CHAPTER 5

GEOLOGY OF THE MEASURED SECTIONS

As mentioned earlier four stratigraphic sections exposed at Sitapuri village, along Man River near Avalda village, Baria village and Zeerabad village (Text Fig. 1) were selected for micropalaeontological assessments and stratigraphic correlation of the Bagh Beds. These are located in the vicinity of Avalda village near Manawar township in Dhar District, Madhya Pradesh. Each section is further discussed below with respect to its lithological and palaeontological characteristics, sampling position and thickness of all the constituent horizons.

Sitapuri Section

(Pl. 1, Fig. 2) (Text Fig. 5)

This section is exposed along a fair weather road joining Sitapuri village with Phutibowri hamlet about 1 km North East of former. Altogether, this section attains a maximum thickness of 7 m and can be further differentiated into the following lithological units.

<table>
<thead>
<tr>
<th>Lithological Unit</th>
<th>Description</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deccan Traps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coralline Limestone</td>
<td>Creamish yellow hard and compact bryozan limestone</td>
<td>1 m</td>
</tr>
<tr>
<td>Deola and Chirakhan Marl</td>
<td>Richly fossiliferous pinkish marly bed yielding echinoids and bivalve</td>
<td>1.5 m</td>
</tr>
<tr>
<td>Nodular Limestone</td>
<td>Greyish white argillaceous limestone with nodular appearance</td>
<td>2 m</td>
</tr>
<tr>
<td>Nimar Sandstone</td>
<td>Medium to coarse grained current bedded sandstone with trace fossils</td>
<td>2.5 m</td>
</tr>
<tr>
<td>Base not exposed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TEXT FIG. 5: STRATIGRAPHIC SECTION OF BAGH BEDS AT SITAPURI
The sequence starts here with a medium to coarse grained current bedded sandstone belonging to the Nimar Sandstone Formation whose base is not exposed anywhere in the section. The formation becomes gradually calcareous towards the top and is abundant with the trace fossils. The Nimar Sandstone inturn is overlain by greyish white argillaceous Nodular Limestone. Since this horizon is profusely bioturbated, bedding features are completely obscured. The upper weathered portion of the formation has yielded ammonoids and bivalves.

This two meter thick Nodular Limestone passes gradually upward into a highly fossiliferous pinkish marly bed full of echinoids and bivalve Inoceramus. The measured thickness of this horizon at Sitapuri Section is in the order of 1.5m. This marly bed is further succeeded by one meter thick hard and compact creamish yellow coloured Coralline Limestone. The Coralline Limestone has granular texture and is full of bryozoans and shelly fragments. Towards the top this sedimentary sequence of Bagh beds is capped by Deccan Traps.

Altogether 14 rock samples were collected from this stratigraphic section representing almost all lithologies. Excluding two samples from the lower portion of the Nimar Sandstone, all remaining 12 samples of the section have yielded rich microfaunal assemblage.

Man River Section
(Pl. 2, Fig. 1&2) (Text Fig. 6)

This section is located on the right bank of the Man River, about 6 KM North East of Avalda village. The lithological succession of Bagh Beds exposed at this section is as follows:
Deccan Traps

<table>
<thead>
<tr>
<th>Formation</th>
<th>Description</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coralline Limestone</td>
<td>Creamish yellow hard and compact bryozan limestone</td>
<td>0.5 m</td>
</tr>
<tr>
<td>Nodular Limestone</td>
<td>Greyish to pinkish white compact argillaceous limestone</td>
<td>2 m</td>
</tr>
<tr>
<td>Nimar Sandstone</td>
<td>Oyster bed alternate sandy shale and sandstone with small scale current bedding. Coarse grained conglomeratic sandstone</td>
<td>2.5 m 1 m</td>
</tr>
</tbody>
</table>

Metamorphics

The sequence at this section commences from Coarse conglomeratic Nimar Sandstone resting unconformably on metamorphics. The Nimar Sandstone comprises here an alternating sequence of sandy shale and fine to medium grained ferrigenous sandstone. Towards the top this sandstone becomes hard and compact and contains a thin oyster bed indicating definitely the existence of a high energy environment in a near shore area. The Nimar Sandstone is 2 m thick and is overlain by greyish-pinkish white argillaceous Nodular limestone which is not more the 2 m thick in the present section. Surprisingly the Deola and Chirakhan Marl is not developed here. However, it can be traced in the form of a small localized lensoid body, measuring 30 cm x 6 cm within the overlying Coralline Limestone. Therefore the Nodular Limestone passess upward into buff coloured Coralline Limestone, full of bryozoans and shell fragments. This youngest unit of the Bagh bed exposed here is nearly half meter thick and is finally capped by the Deccan Traps.

Altogether 9 rock samples were collected from this section. Of these, four samples from the Nimar Sandstone have proved palaeontologically barren after laboratory processing.
TEXT FIG. 6: STRATIGRAPHIC SECTION OF BAGH BEDS AT MAN RIVER SECTION.
Baria Section

(Pl. 3, Fig. 2) (Text Fig. 7)

This section is situated about 1 Km North West of Baria village, along an all weather road, joining Avalda and Jhiran on the left bank of the Sukar Nala. Following Lithologic succession representing the Bagh Beds is seen here.

### Deccan Traps

<table>
<thead>
<tr>
<th>Formation</th>
<th>Description</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coralline Limestone</td>
<td>Creamish yellow hard and compact bryozan limestone</td>
<td>1 m</td>
</tr>
<tr>
<td>Deola and Chirakhan</td>
<td>Soft, friable highly fossiliferous pinkish marl, yielding echinoids and bivalves.</td>
<td>1 m</td>
</tr>
<tr>
<td>Marl</td>
<td>Greyish white limestone with poorly preserved fossils from the Upper portion.</td>
<td>4 m</td>
</tr>
<tr>
<td>Nodular Limestone</td>
<td>Greyish white limestone with poorly preserved fossils from the Upper portion.</td>
<td>4 m</td>
</tr>
<tr>
<td>Nimar Sandstone</td>
<td>Calcareous sandstone with shally intercalations, medium to coarse grained ferruginous sandstone with abundant trace fossils, coarse gritty conglomeratic sandstone at the base.</td>
<td>4.5 m</td>
</tr>
</tbody>
</table>

### Metamorphics

The sequence at Baria section starts with coarse gritty conglomeratic Nimar Sandstone resting unconformably over the metamorphics. It is an upward finning sequence with shaly intercalations. This horizon is 2 m in thickness and merges upwards into greyish white argillaceous limestone. The Nodular Limestone horizon, about 4 m in thickness, owes it peculiar nodular appearance due to extensive bioturbation. It has yielded some poorly preserved bivalves and ammonoids. The pinkish Deola-Chirakhan Marl overlie the Nodular Limestone. It is soft and friable in nature and contains a rich population of
TEXT FIG. 7: STRATIGRAPHIC SECTION OF BAGH BEDS AT BARIA
echinoids, bivalves and gastropods. This fossiliferous marly bed, 1.5 m in thickness, passes upward into the Coralline Limestone which is only 1 m thick at Baria Section.

Of the 14 rock samples collected from all the lithologies of this section, 4 samples from Nimar Sandstone has not yielded any microfossils. Remaining 10 samples have provided a rich assemblage of foraminifera and ostracoda.

Zeerabad Section

(Pl. 4, Fig. 1&2) (Text Fig. 8)

This section is exposed in a quarry face about 1 Km North of Zeerabad village along an all weathered road joining Avalda and Jhiran. This section is represented only by two lithounits of Bagh Beds namely Nodular Limestone and Coralline Limestone because of the overlapping nature of the sedimentary succession.

Deccan Traps

<table>
<thead>
<tr>
<th>Lithology</th>
<th>Description</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coralline Limestone</td>
<td>Hard compact, cross bedded bryozoan limestone</td>
<td>1.5 m</td>
</tr>
<tr>
<td>Nodular Limestone</td>
<td>Greyish white argillaceous limestone with trace fossils</td>
<td>4 m</td>
</tr>
</tbody>
</table>

Metamorphics.

The lowermost stratigraphic unit of Bagh Beds viz., Nimar Sandstone is not developed here. Therefore, the sequence starts here with 4 m thick greyish white Nodular Limestone resting unconformably over the Archeans/metamorphics. The characteristic fossiliferous Deola and Chirakhan Marly horizon is also completely missing here. The Nodular Limestone is, therefore, directly overlain by 1.5 m thick cross bedded, hard and compact Coralline Limestone. This entire sequence is finally capped by the Deccan lava flows. The Nodular Limestone of this section is being excavated here for a nearby cement plant at Karondian.
TEXT FIG. 8: STRATIGRAPHIC SECTION OF BAGH BEDS AT ZEERABAD.
Altogether 9 rock samples were collected from both the litho units of this section. All of them have proved micropalaeontologically productive.

The Lithological correlation of the various constituent horizons of the above mentioned measured sections of the Bagh Beds is depicted in Text Fig. 9.