. Moreover, the Kertesz catalogue does not mention this species of Villiers at all.

This species is the sole carrier of yellow fever.

Mr. Howard says "we may expect to find this species everywhere in the moist tropical zone, or at all events, when introduced at any point within the low moist tropics it may be expected to establish itself."

In Malaysia the species seems to be confined to the ports. Leicester notes that the larvae are found in bathroom tubs in houses at Klang, Singapore, Penang, Pangkor-Haut and other places. He notes the dense scaling on the clypeus, which, he says, no previous writer has noted, and also mentions the variety *luciensis* as occurring in Malaysia.

Should the identity of *fasciata*, F., with *calopus*, Mg., be

proved, the species also occurs in South Europe, North, West and East Africa, Madagascar, Palestine, Tahiti and New Caledonia. Theobald records the typical form from Khartoum, the Nile, Greece and Cyprus.

S. fusca, Leices., 1908.

Culic. Malaya, 92, ♂ ♀

"A small species bred from larvae from water in leaves of an atap palm in mangrove swamp at Port Swettenham. Adult a blood sucker, and common in jungle where atap palms occur" (Leicester).

S. gardneri, Ludlow.

Removed to *Quasistegomyia* by Theobald (Monog., iv, 170).

S. gracilis, Leices., 1908.

Culic. Malaya, 81, ♂ ♀

Larva found in water in bamboos. Adults numerous in bamboo jungle.

S. imitator, Leices., 1908.

Culic. Malaya, 89, ♀

"Described from 2 ♀ ♀ from jungle 5 miles from Kuala Lumpur," which is apparently its only locality.

S. leucomeres, Giles, 1904.

Journ. Trop. Med., vii, 367, ♀

LOC.—Phil. Is. *Type* in British Museum.

Banks records it from Pampanga, but Theobald says the species is an uncertain one, the type being in bad condition, but probably a *Stegomyia*.

S. mediopunctata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 187, ♀

Type in British Museum.

S. microptera, Giles.

ADD. REF.—Blanch., Moust., 263.

This author adds "N. W. Prov. India"; in houses during the rains; at one time referred by Giles to *Wyeomyia*.

Theobald (Monog., v, 607, Appendix) says, "Type appears to be lost."

S. minutissima, Theob., 1910.

Rec. Ind. Mus., iv, 9, ♀ ; v, 168, ♀ , fig. 61, wing.

N.B.—Though the ♂ sign prefaces the description of the species, apparently only the ♀ is known.

Type in Indian Museum.

S. nivea, Ludlow.

Referred to *Scutomyia*.

S. periskelata, Giles.

ADD. REF.—Blanch., Moust., 264.

N.B.—Theobald says (Monog., v, 155) that he does not understand this species, which is placed here provisionally. The type is *not* in the British Museum. Further on (*loc. cit.*, 607, App.) he suggests that the name of the species should be dropped.

S. perplexa, Leices., 1908.

Culic. Malaya, 83, ♂ ♀ .

Described from one ♂ and several ♀ ♀ from jungle near Kuala Lumpur in May, October and November. The author seems uncertain of its true position in this genus as it has affinities with *Scutomyia*, and he suggests it may be a hybrid.

S. pipersalata, Giles.

ADD. REF.—Blanch., Moust., 264, ♂ ♀ .
Theobald (Monog., v, 607, App.) is doubtful if a *Stegomyia*.

Type in British Museum.

S. pseudonivea, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 188, ♀ ; v, 176, ♂ , fig. 64, head.

Type ♂ in British Museum, *type* ♀ in Hungarian Museum Four of each sex were taken by Lowis in the Andamans.

S. punctolateralis, Theob.

Type in British Museum.

S. scutellaris, Wlk.

ADD. REF.—Blanch., Moust., 257, ♂.
Leices., Culic. Malaya, 86, ♂ ♀

ADD. LOC.—Sylhet, April [*Hall*]; Lushai Hills, May to July [*Macleod*]; Manipur, July [*Gourlay*]; Calcutta, March, July to October, common during the hot weather in the rains, disappearing in winter, active by day; Katihar, N. Bengal, October [*Paiva*]; Purnea, viii, ix [*Paiva*]; near Puri, x-08; Lucknow, 4-iv-05 [*Brunetti*]; Sukna, 1—2-vii-08; Mandalay, ii, iii-08; Bhim Tal, breeds in hollow trees in jungle, ix-06; Trivandrum, 14-xi-08; Maddathorai, 18-x-08 [all *Annandale*]; Madras Town, 30-x-08 [*Hodgart*]; Shahjahanpur [*Giles*]; Victoria gardens, Colombo, 26-iv-08 [*Paiva*]; Singapore, 21-vi-06 [*Brunetti*].

Sarawak, Papua generally, Upper Burma, Foochow, Hankow, 21—28-vi, Seychelles, Mauritius, Pitcairn Is., Honolulu.

All the above specimens identified by Theobald are in the Indian Museum.

I have taken it in Calcutta as late in the year as 10-xi-04.

Type in the British Museum.

N.B.—The species breeds freely in the flowers of *Heliconia brasiliensis*. Dr. Barker says that at Sarawak it is abundant in the neighbouring thick undergrowth, but that it seldom enters houses in the daytime, and not at all at night. Common in Calcutta in hot weather and rains, disappears in winter. Is the most abundant species in Mauritius.

Dr. Leicester notes in his description of the species, one or two points not mentioned by Theobald, adding that the insect breeds as freely in bath tubs as in the jungle.

Sub-species **samarensis**, Ludlow.

Theobold retains this (Monog., iv and v) as a variety of *scutellaris*, Wlk., and disputes Banks's suggestion that possibly intergradations may occur between *scutellaris* and *fasciata*.

Type in Army Medical Museum, Washington.

"**S. albopictus**," Skuse.

Definitely accepted as synonymous with *scutellaris*.

S. sexlineata, Theob.

Further corroboration of the identity of the Philippine Island specimens received from Banks, with this species, described from Trinidad.

Type in British Museum.

S. striocrura, Giles, 1904.

No sex is mentioned, the *type* is *not* in the British Museum, and Theobald is doubtful of its specific validity.

S. thomsoni, Theob.

ADD. REF.—Monog. Culic., iv, 174.
From N. W Prov. India. *Type* in British Museum.

S. tripunctata, Theob., 1908.

Rec. Ind. Mus., ii, 288, ♀; iv, pl. i. wing, pl. iii, wing scales; v, 182, fig. 68, wing.

LOC.—Lushai Hills, Assam, 6-vi-04 [*Macleod*].

N.B.—Described from two ♀ ♀, very near *S. amesii*, Ludlow. *Type* in Indian Museum.

S. w-alba, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 180, ♀, fig. 151 (head, thorax, femur).

PSEUDOSKUSEA, Theob., 1907.

Monog. Culic., iv, 192, ♂ ♀

P. multiplex, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 192, ♂
Removed here by Theobald from *Skusea*.
Type in Hungarian Museum.

P. nigrotarsis, Ludlow, 1908.

Can. Ent., xl, 52, ♀.

LOC.—Infanta, Tayabas (Phil. Is.), October, a unique specimen.

SKUSEA, Theob.

ADD. REF.—Blanch., Moust., 416.

In Monog., iv, 542, Theobald definitely places this genus in Aedinae and retains it there in vol. v, but in view of possible further alterations in the sequence of genera in this family, I prefer to retain the order adopted in my previous catalogue, as near as possible, merely for the sake of convenience.

Leicester (Culic. Malaya, 117) says, "This genus was originally placed in the sub-family Aedeomyinae by Theobald in vol. iii of his Monograph, and my genus *Amauromyia*[1] exactly corresponds to it, but in the Genera Insectorum, Fasc. 26 (1905), Theobald has transferred *Skusea* to the Culicinae, as the ♂ ♂ have long palpi. The genus is unrepresented in Malaya.'

[1] I can find no reference to this genus.

S. culiciformis, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 546, ♀, fig. 251 wing ♀

S. diurna, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 547, ♀ The type was bred by Dr. Durham in September.

Type in British Museum.

S. funerea, Theob., var. **ornata**, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 542, fig. 248 wing ♀

Type in Hungarian Museum.

S. mediofasciata, Theob., 1907.

Monog. Culic., iv, 544, ♂ ♀, fig. 249, wing ♀, 250, ♂ genitalia, pl. vii, wing scales ♀ pl. ix, ♂ genitalia.

Syn. *Pseudoskusea mediolineata*, Ludlow (*t.* Ludl., Can. Ent., xl, 332).

LOC.—India [*Christophers*]. Described from 1 ♂ 3 ♀ ♀ Very near *Skusea funerea*, Theob. Miss Ludlow says it has been received from the Philippines. Theobald does not give *mediolineata* as synonymous with his *mediofasciata* in vol. v.

Type in British Museum.

S. pseudodiurna, Theob., 1910.

Rec. Ind. Mus., iv, 32, ♂.

Theob., Monog. Culic., v, 491, ♂

A unique specimen; in the Indian Museum, from Sukna, 1-vii-08 [*Annandale*]. Very near *S. diurna*.

S. pseudomediofasciata, Theob., 1910.

Monog. Culic., v, 489, ♂.

From Peradeniya and Hakgala, Ceylon, iii and iv, 1907 [*Green*].

Type in British Museum.

S. uniformis, Theob., 1910.

Rec. Ind. Mus., iv, 33, ♀.

Theob., Monog. Culic., v, 491, ♀

Type in the Indian Museum; a unique specimen from Pallode, S. India, 15-xi-08 [*Annandale*].

SCUTOMYIA, Theob.

ADD. REF.—Theobald, Monog. Culic., iv, 196, 197 (short description and tabulation of the only known five species).
Leices., Culic. Malaya, 105.

S. albolineata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 197, ♀
Leices., Culic. Malaya, 105, ♂ ♀.

N.B.—Nothing is said by Theobald as to Giles's species of this name (*vide* my Catalogue, p. 336).
Type in British Museum.

S. nivea, Ludlow.

ADD. REF.—Leices., Culic. Malaya, 87, ♂ ♀
Leicester described from a series of adults and some bred from bamboo water in jungle. "Entirely sylvan, although appearing in houses close to jungle, fairly common, and a vicious biter."
Type said to be in the Army Medical Museum, Washington, but Theobald says (Monog., v, 203) it has been given by Miss Ludlow to the British Museum.

S. notoscripta, Skuse.

ADD. REF.—Theob., Monog. Culic., i, 286, ♂ ♀, fig. 84 (wing ♀), fig. 85 (wing scales); iii, 145.
Blanch., Moust., 257, ♂ ♀.

ADD. LOCS.—Muiria, Seleo, Berlinhafen, Friedrich-Wilhelmshafen (all Papua) and Ins. Graget [all locs. *t.* Biro].
"India" is given by Theobald as doubtful, although Giles reports it from that country.

S. notoscripta, sub-species samarensis, Ludlow.

Also occurs at Kuranda, Queensland, taken by Dr. Bancroft.

S. sugens, W

ADD. REF.—Blanch., Moust., 256, ♀

LEICESTERIOMYIA, mihi, nom. nov.[1]

Syn. *Chaetomyia*, Leices., Culic. Malaya, 100, 1908 (preoccupied).

[1] The present name is suggested merely as a substitute for *Chaetomyia*, but it must be understood that I do not consider it as of generic rank, any more than the great majority of the so-called "genera" in this family.

Near "*Desvoidya*" and *Leicesteria*; purely sylvan, and breeds in bamboo water.

N.B.—The generic name *Chaetomyia* being preoccupied in Tachinidae by Brauer and Berganstamm,[1] I propose *Leicesteriomyia* as a nomen novum.

C. flava, Leices., 1908.

Culic. Malaya, 101, ♂ ♀

Described from a series bred from larvae from bamboo water and in cocoanut shells in jungle in Malaysia. Sylvan, a vicious day biter.

DASYMYIA, Leices., 1908.

Culic. Malaya, 102.

"There is no mosquito this species could possibly be mistaken for," the author adding that it might be found to belong to the Aedeomyina, and notes its affinity to *Mimomyia*.

D. fusca, Leices., 1908.

Culic. Malaya, 102, ♂ ♀

A ♂ in jungle five miles from Kuala Lumpur, and a ♀ in bungalow at Bukit Kutu. Appears to have affinities with *Stegomyia*, *Scutomyia*, *Uranotaenia*, *Etorleptiomyia* and *Mimomyia*.

CONOPOMYIA, Leices., 1908.

Culic. Malaya, 113.

Copious notes on this genus are given by this author, who is uncertain where to place it, and as to whether it belongs to the Culicinae or Aedeomyinae. I therefore leave it here where he temporarily places it.

C. aurea, Leices., 1908.

Loc. cit., 116, ♂ ♀

Described from one ♂ (taken in a bungalow in Kuala Lumpur) and one ♀, in jungle at Raub.

C. hybrida, Leices., 1908.

Loc. cit., 115, ♂ ♀

Described from a series. A ♂ from a bungalow in Kuala Lumpur and other ♂ ♂ and a ♀ sent to Leicester by Dr. Finlayson of Singapore.

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[1] Denk. Ak. Wien., lviii, 311 (1892).

C. metallica, Leices., 1908.

Loc. cit., 113, ♂ ♀

Described from a series from larvae from marshy ground near Kuala Lumpur and elsewhere.

PSEUDOCARROLLIA, Theob., 1910.

Rec. Ind. Mus., iv, 12, near *Carrollia*, Lutz.

Theob., Monog. Culic., v, 186.

P. lophoventralis, Theob., 1910.

Rec. Ind. Mus., iv, 13, ♀. Monog. Culic., v, 186, ♀

Described from a single perfect ♀ taken by Mr. Paiva at Purnea, Bengal, 6-viii-07, resting on the under side of a leaf of a lichi tree during the day.

Type in Indian Museum.

LEICESTERIA, Theob.

Add. Ref.—Theob., Monog. Culic., iv, 201.
Leices., Culic. Malaya, 94.

L. annulitarsis, Leices., 1908.

Culic. Malaya, 99, ♂ ♀

Apparently sylvan and local in jungle 5 miles from Kuala Lumpur; quite a distinct species, a bamboo breeder; only one ♂

L. apicalis, Theob., 1908.

Rec. Ind. Mus., ii, 291, ♂ ♀; iv, pl. i, wing, pl. iii, wing scales.
Theob., Monog. Culic., v, 213, ♂ ♀, fig. 86, wing.

Described from one ♂ and two ♀ ♀: "two hatched from larvae and one caught." Lushai Hills, Assam (1,500 ft.), May [*Macleod*].

Types in Indian Museum.

L. cingulata, Leices., 1908.

Culic. Malaya, 97, ♀

Described from three ♀ ♀ (April and June), of which one was bred from a larva from bamboo in jungle five miles from Kuala Lumpur.

A vicious biter, but apparently very local.

L. dolichocephala, Leices., 1908, em. mihi.

Culic. Malaya, 95, ♂ ♀ (*dolicocephala*).

In jungle round Kuala Lumpur and at Bukit Kutu, probably a bamboo breeder, a vicious biter in daytime and at sunset.

L. longipalpis, Leices., in Theob.

ADD. REF.—Theob., Monog. Culic., iv, 201, ♂ ♀
Leices., Culic. Malaya, 94, ♂ ♀
Types in British Museum.

HULECOETOMYIA, Theob., 1907.

ADD. REF.—Monog. Culic., iv, 220 (*Hulecoeteomyia*).
Leices., Culic. Malaya, 107.

H. fluviatilis, Leices., 1908.

Culic. Malaya, iii, ♂ ♀

Very near *jugraensis* and *trilineata*, the larva, however, is quite distinct. Probably rare, as it has only been found in one locality, Ulu Gombak jungle, 13 miles from Kuala Lumpur.

H. jugraensis, Leices., 1908.

Culic. Malaya, 109, ♂ ♀ [*Helecoeteomyia id., lapsus*).

Described from a series bred from water in fallen leaves in jungle at Jugra. Very near *H. trilineata*, Leices., but the larvae are quite different. Leicester adds: "the name *trilineata* is an unfortunate one, as there are really seven distinct lines on *H. trilineata* whereas in *H. jugraensis* there are only three."

H. pseudotaeniata, Giles.

ADD. REF.—Blanch., Moust., 261, ♀
Theob., Monog. Culic., v, 222, describes ♂ for first time, fig. 89, wing, 90, head ♂, 91, genitalia ♂

Leicester says it will breed in small collections of rain water near houses. Theobald (Rec. Ind. Mus., ii, 291) mentions 3 ♂ ♂ and 2 ♀ ♀ "hatched 29-viii-04" from Lungleh (?) in the Lushai Hills.

Also recorded from Dehra Dun by Thomson.

Banks records it from the Philippines.

H. trilineata, Leices., in Theob.

ADD. REF.—Theob., Monog. Culic., iv, 220, ♂ ♀
Leices., Culic. Malaya, 107, ♂ ♀

Add. Loc.—Kurseong, 3-vii-08 [*Annandale*]; Bukit Kutu (May), Bamboo jungle 5 miles from Kuala Lumpur, April, May, July, October, December; Ulu Gombak, 13 miles from Kuala Lumpur (both *t. Leicester*).

The slightly damaged types came from the former jungle.

Leicester says it is a very distinct species, a bamboo breeder, not common, quite sylvan and a blood sucker.

PHAGOMYIA, Theob.

P. gubernatoris, Giles.

Add. Ref.—Blanch., Moust., 261, ♀ (*Stegomyia*).

HOWARDINA, Theob.

Add. Ref.—Blanch., Moust., 415.

H. chrysolineata, Theob., 1907.

Monog. Culic., iv, 218, ♀, pl. i, wing scales, ♀

A unique ♀ from Peradeniya, Ceylon [*Green*].
Type in British Museum.

H. greeni, Theob.

Add. Ref.—Blanch., Moust., 416.
Type in British Museum.

H. himalayana, Giles, 1904.

Journ. Trop. Med. (1904), 384, ♀

Loc.—Naini Tal (in August), bred. Giles puts it doubtfully here and Theobald states that Mr. Carter suggests, after examining the type, that it would be better placed in *Pseudohowardina*.

PSEUDOHOWARDINA, Theob., 1907.

Monog. Culic., iv, 223, ♀.

P. chrysoscuta, Theob., 1907.

Op. cit., v, 228, ♀, fig. 94, wing.

A unique specimen from Peradeniya, iv-07 [*Green*].
Type in British Museum.

CULICIOMYIA, Theob., 1907.

Monog. Culic., iv, 227, ♂ ♀, pl. iii, wing scales ♀

C. annulata, Theob., 1907.

Op. cit., 230, ♂ ♀, fig. 64, wing ♀, 65, ♂ genitalia; pl. i, wing scales ♀

LOC.—Kuching, Sarawak [*Dr. Barker*]; taken in company with *C. inornata*, Theob. "Looks like a small *Culex pipiens*."
Type in British Museum.

C. annuloabdominalis, Theob., 1910.

Monog. Culic., v, 236, ♂ ♀, fig. 102, head occiput, 103, head.
LOC.—Peradeniya and Hakgala, Ceylon, i and v-07 [*Green*].
Type in British Museum.

C. ceylonica, Theob., 1907.

Op. cit., 236, ♂ ♀, fig. 70, wing, ♀

Described from a perfect ♂ and ♀ from Peradeniya and Maskeliya, Ceylon (February and April) [*Green*].
Type in British Museum.

C. inornata, Theob., 1907.

Loc. cit., 227, ♂ ♀, fig. 61, head scales, 62, wing ♀, 63, ♂ genitals.

LOC.—Kuching, Sarawak [*Dr. Barker*], in a house, November.
Type in British Museum.

N.B.—Miss Ludlow records it from the Philippines (Can. Ent., xli, 97).

C. minutissima, Theob., 1907.

Loc. cit., 235, ♀

LOC.—Peradeniya, Ceylon, February [*Green*].
Type in British Museum.

C. nigerrima, Theob., 1910.

Monog. Culic., v, 233, ♀, fig. 106, wing.

A perfect unique specimen from Trincomalee, Ceylon, taken October 1907 by Green.
Type in British Museum.

C. pulla, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 232, fig. 66, head scales.
Removed here from *Culex*.
Type in British Museum.

NEOMACLEAYA, Theob., 1907.

Monog. Culic., iv, 238, ♀

N. indica, Theob., 1907.

Loc. cit., 238, ♀

LOC.—India [*Christophers*]. "At first sight resembles *Skusea funerea* Theob." Philippines [*t. Ludlow*]. Woodlands, Ceylon, 9-x-07.

Type in British Museum.

Var. simplex, Theob.

Rec. Ind. Mus., ii, 291, ♀

LOC.—Sylhet, June [*Hall*]. A single ♀ *Type* in Indian Museum.

DANIELSIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 240.
Leices., Culic. Malaya, 117.

N.B.—It may be noted that there is a *Daniela*, Koch, 1891, in Coelenterata.

D. albotaeniata, Leices., in Theob.

ADD. REF.—Theob., Monog. Culic., iv, 241, ♂ ♀, fig. 72 (cephalic and scutellar adornment).
Leices., Culic. Malaya, 117, ♂ ♀

Leicester describes it in the above work from a series bred from larvae from bamboo water. Sylvan, a vicious day biter.

LEPIDOTOMYIA, Theob., 1905.

REFS.—Gen. Insect., Fasc., 26, p. 22.
Theob., Monog. Culic., iv, 249.
Leices., Culic. Malaya, 132.
Erratum.—Delete line 3, p. 339 of my Catalogue.

N.B.—"An error has occurred here. The *Lepidotomyia* of Theobald, in his paper on the Hungarian Museum Culicidae, referred to the genus *Reedomyia*, Ludlow, to which the species *Lepidotomyia alboscutellata* Theob., belongs. The true *Lepidotomyia* contains only one species, *magna* Theob., and comes very near *Danielsia*" (Theobald).

Leicester however, in his Culicidae of Malaya (p. 132) retains *alboscutellata* in *Lepidotomyia* without comment.

Type in British Museum.

L. magna, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 250, ♂ ♀

Described from two perfect specimens; a true *Lepidotomyia*. Recorded from Bombay, 19-viii-02, by James. *Type* in British Museum.

L. taeniata, Leices., 1908.

Culic. Malaya, 133, ♂ ♀

Described from a large series bred from larvae taken in water collected in ruts in a jungle waggon track. The only time this author has seen the larvae.

THEOBALDIA, Nev. Lemaire.

Theobaldinella, Blanch., 1905, Moust, 390, nom. nov. (gen. chars. given).

N.B.—Blanchard changed the name from *Theobaldia* to *Theobaldinella* on account of *Theobaldius* of Neville in Mollusca; but Mr. Theobald retains the spelling as originally written, which in accordance with zoological rules is permissible.

T annulata, Schrk.

Beitr. zur. Naturgesch., 97 (1776).

ADD. REF.—*Culex annulatus*, Blanch., Moust., 280, ♂ ♀, fig. 206, ungues and genitalia, fig. 207, adult larva.

Apparently a hill species. Blanchard records it from 4,000 ft. (Brianon, France), also from 8,000 feet in Mexico (Durango State).

T spathipalpis, Rond.

ADD. REF.—Theob., Monog. Culic, iv, 276 (larva described).
Blanch., Moust., 283, ♂ ♀ fig. 209, ungues and genitals.

N.B.—Blanchard says that Ficalbi thinks the adult does not bite, but lives on plant juices. The larva has been found during winter (? in Sardinia). Blanchard thinks it may carry "undulating" fever in Malta, adding that, at least in Gibraltar, where it abounds, it is infested by a microbe closely resembling *Micrococcus melitensis*.

PECOMYIA, Theob.

Geitonomyia, Leices., 1908, Culic. Malaya, 134.

P. caeca, Theob. (*Culex id.*).

ADD. REF.—Blanch., Moust., 305, ♀ (*Culex id.*).
Leices., Culic. Malaya, 135, ♂ ♀ (*Geitonomyia id.*)

ADD. LOCS.—Fed. Malay States (Ipoh-Parak), Philippines

N.B.—Re-described by Leicester from a series bred from larvae in water in pools and waggon tracks at Ulu Klang near Kuala Lumpur.

"As the scutellar scaling and the palpi are quite distinct from those of a *Culex*, I have no hesitation in placing this mosquito in a separate genus" (Leicester) However, Leicester had probably overlooked Theobald's genus *Pecomyia*, to which the latter author referred this species (Monog. Culic., iv, 268, fig. 86, wing ♀, pl. i, wing scales ♀).

Type in British Museum.

P. maculata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 266, ♂ ♀; figs. 82, 83, 84, ♀ wings.

Type in British Museum.

PARDOMYIA, Theob., 1907.

Monog. Culic., iv, 280.

P. aurantia, Theob., 1907.

Loc. cit., 280, ♀

LOC.—Kuching (Sarawak), November [*Dr. Barker*]. Received also from Kuala Lumpur. *Type* in British Museum.

P. quadripunctis, Ludlow.

No reference to the description of this species is given, of which Theobald (Monog., v, 608) copies the original description. It is from Parang, Mindanao (Phil. Is.), Oct. 26.

PSEUDOGRAHAMIA, Theob.

P. aureoventer, Theob., 1910.

Rec. Ind. Mus., iv, 27, ♀
Monog. Culic., v, 551, ♀

A unique ♀, at present in the British Museum.
Pallode (Travancore, S. India), 16-xi-08 [*Annandale*].

PSEUDOGRABHAMIA, Theob.

P. maculata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 314, ♂ ♀, fig. 109 wing ♀

Id., Journ. Bom. Nat. Hist. Soc., xvi, 244, ♂ ♀

ADD. LOC.—Madras Town, 30-x-08 [*Hodgart*, Ind. Mus.].
Type in British Museum.

GRABHAMIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 284 (list of known sp.), 285 (table of leg bands).
Blanch , Moust., 396, ♂ ♀

N.B.—*Feltidia*, a genus by Dr. Dyar, for some American species, is an absolute synonym of *Grabhamia*, being founded on *jamaciensis*, the very species which is the type of *Grabhamia*.

G. ambigua, Theob.

Type in British Museum.

G. ochracea, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 300.
Described from two perfect ♀ ♀
Type in British Museum.

G. spenceri, Theob.

Type in British Museum.

G. sollicitans, Wlk.

ADD. REF.—Theob., Monog. Culic., iv, 291 (life-history notes), figs. 97-98 (larval characters).

N.B.—As in that work Mr. Theobald makes no further mention of the Formosan example, on which the species was introduced into my Catalogue, it should be, *pro tem.*, eliminated from the list of Oriental species.

G. taeniarostris, Theob., 1907.

Monog. Culic., iv, 299, ♀

LOC.—Peradeniya, January [*Green*].
Type in British Museum.

CULICADA, Felt., 1904.

Mosq. of New York State, App. p. 391b.

Theob., Journ. Econ. Biol. (1905), i, 26
Id., Monog. Culic., iv, 318.

C. eruthrosops, Theob., 1910.

Monog. Culic., v, 299, ♀, fig. 140, wing.

Trincomalee, Ceylon, xi, 1906.
Type in British Museum.

C. minuta, Theob., 1907.

Monog. Culic., iv, 338, ♀

LOC.—India [*Christophers*]. Described from a perfect ♀.
Type in British Museum.

C. suknaensis, Theob., 1910.

Rec. Ind. Mus., vi, 21, ♀.

Monog. Culic., v, 297, ♀, fig. 139, wing.
Described from four perfect ♀ ♀ from Sukna, 1—2-vii-08 [*Annandale*]. Near *C. nipponii*, Theob. The specimens were taken in dense jungle, and bit during the day.
Type in Indian Museum.

THEOBALDIOMYIA, mihi, nom. nov.

Syn. *Leucomyia*, Theob., 1907, Monog. Culic., iv, 372, pl. ix, ♂ genitalia.
Type of genus (=*sub-genus t. mihi*), *Culex gelidus*, Theob.
N.B.—*Leucomyia* is preoccupied in 1892 by Brauer and Bergenstamm in Sarcophaginae (Denk. Ak. Wien., lviii, 368). I therefore propose the name *Theobaldiomyia*, with the view that the group represents, at most, a sub-genus

T. argentea, Ludlow.

Taeniorhynchus argenteus, Ludlow.
Id. *id.*, Theob., Monog. Culic., iv, 487, ♀ copies Miss Ludlow's descr.); v, 426, fig. 191, wing.
Described from several taken by Dr. Whitmore in September at Angeles (Pampanga, Phil. Is.).
Type in Army Medical Museum, Washington.
N.B.—In vol. v Theobald says that Miss Ludlow informs him that it is a *Leucomyia*.

T. gelidus, Theob. (*Leucomyia*).

ADD. REF.—Leices., Culic. Malaya, 147, ♂ ♀ [*Leucomyia*].
ADD. LOCS.—Calcutta, August; Calcutta, 6-x-04 [*Brunetti*]; Rajshahi, E. Bengal, 1—6-ii-07; Rangoon, 25-ii-08; Travancore and Cochin States, xi-08 [*Annandale*]; Purnea, ix-x [*Paiva*];

Madras Town, 30—31-x-08 [*Hodgart*]; Maskeliya, Ceylon (April) [*Green*].

N.B.—Leicester re-describes the ♀ from a long series bred from pools and taken in bungalows at Kuala Lumpur. He notes that Theobald classes this species with those with an unbanded proboscis instead of with the *banded* ones. He says the ♂ has not before been described, but Theobald did so at the time of establishing *Leucomyia*.

Type in British Museum.

T gelidus, var. **bipunctata**, Theob., 1907.

Monog. Culic., iv, 374, ♂ (*Leucomyia id. id.*).

LOC.—India [*Maj. Aldrich*]; Sarawak [*Dr. Barker*].

T gelidus, var. **cuneata**, Theob.

Erratum.—My reference to the original description of this form is incorrect, as it should be, Theob., 1901, Monog. Culic., ii, 22.

ADD. REF.—Blanch., Moust., 316, ♀

ADD. LOCS.—Balighai, near Puri, 23-x-08, at light; Calcutta, Aug. to Dec., "not uncommon in houses and at light, and in the open, on shrubs and in railway carriages; Travancore State, 5 and 19-xi-08 [all *Annandale*]; Calcutta, 6-x-04 [*Brunetti*]; Katihar, Bhogaon, ix, x; Purnea, viii, x [*Paiva*]; Sylhet (May) [*Hall*]; and between Bolpore and Rampore Haut, Bengal, in August in railway carriage [*Paiva*]; western base of W. Ghats, Travancore, 19-xi-08 [*Annandale*]; Malabar, 4-xi-08 [*Annandale*]; Madras, 30-x-08; Pangasinan (Ph. Is.).

T sinensis, Theob.

(*L. gelida*, var. *sinensis*, Theob.).

Theobald (Rec Ind. Mus., iv, 20) raises this variety to specific rank, and adds the locality Balighai, near Puri, 23-x-08, at light [*Annandale*].

T (?) whitmorei, Giles.

See *Taeniorhynchus, id.*

LOPHOCERATOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 471 (generic notes).
Leices., Culic. Malaya, 119.

L. bicornuta, Theob., 1910.

Rec. Ind. Mus., iv, 25.

Theob., Monog. Culic., v, 412, ♂, fig. 178 antennal organs, 179 wing, 180 genitalia, 181 head, 182 antennal organs in profile.

Type in Indian Museum. A single (dissected) male from Kawkareik, base of Dawna Hills, 4-iii-08 [*Annandale*].

Closely related to *fraudatrix*, Theob.

L. brevipalpis, Theob.

Monog. Culic., iv, 477, ♂, fig. 12 ♂ proboscis, palpus, basal antennal segment, antennal organs, ungues.

ADD. REF.—Leices. Culic. Malaya, 129 (copies Theobald's description, as he has not seen the species in Malaysia).

L. eminentia, Leices., 1908.

Culic. Malaya, 131, ♂.

Described from a single ♂ from jungle near Kuala Lumpur. "Very distinct and easily recognised."

L. fraudatrix, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 474, ♂ ♀, fig. 208 palpi, 209 wing ♀, 210 antennal organs ♂, 211 wings ♂.

Type in Hungarian Museum.

L. mammilifer, Leices., 1908.

Culic. Malaya, 128, ♂ ♀.

Described from a series of ♂ ♂ and one ♀ bred from larvae from pools in jungle near Kuala Lumpur and at Raub.

A somewhat distinct species, according to the author.

L. minor, Leices., 1908.

Loc. cit., 126, ♂ ♀.

Described from a series bred from bamboo water. Sylvan and the smallest of the Malayan species, and dull coloured.

L. niger, Leices., 1908.

Loc. cit., 123, ♂ ♀.

Described from a series from larvae from ponds at Kuala Lumpur.

L. rubithoracis, Leices., 1908.

Loc. cit., 119, ♂ ♀.

Described from a series from ponds in Kuala Lumpur.

Easily known by its brilliant red thorax.

L. sylvestris, Leices., 1908.

Loc. cit., 125, ♂ ♀

Bred from larvae from still ponds in Malayan jungle.

L. taeniata, Leices., 1908.

Loc. cit., 127, ♂ ♀

Bred from larvae from ponds in the open near Kuala Lumpur and Klang. A very distinct species.

L. uniformis, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 473, ♂ ♀
Id., Journ. Bomb. Nat. Hist. Soc., xvi, 245.
Type in British Museum.

L. variata, Leices., 1908.

Culic. Malaya, 121, ♂ ♀

Described from a large series bred from larvae mostly found in small ponds and puddles in swamps and ponds.

RADIOCULEX, Theob., 1908.

Rec. Ind. Mus., ii, 295.
Theob., Monog. Culic., v, 192.

R. clavipalpus, Theob., 1908.

Rec. Ind. Mus., ii, 295, ♂ ♀ iv, pl. i, wing, pl. ii, head.
Theob., Monog. Culic., v, 193, ♂ ♀
LOC.—Calcutta, Nov. and Dec.; and one in July; Berhampur (Murshidabad Distr.), Bengal, 1-i-08 [*Lloyd*]; Katihar, 4—5-x-08 [*Paiva*]; Rangoon, 25-ii-08 [*Annandale*]; Vaikam Coast of Travancore State, 5-xi-08 [*Annandale*]. Common in brushwood in the cold weather in Calcutta.

N.B.—"Described from a long series, some taken at light, the marked black shiny thorax with the clear-cut yellow area on it, and the quaint marginal cell will at once identify it" (Theob.).

Type in Indian Museum, *co-types* in British Museum.

CULEX, L.

For sub-division of even the restricted genus *Culex*, *vide* Theobald (Monog. Culic., iv, 387). Blanchard divides the genus into nine sections (Moust., 269) and arranges the groups of species in further analytical tables, one for each section, incorporating

the specific descriptions in the tables. Theobald (vol. v) admits nearly 200.

Leicester also (Culic. Malaya, 138) divides the Malayan species into groups, in an analytical table.

C. albolineatus, Giles.

Type in British Museum.

C. albopleura, Theob., 1907.

Monog. Culic., iv, 456, ♀.

LOC.—India [*Christophers*]. Described from a perfect unique specimen.

Type in British Museum.

C. albus, Leices., 1908.

Culic. Malaya, 148, ♀

One ♀ from a bungalow at Kuala Lumpur.

C. alis, Theob., 1903.

Monog. Culic., iii, 167, ♂ ♀

LOC.—Christmas Island.

N.B.—Described from a series bred by Dr. Durham from larvae from salt pools. Miss Ludlow says it occurs in the Philippines.

Type in British Museum.

C. angulatus, Theob. (*angulata emend.*).

ADD. REF.—Blanch., Moust., 362, ♀

C. annuliferus, Ludlow.

See *ludlowi*, Blanch., nom. nov., *annuliferus* being preoccupied.

C. annulioris, Theob., 1901.

Monog. Culic., i, 371, ♀

N.B.—Described from a single ♀ from Mashonaland, but it has since been found to occur in the Philippines.

C. annulus, Theob.

ADD. REF.—Blanch., Moust., 293, ♀

Leices., Culic. Malaya (reproduces Theobald's description of the ♀).

C. arabiensis, Patton, 1905.

Journ. Bomb. Nat. Hist. Soc., xvi, 633, ♂ ♀

In the crater, Aden.

N.B.—Not, correctly speaking, within the Oriental Region, but included because I included Patton's species from Arabia in my Catalogue.

C. argentinotus, Banks, 1910.

Phil. Journ. Sci., iv, 547, ♂ ♀

LOC.—Rizal (Phil. Is.). *Types* ♂ ♀ (No. 11,460) in the entomological collection, Bureau of Science, Manila.

L. auratus, Leices., 1908.

Culic. Malaya, 153, ♀

One of the largest species of *Culex*; a vicious biter; some affinity with *C. occidentalis* and *C. flavifrons*.

C. aureostriatus, Dol.

ADD. REF.—Blanch., Moust., 310 ♀

N.B.—Blanchard gives Tokio as well as Amboina, "in houses" as localities, but the species is not included as Japanese in the recent Palaearctic catalogue. Theobald in his last volume still retains it doubtfully in *Culex*.

C. biro, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 390, ♂ ♀, fig. 165, wing ♂, 164, wing ♀

Described from 3 ♂ ♂ and 3 ♀ ♀ *Type* in the Hungarian Museum.

C. caecus, Theob.

Type in British Museum.

C. cantans, Meig.

Erratum.—Delete my note about *C. maculatus*, Mg., in my Catalogue.

C. christophersi, Theob., 1907.

Monog. Culic., iv, 453, ♂ ♀

LOC.—India [*Christophers*]. Described from 1 ♂ and several ♀ ♀

Type in British Museum.

C. concolor, R. Desv.

ADD. REF.—Blanch., Moust., 365, ♂ ♀.
Leices., Culic. Malaya, 154, ♂ ♀

ADD. LOCS.—Sylhet, ii, iv, v, xi [*Hall*]; Manipur, viii [*Gourlay*]; Calcutta, 1-viii-07; 6-x-04; 4-xi-06 [all *Brunetti*]; iii, vi, vii, viii, ix, x, xi; Port Canning; Purnea, 4—6-viii-07 [*Paiva*]; Damukdia Ghat (N. Bengal), vii; Lucknow, 4-ix-05 *Brunetti*]; Kulattupuzha (Travancore), 19-xi-08, in bungalows [*Annandale*]; Samarang [*Jacobson*]; Phrapatoon, Siam, viii-06 [*Woolley*]; Andaman Is. [*Ray White*]; also in the Straits, Burma, and China.

Leicester says, "Fairly abundant in Malay Peninsula, very variable, larvae in stagnant pools, stable tanks or drainage."

Theobald observes that Giles erroneously refers it ("Journ. Trop. Med.," 1904, p. 383) to *Taeniorhynchus*.

C. fatigans, W.

ADD. SYN.—*Desvoidea panalectros*, Giles; *t.* Theob., Rec. Ind. Mus., iv, 5.

ADD. REF.—Theob., Monog. Culic., iv, pl. xvi (larval chars.).
Blanch., Moust., 353, ♂ ♀, fig. 230 ♂ ♀ (as *pungens*), 231 ♀, 232 head ♂ ♀ (*anxifer*), 233 adult larva and nymph (*pungens*), 234 head of larva above and below (*pungens*).
Leices., Culic. Malaya, 157, ♂ ♀

ADD. LOCS.—In the Rec. Ind. Mus. (ii, 298) Theobald gives a long list of dates and localities from specimens in the Indian Museum collection, and adds a further list in Rec. Ind. Mus., iv, 17.

Between the two reports nearly all parts of India are represented by this common species, with specimens from Nepal, Mandalay, Rangoon, Moulmein, Manipur; Soerabaya, Java, 16—25-vii-06 [*Brunetti*], Manila, 10—16-iii-06 [*Brunetti*], and at sea between the mouth of the Hooghly River and Rangoon, 22—23-ii-08 [*Annandale*].

Personally, I have taken it in Calcutta in February, March, April, July, October, November and December; Meerut 25-iv-05 (common in bedroom), Lucknow 7-viii-05, 4-ix 05, 2-xii-04, in bedrooms and at the old Residency, Agra 28-iii-05, Rangoon 24-xii-04 to 3-i-05 (common in bedroom), 9-ii-06, Penang 3—8-viii-06, Singapore 21-vi-06, Batavia 27-vi and 9-vii-06, Soerabaya 16—25-vii-06 common, Shanghai 16—25-vii-06, where it was literally swarming in a ditch in front of a hedge facing the west; Hankow 22—26-iv-06, Manila 10—16-iii-06. Nearly all the specimens are in inferior condition, and were named by Mr. Theobald.

Theobald in his 5th volume adds the following localities :—

Phrapatoon, Siam, 10—18-i; 19-iii; 30-xii-07; viii and xi-06 [*Dr. Woolley*]; Sarawak. Outside the East it has a very wide range, Japan, Natal, Mombasa, Pemba Is. (E. Africa); Zanzibar,

Soudan, Egypt, British Central Africa, Senegambia, Mauritius, Seychelles, Australia, Fiji, and the southern part of North America.

N.B.—Both Theobald and Blanchard consider the species identical with *pungens*, W., and this latter name being given first by Wiedemann, although on the same page, should perhaps be adopted. In the absence of absolute certainty of identification and on account of the confusion that would be caused by the change, neither author adopts *pungens*. It is doubtful if the type of *pungens* still exists in any state sufficiently good to decide so close a point of identity.

Moreover, my own personal opinion, not as a culicidologist but as being fairly intimate with the magnificent work done by Wiedemann, is that that author must have had two distinct species before him, for he certainly would not have regarded such minute differences as specific, as are to-day delighted in by the workers in Culicidae.

In a paper just published by Mr. F. W. Edwards [1] *fatigans*, W., is sunk (with some species of Theobald's) as a synonym of *pipiens*, L. If the two are identical it is very strange no previous author has ascertained it.

The species carries Filariasis.

Miss Ludlow's tables show that it is common in all parts of the Philippines all the year round.

Leicester says it occurs in houses all over the Malay Peninsula, the larva breeding in any small collection of water near houses.

C. fatigans, var. trilineatus, Theob.

Admitted as a good species.

C. foochowensis, Theob.

ADD. REF.—Blanch., Moust., 344, ♂ ♀ (*fouchowensis*).
Type in British Museum.

C. fragilis, Ludlow.

ADD. REF.—Theob., Monog. Culic., iv, 424, ♂ ♀
ADD. LOCS.—Oras (Samar, Phil. Is.), Aug. 6th [*t. Ludlow*].
N.B.—*Type* in Army Medical Museum, Washington.

C. fuscanus, Wied.

ADD. REF.—Blanch., Moust., 275.

C. fuscocephalus, Theob., 1907.

Monog. Culic., iv, 420, ♀

LOC.—Peradeniya, March and September [*Green*]; Hakgala, Ceylon, 5-xi-07 (*Green*); Pallode, 15-xi-08 [*Annandale*].

[1] Bulletin of Entomological Research, ii, 262 (Oct. 1911).

Described from 2 ♀ ♀
Type in British Museum.

C. graminis, Leices., 1908.

Culic. Malaya, 158, ♂ ♀

Described from a large series from larvae from open bamboo in jungle; sylvan species.

C. gnophodes, Theob.

ADD. REF.—Leicester copies Theobald's description, ♀
Type in British Museum.

C. halifaxii, Theob., 1903.

Placed with uncertainty here, only one specimen known (Theob., Monog. Culic., v, 350). *Type* in British Museum.

C. hirsuteron, Theob.

Type in British Museum.

C. impellens, Wlk.

ADD. REF.—Blanch., Moust., 294, ♀
Leices., Culic. Malaya, 142 (copies Theobald's description).

ADD. LOCS.—A long list from specimens in the Indian Museum (Theob., Monog. Culic., iv, 15). Thaumaspur, Nepal, 10—14-ii-08, Sukwani, 15—16-ii-08; Moulmein, Feb.; Mandalay, 11—12-iii-08; Rangoon, 24—25-ii-08; Lucknow, 21-iv-07 [all three *Annandale*]; Chittagong, 26-vii-08 [*Hall*]. Sukna, in deep jungle; Puri, x-08, common; Port Canning, 9-x-08, also several localities in Travancore and Cochin States collected 4—25-xi-08, all taken by Dr. Annandale.

Calcutta, 1-iii-vi to ix; on board ship 5 miles off Alleppey, Malabar Coast, 4-v-08 [*Paiva*]. Also taken by me in Calcutta (bedroom), 1-iv-08; 10-ii-07, June, July: Lucknow, 7-viii-05; Rangoon, 24-xii-04 to 3-i-05, and Batavia, 27-vi-06 to 9-vii-06.

C. imprimens, Wlk.

ADD. REF.—Blanch., Moust., 306.
Type (remnant) in British Museum.

C. infula, Theob.

ADD. REF.—Blanch., Moust., 298, ♀.
Leices., Culic. Malaya, 146 (copies Theobald's description).
Type in British Museum.

C. japonicus, Theob.

Theobald (in vol. v, 391) admits this species from Tokio and Ceylon, making the latter a distinct variety which he terms *ceylonica*. The types of both forms are in the British Museum. He places *ceylonica* doubtfully in *Culex*, eliminates *aureostriatus*, Dol., from the synonymy, placing the latter separately and doubtfully in *Culex*.

C. longifurcatus, Theob.

See *pseudolongifurcatus*, Theob., nom. nov.

C. longipalpis, V. Wulp.

ADD. REF.—Blanch., Moust., 318, ♀

N.B.—This author correctly notes that although Van der Wulp says the palpi have only two joints, that author shows four in his figure.

C. longipes, Theob.

See *macropus*, Blanch., nom. nov.

C. loricatus, Leices., 1908.

Culic. Malaya, 151, ♀

One ♀ taken in bungalow at Kuala Lumpur. Very distinct.

C. ludlowi, Blanch., nom. nov.

Syn. *C. annuliferus*, Ludlow, 1903 (Journ. N. Y Ent. Soc., ii, 141).

ADD. REF.—Theob., Monog. Culic., iv, 388, ♂ ♀

ADD. LOC.—Mangarin and Dagupan (Phil. Is.), Feb. to April.

N.B.—The species was described from 234 ♂ ♂ and 28 ♀ ♀, but many were in bad condition. Blanchard renames the species, *annuliferus* being preoccupied by Em. Blanchard in 1852 for a species from Chili.

C. luteola, Theob., 1910.

Monog. Culic., v, 378, ♀

Peradeniya, x-1900. A single perfect ♀ in the British Museum. A very distinct species.

C. luteolateralis, Theob.

The genus *Banksiella*, Theob., is established for this species.

C. macropus, Blanch., nom. nov. (1905).

Comp. Rend., liii, 1045.

Blanch., Moust., 327.
For *longipes*, Theob., preoccupied.
Type in British Museum, a unique specimen from Singapore.

C. mediolineatus, Theob.

ADD. REF.—Blanch., Moust., 369, ♀
Type in British Museum.

C. microannulatus, Theob.

ADD. SYN.—*C. rolandi*, D'Emm. de Ch., Ann. Trop. Med. et Par., ii, No. 3, 259 [1908].
ADD. REF.—Blanch., Moust., 292, ♂ ♀
Leices., Culic. Malaya, 140, ♂ ♀
ADD. LOCS.—Calcutta, July to November, common; Purnea, August; Gopkuda Is., Lake Chilka, August; Sylhet, i, ii, iv, v, xi, xii; between Bolpore and Rampore Haut, Bengal, August, in railway carriage [all *t. Theob.* in *Ind. Mus.*].

N.B.—Leicester describes it from a series sent him by Dr. Finlayson from Singapore, mostly taken in houses. I have only taken it once, in Calcutta, 1—10-viii-08. Green has taken it at Trincomalee and Hakgala, Ceylon, 24-viii to 9-ix-07. It occurs in Mauritius.
Type in British Museum.

C. mimeticus, Noë.

ADD. REF.—Blanch., Moust., 271, ♂ ♀
Leices., Culic. Malaya, 139, ♂ ♀
ADD. LOC.—Lushai Hills, 1-vi-04, one ♀ [*Macleod*]; Theog, Simla district, 2-v-07, one ♀ [*Annandale*]; Thaumaspur, Nepal, 18—20-ii-08, one ♂; Peradeniya, 17-ix-07 [*Green*].

N.B.—Leicester says he describes the ♂ for the first time, but this is not so. He says it occurs in any roadside pool or marshy ground. Blanchard notes its occurrence in Italy and Palestine, also Malacca.

C. minimus, Leices., 1908.

Culic. Malaya, 160, ♂ ♀

Described from a series bred from larvae from mud holes full of water, in swampy ground in Kuala Lumpur.

C. minor, Theob., 1908.

Rec. Ind. Mus., ii, 298, ♂ ♀ ; iv, pl. i, wing.

Monog. Culic., v, 363, ♂ ♀ , fig. 150, wing.
ADD. LOCS.—Sylhet [*Hall*]; Lushai Hills, June, July [*Macleod*]; Calcutta, December [*Annandale*].

N.B.—Described from 3 ♂ ♂ and 2 ♀ ♀ in the Ind. Mus. coll. "A very small obscure species, easily told by its unbanded abdomen."
Type in Indian Museum.

C. multimaculosus, Leices., 1908.

Culic. Malaya, 155, ♂ ♀

Described partly from jungle examples and partly from larvae from roadside ditches.

C. nigricephalus, Leices., 1908 (emend. mihi).

Culic. Malaya, 149, ♂ ♀ (*nigricephala*).

Bred from paddy swamps near Batu Gajah by Dr. Daniels.

C. pallidostriatus, Theob., 1907.

Monog. Culic., iv, 410, ♂ ♀ , fig. 175, wing ♂

LOC.—Peradeniya, December [*Green*]; India [*Christophers*].
Described from 2 ♂ ♂ and a ♀
Type in British Museum.

C. pallidothorax, Theob.

Emend. by Theob. in Monog., iv, 446, from *pallidithorax*.
ADD. REF.—Theob., Monog. Culic., iv, 446, ♂ ♀
"Something like *C. fatigans*, Wied."
Type in British Museum.

C. parascelos, Theob., 1910.

Rec. Ind. Mus., iv, 18, ♀

Theob., Monog. Culic., v, 379.
Described from 2 ♀ ♀ from Madras Town, 30-x-08 [*Hodgart*].
A very marked species.
Type in Indian Museum.

C. perplexus, Leices., 1908.

Culic. Malaya, 150, ♂ ♀

Bred from larvae from marshy edges of lake near Kuala Lumpur.

C. pettigrewii, Theob., 1910.

Rec. Ind. Mus., iv, 15, ♀

Theob., Monog. Culic., v, 351, ♀

A perfect ♀ from Ukhrul, Manipur, viii-08, taken by the Rev. W. P. Pettigrew.

In the Indian Museum.

C. pseudolongifurcatus, Theob., nom. nov., 1910.

Monog. Culic., v, 366.

A new name for his *longifurcatus* (Rec. Ind. Mus., iv, 19, ♂ ♀), that name being preoccupied by Becker in 1903. Described from 1 ♂ and 2 ♀ ♀ from Dahawangahary Hill, Bengal—Nepalese Frontier, 16-ii-08.

Type in the Indian Museum.

C. pseudostenoetrus, Theob., 1910.

Monog. Culic., v, 343, ♀, fig. 154 wing.

Two ♀ ♀ from Hakgala, Ceylon, v and viii, 1907 [*Green*]. Whereabouts of type not mentioned.

C. pulchriventer, Giles.

ADD. REF.—Blanch., Moust., 338, ♂ ♀

Type in British Museum.

C. pullus, Theob.

Removed to *Culiciomyia*.

C. **quasipipiens**, Theob

ADD. REF.—Blanch., Moust., 344, ♀

Type in British Museum.

C. quasiunivittatus, Theob.

Type in British Museum.

C. reesii, Theob.

ADD. REF.—Blanch., Moust., 361, ♂ ♀

C. rizali, Banks.

Theobald (Monog., v, 391) notes on its differences from *japonicus*, to which it is closely allied. He puts it doubtfully here.

C. sepositus, Leices., 1908.

Culic. Malaya, 152, ♀

A single ♀ from jungle near Kuala Lumpur. Very distinct.

C. sericeus, Theob.

ADD. REF.—Blanch., Moust., 362, ♀

ADD. LOCS.—Taken by me at Meerut, India, 25-iv-05, Lucknow (the Residency), 2 xii-04; Rangoon, 24-xii-04 to 3-i-05, in bedroom; Shanghai, 8—10-v-06, in ditch. The specimens identified by Theobald with some doubt owing to their rubbed condition.

C. sitiens, Wied.

ADD. REF.—Blanch., Moust., 293, ♀
Leices., Culic. Malaya, 143, ♂ ♀

ADD. LOCS.—Blanchard adds Sumatra, Celebes, Malacca; Theobald adds Calcutta—Aug. and Sept. Philippines (*t. Ludlow*).

Leicester describes it from a series bred from marshy ground and from adults taken in the bungalows in the Malay Peninsula.

C. stenoetrus, Theob, 1907.

Monog. Culic., iv, 395, ♀

LOC.—Maskeliya, Ceylon, April [*Green*].
Type in British Museum.

C. taytayensis, Banks, 1910.

Phil. Journ. Sci., iv, 545, ♂ ♀

LOC.—Rizal (Ph. Is.). *Type* ♂ ♀ in entomological collection, Bureau of Science, Manila. Bred from larvae from the water of the esteros.

C. tigripes, Grand. et Char.

ADD. LOCS.—Manipur (bungalow), August [*Gourlay*]; Sylhet, ii, iv, v-xii-04 [*Hall*]; Mandalay, 11-iii-08 [*Annandale*]; Calcutta, July to November; Damukdia Ghat [Riv. Ganges, E. Bengal), July; Port Canning, Dec.; Kurseong, 4-viii-08. I took it in Calcutta, Aug. 1908 and Dec 1905; Kirindi, 20-xi 08; Weligama, 3-i-08; Dondra, 28-iv-08. and Mandulsima, 14-xii-08 (all four in Ceylon). Also occurs in South, Central and West Africa.

The larvae are carnivorous and cannibalistic. Patton found it at Aden in a tank of rain water feeding on *C. fatigans* larvae.

Theobald describes three varieties, none being Oriental.

C. tipuliformis, Theob.

ADD. LOCS.—Blanch., Moust., 363, ♀
Type in British Museum.

C. trilineatus, Theob., 1901.

Monog. Culic., ii, 159, ♀

Blanch., Moust., 330, ♀

Loc.—Thayetmyo, Upper Burma. First regarded as a variety of *fatigans*. Theobald admits it (Monog., v, 359) as distinct.

Type, a unique specimen, in the British Museum.

C. trimaculatus, Theob.

Type in Hungarian Museum.

C. tritaeniorhynchus, Giles.

Add. Ref.—Blanch., Moust., 294, ♂ ♀

Type in British Museum, from Madras.

C. uncus, Theob.

Add. Ref.—Blanch., Moust., 350, ♀.

Type in British Museum.

C. uniformis, Leices., 1908.

Culic. Malaya, 159, ♀

Two ♀ ♀ from marshy ground near Batu Gajah. Very near *C. viridis*.

C. univittatus, Theob.

Add. Ref.—Blanch., Moust., 321, ♀

Type in British Museum.

C. vagans, Wied.

Add. Ref.—Blanch., Moust., 304, ♀ (Foochow).

Theob., Rec. Ind. Mus., iv, 14 ♂; Monog. Culic. v, 347, ♂.

Theobald describes the ♂ of this species, as the present example referred to (Madras Town, 31-x-08, *Hodgart*) is the only one of this species he has seen. It is in the Indian Museum.

C. viridiventer, Giles.

Add. Ref.—Blanch., Moust., 346, ♂ ♀ The ♀ is said not to bite.

Type in British Museum.

C. vishnui, Theob.

Add. Ref.—Blanch., Moust., 292, ♂ ♀

Theob., Monog. Culic., iv, 387, ♂, fig. 162, wing ♀; 163, ♂ genitalia; pl. v, wing scales, ♀

Leices., Culic. Malaya, 141, ♂ ♀ (description of ♂ copied from Theobald).

ADD. LOCS.—Sylhet, Jan. and Feb. [*Hall*]; Port Canning, July; Gopkuda Is., August; Lake Chilka, August; Ferozepore, Punjab (*Adie*).

Leicester has taken one ♀ from jungle near Kuala Lumpur *Type* in British Museum.

BANKSIELLA, Theob., 1907.

Monog. Culic., iv, 468.

B. luteolateralis, Theob., 1901.

Monog. Culic., ii, 71 (*Culex id.*).

ADD. REF.—Blanch., Moust., 278, ♂ ♀
Leices., Culic. Malaya, 160, ♂ ♀
Theob., Monog. Culic., iv, 469, ♀

N.B.—*Banksiella* established for this species, which, originally described from the Soudan, has been recorded by Theobald from Sylhet, 23-xi-04 and 5-x-04, taken by Lieut.-Col. Hall, and now in the Indian Museum. Leicester describes it from larvae from the margins of small pools in grounds of the Institute of Medical Research at Kuala Lumpur. Taken there also in the adult stage. Occurs in several parts of Africa, where it varies considerably.

Type in British Museum.

TRICHOPRONOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 479.

T. annulata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 479 ♂, fig. 213a, apex of proboscis; b, scales; fig. 214, wing ♂

TRICHORHYNCHOMYIA, mihi., nom. nov.

Syn. *Trichorhynchus*, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 270.

Comes between the Stegomyian group and true *Culex* (Theobald).

N.B.—*Trichorhynchus* was preoccupied as far back as 1887 by Balbiani in Protozoa. The above name is therefore suggested in its place, with the presumption that it only represents a subgenus, at most.

T fuscus, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 270, ♀

Erratum.—In my catalogue "a single perfect ♂" is an error for ♀

Type in British Museum, according to Theobald (*loc. cit.*, vol. v), but in a previous letter to me he says in the "Hungarian Museum."

PSEUDOTHEOBALDIA, Theob., 1907.

Monog. Culic., iv, 271.

P. niveitaea, taai Theob., 1907.

Loc. cit., 272, fig. 87, ♂ genitalia; 88, wing ♂

LOC.—Dehra Dun, February, March [*Thomson*].
Described from two perfect ♂ ♂
Theog, Simla district, 2-v-07 [*Annandale*].
Type in British Museum.

TAENIORHYNCHUS, Arrib.

ADD. REF.—Theob., Monog. Culic., iv, 483 generic and egg notes.
Blanch., Moust., 381, fig. 244 generic chars. ♂ ♀; table of spp. p. 383.
Leices., Culic. Malaya, 163 table of six Malay spp.

T. ager, Giles.

ADD. REF.—Blanch., Moust., 385, ♂ ♀
Leices., Culic. Malaya, 168, ♂ ♀ Recorded from Kuala Lumpur, and Westlake, Hankow, 27-vi-07 [*Cornford*].

ADD. LOCS.—Sylhet, Jan. to May [*Hall*]; Miss Ludlow says it has been recorded from the Philippines. Calcutta, 2-ii-08; Balighai, near Puri, 26-x-08; Mandalay, 12-ii-08; Pallode, S. India, 14-xi-08; Kerumadi (S. end of Vembanaad Lake, Travancore State), 6-xi-08 [all *Annandale*].

N.B.—Leicester describes it from a large series bred from larvae from water at marshy edges of lakes, and entangled in floating green weed at the sides of a running stream.

T. argenteus, Ludlow.

Removed to *Theobaldiomyia*, nom. nov. for *Leucomyia*.

T. (?) aureosquammatus, Ludlow, 1909.

Can Ent., xli, 234, ♀.[1]

Theob., *T* (*?*) *aureosquamata* (*lapsus ?*) Monog., v, 425.
LOC.—Parang, Mindanao (Phil. Is.), December.
Type in Army Medical Museum, Washington

[1] Theobald (Monog., v) erroneously quotes the page as 101.

T aurites, Theob.

T. brevicellulus, Theob.

Both referred to *Chrysoconops*.
Type of latter in British Museum.

T. confinnis, Arrib., 1891.

Dipt. Argent. La Plata, 49.

Theob., Monog. Culic., iii, 289.
Recorded from Chaca, Formosa, possibly incorrectly, as it is a South American species.

T. conopas, Frnfld.

Referred to *Chrysoconops*.

T domesticus, Leices., 1908.

Culic. Malaya, 169, ♂ ♀

Described from a series bred from larvae, and from adults from bungalow at Kuala Lumpur and elsewhere.

T. epidesmus, Theob., 1910.

Rec. Ind. Mus , iv, 22 ♀

Theob., Monog. Culic., v, 429, ♀
Described from a single perfect ♀ in the Indian Museum taken by Mr. Paiva at Bhogaon, Bengal, 2-x-08.

T lineatopennis, Ludlow.

ADD. REF.—Theob., Monog. Culic., iv, 489, ♀

N.B.—The *types* (in the Army Medical Museum, Washington) were labelled "inside screens of screened houses," Sept. 13, 14.

T. luteoabdominalis, Theob., 1910.

Rec. Ind. Mus., iv, 23 ♀

Theob., Monog. Culic., v, 423.

A single perfect ♀ from Katihar, Purnea (Bengal), 5-x-08 [*Paiva*]. Very near *T epidesmus*.
Type in Indian Museum.

T. ochraceus, Theob.

Referred to *Chrysoconops*.

T. pagei, Ludlow, ♂ ♀.

Given in Theobald's vol. v, 618, without reference to author's description, which is copied verbatim.

From Parang, Mindanao, Phil. Is., Oct. 27.

T. tenax, Theob.

ADD. REF.—Blanch., Moust., 386, ♀
Leices., Culic. Malaya, 167, ♀

ADD. LOCS.—Sylhet, March to June [*Hall*]; Manipur, August [*Gourlay*]; Balighai, near Puri, 23-x-08, at light, one ♀ [*Annandale*].

N.B.—Leicester describes from one ♀ taken in a bungalow at Kuala Lumpur.

Type in British Museum.

T. tenax, var. **ocellata,** Theob., 1907.

Monog. Culic., iv, 488, ♀

LOC.—Kuching (Sarawak, Borneo), November [*Dr. Barker*]. This form apparently also occurs in China (*v.* Theob., Monog., iii, 259).

N.B.—There is a var. *maculipes*, Theob. (Monog., iv, 488), from African localities (White Nile, etc., v, pl iv, wing scales), and one termed *maculipes arabiensis* by Patton found in the Aden Hinterland.

Type in British Museum.

T. whitmorei, Giles.

Theobald says (Monog., v, 431) that Mr. Carter has examined the type and reports it a distinct "*Leucomyia.*" See *Theobaldiomyia.*

Type in British Museum.

CHRYSOCONOPS, Goeldi.

Os. Mosq. no Para, 114.
Theob., Monog. Culic., iv, 491.

C. aurites, Theob.

Removed here from *Taeniorhynchus.*

ADD. LOC.—Kuala Lumpur, 10-xi-02 and 25-v-02 [*Durham*].

Miss Ludlow says it has occurred in the Philippines.

Type in British Museum.

C. brevicellulus, Theob.

Removed here from *Taeniorhynchus*.

ADD. REF.—Blanch., Moust., 389, ♂ ♀
Leices., Culic. Malaya, 163, ♂ ♀

ADD. LOC.—Ceylon [*Green*]; Sylhet, Saugar, Manipur Haut (Feb., May, June), Manipur, Aug. [*Gourlay*]; Calcutta, August; Philippines (*t. Ludl.*, Can. Ent., xli, 234).

Leicester describes from a large series taken in bungalows at Kuala Lumpur. He says the ♂ is described for the first time, but Blanchard antedates him.

Typê in the British Museum.

C. conopas, Frnfld.

ADD. REF.—Blanch., Moust., 387, ♀ (*conopus*).
Leices., Culic. Malaya, 166, ♀

N.B.—Blanchard spells it *conopus*, but Theobald reverts to the original spelling. Miss Ludlow says it has been recorded from the Philippines. Leicester describes from a single ♀ from Klang jungle, saying it is a very distinct and easily recognized species.

C. ochraceus, Theob.

ADD. REF.—Leices., Culic. Malaya, 164.

Described from specimens taken in bungalows at Kuala Lumpur.

Referred here from *Taeniorhynchus* by Theobald.

Type in British Museum.

C. pygmaeus, Theob., 1908.

Rec. Ind. Mus., ii, 300, ♀

Loc. cit., iv, 25, ♂ pl. i, wing, pl. iii wing scales: Monog. Culic., v, 435, ♂ ♀, fig. 192 wing, 193 head ♂, 194 genitalia ♂ 195 wing ♀

Described from a single perfect ♀ from Sylhet [*Hall*].

The ♂ described later, from examples from Purnea, Rajmahal, and Calcutta in July and August.

Type ♂ ♀ in Indian Museum, *co-type* ♂ in British Museum.

Dr. Annandale says the eyes of the ♂ are iridescent in life.

MANSONIA, Blanch.

ADD. REF.—Blanch., Moust., 375, generic chars. ♂ ♀
Leices., Culic. Malaya, 171.

M. annulata, Leices., 1908.

Culic. Malaya, 174, ♀

Described from examples from bungalows at Kuala Lumpur and elsewhere near rivers. Near *uniformis*.

M. annulifera, Theob.

ADD. REF.—Blanch., Moust., 380, ♀
Leices., Culic. Malaya, 174, ♀ (copies Theobald's description).

ADD. LOCS.—Sylhet, May, June [*Hall*]; Manipur [*Gourlay*]; Calcutta, Aug. and Dec.; Port Canning, Dec. [*Annandale*]; Purneah, Oct.; Bhogaon, 7-viii-09 [both Bengal, and *Paiva*].

N.B.—At one time placed by Theobald in *Mansonioides*.[1]

Type in British Museum.

M. annulipes, Wlk.

ADD. SYN.—*Mansonia nero*, Dol., *t.* Blanch., Moust., 380, ♀

ADD. REF.—Leices., Culic. Malaya, 172, ♂ ♀

This latter author describes both sexes from a series taken in jungle near Klang, Kuala Lumpur, Port Swettenham and Jugra.

Very local, troublesome in jungle; probably a river breeder, according to Leicester.

I took one in Calcutta, 6-x-04.

Type in British Museum.

M. arabica, Giles, 1906.

Journ. Trop. Med., May 1906, 130.

Theob., Monog. Culic., v, 451.

LOC.—Isle of Barham, North Arabia.

N.B.—Properly speaking, should not be included in Oriental lists.

M. chrysogona, Knab, 1909 (November).

Entom. News Philad., xx, 386, ♂ ♀.

"*Chrysoconopas aurites*," Ludlow.

Described from one ♂ and two ♀ ♀ from Parang, Mindanao (Phil. Is.), 31-v-06.

Type (cat. No. 12,626) in United States National Museum.

In describing this species Miss Ludlow was under the impression she had *Taeniorhynchus aurites*, Theob., before her (*t. Knab*).

M. seguini, Laveran (*Panoplites id.*).

Blanchard admits this species as a good one (Moust., 380, ♀), from Hanoi, Tonkin, taken in the military hospital during the

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1 "First Rep. on Culic. in Ind. Mus. Coll.," Rec. Ind. Mus., ii, 287—302 (1908).

fever season (July to September), where it was found to suck blood. Theobald (Monog. Culic., iv) notes that he has seen no example of the species, and that from the description he considered it identical with *uniformis*.

In the "Genera Insectorum" the name *seguini* is not mentioned. Theobald's latest suggestion is "close to, if not, *uniformis*, Theob."

M. septempunctata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 494, ♀
Closely related to *M annulipes*, Wlk.

M. uniformis, Theob.

ADD. REF.—Blanch, Moust., 379, ♀.
Leices., Culic. Malaya, 171, ♂ ♀

ADD. LOCS.—Sylhet i, ii, iii, v, vi, vii, xii [*Hall*]; Manipur, June and Sept., in stable and bungalow; Gopkuda Is., Lake Chilka, August; Bhogaon, 30-ix-08 and Oct.; Katihar, Oct. [both *Paiva*]; Balighai, near Puri, 23-x-08; Travancore and Cochin States, 19-xi-08 and 4-xi 08, "very common in bungalows;" Calcutta, 2-vii-07; Rangoon, 25-ii-08 [all *Annandale*]; Kuala Lumpur.

N.B.—Leicester says it is in some parts of Kuala Lumpur the most troublesome mosquito after *C. fatigans*, W He describes the ♂ for the first time. He has only bred one example of the species; from a larva taken in a swamp.

Very common throughout the Philippines all the year round, according to Miss Ludlow's extensive tables, though she notes it is much more abundant during the winter.

It is recorded from many parts of Africa, also Madagascar and Australia, and it is a very variable species.

Type in British Museum.

MANSONIOIDES, Theob., 1907.

Monog. Culic., iv, 498. "closely related to *Mansonia*."

M. annulifera, Theob.

Replaced in *Mansonia*.

M. septemguttata, Theob., 1907.

Monog. Culic., iv, 499, ♀, figs. 226, 227 wings ♀

LOC.—Sarawak [*Dr. Barker*].
Type in British Museum.

ETIORLEPTIOMYIA, Theob.

Syn. *O'Reillia*, Ludl., 1905. Can. Ent., xxxvii, 101.
ADD. REF.—Theob., Monog. Culic., iv. 505.
Leices., Culic. Malaya, 178 ("position undetermined").
Spelt *Etorleptiomyia* originally and placed in Corethrinae, but Theobald now considers it "undoubtedly culicid," though the proboscis is characterised as very weak.

E. completiva, Leices., 1908.

Culic. Malaya, 178, ♂

Leicester thinks that the unique specimen sent him by Dr. Finlayson of Singapore, and from which this description was drawn up, represents the ♂ of some species of this genus. Theobald only describes the ♀ of his genus.

E. luzonensis, Ludl.

ADD. REF —Theob., Monog. Culic., iv, 506, ♀
Type in Army Medical Museum, Washington.

MELANOCONION, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 507, further generic notes.
Glen Herrick, Ent. News Philad. (1905), p. 282.
Blanch., Moust., 395, ♂ ♀
Leices., Culic. Malaya, 136.

M. juxtapallidiceps, Theob., 1910.

Monog. Culic., v, 456, ♀

A single ♀ in the British Museum, from Trincomalee, Ceylon, taken by Green, Oct. 1907.

M. ornatus, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 508 ♀, fig. 231 wing ♀.

M. pallidiceps, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 509 ♂

M. uniformis, Theob.

ADD. REF.—Leices., Culic. Malaya, 136, ♂ ♀
Redescribed by Leicester from bred examples from hollow bamboo and other jungle trees. Probably entirely sylvan. Leicester notes that his present description corrects some errors in his

previous one sent to Mr. Theobald for publication in "The Entomologist."

OCULEOMYIA, Theob., 1907.

Monog. Culic., iv, 515.

O. fulleri, Ludl., 1909

Can. Ent., xli, 97, ♀

Theob., Monog. Culic., v, 478 ♀ (Ludlow's descr. copied).
LOC.—Parang, Mindanao, Phil. Is., October.
N.B.—Miss Ludlow spells the genus *Oculiomyia.*

O. sarawakii, Theob., 1907.

Monog. Culic., iv, 515 ♀, fig. 236, head and ♀ haltere; 237, wing ♀; pl. vi, wing scales ♀
LOC.—Sarawak [*Dr. Barker*]. Described from a unique specimen.
Type in British Museum.

POPEA, Ludlow.

This genus is now placed by Theobald (Monog., iv) between *Leicesteria* and *Howardina.* It is, by the way, almost preoccupied by *Poppea*, Stal., 1867, in Hemiptera.

P. lutea, Ludlow.

Type in Army Medical Museum, Washington.

RACHIONOTOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 518.
In this volume Theobald places this genus next to *Oculeomyia*

R. ceylonensis, Theob

ADD. REF.—Theob., Monog. Culic., iv, 518, ♀
Type in British Museum.

FINLAYA, Theob.

ADD. REF.—Blanch., Moust., 415.
N.B.—Mr. Theobald (Monog., iv) considers this genus and *Orthopodomyia* as intermediate between Culicinae and Aedinae.

F. aranetana, Banks.

LOC.—Negros Occidental, Phil. Is., 17—24-vi-1906

F. poicilia, Theob.

ADD. REF.—Blanch., Moust., 415.

N.B.—Theobald notes that the figure of wing scales on page 283 (Monog., iii) is slightly incorrect, and shows a corrected wing in vol. iv, 520, fig. 238, with other notes. Papuan specimens differ a little from Malayan ones. The species is recorded from N. Queensland by Dr. Bancroft.

Type in British Museum.

ORTHOPODOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 527.
Leices., Culic. Malaya, 175.

Theobald admits this as intermediate between Culicinae and "Aedinae." Leicester (*loc. cit.*) notes its affinities with Aedeomyinae.

O. albipes, Leices. in Theob.

ADD. REF.—Theob., Monog. Culic., iv, 527, ♂ ♀
Leices., Culic. Malaya, 176, ♂ ♀

Leicester describes in above work from a long series bred from larvae from bamboos. Sylvan, probably not a blood-sucker.

Type in British Museum.

O. maculata, Theob., 1910.

Rec. Ind. Mus., iv, 29, ♂

Monog. Culic., v, 473, ♂

A single ♂: Indian Museum, from Maddathorai, 17-xi-08 [*Annandale*].

O. maculipes, Theob., 1910.

Monog. Culic., v, 470, fig. 208 head ♀, 209 wing, 210 wing ♀ (? error for ♂).

LOC.—Andaman Is., 22-vii-08 [*Lowis* and *Ray White*]; Peradeniya, Ceylon, 5-vii-09 [*Green*]; Maddathorai, S. India, 17-xi-08 [*Annandale*].

Type ♂ Indian Museum, ♀ British Museum.

O. nigritarsis, var.

Leicester notes (Culic. Malaya, 177) a new variety of this species, stating its affinities with *O. albipes*, but I have found no mention of any species of the name of *nigritarsis*.

The specimen was taken in the hollow of a tree on a small island, Pangkor-Haut, by Dr. Daniels.

REEDOMYIA, Ludlow.

Syn. *Lepidotomyia*, Theob., Ann. Mus. Hung, iii, 80.

ADD. REF.—*Reedomyia, id.*, Monog. Culic., iv, 257, ♂ ♀

N.B.—Theobald (*l.c.*, iv, 249) notes that his *Lepidotomyia* in Ann. Mus. Hung., iii, referred to, and is a synonym of *Reedomyia*.

His second genus under this name stands good, with at present four Oriental species.

R. alboscutellata, Theob.

Removed here from "*Lepidotomyia.*"

ADD. REF.—Theob., Monog. Culic., iv, 261 ♀, fig. 80 wing ♀ Leices, Culic. Malaya, 132, ♂ ♀ (*Lepidotomyia id.*).

The latter author redescribes it from a series of adults from jungle near Kuala Lumpur, and from bred specimens from larvae from a jungle pool. Theobald spells this species *alboscutella* in vol. v, 257; presumably in error.

Type in Hungarian Museum.

R. lowisii, Theob., 1910.

Monog. Culic., v, 257, ♂ ♀; fig. 121 ♀ head, 122 wing, 123 head ♂, 124 wing ♂

LOC.—Andaman Isles [*Lowis* and *Ray White*]; Galle, Ceylon, 6-iv-07 [*Bainbrigge Fletcher*].

Type in British Museum.

R. niveoscutellata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 259, ♂ ♀; fig. 79 ♂ fore ungues.

Resembles *Culex pipiens*. Miss Ludlow says it has been recorded from the Philippines.

Type in British Museum.

R. pampangensis, Ludlow.

ADD. REF.—Theob., Monog. Culic., iv, 258, ♀

Type in Army Medical Museum, Washington.

Sub.-Family *AEDEOMYINAE*.

ADD. REFS.—Aedeinae, Blanch., Moust., 398 (table of genera)

Aedinae, Theob., Monog. Culic., iv, 537.

Aedeomyinae, Leices., Culic. Malaya, 180.

Leicester gives notes on sub-family, also table of genera, in which he includes *Deinocerites*, Theob., *Aedeomyia*, Theob., *Aedes*, Mg., *Aioretomyia*, Leices., gen. nov., *Acalleomyia*, Leices, gen. nov., *Verrallina*, Theob., *Mimomyia*, Theob., *Uranotaenia*, Theob.,[1] *Ficalbia*, Theob., *Hodgesia*, Theob., *Zeugnomyia*, Leices., gen. nov.,

[1] Incorrectly attributed to Theobald instead of Arribalzaga.

Colonemyia, Leices., gen. nov., *Topomyia*, Leices., gen. nov., *Haemagogus*, Theob., *Skeiromyia*, Leices., gen. nov. Several of these genera are not represented in the East.

In his "genera of the *Aedes* type" Col. Alcock sinks *Mimomyia*, Theob., and *Pseudoskusea*, Theob.

SKUSEA, Theob.

By some authors referred to this sub-family, but herein it is retained in its position in my Catalogue.

LEPTOSOMATOMYIA, Theob.

Erratum.—In my reference to this genus (Cat., p. 362) change p. 80 to p. 110.

L. lateralis, Theob.

Add. Ref.—Theob., Monog. Culic., iv, 548 ♂ ; fig. 252, head, scutellum ungues ♂

The *type* is partly dissected. I am uncertain whether it reposes in the British Museum or the Hungarian Museum.

AEDEOMYIA, Theob.

Add. Ref.—Blanch., Moust., 403, ♂ ♀ , fig. 255, var. generic chars.

Leices., Culic. Malaya, 181.

This author says he cannot agree with Theobald in the relationship of this genus to *Aedes*. "Even the ♂ palpi, the only point of agreement, are very different from those in *Aedes*."

A. catasticta, Knab, 1909.

Ent. News Philad., xx (November), 387, ♀

He only describes the ♀ , apparently, but he must have had both sexes present as, in comparing it with *A squamipenna*, Arrib., he says "the ♂ genitalia of the two species show specific differences."

A. squamipenna, Arrib.

(*Aedeomyia squammipenna*, Theob., Monog., vol. ii, *t.* Leices.)

Add. Ref.—Blanch., Moust., 404, ♀ (*squamipennis*).

Leices., Culic. Malaya, 182, ♂ ♀ (*squammipenna*).

Add. Locs.—Examples taken occasionally during the year in bungalows at Kuala Lumpur; Calcutta, at light, November; base of Dawna Hills, 2-iii-08 [*Annandale*]; at light at sea, 4 miles off Tuticorin, 25-v-08 [*Paiva*].

N.B.—Leicester reverses the correct quotation of this species, making it appear as if Arribalzaga's name was a synonym, whereas the species was first described by him.

PSEUDOGRAHAMIA, Theob., 1910.

Rec. Ind. Mus., iv, 26, near *Grahamia*, Theob.

P. aureoventer, Theob., 1910.

Loc. cit., 27, ♀

LOC.—Pallode, Travancore State, S. India, 16-xi-08, a single ♀ [*Annandale*].

"A very marked and beautiful species which cannot be confused with any other culicid."

N.B.—Care must be taken to avoid confusion through the similarity of these generic names, *Grahamia*, *Pseudograhamia*, *Grabhamia* and *Pseudograbhamia*.

SQUAMOMYIA, Theob., 1910.

Rec. Ind. Mus., iv, 28.

Theob., Monog. Culic., v, 529.

S. inornata, Theob., 1910.

Rec. Ind. Mus., iv, 28, ♂

Theob., Monog. Culic., v. 529, ♂

Described from a single ♂ in the Indian Museum from the Dawna Hills (2—3 000 ft.), 2 or 3-iii-08 [*Annandale*].

AEDES, Mg.

ADD. REF.—Blanch., Moust., 399, ♂ ♀
Leices., Culic. Malaya, 183.

"This genus is closely related to *Culex* and *Melanoconion* on the one hand, and less so to *Aioretomyia* amongst the Aedeomyinae. In fact, nothing could better show how unscientific is a classification based on palpi, than that genera so closely related as *Culex*, *Melanoconion* and *Aedes* should be placed in different families" (Leicester).

N.B.—Leicester, I *hope*, means "sub-families."

A. butleri, Theob.

N.B.—In his Monog., iii, 295, Theobald created the genus *Verralina* for *Aedes butleri* and two other species; and Blanchard (Moust., 417) retains the genus, but in the "Genera Insectorum" Theobald does not mention it, referring *butleri* to the "uncertain position" section of the species of *Aedes*.

Type in British Museum.

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[1] This species has inadvertently been dealt with before, *see* p. 460. The mistake was discovered too late for correction in the text.—*Ed.*

A. malaya, Leices., 1908.

Culic. Malaya, 184, ♀.

Bred from larvae from pond in Kuala Lumpur.

A. nigrescens, Theob., 1907.

Monog. Culic., iv, 540, fig. 246 wing ♀, 247 ♂ genitals, pl. vi, wing scales ♀

Loc —Castle Rock (Canara Dist., S.-West India), Jan. to March.

" A very small species, looking like a *Melanoconion*" (Theob.).

Type in British Museum.

AIORETOMYIA, Leices., 1908.

Culic. Malaya, 185. " Near *Verrallina* and *Howardina.*"

A. aedes, Leices., 1908.

Loc. cit., 189, ♂

One ♂ bred from a larva from a pond in Kuala Lumpur, the species doubtfully referred by the author to this genus.

A. ostentatio, Leices., 1908.

Loc cit., 193, ♀

Described from a series of ♀ ♀, some from larvae from a jungle pool, and some taken as adults. Sylvan species, a vicious day biter.

A. perdita, Leices., 1908.

Loc. cit., 192, ♂

Description drawn up from recollection from a single ♂ taken at midday in jungle five miles from Kuala Lumpur.

The *type* is lost.

A. singularis, Leices., 1908.

Loc. cit., 188, ♂

A single ♂ from a bungalow in Kuala Lumpur.

A. taeniata, Leices., 1908.

Loc. cit., 190, ♀

Two ♀ ♀ only taken at midday in jungle near Kuala Lumpur.

A. varietas, Leices., 1908.

Loc. cit., 185, ♂ ♀

Fairly common in Malayan jungle, where the ♀ bites viciously. Occurs at Kuala Lumpur, Ulu Gombak, Pangkor Haut and Klang. Leicester only bred one example, a ♂

ACALLEOMYIA, Leices., 1908.

Loc. cit., 194.

A. obscura, Leices., 1908, emend. mihi.

Loc. cit., 194, ♂ ♀ (*obscurus*).

No notes or dates are given.

VERRALLINA, Theob., 1903.

Monog. Culic., iii, 295.

ADD. REF.—Leices., Culic. Malaya, 196.

V butleri, Theob.

(*Aedes. id.*) Theob., Monog. Culic., ii, 230

ADD. REF.—Leices., Culic. Malaya, 196, ♂ ♀

The ♂ described for the first time. The commonest mosquito in the mangrove swamps; not unlike *Stegomyia fusca*, Leices.: larva living in brackish pools in mangrove swamps.

N.B.—Although Theobald created *Verrallina* for this species, he ignores the genus in the "Genera Insectorum," placing *butleri* in the "uncertain position" section of *Aedes*. But in vol. v he replaces it in the present genus

Type in British Museum.

V fragilis, Leices., 1908.

Culic. Malaya, 199, ♂

A sylvan species in jungle near Kuala Lumpur.

N.B.—Possibly the same species as *malayi*; if so, the name *fragilis* must stand.

V imitator, Leices., 1908.

Loc. cit., 201, ♀

Two ♀ ♀ from jungle five miles from Kuala Lumpur.

Types rather damaged, but distinct.

V. indecorabilis, Leices., 1908.

Loc. cit., 200, ♂ ♀

Bred from larvae from small jungle pool near Kuala Lumpur. Very near *imitator*.

V malayi, Leices., 1908.

Loc. cit., 198, ♀

One ♀ in jungle ten miles from Kuala Lumpur.
? ♀ of *fragilis* (Leicester).

V. virilis, Leices., 1908.

Loc. cit., 197, ♂

One ♂ from jungle a few miles from Kuala Lumpur.
Near *V malayi*.

BOLBODEOMYIA, Theob., 1910.

Rec. Ind. Mus., iv, 31.

B. complex, Theob., 1910.

Loc. cit., 31, ♂ ♀

Monog. Culic., v, 581, ♂ ♀ , fig. 253 ♂ genitalia, 254 wing ♂, 255 wing ♀

Loc.—Dawna Hills, 2—3,000 ft., 1—3-iii-08 [*Annandale*].

Types (a unique pair) in Indian Museum.

N.B.—There is a *Bolbodimyia* by Bigot, 1892, in Tabanidae (Wien. Ent. Zeit., xi, 162).

MIMOMYIA, Theob.

ADD. REF.—Blanch., Moust., 419.
Leices., Culic. Malaya, 202 ; notes, apparently criticising its place in this sub-family.

M. chamberlaini, Ludlow.

Vide *Ludlowia*.

M. minuta, Theob., 1908.

Rec. Ind. Mus., ii, 301, ♂.

Theob., *Loc. cit.*, iv, 30, ♀ ; pl. i wing, pl. iii wing scales.

Id., Monog. Culic., v, 531, ♂ ♀ , fig. 226 wing.

Locs.—Sylhet, 27-xi-04 [*Hall*]; Calcutta, 30-vii and 3 or 4-viii-07 [*Annandale*].

Types in British Museum.

RUNCHOMYIA, Theob.

Syn. *Binotia*, Blanch., 1904. (Archiv. de Parasit., viii, 478). Blanchard's name, suggested, on account of alleged preoccupation (*Rhynchomyia*, R. Des., in Muscinae), cannot stand, the names not being identical.

R. philippinensis, Giles.

ADD. REF.—Theob., Monog. Culic., v, 555 (copies Giles's descr.).

Type in British Museum. Theobald has not seen it, but says that Banks says "this species is identical with *Uranotaenia nitidoventer* Giles, but both are incorrectly placed as to genera." Mr. Carter also thinks the present species neither a *Runchomyia* nor a *Uranotaenia*.

LUDLOWIA, Theob., 1907.

Monog. Culic., iv, 193, ♂

Established for *Mimomyia chamberlaini*, Ludlow, also to comprise a Soudanese species.

L. chamberlaini, Ludlow.

(*Mimomyia id.*, Ludlow.)

ADD. REF.—Theob., Monog. Culic., iv, 194, ♂ (Miss Ludlow's description copied).

N.B.—This author adds that since vol. iv of his Monograph went to press Miss Ludlow has sent him a description of the ♀

Type in British Museum.

L. minima, Ludlow, 1907.

Can. Ent., xxxix, 413, ♂ ♀

Theob., Monog. Culic., v, 191, ♂ ♀ (copies Miss Ludlow's description).

Type in Army Medical Museum, Washington.

ANISOCHELEOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 570.

A. alboannulata, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 573, ♂, fig. 267 wing ♂; pl. vii wing scales ♀

N.B.—*Type* (unique) in British Museum. "The species is a very beautiful and marked one, and cannot be confused with any other" (Theob.).

A. albitarsis, Ludlow.

ADD. REF.—Theob., Monog. Culic., iv, 576, ♀ (Miss Ludlow's description copied).

N.B.—Type in Army Medical Museum, Washington. Theobald thinks its place in this genus doubtful.

FICALBIA, Theob.

ADD. REF.—Blanch., Moust., 418.
Leices., Culic. Malaya, 228.

F. longirostris, Leices., 1908.

Culic. Malava, 228, ♂ ♀

Bred from larvae from stagnant water at Kuala Klang in January; a very distinct species. Apparently slightly aberrant.

F. minima, Theob.

ADD. REF.—Blanch., Moust., 418

N.B.—First placed in *Uranotaenia*, then referred here.

As Theobald (Monog., v) retains a species of this name under both genera, it is left here for the present.

Type in British Museum.

F. simplex, Theob.

ADD. REF.—Blanch., Moust., 418.
Theob., Monog. Culic., v, 541, ♀ , fig. 235 wing.

ADD. LOC.—Two ♀ ♀ from Trincomalee, xi-1906 [*Green*].

Type in British Museum.

PSEUDOURANOTAENIA, Theob., 1905.

Journ. Econ. Biol., i, 33.

Theob., Monog. Culic., iv, 566, fig. 262 (p. 567) wing ♂

P. parangensis, Ludl., 1909.

Can. Ent., xli, 24, ♀

Theob., Monog. Culic., v, 524 (copies Miss Ludlow's description).

LOC.—Parang, Mindanao (Phil. Is.).

P. triangulata, Ludl., 1908.

Can. Ent. xl, 331, ♂

Theob , Monog. Culic., v, 525 (copies Miss Ludlow's description).

LOC.—Reine Regente, Mindanao (Phil. Is.) ; February.

URANOTAENIA, Arrib.

ADD. REF.—Blanch., Moust., 406, ♂ ♀ generic chars.
Leices., Culic. Malaya, 203 (genus incorrectly attributed to Theobald).
Table of 18 new Malayan species.

U. argyrotarsis, Leices., 1908.

Culic. Malaya, 214, ♂ ♀

Described from series bred from larvae from a pool in a patch of jungle five miles from Kuala Lumpur, and one adult on surface of same pool. Very distinct.

U. atra, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 563, ♀

U. bicolor, Leices., 1908

Culic. Malaya, 225, ♂ ♀

Bred from larvae from the marshy edges of a jungle stream in Kuala Lumpur. Leicester has not captured the adult, which is the largest Malay species after *maxima*.

U. bimaculata, Leices., 1908.

Loc. cit., 226 ♀

Fairly common in damp places of jungle at "The Gap," Kuala Lumpur, the only place it seems to occur at.

U. bimaculiala, Leices., 1908.

Loc. cit., 208, ♂ ♀

The ♂ from Raub jungle; the ♀ described from a series caught over jungle pools (presumably at Kuala Lumpur). Near *unimaculiala*.

U. caeruleocephala, Theob. var. lateralis, Ludlow.

In vol. v Theobald makes it a species.

U. campestris, Leices., 1908.

Culic. Malaya, 213, ♂ ♀

Very near *Verrallina pygmaea*, Theob. Captured on swampy ground.

U. cancer, Leices., 1908.

Loc. cit., 215, ♂ ♀

Abundant in crab holes at Port Swettenham, and among Nepah palms at that place, and Klang. Larvae in crab holes or stagnant pools. Male very distinct.

U. ceylonica, Theob., 1910.

Monog. Culic., v, 503, ♀ , fig. 213 wing.

LOC.—Galle, Ceylon, 10-iv-07 [*Bainbrigge Fletcher*]
Type (a unique specimen) in British Museum.

U. fusca, Leices., 1908.

Culic. Malaya, 227, ♂ ♀

Described from a series bred from larvae from a pool at Sungei Limbing, Malay Peninsula, taken by Dr. Daniels.

U. lateralis, Ludl.

Phil. Journ. Sci., i, 590.
Syn. *U. caeruleocephala*, Th., var. *lateralis*, Ludl. Mosq. Phil. Is., p. 10.

U. longirostris, Leices., 1908.

Loc. cit., 217, ♂

Only one specimen known, bred from a pupa taken in a pond (presumably at Kuala Lumpur).

U. lutescens, Leices., 1908.

Loc. cit., 222, ♂ ♀

A bamboo sylvan breeder Leicester has not taken the adult form. Presumably from Kuala Lumpur.

U. maculipleura, Leices., 1908.

Culic. Malaya, 223, ♀

Only one specimen known, taken by a jungle stream six miles from Kuala Lumpur.

U. malayi, Theob.

ADD. REF.—Blanch., Moust., 410.
Type in British Museum.

U. maxima, Leices., 1908.

Culic. Malaya, 221, ♀

Described from specimens taken at "The Gap," Selangor. The largest Malay species. Dr. Leicester possesses a ♂ which may be that of this species.

U. micans, Leices., 1908.

Loc. cit., 206, ♂ ♀

Described from a series taken on marsh land, Malaysia.

U. minima, Theob.

See *Ficalbia id.*

U. modesta, Leices., 1908.

Culic. Malaya, 218, ♂ ♀

Described from a series bred from larvae from water in a hollow tree in Ampang jungle.

U. nitidoventer, Giles.

See *Runchomyia philippinensis.*

U. nivea, Leices., 1908.

Loc. cit., 211, ♂

Only one specimen known, taken by Dr. Leicester in his bungalow at Kuala Lumpur.

U. nivipleura, Leices., 1908.

Loc. cit., 219, ♂ ♀

Described from a single pair: ♂ taken by Leicester at "The Gap," Selangor, ♀ sent by Dr. Finlayson, bred from a larva in a pitcher plant at Singapore.

U. powelli, Ludl., 1909

Can. Ent., xli, 235, ♀

Theob., Monog. Culic., v, 519, ♀

The locality is given as Yayabas (Phil. Is.), which is probably a misprint for Tayabas. January.

U. testacea, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 560, ♀, fig 258 wing ♀

ADD. LOC.—Base of Dawna Hills, 4-iii-08 [*Annandale*]; Phil. Is. [*t. Ludlow*].

U. trilineata, Leices., 1908.

Culic. Malaya, 204, ♂ ♀

Larvae found in quiet pools, adults in neighbourhood of jungle pools. The only species in Malaysia with a banded proboscis.

U. unilineata, Leices., 1908.

Culic. Malaya, 220, ♂ ♀

In jungle close to water, Leicester has found females full of blood. Malaysia.

U. unimaculata, Leices., 1908.

Culic. Malaya, 210, ♀

Near water in jungle, Malaysia. ♂ unknown.

ZEUGNOMYIA, Leices., 1908.

Culic. Malaya, 231.

Links *Uranotaenia* to *Colonemyia* and *Skeiromyia*, and thence to *Wyeomyia*.

Z. gracilis, Leices., 1908.

Culic. Malaya, 232, ♂ ♀

Fairly common in certain localities, especially October to December; a vicious biter. Occurs all the year sparsely at Jugra and Kuala Lumpur. Larvae in water in fallen leaves, feeding on other larvae. (*Leicester*).

COLONEMYIA, Leices., 1908.

Culic. Malaya, 233.

C. caeruleocephala, Leices., 1908.

Loc. cit., 233, ♂ ♀

Described from a series of both sexes bred from larvae from bamboo water at Bukit Kutu and Ulu Klang (Malaysia).

C. hybrida, Leices., 1908.

Loc. cit., 237, ♀.

One ♀ at Bukit Kutu; quite distinct.

C. mendacis, Daniels, 1908.

Studies from Instit. for Med. Research (Fed. Malay States), iii, 266, ♂ ♀

"Notes on the Mosquitoes on the river and coast district of the eastern side of the Peninsula," C. W Daniels.

N.B.—Sequential to Leicester's paper.

Bred from larvae from pitcher plants on East Coast, Malay Peninsula.

TOPOMYIA, Leices., 1908.

Culic. Malaya, 238.

Very near *Zeugnomyia* and *Colonemyia*.

T. argyropalpis, Leices., 1908.

Loc. cit., 242, ♂ ♀

A unique ♂ from a stream at "The Gap," Selangor, in April. The unique ♀ by a jungle stream five miles from Kuala Lumpur in March.

T argyroventralis, Leices., 1908.

Loc. cit., 240, ♂ ♀

Described from 2 ♂ ♀ and a series of ♀ ♀ from "The Gap," Selangor, near jungle streams. Possibly the two sexes described under this name by Leicester are not of the same species, but *T tipuliformis* may be the real ♂ (Leicester.)

N.B.—If this should prove the case, the name must stand for the ♂ according to zoological precedent, and "*argyroventralis* ♀" be sunk as the ♀ of "*tipuliformis*;" the present suggested ♂ of *argyroventralis* being either renamed or allowed to retain that specific name.

T decorabilis, Leices., 1908.

Loc. cit., 239, ♂ ♀

One ♂ and ♀ at "The Gap," Selangor, in jungle.

T durbitans, Leices., 1908.

Loc. cit., 246, ♀

A unique ♀ from "The Gap" in May.

T gracilis, Leices., 1908.

Loc. cit., 244, ♂ ♀

"The Gap," Selangor, May.

T. minor, Leices., 1908.

Loc. cit., 238, ♂ ♀

In jungle near Kuala Lumpur near streams. Both sexes, when settled, have a habit of dancing up and down like certain Tipulidae.

T nigra, Leices., 1908.

Loc. cit., 245, ♂ ♀

Near jungle streams at Ampang, six miles from Kuala Lumpur, May.

T rubithoracis, Leices., 1908.

Loc. cit., 243, ♂ ♀

Described from two ♂ ♂ and a series of ♀ ♀.

T. tipuliformis, Leices., 1908.

Loc. cit., 247, ♂

Several ♂ ♂ near a stream in "The Gap" jungle, and in the dried bed of a stream at Raub. Leicester suggests that this may be the ♂ of "*rubithorax*" (? lapsus). He also previously suggests it is the same as *argyroventralis* (*vide* note under *argyroventralis*).

Abdomen very thin, longer proportionately than in any other species of the family, and in general appearance closely resembling several species of Tipulidae.

SKEIROMYIA, Leices., 1908.

Culic. Malaya, 248.

S. fusca, Leices., 1908.

Loc. cit., 248, ♂ ♀.

Leicester has not seen the adult, except when bred, from larvae, which are common in bamboo.

HODGESIA, Theob.

ADD. REF.—Leices., Culic. Malaya, 229.

N.B.—To the generic definition, Leicester proposes to add "antennae pilose in ♂ and ♀"

H. malayi, Leices., 1908.

Culic. Malaya, 231, ♂ ♀.

Described from a series bred from jungle pools near Kuala Lumpur.

H. quasisanguinae, Leices., 1908.

Loc. cit., 230, ♀.

In jungle near Kuala Lumpur; a vicious biter.

H. sanguinea, Theob.

Type in British Museum.

WYEOMYIA, Theob.

ADD. REF.—Leices., Culic. Malaya, 250.

N.B.—Leicester admits a sub-family Wyeomyinae, with the following genera: *Wyeomyia* Theob., *Phoniomyia* Theob., *Dendromyia* Theob., *Runchomyia* Theob., *Sabethes*, *Sabethoides*, *Goeldia*, *Limatus*, *Malaya*, Leices., all gen. nov.; giving a table of them, several however not being Malayan.

W. aranoides, Theob.

ADD. REF.—Blanch., Moust., 425.
Type in British Museum.

W. funerea, Leices., 1908.

Culic. Malaya, 252, ♀

A unique ♀ from jungle six miles from Kuala Lumpur.

W. greenii, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 596.
Blanch., Moust., 423.
ADD. LOC.—Peradeniya [*Green*].

N.B.—Mr. Theobald omitted this species from the "Genera Insectorum" but mentions it, as above, for a good species.
Type in British Museum.

W metallica, Leices., 1908.

Culic. Malaya, 251, ♀

A unique ♀ in bungalow at Bukit Kutu, Malaysia.

W. nepenthicola, Banks, 1910.

Phil. Journ. Sci., iv, 550, ♂ ♀

LOC.—Benguet, Trinidad (Phil. Is.). Bred from larvae in pitchers of *Nepenthes alata*, Bl.
Type ♂ ♀ (No. 8159) in entomological coll., Bureau of Science, Manila.

PHONIOMYIA, Theob.

Erratum.—"Vol. ii" is a misprint for vol. iii in my Catalogue, p 365.

ADD. REF.—Blanch., Moust., 425.
Leices., Culic. Malaya, 253.

N.B.—The name of this genus is likely to be confounded with *Phonomyia* established in Tachinidae by Brauer and Bergenstamm in 1894.

P. bimaculipes, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 600, ♀
"A very distinct and beautiful species" (Theob.).

P. caeruleocephala, Theob., 1910.

Monog. Culic., v, 577, ♂ ♀, fig. 252 wing.

LOC.—Hakgala, Ceylon, iii-07 [*Green*].
Types, a unique pair, in British Museum.

P. indica, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 601, ♂, fig. 275 wing ♀
Redescribing the species in this volume, the author repeats, "Described from a perfect ♂," and again makes no direct reference to the ♀, yet he figures a wing marked ♀ Is this in error?

In vol. v he says simply that the *type* is from Singapore.

Leicester records a ♂ and two ♀ ♀ from jungle, six miles from Kuala Lumpur.

POLYLEPIDOMYIA, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 625.

P. argenteiventris, Theob.

ADD. REF.—Theob., Monog. Culic., iv, 625, fig. 292 wing ♀.

N.B.—The *types* were taken November and December 1892.

DENDROMYIA, Theob., 1903.

Monog. Culic., iii, 313.

Blanch., Moust., 426.

Leices., Culic. Malaya, 254.

Syn. *Heinzmannia*, Ludlow.

N.B.—*Heinzmannia* is sunk for *Dendromyia*. Mr. Theobald says (Monog., iv, 603) that, due to some error of his in writing to

Miss Ludlow, she founded her genus on a species which is an undoubted *Dendromyia.*

D. achaetae, Leices., 1908.

Culic. Malaya, 257, ♀

Described from a single example; genitalia very concealed, and sexes very alike in this genus.

D. aureochaeta Leices., 1908.

Loc. cit., 255, ♀

A series of ♀ ♀ taken by day in jungle near Kuala Lumpur in April and May.

D. communis, Leices., 1908.

Loc. cit., 254, ♀

Described from one ♂ and a series of ♀ ♀ from "The Gap," Selangor.

D. scintillans, Ludlow.

(*Heinzmannia id., id.*)

This species was described from a perfect ♀, except that the antennae are missing.

Type in Army Medical Museum, Washington.

PHILODENDROMYIA, Theob., 1907.

Monog. Culic., iv, 623.

P. barkeri, Theob., 1907.

Monog. Culic., iv, 623, ♂, fig. 289 head, scutellum, palpus ♂, fig. 290 wing ♂, pl. vii, wing scales ♀

Loc.—Sarawak, in July [*Dr. Barker*]. Described from two ♂ ♂ taken in a house.

Type in British Museum.

MALAYA, Leices., 1908.

Culic. Malaya, 258.

M. genurostris, Leices., 1908.

Loc. cit., 258, ♂

Taken by Dr. Daniels in bungalow in Malay Peninsula.

HARPAGOMYIA, Meij., 1909.

Tijd. voor. Ent., lii, 165.

N.B.—The author places this simply in "Aedeinae," without any more definite note as to its exact position, so I place it here at the end of this sub-family.

H. splendens, Meij., 1909.

Tijd. v. Ent., lii, 167, ♂ ♀, pl. x, 1—9 (var. figs.).

LOC.—Java.

N.B.—The author notes that this mosquito is eaten by the widely distributed ant *Crematogaster difformis*, Smith.

Sub-Family *CORETHRINAE.*

Corethra and its allies form a sub-family of Culicidae, and cannot morphologically be separated from this family. The absence of a biting mouth, and the absence of scales on the body are quite secondary characters.

Moreover, the discovery in Ceylon quite recently by Major MacDougall, R.A.M.C., of a new genus which Dr. Annandale has described as *Ramcia*[1] irrevocably links together, on account of its undeniably intermediate nature, the two groups Culicinae and Corethrinae. The short, feeble proboscis and absence of scales on the head, body and legs approximate it to the Corethrinae, the presence of scales on the distal half of all the longitudinal veins connects it with the Culicinae. Two peculiarities of venation distinguish it: the 1st longitudinal vein ends soon after the middle of the wing, running parallel to the auxiliary vein, instead of reaching the distal margin as in both Culicinae and Corethrinae, in this peculiarity resembling *Phlebotomus*; and, secondly, the 2nd longitudinal vein begins almost in a line with the origin of the 3rd and comparatively close to it instead of some distance before it, as in both Culicinae and Corethrinae. Only the male is known, but the larva and pupa were also obtained and from the characters of these Dr. Annandale considers its total affinities lie mainly with the Corethrinae.

Two short papers of mine[2] thoroughly investigate the synonymy of *Corethra*, Mg., *Sayomyia*, Coq., and *Chaoborus*, Lichtenstein, with the result that it is found that no species of *Corethra*, Mg., occurs in the East, the genus being apparently restricted to two or three European species. The genus *Sayomyia* is antedated by Lichtenstein's *Chaoborus*, as admitted by Coquillett himself, and both *asiatica*, Giles, and *cornfordi*, Theob., certainly belong here,

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1 Thus named, by special request of Major MacDougall, after the Royal Army Medical Corps.

2 "Synonymy in Corethrinae," Rec. Ind. Mus., iv, 317, and vi, 227.

whilst there can be no reasonable doubt that *manilensis*, Sch., is also congeneric.

RAMCIA, Annandale, 1911.

Spolia Zeyl., vii, pt. xxviii, p. 187 (Aug., 1911).

R. inepta, Annandale, 1911.

Spolia Zeyl., vii, pt. xxviii, p. 189, fig. (p. 188) and plate giving larva, pupa, wing, and other characters.
Type in the possession of Major A. J. MacDougall, R.A.M.C.

CHAOBORUS, Lichtenstein, 1800.

Syns. *Sayomyia*, Coq. "*Corethra*" Auct.

C. asiatica, Giles.

ADD. LOCS.—Calcutta Zoological Gardens, May, July, August, "common, resting on damp walls during daytime and flying to light at night" [*Annandale*]; also occurs in Calcutta, September, November and December; Sibpur (near Calcutta), August; Katihar, Purnea District, at light.