

## A B S T R A C T

The Precambrian pelitic, psammitic, calcareous and occasionally manganiferous metasediments in the western part of the Gangpur Group show unequivocal evidences of superposed folding. Three generations of folds differing from each other in tectonic style and orientation are present. The earliest fold in bedding ( $S_1$ ) is isoclinal reclined with easterly plunge. They are characterised by the presence of axial plane schistosity ( $S_2$ ) parallel to their axial planes.  $S_2$  is the predominant planar structure over a large part of the area. The second set of folds are upright with subvertical axial planes striking E-W. They fold coaxially the limbs and axial planes of the early isoclinal folds ( $F_1$ ). Where the early folds have been blurred,  $F_2$  folds warp the axial plane schistosity.  $F_1$  and  $F_2$  folds are strictly coaxial when  $F_1$  is larger or when they are of comparable dimensions. But when  $F_2$  is much larger in dimension than  $F_1$ ,  $F_1$  folds are rotated and reoriented along the limbs of  $F_2$  folds. Still later, a third generation of gentle to open upright folds ( $F_3$ ) with NS-trending axial planes have been overprinted on  $F_1$  and  $F_2$  folds and this superposition results in (a) zones of culminations and depressions of the axes of the early isoclinal folds already cofolded during  $F_2$  deformation, (b) outcrop patterns characteristic of doubly plunging folds, and (c) remarkable pairing of girdles of poles of bedding (and axial plane schistosity) around a NS-trending vertical plane of symmetry.

The major and intermediate axes of deformed pebbles of Raghunathpalli conglomerate in the southern limb of the Gangpur Fold

invariably lie on the axial plane schistosity. The analysis of shape and strain of the pebbles suggests a flattening strain normal to  $S_2$  on originally constricted pebbles. The shape of the pebbles has been affected by the earliest folding episode only.

The Raghunathpalli conglomerate lacks totally any evidence of thrusting or cataclasis. The rocks to its north and south do not show any discordance. On the other hand they show the same plan of superposed deformations. The conglomerate does not represent any pronounced unconformity and the rocks of its south also belong to the Gangpur Group. Furthermore, useful cross beds prove that these rocks to the south of the conglomerate are the oldest in a continuous sequence with northerly younging towards the core of the Gangpur Fold.

Three successive fold movements have shaped the present outcrop pattern of the entire Gangpur Group which is characterised by prominent axial plane folding on a large scale. The major closure towards the east is caused by  $F_2$  movement, but in the deeper tectonic level the reclined fold is retained. There is a large scale inversion because of the special fold geometry, as evidenced from the major easterly antiformal closure in a large scale fold with the youngest rocks at the core. The large scale axial plane folding causes the repetitions of the two limestone - dolomite horizons and the single carbonaceous quartz phyllite and banded quartzite horizon. Unfoliated granites that intruded in the western part of the area probably along the third episode of folding disrupt the regional fold geometry.