56.57(78.8)

# Article VI.— FOSSIL INSECTS FROM FLORISSANT, COLORADO.

By T. D. A. Cockerell.

Plate III.

## COLEOPTERA.

### **Paussopsis** n. gen. (Paussidæ ?)

Small beetles apparently belonging to the Paussidæ; general form much as in *Pentaplatarthrus* (*cf.* Ants, by W. M. Wheeler, p. 399, fig. 236 D), but antennæ with at least seven, probably eight, joints; elytra reaching nearly to end of abdomen; thorax broader than long; femora thick, but tibiæ not remarkably stout.

### **Paussopsis nearctica** n. sp.

Length about 5½ mm.; face and antennæ dark brown; hind part of head, thorax, femora and abdomen ferruginous; elytra and tibiæ dark brown or black; thorax 1 mm. long, and about 1½ wide; elytra 3½ mm. long and apparently little over 1 mm. wide, parallel-sided, without evident sculpture. The following measurements are in microns: width of last antennal joint 460, of penultimate joint 475; length of penultimate joint 270; length of anterior femur about 865, its width about 320; width of anterior tibia 160; length of hind femora about 1270.

Miocene shales of Florissant, Station 13 B (S. A. Rohwer).

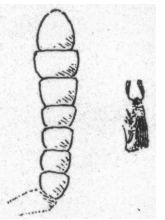

Fig. 1. *Paussopsis nearctica.*

The Paussidæ are a family of remarkable myrmecophilous beetles, occurring in the old world, with the exception of two species in South America. Although they are highly specialized, they are of considerable antiquity, species having been described by Motschulsky (1856), Stein (1877) and Schaufuss (1896) from Baltic Amber. While I believe the beetle now described is a Paussid, the actual demonstration of its relationships seems impossible, as the tarsi and other important characters are not clearly visible. Granting it to be a Paussid, it will stand near the African *Pentaplatarthrus*, differing by the greater number of antennal joints. Unfortunately, the supposed basal joint cannot be clearly made out, but from the position of the antennæ, and analogy with living forms, there can be little or no doubt that there was a more or less elongate joint, something like the first joint in *Paussus dama*. Although the Paussidæ are mainly tropical or subtropical, the presence of a species at Florissant cannot be used as an argument in favor of a tropical Miocene climate at that place, since at the present time *Paussus favieri* occurs as far north as the south of France.

**Chrysobothris gahani** n. sp. (Buprestidæ.)

♂. Length about 10⅔ mm.; width of thorax slightly over 3 mm., of abdomen in middle nearly 4; elytra about 8 mm. long and 1¾ wide, closely and finely punctured, not at all striate; thorax with fine vermiform sculpture, its sides convex; abdomen with strong sublateral sulci, about half a mm. from margin. Black, last abdominal segment ferruginous; elytra appearing black in one impression, but in the reverse warm light brown with strong metallic (greenish and pinkish) tints, the margins narrowly dark; legs, so far as visible, black; wings warm brownish, darker along costa. I figure what can be seen of the venation, and also the genitalia. The posterior corners of the thorax seem to have curious round outstanding knobs, quite different from anything I could find described, but closer study shows that these are nothing but the ends of the femora, standing out as they often do in living species.

Miocene shales of Florissant (Willard Rusk and Terry Duce, 1909).

I am greatly indebted to Mr. C. J. Gahan of the British Museum for advice on this insect. After examining sketches I sent him, he expressed the opinion that it must be near *Chrysobothris*, and upon comparing it with a recent specimen of that genus, I cannot detect any difference of generic value. Mr. Gahan remarks that *Chrysobothris* has fine denticulation along the outer and apical border of the elytra, apparently wanting in my insect. I have quite failed to find any trace of this in *C. gahani*, but in the living species it may be exceedingly minute and obscure. I also fail to find any subapical lateral denticulation of the abdomen, such as occurs in many *Chrysobothris*. The form of the head and thorax appear normal, and the elytra were evidently metallic. In the wings, the angle formed at the junction of the media and cubitus is much more acute than in a recent *Chrysobothris* examined, but the double cubitus exactly agrees.

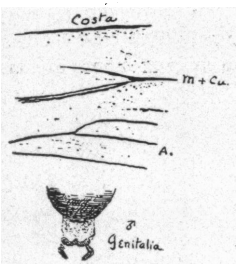


Fig. 2. *Chrysobothris gahani.* Part of venation and genitalia.

The only other Florissant Buprestid, *Chrysobothris haydeni* Scudder, is half as large again.

## HYMENOPTERA.

**Palæovespa scudderi** *Cockerell.* (Vespidæ.)

A well preserved anterior wing, collected by Mr. S. A. Rohwer, is about 15 mm. long, length of first discoidal about 6¾, of marginal cell about 3¾ mm. The following are approximate measurements in microns: upper end of b. n. from stigma 480; second s. m. on marginal 450; third s. m. on marginal

1010; lower side of marginal beyond third s. m. 1410; third discoidal on second s. m. 800; second s. m. from insertion of second r. n. to apical corner 420; lower side of third s. m. 1190; lower end of basal nervure basad of t. m. 270. The various specimens attributed to this species differ in size, but not more so than modern *Vespa.*

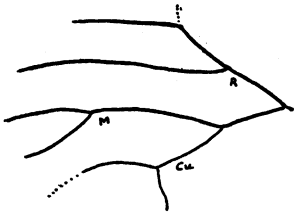


Fig. 3. *Nicropsylla rigidula.* Venation.

In the insertion of the recurrent nervures *Palæovespa* resembles *Polybia,* but in *Polybia* the cubital nervure is very little deflected to meet the first recurrent, so that the end of the first discoidal cell is much more oblique than in *Palæovespa.* The abdomen of *Polybia* is quite unlike that of *Palæovespa.*

## **Andrena grandipes** n. sp. (Andrenidæ.)

♀. Length 13½ mm.; anterior wing 9½ mm.; width of head 4 mm., of abdomen 5; head and thorax black; abdomen broad, reddish-brown, the hind margins of the segments very broadly pallid; antennæ thick, not very long; facial quadrangle longer than broad, distance between eyes only about 1⅓ mm.; ocelli normal, in a curve; cheeks large apparently swollen; mandibles long, about 448 μ broad, bidentate, the apical tooth very obtuse; malar space apparently about ¾ mm. long; eyes small, about 1600 μ long and 576 broad; wings clear, hairy, especially along veins; stigma dark brown, very hairy; legs stout, dark reddish-brown, hind tibia and basitarsus densely covered with coarse dark hair; hind tibia very broad (breadth about 1360 μ), about 3½ mm. long; its basitarsus short and broad, about 2 mm. long; venation in general normal for *Andrena,* but marginal cell very long and narrow, ending in a point on costa; stigma large but narrow; b. n. meeting t. m.; t. m. oblique, the lower end most apicad; third s. m. long, much longer below than above.

The following wing-measurements (anterior wing) are in microns: —

| | |
|---|---|
| Length of marginal cell, from its very acute basal angle to apex | 2832 |
| Breadth (depth) of marginal cell | 480 |
| Basal nervure on first submarginal cell | 560 |
| Basal nervure on first discoidal cell | 849 |
| Length of transversomedial nervure | 448 |
| Length of first s. m. (lower basal to upper apical corner) | 1600 |
| First s. m. on marginal | 256 |
| Second s. m. on marginal | 512 |
| Third s. m. on marginal | 528 |
| First discoidal on second s. m. | 528 |
| Third discoidal on second s. m. | 400 |
| Length of third s. m. below | 960 |
| Second discoidal on third (the second r. n. arising below middle) | 640 |
| Length of first discoidal | 2720 |

The hind wing is also visible, and is normal. I have taken two measurements: —
Median cell on marginal . . . . . 1088
Upper end of t. m. to base of discoidal cell . . . . . 992
*Hab.*— Miocene shales of Florissant, Station 13 (T. D. A. Cockerell, March, 1911).

This agrees closely with modern *Andrena* in most respects, but is peculiar for the very broad hind tibia and basitarsus, the small eyes and the long slender marginal cell. The upper end of the second recurrent nervure cannot be clearly made out, but its lower part is visible, and it evidently must end some distance before the end of the third s. m., as in *Andrena*. In the table in Bull. Mus. Comp. Zoöl., June 1906, p. 36, it runs to 2, and runs out because the first r. n. is received by second s. m. beyond the middle, and the wing is over 7 mm. long.

## **Eriocampa synthetica** n. sp.

♂. Length 7 mm., anterior wing 5 mm.; head and thorax black; abdomen dark fusco-ferruginous; wings clear, nervures dark, costal cell entirely fuscous. Anterior wings with cross-nervure of marginal cell oblique, arched, bent in middle (as in *Pseudosiobla*); cubital nervure bent upwards at base, separated by a little interval from basal (as in *Strongylogaster*); basal nervure not at all bent; externo-medial nervure as in *Eriocampa ovata* (not modified as in *E. wheeleri*); second s. m. on marginal much longer than first s. m. on first discoidal, yet not nearly twice as long;[1] third s. m. on marginal about twice as long as first on first discoidal; lanceolate cell strongly contracted (yet not so much as in *E. ovata*) and with a very oblique cross-nervure; sides of first discoidal cell, formed by basal and first recurrent nervures, parallel or almost so.

Hind wing with the median and discal cells apparently not at all closed apically, but the strong transverse veins really run around the wing margin, exactly as in male *Eriocampoides*, though the subcostal cell is narrowed and sharply truncated at apex, as Macgillivray figures for female *Eriocampoides*. The lanceolate cell of the hind wings is slender, its width about 240 $\mu$. According to the hind wing, the insect belongs to Phyllotominæ, but the anterior wing is that of Emphytinæ. Although the sides of the first discoidal cell (anterior wing) are parallel, the basal side (basal nervure) is longer (length 640 $\mu$) than the apical (length 512 $\mu$), in the manner of *E. wheeleri*, and departing from the condition of true *Eriocampa* in the direction of the Phyllotomines. The transversomedial nervure is more oblique than in *E. ovata*. The third t. c. is slightly arched inwards.

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[1] In Rohwer's table (Bull. Amer. Mus. N. H., XXIV, p. 592) it is stated that in *E. wheeleri* the second cubital on radial is no longer than first on cubitus; it should read "not greatly longer than," as the measurement of the first s. m. in the original description is diagonal. The character validly separates *wheeleri* from *scudderi* and *bruesi*, and associates it with *synthetica* and *pristina*.

The following measurements are in microns: —

| | |
|---|---|
| Length of marginal cell | 2144 |
| End of stigma to end of marginal cell | 1376 |
| Upper end of third s. m. to end of marginal | 672 |
| Second s. m. on marginal | 608 |
| Third s. m. on marginal | 784 |
| Lower end of marginal cross-vein to end of third s. m. | 192 |
| First s. m. on first discoidal | 400 |
| Second s. m. on first discoidal | 224 |
| Second s. m. on third discoidal | 560 |
| Third s. m. on third discoidal | 128 |
| Lower end of b. n. to upper end of t. m. | 368 |
| Length of t. m. | 384 |

*Hab.*— Miocene shales, south end of Fossil stump Hill, Florissant (W. P. Cockerell, March, 1911).

Close to *E. wheeleri*, but differing by the smaller size, the form of the transverse marginal nervure and the externomedial, and other details shown by the measurements. It is probable that this species should stand as the type of a new genus, to which *E. wheeleri* could also be referred. From *E. pristina*, the new species is known by its much smaller size and the various details of the measurements.

## HEMIPTERA.

### **Necropsylla rigidula** n. sp. (Psyllidæ.)

Length about 2 mm.; anterior wings a little over 1½ mm., hyaline, with strong dark veins; venation normal for the genus. The venation is much like that of the Australian *Creiis longipennis* Walker, $R_1$ having the same bend, and the cell in the fork of the radius having the same form, with parallel sides; $R_1$ beyond the bend also is widely separated from the costa, and the radial fork is a little *basad* of the mediocubital fork, a character which readily separates the genus from *Psylla*. In the *Creiis*, however, the fork of the media is at the same level as that of the cubitus, whereas in our insect the media forks about 260 $\mu$ apicad of the fork of cubitus. In the *Creiis* the lower branch of the cubitus is oblique, in our species it is vertical or transverse, even directed slightly basad. The shape of the cell in the fork of the cubitus is much as in *Psylla*, except that it is longer. The cell in the fork of the media is quite long (about 435 $\mu$), and widely open; the radial sector curves upward a little at end; from the radius ($R_1$) to the radial sector is about 130 $\mu$, from the latter to the media about 145.

Miocene shales of Florissant (Geo. N. Rohwer); on the same piece of shale as the type of *Taracticus renovatus*, and only about 3 mm. from it.

Miocene shales of Florissant (Geo. N. Rohwer); on the same piece of shale as the type of *Taracticus renovatus*, and only about 3 mm. from it.

This is about a third smaller than Scudder's *N. rigida,* and appears to be distinct, but it is just possible that the difference is merely sexual.

**Cicada grandiosa** Scudder. (Cicadidæ.)

This species was based by Scudder on a hind wing, which was remarkable for its large size, and supposed to differ from true *Cicada* in several venational characters. The wing, however, agrees very nearly with that of the living American *Cicada marginata,* and I believe represents a quite typical *Cicada.* In March, 1911, my wife and I found at the south end of Fossil Stump Hill, Florissant, a rather poorly preserved upper wing of *Cicada,* showing all the central area, including the forking of the radius and cubitus, the median cell and the two large discal cells above it. All this is perfectly typical for *Cicada,* and might almost have come from a wing of *C. marginata.* The large cell in the forks of the media has its side on the cell (median) below 12 mm., and that on the cell above 10 mm. As the proportions agree excellently with the upper wing which should go with Scudder's hind wing, it seems safe to assume that they belong to the same species.

## DIPTERA.

**Leia miocenica** n. sp. (Mycetophilidæ.)

Length slightly over 4 mm., wing 3; pale brownish, the first six abdominal segments with the apical third or rather less dark fuscous, apex of abdomen fuscous; wings hyaline, not hairy; antennæ thick, normal for the genus in appearance, but I think I can count at least 18 joints, though this is not positive; legs slender, hind tibia with tarsus a little over 3 mm.; claws simple; thorax arched; none of the wing-veins bristly. Wing in general like that of *Leia*; the measurements given are in microns.

| | |
|---|---|
| End of auxiliary vein to end of first | 960 |
| Origin of third vein from first (according to authors) to end of first | 320 |
| Anterior cross-vein of authors | 510 |
| Fourth vein from basal end of "cross-vein" to fork | 400 |
| Fork of fifth vein from base of wing, about | 800 |
| Fork of fifth vein basad of level of fork of fourth | 290 |
| At level of end of first vein:— | |
| Distance from first to third | 80 |
| Distance from third to fourth | 290 |
| Distance between branches of fourth | 175 |

This has the Sciarine feature of the so-called anterior cross-vein being in a perfectly straight line with the so-called second division of the third vein, although at its point of origin from the fourth vein the cross-vein makes with it a distinct angle above. The other characters, as the fork of the

fifth vein being remote from the base of the wing, the auxiliary vein being distinct, etc., are Mycetophiline. *Leia* Meigen (*Neoglaphyroptera* O. Sacken) appears to be a genus connecting the Sciarinæ and Mycetophilinæ, and it is certainly of great antiquity, being represented by many species [1] in the Oligocene of Europe. Compared with *Leia nitens* (*Neoglaphyroptera nitens* Williston), as figured by Williston, our species differs conspicuously in the absence of sinuosity in the third vein, and the lack of hairs or bristles on the basal part of fourth vein, "cross-vein," and apical part of third.[2] It also differs in the fork of the fifth, which is complete basally, the upper branch joining the lower at a rather large angle, owing to a bend at its base. Meunier has described a genus from Baltic amber as *Proneoglaphyroptera*, and since it has the veins free from bristles, and the venation in general almost exactly like that of our Florissant species, I have hesitated whether to place the latter in it. However, the antennæ of Meunier's genus are much more slender, and it is perhaps even doubtful whether his insect should really be separated from *Leia*. If *Proneoglaphyroptera* is maintained, the reference of *L. miocenica* to it may yet prove necessary. Miocene shales of Florissant (Geo. N. Rohwer.)

**Plecia melanderi** n. sp. (Bibionidæ.)

Plate III, Fig. 1.

♂. Length about 7⅔ mm.; wing 6 mm.; ferruginous, the slender abdomen with a pallid band on each segment posteriorly; wings reddish hyaline. Venation as usual in the genus, except that the distance from the anterior cross-vein to the forking of fourth is rather *greater* than the length of the cross-vein (the reverse being true of recent *Plecia* examined). The apex of the second basal is so faint that I cannot be sure of the upper nervure, separating the second basal from the third posterior, but it seems to be more oblique than in the living species. The following measurements are in microns:—

| | |
|---|---|
| Depth of marginal cell at level of anterior cross-vein | 290 |
| Depth of submarginal cell at level of end of second vein (so-called anterior branch of third) | 160 |
| Distance from end of second vein to end of third | 1040 |
| Distance in a straight line from base of marginal cell to separation of second vein from third (so-called fork of third) | 2015 |

[1] These are the following, described as *Glaphyroptera* and *Neoglaphyroptera*: *Leia curvipetiolata* (Meunier), *L. longipetiolata* (Meunier), *L. crassipalpis* (Meunier), *L. longipalpis* (Meunier), *L. gracillima* (Förster), *L. longipes* (Förster), *L. crassiuscula* (Förster).

[2] The course of the pilosity in *L. nitens*, as figured by Williston, may be used as an argument against the idea that the vein connecting the apical part of the third with the stem of the fourth is a cross-vein. (See the discussion in Canadian Entomologist, 1908 pp. 421–422; the insect there described is however a female, not a male, as Dr. Felt points out to me). The pilosity follows what I suppose to be the real course of the third vein (united basally, with the fourth).

Miocene shales of Florissant. Named after Prof. A. L. Melander, who first called my attention to the occurrence of *Plecia* in the Florissant shales. The genus is still found in the same region; *P. heteroptera* Say occurs at Colorado Springs.

It is to be remarked that the character of the lengthening of the stem of the fourth vein beyond the anterior cross-vein is even more pronounced in *Plecia similkameena* Scudder, fossil in British Columbia. *P. melanderi* is smaller than any of the three fossil species of *Plecia* described by Scudder.

**Symphoromyia subtrita** n. sp. (Leptidæ.)

Plate III, Fig. 2.

♀. Length 10 mm.; wing 7; robust, looking like a Muscid (Verrall remarks that the living *S. crassicornis* has the appearance of an *Anthomyia*); ferruginous, darker above; abdomen with scattered minute hairs; legs very finely pubescent; proboscis slender. Venation as figured by Verrall (British Flies, V, p. 299) for *S. immaculata*, except in some slight particulars; thus the second submarginal cell in the fossil is much less broadened apically. The characteristic form of the marginal cell, the position of the anterior cross-vein, the long præfurca, the open anal, etc., are all normal. The following measurements are in microns:—

| | |
|---|---|
| Marginal cell on costa | 290 |
| Length of second submarginal | 3360 |
| Length of second posterior | 2400 |
| Width of anal at level of second basal | 830 |
| Width of first posterior near end | 625 |
| Width of second posterior near end | 610 |
| Width of third posterior near end | 675 |
| Length of præfurca, about | 1440 |
| First basal on first submarginal | 850 |
| First posterior on first submarginal | 1200 |

Miocene shales of Florissant, station 14 (Wilmatte P. Cockerell.)

Verrall remarks of this genus: "Osten Sacken has stated that the females of a Californian species bit him quite painfully and drew blood like a *Tabanus*, and though there is no other well authenticated case of a Leptid biting, the statement of such a dipterologist as Osten Sacken is beyond doubt, and as some confirmation Bezzi has recorded that the female of *S. grisea* settled on his hands as if intending to attack him."

The genus *Symphoromyia* is well represented in the modern fauna of Colorado, with the following species: *S. fera* Coquillett, *S. pachyceras* Williston, *S. flavipalpis* Adams, *S. pullata* Coquillett. The whole palæarctic region has only the same number of recorded species.

**Asilus amelanchieris** n. sp. (Asilidæ.)

Length about 21 mm., wing 11 mm.; general structure and appearance as in *Asilus*; black, the abdominal sutures broadly pallid, legs apparently ferruginous, the tarsi darker; venation ordinary, marginal cell closed; five posterior cells, the fourth closed some distance from margin; anal cell closed just before margin.

In my description of the Florissant fossil *Asilus peritulus* (Bull. Am. Mus. N. H., 1909) I made comparisons with *A.* (*Tolmerus*) *notatus* Wied, and it is convenient to do the same here. *A. amelanchieris* differs from *A. notatus* thus:

(1.) Apex of marginal cell more acute, but lower nervure evidently curved subapically, the form being precisely that of *Asilus crabroniformis*.

(2.) Second submarginal cell slightly over 3 mm. long, its base a little over 2 mm. from anterior cross-vein; thus proportionately it is longer than in *A. notatus*, but not nearly so much so as in *A. peritulus*. The shape of the second submarginal is nearly as in *A. notatus*, but it is more contracted subapically (its width at most contracted place is about 450 $\mu$, at widest part toward base about 695; at extreme apex it flares widely, and is even a trifle wider than toward base.)

(3.) The third posterior, which in *A. peritulus* differed from *A. notatus*, is here of the *notatus* type, the sides of the second posterior being nearly parallel.

(4.) The anterior cross-vein is conspicuously beyond middle of discal cell (2400 $\mu$ from base, 1520 from apex.)

(5.) The fourth posterior, which in *A. peritulus* differed from *A. notatus*, is here about as in *notatus*.

The legs have fine hairs and strong spines as in *A. notatus*, but the spines are fewer and rather shorter; on the hind tibia only three spines are visible, all in the apical region. The hind femur is shorter than in *A. notatus*, reaching only to end of basal third of third abdominal segment; it is about 5 mm. long, its tibia about 4 mm.

The venation, compared with *Asilus crabroniformis*, shows the following differences:

(1.) The lower apical corner of fourth posterior cell is a little more apicad than upper apical corner; in *A. crabroniformis* the upper apical corner is more apicad.

(2.) The second posterior cell does not bulge at the upper basal corner.

(3.) The oblique basal side of discal cell is straight.

(4.) The second submarginal is more contracted subapically.

Miocene shales of Florissant, partly overlapping a leaf of *Amelanchier peritula* Ckll.

**Taracticus renovatus** n. sp. (Asilidæ.)

Length about 10 mm., wing 6; a better *Taracticus* than *T. contusus* (Bull. Amer. Mus. N. Hist., XXVIII, p. 282), the lack of hair, general form, and strong dark veins, being very characteristic, also the wide second submarginal cell. The width or depth of the second submarginal, 320 $\mu$ from the end, is 480 $\mu$, whereas in *T. contusus* at this point it is only about 260. The femora are evidently more robust than in the living *T. octopunctatus*, and the abdomen (in lateral view) is not at all constricted subbasally. The anterior cross-vein is beyond the middle of the discal cell, and the second posterior on the discal is only half as broad as the third. The following measurements are in microns:—

| | |
|---|---|
| Length of second submarginal cell | 1840 |
| First posterior on first submarginal | 1040 |
| First posterior on margin | 500 |
| Second posterior on discal | 160 |
| Second posterior on margin | 500 |
| Third posterior on discal | 320 |
| Third posterior on margin | 770 |
| Fourth posterior on margin | 450 |
| First posterior on discal | 720 |
| First basal on discal | 910 |
| Second basal on discal | 430 |
| Marginal on margin | 720 |
| Subcostal on margin | 1440 |

The last two measurements are inexact owing to the very gradual merging of the first vein into the margin. The lower part of the anal cell is not preserved.

Miocene shales of Florissant (Geo. N. Rohwer).

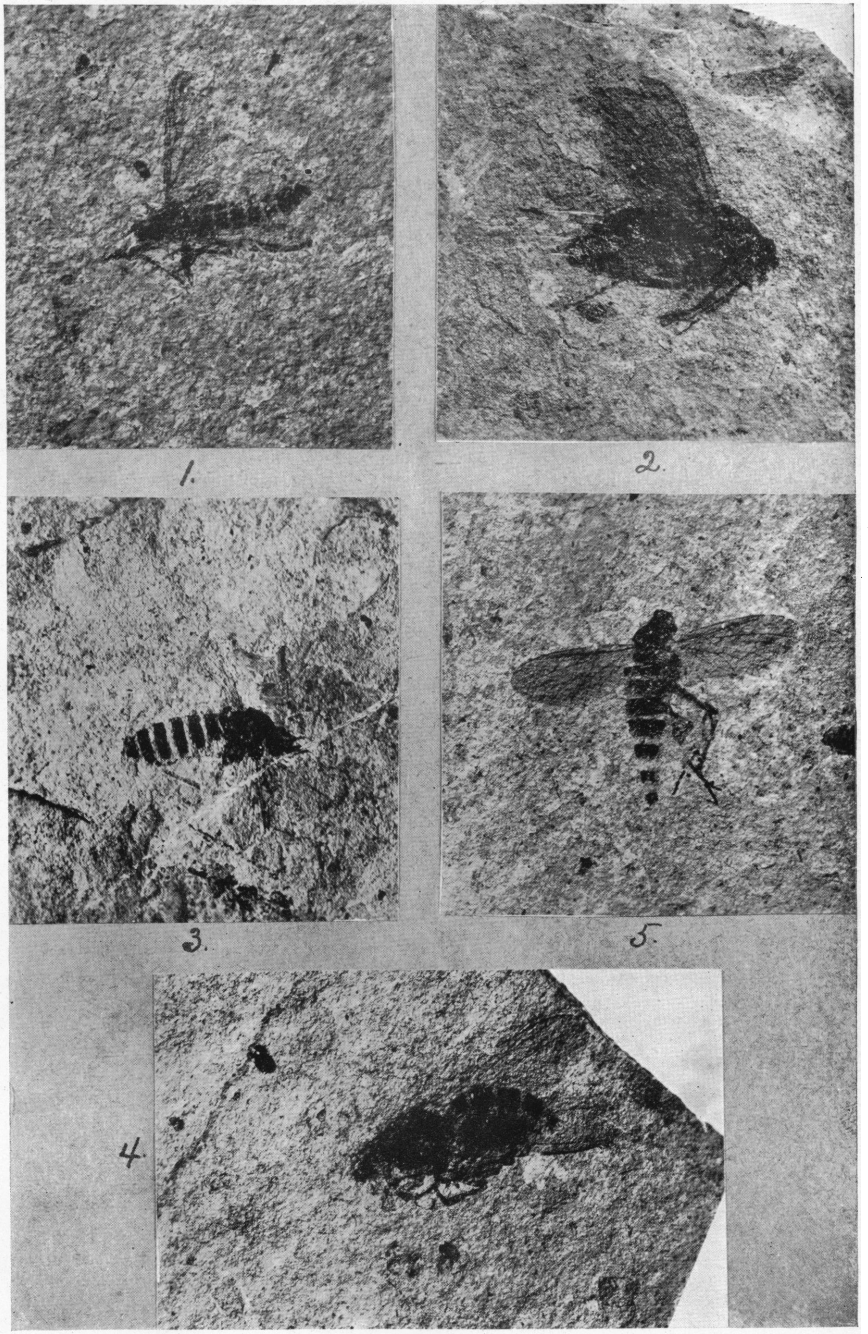
This also resembles *Heteropogon*, the most obvious difference being that the fourth posterior cell is not contracted apically.

**Megacosmus secundus** n. sp. (Bombyliidæ.)

Wing 12⅓ mm. long, 4 broad, dilute fuliginous; thorax black, 3½ mm. broad; face with some long hairs; proboscis slender, about 4 mm. long. Close to *M. mirandus*, but readily distinguished by the form of the second and third posterior cells; the second is very much widened apically, while (as a consequence) the third is contracted, being of the same width at apex (320 $\mu$) as the anal cell.

The following measurements in microns also differ more or less from those of *M. mirandus*:

| | |
|---|---|
| Distance between end of second vein and of anterior branch of third | 1500 |
| Anterior cross-vein from apex of discal cell | 880 |
| Anterior cross-vein from base of discal cell | 4080 |
| Third posterior on discal (not allowing for curve) | 2720 |
| Second posterior on discal | 530 |




1. *Plecia melanderi* n. sp.
2. *Symphoromyia subtrita* n. sp.
3. *Melanderella glossalis* n. sp.
4. *Eucallimyia fortis* n. sp.
5. *Leptis mystaceæformis* Ckll. (See Vol. XXVI, 1909, p. 69.)

All figures three times natural size.

| | |
|---|---|
| First posterior on margin | 510 |
| Width of anal cell opposite end of second basal | 770 |
| Second basal on discal | 960 |

While the length of the discal cell is practically as in *M. mirandus*, the anterior cross-vein is nearer the end in *M. secundus*.

Miocene shales of Florissant, station 13 B. (Geo. N. Rohwer.)

In venation this genus resembles *Legnotomyia* Bezzi, found in Syria. The most noticeable difference is in the long discal cell of *Megacosmus*.

### **Lithocosmus coquilletti** *Ckll.* (Bombyliidæ.)

A good specimen was found by Mr. S. A. Rohwer at station 14, Florissant. It is 8 mm. long, the wings $6\frac{1}{3}$ mm., thus rather smaller than the type.

### **Melanderella glossalis** *Ckll.* (Bombyliidæ.)

Plate III, Fig. 3.

A specimen from Station 14, Florissant (S. A. Rohwer) lacks the ends of the wings, but is in some respects better preserved than the type. The præfurca is very short (130 $\mu$); in the type it was described as absent, but it is really present, though only 64 $\mu$ long. The following measurements are from the new specimen, but those marked * have been compared with the type and found to agree: —

| | |
|---|---|
| End of first vein (at a very acute angle on costa) basad of level of forking of third | 210 |
| First submarginal cell on first basal * | 960 |
| First submarginal cell on first posterior | 1105 |
| First basal cell on discal * | 800 |
| First posterior on discal | 565 |
| Second basal on discal * | 145 |
| Second basal on third posterior (the bounding nervure straight) | 220 |
| Discal on third posterior | 800 |
| Width of anal opposite end of second basal | 195 |

The measurements here given are a little smaller than those of former papers, a new test of the micrometer scale showing that the estimated values were slightly too great.

The anal cell is closed just before the margin of the wing. The thorax is not much humped, and is without evident bristles; the legs are not

bristly, but are very minutely hairy. The hind margins of the abdominal segments have short black bristle-like hairs, the longest about 110 $\mu$.

This must be near the common stem of the Toxophorinæ and Systropinæ.

**Eucallimyia** n. gen. (Platypezidæ.)

Rather large and robust flies, the general aspect, and marking of the abdomen, very suggestive of *Glossina* (especially *G. pallidipes* Austen); thorax and abdomen with fine dark bristles, those on hinder part of abdominal segments larger, the longest about 490 $\mu$; legs rather robust, finely hairy all over; tarsi not deformed (but type is apparently a female); middle tibiæ with a fringe of stout black spines at apex; venation essentially as in *Callimyia*, but end of first vein (which is very conspicuously bristly) exactly midway between ends of auxiliary and second veins (the distance in the type species being in each case 2720 $\mu$); vein bounding outer side of discal cell evanescent, but its position clearly indicated by a bend in fourth vein.

This insect has caused me some perplexity, but I believe it can only rest in the Platypezidæ, close to *Callimyia*, with which it agrees in the essential characters of the venation. Flies referred to *Callimyia* have already been described from the Eocene of Colorado and Wyoming, and it is probable that this type, now confined to a few species, was once much more abundant and varied.

**Eucallimyia fortis** n. sp.

Plate III, Fig. 4.

Length about 10 mm., reddish-brown, paler beneath, dorsal abdominal segments dark fuscous, with the sutures broadly pallid; wings 8½ mm. long, ample, pale reddish hyaline; end of first vein, which carries a row of black bristles, about 5 mm. from base of wing and 3½ from apex; auxiliary vein forming an acute angle with costa (as in Platypezidæ and Ortalididæ, not as in Trypetidæ); one submarginal and two posterior cells; first posterior gradually broadening to level of end of discal, thence slightly narrowing; width of discal cell at apex the same (880 $\mu$) as width of first posterior at same level; anterior cross-vein far basad, not quite clearly visible, but apparently about 1085 $\mu$ from base, and 2480 $\mu$ from apex, of discal cell; middle tibia at apex with seven spines; this tibia is about 1920 $\mu$ long, and 400 wide at apex.

Miocene shales of Florissant (Geo. W. Rohwer).

Meunier notes the affinity between the Dolichopodidæ and Platypezidæ, suggesting that the former gave rise to the latter in the early Tertiary. Lameer, perhaps with the same idea, places Dolichopodidæ at the end of the Orthorrhapha, immediately followed by Platypezidæ at the beginning of the Cyclorrhapha. The venation of *Eucallimyia* is not very unlike that of various Dolichopodidid genera.