

MICROFOSSILS FROM ZEWAN BEDS (PERMIAN) OF KASHMIR*

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ABSTRACT—Sixteen species of smaller foraminifera and ostracoda are recorded and illustrated for the first time from the Zewan beds (Permian), Zewan Spur, Kashmir.

INTRODUCTION

THE present paper records and illustrates the first find of smaller foraminifera and ostracoda from Zewan limestone (Permian) of Zewan Spur, Kashmir. The material under study was collected by Sri H. M. Kapoor, Geologist, Geological Survey of India. The sample also contained a number of crinoidal stems, bryozoans, micro-gastropods, lamelli-branches and brachiopods.

At present we are listing only the forms which could readily be identified from the limited literature available to us. A more detailed account will follow later. Camera-lucida sketches were prepared by the Junior author.

FORAMINIFERA

Genus: INVOLUTINA Terquem, 1862
INVOLUTINA SEMICONSTRICTUS Loeblich & Tappan, 1954
Pl. 12, fig. 1

Remarks: This species is fairly common in our material.

Dimensions: Diameter of specimen 0.9 mm.

INVOLUTINA LONGEXERTUS Cutschick & Treckman, 1959
Pl. 12, fig. 2

Remarks: The holotype is from the Rockford limestone of Northern Indiana (Lower

Carboniferous). A few specimens of this species occur in our material.

Dimensions: Diameter of test 0.4 mm.

Genus: TOLYPAMMINA Rhumbler, 1895
TOLYPAMMINA sp. indet.
Pl. 12, fig. 3

Remarks: A solitary broken specimen referable to this genus has been found in our material. The specimen is attached to quartz grains. Test consisting of a globular proloculus and gradually expanding second chamber which is coiled in the early stages, later coiling becomes random. Wall finely arenaceous with siliceous cement.

Dimensions: Maximum diameter of tubular chamber 0.1 mm., length 0.5 mm.

Genus: AGATHAMMINA Neumayr, 1887
AGATHAMMINA sp. indet.
Pl. 12, fig. 4

Remarks: A few specimens of this genus were found in our material. Test is tubular, undivided winding about an elongate axis. Aperture formed by the open end of the tube. Wall is calcareous and imperforate with arenaceous material at the surface.

Dimensions: Length 0.8 mm., breadth 0.4 mm.

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Genus : SPIROLOCULINA d'Orbigny, 1826
SPIROLOCULINA sp. indet.
Pl. 12, fig. 5

Remarks : A single specimen which is figured here, was found in the present material. The morphological characters are too obscure to be of any help in specific determination.

Dimensions : Length 0.6 mm., breadth 0.3 mm.

Genus : TRILOCULINA d'Orbigny, 1828
TRILOCULINA sp. indet.
Pl. 12, fig. 6

Remarks : A single specimen which can be referred to this genus was found in our material.

Dimensions : Length 0.7 mm., breadth 0.6 mm.

Genus : TROCHAMMINA Parker & Jones, 1859
TROCHAMMINA sp.

Remarks : The material is rich in *Trochammina* which, however, are not very well preserved. The genus has been reported from Carboniferous (Uralian) formations from Manendragarh, Central India, by S. B. Bhatia and S. K. Singh (1959)

Genus : NODOSARIA Lamarck, 1812
NODOSARIA Sp. indet.
Pl. 12, fig. 7

Remarks : A solitary, broken specimen of this indeterminate species occurs in our material.

Dimensions : Length of preserved specimen 0.7 mm., breadth 0.2 mm.

Genus : TEXTULARIA DeFrance, 1824
TEXTULARIA Sp. indet A
Pl. 12, fig. 8

Remarks : Test elongate, tapering, biserial with carinate periphery. Rare in occurrence.

Dimensions : Length 0.9 mm., breadth 0.5 mm.

TEXTULARIA Sp. indet B
Pl. 12, fig. 9 a & 9 b

Remarks : This species differs from the previous one in being smaller in dimensions, in

having a median sulcus and a rounded periphery. Frequent in occurrence.

Dimensions : Length 0.5 mm., breadth 0.2 mm.

OSTRACODA

Genus : AMPHISSITES Girty, 1910
AMPHISSITES cf *A. rothi* Bradfield, 1935
Pl. 13, fig. 1

Remarks : A single, left valve which may be referred to *A rothi* Bradfield (1935, p. 57, pl. 4, fig. 1) and from which it differs in having a larger, slightly subcentral node above Kirkbyan pit and slightly protruding posterodorsal angle, which suggest it to be a new species.

Dimensions : Length 1.0 mm., height 0.5 mm.

Genus : BAIRDIA M' Coy, 1844
BAIRDIA ARDMORENSIS Harlton, 1929
Pl. 13, fig. 2

Remarks : There are quite a few, fairly typical specimens of the species in our material. It has been reported from Dornick hills group (Lower Pennsylvanian) and Johns Valley shale (Upper Carboniferous) in Oklahoma and also from Ferdinand limestone, Indiana (Upper Carboniferous).

Dimensions : Length 1.2 mm., height 0.6 mm.

BAIRDIA Sp. indet. A
Pl. 13, fig. 3

Remarks : A few complete carapaces referable to this genus were found in our material. In side view it is elongate, inflated with arched dorsum that becomes slightly concave terminally. Ventral margin straight but curved anteriorly and posteriorly. Anterior end more rounded than posterior. Highest point of the carpace in the middle and surface smooth. Common in occurrence.

Dimensions : Length 1.2 mm., height 0.6 mm.

BAIRDIA Sp. indet. B
Pl. 13, fig. 4

Remarks : A broken left valve of this genus occurs in our material. Carapace large, elongate, subtriangular with protuberances. Dorsal margin arched, ventral margin convex. Highest

part of carapace in the middle. Anterior end rounded with no antero-dorsal angle and low acuminate, slightly upturned posterior beak.

Dimensions: Length 1.0 mm., height 0.6 mm.

Genus: HEALDIA Rundy, 1926
HEALDIA CYPHA Shaver, 1959
Pl. 13, fig. 5

Remarks: A solitary specimen, typical of the species was found in the material. Carapace is short, subtriangular with high angled arched dorsum and slightly ridged shoulders.

Dimensions: Length 0.7 mm., height 0.5 mm.

Genus: SILENITES Coryell & Booth, 1933
SILENITES Sp. indet
Pl. 13, fig. 6

Remarks: Only one complete carapace was found which may be referred to the genus *Silenites*. Carapace smooth, very high with dorsal convexity. Left valve over reaches right valve.

Dimensions: Length 0.9 mm., height 0.7 mm.

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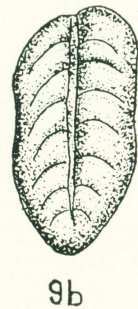
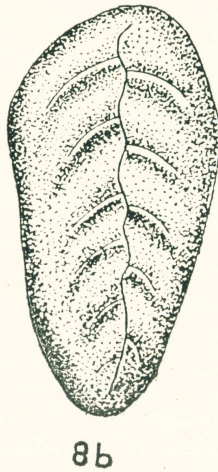
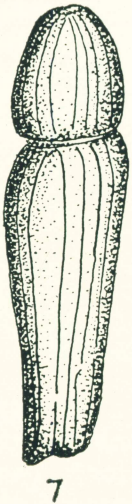
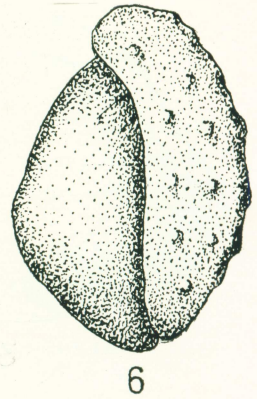
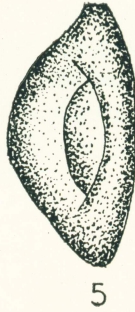
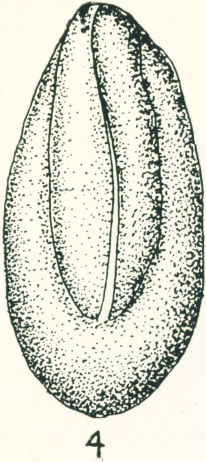
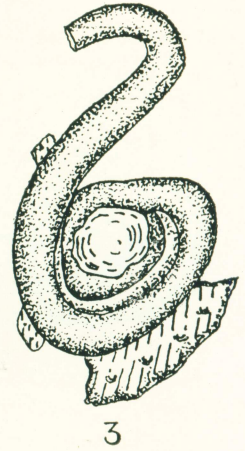
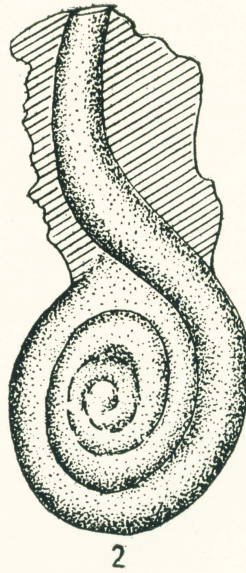
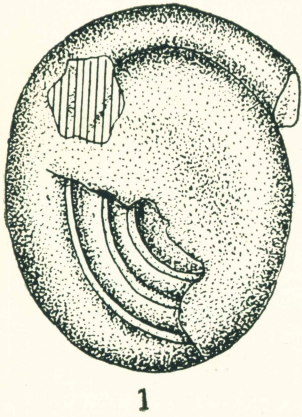
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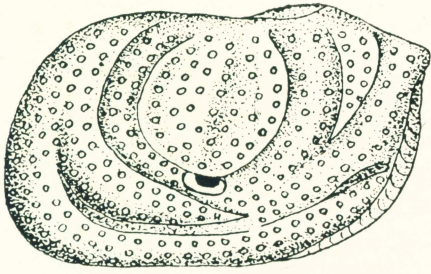
EXPLANATION OF PLATE 12

1. *Involutina semiconstrictus* Loeblich & Tappan, 1954.
2. *Involutina longexertus* Gutschick & Treckman, 1959.
3. *Tolypanmina* sp. indet.
4. *Agathammina* sp. indet.
5. *Spiroloculina* sp. indet.
6. *Triloculina* sp. indet.
7. *Nodosaria* sp. indet.
8. *Textularia* sp. indet. A, a—apertural view, b—side view.
9. *Textularia* sp. indet. B, a—apertural view, b—side view.

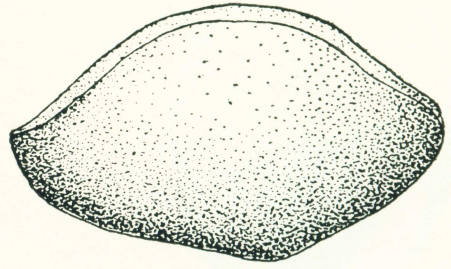
EXPLANATION OF PLATE 13

1. *Amphissites* cf. *A. rothi* Bradfield, 1935, left valve.
2. *Bairdia ardmorensis* Harlton, 1929, right valve.
3. *Bairdia* sp. indet. A, right valve.
4. *Bairdia* sp. indet. B, left valve.
5. *Healdia cypha* Shaver, 1959, left valve.
6. *Silenites* sp. indet. right valve.

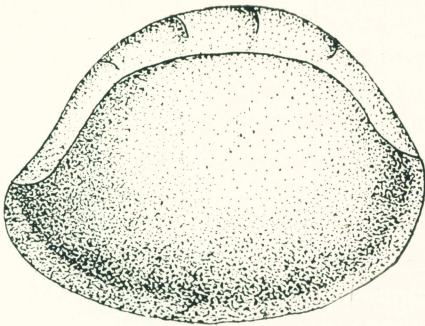




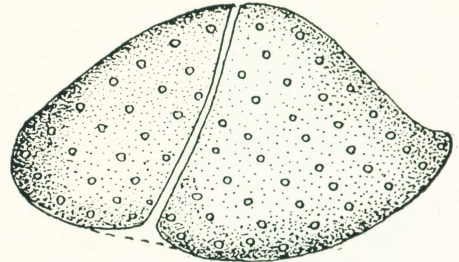
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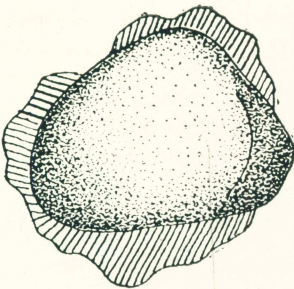
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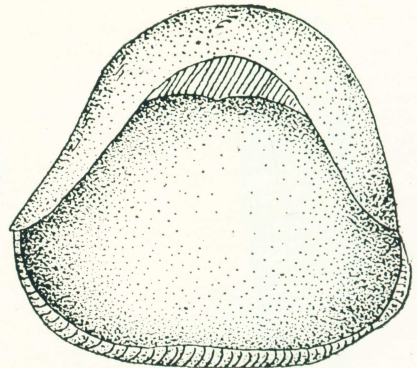
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