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State Key Laboratory of Palaeobiology and Stratigraphy

Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences

Beijingdonglu 39, 210008 Nanjing, PR China

e-mail: [palaeoworld@nigpas.ac.cn](mailto:palaeoworld@nigpas.ac.cn)

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## MALFORMED AGNOSTOID TRILOBITE FROM THE MIDDLE CAMBRIAN OF NORTHWESTERN HUNAN, CHINA

Loren E. BABCOCK<sup>1)</sup> and PENG Shanchi<sup>2)</sup>

1) Department of Geological Sciences, The Ohio State University, 125 South Oval Mall, Columbus, Ohio 43210, USA. E-mail: babcock.5@osu.edu

2) Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, 39 East Beijing Road, Nanjing 210008, China. E-mail: speng@pub.jlonline.com

A new specimen of agnostoid trilobite from the Middle Cambrian of Hunan, China, adds to a meager record of malformations in this group of small, pelagic arthropods. The specimen, a cephalon of *Ptychagnostus atavus*, is from a thinly laminated, dark lime mudstone layer of the Huaqiao Formation (*Ptychagnostus atavus* Zone, upper Middle Cambrian), as exposed in the Wangcun section (see Peng and Robison, 2000), northwestern Hunan Province.

The malformation on the specimen of *P. atavus* consists of a small, deep, elliptical pit at the right posterolateral corner of the cephalic axis. From the dorsal surface, the axial trend of the pit appears to be slightly inclined anteromedially. The pit resembles that previously illustrated on an Ordovician agnostoid, *Arthrorhachis elspethi*, from the Middle Ordovician of Virginia, USA (Babcock, 1993, figs. 1.3, 1.4). Examination of the pit on the specimen of *A. elspethi* shows the pit to have a bulbous, pearl-like expression on the internal surface of the cephalon. In both examples, the pits resemble small borings, they are located in comparable positions, and they are slightly inclined anteromedially. Similar to the Ordovician specimen, the specimen of *P. atavus* has been healed over, and some regeneration of exoskeletal material has occurred. In all likelihood, progressive regeneration occurred through a series of molts. Malformations of this type have not been reported from polymeroid trilobites, most of which are larger than agnostoids.

It is probably significant that the two known examples of small healed pits on agnostoids are located in nearly identical places, at the posterolateral corner of the cephalic axis, and that they have a similar trend of penetration. There are two alternative ways of interpreting the similarity in the positions of the pits: 1, as an indication of the position of the intended target of putative predation or parasitism; or 2, as a miscalculation of the drilling position required for a predaceous injury to become lethal. In considering the first hypothesis, the positions of the pits are close to points of muscle attachment (compare Müller and Walossek, 1987), and close to the right bacculae in both specimens. Whether the intended target of predation or parasitism were along the axis (e.g., the intestinal tract) is uncertain, but it is a strong possibility. It may also be that another appetizing soft structure (e.g., a brood pouch) was located close to that position. In

