

Attempt at a Classification of the Trilobite Family Solenopleuridae

By

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Introduction

Solenopleura ANGELIN, 1854, the type genus of the family Solenopleuridae ANGELIN, 1854, is one of the numerous mediocre opisthoparian trilobite forms which show very close resemblance to the genera *Ptychoparia* CORDA, 1847 and *Parasolenopleura* WESTERGÅRD, 1953 (= *Liostracus* ANGELIN, 1854, *partim*); in spite of this close resemblance, which was early recognized and later discussed at considerable length by LAKE 1931 (8) and THORAL 1948 (20), it has been common practice to regard the mentioned three genera as representatives of three distinct families. As emphasized by WESTERGÅRD 1953 (26), the dissimilarities between the type species of *Solenopleura*, *Ptychoparia*, and *Parasolenopleura* are not very conspicuous, and, accordingly, it is extremely difficult and in many cases impossible to secure a safe reference of relevant, imperfectly known genera to one or the other of the above-mentioned families.

As pointed out by WESTERGÅRD 1953 (26) *Solenopleura* differs from *Ptychoparia* in having the frontal part of the cranidium strongly arched down, shallower glabellar furrows, subparallel to converging course of the anterior branches of the facial suture from the eyes to the anterior border, and rounded terminations of the thoracic pleurae.

Solenopleura differs from *Parasolenopleura* in having more convex dorsal exoskeleton, more strongly sloping anterior portion of cephalon, deeper axial and border furrows, more inflated cheeks, more convex anterior and lateral cephalic border, pygidium with less pronounced interpleural grooves, and the outer surface of the exoskeleton granulate or finely tuberculate to the naked eye. The present writer is of opinion that WESTERGÅRD (26) is right in regarding these differences as unessential so that *Parasolenopleura* may be safely placed in the Solenopleuridae very close to *Solenopleura*.

Opinions may of course vary as to the taxonomic value of the above-mentioned dissimilarities. It is a fact, however, that a considerable number of average opisthoparian trilobites form a fairly compact group of genera, which appear to be more or less closely related to *Solenopleura* so as to make their membership of the Solenopleuridae probable, although, in

several cases, the insufficient knowledge of their range of variation must induce reflection; some of them may possibly represent stages of convergent evolution in different lines of descent.

Under the circumstances a faultless grouping of genera can hardly be expected, and, accordingly, the following classificatory arrangement must be regarded as tentative.

Family Solenopleuridae Angelin, 1854.

Diagnosis: Opisthoparian ovate to elongate, fairly convex dorsal exoskeleton, micropygous to heteropygous, having semicircular cephalon (in most cases), conical to ovate glabella defined by wide and deep axial and occipital furrows, generally deep cephalic border furrow, prominent, most frequently narrow cephalic border, thorax (as far as known) of 11–17 segments with prominent axis and deeply furrowed pleurae, pygidium with 1–9 axial rings, more or less distinctly segmented pleural regions, entire margin, and usually well-defined narrow border, and most frequently granulate or tuberculate outer surface; character of cephalic doublure, ventral sutures and hypostome imperfectly known. Stratigraphic range: Middle Cambrian-Lower Ordovician.

Subfamily Solenopleurinae Angelin, 1854 (as Solenopleuridae)

KOBAYASHI, 1935:

Diagnosis: Solenopleuridae having strongly convex, anteriorly rounded glabella, 2–3 pairs of oblique glabellar furrows, usually distinctly defined eye-ridges, short palpebral lobes, poorly developed genal spines or spineless genal angles, thorax (as far as known) of 14–16 segments with rounded extremities or (rarely) short pleural spines, pygidium with 2–9 axial rings, and granulate or finely tuberculate outer surface of dorsal exoskeleton. Stratigraphic range: Middle Cambrian-Upper Cambrian.

Genera:

- Solenopleura* ANGELIN, 1854 (type species: *Aulacopleura (Calymene) canaliculata* ANGELIN, 1851). Occurrence: Middle Cambrian, Europe, Asia, N. America (Atlantic Province), ?Novaya Zemlya (3, 26).
 ?*Albansia* HOWELL, 1937 (type species: *A. pusilla* HOWELL, 1937). Occurrence: Late Middle Cambrian, Eastern N. America (5).
Asthenopsis WHITEHOUSE, 1939 (type species: *A. levior* WHITEHOUSE, 1939). Occurrence: Middle Cambrian, NE. Australia (27).
Berkeia RESSER, 1937 (type species: *Agraulos convexus* var. *B* BERKEY, 1898). Occurrence: Upper Cambrian, N. America (29).
 ?*Crusioia* WALCOTT, 1924 (type species: *C. cebes* WALCOTT, 1924). Occurrence: Middle Cambrian, N. America (22).
 ?*Knechtella* LOCHMAN, 1950 (type species: *K. ann* LOCHMAN, 1950). Occurrence: Upper Cambrian, N. America (10).
 ?*Menocephalites* KOBAYASHI, 1935 (type species: *Solenopleura acantha* WALCOTT, 1905). Occurrence: Middle Cambrian, E. Asia (7).
Parasolenopleura WESTERGÅRD, 1953 (type species: *Calymene aculeata* ANGELIN, 1851). Occurrence: Middle Cambrian, Europe, N. America (Atlantic Province) (26).

- Perneraspis* PRANTL, 1947 (type species: *Perneria lata* Růžička, 1940). Occurrence: Middle Cambrian, Bohemia (13).
- Pseudosolenopleura* SUN, 1935 (type species: *Solenopleura kotoi* KOBAYASHI, 1933). Occurrence: Upper Cambrian, E. Asia (19).
- ?*Solenoparia* KOBAYASHI, 1935 (type species: *Ptychoparia (Liostracus) toxus* WALCOTT, 1905). Occurrence: Middle Cambrian, Asia, W. Australia (7).
- Solenopirella* POULSEN, 1927 (type species: *S. ulrichi* POULSEN, 1927). Occurrence: Middle Cambrian: Greenland, N. America (11, 13).
- Solenopleurina* Růžička, 1938 (type species: *S. tyroviensis* Růžička, 1938). Occurrence: Middle Cambrian, Bohemia (17).
- Spencia* RESSER, 1939 (type species: *S. typicalis* RESSER, 1939) [= *Staurololcus* RESSER, 1939]. Occurrence: Middle Cambrian, N. America (14).
- Sulcocephalus* J. L. WILSON, 1948 (type species: *Talbotina candida* RESSER, 1942). Occurrence: Upper Cambrian, N. America (28).

Subfamily Acrocephalitinae Hupé, 1953 (as Acrocephalitidae).

Diagnosis: Solenopleuridae having moderately to strongly convex, anteriorly truncated glabella, usually 3 pairs of oblique glabellar furrows, a swelling or boss occupying more or less well-developed pre-glabellar field, faintly marked eye-ridges, fairly well developed genal spines, pygidium with 1-8 axial rings, and granulate to finely tuberculate outer surface of dorsal exoskeleton. Stratigraphic range: Middle Cambrian-Upper Cambrian.

Genera:

- Acrocephalites* WALLERIUS, 1895 (type species: *Calymene stenometopa* ANGELIN 1851). Occurrence: Middle Cambrian-Upper Cambrian, Europe, Asia, ?Novaya Zemlya (24, 25).
- Cliffia* J. L. WILSON, 1951 (type species: *Acrocephalites lataegenae* J. L. WILSON, 1949). Occurrence: Upper Cambrian, N. America (29).
- ?*Glaphyraspis* RESSER, 1937 (type species: *Liostracus parvus* WALCOTT, 1899) [Synonym: *Pinctus* J. L. WILSON, 1951]. Occurrence: Upper Cambrian, N. America (29).
- ?*Paracrocephalites* nov. nom. [pro *Arctaspis* LERMONTOVA, 1940 (non HEINTZ, 1929)] (type species: *Arctaspis robusta* LERMONTOVA in VOLOGDIN, 1940). Occurrence: Upper Cambrian, Siberia (21).
- Pesaia* WALCOTT & RESSER, 1924 (type species: *P. exsculpta* WALCOTT & RESSER, 1924). Occurrence: Upper Cambrian, Novaya Zemlya (23).
- ?*Raaschella* LOCHMAN, 1938 (type species: *R. ornata* LOCHMAN, 1938). Occurrence: Upper Cambrian, N. America (9).

Subfamily Saoinae Hupé, 1953 (as Saoidae).

Diagnosis: Solenopleuridae having moderately convex glabella, 3 pairs of transverse or (rarely) oblique glabellar furrows, usually well-defined eye-ridges, palpebral lobes of medium size, short, poorly developed genal spines, thorax of about 16-17 segments with rounded or truncated extremities, pygidium of small size, with about 2-4 axial rings, and outer surface of dorsal exoskeleton covered with spine-like tubercles or spines or both. Stratigraphic range: Middle Cambrian.

Genera:

- Sao* BARRANDE, 1846 [non BILLBERG, 1820] (type species: *S. hirsuta* BARRANDE, 1846*) [Synonyms: *Monadina* BARRANDE, 1846; *Staurogmus* CORDA, 1847; *Acanthocnemis* CORDA, 1847; ?*Acanthogramma* CORDA, 1847; *Crithias* CORDA, 1847; *Enneacnemis* CORDA, 1847; *Goniacanthus* CORDA, 1847; ?*Micropyge* CORDA, 1847; *Selenosema* CORDA, 1847; *Tetracnemis* CORDA, 1847]. Occurrence: Middle Cambrian, Europe (1, 12, 15).
- Pardailhania* THORAL, 1947 (type species: *Solenopleura* (?) *hispidus* THORAL, 1935). Occurrence: Middle Cambrian, S. Europe, ?N. Africa (20).
- Solenopleuropsis* THORAL, 1947 (type species: *Conocoryphe rouayrouxi* MUNIER-CHALMAS & BERGERON, 1889). Occurrence: Middle Cambrian, Europe (20).

Subfamily Hystricurinae Hupé, 1953 (as Hystricuridae).

Diagnosis: Solenopleuridae having moderately to strongly convex, anteriorly rounded glabella, effaced glabellar furrows or these represented by non-pustulose patches on sides of glabella, usually effaced eye-ridges, short to long palpebral lobes, generally well-developed genal spines, thorax of about 11 segments (in the type genus) with blunt or spined extremities, pygidium with about 3-6 axial rings, and, usually, coarsely tuberculate outer surface of dorsal exoskeleton. Stratigraphic range: Upper Cambrian-Lower Ordovician.

Genera:

- Hystricurus* RAYMOND, 1913 (type species: *Bathyrurus conicus* BILLINGS, 1859). Occurrence: Lower Ordovician: N. America, Greenland, E. Asia (4, 16).
- Amblycranium* ROSS JR., 1951 (type species: *A. variabile* ROSS JR., 1951). Occurrence: Lower Ordovician, N. America (16).
- ?*Apachia* FREDERICKSON, 1949 (type species: *A. trigonis* FREDERICKSON, 1949). Occurrence: Upper Cambrian, N. America (2).
- Hillyardina* ROSS JR., 1951 (type species: *H. semicylindrica* ROSS JR., 1951). Occurrence: Lower Ordovician, N. America (16).
- Pachycranium* ROSS JR., 1951 (type species: *P. faciclinis* ROSS JR., 1951). Occurrence: Lower Ordovician, N. America (16).
- Parahystricurus* ROSS JR., 1951 (type species: *P. fraudator* ROSS JR., 1951). Occurrence: Lower Ordovician, N. America (16).
- Psalikilus* ROSS JR., 1951 (type species: *P. typicum* ROSS JR., 1951). Occurrence: Lower Ordovician, N. America (4).

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* The present writer has revived Professor RUDOLF RICHTER's application of 1941 (15) for conservation of the name *Sao barrande*, 1846; accordingly, this *nomen conservandum* is maintained here in the hope that it may be added to the official list of *nomina conservata* by THE INTERNATIONAL COMMISSION OF ZOOLOGICAL NOMENCLATURE.

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