Art. XXV.—Descriptions of Tertiary Insects; by T. D. A. Cockerell.

Part II. [Continued from p. 52.]

(3) A Belostomatid (Hemiptera) from Colorado.

The occurrence of Belostomatid bugs in the Tertiary rocks of Europe has been known ever since 1837, when Germar described Belostoma goldfussii from the vicinity of Bonn, in Rhenish Prussia. Belostoma spectosum Heer, from Ensingen, is one of the largest and finest fossil insects from that famous locality. So far as the paleontological evidence went, one might have supposed that the Belostomatids, now so characteristic of America, were in Tertiary times confined to the Old World. That this was not really the case is shown by the discovery of a small species in the Florissant Miocene.

Zaitha vulcanica sp. nov.

Length of body 10 mm, not counting the thick caudal valves, which are about 2 mm long; breadth in middle a little over 5 mm; shape normal; anterior femora 4 mm long, thick, but not swollen in the middle, the anterior edge practically straight (distinctly convex in the living Z. fluminea), the anterior side with a distinct groove; anterior tibia + tarsus about 3 mm long, curved as in Z. fluminea; hind femora distinctly incrassated in the middle; hind tibia + tarsus about 6 mm, thus shorter proportionally than in Z. fluminea. General appearance quite Neopa-
like, but the structure is that of Zaitha. The apical angle of the corium appears to have been broader than in Z. fuminescens, but the whole dorsal region is very indistinctly preserved. Florissant Station 14 (W. P. Cockerell, 1907).

(4) A Tipulid Fly from the Green River Shales.

The genus Dicranomyia Stephens is represented in the living fauna of North America by 35 described species. In the fossil state, numerous species occur in Prussian amber,

Fig. 2.—Dicranomyia rhodolitha, x 2.

according to Loew. Scudder has described eight species from the Tertiary rocks of the Rocky Mountains; five being from Florissant and three from the Lower White River, at the boundary between Utah and Colorado. A new species is added from Wyoming.

*Dicranomyia rhodolitha* sp. nov.

Male. Length 7 mm; length of thorax 2 mm, its width 1 1/2 mm; genitalia essentially as in *D. stigmosa* Scudder. Eyes separated by an interval of about 135 μ.
Legs long and slender; anterior femur 4½, tibia 5½, tarsus 6½ mm; middle femur 5½, tibia 6 mm; hind femur 6, tibia 6½ mm.

Wings 7 mm long: a small dark spot on costa 2½ mm from base; another 4 mm from base; stigmal spot large, as in D. stigmosa. Venation not well preserved, but the subcosta (mediastinal of Loew) and the four apical veins are all quite normal.

Allied to D. stigmosa Scudder, but distinguished by the details of the measurements, and especially by the two costal spots.


(5) A Pompidid Wasp from Florissant.

In all, four fossil Pompididae have been described, three from Florissant, and one from Öeningen. One or two others, not named, are said to occur in Baltic amber. The Florissant species have been referred to Hemipogonius (2) and Cercopales (1); an additional species, now described, belongs to Agenia.

Fig. 2.—Agenia saxigena, ×2.

Agenia saxigena sp. nov.

Length about 14½ mm; rather stout, width of abdomen about 3½ mm; anterior wing 9½ mm long; body and femora black, tibiae and tarsi ferruginous; wings faintly dusky, with a dark cloud in the marginal cell and below, and another in lower basal part of first discoidal and below; venation ferruginous; antennae more or less curled apically; legs not at all spinose; stigma fairly large; marginal cell lanceolate, ending in a point.
on costa; first discoidal cell of the same length as first submarginal, viz. 2890 μ; cubitus of hind wings originating about 34 μ beyond transversomedial. The following measurements are in μ:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatest width of marginal cell</td>
<td>595</td>
</tr>
<tr>
<td>First submarginal on marginal</td>
<td>255</td>
</tr>
<tr>
<td>Second &quot; &quot; &quot; &quot;</td>
<td>714</td>
</tr>
<tr>
<td>Third &quot; &quot; &quot; &quot;</td>
<td>1020</td>
</tr>
<tr>
<td>Marginal from end of third transverso-cubital to apex</td>
<td>880</td>
</tr>
<tr>
<td>Basal nervure on first submarginal</td>
<td>340</td>
</tr>
<tr>
<td>&quot; &quot; &quot; discoidal</td>
<td>595</td>
</tr>
<tr>
<td>&quot; &quot; from transversomedial (basad of it)</td>
<td>680</td>
</tr>
<tr>
<td>Length of transversomedial</td>
<td>340</td>
</tr>
<tr>
<td>Lower side of first submarginal</td>
<td>2346</td>
</tr>
<tr>
<td>First transverso-cubital nervure</td>
<td>646</td>
</tr>
<tr>
<td>Second submarginal on first discoidal</td>
<td>285</td>
</tr>
<tr>
<td>&quot; &quot; &quot; third &quot;</td>
<td>812</td>
</tr>
<tr>
<td>Third &quot; &quot; &quot; &quot;</td>
<td>501</td>
</tr>
<tr>
<td>Lower side of third submarginal beyond third discoidal</td>
<td>1105</td>
</tr>
</tbody>
</table>

Fig. 4.—Embia florissantensis, x 2.

According to Fox’s* table the Pompilini (to which Agenia belongs) should have the first discoidal cell definitely longer than the first submarginal, but in some of the living forms the difference is trifling. *A. savigena* is from Florissant, Station 14 (W. P. Cockerell, 1907).

(6) The Second Tertiary Embiid.

Picott in 1854 described *Embia antiqua* from Baltic amber, and this has remained the single fossil representative of the family; *E. westwoodi* Hagen, from copal, being properly of the recent period.

An insect occurring at Florissant, having a strong general resemblance to a Termitid, proves upon careful examination to disagree in important particulars with all Termitidae, and to agree well with the Embiidae, to which it must be referred. It has even the peculiar streaked appearance of the wings, so characteristic of this family.

*Embia florissantensis* sp. nov.

Length 12½ mm.; head about 2 mm.; prothorax about 1½; anterior wing 11½ mm. long and 3½ broad; posterior wing just over 9 mm. long, but as broad as the anterior; shape of wings normal, with the usual longitudinal bands of color, giving rather the appearance of a flower-petal with colored veins. The head is narrow-oblong, considerably narrower than in *E. (Oligotoma) michaeli*, McLachlan; prothorax unusually elongated, shorter, but not very much smaller than the head; the distinct venation consists of two parallel veins, barely separated, running along the upper part of the wing for about three-quarters its length, nearly parallel with the costa, but gradually nearing it apically, and apparently fusing at their ends; and of an oblique vein in the anal region. According to the interpretation of Melander the parallel veins represent the sub-costa, and the oblique vein the cubitus, with its lowermost branch. The color bands, regarded as representing veins, show the media + radius, giving off two large branches above, essentially as in *E. urichi* Saussure (this Trinidad species is presumably named after Mr. Urich, the well-known naturalist of that island; hence there is no reason for perpetuating the erroneous form "urichi"), except that the branches are given off much sooner, the first about 4½ mm. from base of wing, the second a little more than 4 mm. from apex. The two lower color-bands, representing the third media and first cubitus, are also well represented. These particulars are derived from the anterior wing, but the hind wing is similar.

Hab.—Florissant, Station 14 (W. P. Cockerell, 1907). Also two from Station 13 (S. A. Rohwer, 1907, W. P. Cockerell, 1906). Melander, in giving an account of the discovery of *E. tassana*, remarks that *Sapindus* and *Eusenhardia* grew profusely in the locality where it was found. It is of interest to

note that *Sapindus* was abundant at Florissant and *Eysenhardtia* also grew there.

(7) A Mayfly from Florissant.

Seven Ephemerids have been described from Baltic amber, and one from Önningen. In America, Scudder has described five nymphs and one adult from Florissant. I have examined the type of the latter (*E. cressyco*) in the Museum of Comparative Zoology. A much larger form is here described; like the other, it unfortunately does not show the characters necessary for precise generic reference.

![Figure 5: *Ephemera howarthi*, x2.](image)

*Ephemera (s. lat.) howarthi* sp. nov.

Length of body, excluding caudal setae, 15 mm; thorax about 5 mm; three slender caudal setae; head transversely oval, about 2 mm broad, eyes about 3 mm distant on vertex; length of anterior wing 13 mm; costa very slightly arched, subcostal vein close to costa; outer margin about 9 mm long, distinctly convex.

Another specimen (from Sta. 13 B) is larger (anterior wing about 14 mm), but evidently the same species.

Florissant, Station 14 (*T. D. A. Cockerell*); also Sta. 13 B (*Geo. N. Rhorer, 1907*). I have named this species after Mr. Howarth, of Florissant, who is known even in Europe as a skillful creator of new genera and species of mayflies, of wonderful form and color, used by fishermen to lure the speckled trout.

*Eysenhardtia* (or *Viborgia*) *vagrostipilata* Oll., ined., was collected at Florissant by the Princeton expedition, and is now in the British Museum. The leaflets have the blade about 5½ mm long and 2½ broad, and are almost exactly as in *E. orthocarpa* (Gray) Watson. The little black pointed stipels are like those of *E. spinosa* Engelm.