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THE HYPOSTOMA OF PAGETIA

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ABSTRACT.

For the first time the hypostoma of an eodiscid trilobite, Pagetia bootes Walcott, is described. The presence of a doublure with terraced lines, and schizochroal eyes as observed on Australian Pagetiae, is mentioned. Obviously the trilobite nature of the Eodiscidae is no longer in question.

ACKNOWLEDGMENTS.

The writer is indebted to Sir Douglas Mawson, Adelaide, for kind permission to study and describe the specimens of Pagetia bootes from the palaeontological collections of the Adelaide University.

Preliminary note on the structure of Australian Pagetia.

Pagetia significans (Etheridge), redescribed by Whitehouse (1936), and some allied species, are well represented in collections of Cambrian fossils from the Northern Territory of Australia made by members of the Commonwealth Bureau of Mineral Resources, Geology and Geophysics during the years 1947-49. The writer is at present studying these fossils.

In the Northern Territory the trilobites occur most commonly in silicified cherts composed of sponge spicules. Many complete specimens of Pagetia can be recovered from these rocks revealing a number of features which have not been previously described. The most important of these are the doublure with terraced lines, schizochroal visual faces of the eyes, and the hypostoma which is preserved in some specimens in its original position.

Also the ontogeny of Australian Pagetiae can be examined in a multitude of immature specimens.

Discovery of the hypostoma of Pagetia bootes Walcott.

The writer searched in Australian museums for specimens of Pagetia from other countries, particularly for P. bootes from the Burgess shale, British Columbia, which is the type of the genus. A comparison of the Australian forms with the genotype of Pagetia is very desirable, as T. Kobayashi (1944) erected for Pagetia significans a new subgenus Eopagetia. However, Kobayashi's interpretation of the structure of P. (Eopagetia) significans is quite different from the real structure of this Australian trilobite.

In the Geological Museum of the University of Adelaide, S.A., the writer observed a piece of the Burgess shale, from British Columbia, showing two specimens of Pagetia bootes each having the hypostoma in situ. By courtesy of Sir Douglas Mawson, Professor of Geology in the University of Adelaide, this piece of shale was sent to the Bureau of Mineral Resources, Canberra, for further study and description. It will be necessary to spend much more time in studying the abundant Australian Pagetia material but it seems desirable to publish the results of an examination of Pagetia bootes

immediately because, according to a letter from Franco Rasetti (The Johns Hopkins University) structures similar to those described herein are not known as yet for Pagetia and Eodiscus, and published information on the matter is needed for the "Treatise on Invertebrate Palaeontology."

MATERIAL.

/shields The material studied is a piece of black shale, with a green circular label showing the number 35 k. As communicated by Franco Rasetti in a letter, "all material from the Burgess shale in the United States National Museum bears the locality number 35 k on a green label." The number of the specimen, as registered in the Geological Department, University of Adelaide, is 3182 in red paint. The fossils are correctly labelled as Pagetia bootes Walcott, Middle Cambrian, Burgess shale, Burgess Pass, near Field, British Columbia. This shale specimen bears seven complete ~~axapaxax~~ of Pagetia bootes, two of them having the hypostoma in situ.

PRESERVATION.

The tests of the trilobites are not preserved at all; they are represented only by casts and moulds. The cavities left by the hollow pygidial terminal spine and the articulation halfrings of the pygidium and of the tergites of the thorax are filled up by pyrite. The hypostomata are preserved as pyrite casts of the oesophagal, or subglabellar, cavities. Distortion is negligible.

DESCRIPTION OF THE HYPOSTOMA.

The hypostoma is an unforked shield with concave lateral and posterolateral borders, the posterior margin being slightly angular. A pair of shallow furrows run along the lateral margins. The maculae are developed as a pair of shallow depressions at the posterolateral borders. The shield is markedly convex and has been perhaps subangular along the median line. The anterior lateral angles form short spine-like processes which perhaps meet the dorsal shield at points where the ocular ridge is connected with the dorsal furrow. Altogether, Pagetia bootes shows a normal trilobite hypostoma.

The hypostoma has apparently been connected to the doublure by a wide rostral plate which is not preserved.

SYSTEMATIC POSITION OF THE GENUS PAGETIA.

/and The structure of the hypostoma and of the ventral side of the cephalon of Pagetia are exactly the same as in any normal Cambrian trilobite. Many authors have stated that in Pagetia the structure of the dorsal shield as a whole is the same as in normal Cambrian trilobites. Eodiscus is rightly interpreted as a blind Pagetia, the erection of a separate family, the Eodiscidae (Gülich) (Raymond 1913) to include these genera is, as stated by R. & E. Richter (1941), amply justified. The Richters interpret the families Agnostidae and Eodiscidae as members of a higher unit, the trilobite superfamily Agnostidea (Salter). This has been accepted without change by Westergaard (1946). Rasetti (1948), however, proposed that two

orders be recognized the Agnostida, and the Eodiscida. This is perhaps acceptable. Rasetti's main reason for suggesting that the Agnosti be regarded as an order is the indisputable fact that the total number of segments in the agnostids is constant, whereas in all other trilobites this number is variable, being related to the variability of the number of segments in the thorax and the pygidium. The constancy of the segmentation of the Agnosti means, perhaps, that they represent a very limited and simple group only. If the Agnosti are compared with some other trilobites which have a constant number of segments in the thorax, (as for example the Asaphidae), the conclusion may be reached that they form a unit not much larger than an extended genus or subfamily. The constant number of segments may indicate a close relationship of the members of the unit without being necessarily a reason to remove the Agnosti from the trilobites at all. The modern and elaborate classification of the Agnosti, with its multitude of genera, subfamilies, and families, is very artificial. It seems to be more a key for determination, as it was in the hands of Tullberg, than a system in the biological sense. The same applies to the treatment of the eodiscids by Kobayashi (1944).

The gap between the Agnosti and the other trilobites, as pointed out by Rasetti (1948), is indeed very wide; but perhaps the blind Pagetia, Eodiscus, after all may be a bridge. As yet, no major differences are known between the structure of the cephalon of an Agnostus and that of an Eodiscus.

EXPLANATION OF THE TEXT FIGURE.

Text Figure was not supplied in the hardcopy of record 1950/27.

Paquetia bootes Walcott, explanatory sketch for Plate; the specimen in the lower left corner. The subglabellar (oesophagal) cavity (black) is covered by the hypostoma. The lateral furrows of the hypostoma, and the maculae are indicated. Magnification about 12 diameters.

EXPLANATION OF PLATE.

Plates were not supplied in the hardcopy of record 1950/27.

Pagetia bootes Walcott, Middle Cambrian Burgess Shale, Burgess Pass near Field, British Columbia. The specimen belongs to the University of Adelaide (South Australian University Museum No. 3182). Three complete shields, two of them (below) having each the hypostoma in situ. Magnification 12 diameters.

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