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A. Martynov, Jurassic fossil  
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Jurassic fossil *Mecoptera* and *Paratrichoptera* from  
Turkestan and Ust-Balei (Siberia).

By A. Martynov.

(Présenté par P. Suškin, membre de l'Académie des Sciences, le 15 Décembre 1926).

I describe here several forms of *Mecoptera* from Galkino, Turkestan, and Ust-Balei, Siberia, and one extremely interesting form which I consider as belonging to the order *Paratrichoptera*, allied both to *Mecoptera* and *Diptera*. This last species (*Pseudopolycentropus latipennis*, n. sp.) was found in Karabas-tau, NE Kara-tau, Turkestan.

Order **Mecoptera**.

Fam. **Orthophlebiidae** Handl.

*Orthophlebiidae* Handlirsch, Die Fossilen Insekten, 1908, S. 479; Schröder's Handbuch der Entomologie, Lief. 5, 1921, S. 196.

Gen. **Orthophlebia** Westw. (s. emend.).

*Orthophlebia* (*communis*) Westwood, in Brodie, Foss. Insect., S., 102, 126, Taf. 8, Fig. 7, 8, 9 (1845); Handlirsch, Foss. Insekten, S. 480, Taf. XLII.

Anterior wing. Sc reaching the pterostigmal region; anterior main branch of RS dividing approximately at one level with the point of dividing of the posterior branch or even somewhat before, and forming not less than 4 branches, sometimes 7. M dividing somewhat after RS and forming 5 branches. Cu united at its base with  $A_1$ ; then follow  $A_2$ — $A_4$ . Cross-veins sparse (and usually indistinct). Claws simple, not serrate. Size rather great; length of anterior wings usually 15—17,5 mm; in one species (*O. intermedia* Giebel) it is 11 mm, in another (*O. grandis*, n. sp.)—35 mm. This genus is allied to *Mesopanorpa* Handl. (s. emend.), but distinct, differing by more composite structure of  $RS_{1+2}$  and by greater size.

Some species (*O. grandis* from Jurassic beds of Turkestan) had reached very large size. The whole genus apparently extinct in Mesozoic age.

To this genus we refer *O. communis* Westw., *O. similis* Giebel, *O. lata* Giebel, *O. intermedia* Giebel, *O. grandis*, and perhaps *O. phryganoides* Mart.

*O. grandis*, n. sp.

One specimen, Galkino, VII 1925. A. Martynov. Coll. Geol. Mus. Acad. Sci.

The specimen is represented by the wings, each superior wing lying above the inferior, by two posterior and remains of two (anterior?) legs,

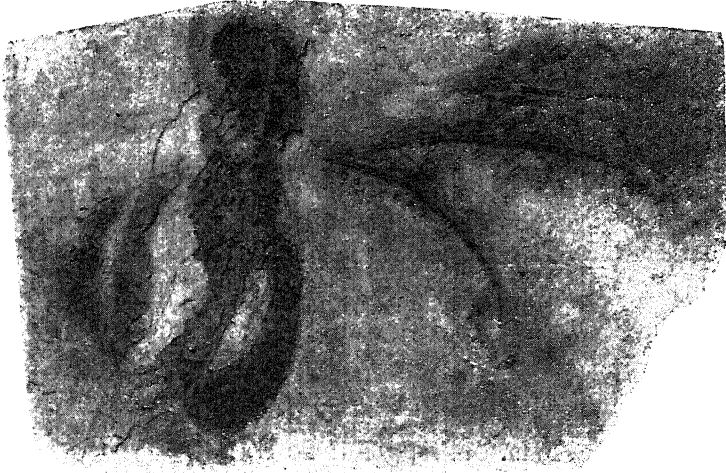


Fig. 1. Specimen of *Orthophlebia grandis*, n. sp. ( $\times 1\frac{1}{2}$ ).

and by the damaged portions of the thorax and abdomen (Fig. 1). Anterior wings. I could discriminate the nervuration only in the anterior wings

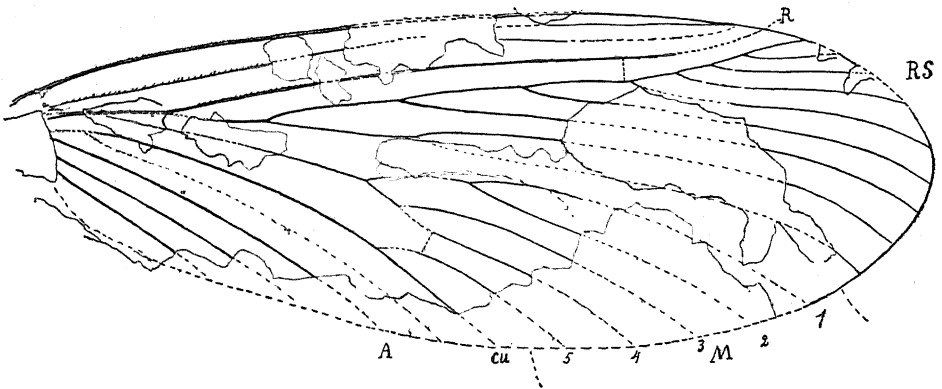


Fig. 2. Anterior wing of *Orthophlebia grandis*, n. sp.

(Fig. 2). These wings are nearly elliptical, with convex costal margin, dark yellow, with dilute brownish markings; membrane clothed with minute

adjacent hairs; on the nervures the hairs are greater, stouter, and placed sometimes in 2—3 rows. Subcosta nearly reaches the end of R; under its distal portion one can appreciate a second longitudinal vein, but the point of its arising is invisible; perhaps that is  $R_1$ . RS arises in the basal portion of the wing, and soon divides into two branches; anterior branch ( $RS_{1+2}$  auct.) composite, and forms successively 7 branches; the point of its first furcation is placed somewhat nearer to the base than that of the posterior branch which forms only two long branches. M divides slightly before the point of furcation of the posterior branch of RS ( $RS_{3+4}$  auct.), and forms 5 branches as usually; its anterior fork long;  $M_3$  appears to be as a branch of Cu; anals nearly straight; cross-veins invisible.

The surface of the legs and even of the abdomen densely clothed with minute adjacent hairs, those on the legs (Fig. 3, *a*) being placed in rows. At the end of tibiae one can perceive about 10 small spines and 1—2 very long and stout spurs (Fig. 3, *a*); each tarsal joint bears on its hind margin a row of not very long, but stout spines; claws simple (Fig. 3*b*), not serrate, strongly curved.

Length of the anterior wing about 35 mm, breadth — 11 mm.

Allied to *O. communis* Westw., differing chiefly by the more composite  $RS_1$  and by being much larger in size.

*O. maculata*, n. sp.

One specimen, № 45. Galkino, 1924. M. Brick. Coll. of the Geol. Institute at the Tashkent University.

The specimen is represented by both pairs of wings, but unfortunately each anterior wing lies on the posterior of the same side, and thus the

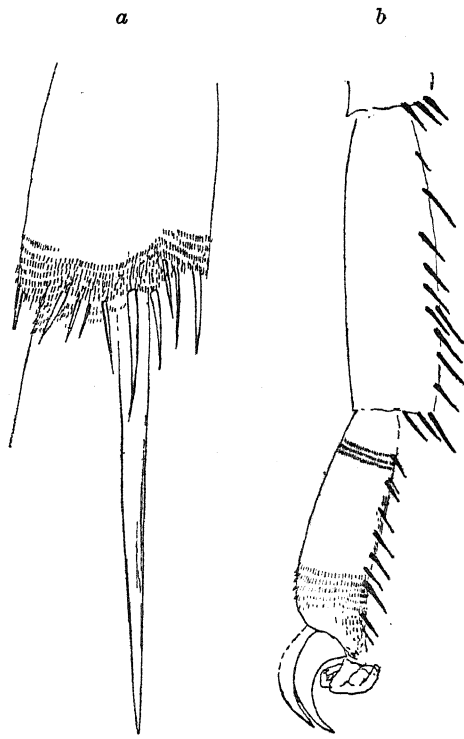


Fig. 3. End portion of tibia (*a*) and two last tarsal joints (*b*) of the posterior leg of *Orthophlebia grandis*, n. sp.

nervuration of the hind wings remains indistinct. The shape of the anterior wings resembles that of the gen. *Panorpa*; posterior wings slightly shorter and narrower. Sc ending not far from the R; RS arising from R at the same level as in the gen. *Panorpa*, the free portion of R being nearly straight; the anterior branch of RS forming four branches; the posterior branch forking nearly at the same level as the anterior. The branching of M resembles that in *Panorpa* or in some *Orthophlebia*, but the branching of its hind portion is indistinct (damaged). Cu united with  $A_1$ , as usually;  $A_2$ ,  $A_3$ , and  $A_4$  curved as in European species of the gen. *Panorpa*; cross-veins indistinct.

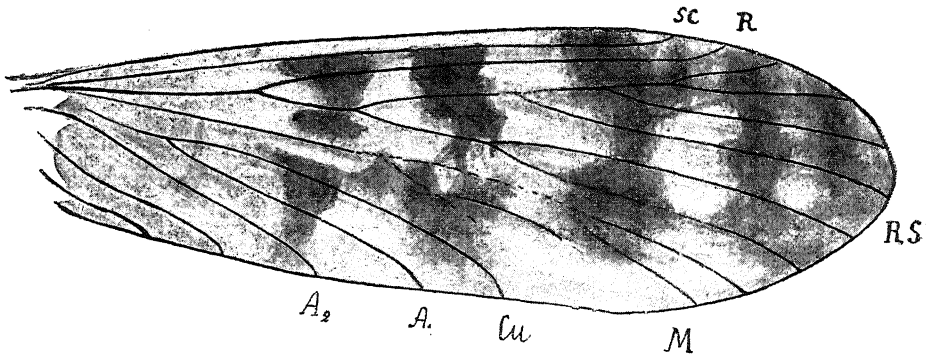


Fig. 4. Anterior wing of *Orthophlebia maculata*, n. sp.

There are about five brown irregular transverse bands as follows: the first fascia crosses the common stem RS; the second fascia touches the point of furcation of the posterior branch of RS; the anterior portion of the broad

third fascia occupies the regions near the end of Sc; its posterior portion crosses the basal half of  $M_1$  and  $M_2$ ; the fourth fascia is placed between the end portions of RS and M, and the fifth fascia occupies the apical portion of the wing. In the basal part of the wing there is one more small spot. Membrane clothed with dense and short pubescence (Fig. 5); the hairs on the nervures are longer and stouter, but in general somewhat shorter than in the recent species of *Panorpa*. Length of anterior wings 17,5 mm.

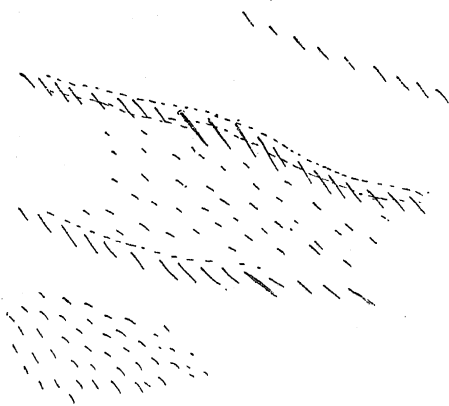


Fig. 5. Portion of anterior wing in the region of  $A_2$  and  $A_3$  in *O. maculata* (more magnified).

Length of anterior wings 17,5 mm.

In the nervuration and in the whole habitus of the anterior wings this form much resembles the recent species of the gen. *Panorpa*, but differs obviously from this genus, as well as from the fam. *Panorpidae* (s. str.) in that both main branches of RS divide nearly at the one level. The number of branches of M is probably five.

Gen. *Mesopanorpa* Handl. (s. emend.).

*Mesopanorpa* Handlirsch, Foss. Insekten, S. 615 (for *M. hartungi* Br., Redt., Ganglb.).

Allied to *Orthophlebia* Westw., but distinct and partly leading to the gen. *Panorpa* and to *Panorpidae* (s. str.) in general.

Sc long, reaching the pterostigmal region; RS furcating as in the gen. *Panorpa*, i. e. its anterior branch dividing much after the point of furcation of its posterior branch (=  $RS_{3+4}$  auct.), and forming 3 or 4 branches. M branching somewhat beyond the level of the first furcation of RS and forming 5 branches. Cu and anal as in *Panorpa*;  $A_2$  and  $A_3$  sometimes furcate at the ends; cross-veins sparse. Size mediocre; length of anterior wings 9,5—14 mm.

I refer to this genus *M. hartungi* Br., Redt., Ganglb., *M. angarensis*, n. sp., *M. (Orthophlebia) germanica* Handl., *M. (Orthophlebia) geinitzi* Handl., *M. (Orthophlebioides) obscura* Mart., *M. incerta*, n. sp., *M. felix*, n. sp.

*M. hartungi* Br., Redt., Ganglb.

*Panorpa hartungi* Br., Redt., Ganglb. Mém. Acad. Imp. Sci. St.-Pétersburg, T. XXXVI, № 15, 1889, p. 16, Fig. 20; *Mesopanorpa hartungi* Handlirsch, Foss. Insekten, S. 615, Taf. XLVIII, Fig. 16. Type-specimen from Ust-Balei. Coll. Geol. Mus. Acad. Sci.

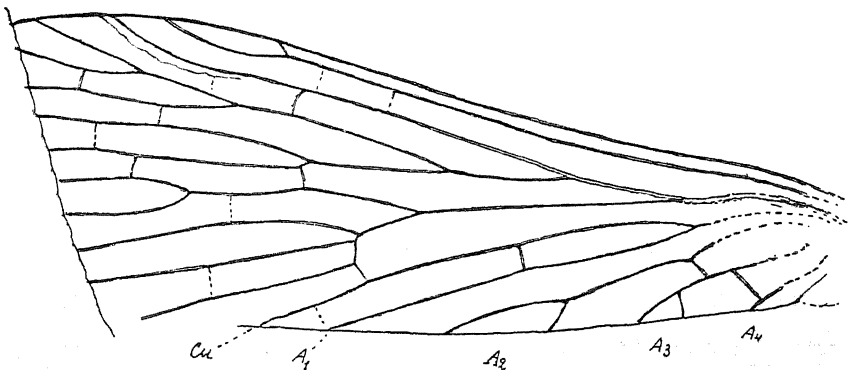


Fig. 6. Anterior wing of *Mesopanorpa hartungi* Handl.

The re-examination of the well preserved type enabled me to reveal some new details in the nervuration of the wing (anterior). I give here a new figure of the wing (Fig. 6).

The nervuration much resembles that in the gen. *Panorpa*, the nervures in general are more regular and not as curved as represented on Fig. 20 (loc. cit.). M runs at its base close to R, and this common stem is curved in a manner characteristic of the gen. *Panorpa*. Cross-veins placed as shown on Fig. 6. Posterior branch of M forms 3 branches,  $M_3$  being connected with Cu by a transverse nervule.  $A_2$  and  $A_3$  furcating at their ends, and connected with  $A_3$  and  $A_4$  by two distinct transverse nervures;  $A_4$  short.

Length of the whole wing must have been about 10,5 mm.

This species is allied to the recent species of the genus *Panorpa* and differs chiefly by the presence of a superfluous branch of M, by the analia being shorter, and by the  $A_2$  and  $A_3$  furcating at their ends. These differences are features of primitiveness.

*M. angarensis*, n. sp.

One specimen. Ust-Balei, 1925. Žemčuznikov. Coll. of the Geol. Committee, Leningrad.

The specimen represents the anterior wing, somewhat kneaded and cracked in the apical portion.

Sc ending near R. Posterior branch of RS divides much earlier than the anterior one which forms 4 branches. Cross-veins are more numerous than in the preceding species; their disposition is represented on Fig. 7; between

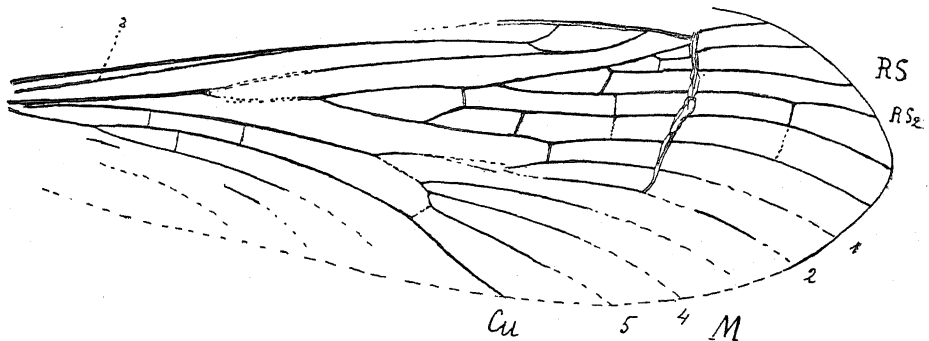


Fig. 7. Anterior wing of *Mesopanorpa angarensis*, n. sp.

$RS_{1+2}$  and  $RS_3$  there is a cross-vein closing the discoidal cell, and between  $RS_2$  and  $RS_3$  there are two more such nervules. The fork between  $M_1$  and  $M_2$  long;  $M_3$ ,  $M_4$ , and  $M_5$  set at their bases more close together; Cu and  $A_1$  somewhat arcuate. Length of the wing — 14 mm.

In its nervuration the wing described greatly differs from the preceding species, and resembles more such species as *M. (Orthophlebia) geinitzi* Handl. and *M. germanica* Handl., from Upper Lias of Mecklenburg.

*M. incerta*, n. sp.

One specimen. Ust-Balei, 1925. Žemčužnikov. Coll. of the Geol. Committee.

The specimen represents the anterior portion of the wing. The dividing point of  $RS_{1+2}$  is not far from that of  $RS_{3+4}$ ; M divides at the same level as RS. Length of the wing must have been about 10 mm.

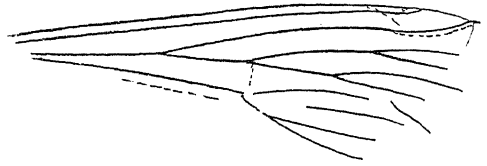


Fig. 8. Anterior wing of *Mesopanorpa incerta*, n. sp.

*M. (?) felix*, n. sp.

One specimen. Galkino, 1925. A. Martynov. Coll. Geol. Mus. Acad. Sci.

The specimen represents the whole body of a female, with head and antennae, but without wings. Head stretched into a neck, but this stretching is more gradual and not as great as in the recent *Panorpa*. Palpi maxillares as

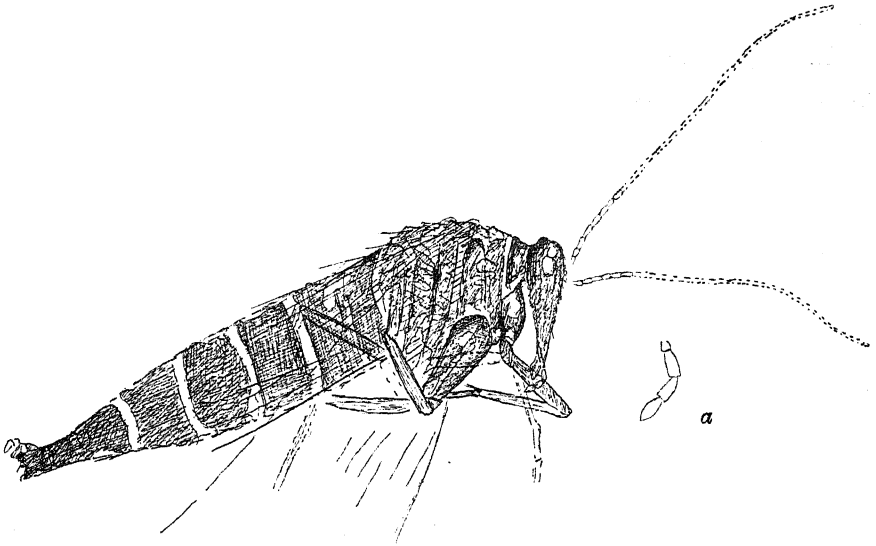


Fig. 9. The body of *Mesopanorpa (?) felix*, n. sp.; a — palpi maxillares.

in this genus, 3rd—5th joints thick, 1st—2nd more slender. Antennae long and consisting of about 30—32 joints which are slightly shorter than in the recent *Panorpa*, and clothed with very short hairs (Fig. 9). Pleural regions of the thorax structured as in *Panorpa*, but the epimera and episterna appear to be somewhat shorter; pronotum concave above (viewed from side), but



its anterior thickening apparently is not as strong as in *Panorpa*; coxae and trochanteres also similar, but the greatest part of the legs, unfortunately is indistinct. Abdomen of the ♀ shaped as in females of *Panorpa*; 8th and 9th segments small and without any distinct limits between them. Wings not preserved.

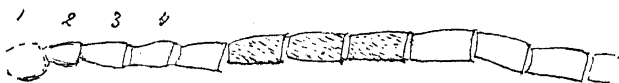


Fig. 10. Portion of antennae in *M. (?) felix*, n. sp.

Length of the whole body, without antennae, 10 mm.

The above described form undoubtedly represents a *Panorpa*, but in more primitive condition, in other words, a *Mesopanorpa* or perhaps *Orthophlebia*. The last genus is much like *Mesopanorpa*, but the size of the species of *Orthophlebia* is on the average much greater than in *Mesopanorpa*, and on this account I consider that the body under description belongs rather to *Mesopanorpa* which, besides, in general is more allied to the recent *Panorpa* than *Orthophlebia*.

The specimen described is very interesting, and confirms our supposition that the genus *Mesopanorpa* in general is ancestral to the fam. *Panorpidae*, s. str. (*Choristidae* excluding) and partly to the species of the genus *Panorpa*.

#### Fam. Neorthophlebiidae Handl.

*Neorthophlebiidae* Handlirsch, in Schröder's Handbuch der Entomologie, Paleontologie, 1921, B. III, Lief. 5, S. 198.

#### Gen. Probittacus, n. gen.

Closely allied to the recent gen. *Bittacus* Latr., differing chiefly by the posterior branch of M forming not 2, but 3 branches. Probably ancestral to some of the recent species of *Bittacus*.

#### *P. avitus*, n. sp.

One specimen. Galkino, VII 1925. Martynov. Coll. Geol. Mus. Acad. Sci.

The specimen represents an anterior wing, slightly damaged at the base.

General shape as in recent *Bittacus*. Cross-vein C—SC invisible; between SC and R there are two cross-veins, the distal one at the level of branching of RS; pterostigma distinct, dark; between R<sub>2</sub> and RS there is a feeble cross-vein, and before the pterostigma there is another oblique

and distinct cross-vein. 1st apical fork ( $AF_1$ ) short, simple,  $AF_2$  enclosing three,  $AF_3$  four cells.  $M_4$  soon divides into  $M_4$  and  $M_5$ , connected by a cross-vein; between  $M_2$  and  $M_3$  three cross-veins.  $A_1$  runs near to Cu

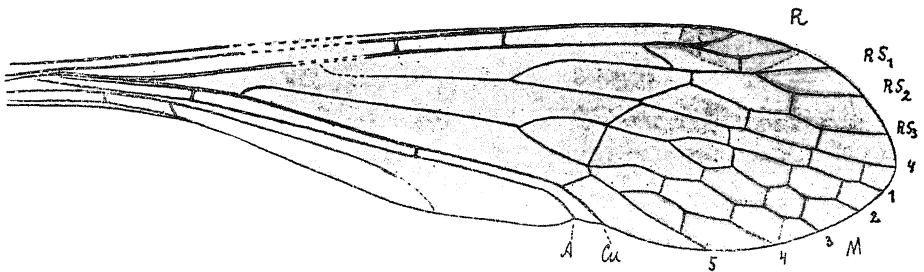


Fig. 11. Anterior wing of *Probittacus avitus*, n. sp.

and is connected with it by two cross-nervules, the distal one placed nearly at the middle of the free portion of Cu; between  $A_2$  and  $A_3$  two cross-nervules. In the distal portion some longitudinal as well as transverse nervules slightly tinged with brownish; pterostigma also brownish. Length of the whole wing about 16,5 mm.

This form is nearly a *Bittacus*, differing only by the presence of  $M_4$  which is vanished in all recent species of *Bittacus*, and by somewhat smaller size. Thus, this species is probably ancestral of some of the recent ones. Analogical relations we met with in the case of *Mesopanorpa hartungi*.

#### SOME GENERAL CONSIDERATIONS.

Most of the species in the fam. *Orthophlebiidae* belong to the genera *Orthophlebia* Westw. and *Orthophlebioides* Handl. The species which Handlirsch united into the gen. *Orthophlebia* are diverse enough. Comparing all these species, as well as the species just described, I arrived to the conclusion that by the nervuration of their wings, as well as by their size, they can be divided into two groups. In the first group the anterior branch of RS divides at the same level or somewhat earlier than the posterior one, and forms not less than 4 branches, sometimes even 7. In the second group the anterior branch of RS divides considerably beyond the point of furcation of the posterior branch ( $RS_{3+4}$ ), and forms only 3 or 4 branches.

The size of the body and that of the wings in the species of the first group are on the average distinctly larger than that of the second one; in the former group the length of anterior wings reaches 15—17,5 mm; in one

species, *O. intermedia*, it is only 11 mm, but in *O. grandis* it reaches 35 mm. In the second group the length of anterior wings is 9,5—14 mm.

These differences seem to me to be very valuable, and on that account I ranked both groups into two separate genera, gen. *Orthophlebia* Westw. (1st group) and gen. *Mesopanorpa* Handl. (2nd group). Accordingly I was obliged to alter the characteristics of both these genera.

The genus *Orthophlebia* is known from Lias of Europe and Turkestan; some of its species had reached at that time rather large and sometimes even gigantic size (*O. grandis*).

The species of the genus *Mesopanorpa* are known from Upper Lias of Europe and Turkestan, and also from Dogger of Siberia (Ust-Balei); they preserved rather small size.

The reaching of large size in whatever group is usually a feature of approaching extinction. This proves to be true in the case of *Orthophlebia* as well, and is obvious when comparing the forms of this genus and of the gen. *Mesopanorpa* with the recent *Panorpidae*.

In the recent *Panorpidae* (s. str., *Choristidae* and *Nannochoristidae* excluding which I consider as offshoots of Permian *Permochoristidae*), the anterior branch of RS furcates considerably further than the posterior one, and forms usually 3, sometimes 4, and even 2 branches as in *Mesopanorpa*. No species with the branching of RS resembling that in *Orthophlebia* are yet known.

Thus, this last genus is really quite extinct, and its extinction resulted probably at the end of Mesozoic age.

The recent *Panorpidae* are more similar to the genus *Mesopanorpa* (s. emend.). As we have seen in the case of *M. felix*, the body and the head in this genus had yet an utterly panorpid aspect, and were only somewhat more primitive than in *Panorpa*. In the nervuration of their wings some *Mesopanorpa*, for instance *M. germanica*, *M. incerta*, were not very distant from the *Orthophlebia*, the other ones, as *M. angarensis* and especially *M. hartungi*, from Ust-Balei, were very similar to the recent species of *Panorpa*. The affinity in nervuration of *M. hartungi* and of recent species of the gen. *Panorpa* is very great, and nothing hinders to consider this species of *Mesopanorpa* as being ancestral of some recent species of *Panorpa*.

The preservation of 5-branched condition of M in *M. hartungi* is but a feature of primitiveness which characterised most of the species of *Orthophlebiidae*. Later, the 5th or 4th branch of M disappears, and

M becomes 4-branched.<sup>1</sup> Besides in the recent *Choristidae* M preserves five branches in the fore wings.

The small forks at the ends of  $A_2$  and  $A_3$  are also features of primitiveness which later must disappear.

The most recent species of the gen. *Panorpa* presently occur in East Asia, in Japan and China, and it is of interest that *Mesopanorpa hartungi*, as well as *M. angarensis* and *incerta*, were found in Ust-Balei, i. e. in East Siberia.

The extinct genus *Orthophlebioides* is not satisfactorily known. The branching of RS in some species resembles more that in *Orthophlebia*, in others — that in *Mesopanorpa*, but M apparently was 4-branched. *O. obscurus* Mart.<sup>2</sup> I consider now as belonging rather to the genus *Mesopanorpa*. The Upper-Jurassic genera *Stenopanorpa* Handl. and *Calopanorpa* Handl. represent specialised, extinct forms.

Among *Neorthophlebiidae*, *Probittacus avitus*, exhibits the same relationship to the recent gen. *Bittacus*, as *M. hartungi* to the recent gen. *Panorpa*.

#### Order Paratrichoptera Till. (1919).

In summer 1925 in the beds of Karabas-tau,<sup>3</sup> 75 km SW from Galkino, I found two specimens of a very interesting form which was easily determined as a species of *Pseudopolycentropus* Handl. At first A. Handlirsch considered this genus as belonging to his family *Orthophlebiidae*, then ranked it into a separate family of the order *Mecoptera*.

Two species were described from Upper Lias of Mecklenburg, and both are known by the anterior wings only. In our specimens not only the anterior, but also the posterior wings are preserved, and the remains of the body, of the antennae and of the legs as well. The study of these specimens led me to the conclusion that this genus (and family), though undoubtedly allied to *Mecoptera*, belongs rather to the order *Paratrichoptera*. As Tillyard pointed out,<sup>4</sup> this order is allied both to *Mecoptera* and *Diptera*, but I consider that the genus *Pseudopolycentropus* resembles the more primitive *Diptera* more closely than any other forms of *Paratrichoptera*.

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<sup>1</sup> 5-branched condition of M is preserved in the Tertiary gen. *Dinopanorpa* Cockerell.

<sup>2</sup> A. Martynov, in Bull. Acad. des Sciences de l'URSS, 1925, p. 760, fig. 19. The vein that I designated as  $Cu_1$  is really  $M_2$ .

<sup>3</sup> The age of these beds is the same as that of the beds of Galkino, i. e. probably Upper-Liassic.

<sup>4</sup> Proc. Linn. Soc. N. South Wales, vol. XLIV, part I, 1919, pp. 199—200.

### Fam. Pseudopolycentropidae Handl.

*Pseudopolycentropidae* Handlirsch, in Schröder's Handbuch der Entomologie, Lief. 5, Palaeontologie, 1921, S. 198.

I give below a more detailed description of the family. Head rounded above, not elongated into proboscis; thorax great, swelled, but not as much as in *Diptera*; in the abdomen one may discriminate about 8—9 segments. Antennae shorter than the body, and in the middle portion almost rosary-like; palpi rather long; legs slender and long. Anterior wings large, narrow at the base and strongly dilated in the apical portion. R strong, straight; pterostigma present. SC very short, reaching only the base of RS; between C and R one distinct transverse nervure. RS deviating from R, then dividing into two branches, each forming still two branches; fork  $AF_1$  short,  $AF_2$  long. M dividing nearly at one level with RS, and forming 5 branches as in most Mesozoic *Mecoptera*, both main branches of M form a closed median cell. The base of M fused at short distance with Cu, then separating and fusing with R. Cu simple, curved.  $A_1$  and  $A_2$  parallel, long;  $A_3$  shorter,  $A_4$  still shorter. Cross-veins very scarce.

Posterior wings one third shorter than the anterior, but broad, rounded on the hind apical margin, narrow at the bases. SC also very short; R bow-shaped, in the middle portion rather remote from the costal margin; RS 4-branched; M forming analogous median cell, but probably 3-, or perhaps 4-branched. Cu and anals probably simple and straight; jugal region probably very small or lacking (reduced).

Size mediocre; length of body about 8 mm.

One genus with features of the family.

#### Gen. Pseudopolycentropus Handl.

*Pseudopolycentropus* Handlirsch, Foss. Insekten, Bd. XLII, S. 432, Fig. 30.

##### *P. latipennis*, n. sp.

Two specimens. Karabas-tau, 15 VI 1925. Martynov.

Anterior wings (Fig. 14) as in *P. triangularis* Handl.,<sup>1</sup> but their apical margin is more rounded, not as obliquely truncate as in the last species. Sc short as in *P. perlaciformis* Geinitz; R strong, attenuating to the end; pterostigma large, nearly reaching  $RS_1$ ; cross-vein c—r placed somewhat nearer to the origin of the discoidal cell than to the base of RS; RS as in

<sup>1</sup> Schröder's Handbuch der Entomologie, Lief. 5., S. 199, Fig. 167.

European species, but the discoidal cell is closed; 1st apical sector broader than in *P. triangularis*. M as in the last species, but between  $RS_{3+4} + RS_4$  and  $M_{1+2} + M_1$  there are two cross-veins;  $M_{3+4}$  and Cu are connected also by

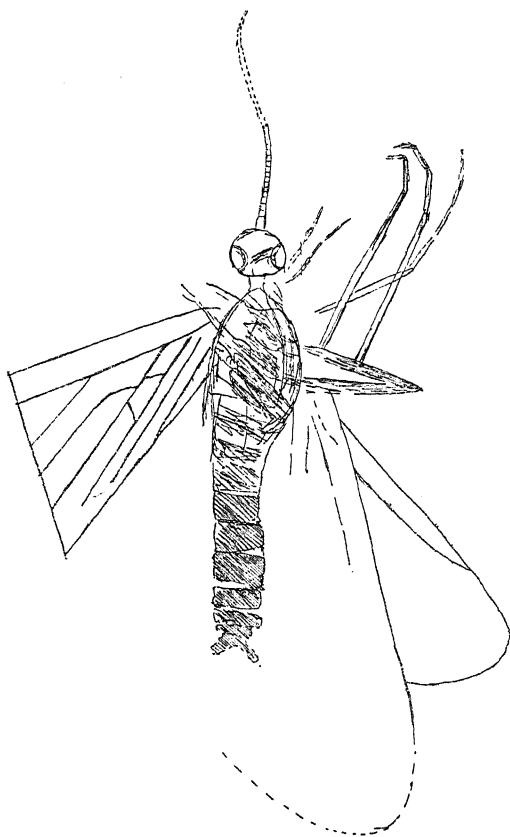


Fig. 12. *Pseudopolycentropus latipennis*, n. sp. General aspect of the specimen № 1.

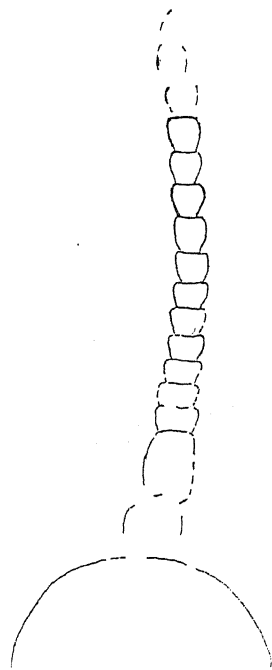


Fig. 13. Basal portion of antennae of *P. latipennis*, n. sp. (more magnified).

two oblique cross-veins; basal portion of Cu connected with  $A_1$  by two diverging cross-veins, basal one representing perhaps the continuation of Cu.  $A_1$ ,  $A_2$ , and  $A_3$  reaching the base of the wing and running parallelly;  $A_2$  connected with both  $A_1$  and  $A_3$  by one cross-nervule;  $A_4$  short; small jugum apparently present.

Posterior wings (Fig. 14 and 15) much shorter, with straight anterior and rounded posterior margins, narrow at the base, very thin, with slender nervures (R, M); SC short; R bow-shaped and removed from the costal margin; RS 4-branched, with configuration resembling that of the anterior wings, but the discoidal cell apparently open. M dividing into two main

branches almost at the point of the origin of DC, but its distal branching unfortunately indistinct. Cu straight, but its basal and apical portions not preserved; anals also invisible. Length of anterior wings about 8 mm; breadth — 4 mm; length of posterior wings — 6 mm; length of body — 7,5 mm.

The specimen № 1 is better preserved, with antennae and four wings (Fig. 12). Another specimen is not well preserved, the outlines of the body indistinct.

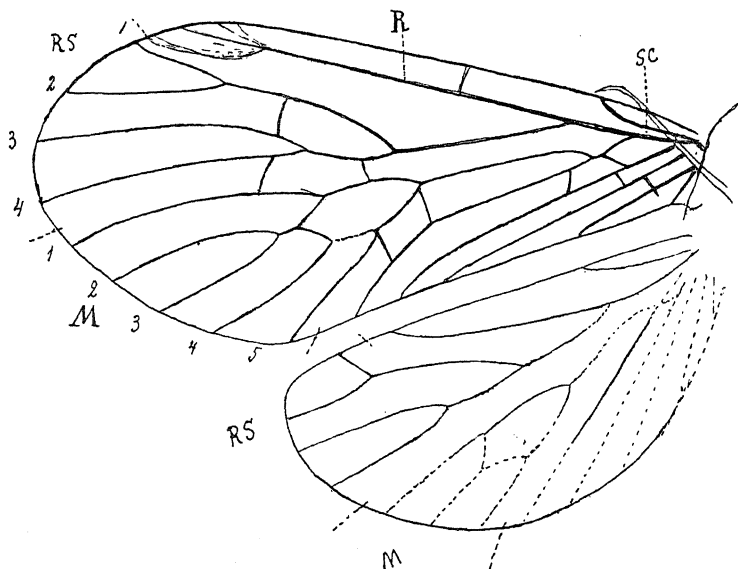


Fig. 14. *Pseudopolycentropus latipennis*, n. sp. Anterior and posterior wings; posterior wing partly restored.

In the nervuration of its anterior wings the species described is similar to both European species, to *P. triangaris* especially, but distinct.

A comparison of our form with the Australian Upper-Triassic genera of the order *Paratrichoptera* Till. clearly shows that the genus *Pseudopolycentropus* belongs to this order, and is allied more to *Aristopsyche superba* Till.<sup>1</sup> From the Australian genera it differs chiefly in that M preserved 5-branched condition in the anterior wings, whereas in the Australian genera the posterior branch of M forms only two branches. The resemblance of *Pseudopolycentropus* to the gen. *Aristopsyche* Till. is rather close, but in the former genus there exist only a short basal subcosta, whereas in *Aristopsyche* there is still a second long subcosta (or branch of one subcosta).

<sup>1</sup> Tillyard, l. c., p. 202, Fig. 25.

In the configuration of RS and that of its branches, in the deviation of RS from R, in the shape of median cell, in the character of basal junction of M with Cu and R, and in the shape of Cu, the anterior wings of *Pseudopolycentropus* resemble rather closely the wings of some *Diptera* with more complete nervuration, especially those of *Rhyphidae* (recent) and *Protorhyphidae* (extinct), and there can be no doubt as to the stem of *Diptera* being closely related to this genus and, further, to the whole order *Paratrichoptera*.

The posterior wings in *Pseudopolycentropus* are much shorter than the anterior ones, and appear to be in a state of reduction; their nervures are very slender; the nervuration is formed on the same plane as in the anterior wings, but is somewhat destroyed; M divides doubtless not more than in fore branches; basal portion narrowed (Mecopteran feature).

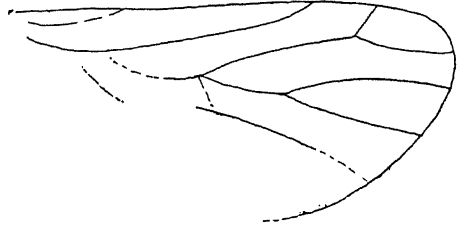


Fig. 15. Right posterior wing of *P. latipennis*, n. sp.

*Pseudopolycentropidae* existed in Upper Lias together with some families of more primitive *Diptera*. Almost all these *Diptera* had very small size, whereas *Paratrichoptera*, the Australian genera especially, were rather large insects. It seems to me to be impossible to derive all these small primitive *Diptera* from such rather gigantic forms as the Australian genera. I consider the order *Paratrichoptera* as closely allied to the order *Diptera*, but representing a side-stem which arose, together with *Diptera*, from some unknown common Mecopteran ancestors of small size.

А. В. Мартынов. Юрские ископаемые *Mecoptera* и *Paratrichoptera* из Туркестана и Усть-Балей (Сибирь).

Р. Е. З. Ю. М. Е.

Изучение *Orthophlebiidae* юрской формации с. Галкино (верхний лias) и Усть-Балей (доггер) и сравнение их с представителями этого семейства из юры Западной Европы привело автора к заключению, что род *Orthophlebia* Westw. распадается, собственно, на две группы. В первой группе видов  $RS_{1+2}$  делится ранее или на уровне деления  $RS_{3+4}$  и дает не менее 4, иногда даже до 7 ветвей (*O. grandis*, n. sp.). Размеры у большинства



видов этой группы значительные (длина крыльев 15—17,5 мм), особенно у *O. grandis*, n. sp. (длина передних крыльев до 35 мм). Эту группу автор считает особым родом — *Orthophlebia* Westw. (s. emend.). У видов второй группы  $RS_{1+2}$  делится обычно много позже, чем  $RS_{3+4}$ , и образует всего 3, реже 4 ветви. Размеры у видов этой группы меньшие. Эти виды автор отделяет от рода *Orthophlebia* и переносит в род *Mesopanorpa* Handl., куда относился только один вид, *M. hartungi* Brauer из формации Усть-Балей, и дает иную, измененную характеристику этого рода. Из рода *Orthophlebia* описываются два новых вида, из рода *Mesopanorpa* — три новых вида и переописывается вид *M. hartungi*, который оказывается столь сходным с некоторыми современными видами рода *Panorpa*, что автор не усматривает препятствий считать этот вид предком части современных видов. У *Mesopanorpa* (?) *felix*, n. sp., голова и тело были, в общем, такой же формы, как у современных *Panorpa*.

Из сем. *Neorthophlebiidae* описывается *Probittacus avitus*, n. gen., n. sp., чрезвычайно сходный с современными видами рода *Bittacus*, но несколько более примитивный. Отношения этого рода к роду *Bittacus* подобны отношениям рода *Mesopanorpa* к современным *Panorpa*. Род *Orthophlebia* (s. emend.), наоборот, совершенно вымер. Род *Pseudopolycentropus* Handl. автор относит к вымершему отряду *Paratrichoptera* Till. (верхняя пермь Австралии). Туркестанские представители *P. latipennis*, n. sp., хорошо сохранились и знакомят нас с общим видом насекомых и жилкованием обоих пар крыльев. Своими крыльями этот вид (и род) очень напоминает таких низших *Diptera*, как сем. *Rhyphidae* и *Protorhyphidae*, и это дает автору основание считать отряд *Paratrichoptera* боковым стволом *Diptera*, отделившимся, как и эти последние насекомые, от некоторых примитивных вымерших *Mecoptera*.

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