

NEW OR LITTLE-KNOWN SPECIES OF ASIATIC TIPULIDAE (DIPTERA). IV

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The crane flies discussed at this time belong to the Tipuline genera *Holorusia* and *Tipula*, all materials being from northern India where they were collected by Dr. Fernand Schmid. I again express my sincere thanks and appreciation to Dr. Schmid for the privilege of studying this series of Tipulidae.

Genus *HOLORUSIA* Loew

Holorusia Loew; Dipt. Amer. Sept. Ind., Cent. IV; Berlin. Ent. Ztschr., 7: 277, 1863.

Ctenacroscelis Enderlein; Zool. Jahrb., Syst., 32: 1-2, 1912.

Ctenacroscelis Edwards; Stylops, 1: 145-150, 1932.

Ctenacroscelis Alexander; Philippine Jour. Sci., 94: 535-543, 1965.

Holorusia Vane-Wright; J. Nat. Hist., 1(4): 540-547, 1967.

Holorusia comprises an extensive genus of Tipuline crane flies that chiefly is of note in including the largest known members of the family and among the largest of all Diptera. The somewhat less than 100 species presently known are chiefly Oriental and eastern Palaearctic in distribution, with fewer in the Australasian and Ethiopian regions, including about half a dozen species in Madagascar and its satellite islands. Approximately 40 species are known from the countries that comprise the former British India and Burma. In the New World the only known species is the genotype, *Holorusia rubiginosa* Loew (*grandis* Bergroth, 1888) which has a wide distribution in western North America, presently being known from Alaska (McKinley National Park), south to Baja California, Mexico, eastward to Arizona and Utah.

Members of the genus commonly are plain in color and are difficult to separate into species. The most satisfactory characters include the presence or absence of the nasus, structure of the antennae, and particularly the male hypopygium, including the tergite,

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basistyle, both dististyles, phallosome, and the eighth sternite. In many species this last structure has its posterior border unmodified, on slide mounts appearing to be convex in outline, without lobes or modified setal pencils. In still other species this structure has the border variously indented or emarginate and often is provided with distinctive groups or brushes of setae, in some species these being very long and conspicuous.

In a personal communication, Mr. Vane-Wright, of the British Museum (Natural History) has indicated that the insufficiently known fly described as *Tipula pluto* Brunetti, from Tonkin, actually is a member of this genus. Edwards (Stylops, 1: 237, 1932) had referred the species to the subgenus *Formotipula* Matsumura in *Tipula*, while Alexander (Philippine Jour. Sci., 57: 86, 104, 1935) retained it in *Tipula* but not in *Formotipula* because of the structure of the ovipositor as described by Brunetti. This species and the equally striking *Ctenacroscelis carmichaeli* (Brunetti) are among the most beautiful crane flies known and will be further discussed in a joint paper by Vane-Wright and the writer now in preparation.

For many years the genus *Ctenacroscelis* was considered as being distinct from *Holorusia* and virtually all of the Old World species were assigned to it. In the critical review by Vane-Wright above cited the genus is treated in detail and all known species listed. There still is a question as to the correct name of the genotype of *Holorusia* since there are two names, *Holorusia rubiginosa* Loew and *Holorusia rubiginosa* (Bigot), both proposed in 1863, with some doubt as to which name has priority. The replacement name for *rubiginosa* Loew of *grandis* Bergroth has been adopted in recent years and it seems advisable to retain it until the matter of priority in the case of *rubiginosa* has been established.

***Holorusia agni* n. sp.**

Belongs to the *brobdignagia* group; size large (wing of male over 40 mm); mesonotal praescutum with sides broadly orange yellow, disk with four slate gray stripes that are very narrowly bordered by brown, pleura orange with a very narrow dark brown dorsal stripe; legs dark orange, tips of femora and tibiae not darkened; wings deep fulvous brown, unpatterned except for vague pale areas in centers of cells *Cu*₁ and *1st A*, veins dark orange; abdominal tergites dark cinnamon brown, sternites obscure orange,

hypopygium brownish yellow; male hypopygium with apex of tergite very shallowly emarginate, lobes scarcely developed, on sides before apex with a brush of long erect yellow setae; mesal face of basistyle at apex with a group of very long yellow setae; eighth sternite very extensive, broadest at near midlength, posterior border with a very deep U-shaped emargination, the lobes low and obtuse; marginal setae inconspicuous, those of the disk long and very abundant, involving about the outer four-fifths of the sternal plate.

Male. — Length about 34-35 mm; wing 41-43 mm; antenna about 5.9-6 mm.

Frontal prolongation of head longer than the remainder, fulvous orange, including the long nasus; palpi brownish black. Antennae fulvous, terminal segment a trifle darker; flagellar segments nearly cylindrical, verticils short. Head above dull orange with a scarcely evident capillary more reddened vitta.

Pronotum orange yellow. Mesonotal praescutum with sides broadly orange yellow, the disk with four conspicuous slate gray stripes that are very narrowly margined with brown, more evident anteriorly, intermediate stripes virtually confluent in front; each scutal lobe with a single major slate gray area that is narrowly margined by a brown line behind the suture; anterior half of median region of scutum fulvous orange, posterior half more obscured; scutellum brownish gray, parascutella brown; mediotergite with disk broadly brownish gray, lateral borders and most of pleurotergite orange; posterior praescutal interspaces, posterior callosities of scutal lobes, scutellum and mediotergite with pale setae, much longer behind. Pleura orange, with a very narrow dark brown line on extreme dorsal edge of anepisternum, the propleura and posterior pleurotergite more extensively paler brown; ventral pleurites and dorsopleural membrane paler orange. Halteres with stem light brown, knob dark brown. Legs with coxae orange yellow, with long pale setae; trochanters darker orange; remainder of legs dark orange, without darkenings on femora or tibiae, third and fourth tarsal segments darker, terminal segment brownish yellow with a conspicuous epicondyle. Wings intense fulvous brown, with vague pale areas in centers of cells *Cu*₁ and *1st A*; veins dark orange, scarcely differentiated from the ground. Venation: Petiole of cell *M*₁ about one-half *m*; *m-cu* at near two-thirds *M*₄₊₅.

Abdominal tergites dark cinnamon brown, lateral borders narrowly grayish yellow, sternites obscure orange; hypopygium brownish yellow, central area of tergite brownish gray, the brushes of tergal setae yellow, erect. Male hypopygium (fig. 1) with the tergite, *t*, long and narrow, posterior border very shallowly emarginate, the lobes scarcely evident; outer third of plate with abundant short black setulae that are lacking at midline and on outer margins, sides near base of the setuliferous area with a concentration of very long yellow setae, as described; extreme tergal border with dense short yellow setulae. Basistyle, *b*, near apex of mesal face with a group of very long yellow setae. Outer dististyle, *d*, broad, slightly less than twice

as long as wide, apex rounded; inner style on margin near base with a rounded lobe provided with a few short dark setae, the opposite margin with sparse longer yellow setae; apex flattened, the lower margin before tip with a rounded lobe, the face of the blade with a low flange. Eighth sternite, δs , very extensive, broadest at near midlength, the basal impressions conspicuous, reaching the lateral borders; posterior margin with a very deep U-shaped notch that is virtually equal in length to the base of style; lobes low and obtuse, relatively narrow; outer four-fifths of sternite with very abundant yellow setae, marginal ones relatively short, those on disk of lobes long but relatively inconspicuous by being directed laterad and cephalad over the surface of the plate.

Holotype. — δ , Nizong, Kameng, North East Frontier Agency, Assam, 4800 feet, June 27, 1961 (Schmid). *Paratype*, δ , Nafra, Kameng, 4000 feet, June 26, 1961 (Schmid).

Holorusia agni is most readily told from other members of the *brobdignagia* group by the thoracic pattern, intensely fulvous wings, and in the details of hypopygial structure, including especially the tergite, basistyle and eighth sternite. The conformation of the tergite is somewhat as in *H. vishnu* n. sp., but the eighth sternite is quite different. The name *agni* is derived from the Hindu designation for the God of Fire, suggested by the intense fulvous color of the wings.

Holorusia cerbereana (Alexander)

Tipula fumipennis Brunetti; Rec. Indian Mus., 6: 250, 1911; name preoccupied by *Tipula fumipennis* Hudson, 1892.

Ctenacroscelis fumipennis Edwards; Stylops, 1: 149, 1932.

Ctenacroscelis cerbereanus Alexander; Rec. Indian Mus., 44: 29, 1942.

Brunetti's type is a female, taken at Darjiling in the eastern Himalayas, June 3-9, 1909. Edwards briefly characterized the male, based on a specimen taken at Sureil in the Darjiling district. I am providing further details on the male hypopygium and designating an allotype.

Male hypopygium (fig. 2) with posterior border of tergite, *t*, slightly convex, the median area slightly more produced into a small depressed area that is densely provided with short yellow setulae, the lateral borders yellowed, with long setae. Outer dististyle, *d*, relatively narrow, apex obtuse, inner margin thickened, nearly parallel with the outer; inner style as figured; beak very stout, lower beak produced into a sclerotized plate that terminates in about four strong teeth or points. Phallosome, *p*, with gonapophyses

and aedeagus long and narrow, subequal in length and size. Eighth sternite, 8s, extensive, posterior border very gently convex, the setiferous area relatively small, only the restricted central marginal part with longer setae, the small lateral bristles abundant but lacking on the midline.

Allotype. — ♂, Khumyara, Pauri Garhwal, Kumaon, India, 4300-5000 feet, May 28, 1958 (Schmid).

Other specimens from Sikkim (Manu, 4920 feet, August 5, 1959; Singhik, 3700 feet, August 7, 1959) agree with the allotype in the tergite and phallosome but differ in details of the dististyles and eighth sternite. In this material the outer points of the inner style are very reduced in one specimen and virtually lacking in another, while the sternal setae are longer and extended much farther cephalad along the midline. It is possible that these specimens will be found to represent a distinct race or perhaps a closely related species.

Holorusia glebosa n. sp.

Belongs to the *albovittata* group, allied to *cerbereana*; general coloration of mesonotum dark brown, the four praescutal stripes narrowly bordered by dark brown; antennal flagellum brown, outer two segments dark brown; femora yellowish brown, tips conspicuously blackened; wings narrow, strongly infuscated, especially anteriorly; oblitterative area over anterior cord very narrow, veins unusually glabrous; male hypopygium with posterior border of tergite broadly concave, lateral lobes small, rounded; outer dististyle broad, its inner margin conspicuously thickened, inner style very irregular in outline, its outer margin with coarse parallel ridges; phallosome with gonapophyses darkened, suboval, aedeagus relatively large; eighth sternite very extensive, with relatively inconspicuous setae, posterior border subtruncate to gently convex.

Male. — Length about 22 mm; wing 30 mm; antenna about 4 mm.

Frontal prolongation of head dark brown, including the nasus, sides restrictedly paler brown; palpi brownish black, terminal segment darker. Antennae with scape yellowed, darkened above, pedicel light brown, flagellum somewhat darker, two outer segments dark brown; flagellar segments nearly cylindrical, the intermediate ones slightly enlarged beneath. Head above broadly dark brown, including the vertical tubercle, the sides of the latter more reddened; genae dark brown, separated from the central darkening by a paler area, posterior orbits narrowly silvery.

Pronotum dark brown, silvery yellow on sides, this being the anterior end of the pleural stripe. Mesonotal praescutum generally dark brown, including four brownish gray stripes that are bordered by dark brown, lateral margins broadly brown, the restricted interspaces obscure orange; scutal

lobes with three brown areas, the internal pair bordered by darker brown to leave a small orange spot adjoining the suture, the central area dark; posterior sclerites of notum brown, the postnotum more gray pruinose except behind; scutellum, mediotergite and anapleurotergite with long pale delicate setae. Pleura variegated brown and brownish yellow, ventral sternopleurite clear light gray; dorsopleural region narrowly light yellow, extending from the cervical area to beneath the wing root, ventrally bordered by a narrow brownish black stripe. Halteres dark brown, base of stem narrowly paler. Legs with bases of coxae broadly brown, apices grayish yellow; trochanters brown; femora yellowish brown, tips conspicuously blackened; tibiae light brown, tips narrowly darkened; tarsi brownish yellow, epicondyle of terminal segment very conspicuous; claws relatively stout, central spine obtuse. Wings narrower than in *lacunosa*, strongly infuscated, especially in the prearcular and costal fields, stigma vaguely darker brown; pale oblitative area at anterior cord very narrow and inconspicuous; veins basad of cord brownish yellow, the outer radial veins pale yellow, especially at outer ends. Wing veins behind *R* virtually glabrous, distal section of R_{4+5} with five or six widely separated punctures; trichia of vein *R* very sparse and scattered. Venation: *Rs* short, very slightly longer than R_{2+3} , R_2 at fork of latter; petiole of cell M_1 longer than *m*; cell 1st M_2 narrow; *m-cu* at near one-third the length of M_{3+4} .

Abdominal tergites and pleural membrane dark brown, sternites fulvous yellow, outer segments chiefly pale. Male hypopygium (fig. 3) with the tergite, *t*, relatively small, posterior border broadly concave, the lateral lobes small and rounded. Outer dististyle, *d*, broad, as in the related species, the inner margin conspicuously thickened; inner style distinctive, shaped about as figured, the outline very irregular; beak broadly obtuse, with a second blunt projection beneath, the outer margin of style with coarse parallel ridges. Phallosome, *p*, with aedeagus unusually large and stout, subequal in area to the darkened suboval apophyses. Eighth sternite, δ_8 , very extensive, the posterior border subtruncate to gently convex, central area with relatively inconspicuous setae, the longest setae marginal, yellow, the others darker; setiferous area central in position, narrowed behind, the more posterior setae very small, the intermediate ones forming two more or less distinct longitudinal rows.

Holotype. — ♂, Nafra, Kameng, North East Frontier Agency, Assam, 4000 feet, June 26, 1961 (Schmid).

The most nearly related regional species include *Holorusia cereberana* Alexander and *H. lacunosa* n. sp., all distinguished from one another chiefly by the structure of the male hypopygium, including the tergite, inner dististyle, phallosome and eighth sternite.

Holorusia lacunosa n. sp.

Belongs to the *albovittata* group, allied to *cerbereana*; size medium (wing of male about 30 mm); mesonotal praescutum with four brownish gray stripes that are narrowly bordered by darker brown; pleura brownish yellow, vaguely patterned with darker; antennal flagellum orange, terminal one or two segments black; femora brownish yellow, tips brownish black, preceded by a vague more yellowed ring; wings relatively broad, strongly infuscated, vaguely patterned with darker brown in cubital and anal fields, obliterative area at cord conspicuous; abdominal tergites brown, sternites yellowed; male hypopygium with tergal lobes short but evident, apices truncate; outer dististyle broad, tip obtuse, inner style long and narrow, outline very irregular; phallosome with apophyses conspicuously darkened, aedeagus very small; eighth sternite very extensive, posterior border convex, the broad central area more produced, provided with unusually long and abundant yellow setae.

Male. — Length about 24-25 mm; wing 30-32.5 mm; antenna about 3.8-3.9 mm.

Female. — Length about 28 mm; wing 31 mm.

Frontal prolongation of head subequal in length to the remainder, dark brown above, including the long nasus, paler brown on sides and beneath; palpi brownish black. Antennae with scape light brown, pedicel paler, flagellum orange, the terminal one or two segments black; proximal flagellar segments nearly cylindrical, the intermediate ones slightly produced beneath, with very short verticils. Head dark brown on central part, the narrow orbits and broad genae pale brown, pruinose.

Cervical region and pronotum dark brown above, light yellow on sides. Mesonotal praescutum with ground interspaces obscure orange, with four brownish gray stripes that are narrowly bordered by darker brown, the humeral and lateral borders paler brown; scutal lobes with two brownish gray areas that are narrowly margined with darker brown, central area pale brown behind, in front with a conspicuous orange spot on either side of the broad darkened point of the suture; scutellum with paired darkened basal areas, posterior half paler brown, with long yellow setae, parascutella yellowish brown; mediotergite yellowish brown, the declivitous posterior border darker brown, preceded by a more yellowed central area that bears long yellow setae; pleurotergite pale brownish yellow above, with long yellow setae, katapleurotergite yellow, glabrous. Pleura brownish yellow, vaguely patterned with very pale brown on the sternopleurite, darker above, the dark brown dorsal stripe narrowed behind, becoming obsolete before the wing root; dorsopleural membrane light yellow. Halteres with stem light brown, knob dark brown. Legs with fore coxae pale brown, middle and hind pairs paler brown with broad more yellowed apices; trochanters yellow; femora brownish yellow, tips conspicuously brownish black, preceded by a vague more yellowed ring; tibiae brownish yellow, tips narrowly dark-

ened; tarsi light brown; last tarsal segment of male with a conspicuous epicondyle, claws with outer tooth subacute, basal spine acute. Wings relatively broad, strongly infuscated, stigma virtually concolorous, a darker brown spot at junction of *m-cu* with *Cu*₁ and a narrow darkened seam in cell 1st *A* adjoining vein 2nd *A*; whitened oblitative area at cord narrow but conspicuous against the ground; veins orange yellow, *Cu* darker. Venation: Petiole of cell *M*₁ and *m* subequal; *m-cu* at or before midlength of *M*₃₊₄.

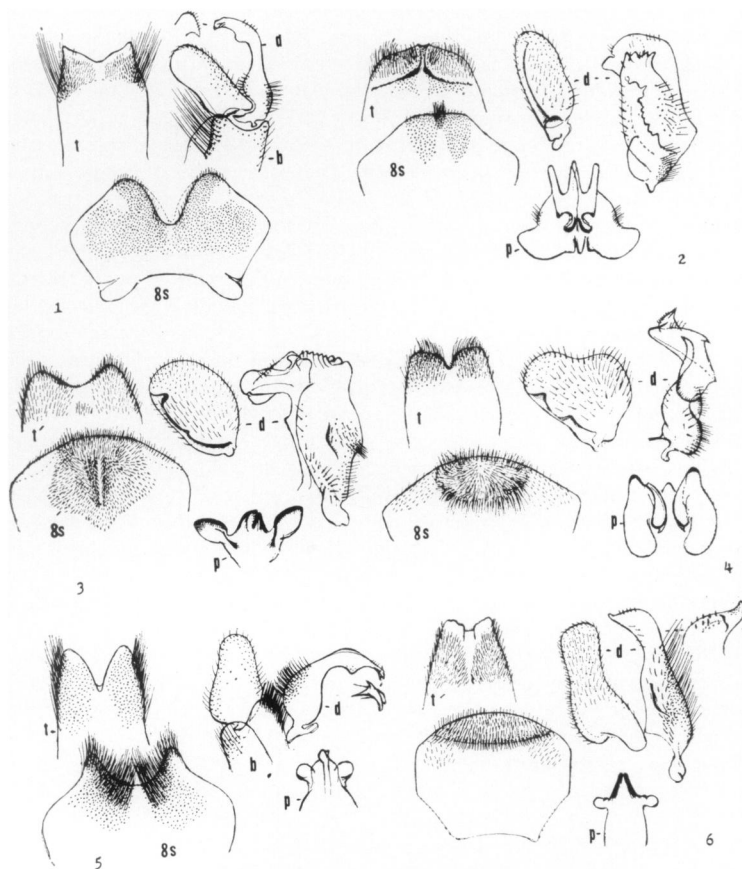
Basal abdominal tergites of male light brown, outer tergites somewhat darker; basal sternites yellowed, on outer segments passing into brownish orange, hypopygium fulvous brown. In female, abdominal tergites beyond base more uniformly dark liver brown, sternites obscure yellow; ovipositor with cerci very long, straight. Male hypopygium (fig. 4) with the tergite, *t*, unusually long, the major setae conspicuous, restricted about to outer two-fifths of plate; lobes separated by a narrow U-shaped emargination, apices truncate; border of notch narrowly darkened and fringed with very short setulae. Outer dististyle, *d*, broad, tip very obtuse, outer margin thickened and irregularly produced, basal thickening long; inner margin of proximal half conspicuously rounded, with long yellow setae; inner style elongate, the outer half very irregular, with evidences of an opening or lacuna that may not be a normal feature; base of style with abundant dark setae. Phallosome, *p*, unusually stout, gonapophyses darkened, obtuse, the outer part produced cephalad as long blades, aedeagus very small. Eighth sternite, *δs*, extensive, posterior border convex, the broad central area slightly more produced to form a transverse shield-shaped portion that is provided with very abundant long yellow setae, the posterior ones directed caudad, the others radiating outward from the central area, the lateral and cephalic setae very long, setulae of sides small and inconspicuous.

Holotype. — ♂, Nyukmadong, Kameng, North East Frontier Agency, Assam, 8000 feet, April 23, 1961 (Schmid). *Allotopotype*, ♀, with the type. *Paratopotypes*, 3 ♂ ♂, with the type.

The most nearly related species include *Holorusia cerebereana* Alexander and *H. glebosa* n. sp., all species being most readily separated by the hypopygial structure, particularly the tergite, inner dististyle, phallosome and eighth sternite.

Holorusia vanewrighti n. sp.

Belongs to the *brobdignagia* group, allied to *majestica*; size large to very large, wing to about 40 millimeters; thoracic pleura light yellow, the dorsal darkened stripe narrow; terminal tarsal segment with an epicondyle; wings infuscated, with an obscure whitened area at the anterior cord, posterior cord narrowly bordered by brown; abdomen dark brown above, basal sternites conspicuously light yellow; male hypopygium with a concentration of



Text-figs. 1-6. — Fig. 1, *Holorusia agni* n. sp., male hypopygium; Fig. 2, *Holorusia cerebrea* Alexander, male hypopygium; Fig. 3, *Holorusia glebosa* n. sp., male hypopygium; Fig. 4, *Holorusia lacunosa* n. sp., male hypopygium; Fig. 5, *Holorusia vanewrighti* n. sp., male hypopygium; Fig. 6, *Holorusia vishnu* n. sp., male hypopygium.

Symbols: *b*, basistyle; *d*, dististyle; *p*, phallosome; *s*, sternite; *t*, tergite.

strong black setae at apex of basistyle; basal half of inner dististyle with abundant black setae on outer margin; eighth sternite with posterior emargination very extensive, the lobes and margin with very abundant yellow setae, those nearer the midline longer.

Male. — Length about 28-33 mm; wing 32-40 mm; antenna about 4.5-5 mm.

Female. — Length about 40 mm; wing 41 mm.

Frontal prolongation of head dark brown; palpi black. Antennae brownish black, pedicel paler; flagellar segments only slightly produced beneath; verticils very reduced. Head above brownish gray, front obscure yellow, vertical tubercle chestnut brown.

Pronotum brown above, sides broadly yellow. Mesonotal praescutum with four clear gray stripes, the intermediate pair confluent behind, interspaces dark brown to brownish black, lateral margins broadly light yellow; posterior sclerites of notum gray, suture uniformly darker; mediotergite broadly darkened on sides, pleurotergite clear light yellow except along the darkened posterior border; katapleurotergite with furcate elevated ridges. Pleura light yellow, the dorsal dark brown stripe including the protuberant cervical region, propleura, dorsal edge of anepisternum, and the sclerotized area at wing base; a paler brown cloud on sternopleurite. Halteres dark brown to brownish black, base of stem restrictedly brown. Legs with coxae yellow, bases of fore pair weakly darkened; trochanters obscure yellow, patterned with darker; femora brown, passing into black at tips; tibiae and tarsi dark brown; last tarsal segment with an epicondyle, claws with an obtuse tooth. Wings rather strongly infuscated, especially on anterior half, stigma only slightly differentiated; an obscure whitened area at anterior cord, extending from vein R_1 to cell $1st\ M_2$; $m-cu$ and distal section of Cu_1 narrowly bordered by brown; veins brown.

Abdominal tergites and hypopygium dark brown; basal sternites conspicuously light yellow, outer segments dark brown. Male hypopygium (fig. 5) with the tergite, t , long, posterior border extended into two broad blades that are separated by a very deep and narrow emargination, lobes with setae, the outer lateral ones yellow, longer. Basistyle, b , on outer mesal part with a concentration of stout black setae. Outer dististyle, d , broad at base, more narrowed on outer half, apex broadly obtuse; inner style with basal half expanded, the outer margin with abundant delicate black setae, distal half narrower, terminating in a small trifid beak, with a strong reflexed spine, lower margin before tip more dilated. Phallosome, p , very small, apophyses oval. Eighth sternite, $8s$, very extensive, narrowest on outer third, posterior border with a very broad emargination with correspondingly narrow lobes, the margin with very abundant yellow setae, shorter on the lobes than those more basally near the midline.

Holotype. — ♂, Talung Dzong, Kameng, North East Frontier Agency, Assam, 7000 feet, May 12, 1961 (Schmid). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, numerous ♂ ♀. *Paratypes*, ♂ ♀, Jhum La, Kameng, 7800 feet, May 13, 1961; Kelang, 6000 feet, July 21, 1961; Rahung, 7000 feet, July 16, 1961 (Schmid).

The species is named for Mr. Richard Irwin Vane-Wright who has made outstanding studies of this genus in the British Museum (Natural History), as mentioned earlier in this paper. Other generally similar regional species include *Holorusia fulvolateralis* (Brunetti), *H. majestica* (Brunetti) and some others defined by the present writer, all differing among themselves in details of hypopygial structure, especially of the tergite, basistyle, both dististyles, and the eighth sternite. The brush of stout black setae on the basistyle in the present fly is similar to that found in *majestica* but the other hypopygial structures are different in the two species.

***Holorusia vishnu* n. sp.**

Belongs to the *brobdignagia* group; size very large (wing about 40 mm); mesonotal praescutum cinnamon brown with four grayish brown stripes that are bordered by darker brown, thoracic pleura with a broad brown dorsal stripe; antennal flagellum brownish orange, terminal segment black, intermediate segments in male strongly produced; femora chestnut yellow, tips broadly brownish black; wings strongly tinged with rich brown, cell *C* and prearcular field darker brown, veins restrictedly seamed by darker brown, including 2nd *A*; abdominal tergites brown, proximal sternites brownish yellow, subterminal segments darker brown, hypopygium light fulvous yellow; male hypopygium with tergal lobes short, obliquely truncated; basistyle unmodified; dististyles terminal, apex of outer style very obtuse to nearly truncate; inner style narrow, its outer margin with a fringe of long yellow setae, apex of beak short, slightly upcurved; gonapophyses very small; eighth sternite with border slightly convex, recurved, without lobes or modified setae.

Male. — Length about 35 mm; wing 40 mm; antenna about 5.8 mm.

Frontal prolongation of head dark brown; palpi brownish black. Antennae with scape and pedicel brownish yellow, flagellum brownish orange, terminal segment black; intermediate flagellar segments in male rather strongly produced, verticils very small. Head above with sides broadly yellowed, including the antennal fossae; center of vertex dark brown, the area parallel-sided, becoming darker on occiput and cervical region.

Pronotal scutum dark brown, scutellum brownish black, the sides abruptly light yellow. Mesonotal praescutum dark cinnamon brown with four grayish brown stripes that are bordered by darker brown, the lateral pair more broadly so, interspaces with transversely striate darkened lines; scutal lobes brownish orange, each with two confluent dark brownish gray areas, point of transverse suture depressed, brownish black; scutellum brown; medio-tergite brownish gray, the declivitous posterior third light gray, the narrow anterior margin brown; anapleurotergite light brown on posterior half, the remainder, with the katapleurotergite light yellow, the latter with two longi-

tudinal furrows. Pleura with a broad brown dorsal stripe, more intense above, below this with a yellow stripe, ventral sternopleurite light gray; dorsopleural membrane broadly light yellow, including the cervical region and sides of pronotum; immediately cephalad of wing root the whitened membrane crossed by two transverse brownish black lines. Halteres with stem light brown, narrowly yellowed at base, knob darker brown. Legs with fore coxae brownish yellow, clearer yellow apically, remaining coxae yellowed; trochanters brownish yellow; femora chestnut yellow, tips broadly brownish black; tibiae chestnut, tips narrowly brownish black; tarsi chestnut, fourth segment darker, fifth brownish yellow, with a conspicuous epicondyle; claws with central tooth obtuse. Wings strongly tinged with brown, prearcular field and cell *C* darker brown, stigma poorly differentiated; narrow darker brown seams over vein *2nd A*, outer half of *Cu₁*, outer end of cell *1st M₂* and on vein *M₁* to the wing margin, remaining branches of *M* each with a darkened marginal spot; veins brownish yellow, conspicuous. Venation: Vein *R₁₊₂₊₃* stout, subequal to or shorter than the weak outer section of *R₁*.

Abdominal tergites brown, proximal sternites obscure brownish yellow, basal segments clearer yellow, subterminal tergites darker chestnut brown; hypopygium, with the exception of the tergite, light fulvous yellow. Male hypopygium (fig. 6) with the tergite, *t*, long, the outer third slightly more narrowed; posterior border with short obliquely truncated lateral lobes that are separated by a very shallow emargination; tergal setae very short, black, not involving the lobes. Apex of basistyle, *b*, not produced caudad into a long point; setae relatively short, those of mesal face longer but shorter than in *dives*. Outer dististyle, *d*, longer than broad, outer half slightly more narrowed, parallel-sided, apex very obtuse to nearly truncate; inner style narrow, outer half more slender, narrowed into a short beak, the apex slightly upcurved; outer margin of more than the basal half with a fringe of long yellow setae that are shorter than in *dives*. Phallosome, *p*, unusually small and inconspicuous, especially the tiny oval apophyses. Eighth sternite, *8s*, broadest beyond midlength, apex very slightly convex, in slide mounts with border slightly recurved, with very small setae; disk on either side of midline with a group of darkened wrinkles that are slightly reticulated.

Holotype. — ♂, Nyukmadong, Kameng, North East Frontier Agency, Assam, 8000 feet, April 23, 1961 (Schmid). *Allotopotype*, ♀. *Paratopotypes*, three ♂♂.

The most similar species is *Holorusia dives* (Brunetti), usually referred to the *albovittata* group of the genus because of its much smaller size. It agrees with the present fly in its general features but with the hypopygial details distinct, including both dististyles, the exceedingly long yellow setae of the inner style and on mesal face of basistyle, and with the apex of the latter extended into a

narrow pale blade with the apex subacute, the dististyles being subterminal in position.

Genus TIPULA Linnaeus

Tipula Linnaeus; *Systema Naturae*, Ed. 10: 585, 1758.

Tipula Alexander; *Philippine Jour. Sci.*, 94: 235-240, 1965.

A recent consideration of the genus has been given by the writer in the paper cited above. In the present report I am presenting a fourth list of those species in this genus that have been named in honor of students of the family Tipulidae and particularly those who have done work on the Eurasian species of the genus *Tipula*. The first such list of patronymics appeared in the *Philippine Journal of Science* in Part 53 of the *Asia* series of papers (1964), the second list in Part 56 (1965), the third list in Part 61 (1966; in press in 1968). The references in the following list to Part III pertain to the preceding article in the present series of studies.

FOURTH LIST OF PATRONYMICS IN THE GENUS TIPULA

- BAGCHI, D. — *Tipula* (*Ramatipula*) *bagchiana* n. sp. (this report).
 BRULLÉ, G. A. — *Tipula* (*Brithura*) *brulleana* n. sp. (this report).
 COMSTOCK, J. H. — *Tipula* (*Indratipula*) *comstockana* Alexander (Part III).
 CURTIS, JOHN — *Tipula* (*Sinotipula*) *curtisiana* n. sp. (this report).
 CZIZEK, KARL — *Tipula* (*Vestiplex*) *czizekiana* Alexander (Part III).
 DICKINSON, W. E. — *Tipula* (*Arctotipula*) *dickinsoni* Alexander, 1932.
 EGGER, J. G. — *Tipula* (*Schummelia*) *eggeriana* n. sp. (this report).
 GOETGHEBUER, M. — *Tipula* (*Emodotipula*) *goetghebuerana* Alexander (Part III).
 HALIDAY, A. H. — *Tipula* (*Schummelia*) *halidayana* Alexander (Part III).
 HENNIG, WILLI — *Tipula* (*Schummelia*) *hennigiana* n. sp. (this report).
 HUGUENIN, GUSTAV — *Tipula* (*Vestiplex*) *hugueniniana* n. sp. (this report).
 IMMS, A. D. — *Tipula* (*Vestiplex*) *immsiana* Alexander (Part III).
 KEILIN, DAVID — *Tipula* (*Brithura*) *keiliniana* n. sp. (this report).
 KUNTZE, ALBERT — *Tipula* (*Ramatipula*) *kuntzeana* n. sp. (this report).
 NEEDHAM, J. G. — *Tipula* *needhami* Cockerell, 1910 (Fossil: Miocene).
 PODA VON NEUHAUS, N. — *Tipula* (*Ramatipula*) *podana* n. sp. (this report).
 RONDANI, CAMILLO — *Tipula* (*Sinotipula*) *rondaniana* Alexander (Part III).
 SCHRANK, FRANZ VON P. — *Tipula* (*Schummelia*) *schranksiana* n. sp. (this report).
 SIEBKE, J. H. S. — *Tipula* (*Vestiplex*) *siebkeana* Alexander (Part III).
 SKUSE, F. A. A. — *Tipula* (*Kalatipula*) *skuseana* n. sp. (this report).
 STAEGER, R. C. — *Tipula* (*Sinotipula*) *staegeriana* n. sp. (this report).
 STROBL, P. G. — *Tipula* *strobliana* n. sp. (this report).

TILLYARD, R. J. — *Tipula (Vestiplex) tillyardana* Alexander (Part III).

WALKER, FRANCIS — *Tipula (Vestiplex) walkeriana* n. sp. (this report).

WIEDEMANN, C. R. W. — *Tipula (Pterelachisus) wiedemanniana* n. sp. (this report).

ZETTERSTEDT, J. W. — *Tipula (Tipulodina) zetterstedtiana* n. sp. (this report).

In the present paper new species have been dedicated to Bagchi, Brullé, Curtis, Egger, Hennig, Huguenin, Keilin, Kuntze, Poda, Schrank, Skuse, Staeger, Strobl, Walker, Wiedemann and Zetterstedt.

Change of name in *Tipula*

Tipula (Acutipula) takahashii nomen novum, for *Tipula (Acutipula) takahashiana* Alexander, of Assam (Philippine Jour. Sci., 93: 108-110, 1964), preoccupied by *Tipula (Vestiplex) takahashiana* Alexander, of Formosa (Philippine Jour. Sci., 66: 101-102, 1938).

Tipula (Acutipula) mannheimsiana culcitifera n. subsp.

Male. — Length about 18 mm; wing 21.5 mm; antenna about 2.8 mm.

Characters generally as in typical *mannheimsiana* Alexander, described from the Naga Hills, Assam [Ann. Mag. Nat. Hist., (12)6: 746-747, 1953], differing especially in hypopygial structure, including the inner dististyle and eighth sternite.

Size slightly smaller. Frontal prolongation of head dark brown; terminal segment of palpus black. Mesonotal scutellum broadly and conspicuously brownish black except on cephalic third. Halteres with apices of knobs yellowed. Legs with tips of femora broadly blackened. Wings with whitened lunate areas in bases of cells M_1 and 2nd M_2 pale and inconspicuous. Basal abdominal tergites more uniformly brown, the extreme posterior borders pale, sternites yellowed; outer four segments black. Male hypopygium (fig. 14) with beak of inner dististyle, d , short, as compared with *mannheimsiana*; outer basal lobe with the outer point longer, the knife-like blade from a very short base. Eighth sternite, $8s$, distinctive, the inner faces of outer apical lobes with a cushion of dense yellow setae from yellow punctures, the latter exceeding 200 in number, on a slide mount the two setiferous areas approximated. In typical *mannheimsiana* (fig. 13) the setal brushes of sternite, $8s$, much more limited, all arising from darkened punctures, on a slide the two groups widely separated at the midline. When more materials become available it appears probable that the two flies will be found to represent valid species.

Holotype. — ♂, Sirhoi Kashong, Manipur, Assam, 6000 feet, June 6, 1960 (Schmid). *Paratopotype*, ♂, with the type.

Tipula (Brithura) brulleana n. sp.

Allied to *imperfecta*; mesonotal praescutum cinnamon brown, darker on

sides, disk with four paler stripes, posterior sclerites and pleura chiefly dark brown; fore and middle femora yellow, each with a narrow dark brown subterminal ring, posterior femora uniformly yellow; wings light brown, patterned with darker brown and yellow, stigma dark brown, subcircular; yellowed area near outer end of cell *M* transversely oblong with a dusky center, outer end of cell darkened, cell *2nd A* uniformly infuscated; male hypopygium with posterior extension of outer dististyle terminating in two short subequal lobes.

Male. — Length about 25 mm; wing 19-20 mm; antenna about 4.8-5 mm.

Frontal prolongation of head dark brown, including the long nasus; palpi brownish black, incisures narrowly pale, segments with conspicuous black setae. Antennae brownish black; flagellar segments subcylindrical, the basal enlargements scarcely developed; verticils longer than the segments. Head above blackened in front, paler brown posteriorly, orbits narrowly pale; vertical tubercle high.

Pronotum dark brown medially, sides more yellowed, pretergites with a narrow silvery line. Mesonotal praescutum with the ground cinnamon brown, dark brown on sides, disk with four stripes, the intermediate pair obscure yellow, narrow, lateral stripes cinnamon brown, virtually concolorous with the ground; scutum largely orange yellow, darkened on sides, extreme lateral border silvery; scutellum orange, with very long setae, parascutella darker, the suture lined with silvery; mediotergite dull orange, sides broadly infuscated, setae conspicuous, pleurotergite light brown posteriorly, more brownish black in front, katapleurotergite conspicuously silvery, paler ventrally. Pleura chiefly dark brown, with faint silvery flecks on the sternopleurite which is conspicuously setiferous, as in the subgenus; dorsopleural membrane darkened. Halteres with stem yellowish brown, knob brownish black. Legs with coxae and trochanters dark brown; fore and middle femora light yellow with a narrow dark brown subterminal ring, the yellow tip slightly wider, posterior femora yellow; tibiae and basitarsi of all legs yellow, remainder of tarsi passing into brownish black; claws of male with a stout tooth before midlength. Wings patterned as in the subgenus; ground light brown with darker brown and yellow markings; dark pattern including chiefly a small area at arculus in bases of cells *R* and *M*, origin of *Rs*, and the small subcircular stigma, with extensive somewhat paler brown clouds in vicinity of anterior cord and cell *1st M*₂; even paler brown clouds in basal half of cells *R* and *M*; prearcular and costal fields brownish yellow; clearer yellow areas before and beyond origin of *Rs* and beyond the stigma in cells *R*₁ and *R*₂; distinctive very pale yellow markings include a V-shaped area in outer ends of cells *R*₃ and *R*₄ and a more or less oblong or transverse mark in cell *M* at some distance before tip, the apex of cell darkened; still other yellow areas in cells *Cu* and *1st A*, cell *2nd A* almost uniformly darkened, with a small brightening near tip, very reduced in size in the type, the base of cell not yellowed as in *imperfecta*; very small nearly marginal yellow dashes in outer medial cells, with two in cell *1st A*, lacking in cell

Cu; veins brownish yellow to clearer yellow in the more brightened fields. Venation: As in the subgenus, with vein *Sc*₁ strongly preserved; *Sc*₂ + *R*₁ very short, less than twice the free tip of the former; cell 1st *M*₂ short-pentagonal; *r-m* distinctly preserved; *m-cu* on *M*₁ near base.

Abdomen brownish black, hypopygium chiefly orange; vestiture of tergites exceedingly small and inconspicuous, of the sternites longer and sub-erect. Male hypopygium (fig. 16) generally as in *imperfecta*. Apex of basistyle, *b*, broad, with abundant long yellow setae. Outer dististyle, *d*, large, anteriorly with a long slender rod, its tip obtuse; posterior extension stout, its apical lobes short and nearly equal in length, one more slender; at base of extension with a compact group of about 50 small blackened spinoid setae; inner style nearly as long but narrower, terminating in a pale scoop-like blade, the sensory area at near midlength, with the individual pits arranged in a linear row. Both the seventh and eighth sternites with posterior borders bearing abundant long setae, those of the latter more yellowed.

Holotype. — ♂, Kurseong, Darjiling District, India, 5454 feet, June 11, 1959 (A. Camilleri). *Paratypes*, 1 ♂, Bop, Sikkim, 5950 feet, July 15, 1959; 1 ♂, Chumtang, Sikkim, 5120 feet, July 18, 1959; 1 ♂, 2 ♀♀, Singhik, Sikkim, 3500 feet, August 6, 1959; 1 ♂, Teng, Sikkim, 4600 feet, August 1, 1959; 1 ♂, Dirang Dzong, Kameng, North East Frontier Agency, Assam, 5300 feet, July 18, 1961 (Schmid).

The species is named for Gaspard Auguste Brullé (1809-1873), who published important papers on *Ctenophora* and allies (1832-1833). In my collection this fly had been misdetermined as being *Tipula (Brithura) imperfecta* Brunetti which is generally similar in size and appearance, differing especially in the wing pattern and hypopygial structure, including particularly the outer dististyle. As discussed in Part III of the present series of papers, the identification of *imperfecta* as being the same as the subgenotype *conifrons* (Edwards) was made by Edwards following a comparison of type materials. From this it now is known that *imperfecta* has the outer dististyle of the hypopygium quite distinct, as has been figured both by Edwards and myself. The yellow area in the outer end of cell *M* of the wing is different in shape in the two species, in *imperfecta* somewhat suggesting the united figures 80. This pattern varies somewhat in different specimens and in cases the whole outer end of the cell is yellowed. In *brulleana* cell *M* is darkened, more heavily so adjoining the veins.

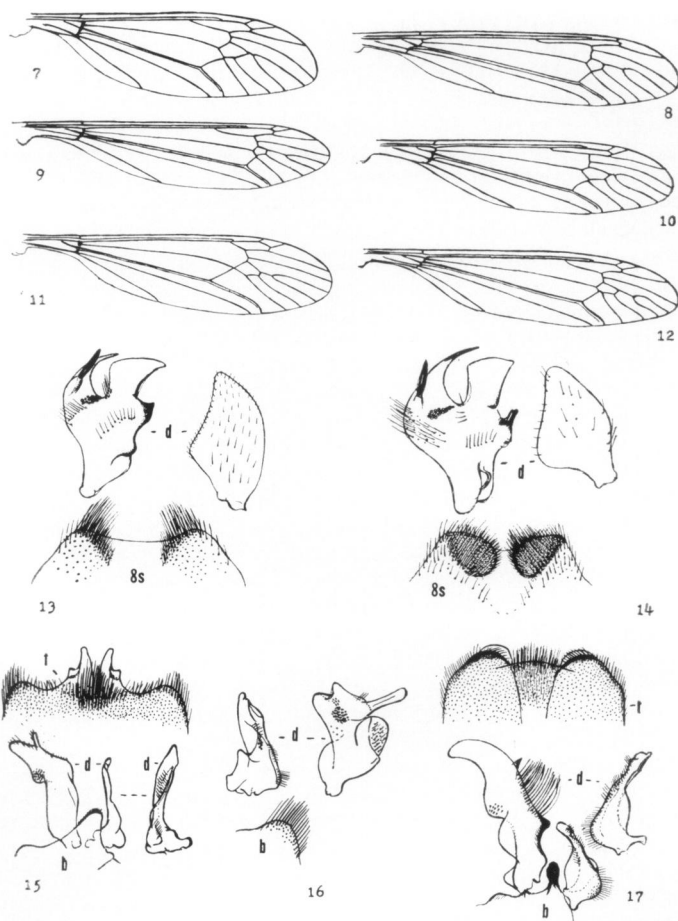
Tipula (Brithura) keiliniana n. sp.

Allied and generally similar to *crassa*; mesonotum cinnamon brown and brownish black, praescutum with three dark orange stripes; femora reddish brown, outer ends narrowly pale yellow; wings pale brown, conspicuously variegated by yellowed areas and restricted darker brown spots at arculus and origin of *Rs*, stigmal area orange yellow; male hypopygium with intermediate tergal lobes conspicuous, basistyle at apex produced into a broad flattened blade, outer dististyle near apex with a small finger-like lobe.

Male. — Length about 26-28 mm; wing 20.5-24 mm; antenna about 4.5-5.5 mm.

Frontal prolongation of head brownish black, including the stout nasus; palpi black, incisures of the intermediate segments pale. Antennae with scape brownish black, pedicel and flagellar segments bicolored, brown basally, tips more yellowed, this pattern persisting through the penultimate segment; longest verticils exceeding twice the segments. Head dark brown, pale brownish yellow on orbits and sides of posterior vertex, disk grayish white pruinose, including the conspicuous conical vertical tubercle.

Cervical region and pronotum dark brown, sides of the latter paler. Mesonotal praescutum brownish black, disk with three dark orange stripes, the median one vaguely divided by a scarcely evident yellow vitta; scutum with each lobe virtually covered by two confluent dark orange areas, the median region and posterior borders of lobes light gray, sides brownish black, confluent across suture with the lateral praescutal darkening; scutellum dark brownish gray, clearer gray on sides and more diffusely as a central line, parascutella dark brown; postnotum gray, mediotergite narrowly darkened on central part and more broadly on sides; anapleurotergite dark brown, the protuberant katapleurotergite cinnamon brown at summit, sides silvery white; setae of mesonotum pale, very long and conspicuous. Pleura chiefly cinnamon brown, ventral sternopleurite and meron paler brown, pteropleurite more blackened; dorsal sternopleurite and ventral pteropleurite silvery; conspicuous groups of setae on sternopleurite and ventral pteropleurite. Halteres with stem light brown, base more fulvous, knob brown, apex margined with pale yellow. Legs with coxae and trochanters dark brown, conspicuously pruinose, with long pale setae; femora reddish brown, outer ends narrowly pale yellow, the extreme apical border brown; tibiae reddish brown, bases narrowly yellow, subequal in amount to the femoral brightenings; basitarsi brown, tips and remainder of tarsi black; claw of male with a stout tooth. Wings pale brown, conspicuously variegated by yellow areas, the darker brown pattern being restricted to a larger mark surrounding the yellowed arculus and a small oval spot at origin of *Rs*; stigmal region and cell *Sc* light fulvous, cell *C* more yellowed; orange yellow markings chiefly concentrated about the stigma and anterior cord as a large area that includes the bases of all outer radial cells and much of cell *1st M*₂; before the cord the yellow marks are pale yellow and relatively



Text-figs. 7-17. — Fig. 7, *Tipula* (*Kalatipula*) *skuseana* n. sp., venation; Fig. 8, *Tipula* (*Pterelachisus*) *aka* n. sp., venation; Fig. 9, *Tipula* (*Ramatipula*) *kuntzeana* n. sp., venation; Fig. 10, *Tipula* (*Schummelia*) *hennigiana* n. sp., venation; Fig. 11, *Tipula* (*Schummelia*) *schrunkiana* n. sp., venation; Fig. 12, *Tipula* *strobliana* n. sp., venation; Fig. 13, *Tipula* (*Acutipula*) *mannheimsiana mannheimsiana* Alexander, male hypopygium; Fig. 14, *Tipula* (*Acutipula*) *mannheimsiana culcitifera* n. subsp., male hypopygium; Fig. 15, *Tipula* (*Brithura*) *keiliniana* n. sp., male hypopygium; Fig. 16, *Tipula* (*Brithura*) *brulleana* n. sp., male hypopygium; Fig. 17, *Tipula* (*Brithura*) *crassa* (Edwards), male hypopygium.

Symbols: *b*, basistyle; *d*, dististyle; *s*, sternite; *t*, tergite.

restricted, being most evident in cells *R* and *M* where they isolate a major ground area at near midlength of the cells, this darker in cell *M* near vein *Cu*; small yellow spots in all outer cells from *R*₃ to 2nd *A*, including small marginal dashes in all cells excepting *Cu*; veins orange yellow, only slightly infuscated in the darkened areas. Costa in the stigmal region only moderately expanded. Venation: Petiole of cell *M*₁ slightly longer than *m*; cell 1st *M*₂ small, pentagonal.

Abdomen chiefly bright orange, lateral borders of both tergites and sternites broadly light brown, becoming narrowly more blackened near bases, outer lateral margins narrowly pruinose; hypopygium darker. Male hypopygium (fig. 15) with posterior border of tergite, *t*, concave, the median region farther produced into paired blades, their tips truncate, lateral borders with a rectangular shoulder; tergites behind the blades and lateral lobes with very long yellow setae. Region of ninth sternite not greatly lengthened, as in *crassa*. Basistyle, *b*, produced into a broad flattened blade, tip obtuse, surface with microscopic yellow setulae. Outer dististyle, *d*, as figured; apex truncate, before this on margin with a cylindrical finger-like lobe; inner style much smaller, conformation as figured. Eighth sternite broadly transverse, widened at midlength; posterior border gently convex, with long fulvous setae; seventh sternite with setae less conspicuous.

In *crassa* (fig. 17) the tergal lobes, *t*, relatively low, very obtuse, and with a comparable lobe immediately beneath on either side; median emargination broad, with long setae. Ninth sternite greatly lengthened, produced ventrad into a massive blackened glabrous structure. Basistyle, *b*, with apical lobe blackened, much smaller and more slender, slightly constricted at near midlength. Outer dististyle, *d*, elongate, outer end produced, the small marginal lobe more basal in position and appearing as an acute glabrous point, margin of style below this with very long curved yellow setae; subbasally with a blackened obtuse lobe, on the opposite or inner margin with a broader rounded blade; inner style only about one-half as long, conspicuously narrower on outer half. Eighth sternite with setae darker, more concentrated on lateral ends of plate, the median group small.

Holotype. — ♂, Jhum La, Kameng, North East Frontier Agency, Assam, 9000 feet, May 31, 1961 (Schmid). *Paratype*, 1 ♂, Talung Dzong, Kameng, 7700 feet, June 6, 1961 (Schmid).

This species is dedicated to the late David Keilin, outstanding student of insect biology and physiology, author of important papers on the morphology of the Trichoceridae (1912, 1928, 1940).² The most similar regional species is *Tipula* (*Brithura*) *crassa* (Edwards) which differs in details of body and wing coloration and

² Keilin, David, *The history of cell respiration and cytochrome*, pp. 416, illustrations, 1966. Cambridge University Press, London (completed and prepared for publication by his daughter, Dr. Joan Keilin).

especially in hypopygial structure, including the tergite, ninth sternite, basistyle and dististyles, as discussed and figured above.

***Tipula (Indotipula) chandra* n. sp.**

Mesonotal praescutum with four darkened stripes, the intermediate pair brownish yellow narrowly bordered by brown, lateral stripes solidly darker brown; antennae of male relatively short, subequal in length to the palpi, first flagellar segment darkened except at base; wings strongly tinged with brown, stigma darker, veins R_{4+5} and M_1 with abundant macrotrichia; outer abdominal segments darkened, eighth tergite brownish yellow; male hypopygium with tergal lobes spinulose, basistyle and ninth sternite with abundant very long yellow setae; outer dististyle narrow, inner style with an outer basal lobe, distal end slightly produced dorsally.

Male. — Length about 13-15 mm; wing 15-20 mm; antenna about 3.5-4.2 mm.

Frontal prolongation of head brownish yellow, nasus concolorous, very long, tufted with black setae; palpi brownish yellow, incisures clearer yellow. Antennae 12-segmented, subequal in length to the palpi; scape and pedicel yellowed, flagellum brownish black, segments shorter than the longest verticils. Front and antennal fossae light yellow; vertex brown, with a darker brown spot behind the fossae adjoining the eye; a vague darker central line; posterior orbits and occiput obscure yellow.

Cervical region and anterior part of pronotal scutum dark brown, the remainder of pronotum obscure yellow. Mesonotal praescutum yellow on sides, disk with four stripes, intermediate pair brownish yellow with narrow brown borders, the broader lateral stripes solidly darker brown, crossing the suture onto the scutal lobes, remainder of scutal lobes paler brown, central area yellowed, vaguely darker medially; scutellum obscure yellow with a narrow dark brown central vitta; postnotum brownish yellow. Pleura yellowed, especially on the mesepimeron and meron, the anepisternum and sternopleurite conspicuously darkened. Halteres with stem brownish yellow, clearer yellow at base, knob dark brown. Legs with fore coxae brownish yellow, remaining coxae and trochanters clearer yellow; femora brownish yellow, tips narrowly blackened, tibiae and tarsi dark brown; claws of male long, bidentate. Wings strongly tinged with brown, prearcular and costal fields more yellowed, stigma elongate, darker brown; oblitative areas very restricted; veins dark brown, lighter brown in the yellowed fields. Abundant macrotrichia on most of R_{4+5} and outer two-thirds of M_1 .

Abdominal tergites brown, sternites light yellow, outer segments brownish black; seventh segment weakly darkened, eighth tergite brownish yellow, sternite dark brown. Male hypopygium (fig. 18) with tergal lobes, *t*, stout, apices rounded, with numerous small black spicules, surface with a low rounded glabrous flange. Ninth sternite, *9s*, and basistyle, *b*, with abundant very long yellow setae. Outer dististyle, *d*, narrow, especially on outer

half; inner style with beak narrow, slightly decurved, tip subacute; lower beak rounded; outer basal lobe a flattened flange, the distal end produced dorsally into a small lobe. Eighth sternite with posterior border truncate, with relatively few scattered small setae.

Holotype. — ♂, Nyukmadong, Kameng, North East Frontier Agency, Assam, 8000 feet, April 23, 1961 (Schmid). *Paratopotype*, 1 ♂. *Paratypes*, 1 ♂, Rupa, Kameng, 5200 feet, May 2, 1961; 1 ♂, Shergaon, Kameng, 6400 feet, May 8, 1961 (Schmid).

The paratype from Shergaon is larger and with the wings more conspicuously yellowed basally but from the hypopygial structure must be considered to be conspecific.

The most similar species is *Tipula (Indotipula) tukvarensis* Edwards, of Sikkim, which agrees in most colorational features, differing in the longer male antennae and in details of hypopygial structure, including the shorter setae of the basistyle and ninth sternite and in the shape of both dististyles. Other generally similar species include *T. (I.) divisa* Brunetti, which lacks spinules on the tergal lobes, and *T. (I.) gracilis* Brunetti, which differs in colorational details, as described by Edwards (1932).

***Tipula (Indotipula) stylacuta* n. sp.**

Size relatively large (wing about 16 mm); mesonotal praescutum with three brown stripes, lateral margins yellowed, pleura yellow; antennal flagellum black; knobs of halteres darkened; femora light brown, tips narrowly blackened, tibiae and tarsi brownish black to black; wings light brown, stigma darker, obliterative areas very small; basal abdominal tergites orange, sternites yellowed, outer segments darker, two terminal segments black; male hypopygium with tergal lobes stout, closely approximated, the broad tips spinulose; outer dististyle narrowed into a slender spine, inner style with beak long, cleaverlike, with a long spine near the small slender lower beak, outer basal lobe with a long slender straight spine; eighth sternite narrowed posteriorly, border very gently convex, with short sparse yellow setae.

Male. — Length about 13-13.5 mm; wing 15-16 mm; antenna about 4-4.2 mm.

Female. — Length about 16-17 mm; wing 16-18 mm.

Frontal prolongation of head, including the long nasus, brownish yellow; palpi brownish black. Antennae with scape obscure yellow, pedicel clear light yellow, flagellum black; flagellar segments with small basal enlargements, subequal to their longest verticils. Front and extreme anterior vertex obscure orange, posterior vertex brownish gray, orbits at narrowest point

restrictedly darkened; vertical tubercle scarcely elevated, obscure orange, narrowly lined with brown.

Cervical region dark brown above, orange yellow laterally. Pronotal scutum yellowed, sides of scutum weakly infuscated, extreme anterior border darkened. Mesonotal praescutum with three brown stripes, the broad median area vaguely divided by a pale line, posterior end slightly paler, lateral borders very narrowly darker brown, lateral stripes dark brown, humeral and lateral areas yellowed; scutum with lobes light brown, median region obscure yellow; scutellum and mediotergite clear orange, parascutella and a stripe along the suture behind pale brown, pleurotergite light yellow; mesonotum virtually glabrous. Pleura yellow, including the dorsopleural membrane, anterior border of mesepisternum weakly darkened. Halteres with stem brownish yellow, knob slightly darker. Legs with coxae and trochanters yellow; femora light brown, tips narrowly blackened, tibiae and tarsi brownish black to black; claws of male toothed. Wings light brown, prearcular and costal fields slightly more yellowed, stigma long, darker brown; very small obliterative areas before stigma and across base of cell *1st M*₂, crossing the cord into extreme end of cell *R*; veins brown. Venation: Cell *M*₁ deep, its petiole and *m* subequal; cell *2nd A* narrow.

Basal abdominal tergites dull orange, second and succeeding segments brownish yellow to dark brown, apices paler, sternites yellowed, hypopygium, including eighth and ninth segments, black. Ovipositor with cerci very long and slender, outer half horn yellow. Male hypopygium (fig. 19) with the tergite, *t*, broad, posterior border with two approximated stout lobes that are separated only by a linear split, apices blackened, provided with numerous small blackened spicules. Ninth sternite on either side with a group of very long yellow setae. Outer dististyle, *d*, an elongate rod, curved to the tip which ends in a long black spine, surface of style with numerous very long setae; inner style complex, as shown; beak a long flattened yellow blade, tip obtuse, dorsal crest very high; posteriorly the beak with a low ridge that bears about 25 long straight setae, their tips bent, the outermost paling to yellow; lower beak a small slender black spine, at its base with a long blackened rod that is directed across the face of style; outer basal lobe stout at base, with a very long spine that narrows gradually into a point, outer surface with scattered long setae. Eighth sternite narrow, widened outwardly, posterior border very gently convex, with unusually sparse relatively short yellow setae, without further modifications.

Ho!otype. — ♂, Shergaon, Kameng, North East Frontier Agency, Assam, 6400 feet, May 8, 1961 (Schmid). *Allotopotype*, ♀.

Tipula (Indotipula) stylacuta is most readily told from other generally similar species by the somewhat noteworthy dististyles of the hypopygium. The closest such species is *T. (I.) apicidilata* Alexander, likewise from Assam, which differs especially in the tergite and dististyles.

Tipula (Indotipula) subvaruna n. sp.

Allied to *varuna*; mesonotal praescutum with disk cinnamon brown, the lateral border, posterior sclerites of notum and the pleura chiefly yellow; wings tinged with brown, costal border and stigma darker; male hypopygium with blackened armature of the tergite conspicuous; inner dististyle large and complex, beak stout, dorsal crest extended into a long membranous blade; outer basal lobe bearing a long spine, the adjacent margin with several long black setae.

Male. — Length about 12 mm; wing 13 mm; antenna about 4 mm.

Female. — Length about 14 mm; wing 15 mm.

Frontal prolongation of head above clear light yellow, including the long nasus, sides slightly more darkened; palpi brown. Antennae with scape and pedicel light yellow, flagellum brown; flagellar segments longer than their verticils, basal enlargements small. Front and anterior vertex light yellow, the latter with a brown central spot immediately behind the antennae; posterior vertex brownish gray, with a small slightly darker spot at margin adjoining the yellow area.

Pronotum weakly infuscated above, sides broadly light yellow. Mesonotal praescutum with disk virtually covered by three cinnamon brown stripes, the interspaces vaguely more brownish gray, lateral borders yellow; scutum cinnamon brown, scutellum clear light yellow, parascutella darker yellow; mediotergite clear yellow. Pleura chiefly yellow, the mesepisternum pale brown to form a weak transverse girdle. Halteres infuscated, base of stem narrowly yellowed. Legs with coxae and trochanters yellow; femora brown, tips darker, bases narrowly yellowed, remainder of legs brown; claws of male with two spines, the one at midlength stouter, basal spine small and slender. Wings tinged with brown, costal border and stigma darker brown, especially the latter; obliterative areas small and inconspicuous, the prestigmal one larger; veins brown. Venation: *Rs* slightly longer than *m-cu*; in male, cell *M*₁ deep, its petiole about one-third to one-half *m*; in the female, the two elements subequal.

Abdominal tergites brown, lateral margins of intermediate segments yellowed, the posterior borders narrowly of this color; proximal sternites yellow, outer segments dark brown. Male hypopygium (fig. 20) with the tergite, *t*, chiefly blackened, posterior border with two broad lobes with subtruncate apices, outer angles rounded; mesal edge of each lobe produced cephalad into a slender blackened rod, their apices contiguous at the midline; ventral armature of tergal lobe extended into a large foot-shaped structure, as shown. Ninth sternite, *9s*, with a subglobular yellow lobe provided with dense long yellow setae. Dististyles, *d*, most as in *varuna* but differing in all details; outer style slender, on outer fifth with several powerful black spinoid setae; inner style with body almost separated from the equally large outer basal lobe, beak black, very obtuse; region of dorsal crest elevated and extended farther into a very long pale membranous blade; outer basal

lobe including a massive black plate, near its tip with a group of long erect setae, and an appressed long black spine on outer margin, near its base with a concentration of long black setae. Gonapophysis, *g*, appearing as an in-curved yellow blade. Eighth sternite small and simple, margin subtruncate, surface with relatively few setae.

Holotype. — ♂, Singbeng, Sikkim, 4920 feet, April 26, 1959 (Schmid). *Allotopotype*, ♀.

Among the generally similar regional members of the subgenus, this species is closest to *Tipula* (*Indotipula*) *varuna* Alexander, especially in the hypopygial characters but differing in all details. Other less similar species include *T. (I.) apicidilata* Alexander, *T. (I.) audcentiana* Alexander, *T. (I.) pandava* Alexander, and *T. (I.) sudra* Alexander.

Subgenus KALATIPULA nov.

Nasus distinct. Antennae with relatively short verticils. Tibial spur formula 1-2-2; claws of male simple. Wing (fig. 7) with squama naked; outer veins with abundant trichia. Venation: *Rs* relatively short, longer than *m-cu*; cell *M*₁ very deep, its petiole shorter than *m*. Male hypopygium (fig. 21) with posterior border of tergite, *t*, with two lobes that are provided with long black setae; inner dististyle, *d*, with outer basal lobe extended into a long black spine; phallosome with aedeagus simple, gonapophyses, *g*, appearing as flattened subcircular blades that are densely covered with short setae; eighth sternite simple, posterior border unmodified.

Type of subgenus. — *Tipula* (*Kalatipula*) *skuseana* n. sp.

From the structure of the male hypopygium the present new group obviously is most nearly allied to the subgenus *Tipulodina* Enderlein, but is quite different in its general appearance and features of the venation and legs. The hypopygium suggests an unusually generalized ally of *Tipulodina*, with resemblances in the tergite, dististyles, phallosome, and eighth sternite.

Tipula (*Kalatipula*) *skuseana* n. sp.

Size medium (wing of male about 18 mm); mesonotal praescutum yellowed, with four light brown stripes, pleura dark gray, paler below; antennae long, flagellum black, bases of the more proximal segments obscure yellow; legs relatively short, femora light brown, tibiae and tarsi brownish black, claws simple; wings pale brown, patterned with yellow and darker brown; veins beyond cord with abundant macrotrichia, petiole of cell *M*₁ very short; abdomen brownish yellow, tergites with a narrow pale brown sublateral line, hypopygium brownish yellow; male hypopygium with characters as in

the subgenus, including unusually conspicuous spatulate gonapophyses that are covered densely with short setae.

Male. — Length about 19 mm; wing 18.5 mm; antenna about 7 mm.

Frontal prolongation of head somewhat shorter than the remainder, light brown, more yellowed beneath; dorsal surface, including nasus, with abundant black setae; palpi black. Antennae with scape and pedicel yellow, flagellum black, the extreme bases of the more proximal segments obscure yellow; segments longer than their verticils, basal enlargements relatively conspicuous. Head above light yellowish brown, clearer yellow on front, darker on sides of posterior vertex and genae; vertical tubercle very low; setae black, virtually lacking on vertex, present on posterior orbits and genae.

Pronotal scutum buffy yellow. Mesonotal praescutum yellowed, with four light brown stripes, the intermediate pair narrowly divided on anterior third by a darker line, lateral stripes poorly indicated; extreme anterior border of praescutum and the pretergites darker; scutum brown, each lobe with two vague paler areas; scutellum small, light brown, parascutella darker ventrally; mediotergite gray, patterned with darker, especially on posterior third, pleurotergite brownish gray above, katapleurotergite more blackened, elevated into a sharp ridge; notal vestiture sparse, very inconspicuous, pale yellow. Pleura dark brownish gray, ventral sternopleurite and meron yellowish brown; dorsopleural region brown. Halteres with stem light brown, knob brownish black, apex slightly darker. Legs with coxae dark brown, apically sparsely pruinose; trochanters paler brown, lower face at apex with a black spot; remainder of legs relatively short, femora light brown, tips slightly darker; tibiae and tarsi brownish black; claws simple. Wings (fig. 7) with the ground pale brown, patterned with pale yellow and darker brown; darkest pattern includes origin of R_s and a major area at stigma and extended over the anterior cord; wing tip in outer radial field more uniformly paler brown; basad of cord the yellow pattern is inconspicuous against the ground, arranged as zigzag areas in the cubital and anal cells; yellow band in outer radial field located at near midlength of cells, not basal as in many species in the genus; prearcular and costal fields more uniformly brownish yellow; veins medium brown, extensively whitened in the obliterative areas. Veins beyond cord with abundant trichia, lacking on R_{1+2} except at base; veins before cord with less extensive trichia, lacking in the whitened outer fourth of R_s . Venation: R_s nearly straight, about one-third longer than $m-cu$; petiole of cell M_1 very short, about one-third to one-fourth m .

Abdomen brownish yellow, tergites with a narrow pale brown sublateral line; hypopygium brownish yellow. Male hypopygium (fig. 21) with the tergite, t , transverse, posterior border subtruncate, on either side of midline produced into a rounded lobe that is provided with bristles, outer lateral angles very slightly produced. Outer dististyle, d , a stout flattened blade, nearly parallel sided, apex obliquely obtuse, vestiture of short setae; inner style with beak short-triangular, obtuse, lower beak lacking; dorsal crest

low, rounded; outer basal lobe a large narrowly connected structure that is extended into a long black spine, with a smaller spine near base, surface between the spines with a fringe of long yellow setae. Phallosome, *p*, including the short slightly curved aedeagus and very conspicuous spatulate gonapophyses, *g*, that are densely and evenly covered with short setae. Eighth sternite, *8s*, transverse, posterior border very gently convex, the broad central part nearly truncate; outer half of plate with numerous relatively long light brown setae, not interrupted at the midline.

Holotype. — ♂, Bomdi La, Kameng, North East Frontier Agency, Assam, 8800 feet, July 15, 1961 (Schmid).

The species is named for Frederick A. Askew Skuse (1864-1896), outstanding early student of the Australian Diptera, including the Tipulidae. He published two principal papers on this family which are cited below, together with a brief account of his life by the writer.³

The species requires no further comparison with other generally similar members of the genus, being quite distinct in the subgeneric and specific features listed. It is quite different in its general appearance from all presently known species of *Tipulodina*.

Tipula (Pterelachisus) aka n. sp.

Size medium (wing about 15 mm); general coloration of thorax of male obscure yellow, of female gray, praescutum with four light brown stripes; antennae of male relatively long, flagellar segments bicolored; femora light brown, tibiae and tarsi brownish black to black; wings pale yellow, conspicuously patterned with brown, including major areas in cells *R* and *M*; *Rs* very long, *R*₁₊₂ atrophied, cell 1st *M*₂ small; basal abdominal tergites obscure yellow, patterned with brown, outer segments dark brown; male hypopygium with apex of tergite bilobed, basistyle with two unequal spines; eighth sternite with the broad apex bearing numerous long yellow setae.

Male. — Length about 13 mm; wing 14.5 mm; antenna about 5.2 mm.

Female. — Length about 17 mm; wing 16 mm.

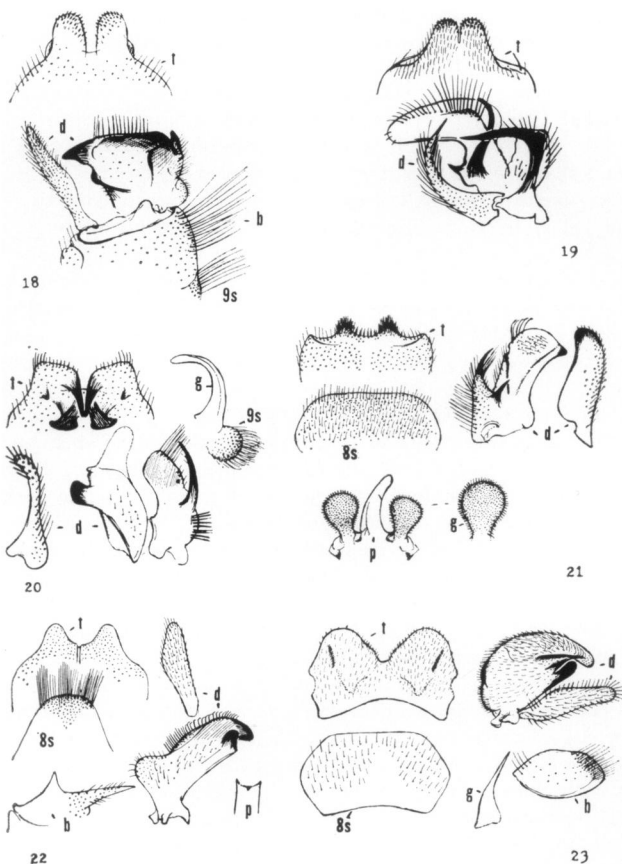
Frontal prolongation of head slightly shorter than the remainder, obscure yellow, with a narrow brown lateral stripe, nasus concolorous, relatively long; palpi with proximal three segments brownish yellow, terminal segment black, relatively short, less than twice the penultimate. Antennae relatively long, exceeding one-third the wing, proximal three segments light yellow, succeeding ones bicolored, yellow with dark brown basal enlargements, outer segments becoming progressively darker, the outer ones almost uni-

³ Alexander, C. P., Proc. Linn. Soc. New South Wales, 57: 6-7, portrait, 1932. Skuse, F. A. A., Proc. Linn. Soc. New South Wales, (2)4 (1889, preprint): 757-892, pls. 21-24; *ibid.*, (2)5: 53-139, pls. 4-6, 1890.

colorous. Head with front and vertical tubercle light yellow; remainder of head very pale brown with a vague darkened central line, best indicated on the tubercle and immediately behind.

Pronotal scutum yellow with a narrow dark brown central line, sides paler brown. Mesonotal praescutum of male obscure yellow, with four light brown stripes, intermediate pair paler behind, lateral stripes narrow, bordered by slightly darker brown; interspaces with conspicuous brown setigerous punctures; scutal lobes patterned with brown; posterior sclerites brownish yellow with a capillary brown central stripe on scutellum and mediotergite; vestiture of praescutum short, pale yellow. In the female, mesonotum light gray with the brown pattern about as in male. Pleura yellow on pteropleurite, meron and dorsal anepisternum, remainder pale brown; dorsopleural region yellow. Halteres with stem yellow, knob dark brown. Legs with coxae and trochanters yellowed; femora light brown, tibiae darker brown; tibiae and tarsi brownish black to black; claws of male with a small subbasal acute spine. Wings (fig. 8) pale yellow, patterned with brown, the two colors subequal in amount; dark pattern includes a postarcular area in bases of cells *R* and *M*, broadly over origin of *Rs*, reaching vein *M* behind, anterior cord and the broad wing tip; other dark brown seams over certain veins, including outer end of *M* and all its branches excepting *M*₁, *Cu* and 2nd *A*; stigma long, brown; prearcular field and cell *Sc* light yellow, cell *C* darker, especially at base; veins light brown in the patterned areas, clear light yellow in the prearcular field and in the ground areas of anterior third of wing. Venation: *Rs* very long, nearly four times *m-cu* in male, about three and one-half in female; *R*₁₊₂ atrophied; cell 1st *M*₂ small.

Basal abdominal tergites obscure yellow with a central brown longitudinal stripe, the line narrower and clearly defined in female, sublateral stripes pale, lateral margins light gray; sternites similar in color, central dark stripe broader and somewhat paler brown, outer segments dark brown. Ovipositor with cerci long and straight, very slender. Male hypopygium (fig. 22) with tergite, *t*, long, broad at base, narrowed outwardly, terminating in two broad obtuse yellow lobes that are separated by a wider rounded emargination, at its base with a microscopic notch that leads into a narrow dorsal furrow; vestiture of tergite abundant but yellow and very inconspicuous, small to microscopic on lobes, especially outwardly. Basistyle, *b*, with two outer spines or rods, one a broad glabrous triangle, directed outwardly over the bases of the dististyles, tip acute, second rod longer, directed laterad, appearing as a stout arm that narrows into an acute terminal spine, surface of rod with numerous yellow setae. Outer dististyle, *d*, relatively broad; inner style with both the beak and lower beak blackened, tips obtuse, the latter appressed; dorsal margin and crest with a series of strong yellow setae, their tips bent at right angles into hair-like points; region of outer basal lobe with scattered setae and abundant short dense yellow setulae to appear cushionlike. Phallosome, *p*, a stout straight rod, apex shallowly



Text-figs. 18-23. — Fig. 18, *Tipula (Indotipula) chandra* n. sp., male hypopygium; Fig. 19, *Tipula (Indotipula) stylacuta* n. sp., male hypopygium; Fig. 20, *Tipula (Indotipula) subvaruna* n. sp., male hypopygium; Fig. 21, *Tipula (Kalatipula) skuseana* n. sp., male hypopygium; Fig. 22, *Tipula (Pterelachisus) aka* n. sp., male hypopygium; Fig. 23, *Tipula (Pterelachisus) wiedemanniana* n. sp., male hypopygium.

Symbols: *b*, basistyle; *d*, dististyle; *g*, gonapophysis; *p*, phallosome; *s*, sternite; *t*, tergite.

emarginate, with three small darkened points, the median one smaller. Eighth sternite, 8s, elongate, narrowed outwardly, apex broadly obtuse, with numerous long yellow setae.

Holotype. — ♂, Nyukmadong, Kameng, North East Frontier Agency, Assam, 8000 feet, April 20, 1961 (Schmid). *Allotopotype*, ♀.

The specific name, *aka*, is that of an aboriginal people inhabiting Kameng. *Tipula* (*Pterelachisus*) *aka* is quite different from other generally similar regional species, including *T. (P.) cruciata* Edwards and *T. (P.) ranee* Alexander, especially in the wing pattern and in hypopygial structure, notably the spinous basistyle. These species formerly were placed in the subgenus *Oreomyza* Pokorny, now in the synonymy of *Pterelachisus* Rondani. A discussion of the subgenera of *Tipula* as presently recognized by the writer is contained in two recent papers.⁴

***Tipula* (*Pterelachisus*) *wiedemanniana* n. sp.**

Size medium (wing of male 15 mm); mesonotum brownish gray, praescutum with three stripes, the broad central area light brown with dark brown margins; antennae of male long, flagellum black; femora and tibiae yellowed, tips inconspicuously infuscated, claws of male small, simple; wings pale brown with whitened areas; abdomen brownish yellow, very restrictively patterned with darker; male hypopygium with tergite large, yellow, posterior border with broad lobes, basistyle unarmed; outer dististyle long, tip rounded, inner style without well-developed dorsal crest or outer basal lobe; gonapophyses small, spinelike.

Male. — Length about 15 mm; wing 15 mm; antenna about 7 mm.

Frontal prolongation of head nearly equal to the remainder, dark brownish gray above, brown beneath; nasus short, tufted with very long yellow setae; palpi with proximal two segments brown, remainder black. Antennae of male very long, nearly one-half the body or wing; scape and pedicel yellow, flagellum black; segments with basal enlargements small, longest verticils about one-half the segment. Front and anterior orbits light gray, vertex dark gray with a vague central darkening.

Pronotal scutum brownish black and elevated medially, the sides and scutellum brownish yellow. Mesonotal praescutum with the ground brownish gray, disk with three stripes, the broad central area light brown, conspicuously margined with darker, lateral stripes solidly dark brown; scutum brownish gray, each lobe with two darker areas; scutellum testaceous gray, darker medially, parascutella yellowed; mediotergite light gray, vaguely patterned with light brown, especially on posterior third; pleurotergite gray above, katapleurotergite more infuscated posteriorly; mesonotum without evident setae. Pleura light testaceous, sparsely pruinose, dorsopleural region darker brown. Halteres with stem obscure yellow, knob dark brown. Legs with coxae testaceous, bases slightly darker; trochanters yellow; femora and

⁴ Alexander, C. P., *Philippine Jour. Sci.*, 94: 235-286, 50 figs., 1965; *Pacific Insects*, 7: 333-356, 33 figs., 1965.

tibiae yellowed, tips narrowly and inconspicuously brown; basitarsi light brown, remainder of tarsi black; claws of male small, simple. Wings with ground pale brown, costal field and restricted prearcular region yellowed; slightly darker brown marks beyond arculus in cell *Cu*, at origin of *Rs* and over anterior cord, including the stigma; whitened areas at or before mid-length of cells *R* to 1st *A*, with others before stigma in cell *R*₁ and beyond cord in cells *R*₂ and *R*₃; cell *R*₅ vaguely brightened near base and on outer half; similar obliterative areas in outer end of cell *R*₁, basal half of 1st *M*₂ and basal half of *M*₃; veins brown, more yellowed in the costal field. Macrotrichia on veins *R*₂ and distal half of *R*₄₊₅, on *M*₁ with only two or three trichia, remaining veins glabrous excepting *C*, *R*, most of *Cu*₁ and 2nd *A* which bear trichia. Venation: *R*₁₊₂ present; *Rs* long, nearly twice *m-cu*; petiole of cell *M*₁ subequal to *m*; *m-cu* on *M*₁ beyond the perpendicular basal section.

Abdomen brownish yellow, outer segments very restrictedly patterned with small darkened areas, basal segments with extreme lateral borders and narrow apex of second tergite darker. Male hypopygium (fig. 23) with the tergite, *t*, large, posterior border with a large U-shaped emargination with a smaller comparable one at its base; lobes broadly obtuse with a long darkened line near outer margin; tergal setae very small and scattered, especially near apices of the lobes. Basistyle, *b*, small, oval, without lobes, mesal end with long yellow setae. Outer dististyle, *d*, large, pale brown, apex broadly obtuse; inner style subequal in length, beak obtuse, lower beak long, narrow, heavily blackened; no development of dorsal crest, outer basal lobe virtually lacking, represented by a small low flange. Phallosome represented by two small yellow gonapophyses, *g*, that narrow into long spines. Eighth sternite, *8s*, transverse, posterior border nearly truncate, without lobes and with very sparse small setae only.

Holotype. — ♂, Tsomgo, Sikkim, in *Rhododendron* association, 12,500 feet, August 26, 1959 (Schmid).

This fly is dedicated to Christian Rudolph Wilhelm Wiedemann (1770-1840), early outstanding student of exotic Diptera, including the Tipulidae. His single most important publication was the *Ausereuropäische zweiflügelige Insekten* (1828-1830), two volumes.

The most nearly allied regional species are *Tipula* (*Pterelachisus*) *mystax* Alexander, occurring in the *Rhododendron* associations at comparable high altitudes in Sikkim, and *T. (P.) sharva* Alexander, of northeastern Burma. The former species has the coloration of the body and wings distinct, antennae and legs uniformly blackened, the wing veins virtually glabrous, and the hypopygial structure distinct, including the outer basal lobe of the inner dististyle and the gonapophyses. *Tipula sharva* is more similar in the

coloration of the wings and legs, differing especially in the shorter antennae, more abundant trichia of the wing veins, and in hypopygial characters, including the conformation of the basistyle, pale outer dististyle with truncated apex, and the very broad lower beak of the inner style. The latter species has subapterous females and it appears possible that a comparable condition occurs in the other species discussed.

Subgenus RAMATIPULA nov.

Nasus long and conspicuous. Antennae of male short to medium in length, flagellar segments with long verticils. Tibial spur formula 1-2-2; claws of male toothed. Wing (fig. 9) with cell *1st M*₂ small, pentagonal; *Rs* approximately twice *m-cu*. Squama naked. Veins of outer half of wing with macrotrichia. Ovipositor with valves elongate, smooth. Male hypopygium (figs. 24-27) with the ninth tergite, *t*, produced into conspicuous lateral lobes with acute or subacute apices, their vestiture very reduced. Ninth sternite at most with a small lobe that is tipped with long setae. Basistyle, *b*, extended into a flattened blade that overlies the bases of the dististyles. Dististyles, *d*, with outer style small, in some species separate, basal in position (*bangerterana*, *bilobula*, *phallacaena*, *pierreana*), in *kuntzeana* more reduced in size but distinct from the inner style, in other species (*bagchiana*, *octacantha*, *oreoctistes*, *podana*) lacking or entirely fused with the inner style just basad of the lower beak of the latter; outer basal lobe large and conspicuous, provided with fleshy lobules or long spines, in *oreoctistes* reduced to a single very long slender spine without basal dilation. Phallosome, *p*, a simple stout central structure, without projecting gonapophyses. Eighth sternite, *8s*, at apex produced into two flattened blades, apparently undeveloped in *phallacaena*.

Type of subgenus. — *Tipula* (*Ramatipula*) *octacantha* Alexander.

Other species presently known to belong here include *T. (R.) bagchiana* n. sp. (Assam), *T. (R.) bangerterana* Alexander (Assam), *T. (R.) bilobula* Alexander (Thailand), *T. (R.) flavithorax* Brunetti (South India), *T. (R.) kuntzeana* n. sp. (Assam), *T. (R.) oreoctistes* Alexander (South India), *T. (R.) phallacaena* Alexander (Assam), *T. (R.) pierreana* Alexander, and *T. (R.) podana* n. sp. (Assam). The strict identity of *flavithorax* remains in question. Edwards (1924) re-examined the type and provided some further notes on the male hypopygium. The fly certainly appears to be distinct from the similar *oreoctistes*.

The most nearly related subgenus is *Indotipula* Edwards, the

species of which are similar in their general appearance but differ in important characters, including the tibial spur formula and in hypopygial features, particularly the tergite, reduction in size or total loss of the outer dististyle, lack of distinct gonapophyses, and the bilobed appendage of the eighth sternite. A further species, *Tipula shawiana* Alexander, of Thailand, differs from all the above in the structure of the eighth sternite but likewise may be found to belong here.

***Tipula* (*Ramatipula*) *bagchiana* n. sp.**

Size relatively large (wing of male about 16 mm); general coloration of thorax fulvous yellow, not or scarcely patterned; antennae of male relatively long, flagellar segments bicolored; legs light yellow, femoral tips slightly blackened; wings brownish yellow, prearcular and costal fields clearer yellow, stigma brown; male hypopygium with no differentiated outer dististyle, inner style with outer basal lobe a long blackened rod, near apex with a strong spine.

Male. — Length about 15-16 mm; wing 16-17 mm; antenna about 5-5.2 mm.

Frontal prolongation of head obscure brownish yellow, including the long slender nasus; palpi brown. Antennae of male relatively long, about one-third the wing; basal three segments light yellow, succeeding ones conspicuously bicolored, light yellow, the small basal enlargements black, outer two or three segments more uniformly darkened; verticils shorter than the segments. Front and vertical tubercle light yellow, the latter impressed medially; remainder of vertex gray, orbits narrowly paler gray, occiput broadly light brown.

Cervical sclerites and pronotal scutum broadly dark brown medially, sides and scutellum light yellow. Mesonotum fulvous yellow, praescutal stripes scarcely differentiated from the more yellowed ground; scutellum and medio-tergite with sparse yellow setae. Pleura fulvous, dorsopleural region yellow. Halteres with stem yellow, knob dark brown. Legs with coxae and trochanters yellow; remainder of legs light brown, femoral bases yellow, tips slightly more blackened; claws of male toothed. Wings brownish yellow, prearcular and costal regions clearer yellow, cell *Sc* slightly darker, stigma brown; distal ends of outer radial cells vaguely darker; veins brown, more brownish yellow in the brightened fields. Veins beyond cord with abundant trichia, lacking on R_{1+2} ; basad of cord with trichia on R_s , over most of M and both Anals, virtually lacking on basal section of Cu_1 . Venation: R_s about one-third to one-half longer than $m-cu$; cell *1st* M_2 small, pentagonal; petiole of cell M_1 about twice m .

Basal abdominal segments fulvous, seventh and eighth blackened to form a ring, hypopygium slightly darker than the basal segments; abdominal

setae very small, pale. Male hypopygium (fig. 24) with the tergite, *t*, unusually glabrous, the setae microscopic; posterior border with two broad subacute lobes that are separated by a broad V-shaped emargination, at its base with a very small elevation. Basistyle, *b*, with outer apical angle produced into a flattened blade, inner angle bearing a rounded lobe with long yellow setae. Dististyle, *d*, single, with no differentiated outer style, its position indicated by a small lobe basad of the lower beak; inner style as shown, dorsal crest elongate, very low; outer basal lobe a long blackened rod, near its apex with a strong spine with a further low protuberance at near mid-length. Phallosome, *p*, as in the subgenus, the gonapophyses virtually lacking, represented by microscopic basal plates. Eighth sternite, *8s*, with outer lobes relatively broad, the lateral margins with long yellow setae.

Holotype. — ♂, Lifakpo, Kameng, North East Frontier Agency, Assam, 3100 feet, May 15, 1961 (Schmid). *Paratopotype*, one ♂, May 29, 1961.

I am pleased to name this fly for Mr. D. Bagchi, entomological artist who provided outstanding illustrations for Brunetti's studies on the Indian Tipuloidea (1912-1918). In an early paper (*Insecutor Inscitiae Menstruus*, 1: 118-120, 1913) I had commented on the high quality and accuracy of Bagchi's drawings.

Tipula (*Ramatipula*) *bagchiana* is most similar to *T. (R.) kuntzeana* n. sp. and *T. (R.) podana* n. sp., differing evidently in hypopygial structure, especially of the dististyle. The otherwise very different *T. (R.) oreoctistes* Alexander, of South India, similarly has no differentiated outer dististyle.

***Tipula* (*Ramatipula*) *kuntzeana* n. sp.**

Size relatively large (wing of male 15 mm); general coloration of mesonotum orange, pleura more yellowed; antennae with flagellar segments beyond the first black; wings light brown, prearcular field and cell *Sc* more yellowed, cell *1st M₂* small, pentagonal; abdomen fulvous orange, segments seven and eight brownish black to form a narrow ring; male hypopygium with tergal lobes blackened, outer dististyle distinct but very small, inner style large and complex, the outer basal lobe with three major spines, eighth sternite with the lobes relatively narrow.

Male. — Length about 15 mm; wing 15 mm; antenna about 4.1 mm.

Frontal prolongation of head light yellow above, lower half infuscated; nasus elongate, obscure yellow, tipped with long black setae; palpi light brown. Antennae with proximal three segments light yellow, remainder black; flagellar segments with poorly developed basal enlargements, exceeding their verticils in length. Head restrictedly light yellow anteriorly and

on orbits, vertex dull orange.

Pronotal scutum above light brown, sides and the scutellum light yellow. Mesonotum almost uniformly orange, the praescutal stripes only slightly differentiated from the ground, vaguely separated by a capillary darker line; notal vestiture virtually lacking on praescutum, light yellow and more evident behind, longest on the mediotergite. Pleura yellow. Halteres with stem obscure yellow, brighter at base, knob infuscated. Legs with coxae and trochanters light yellow; remainder of legs light brown, femoral bases restrictedly yellowed; claws of male with a conspicuous tooth. Wings (fig. 9) tinged with light brown, prearcular field and cell *Sc* more yellowed, cell *Sc* light brown, stigma medium brown; veins dark brown, slightly paler in the brightened fields. Abundant trichia on longitudinal veins beyond cord, basad of this on *Rs* and on outer ends of all primary veins excepting basal section of *Cu*₁. Venation: *Rs* almost twice *m-cu*; cell *M*₁ about one-half longer than its petiole; cell 1st *M*₂ small, pentagonal.

Abdomen fulvous orange, segments seven and eight brownish black to form a narrow ring, segments with dense short yellow setae; hypopygium, including outer end of eighth sternite, yellowed, the outer organs blackened. Male hypopygium (figs. 25, 26) with the ninth tergite, *t*, produced apically into two broad blackened blades, as figured, these separated by a subequal emargination. Basistyle, *b*, produced at apex. Dististyles, *d*, with outer style very small but distinct, not fused with the inner style as in various allied species; inner style very large, including the broad beak and lower beak; dorsal and posterior crests conspicuous, both with abundant microscopic linear areas arranged in rows; outer basal lobe very large, bearing three major spines, one subbasal, the short outer spine with a small point near base, all spines with long delicate pale setae. Phallosome without developed apophyses. Eighth sternite, *8s*, with terminal lobes relatively narrow, apex and outer margin of each with very long yellow setae, the longest nearly equal in length to the lobes.

Holotype. — ♂, Ankaleng, Kameng, North East Frontier Agency, Assam, 2100 feet, May 26, 1961 (Schmid).

The species is dedicated to Albert Kuntze (1842-1933), a German worker on the European Tipulidae, with important papers published in 1914 and 1920.

Other members of the subgenus that have the outer dististyle of the male hypopygium distinct and unfused with the inner style include *Tipula* (*Ramatipula*) *bangerterana* Alexander, *T. (R.) bilobula* Alexander, and *T. (R.) pierreana* Alexander, all differing from one another principally in hypopygial structure, having the outer dististyle much larger, basal in position, and entirely distinct from the inner style, differing further in all details of the tergite,

inner style and eighth sternite. The rows of abundant microscopic areas on the inner style of the present fly are noteworthy.

Tipula (Ramatipula) podana n. sp.

Size relatively large (wing of male 18 mm); general coloration of thorax yellow, praescutum with four conspicuous dark brown stripes, scutal lobes less clearly patterned; antennal flagellum bicolored; wings very pale brown, prearcular and costal fields strongly yellowed, stigma pale brownish yellow; abdomen yellow, tergites with three brown stripes, darker and more clearly defined in the female, outer segments blackened; male hypopygium with no differentiated outer dististyle, inner style with the outer basal lobe relatively small, with two unequal black spines; eighth sternite with terminal blades broad, with relatively few long setae.

Male. — Length about 17 mm; wing 18 mm; antenna about 5 mm.

Female. — Length about 22 mm; wing 20 mm.

Frontal prolongation of head brownish yellow, including the long nasus, laterally with a narrow brown line that extends caudad almost to the eye; palpi with proximal two segments brownish yellow, remainder brownish black. Antennae with proximal three segments light yellow, succeeding segments bicolored, the small basal enlargements dark brown, remainder yellow, the bicolored nature persisting to the terminal segment; longest verticils subequal to the segments. Head with vertical tubercle, occiput and the narrow orbits buffy yellow, remainder of vertex brownish gray, clearer laterally.

Cervical region and pronotal scutum broadly brownish black, sides light yellow, scutellum yellow. Mesonotal praescutum obscure yellow, with four conspicuous entire dark brown stripes, the intermediate pair confluent at anterior end; posterior sclerites of notum yellowed, each scutal lobe with two pale brown areas; mesonotal vestiture short and sparse, yellow. Pleura yellow, dorsopleural region light yellow. Halteres with stem yellow, knob dark brown. Legs with coxae and trochanters yellow; femora brown, bases narrowly yellow, tips brownish black; tibiae brown, tips narrowly more darkened, tarsi brownish black; claws of male small with a strong spine. Wings very pale brown, prearcular and costal fields strongly yellowed, especially cell *Sc*, stigma pale brownish yellow; oblitative areas before stigma and in cell *1st M*₂ small and inconspicuous; veins dark brown, yellow in the brightened fields. Veins of outer two-thirds of wing with conspicuous black trichia, lacking on about the proximal half of *M* and *Cu*₁, more extensive on Anal veins. Venation: *Rs* nearly twice *m-cu*; petiole of cell *M*₁ about twice *m*; cell *1st M*₂ small, pentagonal.

Abdomen yellowed, tergites with three brown stripes, the central one narrow in male, in female more blackened and conspicuous; outer three segments in male blackened, in female the subterminal two segments black. Ovipositor with cerci long and slender, straight, hypovalvae stouter. Male

hypopygium (fig. 27) with the lobes of tergite, *t*, broadly acute at tips, basally on lower surface with a dark brown flange. Basistyle, *b*, with apical lobe broad. Dististyle, *d*, with outer style completely united with the lower projection of the inner style; outer basal lobe relatively small, with two unequal black spines and an additional microscopic blackened point. Phallosome, *p*, stout, gonapophyses appearing as reduced oval plates at base. Eighth sternite, *8s*, with outer lobes broad, their lateral margins with relatively few setae, the more basal ones longer.

Holotype. — ♂, Dirang Dzong, Kameng, North East Frontier Agency, Assam, 5300 feet, July 19, 1961 (Schmid). *Allotopotype*, a broken ♀, pinned with type.

The species is named for Nicolaus Poda von Neuhaus (1723-1798), a contemporary of Linnaeus and Fabricius. In 1761 Poda described *Tipula (Acutipula) maxima*, one of the most conspicuous of the European species of the genus.

Other species of the subgenus having the outer dististyle of the hypopygium completely united with the inner style include *Tipula (Ramatipula) bagchiana* n. sp., *T. (R.) octacantha* Alexander, and *T. (R.) oreoctistes* Alexander, all quite distinct in hypopygial structure, especially the outer basal lobe of the dististyle.

Tipula (Schummelia) eggeriana n. sp.

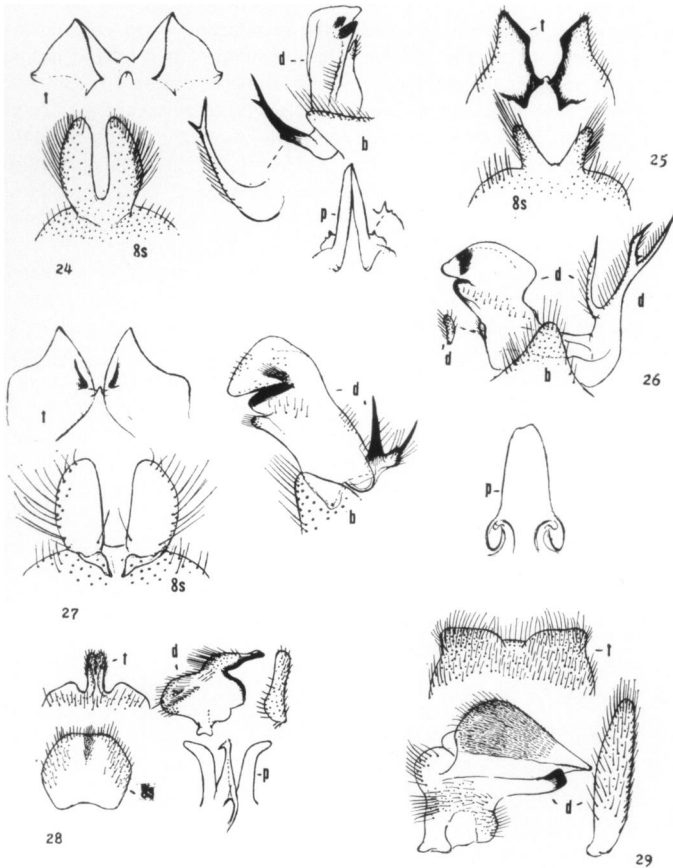
Allied to *pagastiana*, differing chiefly in hypopygial structure; antennae of male longer; male hypopygium with lobe of ninth tergite narrow, the setae relatively short; inner dististyle with the marginal enlargement at base of beak low; gonapophyses appearing as pale blades shaped like a boomerang, apices not enlarged.

Male. — Length about 11 mm; wing 11.5 mm; antenna about 4 mm.

Female. — Length about 12 mm; wing 11.5 mm.

Frontal prolongation of head short, yellow, the small nasus concolorous; palpi with first and fourth segments brownish black, the intermediate ones paler. Antennae of male relatively long, as shown by the measurements; scape and pedicel yellow, first flagellar segment brownish yellow, succeeding segments brownish black, longer than their verticils, basal enlargements small. Head dark orange, posterior vertex on either side with a pale brown cloud.

Pronotum yellow medially, weakly darkened on sides. Mesonotal praescutum with the ground very pale brownish yellow with four scarcely differentiated more yellowed stripes, anterior border narrowly brown; scutum yellowed medially, lobes pale brown, each with two more yellowed confluent areas; scutellum obscure yellow, parascutella darker; postnotum yellow; vestiture of scutellum and mediotergite blackened, sparse, but relatively



Text-figs. 24-29. — Fig. 24, *Tipula* (*Ramatipula*) *bagchiana* n. sp., male hypopygium; Figs. 25, 26, *Tipula* (*Ramatipula*) *kuntzeana* n. sp., male hypopygium; Fig. 27, *Tipula* (*Ramatipula*) *podana* n. sp., male hypopygium; Fig. 28, *Tipula* (*Schummelia*) *eggeriana* n. sp., male hypopygium; Fig. 29, *Tipula* (*Schummelia*) *hennigiana* n. sp., male hypopygium.

Symbols: *b*, basistyle; *d*, dististyle; *p*, phallosome; *s*, sternite; *t*, tergite.

long and conspicuous. Pleura orange yellow. Halteres with stem light brown, base more yellowed, knob brown at base, apex vaguely brightened. Legs with coxae and trochanters yellow; femora yellowed basally, becoming yellowish brown, tips narrowly darker; tibiae and tarsi brownish black to black; claws simple. Wings light brown, restrictedly patterned with slightly

darker brown and pale yellow, prearcular and costal fields light yellow, stigma long-oval, dark brown; medium brown seams over cord and outer end of vein *M*; obliterative areas before and beyond stigma and across cell *1st M*₂ into base of *M*₃; a paler yellow area along posterior border of cell *M* adjoining vein *Cu*; veins brown, pale in the obliterative areas. Venation: *Rs* short, straight, slightly more than one-half *m-cu*, the latter close to fork of *M*; cell *M*₁ deep, four to five times its petiole.

Abdominal tergites brownish yellow, posterior and lateral borders narrowly black; sternites yellowed, eighth sternite infuscated, the base and paired subapical spots more yellowed; hypopygium brownish black, styli pale. Male hypopygium (fig. 28) with the median area of posterior border of tergite, *t*, produced into a narrow parallel-sided blade, apex truncate or weakly emarginate, outer half with numerous relatively short setae, lateral margins of blade inrolled. Mesal face of ninth sternite with numerous long black setae, the latter with a small pencil of still longer setae. Outer dististyle, *d*, relatively short, its length about five times the breadth, setae relatively short; inner style with beak long-produced, blackened, outer face at base with a concentration of long black setae; outer basal lobe large, with similar black setae, including a marginal group arising from very large pale basal punctures. Phallosome, *p*, with apex of aedeagus produced into a slightly recurved spine; gonapophyses as boomerang-shaped pale blades, sides parallel, narrowed very gradually to the obtuse tip. Eighth sternite, *8s*, extensive, posterior border subtruncate, with three concentrations of setae, the lateral groups more diffuse, the central area crowded, linear.

Holotype. — ♂, Shergaon, Kameng, North East Frontier Agency, Assam, 6300 feet, May 7, 1961 (Schmid). *Allotopotype*, ♀, pinned with type. *Paratopotypes*, one ♂, one ♀.

Named for Johann Georg Egger (1804-1866), Austrian student of the European Diptera, including the Tipulidae.

The most nearly related species is *Tipula* (*Schummelia*) *pagastiana* Alexander, of Sikkim, readily told by the hypopygial characters, including especially the tergite, inner dististyle and gonapophyses. Other more distantly allied regional members of the subgenus include *T. (S.) dravidiana* Alexander, *T. (S.) lindneriana* Alexander, and *T. (S.) modica* Alexander.

Tipula (*Schummelia*) *hennigiana* n. sp.

Size medium (wing of male 15 mm); mesonotal praescutum light brown with four virtually concolorous stripes that are bordered by slightly darker brown, pleura light yellow; antennal flagellum black; legs brown, claws of male simple; wings faintly infuscated, stigma dark brown, veins beyond cord vaguely seamed with pale brown; male hypopygium with posterior border

of tergite nearly truncate, the usual lobes very low, provided with abundant long dark setae; inner dististyle with beak pointed, surface of body of style with dense yellow setulae.

Male. — Length about 13 mm; wing 15 mm; antenna about 4 mm.

Frontal prolongation of head brownish yellow, nasus elongate; palpi light brown, tip of terminal segment blackened. Antennae with scape and pedicel light yellow, flagellum black; longest verticils slightly exceeding the segments. Front and anterior vertex pale brown, heavily whitened to appear silvery, remainder of head dark brown.

Pronotal scutum light brown medially, remainder of pronotum and the propleura clear light yellow. Mesonotal praescutum with the ground light brown, disk with four virtually concolorous stripes that are distinguished chiefly by the slightly darker borders, the intermediate pair with a capillary chestnut line on anterior half, humeral area light yellow, the light brown interspaces united behind the central stripes, the extreme border at the suture orange; scutum almost uniformly dark brown, including the central area; scutellum brown, parascutella yellow, its center darkened; mediotergite brown, posterior border broadly yellow, pleurotergite light brown, cephalic half of katapleurotergite yellowed; vestiture of praescutum sparse and weak, sides of scutal lobes with setae black, scutellum and mediotergite with abundant long erect whitened setae. Pleura light yellow. Halteres broken. Legs with coxae and trochanters light yellow; remainder of legs brown, femoral bases narrowly yellowed; claws of male small, simple. Wings (fig. 10) faintly infuscated, stigma long-oval, dark brown, cell *Sc* paler brown, vein *Cu* and veins beyond cord vaguely seamed with pale brown; veins brown. All longitudinal veins with abundant small trichia virtually to the arculus, not quite reaching this on *M* and *Cu* and more extensively on *2nd A*; similar trichia on *m* and sparsely on *m-cu*. Venation: *Rs* relatively long, about one-third longer than the only slightly oblique *m-cu*; cell *M*₁ deep, its petiole about one-half *m*.

Abdominal tergites brown, sternites paler; segments with abundant long dark setae, especially the tergites, including the ninth segment. Male hypopygium (fig. 29) with the tergite, *t*, transverse, posterior border nearly truncate, the usual lobes very low; surface with abundant setae from conspicuous punctures. Outer dististyle, *d*, about four and one-half times as long as the greatest diameter; inner style with beak pointed, lower beak very obtuse; region of outer basal lobe and posterior crest produced into rounded lobes, the former with long coarse setae; body of style behind the beak with dense yellow setulae.

Holotype. — ♂, Jhum La, Kameng, North East Frontier Agency, Assam, 7800 feet, May 13, 1961 (Schmid).

The species is named for Willi Hennig, distinguished student of the higher Diptera and the immature stages of the entire order,

including the Tipulidae and associated families. His most important work on this latter subject is *Die Larvenformen der Dipteren*, 3 parts, 1948-1952.

In its general appearance *Tipula* (*Schummelia*) *hennigiana* suggests *T. (S.) continuata* Brunetti, *T. (S.) xanthopleura* Edwards, and some others but is quite distinct in the details of coloration and especially in the hypopygium.

***Tipula* (*Schummelia*) *schranskiana* n. sp.**

Size medium (wing of male about 10 mm); mesonotal praescutum pale orange brown, with four more yellowed stripes, pleura yellow; antennal flagellum black; legs black, femoral bases yellowed; wings suffused with brown, stigma long-oval, dark brown, *m-cu* long, placed at fork of *M*; male hypopygium with posterior border of tergite produced into a rectangular lobe, the outer lateral margins with sparse stiff setae.

Male. — Length about 10 mm; wing 10.3 mm.

Frontal prolongation of head obscure yellow, nasus small, concolorous; proximal two segments of palpi brown, third yellow, terminal segment darkened outwardly. Antennae of male relatively long, outer part broken but evidently the organ nearly one-half the body; scape and pedicel yellow, flagellum black; flagellar segments beyond the first with very small basal enlargements, exceeding the verticils. Front yellow; anterior vertex dull orange, behind the low tubercle becoming brownish gray, central region of occiput yellowed.

Pronotal scutum brownish yellow, darker anteriorly; scutellum yellow. Mesonotal praescutum with the ground very pale orange brown, disk with four more yellowed stripes that are poorly evident; scutal lobes similarly orange brown, median area obscure yellow; scutellum and mediotergite brownish yellow, the latter clearer yellow medially; notal vestiture pale but relatively conspicuous, longest on the mediotergite. Pleura yellow. Halteres with stem brownish yellow, slightly more brightened at base, knob infuscated. Legs with coxae and trochanters yellow; femora yellow basally, darker outwardly, the tips brownish black; tibiae and tarsi black; claws of male simple. Wings (fig. 11) strongly suffused with brown, prearcular and costal fields yellowed; stigma long-oval, dark brown; narrow darker brown seams over *m-cu* and vein *Cu*; small but conspicuous yellow areas before and beyond stigma and in extreme base of cell *M*₃ and adjacent cells; veins brown, brighter in the yellowed areas. Venation: *Rs* straight, about three-fourths *R*₂₊₃; cell *M*₁ deep, nearly four times its petiole; *m* short, *m-cu* long, placed at fork of *M*.

Abdominal tergites chiefly dark brown, sternites more yellowed, outer segments blackened, styli yellowed. Male hypopygium (fig. 30) with posterior border of tergite, *t*, convexly rounded, the central area farther produced into a rectangular lobe, its outer end subtruncate, with vague indications of

a shallow median notch, lateral margins with very sparse stiff setae, the small lateral shoulders separated from the central lobe by narrow emarginations. Outer dististyle, *d*, short, tip obtuse, broadest across base where it is nearly one-third the length; inner style flattened, with a narrow blackened beak, lower beak very obtuse; posterior end of style with about a dozen large circular pores. Phallosome, *p*, with apophyses very broad.

Holotype. — ♂, Pemayangtse, Sikkim, 5600 feet, April 27, 1959 (Schmid).

Named for Franz von Paula Schrank (1747-1835), early student of the Bavarian fauna, including the Tipulidae (1776, 1803).

There are several species of the subgenus that have the tergite of the male hypopygium produced, most with the apex of this lobe provided with long conspicuous setae. Only a few species have this structure virtually glabrous, as in the present fly, these including *Tipula* (*Schummelia*) *dravidiana* Alexander, of South India, and *T. (S.) vocator* Alexander, of Assam and Thailand. These differ from the present fly in the structure of this lobe and in other hypopygial characters. Both of the above listed species have the circular pale pores near the posterior end of the inner dististyle but they are smaller and fewer in number than in the present fly.

***Tipula* (*Sinotipula*) *curtisiana* n. sp.**

Allied and similar to *savtchenkoana*; size very large (wing of male about 28 mm); general coloration of thorax brownish gray, praescutum with four stripes; legs reddish yellow, tarsi blackened; wings conspicuously marbled with grayish brown, darker brown, and yellow; abdomen cinnamon brown; male hypopygium with the dististyles differing from those of *savtchenkoana*, the outer style having the beak very stout.

Male. — Length about 27-28 mm; wing 27-28 mm; antenna about 5-5.2 mm.

Female. — Length about 32 mm; wing 31 mm; antenna about 4.5 mm.

Frontal prolongation of head long, nearly equal in length to the remainder, without a nasus; dark brown above and on sides, variegated longitudinally with paler brown; palpi dark brown, incisures restrictedly paler, terminal segment black. Antennae relatively long; scape light brown, remainder yellow; basal enlargements of flagellar segments small, verticils very long, the longest about one-third greater than the segment. Head above dark brown, orbits paler; occiput behind still darker brown.

Cervical region light brown above, dark brown on sides. Pronotal scutum brownish gray medially, paler on sides, scutellum light brown. Mesonotal praescutum with the ground light brown, the interspaces narrowly light

gray, provided with long pale setae; disk with four stripes that are slightly darker than the ground and are bordered narrowly by still darker, including also the lateral margins of the sclerite; scutum with ground light gray, each lobe with center obscure brownish yellow bordered anteriorly and mesally by darker brown; scutellum brownish gray with a paler central line, parascutella brown; mediotergite brownish gray, on either side of the midline with a brown area, posterior third with paired brown spots; pleurotergite with anapleurotergite light brown, sparsely pruinose, katapleurotergite dark brown, its dorsal face pruinose; setae of scutellum, mediotergite and posterior angles of scutal lobes yellow, very long and conspicuous. Pleura cinnamon brown, patterned on dorsal sternopleurite and anepisternum with darker brown, dorsopleural membrane paler. Halteres with stem pale yellow, knob dark brown. Legs with coxae reddish brown, their anterior faces darker; trochanters reddish brown; remainder of legs reddish yellow, tarsi blackened, the proximal third to half of basitarsi reddish yellow; vestiture of legs very abundant but microscopic and inconspicuous; claw of male with an obtuse basal tooth. Wings attractively patterned with grayish brown, darker brown, and pale yellow, the last areas narrow and forming a zigzag pattern, especially in the cubital and anal cells; outer half of cell *M* gray, narrowly brown near vein *Cu*, with a pale yellow line at near midlength and again in outer end of cell; at wing-tip a more whitened V-shaped mark, extending from vein *R*₅ across the cell, thence extended outwardly to wing tip in cell *R*₅, the point of the V in the latter cell; the darkest brown markings are in the vicinity of the arculus, origin of *R*₅, and as a series of marginal spots in outer radial and medial cells, alternating with whitened areas; veins clear light yellow. Macrotrichia on veins *R*₃, *R*₄₊₅, *M*₁ and sparsely on *M*₂; basad of cord with trichia on outer ends of *R*₅ and *M*, distal section of *Cu*₁, and vein 2nd *A*. Venation: In the holotype, *R*₁ before outer fork of Radius, obliterating *R*₂, in other specimens the latter element persists as a very short vein; *m-cu* variable in position, from shortly before end of *M*₃₊₄ to extreme base of *M*₄.

Abdominal tergites cinnamon brown, posterior and lateral borders narrowly more yellowed, the margins of basal rings darkened to produce small spots, sternites chiefly cinnamon brown. Ovipositor with cerci relatively short, straight, tip obtuse. Male hypopygium (fig. 31) much as *savtshenkoana*, differing especially in the structure of the dististyles. Ninth tergite, *t*, with posterior border convexly rounded, the median region farther produced into a rectangular plate, its apex divided into two small points; in cases the extension is directed outwardly, as shown, in others bent backward and not visible from above, the convex outer surface of the plate with numerous long setae, the longer ones darkened and more conspicuous at the midline, the lateral setae long, yellow. Outer dististyle, *d*, shaped somewhat like the head of a gull, the beak very stout, as compared with *savtshenkoana*, the flattened dark colored blade at its base larger and broader; an almost continuous row of small blackened peg-like setae along dorsal part of beak,

region of dorsal crest convexly rounded, provided with abundant small yellow setae; inner style smaller, irregular in outline and having different appearances in various positions.

Holotype. — ♂, Talung Dzong, Kameng, North East Frontier Agency, Assam, 7600 feet, June 5, 1961 (Schmid). *Allotopotype*, ♀, May 12, 1961. *Paratype*, ♂, Jhum La, Kameng, 7800 feet, May 14, 1961 (Schmid).

The species is dedicated to John Curtis (1791-1862), outstanding pioneer student of the insects of Great Britain, including the Tipulidae.

The most similar species is *Tipula (Sinotipula) savtchenkoana* Alexander (*savtshenkoi* Alexander, 1961, name preoccupied), a smaller fly with the hypopygial details distinct, especially both dististyles.

***Tipula (Sinotipula) staegeriana* n. sp.**

Size large (wing of male 24 mm); general coloration of thorax and abdomen brown, praescutum with three poorly indicated brownish yellow stripes; antennal flagellum brownish black; legs brownish yellow, darker outwardly; wings broad, light brown, the prearcular and costal fields yellowed, restrictedly patterned with dark brown and abundant pale yellow areas; male hypopygium with posterior border of tergite thickened, produced medially into a reflexed median lobe; eighth sternite with posterior border nearly truncate, fringed with short inconspicuous setae.

Male. — Length about 27 mm; wing 24 mm; antenna about 6 mm.

Frontal prolongation of head darkened, slightly longer than the remainder, sloping gradually to the vertex, nasus lacking, chestnut brown above, slightly more yellowed below; palpi with proximal two segments brown, third brownish yellow, last blackened, all with conspicuous erect setae. Antennae with scape brownish yellow, pedicel yellow, flagellum brownish black; flagellar segments with small basal enlargements, verticils much longer than the segments. Head chestnut brown, the high vertical tubercle darker brown behind, sparsely pruinose anteriorly; space between the antennae pale, with a darkened central line.

Pronotum brown, sides of scutum paler. Mesonotal praescutum with disk virtually covered by three brownish yellow stripes that are narrowly bordered by darker brown, the dividing interspaces scarcely differentiated, humeral and lateral borders dark brown; scutal lobes dark brown, each with two confluent brownish yellow central areas, median region gray pruinose; scutellum and mediotergite dark brown with a capillary pale central line; pleurotergite dark brown, elevated part of katapleurotergite more blackened; mesonotal vestiture relatively conspicuous, longest on scutellum. Pleura

brown, dorsal sternopleurite narrowly darker brown. Halteres with stem light yellow, knob dark brown. Legs with coxae dark brown, sparsely pruinose apically; trochanters brownish yellow; femora brownish yellow, with indications of a narrow subterminal darker brown ring; tibiae and proximal end of basitarsi brownish yellow, remainder of tarsi brownish black to black; claws of male long and slender, with a small subbasal tooth. Wings broad, light brown, more yellowed in the prearcular and costal fields, the small oval stigma and an area at origin of *Rs* dark brown; a relatively abundant light yellow pattern, including marks before and beyond origin of *Rs*, a semicircular area at near basal third, extending backward from vein *M*, involving cells *M*, *Cu* and the Anals; beyond cord with small yellow spots in bases of outer radial cells and a V-shaped apical mark in cells *R*₁ and *R*₂; small clearly defined marginal spots in centers of cells *M*₁ through *M*₄, two in cell 1st *A*, one in 2nd *A*, lacking in cell *Cu*; a comparable group of five pale diffuse areas centering in cell 1st *M*₂, involving cells *R*₁, *M*₁, *M*₂ and *M*₃; veins yellow, even in the darkened parts. Venation: *Rs* longer than *m-cu*; *R*₂ preserved as a short perpendicular element; petiole of cell *M*₁ subequal to *m*; *m-cu* close to fork of *M*₃₊₄.

Abdomen chestnut brown, lateral borders of both tergites and sternites narrowly blackened, posterior margins more narrowly paler brown. Male hypopygium (fig. 32) with the tergite, *t*, transverse, posterior border thickened and reflexed, especially the central produced part which lies on the ventral surface of the plate; posterior end with dense erect setae, including two intermediate groups of short blackened bristles. Dististyles, *d*, shaped about as figured, both folded longitudinally and their outlines appearing to be variable in different positions. Eighth sternite, *8s*, transverse, relatively short as compared to the breadth, posterior border nearly truncate, fringed with short inconspicuous setae.

Holotype. — ♂, Bomdi La, Kameng, North East Frontier Agency, Assam, 8800 feet, June 19, 1961 (Schmid).

Named for Rasmus Carl Staeger (1800-1875), student of the Danish Diptera, including the Tipulidae (1840).⁵

Other generally similar members of the subgenus having the wing pattern somewhat as in the present fly include *Tipula* (*Sinotipula*) *curtisiana* n. sp., *T. (S.) oenone* Alexander, *T. (S.) tibetana* de Meijere, and a few other less similar species, all best distinguished among themselves by details of the wing pattern and the structure of the hypopygium.

***Tipula* (*Tipulodina*) *zetterstedtiana* n. sp.**

Belongs to the *pedata* group, allied to *monozona*; size large (wing of

⁵ Nielsen, Peder, Vidensk. Medd. fra Dansk naturh. Foren., 74: 203-205, 3 figs., 1922.

male to 20 mm); antennae relatively long, scape and pedicel light yellow; femora brownish yellow, tips broadly black, tibiae brownish black, posterior pair with a broad dirty white subbasal ring; wings whitened, patterned with pale brown, including the broad wing tip and a major cloud at midlength of cell *M* that does not include cell *R*; male hypopygium with dorsal crest of inner dististyle very high, rounded, bent slightly backward, its vestiture very sparse, lacking on nearly the outer half.

Male. — Length about 19-22 mm; wing 17-20 mm; antenna about 4.5-5.8 mm.

Frontal prolongation of head above orange yellow, sparsely pruinose, sides infuscated, beneath light yellow, nasus long, orange; palpi brown, terminal segment light orange, incisures pale. Antennae with scape and pedicel light yellow, flagellum black, the microscopic terminal segment yellowed; segments exceeding their verticils, basal enlargements small. Front and anterior vertex light yellow, orbits, genae and occiput darker yellow, posterior vertex infuscated, especially medially.

Pronotum light yellow, scutum narrowly dark brown medially. Mesonotal praescutum grayish yellow with four light brown stripes, the intermediate pair on more than anterior half separated by a capillary dark brown vitta; scutum grayish yellow, each lobe with two large brownish gray areas, the larger more posterior one with the mesal border darker; scutellum brownish gray, darker on central part, parascutella yellowed; mediotergite gray on sides and behind, the disk darker, pleurotergite with anapleurotergite gray, katapleurotergite yellow. Pleura yellow, including the dorsopleural membrane. Halteres with stem yellow, knob brown, its apex brownish yellow. Legs with all coxae and trochanters yellow; femora brownish yellow, tips broadly black, fore and middle tibiae and tarsi brownish black; posterior tibiae brownish black with a broad dirty white subbasal ring, about three to four times as extensive as the darkened base; claws of male simple. Wings with the ground whitened, patterned with pale brown, the stigma and a confluent cloud over anterior cord darker brown; the paler brown areas include a major cloud at midlength of cell *M*, the broad posterior cord and a large area in outer radial field that includes parts of cells *R*₂, *R*₃ and *R*₄, in the two latter involving more than the outer half of cells; cell *R* with slight indications of a pale brown central cloud over virtually the whole length; outer medial veins very narrowly seamed with brown; veins dark brown to brownish black. Venation: *Rs* and *m-cu* subequal in length, the latter at near three-fourths *M*₃₊₄; cell 2nd *A* narrow.

Abdominal tergites obscure yellow on sides, more infuscated medially, on the third and succeeding segments forming a narrow stripe; sternites yellowed; outer segments more uniformly brownish black. Male hypopygium (fig. 33) with the tergite, *t*, transverse, posterior border gently emarginate, the outer lateral lobes blackened, with abundant coarse black setae; no median shield-shaped area as in *monozona*. Outer dististyle, *d*, very broad, apex rounded, pale in color and limits difficult to determine in slide mounts;

inner style with beak relatively small; dorsal crest very high, rounded in outline, bent slightly backward instead of forward, as in *monozona*; vestiture of crest very sparse, lacking on nearly the outer half, setae small, pale, directed laterad; lower beak very low, apex truncate; region of posterior crest a stout curved lobe, the apex pointed; outer basal lobe a long slender pale rod that narrows gradually into a long black spine, with long yellow setae near base, the row continued along face of rod as a dense crest.

In *monozona* (fig. 34) the dorsal crest of the inner dististyle, *d*, has numerous long yellow setae over the entire outer two-thirds.

Holotype. — ♂, Nyukmadong, Kameng, North East Frontier Agency, Assam, 6600 feet, April 18, 1961 (Schmid). *Paratype*, ♂, Domkho, Kameng, 6500 feet, June 8, 1961, (Schmid).

The species is dedicated to Johann Wilhelm Zetterstedt (1785-1874), outstanding student of the Diptera of Scandinavia. His most important works were the *Insecta Lapponica* (1838-1840) and *Diptera Scandinaviae*; 14 volumes (1842-1860), pp. 5709, not 6609, as sometimes recorded.

The most similar regional species is *Tipula* (*Tipulodina*) *monozona* Edwards, presently known from Sikkim and the Naga Hills, Assam. This agrees with the present fly in the restricted white pattern of the legs, differing in the coloration of the wings and especially in the structure of the hypopygium (fig. 34). In materials of *monozona* before me the darkened area in cell *M* of the wings extends also into cell *R*, broadly reaching vein *R*, while the paler brown stigma is shorter and broader than in the present fly.

***Tipula* (*Vestiplex*) *hugueniniana* n. sp.**

Mesonotal praescutum obscure yellow with four brown stripes, the lateral pair darker; antennae relatively long, flagellar segments bicolored; femora brown, tips darkened, subterminal brightening barely indicated; wings very pale brown, inconspicuously patterned with darker brown and pale yellow areas; abdomen fulvous orange, outer segments only slightly darker; male hypopygium with dorsal tergal lobes relatively slender, with short setae, ventral lobes small; basistyle with two unequal spines; appendage of ninth sternite a straight slender rod from a dilated base; inner dististyle with lower beak long and slender; aedeagus narrow, without lateral shoulders.

Male. — Length about 17-18 mm; wing 18-20 mm; antenna about 4.7-5 mm.

Frontal prolongation of head fulvous, narrowly more yellowed above, including the long nasus, dorsally with long yellow setae; palpi obscure yellow to pale brownish yellow, incisures yellowed, terminal segment dark brown. Antennae relatively long; proximal three segments yellow, succeed-

ing segments bicolored, basal enlargements brownish black, remainder obscure yellow, the bicolored nature persisting to the minute terminal segment; longest verticils slightly exceeding the segments. Head buffy yellow, vertex with a capillary brownish black central line, sides of posterior vertex with darkened setae.

Pronotal scutum obscure yellow, with three pale brown areas. Mesonotal praescutum obscure yellow with four brown stripes, the intermediate pair paler brown, especially anteriorly, separated by a capillary darker brown stripe, the lateral areas darker brown, narrowly bordered by gray; scutum yellow, each lobe with two brown markings; scutellum and postnotum yellow with a narrow pale brown central vitta; vestiture yellow, long and conspicuous on scutellum and mediotergite. Pleura obscure yellow, vaguely patterned with darker on ventral sternopleurite, dorsopleural membrane slightly more buffy. Halteres with stem and apex of knob yellowed, base of the latter brownish black. Legs with coxae and trochanters yellow; femora yellow basally, passing into brown, darkest at tip, preceded by a very vague to scarcely evident more yellowed ring; tibiae and tarsi brownish black; claws of male slender, toothed. Wings with ground very pale brown, inconspicuously patterned with darker brown and pale yellow areas, stigma dark brown; the darker markings include a postarcular spot in bases of cells *R* and *M*, others at origin of *Rs*, anterior cord, distal ends of outer radial cells, and along vein *Cu* near outer end of cell *M*; veins brown, more yellowed in the brightened fields. Venation: *Rs* more than one-half longer than *m-cu*; cell 1st *M*₂ pointed at both ends; *m-cu* shortly before fork of *M*₃₊₄.

Abdominal segments fulvous orange, tergites striped medially and less evidently on sides with brownish black; sternites more uniformly orange, outer segments only slightly darker. Male hypopygium (fig. 35) with dorsal lobes of tergite, *t*, relatively narrow, widely separated, the very short setae apical; ventral lobes relatively small, directed mesad, apex heavily blackened and microscopically corrugated. Basistyle, *b*, with two unequal spines, the outer very small, inner spine slender, tip black. Ninth sternite, *9s*, with appendage a long slender straight rod, only the extreme tip curved laterad into a short spine, base strongly dilated, margin of rod with scattered very long yellow setae almost throughout the length. Outer dististyle, *d*, elongate, nearly as long as the inner style, yellowed, with black setae; inner style with beak a large plate, narrowed to the subacute tip, lower beak long and slender; dorsal crest with long coarse setae, those near base and tip yellow, the coarse intermediate series darkened. Aedeagus, *a*, narrow, without lateral shoulders.

Holotype. — ♂, Nanga, Sikkim, 5000 feet, May 11, 1959 (Schmid). *Paratype*, ♂, Duldhar, Pauri Garhwal, Kumaon, 4500 feet, June 2, 1958 (Schmid).

The species is named for Gustav Huguenin (1840-1920), Swiss

entomologist, whose most important contribution to the taxonomy of the European crane flies was the family Tipulidae in his *Fauna insectorum helvetiae*, *Diptera*, pp. 1-73, 34 figs. (venation), 1880.

The regional species that have the male hypopygium most like that of the present fly are *Tipula (Vestiplex) gandharva* Alexander and *T. (V.) tuta* Alexander. The former has the tergal lobes and appendage of the ninth sternite differently constructed, a single stout spine on basistyle, and with the aedeagus very slender. The latter species differs from other regional members of *Vestiplex* in the almost unpatterned wings and from the present fly also in the short antennae with uniformly darkened flagellum, and in the details of the hypopygium, including the dorsal lobes of tergite, single spine of the basistyle, structure of the inner dististyle, and appendage of the eighth sternite. The last mentioned structure has the base dilated much as in the present fly but the setiferous accessory lobe is much smaller, with unusually sparse setae.

Tipula (Vestiplex) walkeriana n. sp.

Size above medium (wing of male about 17 mm); mesonotal praescutum grayish yellow with four light brown stripes; antennae of male relatively long, proximal three segments light yellow; femora brownish black with a conspicuous subterminal yellow ring; wings pale yellow, the dark pattern pale brown, inconspicuous; abdomen with proximal four segments orange, fifth bicolored, six to nine black; male hypopygium with dorsal tergal lobes heavily blackened, slender, ventral armature much larger, toothed; appendage of ninth sternite not dilated outwardly; basistyle with a single blackened obtuse lobe; inner dististyle with beak slender; aedeagus relatively broad, without lateral shoulders.

Male. — Length about 13-14 mm; wing 16-17.5 mm; antenna about 4.5-5 mm.

Frontal prolongation of head light yellow above, including the nasus, more infuscated on sides and beneath; palpi brown, terminal segment brownish black, the extreme tip dull orange. Antennae with proximal three segments light yellow, succeeding segments vaguely bicolored, the small basal enlargement brownish black, pedicels brown; verticils shorter than the segments. Head above yellow pollinose, vaguely patterned with brown on the genae; vertex with a capillary dark brown central line.

Pronotal scutum grayish yellow, vaguely patterned with darker, scutellum yellowed. Mesonotal praescutum grayish yellow with four light brown stripes, lateral borders behind the foveae restrictedly darkened; scutum gray, each lobe with two solidly brown areas; scutellum and mediotergite more yellowish gray, with a capillary brown central line; pleurotergite brownish

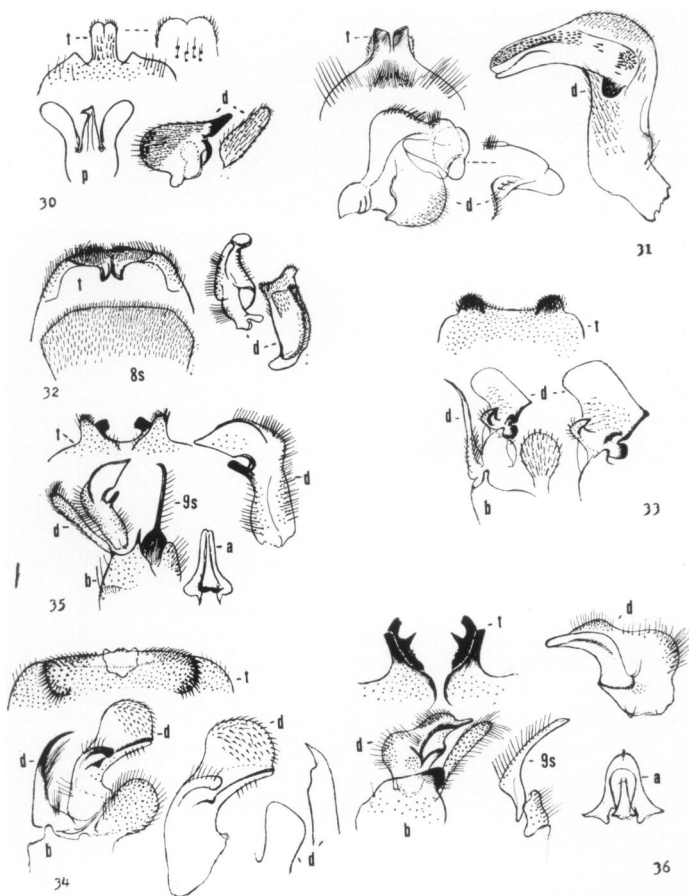
gray above, the katapleurotergite more yellowed. Pleura gray, more yellowed ventrally, including the lower sternopleurite, meron and metapleura; dorsopleural region obscure yellow. Halteres with stem yellowed, base of knob brownish black, apex obscure yellow. Legs with coxae and trochanters yellow; femora dark brown to brownish black, base narrowly yellowed, apex broadly brownish black, preceded by a conspicuous subequal yellow ring; tibiae and tarsi black; claws of male small, nearly simple, with a microscopic point near base. Wings with the ground pale yellow, prearcular and costal fields clear yellow; disk extensively but inconspicuously patterned with pale brown, basad of cord this subequal in amount to the ground, beyond cord including the broad apex; proximal ends of outer radial cells patterned with pale yellow, obliterative band across cell 1st M_2 more whitened; veins brown, more yellowed in the brightened fields. Venation: Rs slightly less than twice $m-cu$.

Abdomen with proximal four segments orange, fifth orange, variegated by brown at apex and sublaterally, outer segments black, including the small hypopygium. Male hypopygium (fig. 36) with the tergite, t , polished black, dorsal lobes slender, divergent, tips narrowly obtuse; ventral armature much more extensive, including a larger lower lobe bearing an acute spine near its base beneath the dorsal lobe; tergal vestiture short and relatively sparse, with no concentration of setae at the midline as in *acutergata*. Appendage of ninth sternite, $9s$, beyond base parallel-sided, not expanded outwardly, tip oblique, obtuse; margin with long yellow setae almost to apex. Basistyle, b , with a single heavily blackened marginal lobe, broad, apex obtusely rounded. Outer dististyle, d , relatively long, with long dark setae; inner style with beak slender, lower beak not produced; dorsal crest elevated, provided with numerous long setae; region of outer basal lobe rounded, with similar setae. Aedeagus, a , relatively broad, without lateral shoulders.

Holotype. — ♂, Tungnath, Pauri Garhwal, Kumaon, 9000 feet, June 1, 1958 (Schmid). *Allotopotype*, ♀, with the type. *Paratopotypes*, two ♂♂.

The species is named for Francis Walker (1809-1874), the most prolific describer of new species of insects, including many Oriental Tipulidae.

Other species of the subgenus with the male hypopygium somewhat as in the present fly, that is, with the dorsal tergal lobes narrow and the ventral tergal armature toothed, include *Tipula* (*Vestiplex*) *acutergata* Alexander, *T. (V.) eurydice* Alexander, *T. (V.) inaequidentata* Alexander, and more distantly *T. (V.) gandharva* Alexander, all differing among themselves in the details of hypopygial structure, including especially the tergite, appendage



Text-figs. 30-36. — Fig. 30, *Tipula (Schummelia) schrankiana* n. sp., male hypopygium; Fig. 31, *Tipula (Sinotipula) curtisiana* n. sp., male hypopygium; Fig. 32, *Tipula (Sinotipula) staegeriana* n. sp., male hypopygium; Fig. 33, *Tipula (Tipulodina) zetterstedtiana* n. sp., male hypopygium; Fig. 34, *Tipula (Tipulodina) monozona* Edwards, male hypopygium; Fig. 35, *Tipula (Vestiplex) hugueniniana* n. sp., male hypopygium; Fig. 36, *Tipula (Vestiplex) walkeriana* n. sp., male hypopygium.

Symbols: a, aedeagus; b, basistyle; d, dististyle; p, phallosome; s, sternite; t, tergite.

of the ninth sternite, armature of the basistyle, and the structure of the phallosome.

Tipula (Subgenus incertis) strobliana n. sp.

General coloration of thoracic dorsum light brown, pleura light yellow; terminal segment of palpus short; legs obscure yellow, outer tarsal segments light brown; wings obscure yellow, the anterior border, including the prearcular and costal fields, most of cell *R* and the outer radial cells brown; abdominal tergites brownish yellow, darker laterally.

Female. — Length about 14 mm; wing 14 mm; antenna about 3 mm.

Frontal prolongation of head above yellow, darker on lower half, nasus stout; palpi yellowish brown, terminal segment short, subequal in length to the penultimate. Antennae with proximal five segments yellow, intermediate segments weakly bicolored, yellow, with the scarcely developed basal enlargement slightly darker, outer segments more uniformly infuscated; verticils long, in female slightly less than the segments. Front obscure yellow, vertex dark brown, the posterior orbits very narrowly gray; vertical tubercle large, tumid, dull orange, the median area more depressed and slightly darkened.

Pronotal scutum light brown, paling to yellow on sides. Mesonotal praescutum almost uniformly light brown, the stripes scarcely differentiated; scutum slightly darker brown, each lobe with two vaguely more yellowed areas; scutellum and mediotergite light brown; praescutal setae small and sparse, those of scutellum and mediotergite longer. Pleura and katapleurotergite almost uniformly light yellow. Halteres with stem light brown, knob darker. Legs with all coxae and trochanters clear light yellow; femora and tibiae obscure yellow; tarsi yellowed basally, passing into light brown. Wings (fig. 12) with the ground obscure yellow, anterior fourth conspicuously brown, including the prearcular and costal fields, stigma, and virtually all of cells *R*₂ and *R*₃; cell *R* slightly paler brown, its posterior border more yellowed; very narrow brown seams over the cord, narrower on *m-cu*; conspicuous more yellowed areas before stigma and cord, including also the outer medial field; a restricted yellow post-stigmal spot in base of cell *R*₂; veins brown, slightly darker in the patterned areas. Veins in outer radial and medial fields with trichia, lacking on *R*₁₊₂ and *M*₄. Venation: *R*₅ longer than *m-cu*; cell *M*₁ slightly more widened on proximal half; *m-cu* at near three-fourths *M*₃₊₄.

Abdominal tergites dark brownish yellow, darker laterally, sternites yellow, chiefly concealed by the overlapping tergites. Ovipositor with valves light yellow; cerci straight, obtusely rounded.

Holotype. — ♀, Amatulla, Kameng, North East Frontier Agency, Assam, 1800 feet, May 24, 1961 (Schmid).

The species is dedicated to P. Gabriel Strobl (1846-1925), who described many European Diptera, including Tipulidae.

In its general appearance the present fly is quite different from

any of the known regional species, being most similar in size and general features to *Tipula* (*Sinotipula*) *pullimargo* Alexander, of northeastern Burma, which has the darkened wing pattern restricted to cells *C*, *Sc*, and the stigma. This latter species is assigned to the subgenus *Sinotipula* Alexander chiefly on the hypopygial structure, especially the dististyles, but is quite different in other respects from the other members of the subgenus. Further knowledge of both of these species should confirm their subgeneric position. For the present it seems advisable to leave the present fly unassigned to any particular subgenus. The nature of the wing pattern is suggestive of that of various members of the Neotropical subgenus *Microtipula* Alexander.