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ON SOME RARE GENERA OF THE CARBONIFEROUS CYRTOSYMBOLINAE HUPÉ, 1953 (TRILOBITA)

Abstract. — Five Lower Carboniferous species of Cyrtosymbolinae Hupé, 1953 are redescribed and one new is established. They come from the territory of Eurasia and represent two rare cyrtosymbolinid genera: *Weania* Campbell, 1963 and *Griffithidella* Hessler, 1965; one of them is tentatively assigned to the genus *Phillibole* Richter & Richter, 1937.

INTRODUCTION

Last ten years brought a good number of very important papers on the trilobites representing the subfamily Cyrtosymbolinae Hupé, 1953 and nowadays our knowledge on this group is quite extensive. Most authors agree that mainly this subfamily gave rise to the new radiation of trilobites at the beginning of the Carboniferous.

The most conservative and characteristic feature of the cyrtosymbolinids seems to be their comparatively short pygidium often with the radial arrangement of the ribs. Nevertheless, exceptionally the longer pygidia — even with 12–14 rings — are known in some genera (*Philibole* Richter & Richter, 1937) and were already reported in the Famennian representative of *Cyrtosymbole* Richter, 1913 (*C. pusilla* (Gürich, 1896), cf. Osmólska, 1962). Morphology of the cephalon is less stable in this group, especially close to the Devonian/Carboniferous boundary. Usually conical glabella becomes in some genera violin-shaped (*Pseudowaribole* Hahn & Hahn, 1967, *Griffithidella* Hessler, 1965, *Gitarra* Gandl, 1968), or shortened and bluntly cut anteriorly (*Weania* Campbell, 1963). Width of the preglabellar field (*sag.*) diminishes and the latter even lacks in some genera (*Cyrtoproetus* Reed, 1943). All these morphological changes reflected most probably the changes in the environmental demands. The ability to produce so many diverse morphological types may be the reason that close to the Devonian/Carboniferous boundary the cyrtosymbolinids were

the most successful group in starting the new radiation and in adapting to the new environments.

Some genera considered in the present paper (*Griffithidella* Hessler, 1965, *Gitarra* Gandl, 1968) were not assigned so far to Cyrtosymbolinae Hupé, 1953. Hessler (1965) ranked *Griffithidella* within Proetidae Salter, 1864 without indicating any subfamilial assignment, but clearly pointed out its similarity with the cyrtosymbolinids (though, differently that it was stated by this author, the number of thoracic segments, which is 10 in the genus under consideration, differs it from the Cyrtosymbolinae sensu Hupé, 1953 and sensu Richter, Richter & Struve, 1959 where its is 9). According to Hahn and Hahn (1967), *Griffithidella* should be assigned to the "Paladin-group" within Griffithidinae Hupé, 1953. The genus *Gitarra* was assigned by Gandl (1968) to Phillipsiidae Oehlert, 1886 [1]. The revision of the non-cyrtosymbolinid Carboniferous trilobites from Eurasia (Osmólska 1970, in press) prepared recently by the present author convinced her that the genera above mentioned should be assigned to Cyrtosymbolinae, having much in common with the representatives of this subfamily e. g. *Pseudowaribole* Hahn & Hahn, 1967 and *Weania* Campbell, 1963.

Nearly all the material here investigated comes from the collections described previously by Weber (1937; housed in the Tshernyshev's Museum in Leningrad, TML), or by Jarosz (1909, 1913; housed in the Museum of the Institute of Geological Sciences, Polish Academy of Sciences in Cracow, ZNG Kr.). The only new material is this of *Weania anglica* n. sp. which comes from the British Museum (Nat. Hist.) collection in London (BM). For the comparative purposes the photographs of the specimens of "*Proetus* (*Semiproetus*) *twistonensis*" Reed, 1943 coming from the type series and housed in the Sedgwick Museum in Cambridge (SMC) are here given (Pl. II, Figs. 3, 4, 8, 9). Up to now, no photographic illustration of this species was published. The lectotype of this species was designated by Richter, Richter & Struve (1959) and its drawing was published then for the first time.

The measurements of the specimens previously described by Weber (1937) were given by this author, thus they are omitted here.

The present author is greatly indebted to the authorities of the Museums above mentioned, who made their collections available to her for study. She wishes also to express her gratitude to Prof. Z. Kielan-Jaworowska (Palaeozoological Institute, Polish Academy of Sciences, Warsaw), who kindly corrected the manuscript, as well as to Miss M. Czarnocka (Palaeozoological Institute, Polish Academy of Sciences, Warsaw), Mr. J. Watkins (Sedimentology Research Laboratory, University of Reading),

[1] The status of this family was recently discussed (Hessler, 1963, 1965; Hahn & Hahn, 1967). It will be also discussed later by the present author (Osmólska 1970, in press).

who are the authors of the photographs, and to Mrs. K. Budzyńska (Palaeozoological Institute, Polish Academy of Sciences, Warsaw), who made the drawings.

DESCRIPTIONS

Subfamily **Cyrtosymbolinae** Hupé, 1953
Genus *Weania* Campbell, 1963

Type species: Weania goldringi Campbell, 1963.

Synonyms:

?1844. *Phillipsia;* F. McCoy, Synopsis..., p. 161.
?1883-1884. *Phillipsia;* H. Woodward, A monograph..., p. 16.
1913. *Proëtus;* J. Jarosz, Fauna des Kohlenkalkes..., p. 161.
1937. *Cyrtosymbole;* V. N. Weber, Kamennougolnye trilobity..., p. 29.
1965. *Archegonus* (*Weania*); G. Hahn, Revision..., p. 244.

Species assigned: Weania goldringi Campbell, 1963, *W. librovitchi* (Weber, 1937), *W. zarecznyi* (Jarosz, 1913), *W. anglica* n. sp., *?W. colei* McCoy (1844).

Stratigraphic and geographic range: Tournaisian of Australia, Poland, Viséan of USSR (the Urals), Great Britain, ?Northern Ireland.

Revised diagnosis. — Genus with typical cyrtosymbolinid pygidia and very variable cephala; cephalic border upturned, genal angles pointed to bearing short genal spines; anterior border in front of glabella, the latter constricted between anterior tips of eyes; S_1 distinctly marked; S_2, S_3 weak; palpebral lobe long (*exsag.*), broad to very broad (*tr.*), usually with a central depression; eye large with steeply placed visual lobe; librigena usually geniculated, lateral border occasionally with longitudinal furrow along its outer margin; pygidium semicircular, no delimited border; axis about a third of total pygidial width, with 8-12 rings; primary subdivision clearly marked on pleural lobe, the first pygidial segment being normally developed, without separation of the half-rib; 6-9 radially arranged ribs, interpleural furrows deeper and longer (*tr.*) than the pleural ones; ornamentation granular, fine.

Remarks. — The holotype cranidium of the type species — *Weania goldringi* Campbell, 1963 is fragmentary and comparatively poorly preserved, thus not all its features can be well observed. But, some of them are very characteristic: e. g. strong convexity of the frontal lobe of the glabella, deeply laying, narrow preglabellar field and the anterior border inflected upwards. Basing on these features, as well as on the structure of the pygidium, which exposes a very characteristic radial arrangement of the ribs, an assignment of all the above quoted species to *Weania* Campbell, 1963 was possible. The most striking character of *Weania*, common to all its species is the conservatism of pygidia, which retain

their typical cyrtosymbolinid appearence and the extremely great variability of the cephala. Cephalon is typically cyrtosymbolinid in e. g. *Weania librovitchi* (Weber, 1937) but "bollandian" with its shortened glabella in *Weania anglica* n. sp. or in *Weania goldringi* Campbell, 1963. On the other hand, two species first mentioned have very similar pygidia and resemblant longitudinal profiles (Pl. I, Figs. 2*b*, 7*b*). Also, in both of them a characteristic, longitudinal furrow along the margin of the lateral border is present. Basing only on the shape of the glabella, which is generally considered as an important diagnostic character, these two species of *Weania* would have to be placed in the different subfamilies within Proetidae, while in all remaining features they are very close.

Weania seems to be related to *Pseudowaribole* Hahn & Hahn, 1967, which may be the ancestor of *Weania*. *Pseudowaribole octofer pauli* G. Hahn, 1967 from the Etroeungt of Morvan, France, the Tournaisian *Pseudowaribole geigensis* (Gandl, 1968) [2] from Frankenwald, Germany and *Pseudowaribole kinderliensis* (Weber, 1937) [3] from the Tournaisian of the South Urals are very close to *Weania*. The main difference between the mentioned *Pseudowaribole* and *Weania* species is the structure of their pygidia. These within *Pseudowaribole* display the radial arrangement of the ribs, as is characteristic of *Weania*, however, their axes are relatively narrower and pygidia are shorter than cephala, which is not the case in *Weania*. Also the anterior branches of the facial sutures, which are strongly diverging in *Pseudowaribole*, are closer to the glabella in *Weania*. But, the comparatively strong divergence of the anterior branches of the facial sutures is marked in *?Weania colei* (McCoy, 1844), which for this reason is only tentatively assigned to *Weania* (= cf. Pl. I, Fig. 13; Text fig. 1 *E, F*). Pygidium of *?Weania colei*, which has a narrow axis, similar to this found in the representatives of *Pseudowaribole*, is however longer than in *Pseudowaribole*.

The entire specimen (TML 1136/5107), erroneously placed by Weber (1937) in "*Phillipsia mitchelli*" and here described as *Weania* sp. is intermediate between *Pseudowaribole* and *Weania*, having the cephalon of the *Pseudowaribole* pattern accompanied by a pygidium typical of *Weania*.

Another genus also close to *Weania* and *Pseudowaribole* as well, is *Griffithidella* Hessler, 1965 (p. 123).

Weania librovitchi (Weber, 1937)

(Pl. I, Figs. 1-3,8)

1937. *Cyrtosymbole librovitchi* n. sp.; V. N. Weber, Kamennougolnye trilobity..., p. 29, Pl. 2, Figs. 37-42; Pl. 3, Fig. 1; Text-fig. 13.

?1937. *Cyrtosymbole* cf. *librovitchi* n. sp.; V. N. Weber, *Ibid.*, p. 30, Pl. 3, Figs. 2-4.

?1937. *Cyrtosymbole* aff. *librovitchi* n. sp.; V. N. Weber, *Ibid.*, p. 31, Pl. 3, Figs. 21, 22.

[2] = *Cyrtosymbole* (*Geigibole*) *geigensis* Gandl, 1968.

[3] = *Cyrtosymbole kinderliensis* Weber, 1937.

Holotype: Cephalon, TML No. 375/5107, figured by Weber (1937, Pl. 2, Fig. 40), here refigured on Pl. I, Fig. 2.

Type horizon: Upper Viséan.

Type locality: Kizil river, the South Urals, USSR.

Revised diagnosis. — Border upturned, comparatively low, sharp; along outer edge of lateral border a broad furrow present; preglabellar field narrow (*sag.*); glabella weakly narrowing forwards, broadened between eyes; a pair of short processes on occipital and thoracic rings, near axial furrows; pygidium with axis as broad as pleural lobe; 11-12 pygidial rings, 10 ribs, reaching nearly to the edge of the pygidium.

Remarks. — Among the species of *Weania* Campbell, 1963 the closest to *C. librovitchi* (Weber, 1937) is *?Weania colei* (McCoy, 1844) from the ?Lower Viséan of Donegal, Northern Ireland and *Weania* sp. (p. 122) from the Lower Tournaisian of Kazakhstan. They have similar conical glabellae and resemblant pygidia, though those of *?Weania colei* and *Weania* sp. expose more slender axes. *Weania* sp. and *?W. colei* differ from *W. librovitchi* in absence of a furrow along the lateral border of the cephalon and the processes on the rings. They also have wider (*sag.*) preglabellar fields than *W. librovitchi.*

Stratigraphic and geographic range. — Type locality and type horizon.

Weania zarecznyi (Jarosz, 1913)

(Pl. I, Figs. 10, ?9)

1913. *Proëtus Zaręcznyi* n. sp.: J. Jarosz, Fauna des Kohlenkalkes..., p. 161, Pl. 20, Fig. 12.

Hylotype: Pygidium, ZNG Kr. AI-18/20, figured by Jarosz (1913, Pl. 20, Fig. 12), here refigured on Pl. I, Fig. 10.

Type horizon: Upper Tournaisian.

Type locality: Racławka river valley, Cracow region, Poland.

Diagnosis. — Pygidium with blunt tip of axis; 10 pygidial rings, 8 ribs, dense, granular ornamentation, which on pleural lobes covers only the anterior bands of ribs.

Material. — Two pygidia and 1 librigena, probably belonging to the species, from the light grey Upper Tournaisian limestone of the type locality.

Dimensions (in mm):

	ZNG Kr. AI-18/20
Length of pygidium	4.4
Width of pygidium	6.0
Length of axis	3.9
Width of axis	2.0

Remarks. — Only the pygidia of *Weania zarecznyi* (Jarosz, 1913) were found in the type locality as well as a fragmentary librigena. The latter has pronounced a strong geniculation, characteristic of *Weania* (cf. Pl. I, Fig. 9) and thus it most probably should be assigned to the same species as the pygidia. The pygidium of *W. zarecznyi* is very close both to *Weania librovitchi* (Weber, 1937) and to *Weania anglica* n. sp. differing from them in having U-shaped axis, bluntly ended, instead of V-shaped as in the species compared. The number of the rings is also smaller in *W. zarecznyi*, being 10, while in the species compared it is 12. Apodemal markings are deeper in *W. zarecznyi* than in *W. librovitchi* and *W. anglica*. One of the pygidia of *W. zarecznyi* found exposes an abnormal development of its axis, namely, the third ring, counting from the end, on the right side of the specimen, is divided into two rings. This caused that the two last rings are somewhat obliquely directed backwards.

Stratigraphic and geographic range. — Type locality and type horizon.

Weania anglica n. sp.

(Pl. I, Figs. 4,7; Text-fig. 1 *B, C*)

Holotype: Cephalon, BM No. In 27939a; Pl. I, Fig. 7 *a, b*, Text fig. 1 *B*.
Type horizon: Viséan (D_1).
Type locality: Narrowdale, Staffordshire, Great Britain.
Derivation of the name: anglica — occurring in England.

Diagnosis. — Cephalon with very short genal spines and a furrow along lateral border; glabella shortened frontally and bluntly rounded; basal lobe overhanging occipital furrow, occupying about a fifth of basal glabellar width (*tr.*); pygidium with V-shaped axis; 12 rings, 9 ribs.

Material. — One cephalon, 2 pygidia from the light grey Viséan limestone of Narrowdale, Staffordshire.

Dimensions (in mm):

	BM	
	In 27939a	In 27939b
Length of cephalon	5.5	—
Width of cephalon	9.3	—
Length of glabella	3.5	—
Width of glabella	4.0	—
Length of pygidium	—	5.0
Width of pygidium	—	7.0
Length of axis	—	4.5
Width of axis	—	2.7

Description. — Cephalon subtriangular with high, upturned border and very short spines; preglabellar field extremely narrow, deeply placed,

glabella very short, pear-shaped, bluntly cut anteriorly, broadest opposite the middle of palpebral lobes; 2 pairs of glabellar furrows, but only S_1 distinct, very shallow at axial furrow; basal lobe convex, narrow, occupying about a fifth of basal glabellar width; occipital ring very broad (tr.), narrowing at extremities; palpebral lobe broad, with a central depression equals two third of the length of glabella; eye steep, very large; librigena geniculate; lateral border very steep anteriorly becomes less steep backwards, along its outer margin a longitudinal furrow present, which begins opposite mid-length of the eye and continues to the genal spine, becoming broader backwards.

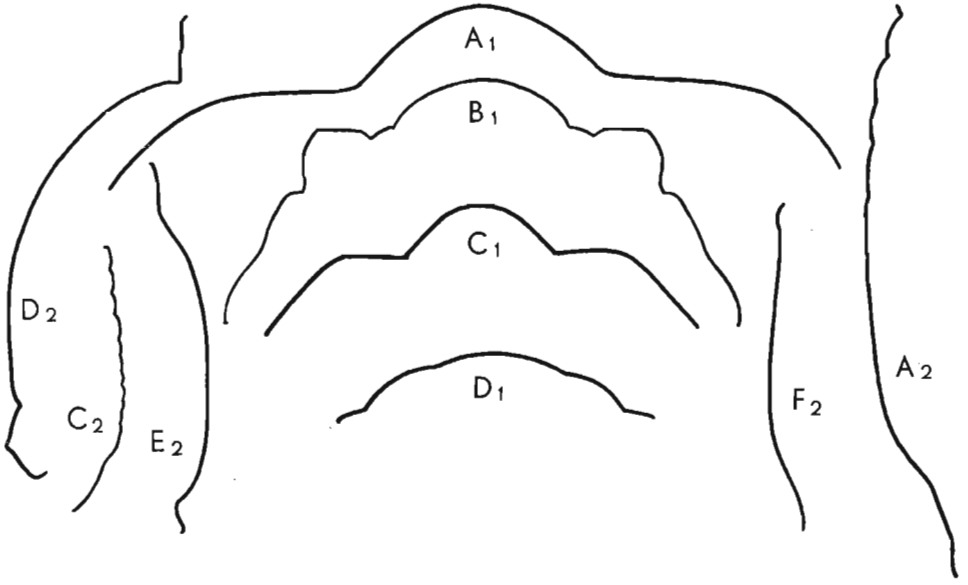

Fig. 1. *A* — *Phillibole twistonensis* (Reed); paralectotype pygidium (SMC E 3600a); Twiston, Lancashire, Great Britain, ?Viséan. *B* — *Weania anglica* n. sp.; holotype cephalon (BM In 27939a), Narrowdale, Staffordshire, Great Britain, Middle Viséan. *C* — *W. anglica;* paratype pygidium (BM In 27939b); same horizon and locality. *D* — *Phillibole twistonensis;* paralectotype cranidium (SMC E 3594); locality and horizon as for *A*. *E* — *?Weania colei* (McCoy); sealing-wax cast of the lectotype cephalon (BM 58863); Flax Mill, Donegal, Northern Ireland, ?Lower Viséan. *F* — Same specimen, pygidium. *1* — transverse section, *2* — longitudinal section

In longitudinal section, occipital ring somewhat higher than glabella, the latter frontally steeply sloping towards the upturned anterior border. In transverse section, glabella comparatively flat, palpebral lobes raising outwards, eyes convex, vertically placed, librigenae very steeply sloping, lateral border somewhat inflected upwards. Thorax and hypostoma unknown.

Pygidium broadly rounded without distinct border, axis conical with 12 (?13) narrow, distinct rings, separated by undulating ring-furrows;

at least 9 ribs on pleural lobe; anterior bands of ribs reaching to the margin of pygidium, the latter rounded in cross section; marginal part of pygidium very faintly distinguished from the rest of pygidium, but still does not constitute a pygidial border.

In longitudinal section, axis sloping gently down, postaxial region rounded. In transverse section, axis, arched, somewhat higher than the weakly vaulted pleural lobes.

Ornamentation granular; granules small and sparsely distributed.

Remarks. — *Weania anglica* n. sp. is closest to *W. librovitchi* (Weber, 1937) in the presence of a longitudinal furrow along the lateral border, and in the structure of strongly geniculated librigenae. Very similar are also their pygidia with conical axes and undulating ring-furrows. *W. anglica* n. sp. differs from *W. librovitchi* in the structure of glabella, which in the new species deviates strongly from the cyrtosymbolinid pattern, in being very short, cut off frontally and having much narrower (*tr.*) basal lobes, which reminds of these in the *Griffithidella* species. Occipital ring, which in *W. librovitchi* is equally broad along (*tr.*) its entire length, being provided with a pair of short spines at the axial furrows, in *W. anglica* is rapidly narrowed, what is in the relation with the basal lobes overhanging strongly an occipital ring.

The cephalon and the pygidium of *W. anglica* here described were separated from each other, but associated on the same piece of rock. It is, however, doubtless that they belong together, as both have very distinctly marked *Weania* characters. Besides, other *Weania* species so far are unknown in Great Britain.

Stratigraphic and geographic range. — Type horizon and type locality.

Weania sp.
(Pl. I, Fig. 12)

1937. *Phillipsia mitchelli* n. sp.: V. N. Weber, Kamennougolnye trilobity..., p. 49, Pl. 5, Fig. 36.

non 1937. *Phillipsia mitchelli* n. sp.; V. N.. Weber, *Ibid.*, p. 49, Pl. 5, Fig. 35.

Material. — One damaged entire specimen (TML No 1136/5107) from the Lower Tournaisian of Kazakhstan, USSR.

Remarks. — The two specimens described by Weber (1937) as "*Phillipsia mitchelli*" are not conspecific. The entire specimen here considered has a comparatively flat, borderless pygidium, and narrow axis, typical for *Weania* Campbell, 1963. The steeply upturned anterior border, and the presence of a narrow preglabellar field are also characteristic of *Weania*. This specimen is similar to *?Weania colei* (McCoy, 1844) in the width (*sag.*) of the preglabellar field, sharp, upturned, but not very high, anterior border, and the lateral border devoid of the lateral furrow

along its margin. Also in the slenderness of the axis is *Weania* sp. resemblant of *?Weania colei*. From other species of *Weania* as well as from *?W. colei* the here discussed form differs in its long genal spines, those in *W. anglica*, *W. librovitchi* and *?W. colei* being very short.

Genus *Griffithidella* Hessler, 1965

Type species: Proetus doris Hall, 1860.

Synonyms:

1860. *Proetus;* J. Hall, Notes and observations..., p. 112.
1865. *Phillipsia;* A. Winchell, Description...., p. 133.
1926. *Proetus;* G. H. Girty, Geologic age...., p. 40.
1937. *Phillipsia;* V. N. Weber, Kamennougolnye....., p. 49.
1938. *Phillipsia;* E. B. Branson & D. Andrews, Stratigraphy...., p. 118.

Species assigned: Griffithidella doris (Hall, 1860), *G. depressa* (Girty, 1926), *G. krasnopolskii* (Weber, 1937), *G. welleri* (Branson & Andrews, 1938), *G. newarkensis* Hessler, 1965, *G. waverlyensis* Hessler, 1965.

Stratigraphic and geographic range: Middle Tournaisian of USSR (Kazakhstan), Upper Kinderhookian-Lower Osagean of USA.

Diagnosis. — See Hessler (1965).

Remarks. — *Griffithidella* Hessler, 1965 was so far reported only from the USA territory, where it is represented by several species, coming from the Upper Kinderhookian to the Lower Osagean. It was placed by Hessler (1965) in the familly Proetidae Salter, 1864. However, this author several times emphasized its close relation with *Cyrtosymbole* Richter, 1913 (as well as with *Griffithides* Portlock, 1843). He considered *Griffithidella* as a possible ancestor of *Griffithides*. The here redescribed *Griffithidella krasnopolskii* (Weber, 1937), which is very close to *Griffithidella doris* (Hall, 1860), has still more cyrtosymbolinid pygidium than *G. doris*. It speaks very much in favour of placing *Griffithidella* within Cyrtosymbolinae.

Gandl (1968) described a new genus *Gitarra* Gandl, 1968 from the Upper Tournaisian of Germany (NE Bavaria). Its only known species, *Gitarra pupuloides* (Leyh, 1897), is extremelly similar to *Griffithidella*, in the shape of the glabella, broadest across the frontal lobe, flat anterior border, very large palpebral lobes, similarly narrow (*tr.*) basal lobes. It differs from *Griffithidella* in having 9 thoracic segments. The pygidium of *Gitarra pupuloides*, as was noticed by Gandl (1968), has preserved a primary subdivision into segments, instead of "ribs". The same is observed in *Weania* Campbell, 1963. The similarities between *Gitarra*, *Griffithidella* and *Weania* go even further, e.g. the shape of the basal lobes is in *Weania anglica* n. sp. very much like this in *Gitarra pupuloides* and *Griffithidella krasnopolskii*, the palpebral lobes are very alike, these in *G. pupuloides* and *W. anglica* being, moreover, centrally depressed.

In the view of this facts, *Griffithidella* Hessler, 1963 and *Gitarra* Gandl, 1968 should be, in the present author's opinion, referred to Cyrtosymbolinae Hupé, 1953.

Griffithidella krasnopolskii (Weber, 1937)

(Pl. I, Figs. 5, 6, 11)

1937. *Phillipsia krasnopolskii* n. sp.; V. N. Weber, Kamennougolnye trilobity..., p. 49, Pl. 5, Figs. 37-41; Text-fig. 42.

?1937. *Phillipsia* sp. indet. No. 7; V. N. Weber, *Ibid.*, p. 59, Pl. 6, Fig. 41.

Holotype: Pygidium, TML No. 1147/5107, figured by Weber (1937, Pl. 5, Fig. 39).
Type locality: Aighyr-djal, Akmolinsk region, Kazakhstan, USSR.
Type horizon: Middle Tournaisian.

Revised diagnosis. — Pygidium somewhat elongated backwards without a delimited border; axis very insignificantly narrowing backwards, as broad as pleural lobe, with 10-11 rings; 6 weakly pronounced ribs visible; cephalon with upturned border, preglabellar field reduced to a deep slit between flat anterior border and glabella; glabella violin-shaped, broad, comparatively short, convex frontally, palpebral lobes broad and long, nearly flat; occipital ring very lowly sloping laterally.

Material. — See Weber (1937).

Description. — Cephalon with strong, moderately long genal spines; glabella constricted, violin-shaped, broadest across frontal lobe; glabellar furrows very faint; S_1 shallow; basal lobe cut off, occupying a quarter of basal glabellar width; preglabellar field narrow, deeply plunged, its anterior part vertically inflected; anterior border flat and almost in horizontal position; palpebral lobe flat, very broad (*tr.*), equals to a half of the basal width of glabella and reaching (*exsag.*) from S_3 back to the occipital ring; anterior branch of facial suture comparatively long and divergent to axial furrow; visual lobe steep, large; librigena geniculate, lateral border upturned; genal spine moderately long, broad.

In longitudinal section, glabella higher than occipital ring, arched frontally, border flat, almost horizontal, but separated from glabella by a deep slit. In transverse section, glabella arched, axial furrows shallow, palpebral lobes somewhat lower than glabella, flat and horizontal. Thorax and hypostoma unknown.

Pygidium short, somewhat elongate in postaxial part, without border; axis broad, U-shaped, with 9-10 rings; pleural lobe with 6 ribs, only anterior bands pronounced, elevated, not reaching to the margin of pygidium.

In longitudinal section, axis sloping, postaxial region inclined, somewhat convex. In transverse section, axis weakly arched, pleural lobes well vaulted.

Fine granular ornamentation.

Remarks. — "*Phillipsia krasnopolskii*" Weber, 1937 in the shape of its glabella, which is violin-shaped and broadest across the frontal lobe, is very similar to the North American representatives of the genus *Griffithidella* Hessler, 1965. It has, moreover, very similarly pronounced basal lobes, which are comparatively narrow (*tr.*). The almost radial arrangement of ribs on the comparatively short pygidium is also very close in the here described species and the American representatives of *Griffithidella.*

Griffithidella krasnopolskii resembles *G. doris* (Hall, 1860) having in addition to a similar glabella, very alike flat and broad (tr.) palpebral lobes as well as the eyes placed on the distinctly demarcated ocular platforms. However, the border furrow, though also very deep in *G. doris,* yet it is not so much plunged and so wide *(sag.)* as in *G. krasnopolskii.* The pygidia of both compared species are different, that of *G. doris* having the anterior bands of ribs constricted at the border furrow and elevated here above the border in a tuber-like form. The number of ring and ribs in both species is the same, as well as the general structure of pygidium.

According to Hessler (1965), the genus *Griffithidella* is characterized by a thorax of 10 segments. The number of thoracic segments in *G. krasnopolskii* is unknown.

Stratigraphic and geographic range. — Middle Tournaisian of Kazakhstan (USSR).

Genus *Phillibole* Richter & Richter, 1937, emend. G. Hahn, 1965

?*Phillibole cracoviensis* (Jarosz, 1913)

(Pl. II, Figs. 1, 2, 5, 7)

1913. *Phillipsia cracoviensis* n. sp.; J. Jarosz, Fauna des Kohlenkalkes..., p. 173, Pl. 20, Fig. 19.
1913. *Phillipsia Colei* M'Coy, 1884; J. Jarosz, *Ibid.,* p. 166, Pl. 20, Figs. 14, 15.
?1913. *Phillipsia Wójciki* n. sp., J. Jarosz, *Ibid.,* p. 170, Pl. 20, Fig. 18.
non 1913. *Phillipsia Colei* M'Coy, 1884; J. Jarosz, *Ibid.,* p. 166, Pl. 20, Fig. 13.

Holotype: Cranidium, ZNG Kr. AI-18/28; figured by Jarosz (1913, Pl. 20, Fig. 19), here refigured on Pl. II, Fig. 2.
Type horizon: Upper Tournaisian.
Type locality: Racławka-river valley, Cracow region, Poland.

Diagnosis. — Glabella slender, constricted in the middle, somewhat narrower frontally; narrow (*sag.*) preglabellar field present; anterior border narrow, upturned; palpebral lobe short, distinctly curved, opposite the hind part of glabella; anterior branch of facial suture faintly divergent, posterior one moderately long, parallel to axial furrow; pygidium with faintly delimited broad and flat border, axis very long, slightly

tapering backwards; 14 axial rings; pleural lobe flat with 7 flat ribs divided into equally broad (*exsag.*) bands; ornamentation fine, granular.

Material. — Four cranidia, 7 pygidia from the light grey Lower Tournaisian limestone of the Racławka-river valley.

Dimensions (in mm):

	ZNG Kr. AI-18				
	28	26a	27	24	25
Length of cranidium	4.1	6.5	7.0	—	—
Length of glabella	2.8	4.8	5.2	—	—
Width of glabella	2.2	3.0	3.4	—	—
Length of pygidium	—	—	—	5.3	6.9
Width of pygidium	—	—	—	7.1	9.7
Length of axis	—	—	—	4.5	5.8
Width of axis	—	—	—	2.2	3.0

Description. — Cranidium with highly arched frontal outline; anterior border upturned, preglabellar field very narrow; glabella slender, constricted at S_3, with 3-4 pairs of glabellar furrows visible, S_1 very deep, basal lobe not completely delimited by S_1, occupying a little less than a third of basal glabellar width; occipital ring broad (*sag.*), faintly narrowing outwards; palpebral lobe short (exsag.), distinctly curved and comparatively broad (tr.), ε opposite half the length of basal lobe, γ at S_3, both close to axial furrow; anterior branch of facial suture long, weakly diverging from axial furrow, posterior branch shorter, parallel to axial furrow.

In longitudinal section, occipital ring as high as glabella, the latter gently arched and falling down to upturned, oblique anterior border. In transverse section, glabella arched and higher than palpebral lobes. Librigena, thorax and hypostoma unknown.

Pygidium flat, broadly subtriangular, with broad and flat border pronounced; axis reaching to border, faintly tapering, followed by a very short postaxial ridge; 14 axial rings; pleural lobe flat, somewhat broader than axis; 7 ribs distinctly delimited, flat, and a place for 2-3 more; half-rib distinctly distinguished; pleural furrows deep, interpleural furrows extremely thin, dividing ribs into equally wide (*exsag.*) bands.

In longitudinal section, axis faintly sloping backwards, post-axial region flat, weakly inclined. In transverse section, axis arched, pleural lobes almost flat. Ornamentation fine, granular.

Remarks. — *?Phillibole cracoviensis* (Jarosz, 1913) in its strongly *Phillipsia*-like glabella and comparatively broad palpebral lobes deviates from the typical representatives of *Phillibole* Richter & Richter, 1937. But presence of the preglabellar field and the general shape of the pygidium makes this species most close to the representatives of the "*brevispina-*

group" within *Phillibole* (Hahn, 1965). The pygidium of *?Phillibole cracoviensis* exposes some features, which are absent in the typical *Phillibole:* axis of 14 rings, while the usual number is not higher than 13; broad pygidial border, which is mostly absent or narrow; somewhat clearer division of pleural lobes into rib-bands than that found in *Phillibole.*

?Phillibole cracoviensis resembles *Phillibole twistonensis* (Reed, 1943) in the structure of pygidium (cf. Pl. II, Figs. 3, 4, 8, 9; Text-fig. 1 *A, D*) with the comparatively well marked segmentation of the axis and pleural lobes, and in the shape of slightly constricted glabella. *Phillibole twistonensis* was assigned by Reed (1943) to *Semiproetus* Reed, 1943 and later excluded from this genus by Hahn (1965), who placed it in *Phillibole.* However, "*Semiproetus twistonensis*" as well as "*Phillipsia cracoviensis*" deviate somewhat from the other *Phillibole* representatives and perhaps they should be separated from the latter and the name *Semiproetus* Reed, 1943 retained for them. But, the present author have not revised the type material of "*Semiproetus twistonensis*" thus she decided to assign tentatively the here redescribed species to *Phillibole.*

In Jarosz' paper (1913) a somewhat abnormally developed specimen representing presumably *Phillibole* Richter & Richter, 1937 was described as *Phillipsia wójciki* Jarosz. This specimen is unfortunately lost, but judging from the Jarosz' illustration (1913, Pl. 20, Fig. 18) and from the fact that it is abnormal (unsymmetrical anterior border, rounded, large, protuberance on glabella), the present author assumes that *P. wójciki* may be conspecific with *?Phillibole cracoviensis* (Jarosz).

Stratigraphic and geographic range. — Type horizon and type locality.

?Phillibole sp.
(Pl. II, Fig. 6)

Material. — One pygidium from the Upper Viséan limestone (D_2) of Besówka Hill, Gałęzice, Holy Cross Mountains, Poland.

Dimensions (in mm):

	Z. Pal. Tr. II. 135
Length of pygidium . .	9.0
Width of pygidium . .	12.5
Length of axis	7.8
Width of axis	4.0

Description. — Pygidium broadly rounded posteriorly, without distinctly marked border; axis V-shaped with 14 rings; ring-furrows undulating; 10 ribs, but only 6 distinct; pleural furrows distinct, interpleural furrows very obscure; ornamentation extremely fine, granular. In longitudinal section, axis gently inclined, postaxial field somewhat sloping

down. In transverse section, axis moderately high, pleural lobes gently vaulted.

Remarks. — In the general shape and in the shape and length of axis, the pygidium described resembles very much the pygidium of *?Phillibole cracoviensis* (Jarosz, 1913). The latter has, however, somewhat pronounced border, which lacks in *?Phillibole* sp. and it is somewhat flatter transversely. *?Phillibole* sp. has unusually long axis of 14 rings, what has never been reported in any *Phillibole* species. This is why it is only tentatively assigned to this genus. From the same exposure as the here discussed specimen comes another representative of Cyrtosymbolinae — *Cyrtoproetus cracoensis* (Reed, 1899), but the latter has pygidium distinctly different, shorter, with a triangular axis (cf. Osmólska, 1968). *?Phillibole* sp. is similar to the pygidium of *Cyrtoproetus glassi anteriolatus* Osmólska, 1968 [4] from the Upper Viséan of Lower Silesia (cf. Osmólska, 1968), but the latter exposes less distinctly furrowed axis and pleural lobes.

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[4] Gandl (1968, p. 78) described from the uppermost Tournaisian of Frankenwald "*Archegonus (Phillibolina) glassi* (Leyh, 1897)". It allowed the present author to state that, most probably, the Upper Silesian form represents the separate subspecies of the species above mentioned. In the present author's opinion, it should be assigned within *Cyrtoproetus* Reed, 1943.

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HALSZKA OSMÓLSKA

O PEWNYCH RZADKICH DOLNO-KARBOŃSKICH RODZAJACH CYRTOSYMBOLINAE HUPÉ, 1953, TRILOBITA

Streszczenie

Praca niniejsza zawiera redeskrypcję 5 dolno-karbońskich gatunków trylobitów, reprezentujących podrodzinę Cyrtosymbolinae Hupé, 1953: *Weania librovitchi* (Weber, 1937), *W. zarecznyi* (Jarosz, 1913), *Weania* sp., *Griffithidella krasnopolskii* (Weber, 1937), *?Phillibole cracoviensis* (Jarosz, 1913) oraz opis jednego nowego gatunku — *Weania anglica* n. sp. Materiał (z wyjątkiem *W. anglica*) pochodzi z kolekcji opracowanych poprzednio przez Jarosza (1909, 1913) i Webera (1937). Zarówno rodzaj *Weania* Campbell, 1963, jak i *Griffithidella* Hessler, 1965 są dość rzadko reprezentowane w faunie trylobitów karbońskich. Rodzaj *Griffithidella* był dotychczas cytowany tylko z górnego Kinderhookian do dolnego Osagean Stanów Zjednoczonych (Hessler, 1965; Chamberlain, 1969), zaś rodzaj *Weania* — z górnego turneju Australii

i górnego wizenu Uralu (Campbell, 1963). Przeprowadzona ostatnio przez autorkę rewizja trylobitów dolnego karbonu Eurazji (Osmólska, 1970, w druku) pozwoliła stwierdzić, że oba wymienione rodzaje mają szerszy zasięg geograficzny i stratygraficzny: *Griffithidella krasnopolskii* (Weber, 1937) występuje w dolnym turneju Kazakstanu, *Weania zarecznyi* (Jarosz, 1913) — w górnym turneju Polski (region krakowski), *W. anglica* n. sp. — w środkowym wizenie Anglii, *Weania* sp. — w dolnym turneju Kazakstanu. Stwierdzono również, że górno-turnejski gatunek *?Phillibole cracoviensis* (Jarosz, 1913), z regionu krakowskiego, odbiega dość znacznie od typowych przedstawicieli rodzaju *Phillibole* Richter & Richter, 1937. Rodzaj ten jest najczęściej obecny w facji łupkowej (goniatytowej), zaś w regionie krakowskim występuje w wapieniach facji koralowo-brachiopodowej. Rewizja wyżej wymienionych materiałów pozwoliła zanalizować pokrewieństwa, łączące omawiane rodzaje z innymi przedstawicielami Cyrtosymbolinae.

ГАЛЬШКА ОСМУЛЬСКА

О НЕКОТОРЫХ РЕДКИХ РОДАХ CYRTOSYMBOLINAE HUPÉ, 1953 (TRILOBITA) ИЗ НИЖНЕГО КАРБОНА

Резюме

В настоящей работе представлена ревизия 5 видов трилобитов из нижнего карбона, принадлежащих к подсемейству Cyrtosymbolinae Hupé, 1953: *Weania librovitchi* (Weber, 1937), *Weania zarecznyi* (Jarosz, 1913), *Weania* sp., *Griffithidella krasnopolskii* (Weber, 1937), *?Phillibole cracoviensis* (Jarosz, 1913), и описание одного нового вида — *Weania anglica* n. sp. Работа основана на материале (за исключением *W. anglica*) из коллекций, исследованных ранее Ярошем (1909, 1913) и Вебером (1937). Род *Weania* Campbell, 1963, как и род *Griffithidella* Hessler, 1965, встречается сравнительно редко среди трилобитов карбона. Род *Griffithidella* до сих пор описывался лишь из отложений интервала: верхний киндерхук — нижний осэдж в Соединенных Штатах (Hessler, 1965; Chamberlain, 1969), а род *Weania* из верхнего турне Австралии и верхнего визе Урала (Campbell, 1963). Проведенная в последнее время автором ревизия (Осмульска, 1970, в печати) доказывает, что оба упомянутых рода характеризуются более широким географическим и стратиграфическим распространением: *Griffithidella krasnopolskii* (Weber, 1937) встречается в нижнем турне Казахстана, *Weania zarecznyi* (Jarosz, 1913) — в верхнем турне Польши (Краковский регион), *Weania anglica* n. sp. — в среднем визе Англии, *Weania* sp. — в нижнем турне Казах-

стана. Констатировано также, что верхнетурнейский вид *?Phillibole cracoviensis* (Jarosz, 1913) из Краковского региона довольно сильно отличается от типичных представителей рода *Phillibole* Richter & Richter, 1937. Этот род чаще всего встречается в сланцевой (гониатитовой) фации, а в Краковском регионе распространен в известняках коралло-брахиоподовой фации. Во время ревизии указанных выше материалов удалось также проанализировать сходства, объединяющие описанные роды с другими преставителями Cyrtosymbolinae.

PLATES

Plate I

Weania librovitchi (Weber)

(Kizil river, the South Urals, USSR, Upper Viséan)

Fig. 1. Librigena, paratype (TML 377/5107), figured by Weber (1937, Pl. 2, Fig. 38) as *Cyrtosymbole librovitchi* n. sp.; ×3.

Fig. 2. Cephalon, holotype (TML 375/5107); figured by Weber (1937, Pl. 2, Fig. 40) as *C. librovitchi; a* dorsal view, *b* lateral view of cephalon and dorsal view of paratype pygidium; ×3.

Fig. 3. Pygidium, paratype (TML 379/5107); figured by Weber (1937, Pl. 2, Fig. 42) ac *C. librovitchi;* ×4.

Fig. 8. Damaged cranidium with spines on occipital ring visible, paratype (TML 376/5107); figured by Weber, (1937, Pl. 2, Fig. 37) as *C. librovitchi;* ×3,5.

Weania anglica n. sp.

(Narrowdale, Staffordshire, Great Britain, Middle Viséan, D_1)

Fig. 4. Pygidium, paratype (BM In 27939b); ×4.

Fig. 7. Cephalon, holotype (BM In 27939a); *a* dorsal view, *b* lateral view; ×4,5.

Griffithidella krasnopolskii (Weber)

(Aighyr-djal, Akmolisk region, Kazakhstan, USSR, Middle Tournaisian)

Fig. 5. Pygidium, paratype (TML 1150/5107); ×4.

Fig. 6. Cranidium, paratype (TML 1144/5107); figured by Weber (1937, Pl. 5, Fig. 37) as *Phillipsia krasnopolskii* n. sp.; ×6.

Fig. 11. Cranidium and pygidium, paratypes (TML 1146/5107); pygidium figured by Weber (1937, Pl. 5, Fig. 40) as *Ph. krasnopolskii;* ×6.

?*Weania zarecznyi* (Jarosz)

(Racławka river, Cracow region, Poland, Upper Tournaisian)

Fig. 9. Damaged librigena (ZNG Kr. AI-18/22); ×6.

Weania zarecznyi (Jarosz)

(Racławka river, Cracow region, Poland, Upper Tournaisian)

Fig. 10. Holotype pygidium with abnormally developed axis (ZNG Kr. AI-18/20); figured by Jarosz (1913, Pl. 20, Fig. 12) as *Proëtus zarecznyi* n. sp.; ×5.

Weania sp.

(Kazakhstan, USSR, Lower Tournaisian)

Fig. 12. Strongly damaged entire specimen (TML 1136/5107), figured by Weber (1937, Pl. 5, Fig. 36) as *Phillipsia mitchelli* n. sp.; ×5.

Weania colei (McCoy)

(Flax Mill, Donegal, Northern Ireland, ?Lower Viséan)

Fig. 13. Sealing-wax cast of lectotype specimen (BM 58863); ×3.

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4

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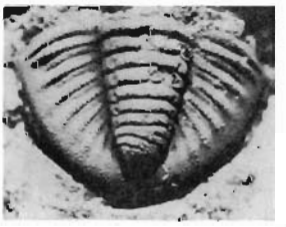
7b

8

2b

7a

9



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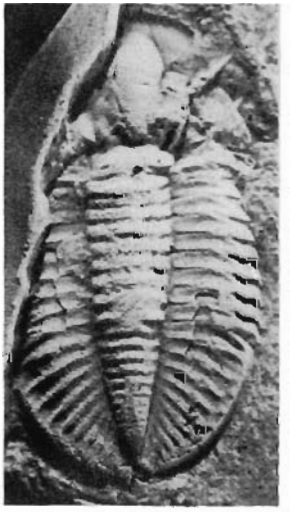

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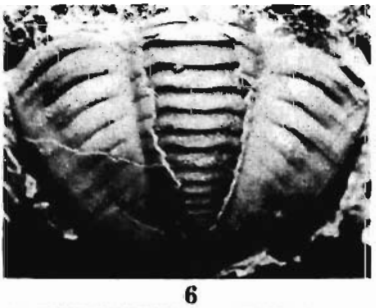

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Plate II

?Phillibole cracoviensis (Jarosz)
(Racławka river, Cracow region, Poland, Upper Tournaisian)

Fig. 1. Cranidium, paratype (ZNG Kr. AI-18/27); ×5
Fig. 2. Young cranidium, holotype (ZNG Kr. AI-18/28); figured by Jarosz (1913, Pl. 20, Fig. 19) as *Phillipsia cracoviensis* n. sp. ×6.
Fig. 5. Fragmentary cranidium, paratype (ZNG Kr. AI-18/26a); approx. ×5.
Fig. 7. Pygidium, (ZNG Kr. AI-18/24); ×5.

?Phillibole sp.
(Besówka Hill, Gałęzice, Holy Cross Mountains, Poland, Upper Viséan, D_2)

Fig. 6. Pygidium (Z. Pal. Tr. II. 135); ×4.

Phillibole twistonensis (Reed)
(Twiston, Lancashire, Great Britain, ?Viséan)

Fig. 3. Pygidium with a thoracic segment attached, paralectotype (SMC E 3600a); ×4.5.
Fig. 4. Cranidium (occipital ring placed in horizontal plane), paralectotype (SMC E 3599); ×4.6.
Fig. 8. Cranidium, lectotype (SMC E 3600b); figured by Richter, Richter & Struve (1959, Fig. 296,2) as *Cyrtosymbole* (*Semiproetus*) *twistonensis* (Reed) and by G. Hahn (1965, Fig. 18) as *Archegonus* (*Phillibole*) *twistonensis* (Reed 1943); ×4.7.
Fig. 9. Assemblage of exuviae from the type-series, latex cast (SMC E 3600); ×3.