

BERGAUERIA PRANTL FROM UPPER CRETACEOUS ROCKS OF MADHYA PRADESH, INDIA

S. K. SINGH

GEOLOGY DEPARTMENT, LUCKNOW UNIVERSITY, LUCKNOW

ABSTRACT

The paper describes *Bergaueria* Prantl from Upper Cretaceous rocks of Narbada Group (Bagh Beds). The forms are associated with oyster beds and crab burrows indicating shallow environment of deposition.

INTRODUCTION

The forms being described here were collected near Chikli village (Fig. 1), while studying the Upper Cretaceous rocks of the Narbada Group¹. The horizon yielding *Bergaueria* like forms were collected from upper part of Nimar Sandstone which underlies the Bagh Formation. In fact, the forms were observed on the under surface of the sample very rich in oysters. The oysters are packed in a medium grained calcareous sandstone which in turn is underlain by yellow clays. The lower surface of the calcareous sandstone in contact with the clay revealed a number of protrusions filled with the overlying matrix. The clay in question showed the corresponding hollows.

DESCRIPTION

The protrusions (cast) are cylindrical smooth, the ventral surface slightly arched-convex outwards. Few protrusions give a faint suggestion of a depression in the centre of the ventral surface.

The protrusions varie in size, diameter ranging from 1 cm-1.5 cm. The length varies from 0.5 cm to 2 cm. Well developed forms are longer than broad, the diameter decreasing slightly, more so in the last 2 to 3 mm. The smaller forms with length of 0.5 cm have a diameter of about 1 cm.

Most of the protrusions are nearly perpendicular to the bedding, but few are inclined at 60° to 70° i.e. 20°-30° from vertical.

The matrix filling the protrusions is the same as in overlying bed, fragments of shells are also seen in the matrix. The bedding above the protrusions is undisturbed. However, the clay around the protrusions shows downward bending.

COMMENTS

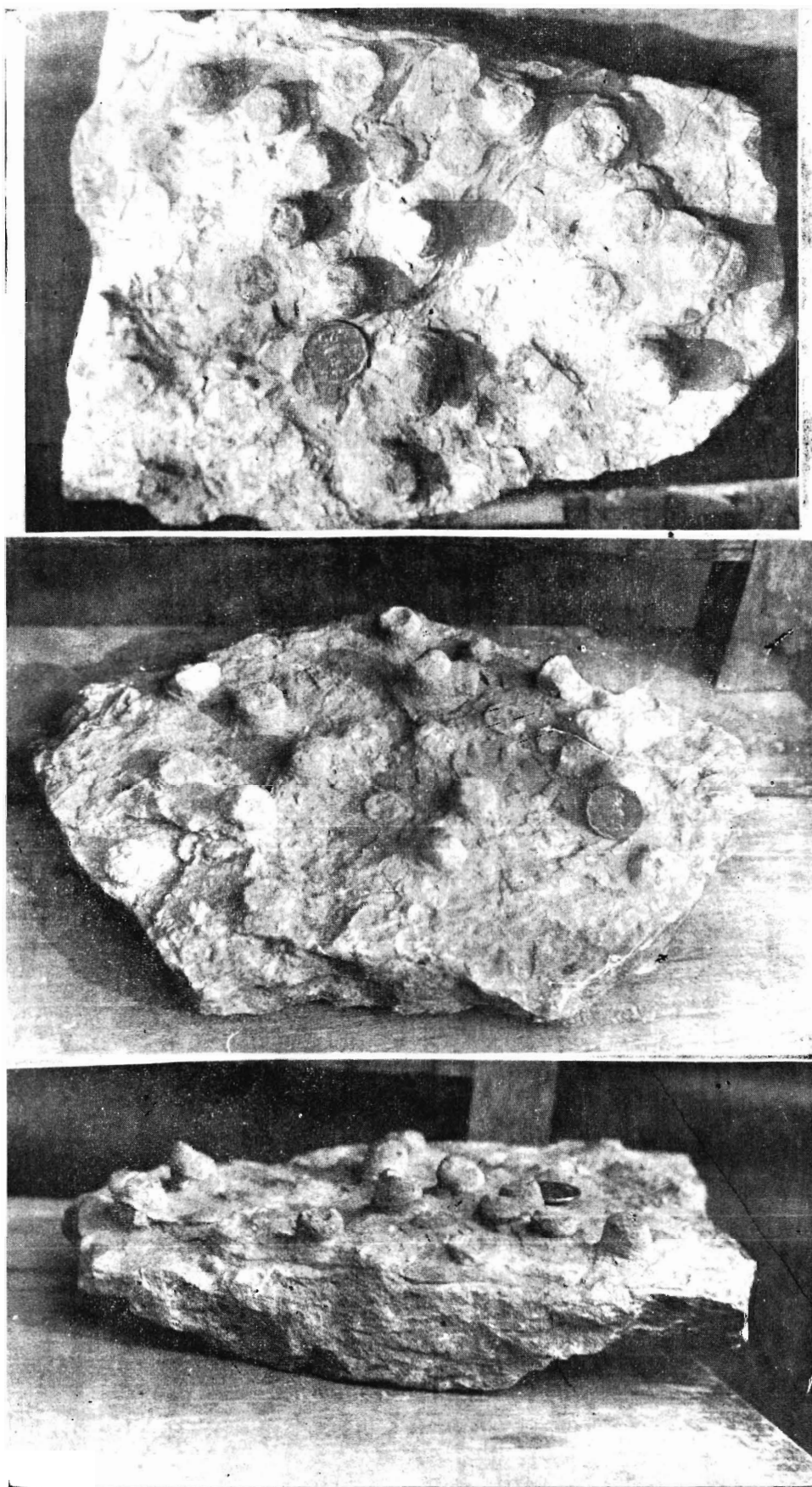
The forms resemble in almost all respects with *Bergaueria* Prantl. However, they differ from *Bergaueria* like forms described from Alberta by Arai and Mc Guban (1968) in not being inverted spheres, besides showing no collapse structures.

This probably is the first report of *Bergaueria* from rocks of Upper Cretaceous age. The forms were known more commonly from Lower Palaeozoic. However, reports are now available from Permian (Arai and Mc Guban, 1968), Upper Jurassic (Fursich, 1974) and the present report (Upper Cretaceous). Thus, it can be seen that the forms are present in rocks of various ages and it is a question of only finding them or searching for them at the right place, i.e. clay-sand interphase and the right environment.

A study of the forms leads to the following conclusions :—

- (1) The animal or part of the animal responsible for the *Bergaueria* like forms made hollows in clayey substrate of approximately uniform diameter.
- (2) The longer and wider protrusions could have been made by larger animals or by longer usage of the same hollows.
- (3) The uniformity in diameter and the bending of the clay laminae around the casts indicate application of pressure from above by a body of nearly uniform size.
- (4) The animal in question lives in a clayey substrate and probably migrated with changing environment of deposition to more favourable niche.
- (5) The association of *Thalassinoides* and other crab burrows with tightly packed oysters in the imme-

¹ Narbada Group includes the Bagh Bed (Formation) and Nimar Sandstone (see Singh and Srivastava, 1981).



diately overlying calcareous sandstone bed is a good indicator of the shallow marine environment.

- (6) The animal responsible for producing *Bergaueria* like forms lived in quiet conditions of very slow rate of sedimentation.

Incidentally, the interpretation given by Seilacher (in Arai and McGugan, 1968) that these forms are restricted to a kind of omission surface, at which sedimentation had stopped for a while and allowed the development of the colonies of burrowing suspension feeders and that they may be safely used as shallow marine facies indicators, appears to be quite sound.

A good discussion regarding the animal in question is given in Arai and McGugan (1968). There is a general

consensus that the form *Bergaueria* is produced by some Actinian.

REFERENCES

- ARAI, M. N. AND MCGUGAN, A. 1968. A problematical coelenterate (?) from the Lower Cambrian, near Moraine Lake, Banff Area, Alberta. *Jour. Pal.* **42**(1) : 205-209.
- FURSICH, F. T. 1974. Corallian (Upper Jurassic) trace fossils from England and Normandy. *Stuttgarter Beitr. Naturk.* Ser. B13: 1-52.
- HANTZCHEL, W. 1962. Trace fossils and Problematica. In *Treatise on Invertebrate Palaeontology*, R. C. Moore (Ed.), Part IV, Miscellanea.
- SINGH, S. K. AND SRIVASTAVA, H. K. 1981. Lithostratigraphy of Bagh Beds and its correlation with Lameta Beds. *Jour. Pal. Soc. India.* **26** : 77-85.

EXPLANATION OF PLATE

PLATE I

Bergauria Prantl. For scale, diameter of coin=1.9 cm

1. Top view, hyporelief, showing several protrusions (casts), few broken.
2. Inclined view.
3. Side view showing angular relationship of protrusions to bedding. Thin clay laminae can be seen surrounding the protrusions.