MOSQUITO NOTES.—II.

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Anopheles flaviceps, sp. nov.

Head with the integument rather light yellowish, especially when viewed from in front. Erect scales mostly brown, a small area of white ones in the middle towards the front, and in front of these a few long, narrow recumbent scales, not forming a definite frontal tuft. Many light brown bristles between the eyes; border bristles dark. *Antennae* with the basal joint yellow; in female with a few small scales on the second joint; male plumes light brown. *Female palpi* very slightly longer than the proboscis, thin, with appressed scales; narrow whitish rings at the tips of the first three joints, just extending on to the bases of the succeeding joints; tip of last joint dark. Second joint slightly longer than the first, slightly shorter than the third and fourth together; fourth joint less than half as long as the third. [*Male palpi* missing.] *Proboscis* dark, except for the labella.

Thorax rather light yellowish, darker in the females (perhaps through discoloration). Mesonotum somewhat shining, not darker at the sides, with light bristles, and in the middle with rather numerous, very narrow hair-like scales. Prothoracic lobes rounded, not mammillate, without scales. Prosternal hairs, five or six.

Abdomen light brown, with narrow dark bands in the male; hairs pale; no scales. *Male hypopygium*: Basal spines, five or six, all rather strong, in a loose, irregular cluster; one distinctly distal to the rest and much longer, but not more slender. Claspettes pointed; a long and fairly strong apical hair, half as long again as the club, which is normal in shape, but much more basally placed than the hair; no accessory hairs discernible. Tip of mesosome with about five rather narrow leaflets; the longest 0·55 as long as the mesosome.

Legs dark; extreme tips of femora and tibiae and extreme bases of tibiae pale; on the front and middle legs the tarsal articulations are also just perceptibly pale under a strong lens. All femora slender, cylindrical.

Wings: Costa dark on basal two-fifths, in one wing of one specimen with a small pale spot included near the base; apical three-fifths with four yellowish patches alternating with three dark ones, of which the third is the smallest, the first being distinctly larger than the adjacent light ones. A small dark spot at the wing-tip opposite apex of upper fork-cell. First vein light with four dark patches, the first being below the apical part of the dark basal two-fifths of the costa, the others below the remaining dark costal spots. Remainder of wing without conspicuous markings, but there are pale areas round the cross-veins, and the bases of the fork-cells, the base of the second vein, the middle half of the third vein, and the extreme tips of the second, third and fourth veins are also pale. Vein-scales linear, rather short and not very dense.

Anglo-Egyptian Sudan: Erkowit, 5.vi.1917, 1 ♂ (type), 1 ♀, also 1 ♀ from the same place, 22.v.17 (*H. H. King*).

Type in the British Museum, presented by the Imperial Bureau of Entomology.

Apparently most nearly allied to *A. turkhudi*, Liston, and *A. hispaniola*, Theo. (which may be a local form of *A. turkhudi*), but differing in the paler colour of the integument, especially of the head, almost obsolete frontal tuft, more numerous prosternal hairs, more shining mesonotum, and somewhat less conspicuous wing markings; also in the male hypopygium in the more pointed claspettes, which have no accessory hair and a more basally situated club, and in the stronger detached basal spine.

Anopheles immaculatus, Theobald.

Swellengrebel and Swellengrebel de Graaf have recently suggested (Bull. Ent. Res., xi, p. 78, 1920) that this may be an albinoid form of *A. vagus*, Dönitz. An examination of the hypopygium of a male from Java presented to the British Museum by Dr. Swellengrebel supports this possibility, since no tangible differences could be discovered between the hypopygia of the two forms.

Anopheles leucosphyrus, Dönitz.

Two rather well-marked forms of this species occur :—

(1) The typical form. Female palpi with the white rings distinct, the last joint white on at least its apical half. Proboscis of normal length, little, if any, longer than the palpi. Dark markings of wings less extensive ; the spots on the first longitudinal vein more broken up.

(2) Var. *hackeri*, nov. Female palpi with the white rings very narrow, the last joint white only at the extreme tip. Proboscis unusually long, longer than the palpi by almost, or quite, or even more than, the length of the last two palpal joints. Dark markings of wings more extensive ; the spots on the first longitudinal vein more fused.

The var. *hackeri* has recently been noted by Dr. H. P. Hacker (Fed. Malay States, Malaria Bureau Reports, ii, p. 33, 1921). A specimen collected by him and presented to the British Museum is designated as the type ; the Museum collection also contains a number of others from the Malay States, from Dr. Leicester's collection. The distinction in colour between the palpi of the two forms is quite sharp, and in length also it is very striking, but variable. Most specimens of the typical form have the palpi as described, almost, or quite, as long as the proboscis. However, among a small number from Borneo collected by Dr. Roper there is one which has an elongate proboscis like that of the dark form. Probably, therefore, the two forms are not specifically separable.

Anopheles punctulatus, Dönitz.

This species has recently been discussed by Swellengrebel and Swellengrebel de Graaf (Bull. Ent. Res., xi, p. 89, 1920), who concluded that it was not specifically distinct from *A. tesselatus*, Theo., and at the same time described a very similar form under the name *Nyssorhynchus annulipes* var. *moluccensis*. Finding that the description of *moluccensis* agreed rather closely with my conception of *punctulatus*, I wrote to Dr. Swellengrebel, suggesting that the two were the same, and received the following reply :—

" As to Dönitz's *punctulata*, there can be no doubt, judging from the published photograph, that its proboscis is white on the apical half. Moreover, the black ring near the apex of the second palpal joint is very narrow. This induced me to separate *moluccensis* from it, and I still think that the specimen from which the photograph was taken (probably the type) is a *tesselata*. As a general rule I believe it is well, from a practical point of view, to separate these allied forms, if, at least, a separation is practicable ; some of them may prove to be good carriers and others not (*rossii* and *ludlowi !*)."

After a close study of the literature and the British Museum collections, somewhat different conclusions seem to be indicated from those arrived at by Dr. Swellengrebel.

All the specimens in the Museum series of *A. punctulatus* prove to be practically identical with *moluccensis* in palpal markings, and most of them also agree in having the proboscis entirely black. One or two, however, including a specimen determined by Dönitz and coming from his type locality (Stephansort), show a pale area on the underside of the proboscis towards the tip. The colour of the proboscis cannot, therefore, always be used to separate *moluccensis* from *tesselatus*. I cannot agree

with Swellengrebel in placing *moluccensis* as a variety of *annulipes*; the latter, apart from its much larger size, shows some quite good differences in the wing-markings.

The three forms under consideration appear to be separable as follows (in the female sex) :—

(1) *A. punctulatus*, Dönitz, typical form. Proboscis pale on the apical half, at least on the underside. Second joint of palpi about equal in length to the third and fourth together; its basal half black, and a narrow dark ring close to the tip of the white apical half. New Guinea.

There is no specimen exactly answering to this description in the British Museum, and Swellengrebel states that he has not met with it. Probably, therefore, Dönitz may have described and figured a somewhat aberrant specimen of the following.

(2) *A. punctulatus* var. *moluccensis* (Swellengrebel). Proboscis entirely black, or with a rather small pale area on the underside towards the tip. Second joint of palpi markedly longer than the third and fourth together; its basal three-fifths or more black, and a broader black ring towards the tip. New Guinea; Moluccas.

This is *A. punctulatus* in the sense in which I have previously understood it.

(3) *A. punctulatus* var. *tesselatus*, Theobald. Proboscis pale on the apical half (above and below). Second joint of palpi markedly longer than the third and fourth together; its basal half black, its apical half entirely white. Oriental Region; also reported by Swellengrebel from Ceram, but this may prove to be the true *punctulatus*.

Anopheles amictus, sp. nov.

Differs from *A. annulipes*, Walker, as follows :—Proboscis entirely dark-scaled in both sexes. Antennae of the female shorter and stouter, especially the last few joints, which are neither thinner nor longer than those immediately preceding, the last ten joints all being of about the same length and thickness. Abdomen rather densely clothed with broad, flat scales on all segments except the first; on the dorsal surface the scales are mostly yellowish, with a patch of dark ones in the middle of segments 4–6; on the ventral surface the scales are mostly whitish and less numerous towards the base. White spots on the legs larger, the posterior surface of the front tibiae being almost entirely white. First longitudinal vein with 14–18 small black spots; no long ones.

QUEENSLAND: Townsville (*G. F. Hill*), type ♀ and one ♂, presented by the Imperial Bureau of Entomology.

The differences between this and *A. annulipes* seem to be too great to fall within the limits of specific variation, especially as regards the abdomen and antennae; nevertheless, the two are certainly very closely allied, and some specimens show intergradation in some respects. A female from Townsville, 2.ii.1903 (*F. P. Dodd*), agrees with the above definition, and also shows a further difference from *A. annulipes* in that the second, third and fourth joints of the hind tarsi have distinct whitish rings at the base as well as at the tip. A female from Port Darwin agrees with this. A female from Townsville (*F. H. Taylor*), and another from Cardington, Queensland (*F. H. Taylor*), have the scaly abdomen of *A. amictus*, but the antennae are somewhat more slender apically, the proboscis is pale on the apical half, the integument of the mesonotum is ochreous, and the first vein has long black spots. The last two specimens may possibly be *A. mastersi*, Skuse, but regarding both *A. mastersi* and *A. musivus* Skuse states that the *last* abdominal segment bears scales, implying that the others do not. Besides the above-mentioned forms, examples of normal *A. annulipes* have been taken at Townsville.

Megarhinus (Toxorhynchites) kempi, sp. nov.

♂. *Head* blue-scaled (? rubbed). Proboscis purple, the thin portion with a greenish tinge. Palpi rather longer than the proboscis, slender ; first three joints about equal in length, mainly yellow-scaled, some purple scales, chiefly on upper surface, towards bases of first and second, and at apices of second and third. Fourth joint dark, acuminate, nearly as long as second and third together. Clypeus and basal antennal joints bluish-grey-dusted, shaft of antennae yellow ; first flagellar joint with a few dark scales. *Thorax* : Prothoracic lobes clothed with deep blue scales, a few white ones beneath. Pro-epimera and pleurae with silvery-white scales. Mesonotum black, scales mostly metallic green, with some purple ones intermixed (very much rubbed). *Abdomen* without apical lateral scale tufts ; dorsal surface mostly metallic purplish blue ; first tergite green ; remaining tergites each with a narrow basal band of bluish green. Venter mostly yellow ; no median purple line ; eighth sternite purple. *Legs* : Femora purple above and in front, yellow beneath. Tibiae purple. Tarsi purple, the first joint on all the legs with a rather narrow and ill-defined whitish ring near the base. First hind tarsal joint with rather long and dense bristles beneath, except at the base. Front and middle claws unequal, the larger with a strong median tooth, the small simple ; hind claws equal and simple. *Wings* as in *M. leicesteri*. *Hypopygium* : Ninth tergite rather narrow, the bare middle part slightly emarginate apically, fully twice as wide as long ; side portions each with 10–12 long hairs. Ninth sternite bare. Side-pieces tapering, nearly three times as long as their basal width ; basal lobes triangular, apically with two long and strong bristles. Claspers slightly shorter than the side-pieces, of even width throughout, terminal spine long, strong and pointed ; about five fine hairs in a row before the tip. Tenth sternites long and rather slender, their tips not conspicuously enlarged or blackened. Lower bridge of mesosome very narrow and nearly basal ; paired processes of mesosome rather slender, distinctly but irregularly serrate above (sternally).

♀. Palpi purple, not longer than the head. Head with mixed colours, mostly blue above and pale round the eyes. Prothoracic lobes purple. Mesonotal scales bright metallic green. White rings on the first tarsal segments more distinct than in the male ; the tarsi have also additional white markings as follows :—on the front and middle legs, a small area at the base of the second joint on the underside ; on the front legs, the inner and lower side of the fourth joint, except its tip, and the underside of the fifth joint ; on the middle legs, practically the whole of the fourth and fifth joints, except the tip of the latter on the upper side. (The last four joints of the hind tarsi are missing.)

INDIA : Talewadi, nr. Castle Rock, N. Kanara district, 3–10.x.1916 (*S. Kemp*), 1 ♂ 1 ♀. *Type* in the Indian Museum.

Closely resembles *M. leicesteri*, Theo., which differs chiefly in having the whole of the last four joints of the middle tarsi of the female white ; the ninth tergite of the male is broader, and the paired anterior processes of the mesosome are not serrate.

Megarhinus (Toxorhynchites) klossi, sp. nov.

♂. Differs from *M. kempi* as follows :—First joint of palpi a little shorter, third a little longer than second. Scales of prothoracic lobes all purplish blue ; those of pro-epimera coppery above ; of mesonotum duller, purplish and bronzy, mixed with green ; of scutellum coppery. Sides of first abdominal tergite whitish. Ninth tergite broader ; tenth sternites more enlarged apically ; lobes of mesosome smooth above ; clasper with hair-like terminal spine. First hind tarsal joint without dense bristles beneath. From *T. gravelyi* the differences are :—Distinct basal bands are present on the abdominal tergites ; ninth tergite is less emarginate ; venter is without median purple stripe, etc.

FED. MALAY STATES : Kedah Peak (Gunong Jerai), 3,200 ft., xi–xii.1915 (*C. Boden Kloss*), 1 ♂. *Type* in the British Museum.

Megarhinus (Toxorhynchites) gravelyi, sp. nov.

♂. *Head* mostly dark-scaled (colour varying with the light), a pale rim round the eyes. Proboscis purple, more greenish on the thin apical portion. Palpi slender, slightly longer than proboscis; first joint distinctly shorter than the second or third, which are about equal in length, and together about as long as the fourth; the palpal scales are purple, on the underside of the first three joints, except towards the tip of the third and the base and extreme tip of the second, mostly golden. Second antennal joint with some golden scales. *Thorax*: Prothoracic lobes and pro-epimera coppery-scaled above, silvery white below; pleurae silvery-white-scaled; mesonotal scales bright metallic green; scutellar scales coppery, a few whitish ones at the sides. *Abdomen*: First tergite bluish green in the middle, shining creamy white at the sides; remaining tergites deep blue, with basal lateral creamy spots. A few yellow hairs at the sides of tergites 6 and 7, not forming definite tufts. Venter golden, with a narrow median purple line; eighth sternite purple. *Legs* purple-scaled; femora golden beneath and towards the base; first joint of all tarsi with a narrow indistinct pale ring near the base (joints 3–5 of hind tarsi denuded). First hind tarsal joint without dense bristles beneath. *Wings* with the cross-veins nearly in a line, the m-cu cross-vein somewhat oblique outwardly. *Hypopygium*: Ninth tergite strongly emarginate apically, narrow in the middle, with well-developed hairy lobes, each bearing 10–15 hairs. Ninth sternite bare. Side-pieces tapering, hardly more than twice as long as their width at the base. Basal lobes with three strong bristles, one weaker than the others. Tenth sternites stout, blackened and somewhat enlarged apically. Claspers as long as the side-pieces, slightly tapering at the tip, terminal spine long, strong, pointed. Mesosome with the lower bridge very narrow, basal; lobes rather slender, smooth above.

INDIA: Pashok, Darjiling district, 2,000 ft., E. Himalayas, 26.v.–14.vi.1916 (*F. H. Gravely*), 1 ♂.

Type in the Indian Museum.

Resembles *T. metallicus*, Lin., differing in the darker upper side of the palpi, coppery rather than purple scales on upper part of prothoracic lobes and pro-epimera; presence of pale rings on first tarsal joints, and more emarginate ninth tergite.

Opifex fuscus, Hutton.

This species was originally described from New Zealand by Hutton (Trans. N.Z. Inst., xxxiv, p. 188, 1902) as a Tipulid, and its true position has not till now been recognised. Recently a number of specimens have been presented to the British Museum by Mr. G. V. Hudson, taken on the ocean beach at Wellington, N.Z.

The insect is a Culicine mosquito, presenting many remarkable features; though its peculiarities seem to be mainly connected with sex, it certainly cannot be placed in any previously known genus of Culicidae, and it is difficult to place it precisely in relation to the other genera of the CULICINI. It seems to be nearer to *Aëdes* than to *Culex*. The following are the most striking features:—

Male.—Antennae rather stout, not plumose, the terminal joints not lengthened; the first joint conspicuously hairy; the third, fourth and fifth joints a little shorter than those which follow, and each bearing a strong spine at the base on the upper side, the spine on the fifth joint very long. Proboscis and palpi strongly curved; the palpi two-thirds as long as the proboscis, the last joint forming a club. The head has no upright scales, these being replaced by hairs. Eyes well separated. Abdomen in several specimens curled under the thorax. Hypopygium with the side-pieces simple, broad at the base, pointed at the tips, a membranous strip along the inside from base to tip; clasper subapical, short, with strong terminal claw and sub-basal projection; anal segment well developed, tenth tergites hairy, tenth sternites each ending in a single strong sharp point; aedeagus of simple structure, resembling that

of *Ochlerotatus*. Femora and tibiae stout, especially on the front legs, where the tibiae are swollen and very short, not more than two-thirds as long as the femora. Fifth joint of front tarsi very small, not longer than broad, but the claws enormous, longer than the last three tarsal joints together, equal, simple, divaricate. Claws of middle and hind legs moderately large, equal and simple. Wings as in *Aëdes*.

Female.—Antennae and front legs not specially modified; claws all simple. Palpi about a quarter as long as the proboscis. Abdomen rather blunt; cerci rather short and broad; eighth sternite very large.

The peculiar antennae and front legs of the male must have some special biological significance, and it is to be hoped that New Zealand collectors will be able shortly to work out the life-history of the insect.*

Leicesteria annulipalpis (Theobald).

In my paper on the genus *Leicesteria* (Bull. Ent. Res., iv, pp. 255–263, 1914) I expressed doubt as to the correct location of *L. annulipalpis*. Recently, however, a female has been received from Dr. N. H. Swellengrebel, taken at Mandailing, Sumatra, which shows that the species really is a true *Leicesteria*. This Sumatran specimen agrees with Theobald's description, except that the claws show a slight swelling towards the middle, which evidently represents a tooth.

Aëdes (Stegomyia) dendrophila, sp. nov.

Closely related to *S. fraseri*, Edw., differing almost solely as follows:—Middle femora without a white spot in the middle in front. Hypopygium of male with the side-pieces shorter, less than twice as long as their breadth at the base; basal lobes larger, more densely hairy; *claspettes entirely unrepresented*; claspers shorter, straighter, and less attenuated apically.

GOLD COAST: Nsawam, 16.iii.1920 and 14.iv.1920, 2 ♂, 3 ♀, reared from larvae in hole in cotton tree; Oblogo, 17.iv.1920, 3 ♂ (including type), 2 ♀, from tree-hole; Aburi, 6.vi.1920, 5 ♂, 2 ♀, from banana (*Dr. A. Ingram*). SIERRA LEONE: Freetown, ix.1914, 1 ♀ from tree-hole (*Dr. G. Butler*, presented by *A. Bacot*); previously recorded as *S. fraseri*.

The absence of a white spot on the mid femora would place this species with *S. pseudonigeria* in my key (Bull. Ent. Res., iii, p. 8, 1912). The new species differs from *S. pseudonigeria* as follows:—All tibiae with small whitish spots at the extreme base, not removed from the base, beneath; mid femora all black on posterior surface, except for the apex; second joint of mid tarsi all yellowish white, except beneath towards tip (in *S. pseudonigeria* white at the base only); last two joints of hind tarsi with some dark scales beneath; segments 2–5 of abdomen with narrower whitish basal bands or none.

Aëdes (Ochlerotatus) bancroftianus, sp. nov.

Head clothed almost entirely with broad, flat scales, a rim of narrow ones round the eyes; the flat scales varying in colour from dark brownish to cream-coloured, generally paler towards the nape; the narrow scales ochreous; ocular bristles pale. Torus ochreous, darker on the inner side. Proboscis dark-scaled and slender throughout, one-third longer than the front femora. Palpi dark-scaled; in the female about one-sixth as long, in the male of exactly the same length as the proboscis; last two joints in the male slightly swollen, with well-developed hair-tufts, the terminal a little shorter than the penultimate. *Thorax* brown, mesonotum clothed in the type with moderately

* Since writing this I learn that Mr. D. Miller, Government Entomologist in New Zealand, has an account of the life history of this insect in course of publication. Larvae and pupae of the species have been received from Mr. G. V. Hudson; they show some resemblances to *Armigeres*.

dark brown narrow scales ; ochreous narrow scales round the front margin, round the ante-scutellar space, and in two lines extending from the scutellum for nearly half the length of the mesonotum ; in other specimens the dark scales are lighter and the pale scales are more numerous, forming an indistinct pale median transverse band. Scutellum with narrow pale ochreous scales. Prothoracic lobes with broadish curved scales ; pleurae with broad flat white ones. *Abdomen* ochreous, with dark brown scales dorsally ; tergites 2–4 with complete basal creamy bands, broadening somewhat laterally, 5 and 6 with lateral basal creamy spots. Venter pale-scaled, sternites 4–6 with dark apical bands. In the female the seventh segment is remarkably small, narrow, and partly retracted ; the cerci are long and narrow, nearly three times as long as broad. *Male hypopygium* : Side-pieces nearly cylindrical, almost four times as long as their width at the base, without lobes, but with an aggregation of hairs into a small dense patch at the base of the lower flap. Claspettes entirely unrepresented. Claspers long, the outer third rather suddenly narrowed and curved inwards ; terminal spine long, slender, almost straight. Lobes of ninth tergite small, with a few short bristles. Mesosome rather short and broad, simple. Anal segment normal. *Legs* entirely dark-scaled, except for the undersides of the front and middle femora, and the greater part of the hind femora, except the tip and a line along the upper side of the outer half. Claw-formula :— ♂ 2 : 1. 1 : 1. 0 : 0 ; ♀ 1 : 1. 1 : 1. 0·0. *Wings* entirely brown-scaled ; scales of the lateral series long, linear, those of the median series also rather long. Cell R_2 as long as its stem in the male, longer in the female, its base slightly proximal to that of cell M_1. *Halteres* ochreous, knob somewhat darker. Wing-length 3·5–4 mm.

QUEENSLAND : Eidsvold (*Dr. T. L. Bancroft*). Type female, 12 other females, and 3 males presented to the British Museum by the Imperial Bureau of Entomology ; received through Mr. G. F. Hill.

The only near ally of this species is *O. multiplex*, Theo., which differs in thoracic ornamentation, in the larger seventh segment of the female abdomen, and in the straighter and nearly cylindrical male claspers.

Aëdes (Ochlerotatus) ashworthi, sp. nov.

Head clothed at the sides with broad flat whitish scales ; in the middle of vertex with loosely applied narrower flat straight scales ; on the nape with quite narrow curved scales ; bristles black. Proboscis dark-scaled, slender, nearly one-half longer than the front femora. Palpi dark-scaled ; in the female nearly one-fourth as long as the proboscis, the second joint swollen and longer than the first ; in the male about four-fifths as long as the proboscis, long joint almost divided in the middle, equal in length to the last two joints together, tip of long joint and whole of penultimate joint with long dark hair, terminal joint very broad, slightly shorter than penultimate, nearly bare. *Thorax* : Integument of mesonotum dark brown, with large pale humeral patches, and traces of three blackish longitudinal lines ; mesonotal scales all narrow, mostly ochreous, with some black ones intermixed. Pleurae with some flat, dull whitish scales. *Abdomen* brown, a broad band of dull grey scales at the base of each segment. Seventh segment of female large ; eighth sternite also rather large and prominent ; cerci very small, not longer than broad. *Male hypopygium* : Lobes of ninth tergite clothed with short hairs. Side-pieces about 3·5 times as long as broad, the lower flap without lobes, but bearing on its edge a row of peculiar bristles which are flattened towards the tips, almost club-shaped, these bristles extending for more than two-thirds of the distance from the base of the side-piece. Claspette represented by a small basal lobe of the upper flap of the side-piece, this lobe truncating apically and bearing about a dozen rather long twisted scales or flattened bristles. Claspers long, nearly cylindrical, gradually narrowed and somewhat curved on the apical half, with a moderately long terminal spine. Mesosome rather short and broad, simple. *Legs* dark, except for the whitish undersides of the femora and the narrowly ochreous tips

of the femora and tibiae. Claw formula: ♂ 2 : 1. 2 : 1. 1 : 1 ; ♀ 1 : 1. 1 : 1. 1 : 1. *Wings* entirely brown-scaled ; scales of the lateral series long, linear ; those of the median series also rather long. Cell R_2 over twice as long as its stem in the female, its base slightly proximal to that of cell M_1. Wing-length 4–4·5 mm.

Larva: Head rather broad for this group ; clypeal hairs all simple. Antennae moderately long, slightly curved, almost cylindrical and nearly bare ; a single hair just beyond the middle. Comb of eighth abdominal segment consisting of a triangular patch of 50 or more pointed scales. Siphon about three times as long as its greatest breadth, slightly contracted at base and tip, not very strongly chitinised. Pecten short, consisting of about 12 (fewer in the younger larvae) sharp-pointed, simple teeth, placed so close together that their bases touch ; the first of these teeth is situated at about one-fifth of the length of the siphon, but in some specimens the actual pecten is preceded by one or two small, widely-spaced, simple bristles. Hair-tuft of about eight hairs, situated a little beyond middle of siphon. Tracheal tubes very large, strongly chitinised, occupying almost the whole of the middle part of the siphon, but strongly and abruptly contracted before the base of the latter. Anal segment with a lightly chitinised saddle ; gills very small and globular. Brush well-developed, with 10–12 elements.

WEST AUSTRALIA: Yallingup, ix.1914 (*Dr. J. H. Ashworth*). Type and one other male, one female, and a dozen larvae presented to the British Museum by the Imperial Bureau of Entomology in 1915.

This species is nearly allied to *O. crucians*, Walker (*tasmaniensis*, Strickland), and *O.* (*Caenocephalus*) *concolor*, Taylor, differing from both chiefly in the details of the hypopygium. *O. crucians* has the clasper very much swollen in the middle, its terminal spine shorter and stouter, and the flattened bristles on the margin of the side-pieces much less numerous ; the terminal joint of the male palpi is much more slender. Probably the specimens of *O. concolor* from Tasmania recorded by Taylor are really *O. crucians* ; the true *O. concolor* from New South Wales (which was wrongly described as having simple female claws) resembles *O. crucians* in its hypopygium, but the claspers are less swollen, the scales on the claspette lobes are less numerous, and the last joint of the male palpi is swollen, as in *O. ashworthi*. Doubtless the three forms are geographical representatives of the same type.

Aëdes (?Skusea) funerea, Theobald.

A male and female, apparently of this species, have been received from Dr. Swellengrebel, from Amboina. No Australian male is available for comparison, and the identification is therefore not absolutely certain, though probably correct. The male hypopygium of the Amboina specimen does not show the least resemblance to *S. pembaensis*, but, on the other hand, resembles that of *Aëdes panayensis*, Ludlow ; from this it differs in the absence of a long process at the base of the side-piece, and in the presence of a short spine instead of a thick projection at the tip of the side-piece. Probably the species would be better placed in the subgenus *Aëdes* than in *Skusea*, but much more knowledge of the biology of these forms is necessary before their classification can be regarded as satisfactory.

Aëdes (?Skusea) funerea var. **ornata,** Theobald.

Lepidotomyia lineata, Taylor, Trans. Ent. Soc., 1914, p. 191 (1914).

A male and female have been received from Dr. Swellengrebel from Ceram. The male hypopygium is identical with that of *S. funerea* from Amboina, and the form is therefore probably correctly regarded as merely a variety of *S. funerea*, in spite of the striking difference in thoracic ornamentation. Two female paratypes of *L. lineata*, sent by Mr. G. F. Hill, agree with the female from Ceram.

Aëdes (Skusea) punctipes, sp. nov.

♀. *Head* entirely clothed with rather close-lying, flat blunt-ended scales; on the upper surface three black patches alternate with four white ones, black scales occurring again low down at the sides. Eyes separated by a rather narrow white-scaled line. Proboscis dark-scaled, not swollen at the tip, equal in length to the front femora. Palpi dark-scaled, rather more than a quarter as long as the proboscis. Antennae missing. *Thorax*: Prothoracic lobes and pro-epimera with rather broad white scales; mesonotum with narrow curved white scales round the front margin, narrow light bronzy-brown scales rather densely covering the rest of the surface; these scales are somewhat broader and denser on the posterior portion of the mesonotum, while on the space in front of the scutellum, which is normally bare, as well as on the scutellum itself, are broad flat blackish-brown scales; a small patch of similar scales above the root of each wing. Postnotum bare. Pleurae with patches of flat white scales. Mesonotal bristles mostly denuded, probably rather long and dense. *Abdomen* brown-scaled above, except the first tergite, which has creamy scales; tergites 2–7 have lateral white spots, which are not quite basal in position and extend a short way on to the dorsal surface. Venter mostly pale, apical sternites dark-scaled apically. The eighth segment and cerci are not visible externally; sixth and seventh sternites prominent in side view. *Legs* mostly brown-scaled; femora lighter beneath, and with a distinct whitish preapical ring; extreme tips of femora and tibiae also whitish. Front tibiae with three, middle and hind tibiae with four small, but distinct, whitish spots on the anterior surface. First joint of all tarsi with a narrow white ring at the base; junction of first and second joints with a small white dorsal spot; first mid-tarsal joint also with a median dorsal white spot, which on the hind legs becomes a complete narrow white ring; second hind tarsal joint narrowly white at the tip. Tibial bristles short, pale. Mid and hind tibiae equal in length. First tarsal joint on front legs about half as long as the tibia, and distinctly shorter than the remaining joints together; on hind legs about two-thirds as long as the tibia. Claws simple. *Wings* brown-scaled, except for the base of the fifth longitudinal vein, which is white. Scales all rather long and broad, mostly obliquely truncate at the tips; only a few longer and narrower ones towards the tips of the veins and along the lower margin of the upper branch of the fifth vein. Wing-fringe very long. Upper fork-cell fully twice as long as its stem, and with its base nearer the base of the wing than that of the lower.

UPPER BURMA: Maymyo, xi–xii.1913 (*Major Bennett*), 1 ♀.

Type in the Indian Museum.

A very distinct species, easily recognised by the leg markings and thoracic scaling. The structure of the abdomen and claws shows that it is quite closely related to *Stegomyia periskeleta*, Giles (=*Ochlerotatus annulifemur*, Edw.), and *S. microptera*, Giles. Both these species have male palpi of the *Ochlerotatus* rather than of the *Stegomyia* type, and, on the other hand, show some relation to *Armigeres* in the structure of the mesosome of the aedeagus. The type species of *Skusea* (*S. pembaensis*, Theo.), though with very dissimilar hypopygium, agrees with these Oriental species in general appearance and in the structure of the male palpi and female abdomen and claws, and all four are probably best relegated to the same genus or subgenus of the *Aëdes* group. The new species, like its ally *S. microptera*, may be expected to be a tree-breeder. It is in such habitats that the species showing the most striking variations from the normal type of Aëdine structure are found, sometimes, as in the present instance, indicating connections with other groups.

Culex crinicauda, nom. nov.

Culex parvus, Taylor, Bull. N. Terr. Austral., 1a, p. 27 (1912); nec *Culex parvus*, Macquart.

Although my suggestion that this might be synonymous with *C. vishuni*, Theo., was adopted by Taylor, such is, nevertheless, not the case. The hypopygium of a

male determined by Taylor and sent by Mr. G. F. Hill is very different from that of *C. vishnui*, and shows some peculiar characters. The clasper is unusually broad, almost straight, and has round its base a rather dense tuft of hairs. The lobe of the side-piece bears the usual leaf and filaments, but the filament adjacent to the leaf is remarkably long, flattened, and backwardly (caudally) directed.

Culex taylori, nom. nov.

Leucomyia annulirostris, Taylor, Trans. Ent. Soc. 1913, p. 696 (1914) ; nec *Culex annulirostris*, Skuse.

A male paratype has been received from Mr. G. F. Hill. The species appears to be a distinct one, allied, as Taylor stated, to *C. sinensis*, Theo., but differing in having the pale bands of the abdomen confined to the bases of most of the segments, and without pale spotting on the tibiae. From *C. sitiens* it differs in the much broader pale apex to the last palpal joint.

Culex basicinctus, nom. nov.*

Leucomyia annulata, Taylor, Trans. Ent. Soc. 1913, p. 695 (1914) ; nec *Culex annulatus*, Schrank.

Two males and three females have been received from Mr. G. F. Hill, collected by him at Townsville. They were sent as *Leucomyia annulirostris*, but agree with Taylor's description of *L. annulata*, and are almost certainly that species. *C. basicinctus* seems nearly allied to *C. whitmorei*, Giles, and, like that species, has the pale rings of the tarsi confined to the bases of the joints, and the pale bands of the abdomen angularly produced in the middle ; it differs obviously in many points, *e.g.*, its larger size, duller thoracic colouring, and broader white tip to the last joint of the male palpi. A peculiar character, not mentioned by Taylor, is that the male palpi have two black bristles at the extreme tip, which are conspicuous against the adjacent white hairs.

Culex ventrilloni, Edw.

Culex ventrilloni, Edwards, Bull. Ent. Res. xi, p. 135 (Sept. 1920).

Culex albigenu, Enderlein, Wien. Ent. Zeitschr. xxxviii, p. 50 (Nov. 1920).

A male of *C. albigenu* lent me by Dr. Enderlein enables me to state the above synonymy. Somewhat unexpectedly, the species proves to be a true *Culex*, in Dyar's most restricted sense ; the hypopygium has almost the same structure as in the African *C. simpsoni*, Theo., and *C. andersoni*, Edw.

Culex quasigelidus, Theo.

Culex auritaenia, Enderlein, Wien. Ent. Zeitschr. xxxviii, p. 49 (Nov. 1920).

The above synonymy, evident from the description, is confirmed by the examination of specimens sent by Dr. Enderlein.

Culex (Lophoceratomyia) jenseni (Meij.).

Cyathomyia jenseni, de Meijere, Ann. Jard. Bot. Buitenzorg, (2) iii, p. 922 (1910).

Lophoceratomyia curtipalpis, Edwards, Bull. Ent. Res. v, p. 127 (1914).

The above synonymy is proved by comparison of the type of *L. curtipalpis* with a paratype of *C. jenseni*, presented to the British Museum by Professor de Meijere. The species is wrongly placed in my table of the species of this subgenus (Bull. Ent. Res. vii, p. 227, 1917) ; it should come under heading 9, differing from the other species there included in the shorter male palpi.

* [There does not appear to be any reasonable ground for proposing this new name. Schrank's species was transferred to *Theobaldia* long before *Leucomyia annulata* was described, and there can be no possibility of confusion between them.—Ed.]

My previous use of the name *Cyathomyia* in the sense of *Protomelanoconion*, Theobald, proves therefore to be erroneous; if the group is retained as a distinct subgenus of *Culex*, Theobald's name will have to be revived, *Cyathomyia* falling as a synonym of *Lophoceratomyia*. However, *C. brevipalpis*, Giles, and *P. fuscum*, Theo., have a hypopygium constructed much as in *Neoculex*, Dyar, and should probably be referred to that subgenus.

Rachisoura filipes (Walker).

Culex filipes, Walker, Proc. Linn. Soc. v, p. 229 (1861).

Rachisoura sylvestris, Theobald, Mon. Cul. v, p. 208 (1910).

Stegomyia hilli, Taylor, Proc. Linn. Soc. N.S.W. xxxix, p. 456 (1914).

Mimeteomyia hilli, Taylor, Proc. Linn. Soc. N.S.W. xli, p. 566 (1916).

The above synonymy appears to be proved by a comparison of Walker's and Theobald's types with a specimen of *S. hilli* from Stapleton, Northern Territory, sent by Mr. G. F. Hill. The genera *Rachisoura* and *Mimeteomyia* are probably not distinguishable; they differ from *Rachionotomyia* in the shorter and stouter proboscis, which is little, if any, longer than the front femora.

Rachionotomyia aenea, sp. nov. ♀.

Head dark-scaled, with a moderately broad pale band in front, which is blue or whitish according to the direction of the light. Palpi and proboscis purplish-scaled, the palpi exceeding the clypeus by about twice the length of the latter. Antennal torus orange. *Thorax* with the integument orange-brown, darker brown on the mesonotum. Prothoracic lobes with black bristles and narrow, almost hair-like, dark brown scales. Mesonotum with narrow dark brown scales, except on, and just in front of, the scutellum and between the scutellum and the wing-bases, where the scales are broad, flat and bronzy-green in colour. Pleurae with a large silver-scaled dark brown patch. *Abdomen* purplish-black above, golden beneath, the tergites with lateral subapical bluish-silvery patches. *Legs* purplish-scaled; middle femora in front with a silvery streak on the basal half and a silvery subapical spot; front and hind femora unmarked. *Wings* with dark brown scales; those on the fork-cells short and rather broad. Upper fork-cell slightly longer than its stalk, its base distinctly distal to that of the lower. Cross-veins separated by more than the length of the posterior. Wing-length 3 mm.

MALAY STATES: Edges of stream, Ampang jungle, Kuala Lumpur, 21.v.1904 (*Dr. G. F. Leicester*), 1 ♀.

Allied most nearly to *R. similis*, Leicester, differing in the unspotted front and hind femora, and in some other points.

Rachionotomyia purpurata, sp. nov. ♀.

Nearly allied to *R. bimaculipes* (Theobald), differing as follows:—Integument of mesonotum orange, almost dull (instead of shining blackish), clothed with narrow greenish scales mixed with some black ones; pro-epimera with small flat black scales (bare, perhaps rubbed, in *R. bimaculipes*); dark scales of abdomen with strong purple reflections (instead of dull black).

FIJI Is.: Suva, 10.iv.1911, 3 ♀ reared from larvae (*Dr. P. H. Bahr*, pres. by *Lt.-Col. A. Alcock*).

Rachionotomyia quasiornata (Taylor).

Stegomyia quasiornata, Taylor, Proc. Linn. Soc. N.S.W. xl, p. 177 (1915).

This is very similar to *R. bimaculipes* and *R. purpurata*, but differs from both in having narrow instead of broad and flat scales on the prothoracic lobes. A female has recently been received through the Imperial Bureau of Entomology, named by Mr. G. F. Hill after comparison with Taylor's type; it shows the long proboscis characteristic of the genus. In all these three Australasian species the palpi are shorter than in the Oriental forms, exceeding the clypeus by hardly more than the length of the latter.