PLATE I

Intraformational conglomerate showing flat unsorted phenoclasts of calcilutite set in lime mud. Note the rough imbricate arrangement of the phenoclast suggesting shingle structure.

Fig. a

Photomicrograph of Akoda Mahadev Sandstone showing rounded to subrounded quartz clast with embayed and sutured contact. Note intragranular strain within the quartz clast manifested as strain shadows (dark photo tone, discrete fractures).

Cross Nicol. Mag (12.5).

Fig. b

Govindgarh Sandstone showing subrounded clast of quartz with floating and point contacts. Note the development of the secondary cement between the quartz clast which at places has modified the grain outline due to internal solution.

Cross Nicol. Mag (12.5).

Fig. c
PLATE II

Photomicrograph of Govindgarh Sandstone showing clastogenic biotite flake. Note alteration of biotite and release of iron oxide which occur as discrete grains within the biotite flakes (dark phototone).

Fig. a

Cross Nicol. Mag. (12.5).

Photomicrograph of Samria Shale showing development of incipient foliation nearly at right angle to bedding. The bedding is defined by alternation of lighter and darker phototones. The incipient foliation is defined by preferred elongation of sericite oriented in NE-SW direction in the photograph.

Fig. b

Cross Nicol. Mag. (12.5).

Photomicrograph of Lakheri Limestone showing calcite of two generations. Primary calcite occurs as fine grained mosaic showing sutured contacts. The secondary calcite occurs as large idioblastic prophyroblasts with inclusions of primary calcite within the prophyroblastic boundaries. The boundaries of porphorblast are defined by dark phototone. Stringers and veinlets of secondary calcite are occasionally developed (lighter phototone) within the porphorblast.

Fig. c

Cross Nicol. Mag. (12.5).
The development of laminated bedding in Suket Shale defined by
tonal variation in the superface of the photograph. Note unequal
thickness of the laminations.

**Fig. a**
Pencil for scale = 14 cm.
Location: Bassi Dispensary.

Trough type cross bedding in Akoda Mahadev Sandstone. Showing
b-c section. Note the truncation of cross bed laminae towards
super face and asymptotic geometry of the foreset laminae towards
the subface of the trough.

**Fig. b**
Lens cover for scale = 5 cm
Location: Rajgarh.

Asymmetric ripple marks in the fine grained arenite beds occurring
as intercalations within the Gannurgarh Shale. Note the development
of the ripples in the Southeastern part of the photograph. The
crests (lighter phototone) are separated by troughs (dark phototone).
The crest show linear to curvilinear crestal orientations and asymmetry
of the profile suggesting variations in the wave dynamics.

**Fig. c**
Pencil for scale = 14 cm.
Location: Nal village
Akoda Mahadev Sandstone showing development of striation cast defined by linear photo fabric parallel to the pencil. Locally the Rain prints are developed as bedding plain inhomogenities imparting pitted appearance to the super face. The rain prints are younger in depositional chronology to striation marks on the sandstone bed.

Fig. a

Pencil for scale = 14 cm.
Location: Nal village.

Flute cast in the sandstone bed occurring as interclations within the Gannurgarh Shale. Note the enechlon pattern of the flute casts and the flaring out of the flute towards the down current end. Striation cast and Pod cast (parallel to the pencil) are developed on the subface of the sandstone at an angle to the flute roller.

Fig. b

Pencil for scale = 14 cm.
Location: Rajgarh.

Folding of Rewa Shale near Great Boundary Fault along proposed Parsoli Railway Station. Note the parallelism of axial plane foliation in the shales with the Great Boundary Fault, suggesting compressive stress field.

Fig. c

Location: Parsoli Railway Station
The folding of the Suket Shale is followed by the development of high angle reverse fault exhibiting strain corresponding to compressive stress regime in the peribasinal area. Note micro displacement and horizontal translation of the hanging wall block towards the East of the photograph corresponding to the centrifugal stress field model.

Pencil for scale = 14 cm.
Location: Bassi Dispensary.

Slip-lineation along the bedding plane in Suket Shale. The slip lineations suggest horizontal translation of beds towards the peripheral zone.

Pencil for scale = 14 cm.
Location: Bassi Dispensary.

Development of slip lineations across the hinge of the mesoscopic syncline in Suket Shale. Note the pervasive nature of the linear phototone across the hinge zone of the flexurally deformed sediments. The linear fabric suggest horizontal transport subsequent to folding.

Pencil for scale = 14 cm.
Location: Bassi Dispensary.
PLATE VI

The thrusted contact of the Akoda Mahadev Sandstone of Kaimur Group (Breciated zone above the hammer) and the Berach Granite (2500 M.a.) occurring as eroded basement (homogenious phototone) below the hammer. Note crushing and breciation of the Akoda Mahadev Sandstone and the absence of regolith cover over the Berach Granite.

Location: Dekri Khera

Fig. a

Disharmonic folding of the Akoda Mahadev Sandstone resulting in the development of layer parallel shear and Decollement. The lack of incompetent material has resulted in the development of curved openings (Dark phototone) between the sandstone layers examplifying the decollement tectonics.

Location: Dekri Khera

Fig. b
The photograph showing the machine with model on the top and the weighing assembly at bottom, designed to generate centrifugal stress field. The machine comprise the following component:

a. Tripod  
b. Circular ring  
c. Supporting rods  
d. Experimental Platform  
e. Pullies  
f. Threaded bolts  
g. Top glass plate  
h. Rubber Sheet  
i. Strings.  
j. Weighing Assembly  
k. Plastic Model.
PLATE VIII

Experiment I
(Model of Fault Bounded Basin)

**Step-I**
Fresh Putty layer in a Rectangular rigid margin. Note the presence of initial wrinkles in the layer representing basement inhomogeneities in the model.

**Step-II**
Note the development of two sets of tensile fracture in the central part of the model and perimarginal folding.

**Step-III**
The model was subjected to centrifugal stress field. Note the opening of tensile fractures in the central part and increase in wavelength and amplitude of the marginal fold.
**Step I U**

Note the continued opening of tensile fractures in the central part and progression of fold wavelength towards basin suggesting transgression of compressive field into tensile regime due to accumulation of stresses along rigid margin under centrifugally directed stress field.

**Step V**

The finite model deformation under centrifugal stress field leading to transgression of compressive field into tensile regime. Note the development of folds in the perimarginal part of the model and occurrence of early formed tensile fractures as open elements within the fold limb (Bottom right corner of the Photograph).
PLATE X

Experiment II
(Model Corresponding to Sagging Basin Geometry)

Step-I
Model with circular rigid margin corresponding to sagging basin.

Fig. a Note the presence of initial wrinkles in the layer representing the basement inhomogeneities which may selectively facilitate nucleations of fold.

Step-II
Note the development of two sets of tensile fractures in the central part of the model and initiation of peribasinal folding at the margin of the model in a compressive stress field.

Step-III
Deformation of model under centrifugal stress field. Note the development of radial fractures and the accentuation of amplitude and progressive decrease in the wavelength of the marginal fold. The fold increased along the strike of limbs due to accumulation of stress. Progressive model deformation led to stress accumulation along the margins. Note the fracturing along the hinge of the fold under compressive regime and extension of radial fractures towards the basin margin suggesting tensile stress in the axial zone of the basin.
**PLATE XI**

*Step-IV*

Progressive deformation led to thrusting of inner limb over the outer limb (Bottom of the model). The inset block represents omission of the outer limb by over thrusting of the inner limbs along axial fracture in the model corresponding to the present geometry along Great Boundary Fault in Dekri Khera sector.

*Fig. a*

*Step-V*

The model showing the strain geometry caused by release of stresses. Note the development of secondary faulting leading dislocation of the fractures within the model. Inset Z & W show strike slip faulting of pre existing fractures by readjustment of stresses within the basin.

*Fig. b*

Enlargement of Fig. (b). Note the development of strike slip faulting resulting in development of left lateral slip along the pre existing fractures.

*Fig. c*
Development of tensile fracturing in the central part of the model and peribasinal folding with axial fracturing (SE part of the model). The model represents deformation under centrifugal stress field generated by a total weight of 11.15 kg.

The model as shown in Fig. (a) deformed in secondary stress field into dome and basin, formed due to constructive strain generated by release of stress brought about by removal of centrifugal pull in the model. This stage corresponds to the naturally occurring strain in the Ramgarh Dome area in the Kota district of Rajasthan.
Folding of Akoda Mahadev Sandstone. Note the development of reverse fault in the tightly folded limbs. Blue and Yellow pencil defines the location of fold hinges. Note the development a synclinal axis below the Blue pencil and an anticlinal closure above the blue pencil. The fracture marked F-F represent the thrust fault.

Pencil for scale = 14 cm.
Location: Barundni Dam.

The folding of Akoda Mahadev Sandstone in the margin of the Vindhyan Basin. Note steepening of the beds to near vertical disposition (bottom right end of photograph) and thrust faulting of the overturned limb. Pencil marks the position of thrusted block. Hammer defines the steeping of the folded limb.

Pencil for scale = 14 cm.
Location: Barundni Dam.