CHAPTER 4

SEDIMENTARY STRUCTURES

4.1. FOSSIL ORIENTATION:

The buff coloured Echinoid bearing and steel grey coloured Nautilus bearing sandstone members of the Mahadek Formation house Gryphaea vesicularis and ostrea (Alectryonia) besides other. They show well developed orientation by their plane of symmetry and hence their directions are studied (Potter and Pettijohn 1963) from Dawki-Pamshutia Road where they are well preserved.

The fossils are entombed in the sandstone with concave side in upward direction (Pl.9, Fig.A). The fossils show average inclination in 15° with 212° azimuth (Table 7, Fig.4).

4.2. PEBBLES:

The conglomerate located at and near pynter is oligomitic as pebbles are mainly of quartzite (Pl.4, Fig.B).

The pebbles have average inclination of 10° with the 140° azimuth (Fig.5, Table 7)

The pebbles have arithmetic mean from 2.72 cms. to 7.52 cms., flatness ratio from 1.16 cms. to 2.43 cms., diameter from 2.49 cms. to 7.40 cms. sphericity from 0.55 to 0.92 and shape factor from 0.68 to 1.32. The conglomerate
has mean grain size in $\phi$ scale as 5.30 (pebbles), standard deviation ($\sigma$) as 4.79, i.e. very well sorted, kurtosis ($K_g$) as -1.05, i.e. flattened and skewness ($Sk_j$) as -0.14 i.e. Negatively skewed (Table 4, 5, 6, 7; Fig.6).

4.3. CROSS-BEDDING:

Cross-bedding has got restricted occurrence in the upper part of the arkosic sandstone member of the Mahadek Formation and observed only at two localities, namely on the eastern and western bank of the River Umngot at Dawki.

Generally, the cross-bedding in the present study is planer (Tabular) variety (McKee & Weir 1953, pp. 384-385 (Pl.9, Fig.B). The foreset of the cross bedding meets the upper (Topset with thickness .85 metre) and underlying (Bottomset with thickness 0.65 metre) sedimentation unit of the normal bedding (master stratification) forming Non-tangential cross-bedding. However, occasionally the bottom end of the foreset shows the tendency to curve and becomes tangential cross-bedding. The average dip of the current bed is $14^\circ$ with an azimuth of $210^\circ$ thickness is about 2 metres. (Table 7)

The cross-bedded units occur on the western side of the River in a vertical succession, separated by the sedimentation unit. The sets of the cross-bedded unit in such cases are "cosets" (McKee and Weir, 1953, pp.384-385)
or "grouped sets" (Allen 1963, pp. 93-114). The cosets have average inclination of 17° with an azimuth of 234° and thickness is 0.70 metre. Generally the cosets maintain the same style, and dip direction. But at places reverse "cosets" interfares, forming the herring bone structure (Pl. 9, Fig.C). The cross bedded unit in the eastern side of the river is however occur in a single sedimentation unit.

4.4. CONCRETIONS:

Concretions are roughly cylindrical bodies ranging in size from 1 cm. to 7 cms. in diameter and from 6 cms. to 12 cms. in length. In general the longest axis of the concretions are oblique to the bedding plane.

4.5. GRADED BEDDING:

Graded beddings are observed at a place near the Hanging Bridge and Nongtalang. Lithostratigraphically, the former occurrence is in the lower unit characterised by arkosic sandstone, where as the later one is the upper unit, marked by fine to medium grained hard sandstone. In both the areas, the coarse grained sandstone grades upward to fine grained sandstone. There is repetition in gradation (Pl. 6, Fig. E).
4.6. SUMMARY:

The concave side of the bi-valves rests in upward direction with respect to the bedding plane. They show low angle of dip towards S.S.W. direction. The conglomeratic pebbles are mainly of quartzite and also show low angle of dip with S.S.E. direction. The cross-bedding, though few and localised, gives palaeoslope of 14° towards S.S.W. The sandstone also houses concretions, lying oblique to the bedding plane. Another noteworthy sedimentary structure is graded bedding.