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XXXVII.—*New or little-known Tipulidæ (Diptera).*—
LXXXIV. *Oriental-Australasian Species.* By CHARLES
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IN the present paper I am describing further novelties from eastern China, mostly from the Kuatun District of Fukien Province and from the mountainous interior of Kwangtung. The village of Ta-chu-lan, frequently cited in this series of reports, lies on the slopes of the Kuatun Mountains in Shaowu Hsien, close to the border of Chungan Hsien wherein Kuatun itself is located. I wish to express my appreciation to Messrs. Chao, Fu, Heitfeld, Maa, and Tinkham for their continued aid in making known the rich Tipulid fauna of eastern China. Except where indicated to the contrary, the types of the novelties are preserved in my personal collection.

Longurio (Longurio) hirsutistylus, sp. n.

Size large (wing, male, 20 mm.): general coloration orange, the præscutum with further deeper orange stripes of distinctive arrangement; wings dark fulvous, more intensely so along the costal border; stigma oval, darker brown; male hypopygium with the inner dististyle unusually hairy, the vestiture black and more or less retrorse; outer face of style with three widely separated black spines.

Male.—Length about 26 mm. : wing 20 mm.

Frontal prolongation of head orange; nasus black, conspicuous; palpi brownish black. Antennæ dark brown, the basal half of scape yellow; outer flagellar segments slender, cylindrical, with long conspicuous verticils. Head orange.

Pronotum orange. Mesonotal præscutum with the disk orange, with further fulvous-orange stripes of peculiar arrangement, on the cephalic half of the sclerite there being two such stripes that are confluent at the midline, ending as points at near midlength of the sclerite, the sublateral stropes then beginning and continuing to the suture; median area of posterior half of præscutum much paler orange yet differentiated against the ground; posterior sclerites of notum yellow, each scutal lobe with two fulvous areas, the more posterior one elongated; posterior third of mediotergite darker. Pleura variegated yellowish, orange and brown, the last colour surrounding the anterior spiracle and around the wing-root, with paler clouds on the anepisternum and dorsal meron; the clearest yellow includes the dorsal sternopleurite and ventral meral areas. Halteres dark brown. Legs with the coxæ orange, darker apically; trochanters liver-brown; remainder of legs darkened, femora pale brown, more yellowed basally, the tips narrowly dark brown; tibiæ brown, the tips and the tarsi passing into black; claws (male) toothed. Wings broad; ground-colour dark fulvous, even deeper and more saturated at base and in costal region; paler brown clouds over cord and especially in cells *M*, *Cu*, and the Anals, in cell *M* including most of the cell excepting the outer end; both Anal cells with paler central areas; stigma oval, still darker brown; veins dark brown, paler in the basal and costal fields. Venation: *Rs* moderately arcuated, subequal to the more nearly straight R_{2+3} ; M_{3+4} about two-thirds as long as the second section of M_{1+2} ; petiole of cell M_1 nearly three times *m*.

Abdomen only moderately lengthened, as compared with the female sex of *chaoianus*; tergites bicoloured, the basal rings light yellow, the posterior ones fulvous, the latter colour increasing in amount on the outer segments, the yellow correspondingly reduced; segments eight and nine black; sternites fulvous on posterior ring, the sides

of basal ring grey pruinose, each sternite with a broad blackened area that is more or less bisected by the transverse impression. Male hypopygium with the dististyles unusually hairy, especially the inner one where the vestiture is black and more or less retrorse; three strong spines in a longitudinal row on face of style, these widely separated, the outermost a trifle larger.

Hab. China (Fukien).

Holotype, ♂, Ta-chu-lan, altitude 1500 metres, May 1948 (*Joseph Fu*).

The closest described relative of this fly is *Longurio* (*Longurio*) *fulvus* Edwards, which differs in the smaller size, slightly different pattern of the thorax and wings, and in the structure of the male hypopygium, especially of the inner dististyle. *L. (L.) chaoianus* Alexander differs particularly in the coloration of the body, especially of the thorax and abdomen, in the venation, and in all details of the male hypopygium.

Longurio (Longurio) quadrinigra, sp. n.

Body almost uniformly orange, the terminal four abdominal segments black; wings obscure yellow, cells *C* and *Sc* brown, this colour continued distad around the tip of the wing; stigma dark brown, relatively small; inner end of cell *R*₃ in virtual transverse alignment with cell *R*₅; male hypopygium with the outer dististyle obtuse at tip; inner dististyle relatively short and broad, with a series of seven or eight strong spines along the face.

Male.—Length about 21 mm.; wing 15.5 mm.

Frontal prolongation of head orange, nasus black; palpi brownish black. Antennæ with scape orange, pedicel brown; flagellum broken. Head deep orange.

Thorax almost uniformly orange-yellow, the præscutum with indications of four more fulvous stripes and each scutal lobe with two weakly infuscated markings; scutellum pale yellow. Pleura orange. Halteres with the stem brown, the apex of knob a little paler. Legs with the coxæ and trochanters orange; remainder of legs black. Wings with a deep obscure yellow ground, cells *C* and *Sc* brown, the colour continued around the wing tip to vein *Cu*; stigma dark brown, much smaller than in *hirsutistylus*; veins brown, narrowly seamed with

paler brown, broadest in cell *M* adjoining vein *Cu*. Venation: R_{2+3} relatively short, about one-half longer than R_{1+2} ; inner end of cell R_3 in virtual transverse alignment with cell R_5 ; petiole of cell M_1 only a little longer than *m*.

Abdomen with basal five tergites orange, the basal rings more orange-yellow; outer four abdominal segments black, the basal ring of the sixth segment more nacreous; basal sternites orange, segments two to five, inclusive, each with a pair of brown spots, much paler on segment five. Male hypopygium with the outer dististyle more obtuse at tip than in *hirsutistylus*; inner dististyle shorter, the outer margin more incised, the beak shorter and stouter; a series of seven or eight strong spines in a single row along face of style; setæ of style black, virtually as long and conspicuous as in *hirsutistylus*.

Hab. China (Fukien).

Holotype, ♂, Ta-chu-lan, altitude 1500 metres, July 4, 1943 (*Joseph Fu*); Alexander Collection through Chao.

This fly is readily told from the related regional species by the coloration of the abdomen, no other Chinese species having this number of blackened terminal segments. Most of the species have two such segments while *Longurio* (*Longurio*) *chaoianus* Alexander has the entire abdomen, including the hypopygium, generally pale in colour. The male hypopygium of the present fly is distinctive.

Longurio (*Longurio*) *congestus*, sp. n.

Size small (wing, male, under 14 mm.); general coloration fiery orange, the terminal two abdominal segments black; wings brownish yellow, the costal border narrowly more darkened; a vague dusky cloud over the anterior cord; male hypopygium with the inner dististyle sparsely hairy, the spines few in number, grouped on a slightly more elevated part of the style beyond midlength of outer face.

Male.—Length about 16–17 mm.; wing 12–12.5 mm.

Female.—Length about 15–19 mm.; wing 12–14.5 mm.

Frontal prolongation of head very short, orange; nasus elongate, tipped with black; palpi brownish black. Antennæ with scape yellow, pedicel brown, flagellum black; segments with long verticils. Head orange.

Thorax uniformly orange, virtually unpatterned. Halteres infuscated, the base of stem narrowly paler. Legs with coxæ and trochanters orange; remainder of legs dark brown; claws (male) toothed. Wings with a brownish yellow tinge; costal border, including cells *C* and *Sc*, deeper brown, the colour continued distad to the wing tip; stigma oval, somewhat darker brown; a vague dusky cloud over the anterior cord; veins brown. Venation: *Rs* arcuated to angulated and weak-spurred at origin; *R*₂₊₃ straight or virtually so, shorter than *Rs*; petiole of cell *M*₁ long, exceeding two-thirds the cell.

Abdomen orange, each of the subbasal sternites with an oval brownish black mark on each ring, on sternite two on the posterior ring only; intermediate sternites with these spots smaller and paler, on the outer segments lacking; terminal two segments, including genitalia, black. Male hypopygium with the inner dististyle only sparsely hairy; spines three to five in number, the outermost all grouped on a slightly more elevated part of the style beyond midlength of outer face.

Hab. China (Kwangtung).

Holotype, ♂, west side of Sam Kok Shan, Lung Moon District, June 5, 1938 (*Tsz Hai*); purchased from E. R. Tinkham. *Allotopotype*, ♀, pinned with type. *Paratopotypes*, ♂♀, with the types; *paratypes*, 3 ♂♀, Chen Wo Tung, Lung Moon District, June 3, 1938 (*Tsz Hai*).

The most similar described regional species is *Longurio* (*Longurio*) *fulvus* Edwards, which is larger, with a different wing pattern and with the male hypopygium, particularly the inner dististyle, quite differently armed.

Ctenacroscelis laticellula, sp. n.

Belongs to the *brobdignagius* group; size large (wing, male, 36 mm.); mesonotal præscutum with the disk chiefly occupied by four brownish grey stripes; pleura light yellow with a dark brown dorsal stripe; femora brownish yellow, the tips blackened; wings pale brown, the costal border more suffused; male hypopygium with the tergite narrow, the caudal margin with a deep and narrow U-shaped notch, the lateral lobes broader, parallel-sided, their tips obliquely truncated; inner dististyle simple: eighth sternite with divergent marginal lobes.

Male.—Length about 30 mm.; wing 36 mm.; antenna about 4.5 mm.

Frontal prolongation of head dark cinnamon brown, narrowly brownish black beneath; nasus distinct, short and stout. Antennæ with scape and pedicel obscure yellow, flagellum light brown; flagellar segments simple, cylindrical, the outer segments progressively shorter; verticils short and inconspicuous. Head above light grey pruinose medially, infuscated on sides.

Cervical sclerites and pronotum light yellow, the scutum with a small brown central spot. Mesonotal præscutum with the disk chiefly occupied by four brownish grey stripes, the intermediate pair separated by a pair of delicate blackish vittæ that become paler and finally obsolete behind; posterior interspaces brownish grey, the anterior interspaces and lateral margins of the stripes dark brown; lateral præscutal borders broadly light yellow; posterior sclerites of notum chiefly brownish grey, each scutal lobe with a more reddened spot; parascutella yellow; lateral borders of mediotergite testaceous yellow. Pleura and pleurotergite light yellow, with a narrow but conspicuous dark brown longitudinal stripe extending from posterior portion of head to the wing-root and dorsal pleurotergite, gently widened behind. Halteres infuscated, the base of stem narrowly brightened, knob dark brown. Legs with all coxæ and trochanters yellow; femora brownish yellow, the tips rather narrowly blackened and feebly enlarged; remainder of legs obscure brownish yellow, the tarsi passing into brownish black; claws (male) toothed. Wings with a brownish tinge, the costal border more suffused, including also the prearcular field, the darkening involving about the proximal halves of cells *R* and *M*; stigma brown; a narrow brown seam over *m-cu*; veins reddish brown to brown. Venation: Petiole of cell M_1 a little longer than *m*; *m-cu* at near three-fifths M_{3+4} ; cell M_4 unusually broad, *m-cu* being as long as or slightly longer than the distal section of Cu_1 .

Abdomen with the basal tergites obscure reddish brown medially, with broad darker brown sublateral stripes that widen behind, the central pale vitta becoming narrower and more obscured; lateral tergal borders grey; basal sternites yellow; outer segments, including hypopygium, more uniformly darkened. Male hypopygium with

the tergite narrow, the caudal border with a deep and narrow U-shaped notch, the much broader lateral lobes parallel-sided, their tips obliquely truncated with the outer angles farthest produced; setæ of tergite longest before the lobes but not forming distinct brushes; setæ of the lobes short, sparse and pale. Outer dististyle broad, the tip very obtuse, the length not exceeding two and one-half times the greatest width. Inner dististyle a nearly simple straight rod that is expanded on outer third into a slightly developed decurved head, the tip obtuse and without points. Eighth sternite with very conspicuous marginal lobes that are slightly divergent, clothed with dense long brownish yellow setæ.

Hab. China (Kwangtung).

Holotype, ♂, Chen Wo Tung, near Sam Kok Shan, Lung Moon District, June 3, 1938 (*Tsz Hai*); purchased from E. R. Tinkham.

Among the various regional species, the present fly appears closest to *Ctenacroscelis herculeanus* Alexander, differing from this and from all other described species by the quite distinct male hypopygium, particularly the tergite and inner dististyle.

Tipula (Oreomyza) subnata, sp. n.

Size relatively large (wing, male, 19 mm.); mesonotal præscutum yellow with four stripes that are bordered by darker; antennæ with basal three segments yellow, the succeeding segments bicoloured; femora obscure yellow, the tips blackened; wings yellow, the prearcular and costal fields bright yellow, the surface marbled with brown; male hypopygium with the basistyle produced caudad into a powerful arm, posterior end of inner dististyle produced into a slender tail-like blade; ninth sternite beneath with a strong brush of blackened setæ on either side of the midline.

Male.—Length about 17 mm.; wing 19 mm.; antenna about 5 mm.

Frontal prolongation of head moderately long, exceeding one-half the remainder of head, brownish yellow above, darker on ventral half; basal two segments of palpi obscure yellow, outer segments broken. Antennæ (male) relatively long; basal three segments yellow, succeeding segments bicoloured, yellow, the relatively small

basal enlargements brownish black; longest verticils subequal in length to the segments. Head with anterior vertex yellow pollinose, with a small brown spot at summit of the entire vertical tubercle; head somewhat more pruinose behind, darker on the sides.

Pronotum obscure yellow, variegated with brown. Mesonotal præscutum with the interspaces yellow, the disk with four stripes, the intermediate pair brownish grey in front, separated by a broad grey central vitta; lateral stripes dark grey, the anterior end narrowly bordered by brown; scutum brownish grey, each lobe with two brown spots; scutellum brownish grey, more brightened basally, with a darker central line, parascutella pale; mediotergite chiefly yellowish grey pollinose. Pleura and pleurotergite chiefly yellowish grey; dorsopleural membrane buffy. Halteres with stem obscure yellow, base of knob dark brown, apex obscure yellow. Legs with coxæ yellow, sparsely grey pruinose; trochanters yellow; femora obscure yellow, the tips blackened, the amount subequal on all legs, including about the distal eighth; tibiæ yellow to brownish yellow, the tips narrowly and weakly more darkened; tarsi brown; claws (male) toothed. Wings with the ground yellow, the prearcular and costal fields clear bright yellow, especially cell *Sc*; a pale brown marbled pattern, the chief darkenings as follows: Post-arcular in bases of cells *R* and *M*; a small oval spot at origin of *Rs*; cord and outer radial field; basad of cord with other extensive pale brown washes in outer end of cell *M*, outer half of cell 1st *A*, interrupted by two pale spots, and a spot at midlength of cell 2nd *A* which is otherwise yellow; veins brown, yellow in the brightened fields. Venation: *Sc*₂ ending a short distance before fork of *Rs*, in alignment with the straight *R*₂₊₃; *R*₁₊₂ entire, yellow; cell 1st *M*₂ relatively long; petiole of cell *M*₁ a little longer than *m*; *m-cu* at near three-fourths *M*₃₊₄.

Abdominal tergites yellow, the basal segments slightly trivittate with brown, the central stripe very pale, sublateral stripes darker, narrowly broken at the posterior borders of the segments, the extreme lateral borders yellowish grey, sternites yellow; seventh to ninth segments blackened. Male hypopygium with the suture between the tergite and sternite deep; suture of basistyle

complete. Ninth tergite large, the dorsal surface divided into two halves by a pale median furrow; each outer lateral angle produced caudad into a blackened point, the tip obtuse; a more ventral pale median lobule. Entire outer end of basistyle produced caudad into a very long and powerful arm or blade, the tip weakly dilated, truncated to obtuse. Ninth sternite on either side of midline behind the basistyle with a strong brush or pencil of blackened setæ, directed ventrad and caudad. Outer dististyle elongate, approximately six times as long as the greatest width, provided with very long setæ. Inner dististyle with the beak a black compressed-flattened cleaver-like blade; opposite end of style produced into a more slender tail-like blade, the tip obtuse; dorsal crest very low: at base of style or on the adjacent portion of the basistyle with a further slender curved rod, on its outer half with several long pale setæ.

Hab. China (Fukien).

Holotype, ♂, Ta-chu-lan, altitude 1500 metres, May 18, 1948 (*Joseph Fu*); Alexander Collection through Chao.

There are rather numerous regional species having a somewhat comparable body and wing pattern, including *Tipula* (*Orcomyza*) *arisanensis* Alexander, *T. (O.) foliacea* Alexander, and various others. The male hypopygium of the present fly is entirely distinctive.

Tipula (*Orcomyza*) *inæquifurca*, sp. n.

Mesonotum grey, the præscutum with four dark brownish grey stripes; antennæ with scape and pedicel pale yellow, the basal flagellar segments weakly bicoloured; femora with an obscure yellow ring before the blackened tip; wings yellow, marbled with pale brown; male hypopygium with the upper tergal lobes pale, finger-like; apical rod of basistyle yellow, forked near apex into two unequal spines.

Male.—Length about 16 mm.; wing 18 mm.; antenna about 3.3 mm.

Frontal prolongation of head yellow above, dark brown on sides and beneath; nasus conspicuous; palpi dark brown. Antennæ with scape and pedicel pale yellow; first flagellar segment brownish yellow, succeeding segments dark brown, the spaces of the more proximal segments pale to produce a weakly bicoloured appearance;

basal enlargements of segments of moderate size; longest verticils a trifle shorter than the segments. Head above yellow, more pruinose behind, the posterior vertex with a capillary brown vitta.

Mesonotum with the ground colour grey, the præscutum with four dark brownish grey stripes, the intermediate pair separated only by a vague pale capillary line that is better indicated behind; borders of stripes, especially the inner margin of the lateral pair, still darker; posterior sclerites of notum grey, the scutal lobes darker grey; scutellum with a narrow dark central line; postnotum greyish yellow pollinose. Pleura of type crushed, apparently chiefly grey pruinose; dorsopleural region yellow. Halteres with stem obscure yellow, knob brownish black. Legs with the coxæ pale, grey pruinose; trochanters yellow; femora yellow basally, passing into brown, the tips brownish black, preceded by a subequal clearer yellow ring; tibiæ and tarsi dark brown; claws (male) toothed. Wings yellowish, marbled with pale brown; stigma still darker brown; cells *C* and *Sc* uniformly yellow, the latter a trifle more intensely so; cells beyond cord chiefly pale brown except for a poststigmatal yellow band and a brightening in outer end of cell R_5 ; basad of cord the yellow and pale brown area are subequal in extent, the latter including a postarcular mark and zigzag bands at level of origin of *Rs* and at the cord; veins brown, R_{1+2} and *Sc* more yellowed. Venation: *Rs* about two and one-half times *m-cu*; R_{1+2} entire; petiole of cell M_1 and *m* subequal; *m-cu* at fork of *M*.

Abdomen with the basal segments brownish yellow, the tergites broadly pale brown medially; sublateral stripes less distinct, broken; lateral tergal margins grey pruinose; outer four segments, including hypopygium, uniformly blackened. Male hypopygium with the ninth tergite in the form of a dorsal plate that terminates in two pale finger-like lobes, these and the caudal emargination between provided with abundant relatively short setæ; ventrad of these on either side with a broader and more flattened glabrous plate, the margins blackened. Apex of basistyle on outer angle with a small blackened spinous point, the corresponding inner angle with a slender arm, at apex narrowing at a right angle into a blackened point. Outer dististyle large, not quite as long as

the inner style, provided with abundant relatively short black setæ. Inner dististyle chiefly blackened, appearing as a little-modified, slightly curved plate that narrows gradually to the stout beak, the lower beak lacking; at base of style and evidently arising separately is a long yellow rod, dilated at base, thence sinuously narrowed, terminating in a long straight black spine, with a much smaller point on margin back from the tip; outer surface of rod with scattered long pale setæ. Eighth sternite simple.

Hab. China (Fukien).

Holotype, ♂, Upper Kuatun, altitude 6000 feet, May 1, 1948 (*Joseph Fu*).

The present fly is so similar to *Tipula (Orcomyza) distifurca* Alexander, of the Punjab, India, that the two may well be found to represent races of a single species having an unusually wide range. The chief distinctions lie in slight details of coloration and structures in the male hypopygium.

Pedicia (Tricyphona) tachulanica, sp. n.

Size relatively small (wing, male, 8 mm.); general coloration grey, the præscutum with three brown stripes; wings with a strong brownish tinge; petiole of cell B_4 very short; cell 1st M_2 long; male hypopygium with the caudal margin unequally trilobed, the lateral lobes longer and narrower; ventral face of basistyle with a slender lobe that is tipped with numerous blackened pegs; dististyle a long slender sinuous rod.

Male.—Length about 8 mm.; wing 8 mm.; antenna about 1 mm.

Rostrum brownish grey; palpi dark brown. Antennæ (male) 15-segmented, short, as shown by the measurements, brownish black throughout; flagellar segments subcylindrical, shorter than the verticils. Head dark greyish brown; anterior vertex tumid.

Thorax chiefly grey, the præscutum with three brown stripes, the broad median one narrowly bordered by still darker brown; centers of scutal lobes infuscated. Pleura blackened, grey pruinose; dorsopleural membrane dusky. Halteres elongate, the stem yellow, knob broken. Legs with the coxæ light grey pruinose; trochanters obscure yellow; remainder of legs brownish black. Wings

with a strong brownish tinge, the stigma not or scarcely differentiated; a vague dusky streak in cell R , crossing $r-m$ into the base of cell R_5 ; veins brown. Venation: Sc_2 at near three-fifths the distance between areculus and origin of R s, the latter relatively long, only a little shorter than R_{2+3} and only slightly arcuated at origin; vein R_2 slightly oblique, a little less than R_{1+2} ; $r-m$ beyond midlength of R_{4+5} , the petiole of cell R_3 thus very short, less than one-half $r-m$; cell 1st M_2 long, with m on vein M_2 more than one-half its own length beyond base; $m-cu$ beyond midlength of M_{3+4} ; cell 2nd A relatively narrow.

Abdomen elongate, brownish black, including hypopygium. Male hypopygium with the tergite transverse, the median region produced into a low lobe that is provided with coarse setæ, the lateral lobes much longer and more slender. Basistyle at apex produced into a stout lobe that is set with numerous blackened pegs; on ventral face of style with a conspicuous more slender lobe, its apical margin likewise provided with comparable pegs; interbase a slender spine from an expanded base, the latter with a few microscopic setæ. Dististyle a long slender sinuous rod, strongly bent near base, the remainder nearly straight, the tip obtuse.

Hab. China (Fukien).

Holotype, ♂, Ta-chu-lan, altitude 1500 metres, March 28, 1948 (*Joseph Fu*).

This very distinct fly seems most nearly related to species such as the Japanese *Pedicia* (*Tricyphona*) *optabilis* Alexander and the western Nearctic *P. (T.) unigera* Alexander, differing from all known species in the structure of the male hypopygium, particularly the basistyle and dististyle.

Dicranota (*Eudicranota*) *circipunctata*, sp. n.

General coloration pale whitish yellow; mesonotum with six marginal black spots, four of which lie on the præscutum; legs whitened, the tips of the femora and tibiæ narrowly dark brown; wings whitish subhyaline, with a very restricted dark pattern; R s angulated at origin; cell M_1 about three times its petiole; $m-cu$ nearly one-half its length beyond the fork of M ; abdomen obscure yellow, vaguely patterned with brown.

Female.—Length about 6 mm.; wing 6.2 mm.

Rostrum and palpi pale yellow. Antennæ 15-segmented, pale yellowish brown; verticils and segments subequal in length. Head pale yellow.

Thorax uniformly pale whitish yellow, the dorsum variegated around the margin with six black spots of which two lie on either side of the præscutum, the third on the outer end of each scutal lobe; pleura with two nearly contiguous similar dark areas on the suture between the anepisternum and sternopleurite. Halteres pale, the apex of knob weakly darkened. Legs whitened, the tips of the femora and tibiæ narrowly dark brown; outer tarsal segments weakly infuscated. Wings whitish subhyaline, the stigma slightly more yellowed, lying between the transverse veins in cell R_1 ; a very restricted dark pattern, most evident as a deepening in colour of the veins, as follows: Sc_2 ; Rs ; cord; supernumerary crossvein in cell R_1 ; R_2 and outer end of cell 1st M_2 ; the remaining veins paler brown, those in the prearcular field light yellow. Venation: Rs angulated at origin; supernumerary crossvein in cell R_1 just before the end of vein Sc_1 ; cell M_1 three times its petiole; cell 1st M_2 closed; *m-cu* nearly one-half its length beyond the fork of M .

Abdomen obscure yellow, the tergites vaguely patterned with pale brown, this including the lateral and caudal borders of the segments, becoming more extensive outwardly, the apex of abdomen uniformly pale brown; cerci conspicuously darkened.

Hab. China (Fukien).

Holotype, ♀, Ta-chu-lan, altitude 1500 metres, May 27, 1948 (*Joseph Fu*).

The most similar described species is *Dicranota* (*Eudicranota*) *dicranotoides* Alexander, which has the entire thorax unpatterned and differs in further details of coloration of the legs and wings. The most recent key to the subgenera of *Dicranota* is one by Alexander, *Arkiv för Zoologi*, 42A, No. 2: 17-18; 1949.

Hexatoma (*Eriocera*) *suberectu*, sp. n.

Size relatively large (wing, male, 16 mm.); general coloration black with a grey pruinosity; præscutum with three black stripes, the median one broad; antennæ, halteres and legs brown to black; wings with a strong brownish tinge, the costal border still darker brown; stigma dark brown; veins beyond cord chiefly glabrous;

vein R_{2+3+4} suberect at origin, about three-fifths R_{2+3} ; Rs in longitudinal alignment with vein Rs_5 ; cell M_1 present; abdominal segments without differentiated basal rings.

Male.—Length about 15 mm.; wing 16 mm.; antenna about 4.5 mm.

Rostrum light brown, relatively short, strongly constricted at base; palpi black. Antennæ (male) 7-segmented, of moderate length, being nearly one-third the length of body, brown; first flagellar segment only a little longer than the second but stouter; flagellar segments three and four subequal, both longer than the second; terminal segment about one-fourth the penultimate; all flagellar segments with coarse setæ distributed over their whole lengths. Head dark brown, more or less pruinose, the low entire vertical tubercle darker.

Pronotum brown. Mesonotal præscutum with the ground greyish yellow pruinose, with three black stripes, the broad median one ending some distance before the suture; posterior sclerites of notum chiefly blackened, sparsely pruinose. Pleura and pleurotergite blackened, sparsely pruinose. Halteres short, dark brown. Legs brownish black, coxæ sparsely pruinose. Wings with a strong brownish tinge, the costal border, including cells C and Sc , with the marginal radial field, still darker brown; stigma oval, dark brown; veins brown. Veins beyond cord chiefly glabrous, with restricted series of trichia on R_{1+2} , outer end of R_3 and R_{4+5} , the medial branches glabrous. Venation: Sc_1 ending about opposite one-third the length of R_{2+3} , Sc_2 nearly opposite the fork of R_{2+3+4} , Sc_3 alone thus moderately elongate, approximately one-third R_{2+3} ; R_{1+2} less than twice R_2 ; Rs long, nearly square at origin, in longitudinal alignment with R_5 ; R_{2+3+4} suberect, about three-fifths R_{2+3} ; cell M_1 present, shorter than its petiole; $m-cu$ about one-third its length beyond the fork of M .

Abdomen dark brown to brownish black, the hypopygium more reddish brown; segments uniformly opaque, without differentiated basal rings.

Hab. China (Fukien).

Holotype, ♂, Kien-o to Feng-lo, May 21, 1941 (*T. Maa*); returned to Professor Maa.

The fly superficially resembles *Hexatoma (Eriocera) cantonensis* Alexander and allied species, differing in

the coloration of the body and wings, the venation and trichiation of the wing veins.

Hexatoma (Eriocera) celestissima, sp. n.

Allied to *abdominalis*; general coloration velvety black and orange, the thorax black with at least the scutellum orange, in the female the yellow pattern of the notum more extensive; antennæ of male relatively long, approximately three-fourths the wing; legs black throughout; abdomen moderately dilated in both sexes, segments two to five orange with their posterior borders black; subterminal segments uniformly black; genital segments of both sexes fiery orange.

Male.—Length about 16–20 mm.; wing 13–15.5 mm.; antenna about 9–12.5 mm.

Female.—Length about 20–22 mm.; wing 15–16 mm.; antenna about 4.2–4.5 mm.

Rostrum light brown above, darker on sides; palpi black. Antennæ of male 7-segmented, of female 10-segmented, in male elongate, approximately three-fourths the wing, in female much shorter; antennæ dark brown throughout; flagellar segments of male very long-cylindrical, with scattered slender setæ throughout the length, in female the vestiture approximately similar but appearing longer because of the shorter segments. Head black, the centre of vertex obscure deep orange, the amount more restricted in male; vertical tubercle entire.

Pronotum medially above deep orange, the sides blackened. Mesonotum deep velvety black, in male with only the scutellum orange, in female with the scutum, scutellum and most of the mediotergite of this colour; vestiture small and sparse. Pleura and pleurotergite black. Halteres short, black. Legs black throughout. Wings tinged with grey, the disk slightly more yellowed; veins yellowish brown. Veins glabrous, those beyond cord including a restricted series on veins R_{1+2} , R_3 , and with one or two trichia on R_3 . Venation: Cell M_1 lacking; *m-cu* about one-half its length beyond the fork of M .

Abdomen relatively widened in both sexes, bicoloured; segments two to five with the bases orange, the caudal borders intensely black, the pattern extended farther cephalad on the sides of the segments and less so on the median portion: segments six and most of five uniformly black; genital segments in both sexes fiery orange. In

the paratype males of this series, the orange colour of the abdomen is more reduced, appearing as restricted patches on the sides of the basal rings of the segments.

Hab. China (Kwangtung).

Holotype, ♂, Sam Kok Shan, Lung Moon District, June 16, 1938 (*Hai Tsz*). *Allotype*, ♀, Sha Lo Shan, Sun Fung District, July 9, 1938 (*Hai Tsz*). *Paratypes*, ♂♀, Shek Moon Shui Hau, Sha Lo Shan, July 22, 1938; Tung Sum Tung, Sha Lo Shan, July 17, 1938 (*Hai Tsz*).

The present fly is related to *Hexatoma* (*Eriocera abdominalis* (Alexander) and *H. (E.) scalator* (Alexander); as well as to the western Chinese *H. (E.) platysoma* Alexander. All members of the group have the abdomen conspicuously dilated and cell M_1 of the wings lacking. The three species listed have the wings much more strongly blackened than is the case in the present fly. In *abdominalis*, the fore and middle femora are yellow, with the tips narrowly blackened, the posterior femora black; in *scalator*, the macrotrichia of the wing veins are more numerous, the abdominal pattern different, and the genital shield of the female is black. It is unfortunate that the length of the antennæ of the male sex is not known in the cases of the two species listed; in the present fly these are of a length that is most unusual in the entire genus, where the organ is either short in both sexes or greatly lengthened in the male.

Hexatoma (Eriocera) eos, sp. n.

Size large (wing, male, 16 mm.); general coloration reddish orange, the surface opaque; antennæ (male) relatively short; halteres and legs black; wings broad, strongly blackened, veins virtually glabrous; abdominal tergites orange, the posterior borders narrowly blackened, more extensively so on the outer segments.

Male.—Length about 21 mm.; wing 16×5.7 mm.; antenna about 3.3 mm.

Rostrum and palpi black, the former very short. Antennæ (male) 8-segmented, relatively short; scape and pedicel dull reddish, flagellum black; flagellar segments cylindrical, with relatively short inconspicuous verticils. Head deep reddish; anterior vertex weakly quadrituberculate, including low lateral tubercles adjoining the eyes

and a pair of slightly more pointed intermediate tubercles.

Pronotum deep reddish. Mesonotum uniformly reddish orange, the præscutal stripes scarcely differentiated from the ground, split by a capillary more yellowish vitta; præscutal vestiture sparse and inconspicuous. Pleura deep reddish, the dorsopleural membrane more infuscated. Halteres short, brownish black. Legs with all coxæ reddish; trochanters dark brown; remainder of legs black, only the bases of the fore femora restrictedly obscure yellow. Wings broad, strongly blackened, the base and costal region more so; veins brown. Veins beyond cord, excepting R_{1+2} and R_5 , virtually glabrous. Venation: Sc_1 ending just beyond level of R_2 . Sc_1 relatively short, subequal to R_{2+3} ; R_{1+2} and R_{2+3+4} subequal, longer than R_{2+3} ; R_s about one-half longer than R ; cell M_1 lacking; cell 1st M_2 about equal to distal section of vein M_3 ; $m-cu$ at near two-fifths the length of cell 1st M_2 .

Abdomen moderately long, stout, but not dilated as in *abdominalis* and allies; opaque orange, the posterior borders of the segments blackened, very narrow on the first tergite, more extensive on the succeeding segments, on the sixth and seventh segments the dark colour much widened, with only the basal rings narrowly orange; sternites orange, conspicuous brownish black medially behind, the clour involving more than one-half the length of the segment, on the third and succeeding segments narrowly reddened, seventh and eighth sternites uniformly orange; hypopygium small, dark brown.

Hab. China (Fukien).

Holotype, ♂, Tao-shui, June 11, 1942 (*T. Maa*); returned to Professor Maa.

In its broad, strongly blackened wings the present fly suggests *Hexatoma (Eriocera) scalator* (Alexander) and other members of the *abdominalis* group, but the relationship is presumably not very close. In the above-mentioned species the thorax is chiefly velvety black with the scutellum and nearby areas restrictedly orange.

Hexatoma (Eriocera) fracida, sp. n.

General coloration grey, the præscutum with three medium brown ill-defined stripes; antennæ (male) elongate, subequal to the body, the flagellar segments with

relatively few long scattered bristles; legs pale yellowish brown; wings with a weak yellowish grey tinge, virtually unpatterned except for the pale brown stigma; veins beyond cord virtually glabrous; abdomen brownish black, without differentiated basal rings on the tergites; male hypopygium large.

Male.—Length about 8.5 mm.; wing 9.3 mm.; antenna about 8.5 mm.

Rostrum light brown; palpi dark brown. Antennæ (male) 7-segmented, including a short terminal one, the organ subequal in length to the entire body, brown; first three flagellar segments each slightly and progressively longer, the fourth more evidently lengthened; vestiture of basal two flagellar segments sparse, the major bristles few and scattered; third and succeeding flagellar segments with abundant appressed black setæ over their lengths. Head brownish grey; vertical tubercle large and conspicuous, bulbous, entire.

Thorax chiefly grey, the præscutum with three medium brown ill-defined stripes; posterior sclerites lighter grey, the caudal portion of the mediotergite darker; thoracic interspaces with scattered erect white setæ; dorsopleural membrane dusky. Halteres with stem obscure yellow, knob darker brown. Legs with the coxæ dark brown, pruinose; trochanters yellowish brown; remainder of legs pale yellowish brown, the tarsi not or scarcely darker. Wings with a weak yellowish grey tinge, virtually unpatterned except for the short-oval pale brown stigma; veins brown, with faint indications of darker seams. Veins beyond cord, excepting R_{1+2} and R_5 , glabrous; outer medial veins weak to subevanescent. Venation: Sc_1 ending about opposite two-fifths R_{2+3+4} . Sc_1 alone subequal to R_{1+2} and slightly longer than R_2 ; R_{2+3} nearly equal to R_2 ; R_{2+3+4} straight, nearly three times the basal section of R_5 ; Rs long, about equal to the full length of R_5 ; cell 1st M_2 shorter than vein M_4 ; $m-cu$ close to fork of M , longer than the distal section of Cu_1 .

Abdomen brownish black, the basal tergites vaguely more reddened on disk; no differentiation of colour in the tergal rings; hypopygium large, black.

Hab, China (Fukien).

Holotype, ♂, Nan-ping to Kien-o, May 23, 1941 (*T. Maa*); returned to Professor Maa,

The present fly superficially resembles species such as *Hexatoma (Eriocera) insidiosa* Alexander, differing from this and other similar forms in the details of coloration and venation. The elongate antennæ are quite different from those of all other similar forms where the male sex is known.

Hexatoma (Eriocera) carinivertex, sp. n.

General coloration grey pruinose, the præscutum with three confluent black stripes, the restricted interspaces indicated only in front; head broad, light grey, the anterior vertex with a slight median carina; antennæ (female) 7-segmented, the first flagellar longer than all outer segments combined; wings broad, light brown, the veins indistinctly seamed with slightly darker brown; Sc_1 and Sc_2 subequal in length; *m-cu* at near midlength of M_{3+4} ; abdomen dark reddish brown, the surface opaque.

Female.—Length about 10 mm.; wing 11.5×5 mm.; antenna about 2.4 mm.

Rostrum short, dark brown; palpi elongate, brown, slightly paler at the incisures. Antennæ (female) 7-segmented, short, dark brown throughout; first flagellar segment elongate, exceeding all the outer remaining segments together; succeeding three segments progressively shorter, the terminal segment very reduced, thimble-shaped, scarcely one-fifth as long as the penultimate; flagellar segments with long coarse setæ. Head broad, light grey, clearest adjoining the eyes; anterior vertex broad with a low tubercle that is further elevated into a low median carina that continues back onto the posterior vertex, becoming lower and finally obsolete behind.

Pronotum black, grey pruinose. Mesonotal præscutum with three confluent polished black stripes, the anterior interspaces and lateral borders more brownish grey; posterior sclerites of notum black, sparsely pruinose. Pleura and pleurotergite more heavily pruinose; dorso-pleural membrane darkened. Halteres infuscated. Legs with the coxæ light grey; trochanters medium brown; remainder of legs dark brown. Wings broad, as shown by the measurements; ground-colour light brown, the veins brown, seamed with slightly darker brown to produce a vaguely streaked appearance. Veins beyond cord

with abundant macrotrichia. Venation: Sc_1 ending opposite midlength of R_{2+3+4} ; Sc_2 at its tip, subequal to or a little longer than Sc_1 alone; Rs nearly three times R_{2+3+4} alone, the latter about one-third longer than the basal section of R_5 ; R_{1+2} nearly three times R_2 ; cell 1st M_2 about as long as distal section of vein M_3 ; $m-cu$ at near midlength of M_{3+4} ; vein 2nd A nearly straight.

Abdomen dark reddish brown, the caudal borders of the segments very narrowly grey; all segments opaque, without differentiated basal rings; pleural region darkened. Genital shield dark; valves of ovipositor long and slender.

Hab. China (Fukien).

Holotype, ♀, Ta-chu-lan, altitude 1500 metres, April 30, 1948 (*Joseph Fu*).

This fly superficially resembles species such as *Hexatoma (Eriocera) insidiosa* Alexander but is quite distinct from this and all other generally similar plain-coloured forms, as shown by the diagnostic characters listed above.

Hexatoma (Eriocera) urania, sp. n.

Mesonotum chiefly polished black, only the restricted interspaces more pruinose; legs uniformly brownish black; wings dark brown, the Anal cells abruptly paler; a nearly transverse white crossband before cord, extending from R to midwidth of cell Cu ; more obscure yellow marks in cell R before and beyond the origin of Rs ; veins beyond cord with abundant trichia; abdominal tergites bicoloured, the basal rings polished nacreous, the posterior borders velvety black; genital shield bright yellowish orange.

Female.—Length about 13 mm.; wing 11 mm.; antenna about 2.5 mm.

Rostrum and palpi dark brown. Antennæ of female 10-segmented, brown, the scape even darker; flagellar segments long-cylindrical, with scattered relatively short verticils. Head plumbeous; vertical tubercle low.

Pronotum light brown. Mesonotum chiefly polished black, the restricted præscutal interspaces slightly more pruinose; mediotergite somewhat more heavily pruinose. Pleura dark brown; dorsopleural region darkened. Halteres short, infuscated. Legs brownish black throughout. Wings with a dark brown ground, the Anal cells abruptly paler, more greyish; a nearly transverse narrow white crossband before the cord, its outer edge at the fork of Rs , extending from vein R to just beyond midwidth of

cell *Cu*, not attaining the posterior border; more obscure yellow spots in cell *R* before and beyond the origin of *Rs* and in cell *Sc*₁ beyond vein *Sc*₂; cells *C* and *Sc* brownish yellow; one wing of type shows a whitened spot in cell *M*₄; veins chiefly light brown, including those in the white band. Veins beyond cord with abundant macrotrichia. Venation: *Sc*₁ ending almost opposite the nearly transverse *R*₂, *Sc*₁ elongate, about twice *R*₂; *Rs* moderately long, about one-third longer than *R*; *R*₂₊₃₊₄ about twice *R*₂₊₃ or subequal to *R*₂; basal section of *R*₅ about one-half longer than *R*₂₊₃₊₄; cell 1st *M*₂ small, pentagonal, *M*₃₊₄ nearly one-half *M*₄; *m-cu* far distad, at fork of *M*₃₊₄.

Abdominal tergites bicoloured, the basal rings polished nacreous, the posterior borders broadly velvety black, occupying approximately one-half of each segment; sternites more uniformly dark brown; genital shield bright yellowish orange; cerci elongate, horn-yellow.

Hab. China (Kwangtung).

Holotype, ♀, Sha Lo Shan, Sun Fung District, July 9, 1938 (*Tsz Hai*); purchased from E. R. Tinkham.

The most similar species include *Hexatoma* (*Eriocera*) *ambrosia* Alexander, having the legs chiefly yellow and differing in still other regards, and the two closely interrelated species *H. (E.) hoffmanni* Alexander and *H. (E.) terryi* (Alexander), both of which have the discal pale area of the wings obscure yellow and more oblique in position.

Cladura (*Cladura*) *fulvidorsata*, sp. n.

Mesonotum clear fulvous, without markings; antennæ black throughout; head dark grey; legs brown, the femoral basas more yellowed; wings with a weak brownish tinge, the stigma slightly indicated.

Female.—Length about 8.5 mm.; wing 10.6 mm.; antenna about 2.2 mm.

Rostrum brown; palpi black. Antennæ black throughout; flagellar segments subcylindrical, subequal to or longer than the verticils; two segments involved in the fusion-segment, the union complete. Head dark grey.

Pronotum brown, more greyish brown on sides. Mesonotum clear fulvous, without pattern. Pleura dark brown, sparsely pruinose, variegated with obscure yellow, especially along the suture between the mesepisternum and mesepimeron. Halteres with stem pale, the base restrictedly yellow, knob weakly infuscated. Legs with the fore

coxæ infuscated, the others obscure yellow; trochanters yellow; remainder of legs brown, femora darker outwardly, the bases more yellowed. Wings with a weak brownish tinge, the stigma, region vaguely and diffusely more darkened; veins brown, those of the prearcular field yellow. Venation: Sc_1 ending nearly opposite R_2 , Sc_2 just before fork of Rs , Sc_1 alone subequal to $m-cu$; R_{2+3+4} about one-third longer than R_{2+3} ; cell M_1 deep, its petiole subequal to or shorter than m ; $m-cu$ about one-half to two-thirds its length beyond the fork of M .

Abdomen dark brown, the genital segment abruptly fulvous; cerci strongly compressed, horn-yellow.

Hab. China (Fukien).

Holotype, ♀, Ta-chu-lan, altitude 1500 metres, November 24, 1946 (*Joseph Fu*); returned to Professor Maa.

The genus *Cladura* had not been recorded from continental China. The single known Formosan species, *Cladura (Cladura) taiwania* Alexander, is entirely different in coloration, especially of the mesonotum.

Gonomyia (Protogonomyia) chaoi, sp. n.

General coloration uniformly dull black, including the appendages; wings with a weak dusky tinge, the small stigma dark brown; male hypopygium with the outer dististyle a slender curved spine; inner dististyle stout, with a group of long setæ at apex.

Male.—Length about 5.5–6 mm.; wing 7–7.5 mm.

Female.—Length about 5.5–6 mm.; wing 6.5–7 mm.

Rostrum and palpi black. Antennæ black throughout. Head black. Thorax uniformly dull black, only the anterior lateral pretergites more fulvous and the pleura slightly more pruinose. Halteres short, black, the base of stem narrowly brightened. Legs uniformly black. Wings with a weak dusky tinge, the small elongate stigma dark brown; veins brownish black. Venation: Sc_1 ending opposite fork of Rs , Sc_2 far from its tip, Sc_1 alone approximately three-fifths Rs ; petiole of cell 2nd M_2 shorter than the arcuated $r-m$; $m-cu$ at fork of M .

Abdomen black, including the genitalia of both sexes. Male hypopygium most like that of *confluenta*, especially the outer dististyle, which is a slender curved spine in both species; inner dististyle entirely different in the two species, in the present fly much stouter with a tuft or group of long setæ at apex; in *confluenta* this style is

very slender, especially outwardly. In *tienmuensis*, the outer dististyle is a stout blade, quite different from the condition found in the present fly and in *confluenta*.

Hab. China (Fukien).

Holotype, ♂, Foochow, grounds of Fukien Christian University, April 26, 1948 (*H. F. Chao*). *Allotopotype*, ♀, April 7, 1948. *Paratopotypes*, 1 ♂ with holotype, 2 ♀♀ with allotype.

I take unusual pleasure in naming this species for the collector, Mr. Hsiu-fu Chao, to whom I am indebted for much help in securing specimens and in correcting the involved geographical nomenclature of China. At this time, Mr. Chao is Teaching Fellow in Entomology at the University of Massachusetts. The nearest relatives of the present fly are *Gonomyia* (*Protogonomyia*) *confluenta* Alexander and *G. (P.) tienmuensis* Alexander, which are readily distinguished by hypopygial characters, as compared above.

Lipsothrix heitfeldi, sp. n.

Thorax almost uniformly dark liver-brown; antennæ (male) elongate, exceeding one-third the length of wing, the flagellar verticils relatively short and inconspicuous; legs obscure yellow, the extreme tips of femora and tibiae more darkened; wings with a weak brownish tinge, the costal border narrowly darker brown; *Rs* elongate, nearly three times R_{2+3+4} , the latter approximately twice the basal section of R_5 , only feebly arcuated.

Male.—Length about 7.5 mm.; wing about 8.2 mm.

Rostrum and palpi dark brown. Antennæ (male) elongate; outer segments broken but when entire the organ is evidently about 3.5 mm. in length, extending to or beyond the base of abdomen, dark brown throughout; flagellar segments cylindrical, clothed with a dense white pubescence, verticils relatively short and inconspicuous. In *pluto*, the antennæ are longer, the pubescence of the flagellar segments coarse, the verticils long and conspicuous. Head dull brownish grey, the anterior vertex more grey pruinose, approximately three times the diameter of scape.

Thorax almost uniformly dark liver-brown, the pretergites restrictedly obscure yellow; postnotum more pruinose. Halteres infuscated, the base of stem narrowly

yellow. Legs with the coxæ and trochanters yellow, the fore coxæ slightly darker; remainder of legs obscure yellow, the extreme tips of femora and tibiæ more darkened; outer tarsal segments infuscated; claws (male) toothed. Wings with a weak brownish tinge, the costal border narrowly darker brown, including cells *C*, *Sc* and the general region of the stigma to vein R_3 ; veins brown, base of *Rs* and the veins in the stigmal area paler. Venation: Sc_1 ending shortly beyond fork of *Rs*, Sc_2 close to its tip; *Rs* elongate, nearly three times R_{2+3+4} , the latter long, approximately twice the basal section of *Rs*, only feebly arcuated; cell 1st M_2 relatively small, M_{3+4} about two-thirds vein M_4 ; *m-cu* more than one-half its length beyond the fork of *M*.

Abdomen, including hypopygium, dark brown.

Hab. China (Fukien).

Holotype, ♂, Ta-chu-lan, altitude 1500 metres, April 26, 1948 (*Joseph Fu*).

This interesting crane-fly is named for Père Ludwig M. Heitfeld, of Sancta Maria de Fatima, Shaowu, to whom we are much indebted for friendly co-operation in our study of the Tipulidæ of Fukien. The genus had not been found in eastern China though represented by a few species in Japan and Formosa, and again in western China. The present fly is generally similar to *Lipsothrix pluto* Alexander, of the high mountains of Formosa, yet quite distinct in coloration and venation.

XXXVIII.—*The Cretaceous Echinoid genera Infulaster Desor and Hagenowia Duncan.* By C. W. WRIGHT, M.A., F.G.S., and E. V. WRIGHT, M.B.E., M.A.

SUMMARY.

The Chalk Echinoids of the genera *Infulaster* and *Hagenowia* are redescribed. Three published species of *Infulaster* are regarded as synonymns of the genotype species. Two new species of *Hagenowia* are described from the English Senonian. While *Infulaster* is held to be an Echinocorythid of the subfamily Cardiasterinæ, *Hagenowia* is shown, by certain important structural features, to belong to the curious family Pourtalesiidæ of Loven. The phylogeny of the forms considered is also discussed.