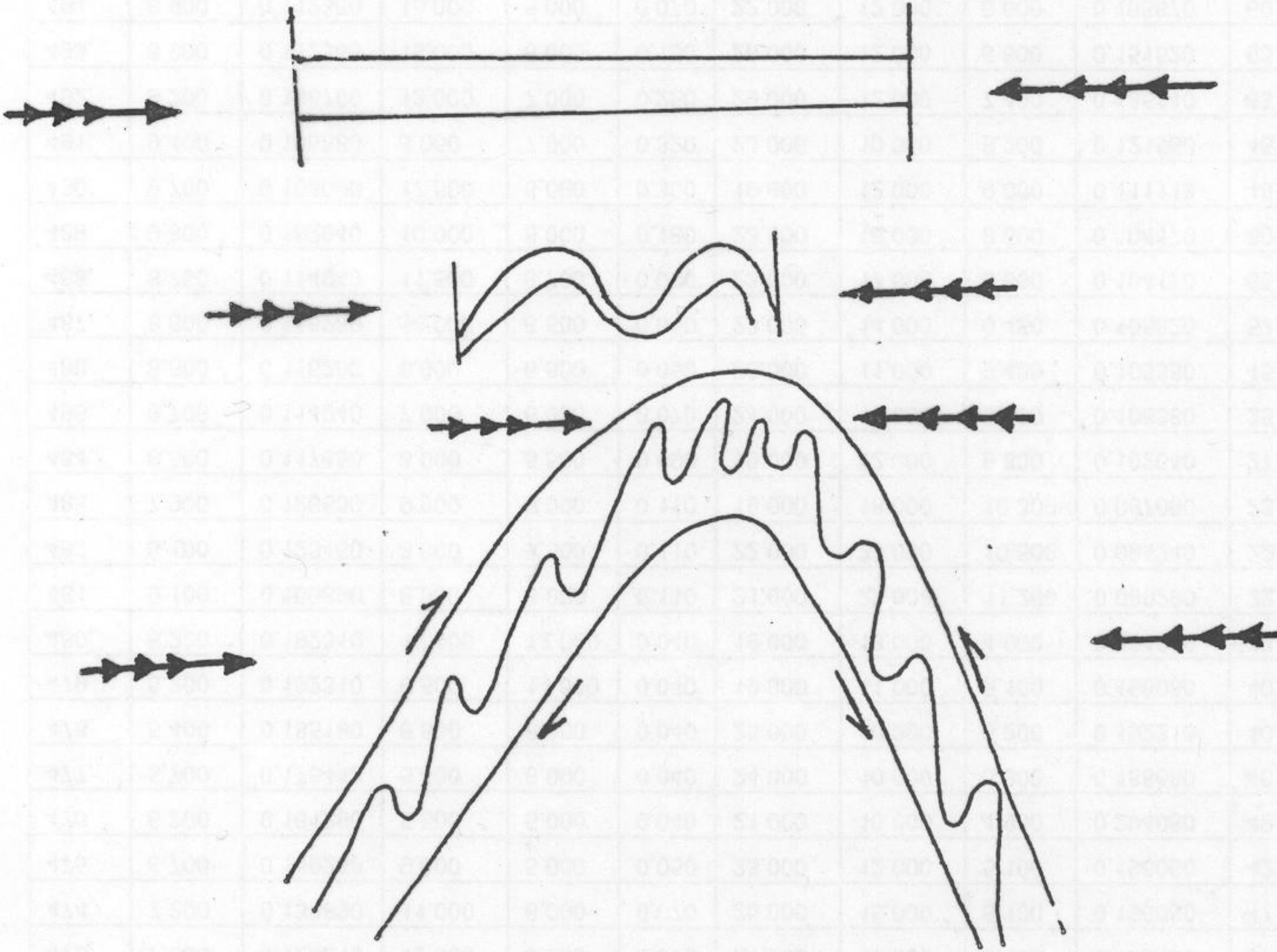
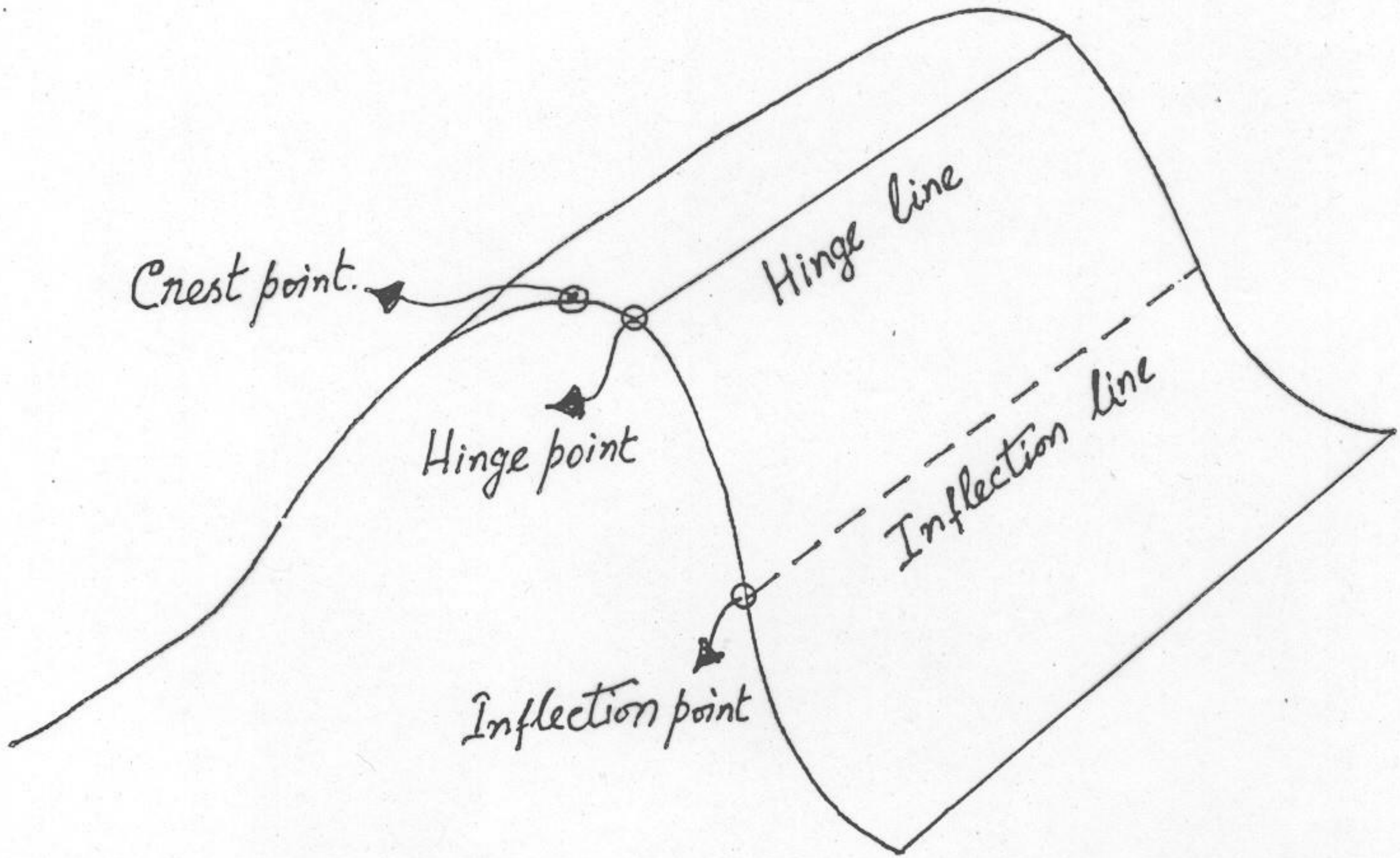
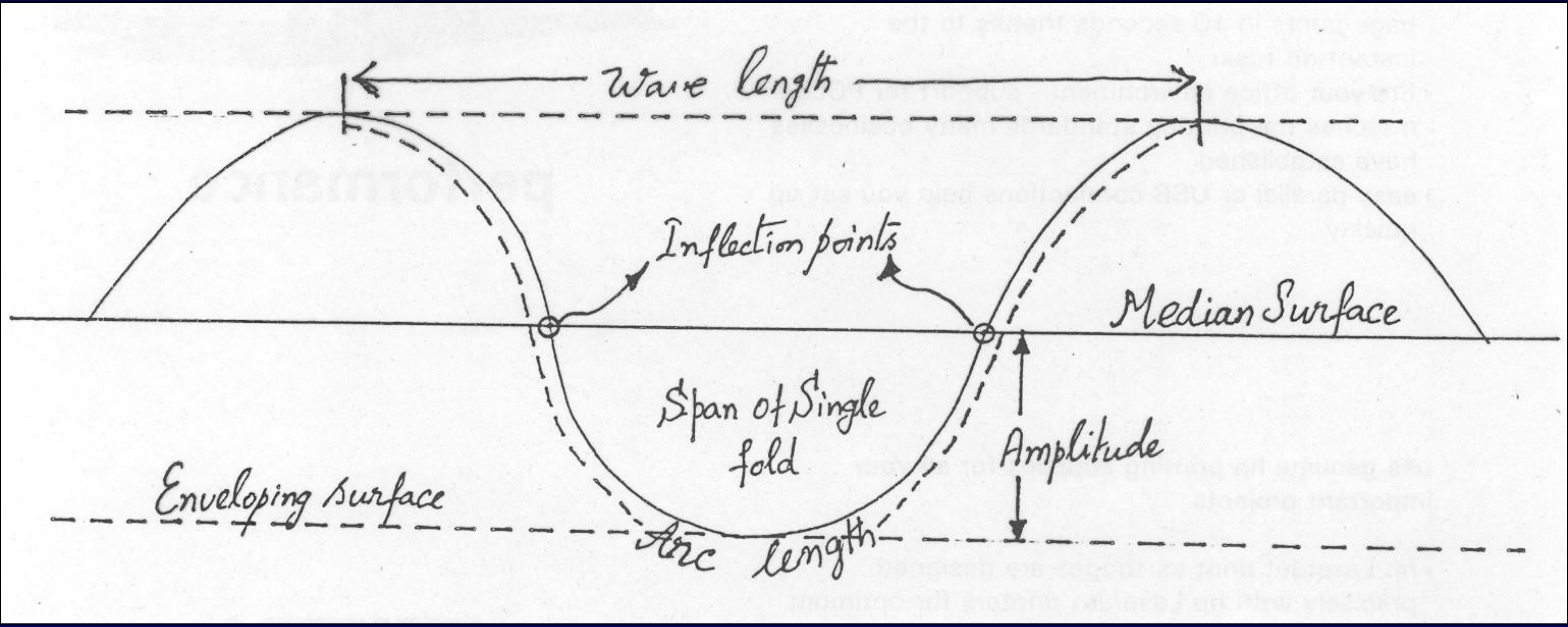
FOLDS



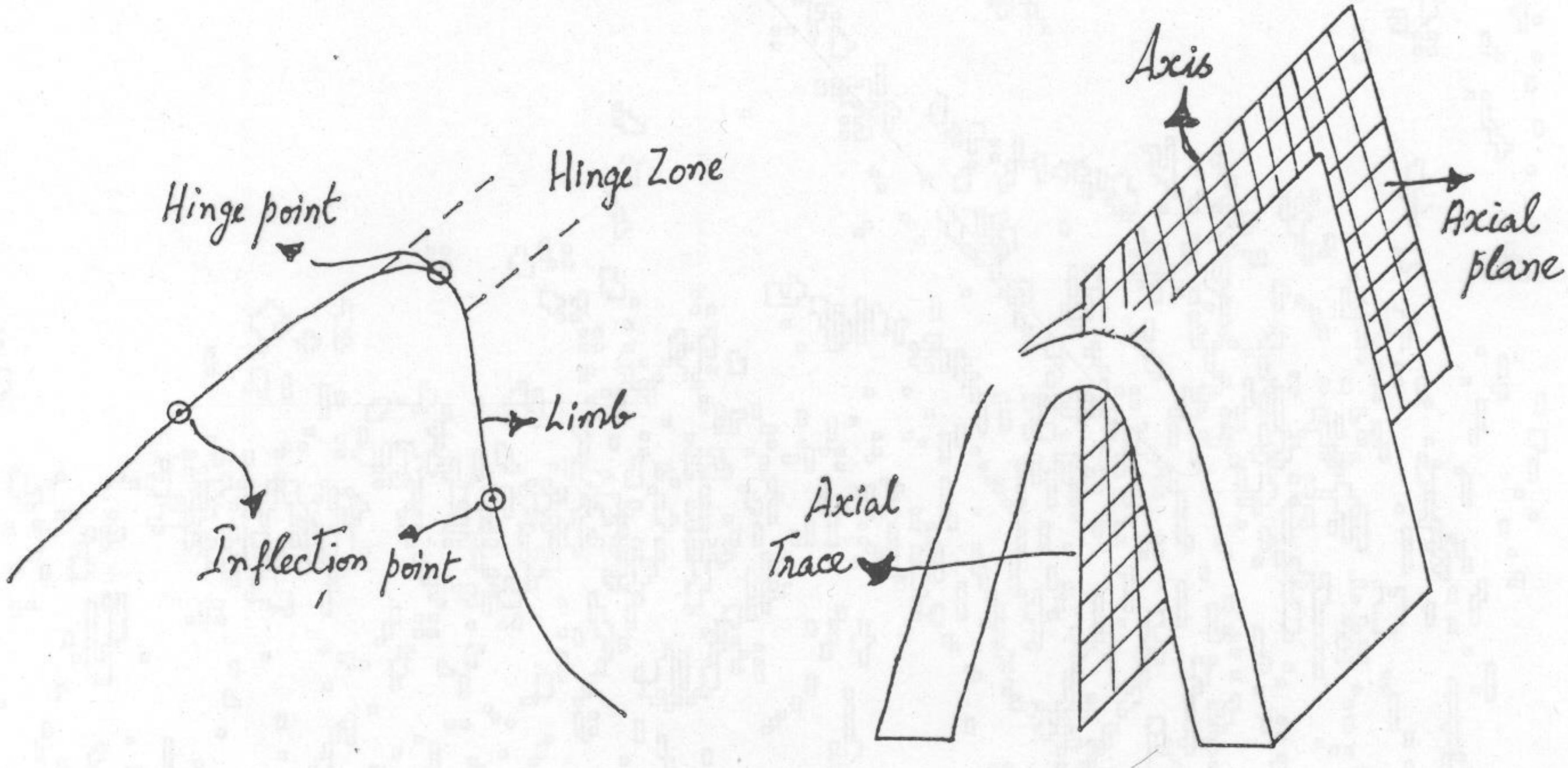
PARTS OF FOLDS



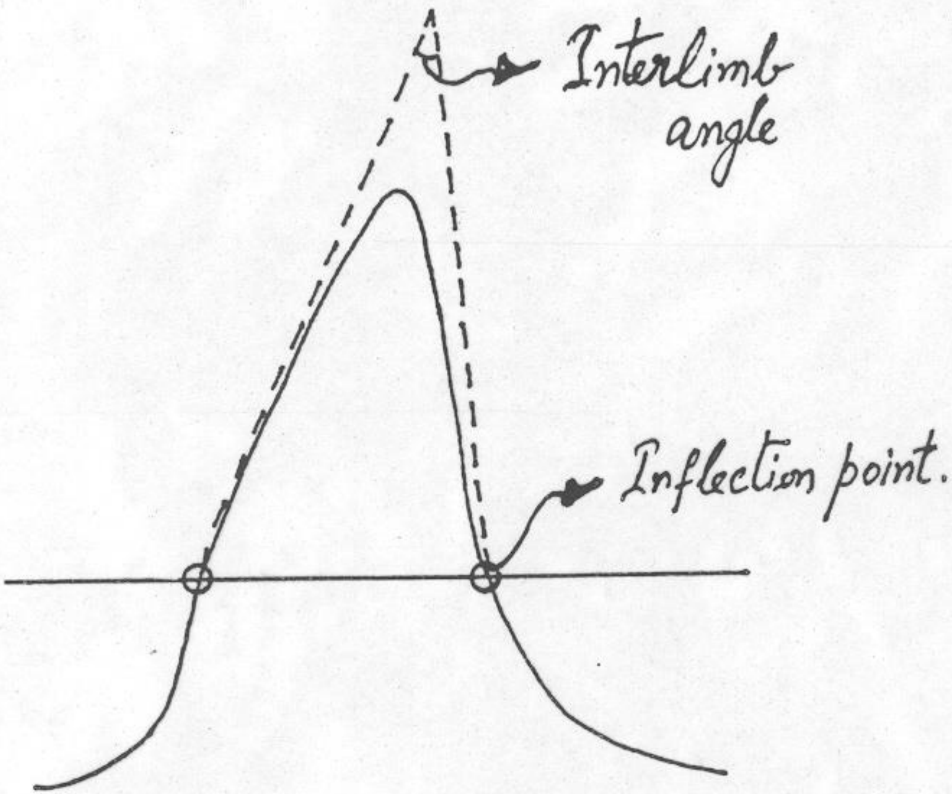
PARTS OF FOLDS



PARTS OF FOLDS

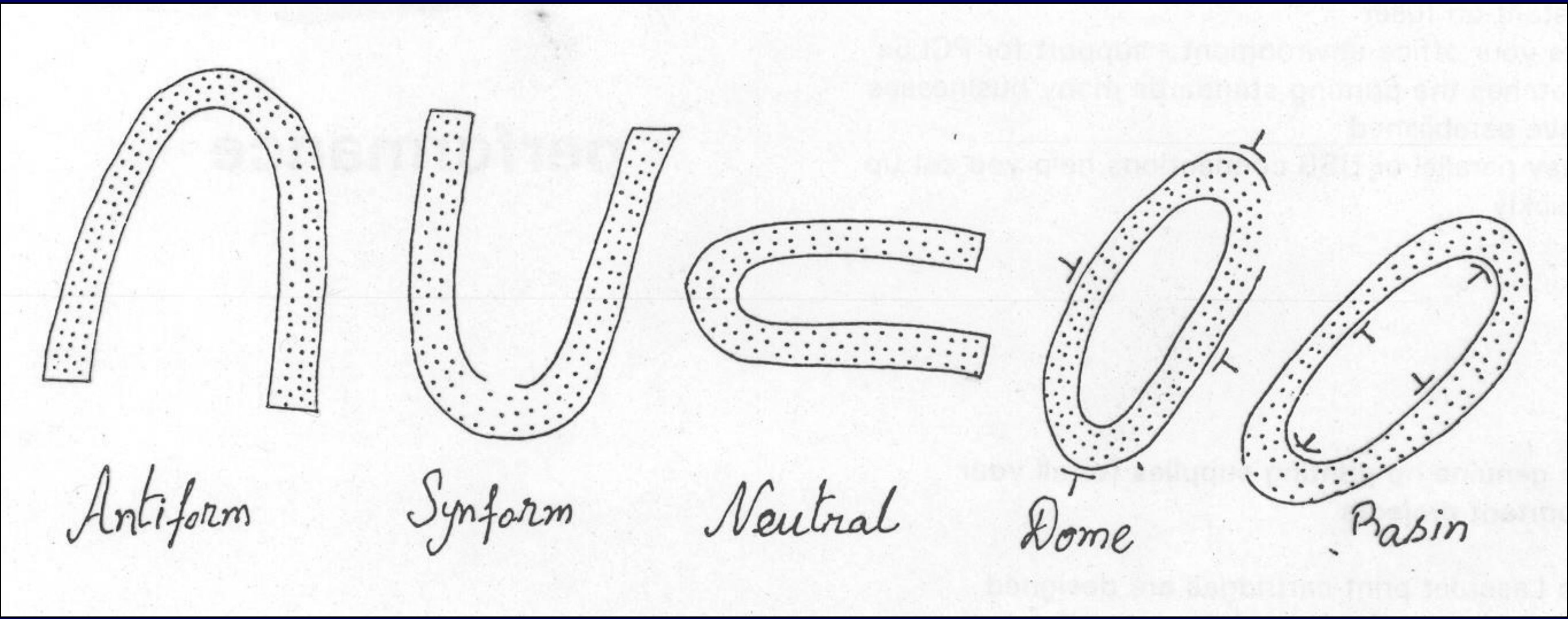


PARTS OF FOLDS



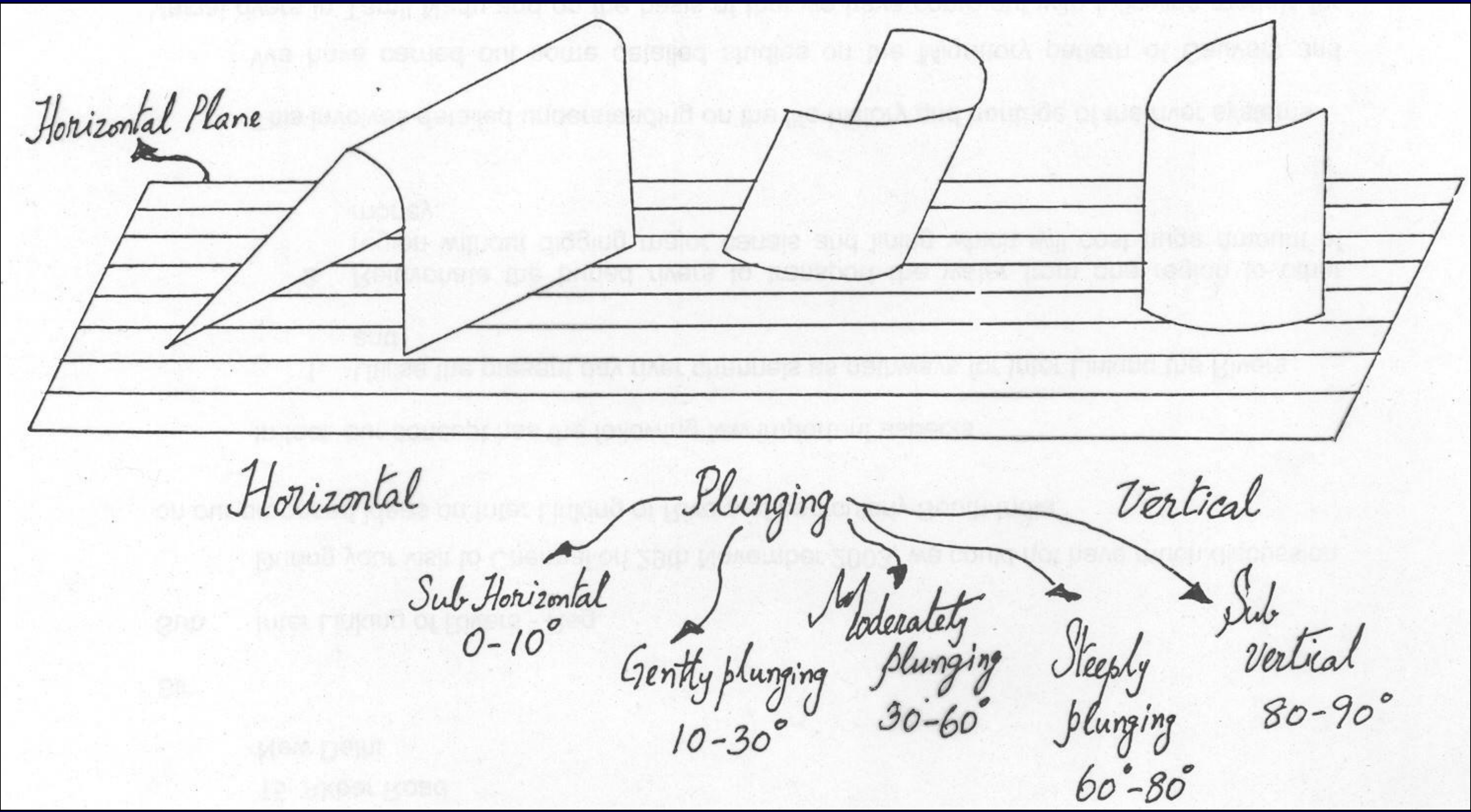
Types of folds

On the basis of sense of curvature



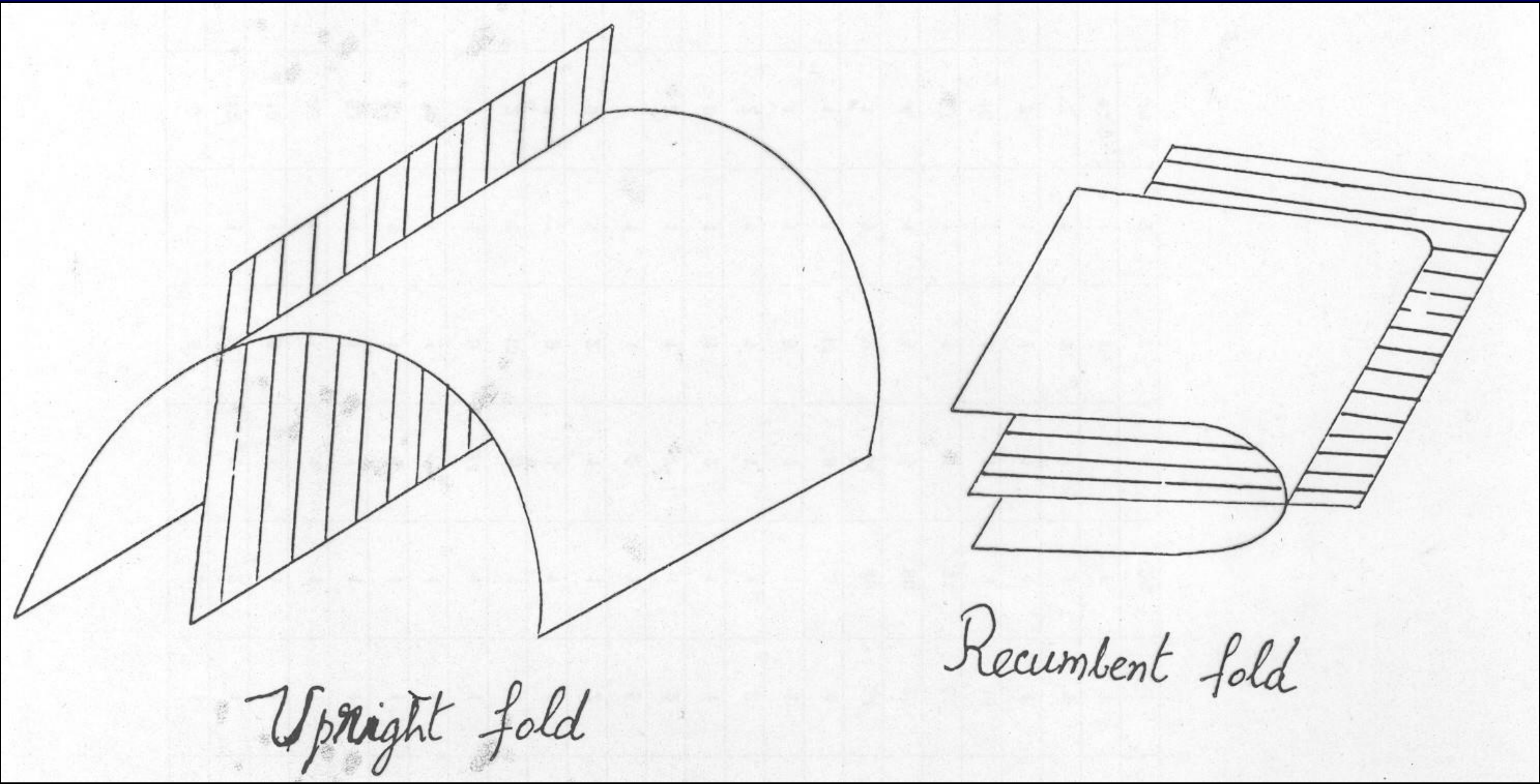
Types of folds

On the basis of Plunge of fold



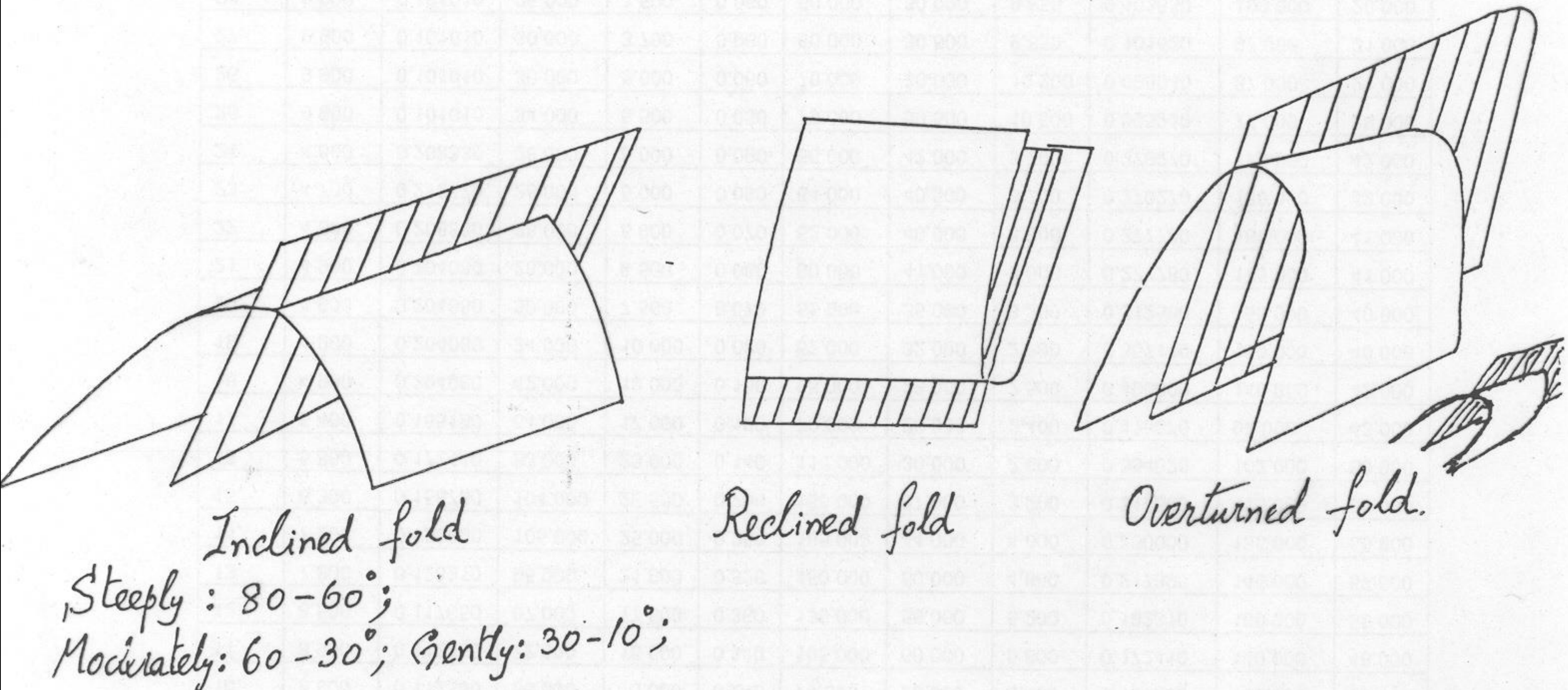
Types of folds

On the basis of Orientation of Axial Plane



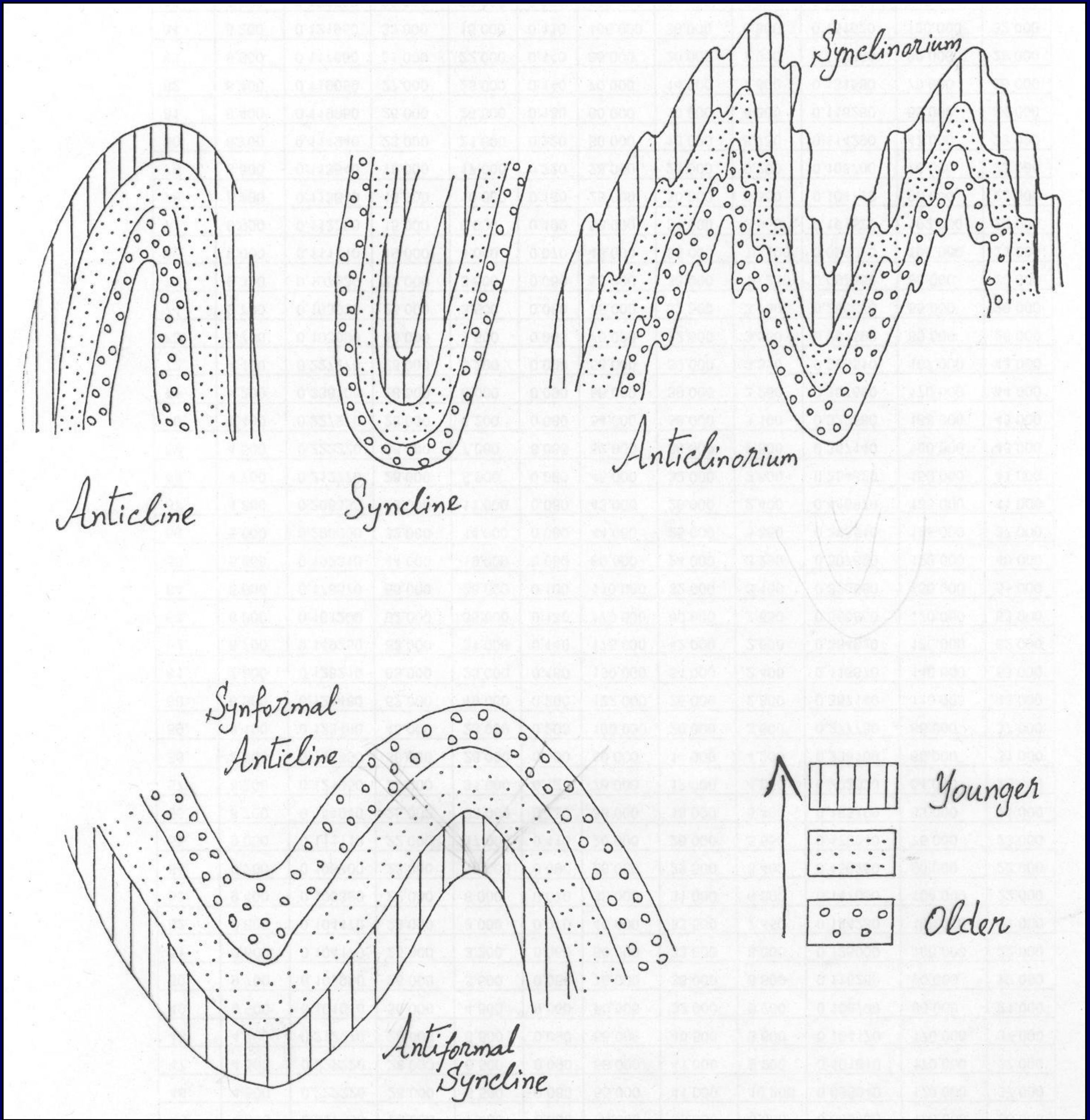
Types of folds

On the basis of Orientation of Axial Plane



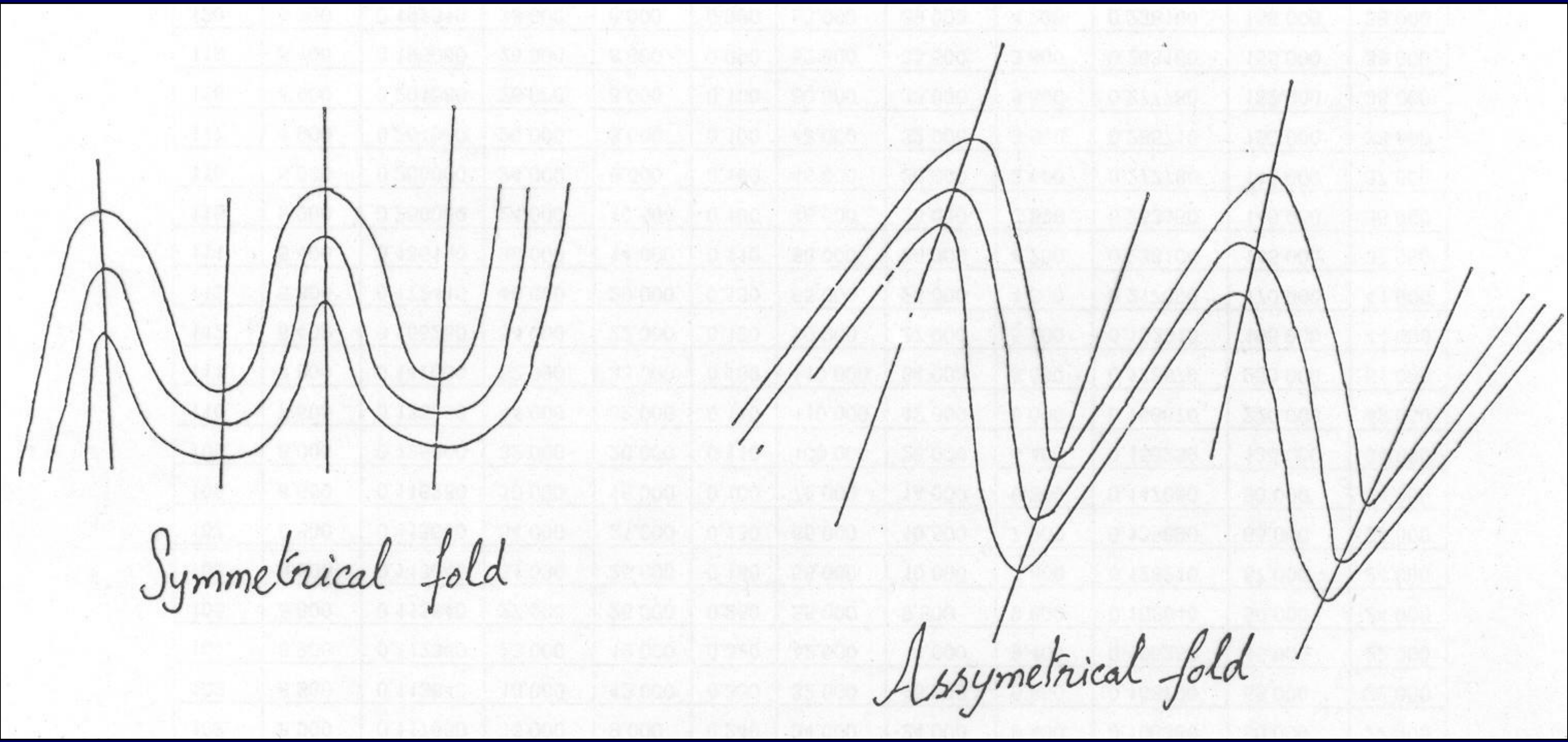
Types of folds

On the basis of Youngling direction



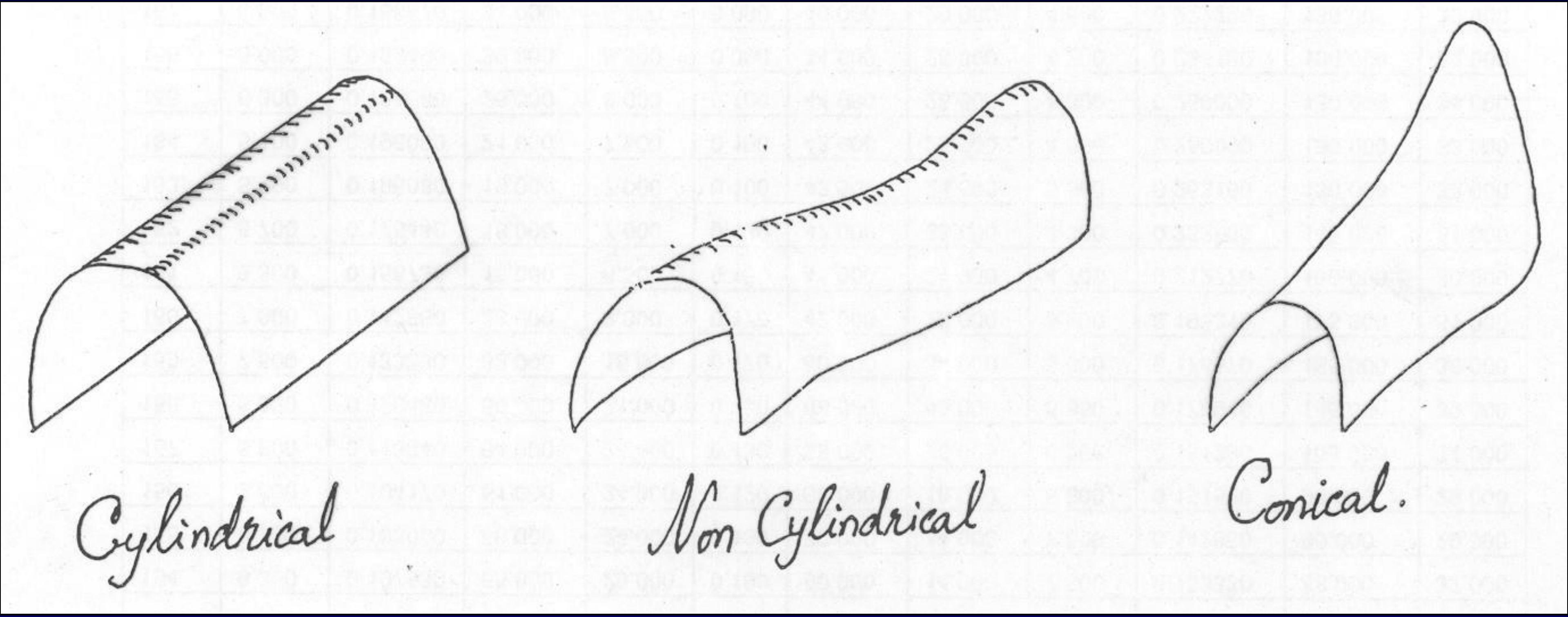
Types of folds

On the basis of symmetry of fold



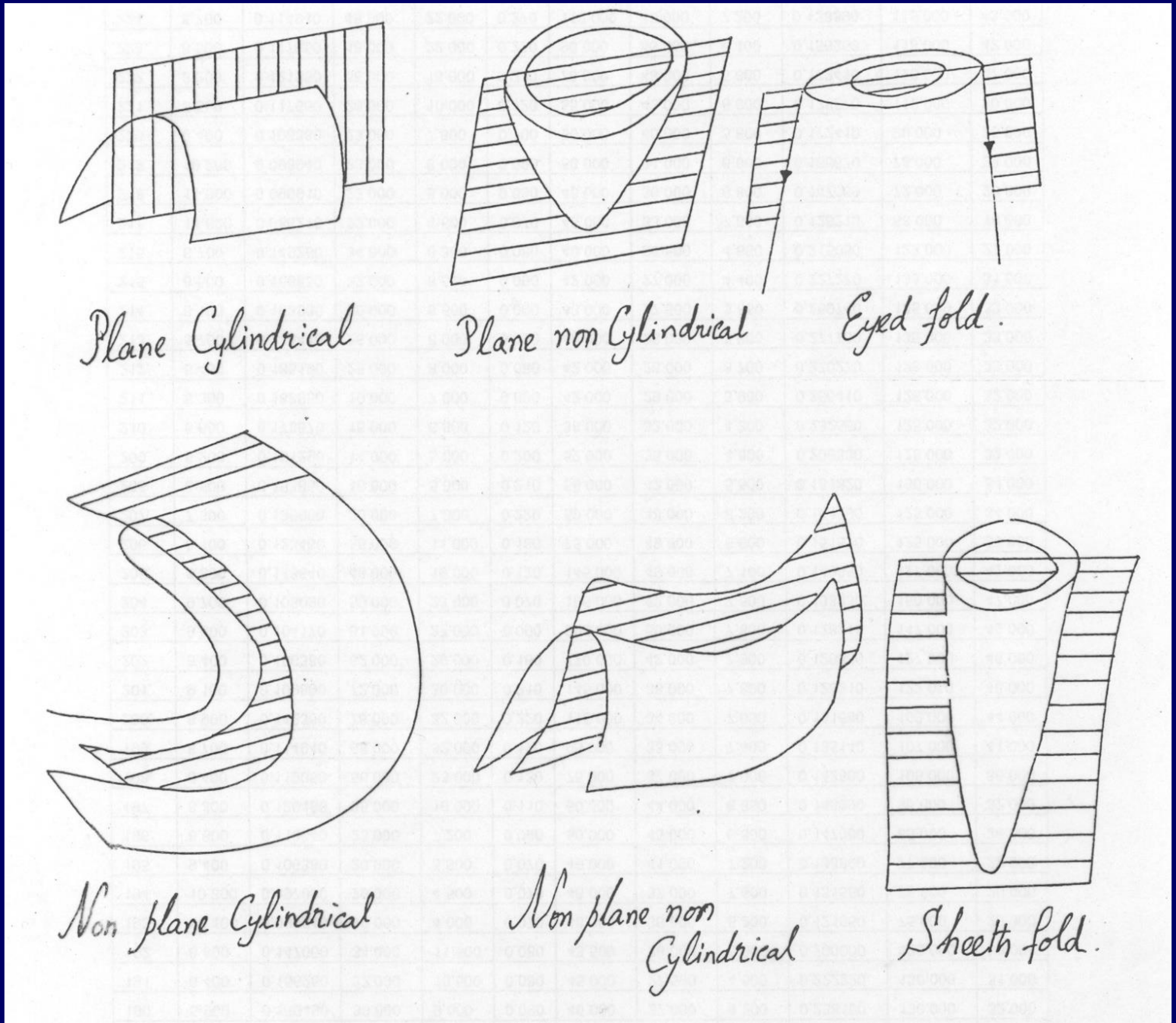
Types of folds

On the basis of nature of hinge line



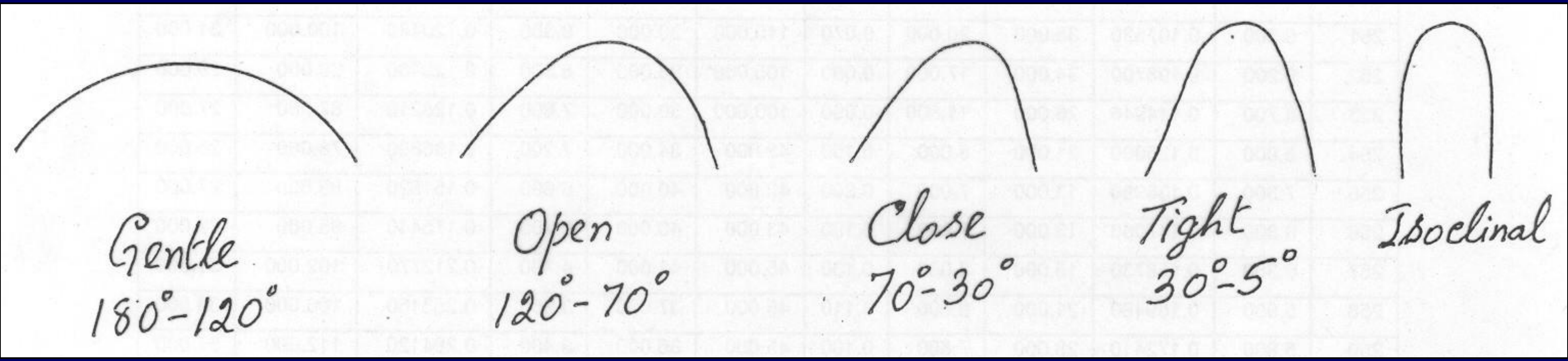
Classification of folds

On the basis of nature of plane and hinge



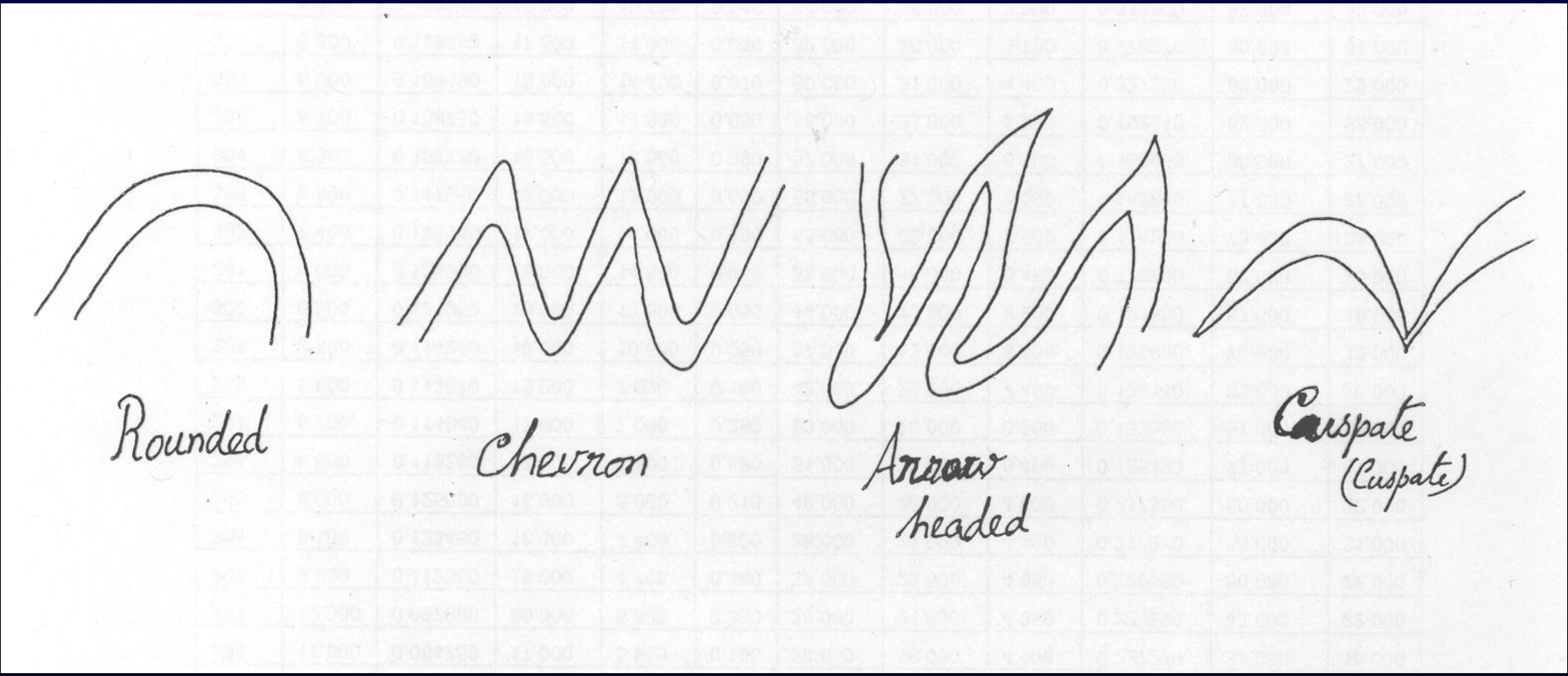
Classification of folds

On the basis of Inter-limb angle



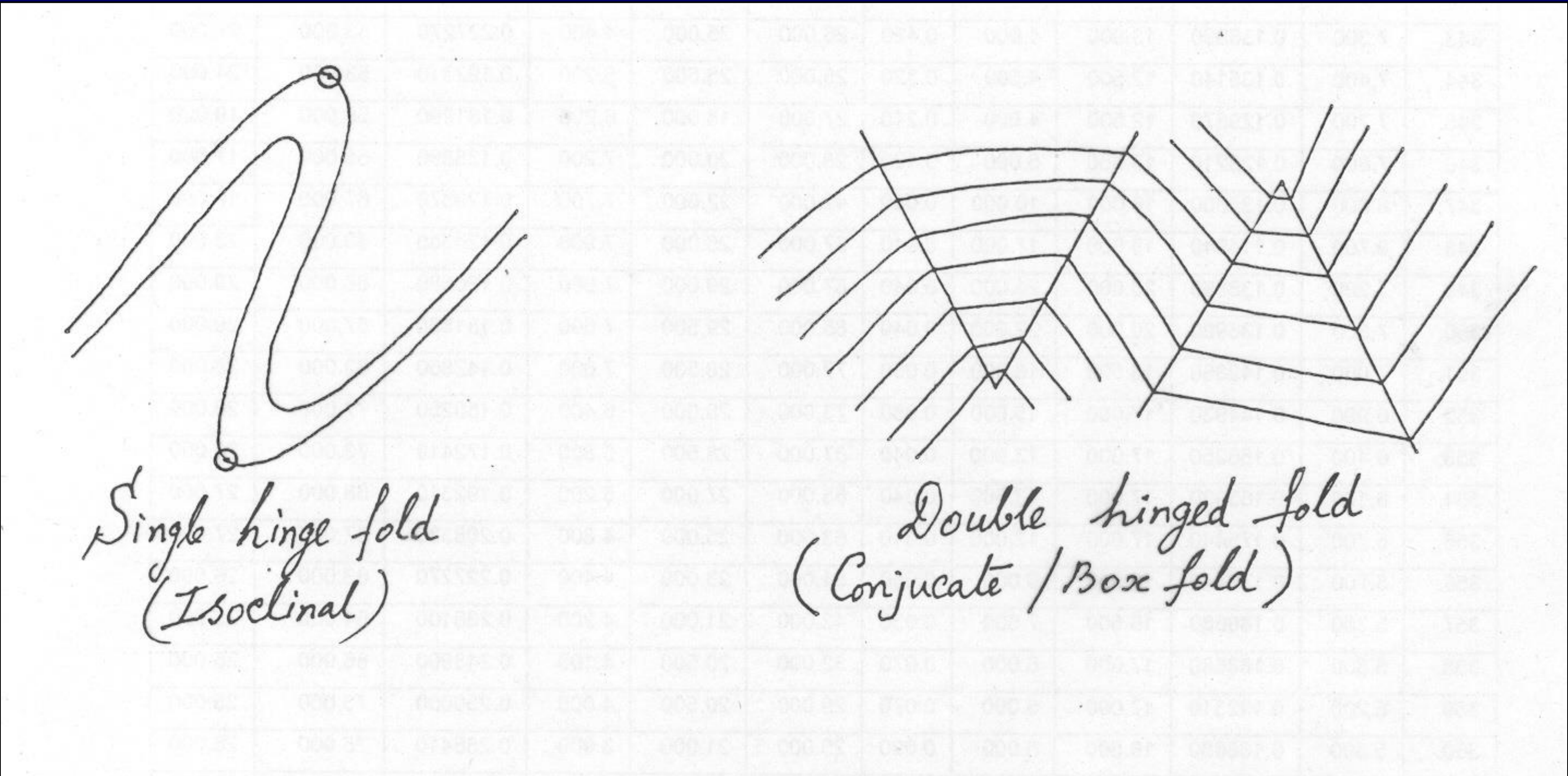
Classification of folds

On the basis of shape of hinge



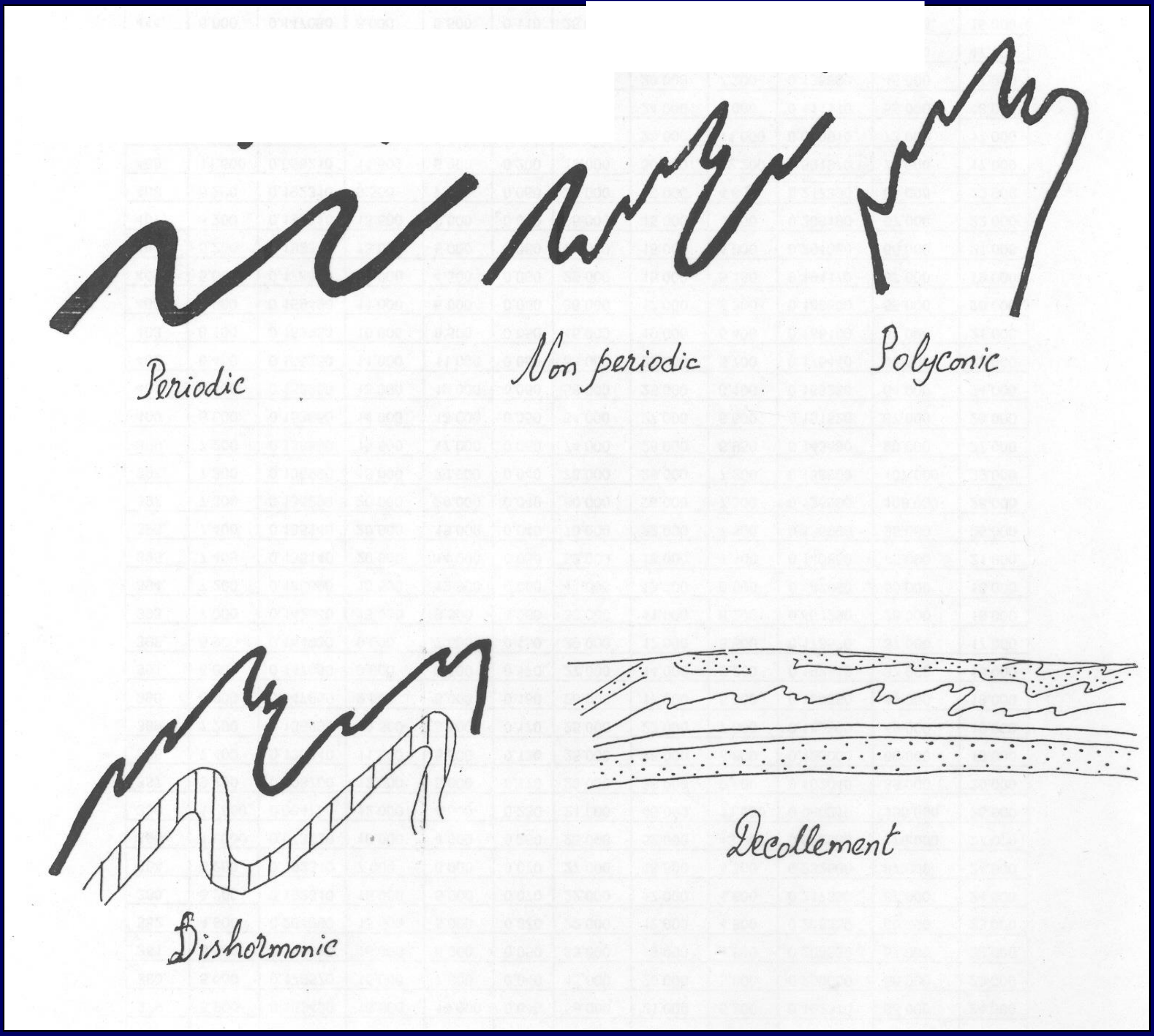
Classification of folds

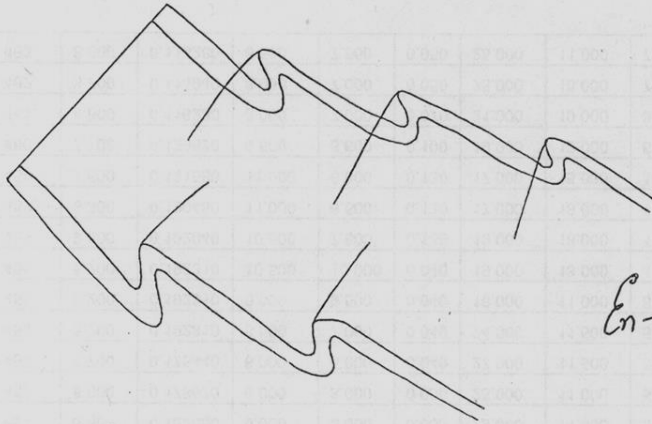
On the basis of number of number of hinges



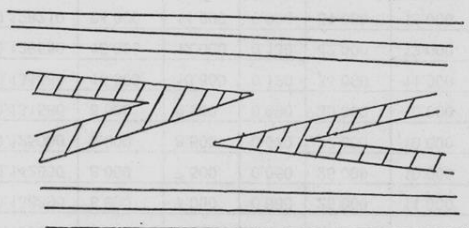
Classification of folds

On the basis of geometrical relation among the neighboring structures

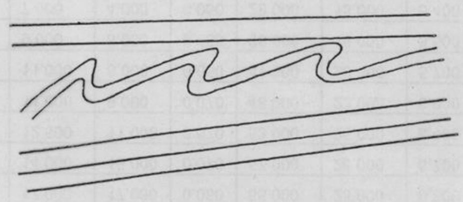




En-echelon fold

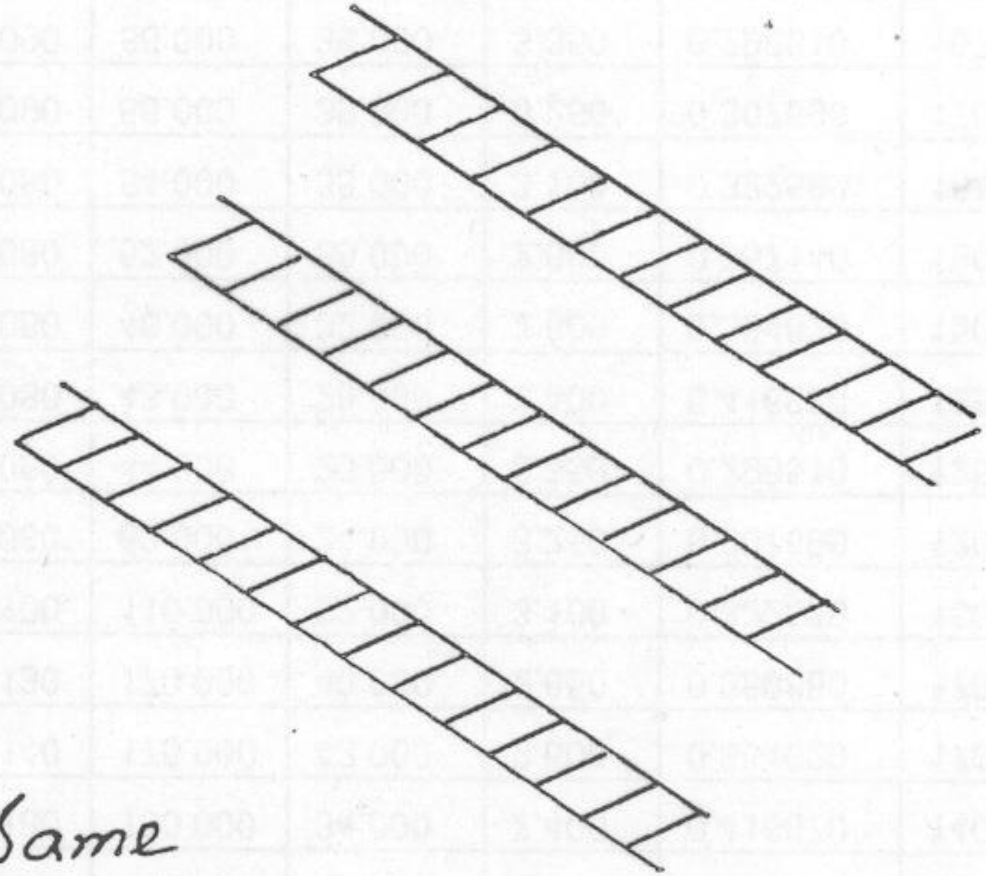


Intra folial fold



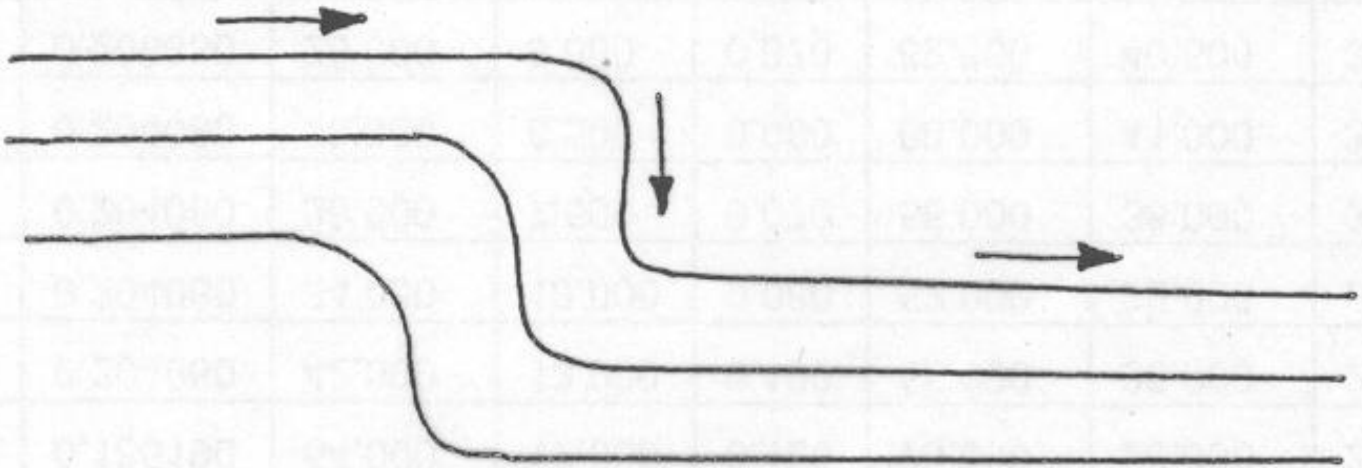
Drag fold

Homoclinal fold

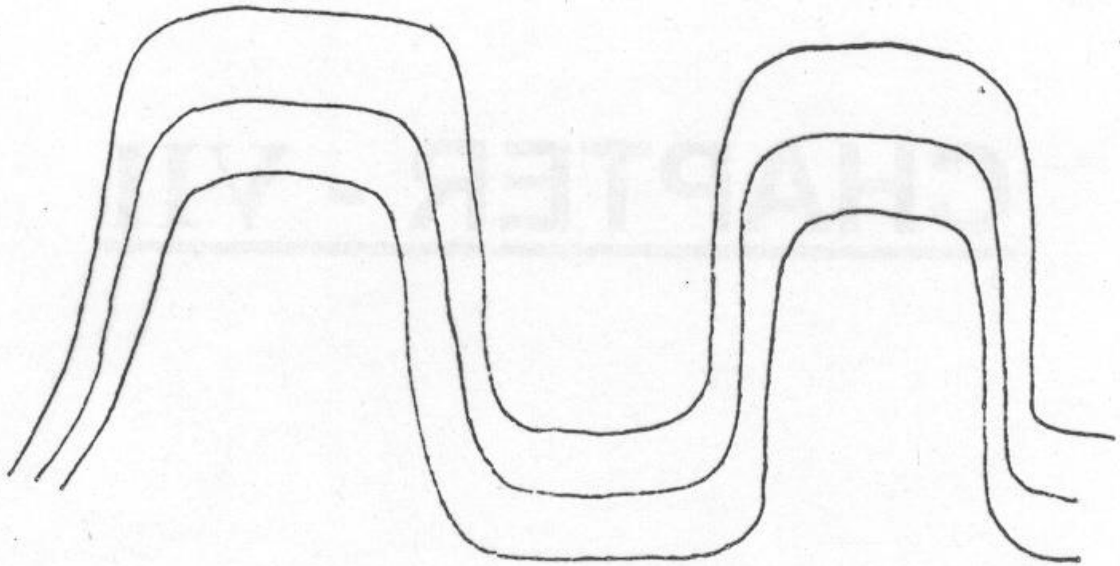


Strata Dipping in Same
Direction with Uniform angle.

Monoclinal fold

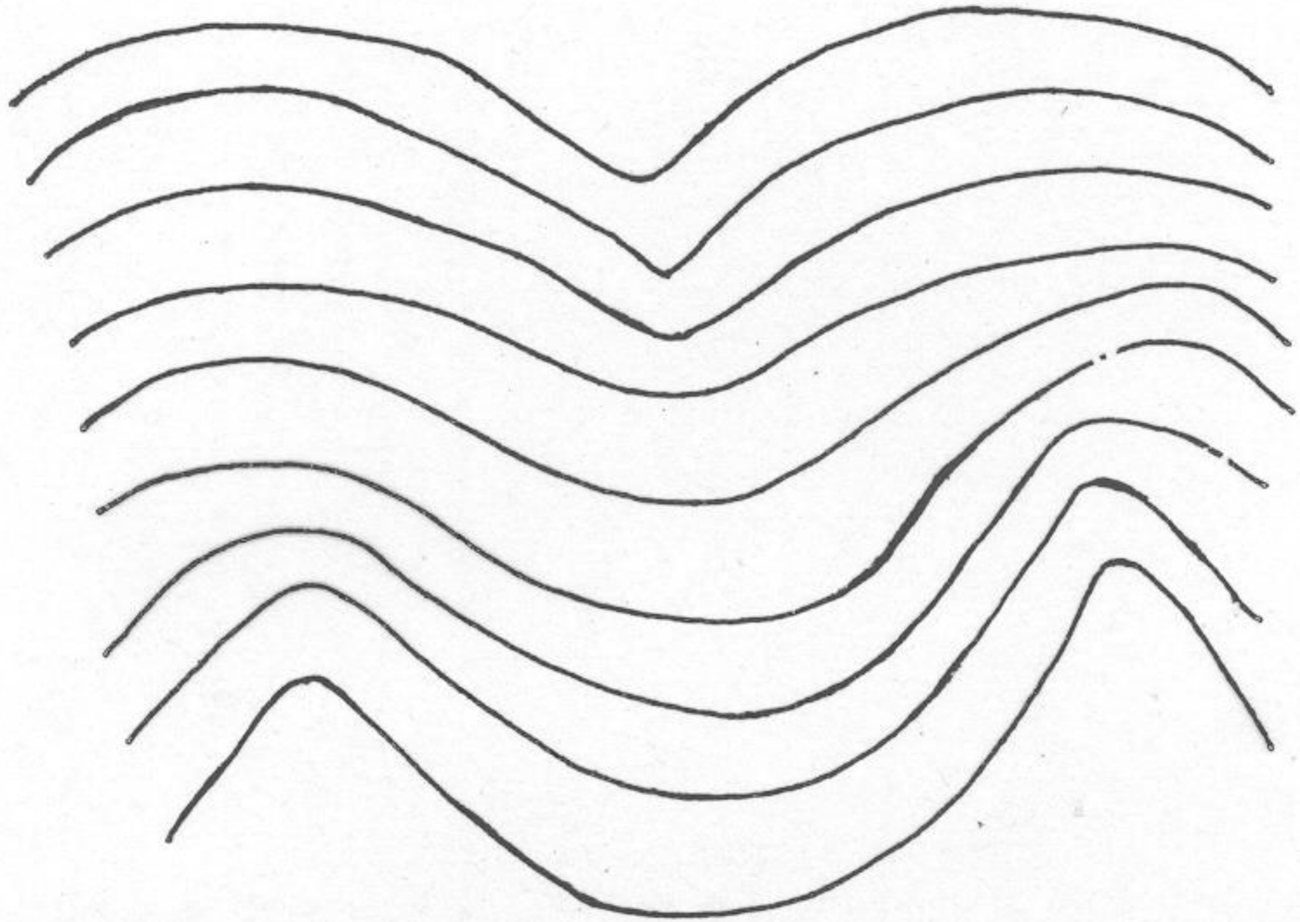


A strata abruptly show steep inclination.



Similar fold:

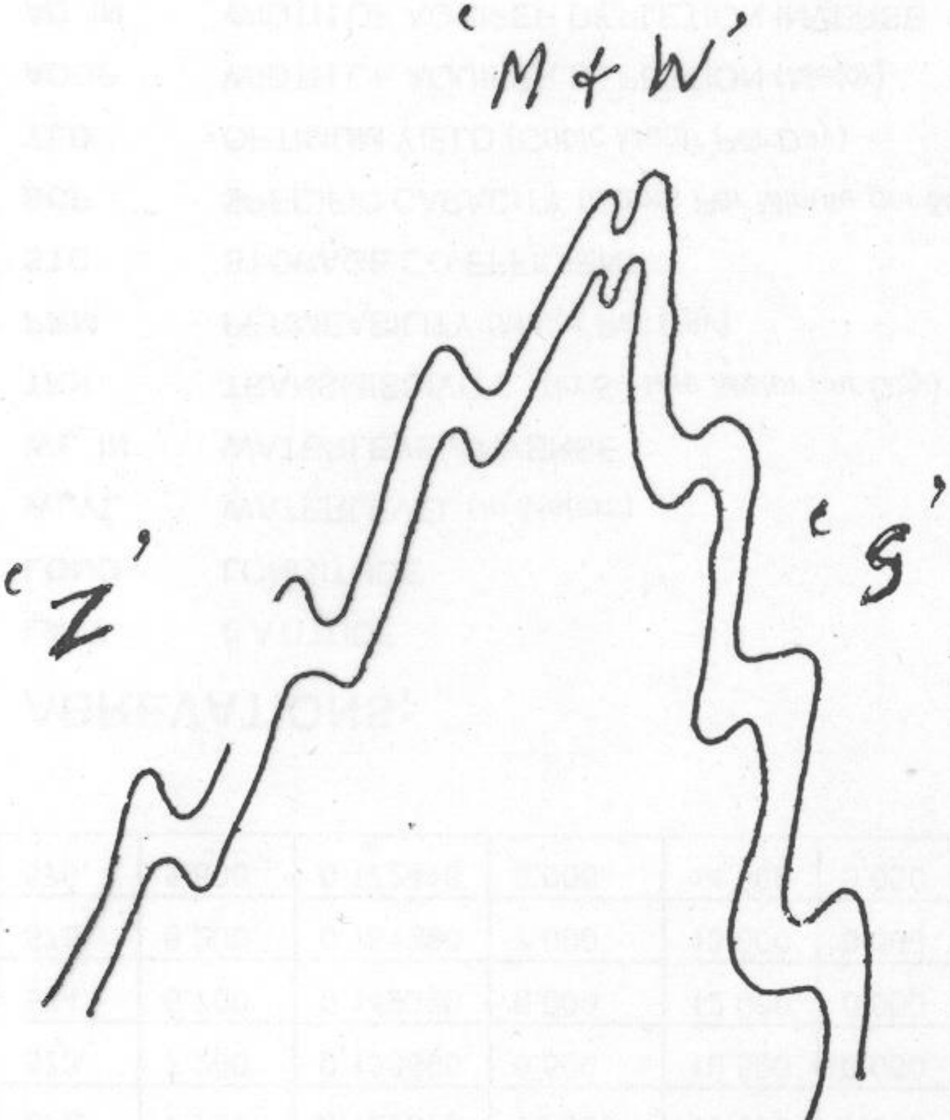
- Similar at indefenite depth
- Axial regions are thicker and limbs are thinner

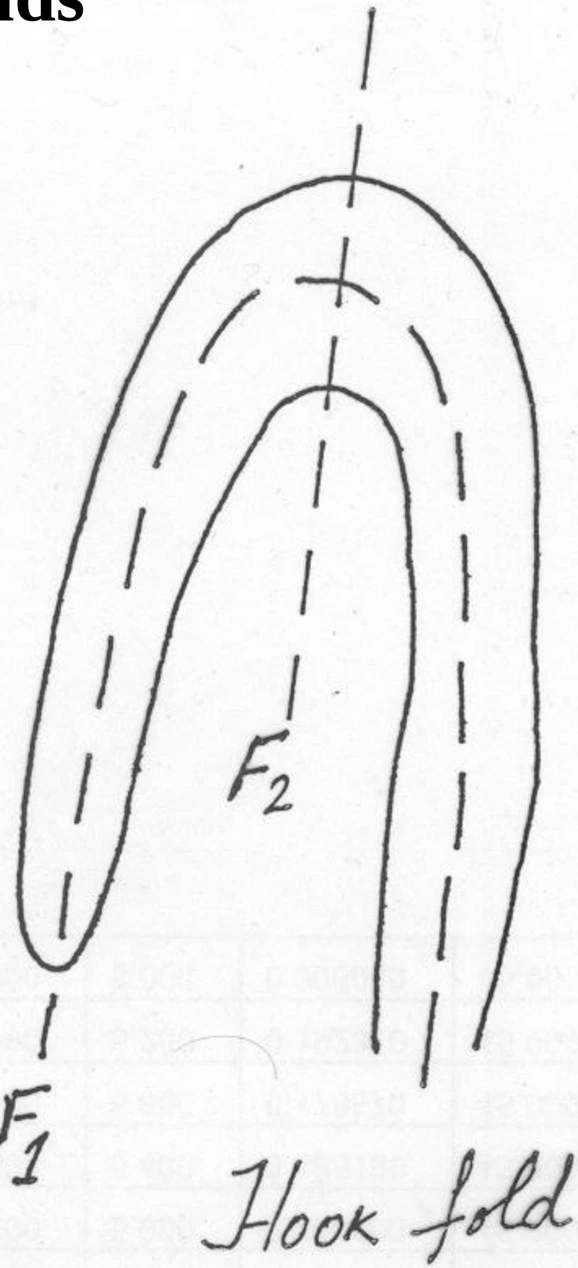


Parallel fold:

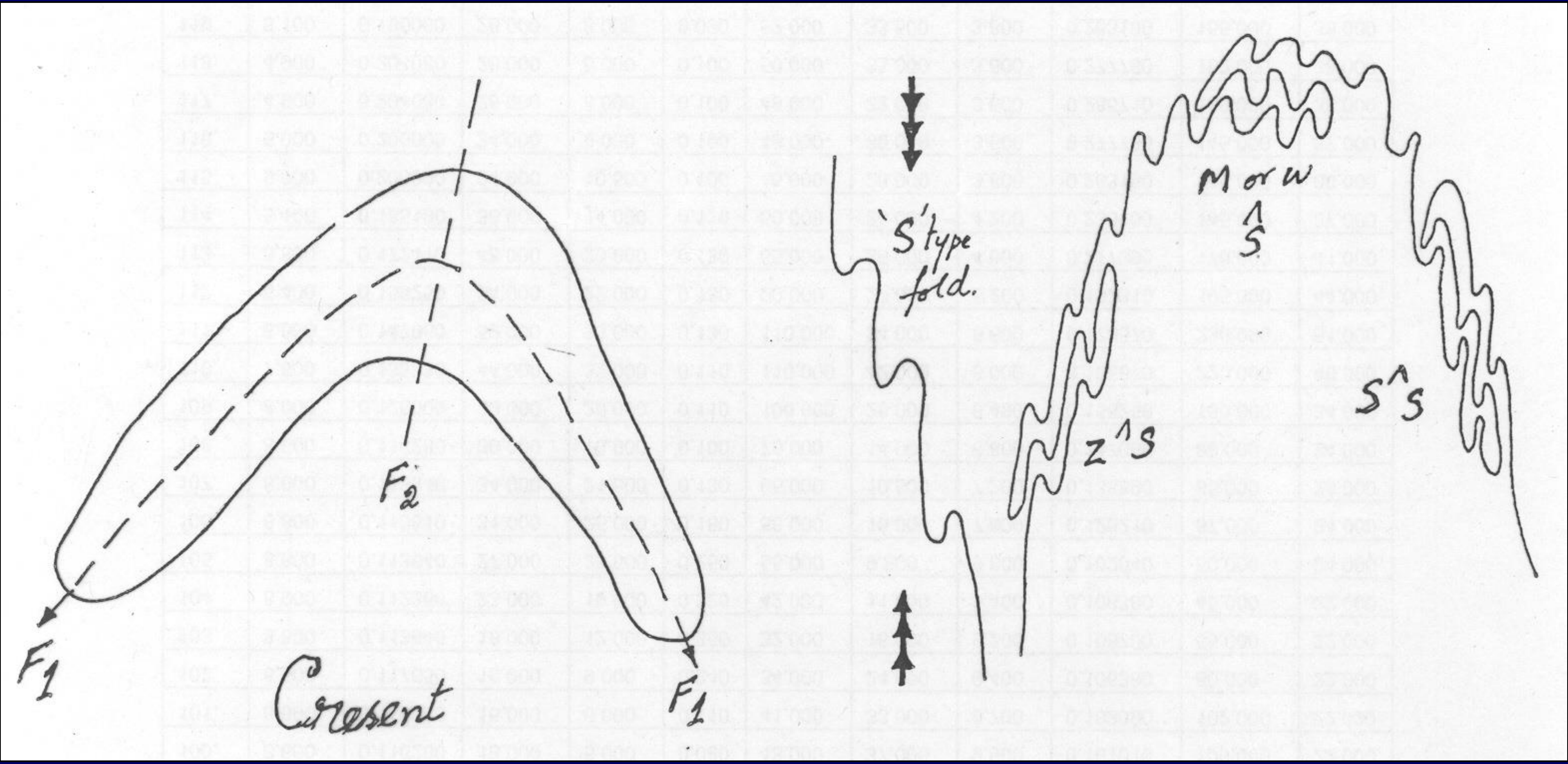
- Anticlinal hinges are sharp at depth
- Synclinal hinges are sharp at surface.

Superposed folds

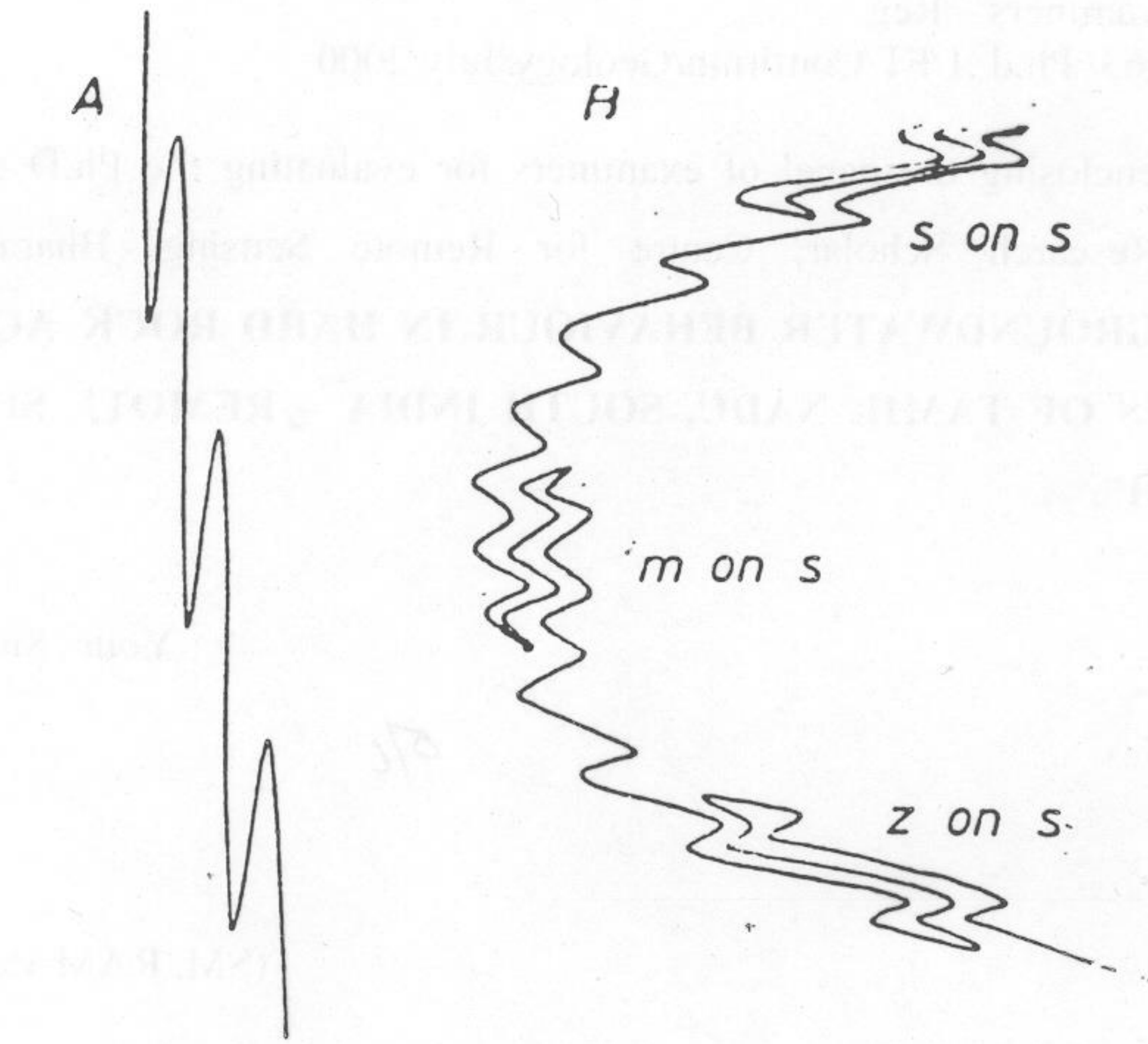




Superposed folds

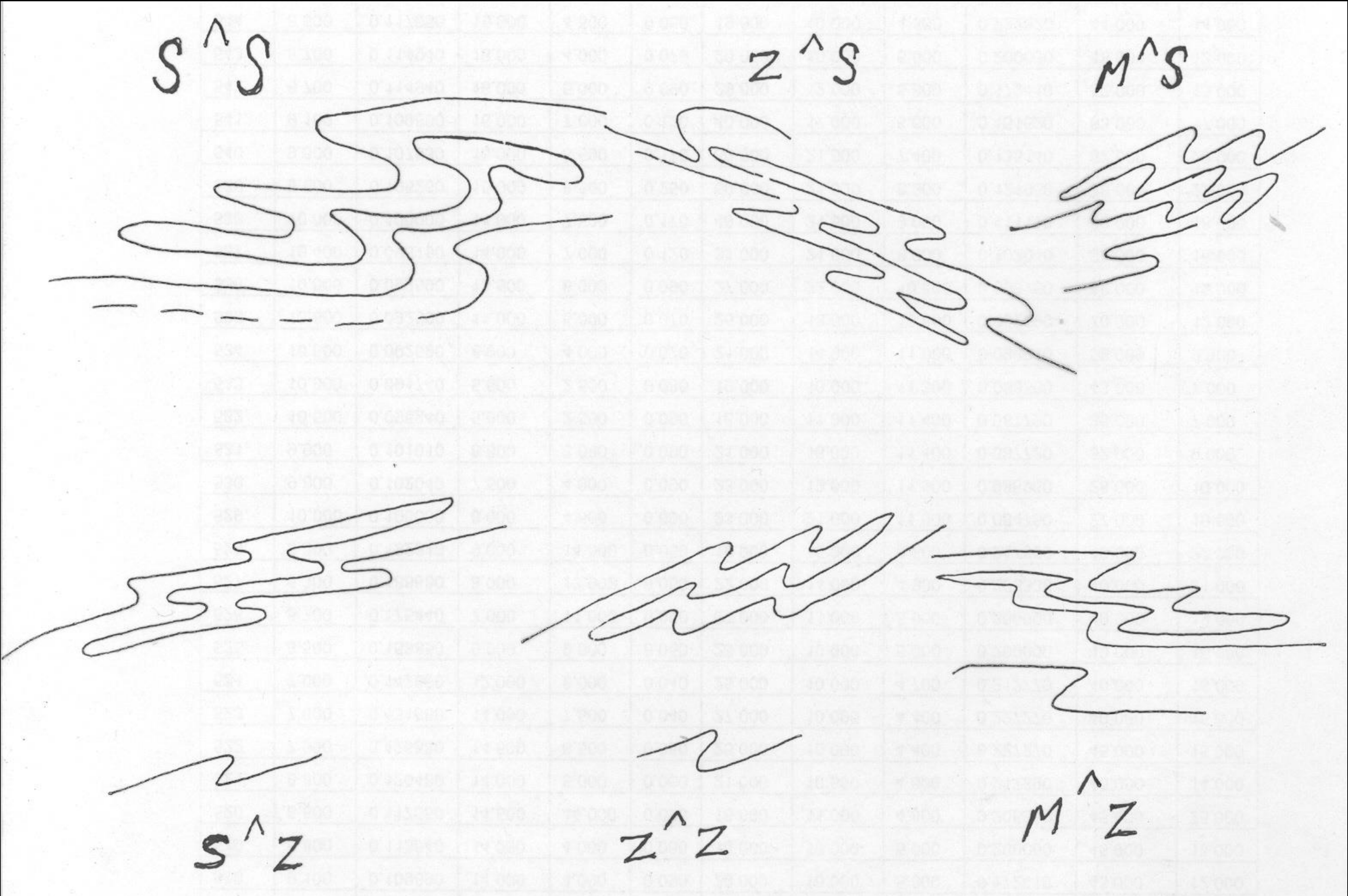


Superposed folds

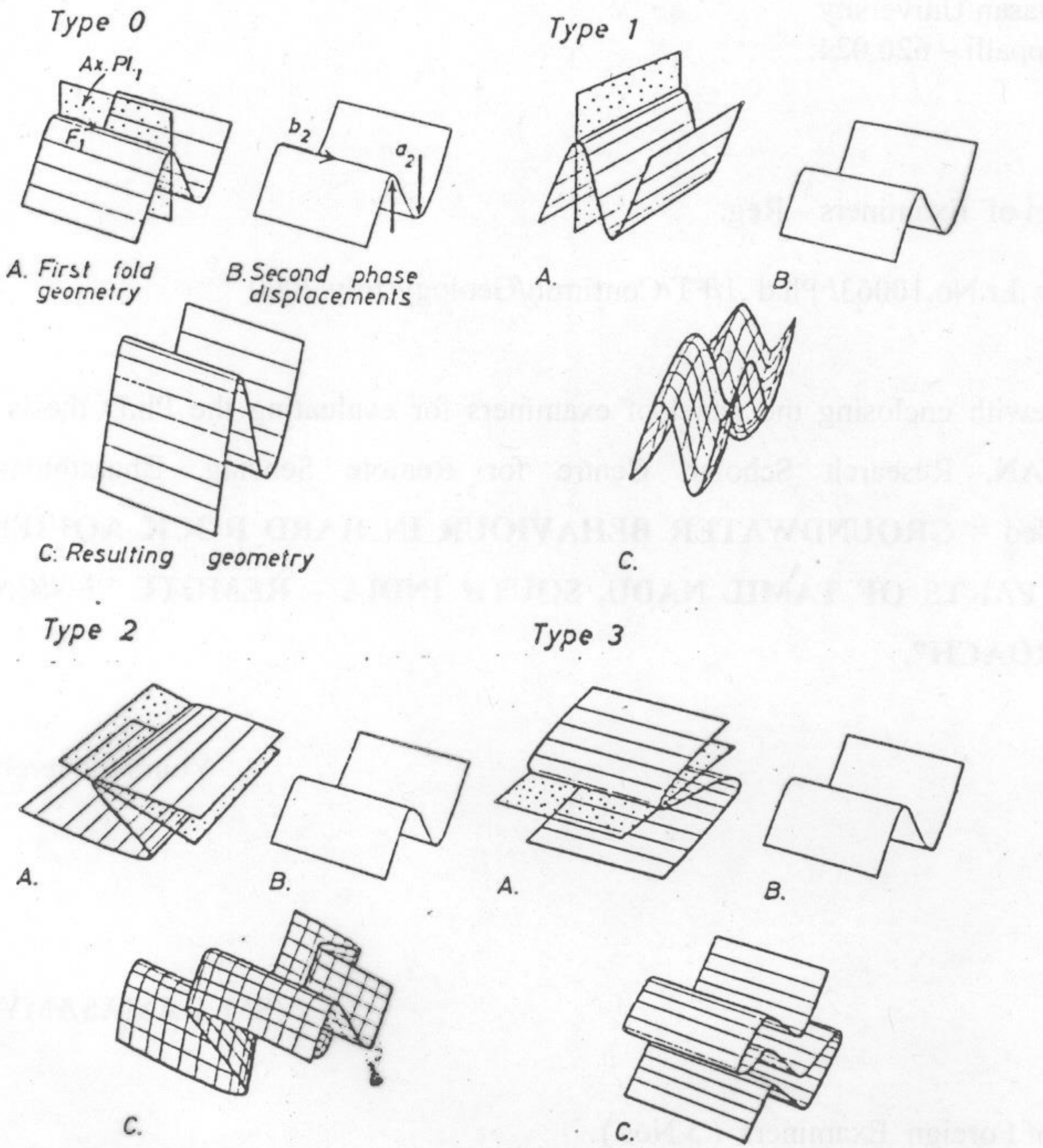


A: *S-shaped first folds.* B: *Effects of refolding the S-shaped initial folds into various forms of Type 3 interference patterns.*

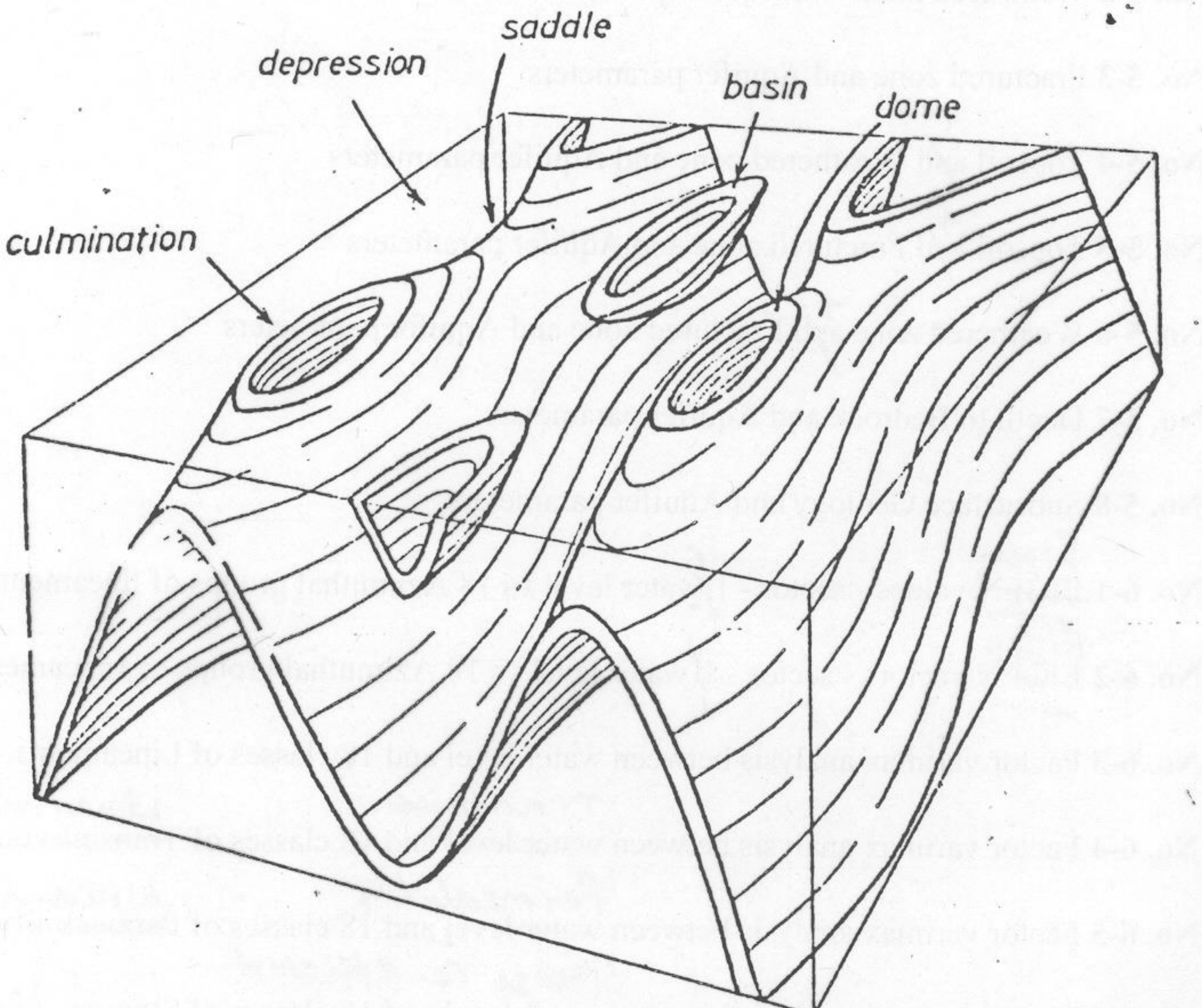
Superposed folds



Superposed folds

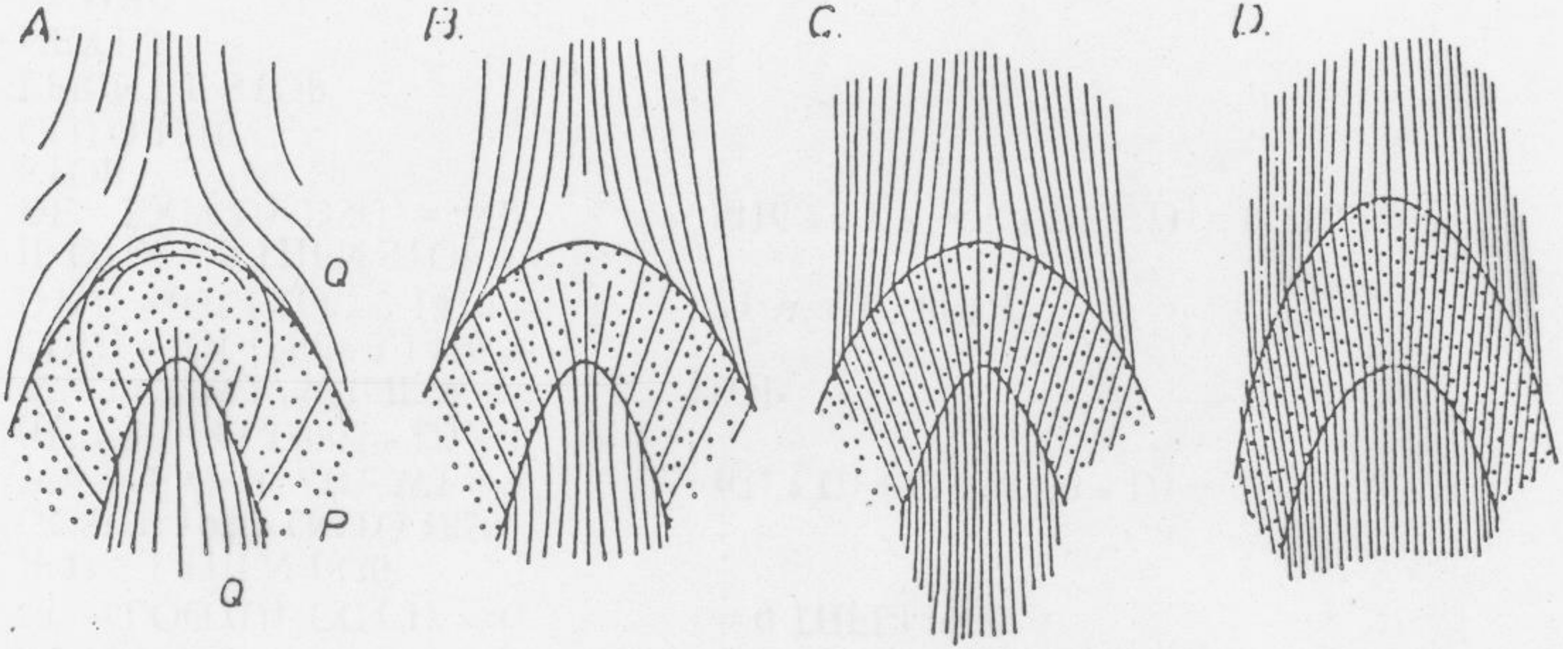


The four principal types of three-dimensional fold forms arising by the superposition of shear folds on pre-existing fold forms.



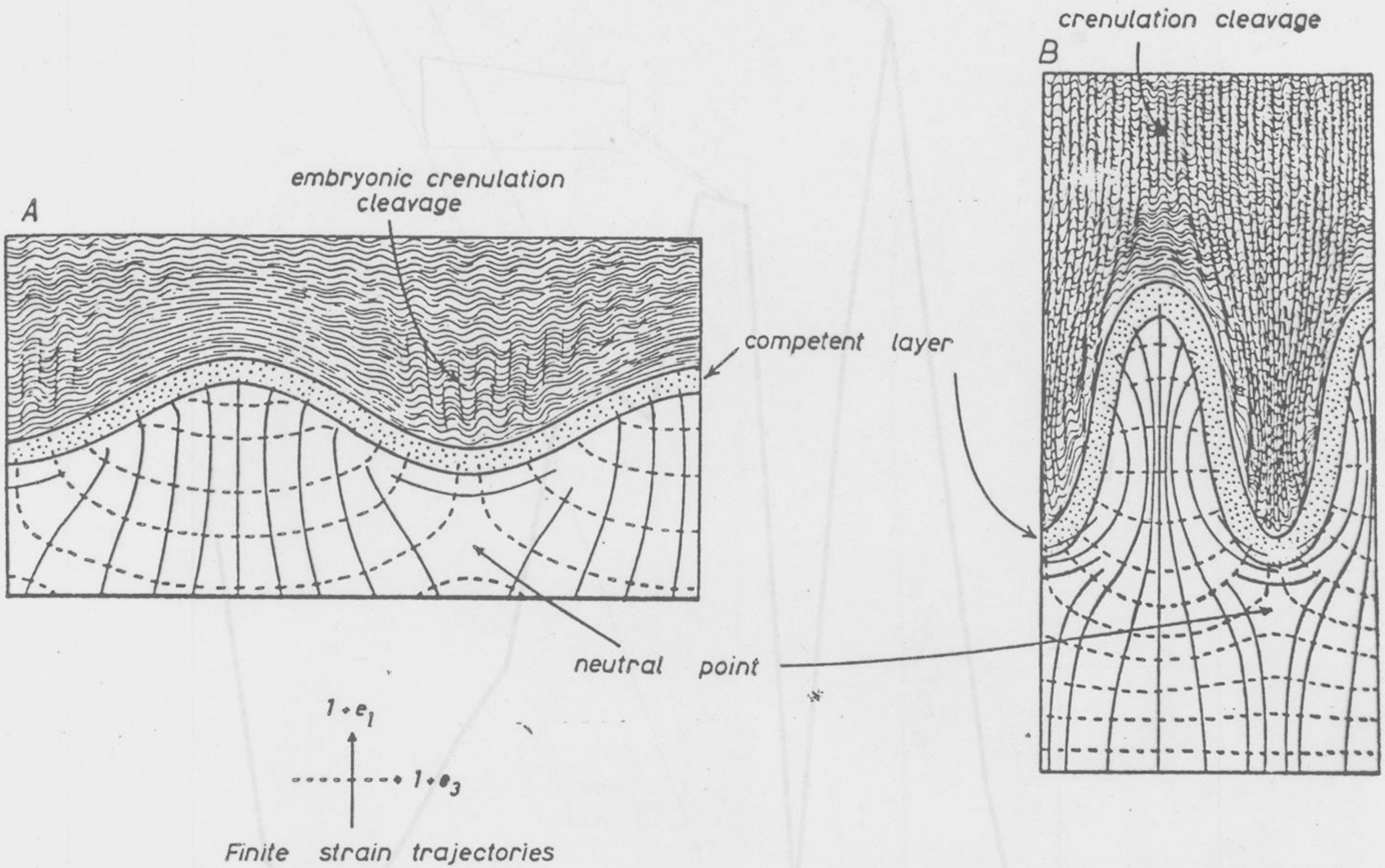
Structural features arising from changes in the hinge line plunges of folds.

Cleavage formation



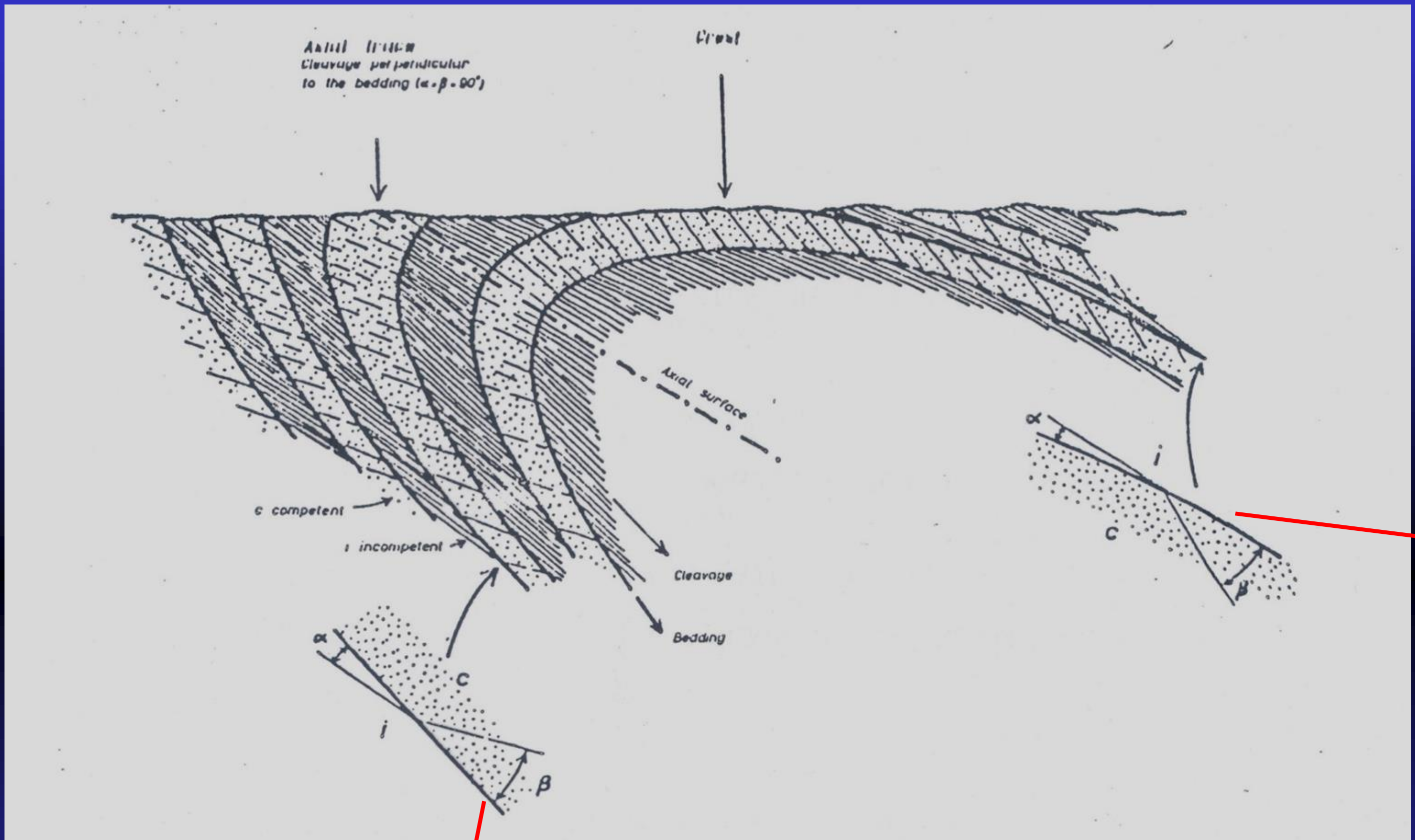
Cleavage patterns in folds with no (A), some (B) and strong (C) initial layer parallel shortening. D shows the modified fold and cleavage geometry arising from a homogeneous strain with shortening normal to the fold axial surface. Rock P is more competent than rock Q.

Cleavage formation



Scheme of development of symmetric and asymmetric crenulation cleavage in a material with a strong initial fabric as a result of buckling of a competent layer.

Bedding – Cleavage relation - Overturned Anticline

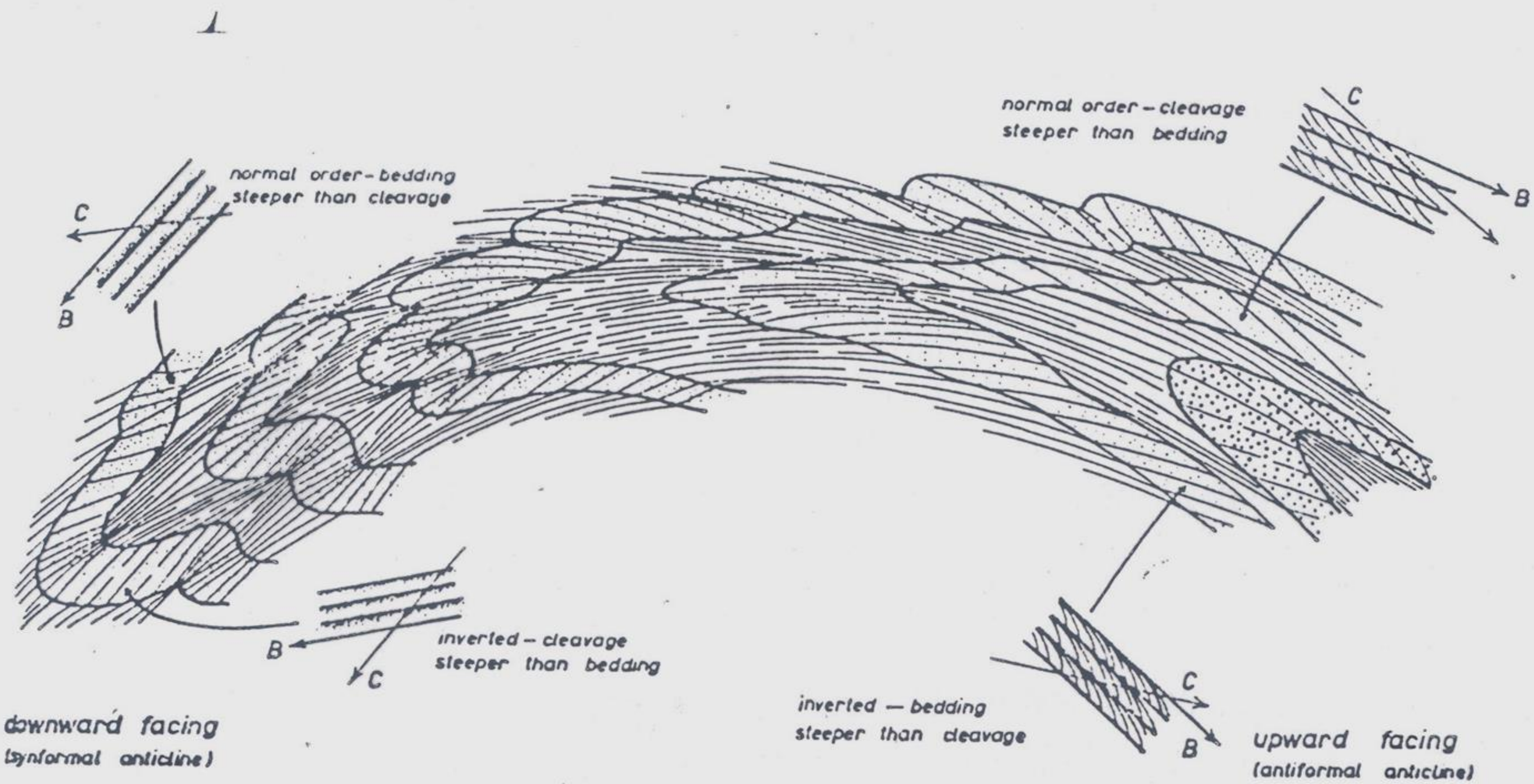


The relationship between cleavage and bedding in an overturned fold.

Normal Limb:
Cleavage steeper than bedding

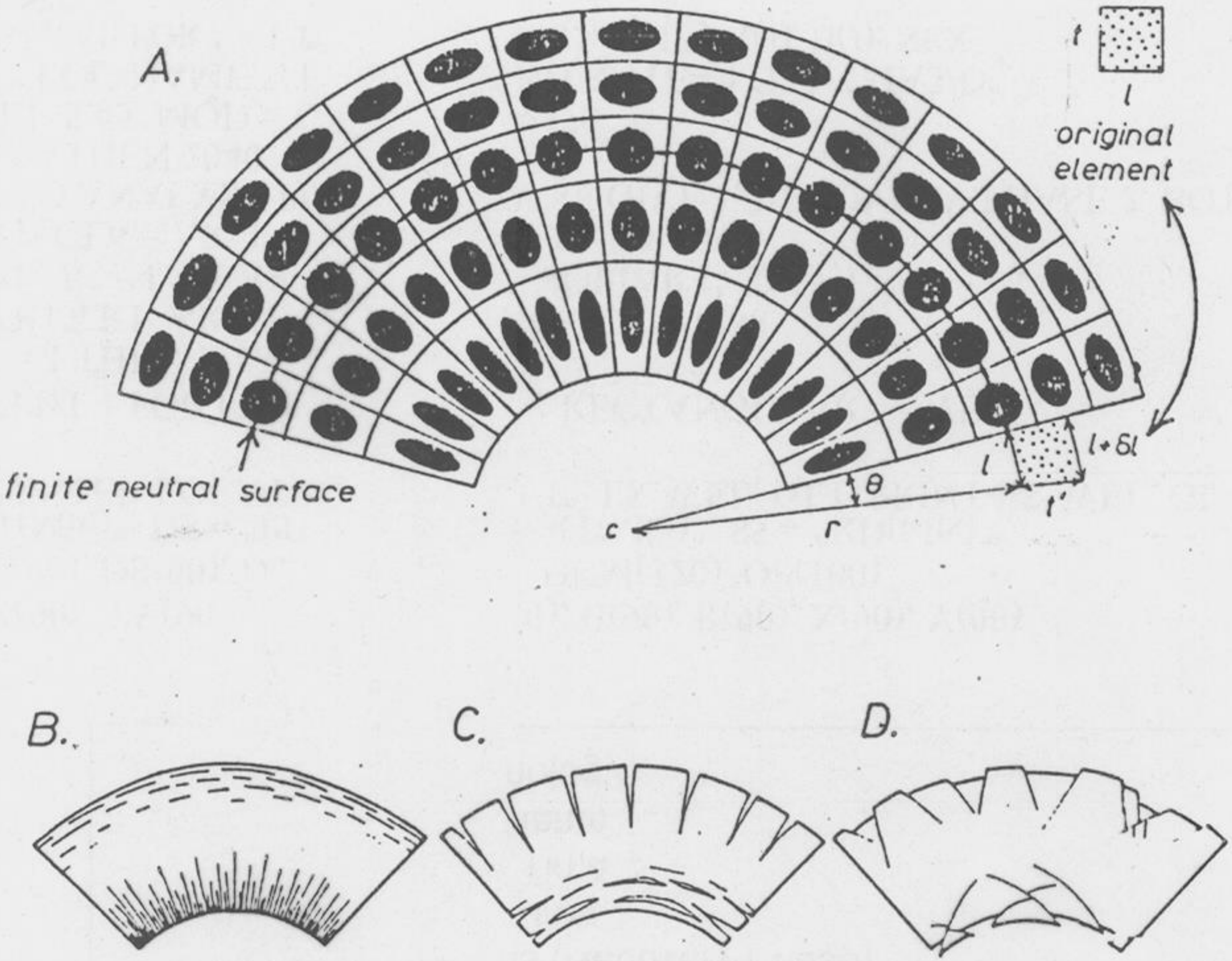
Inverted Limb:
Bedding steeper than Cleavage

It will be vice-versa in the case of overturned syncline.



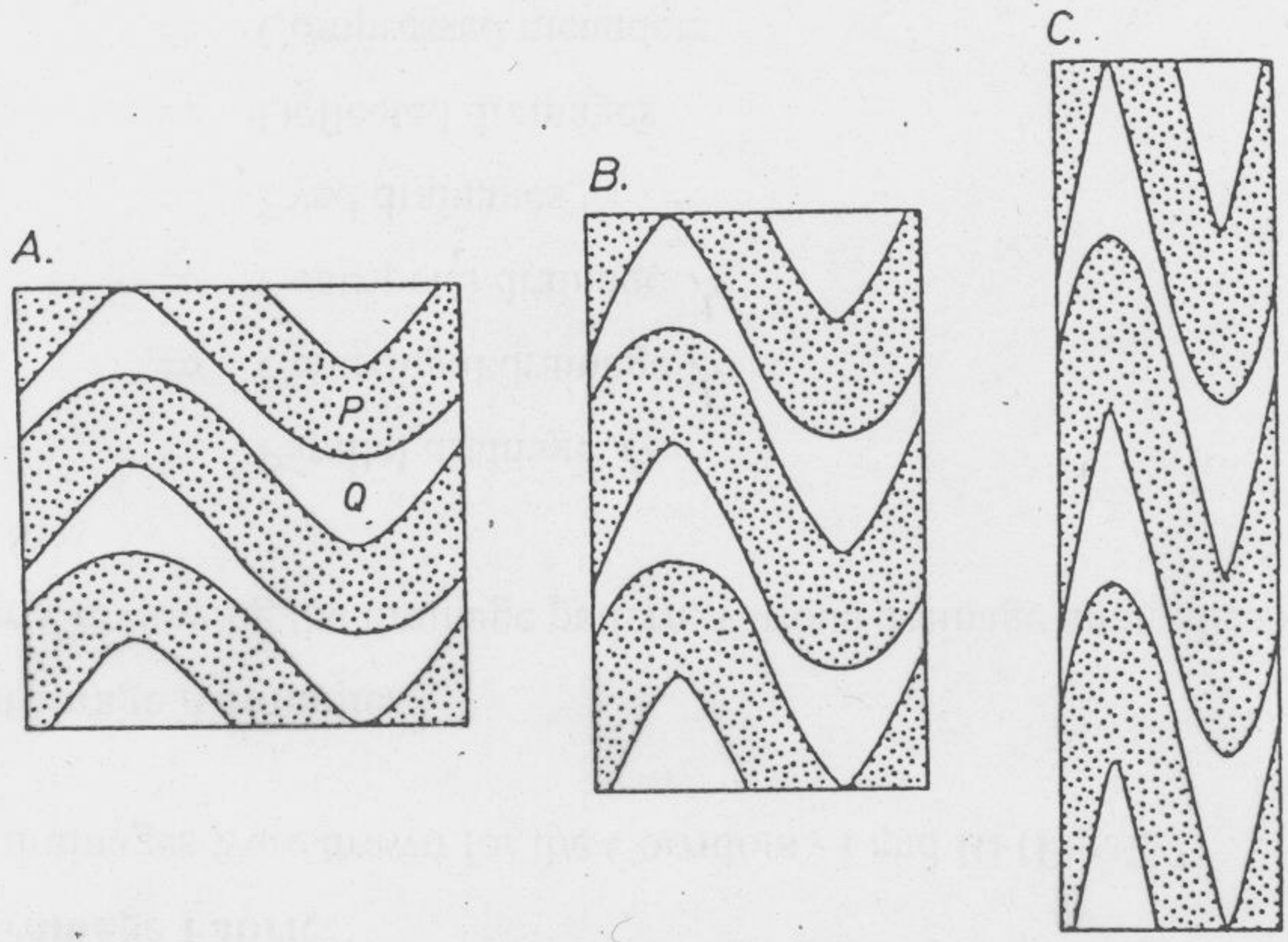
The relationships between cleavage, bedding and bed polarity in upward and downward facing folds.

Structural development of rock strain



A: *The geometrical features of a fold formed under conditions of pure tangential longitudinal strain. Structural development of rock strain:* B, *cleavage;* C, *extension fissures;* D, *conjugate shear faults.*

Fold formation after homogeneous strain



A: Regular multilayer complex of parallel (layer P) and Class 3 folds (layer Q). B and C show the flat . . derivatives of these folds after homogeneous strains with ratios R = 1·78 and 4·0 respectively. See Questi

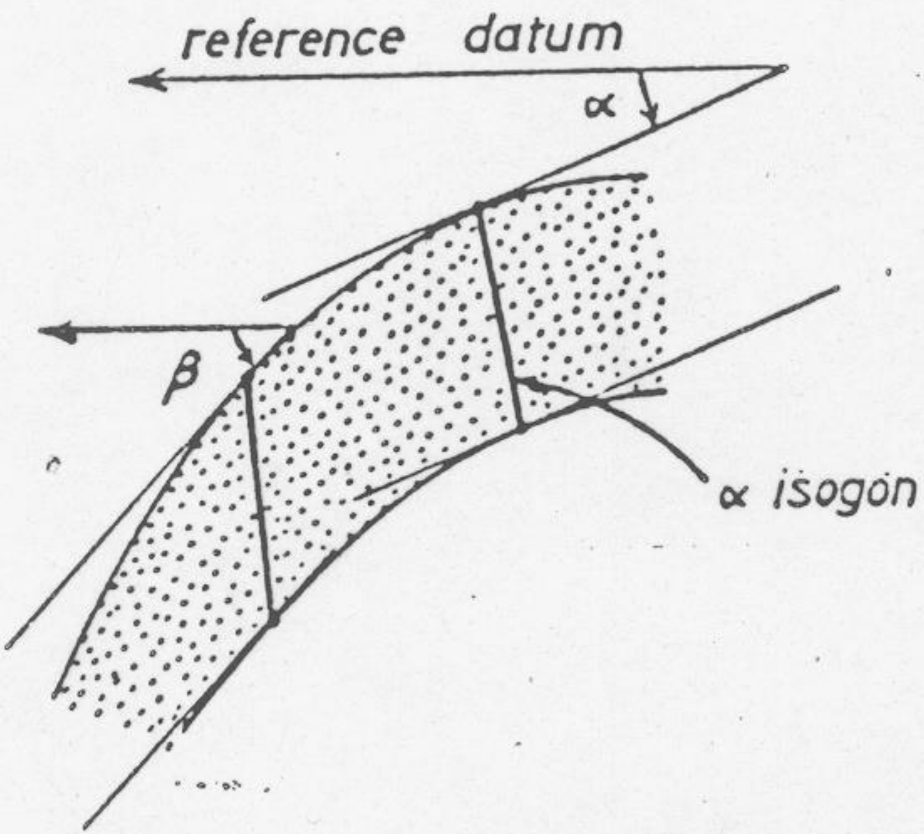
RAMSAY'S FOLD CLASSIFICATION

Ramsay classified the folds on the basis of "Dip Isogon"

Dip Isogons:-

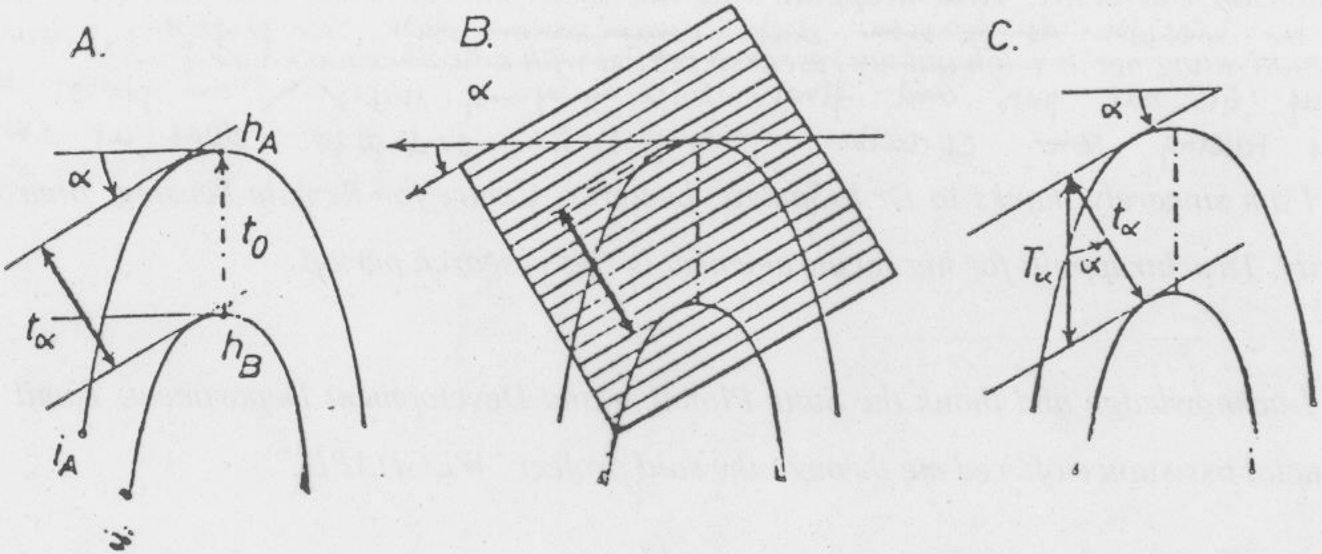
Lines joining locations of equal dip on either side of a folded layer

Dip isogons construction



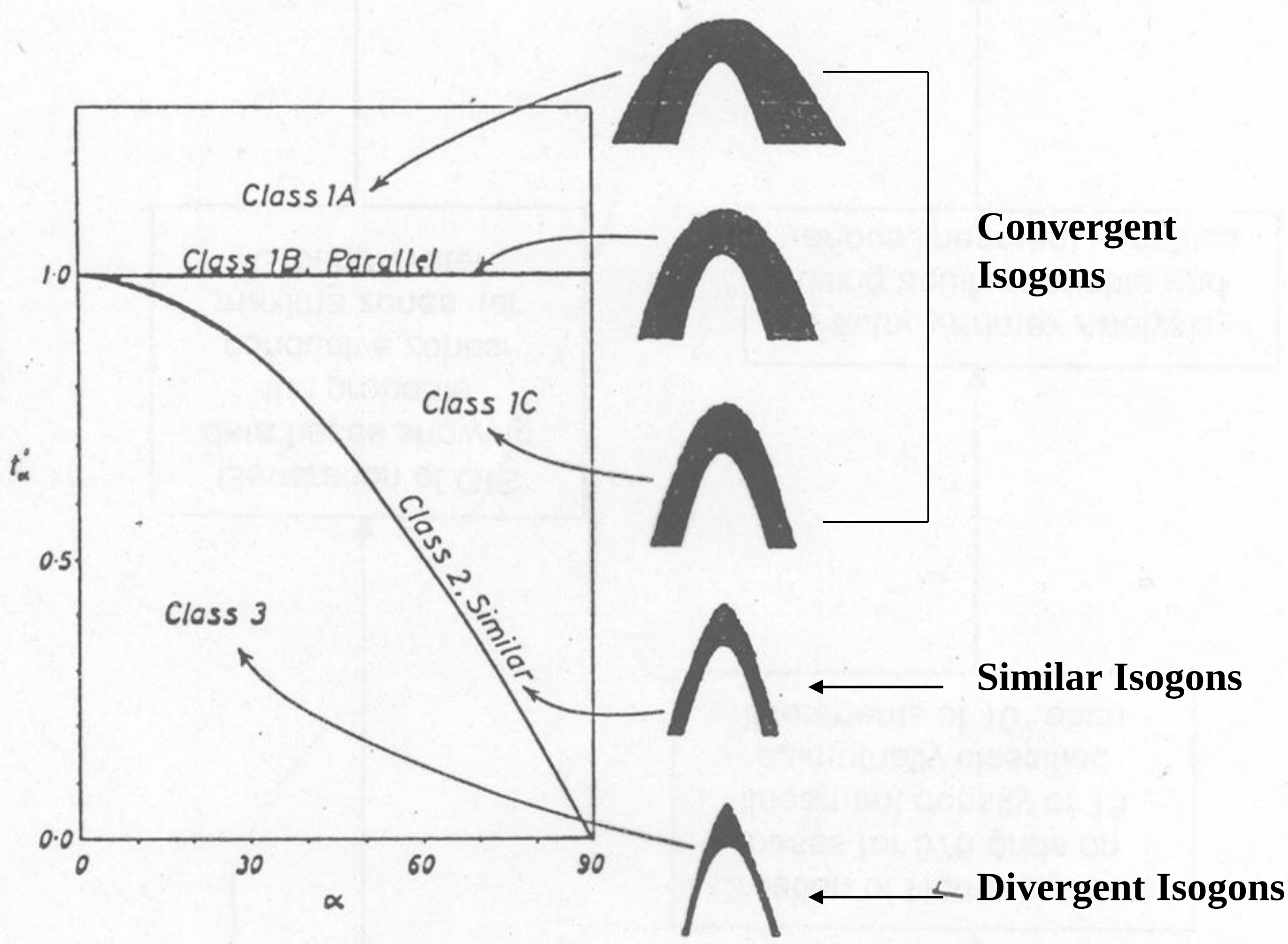
Method of constructing dip isogons of value α and β.

Dip isogons Layer thickness measurement



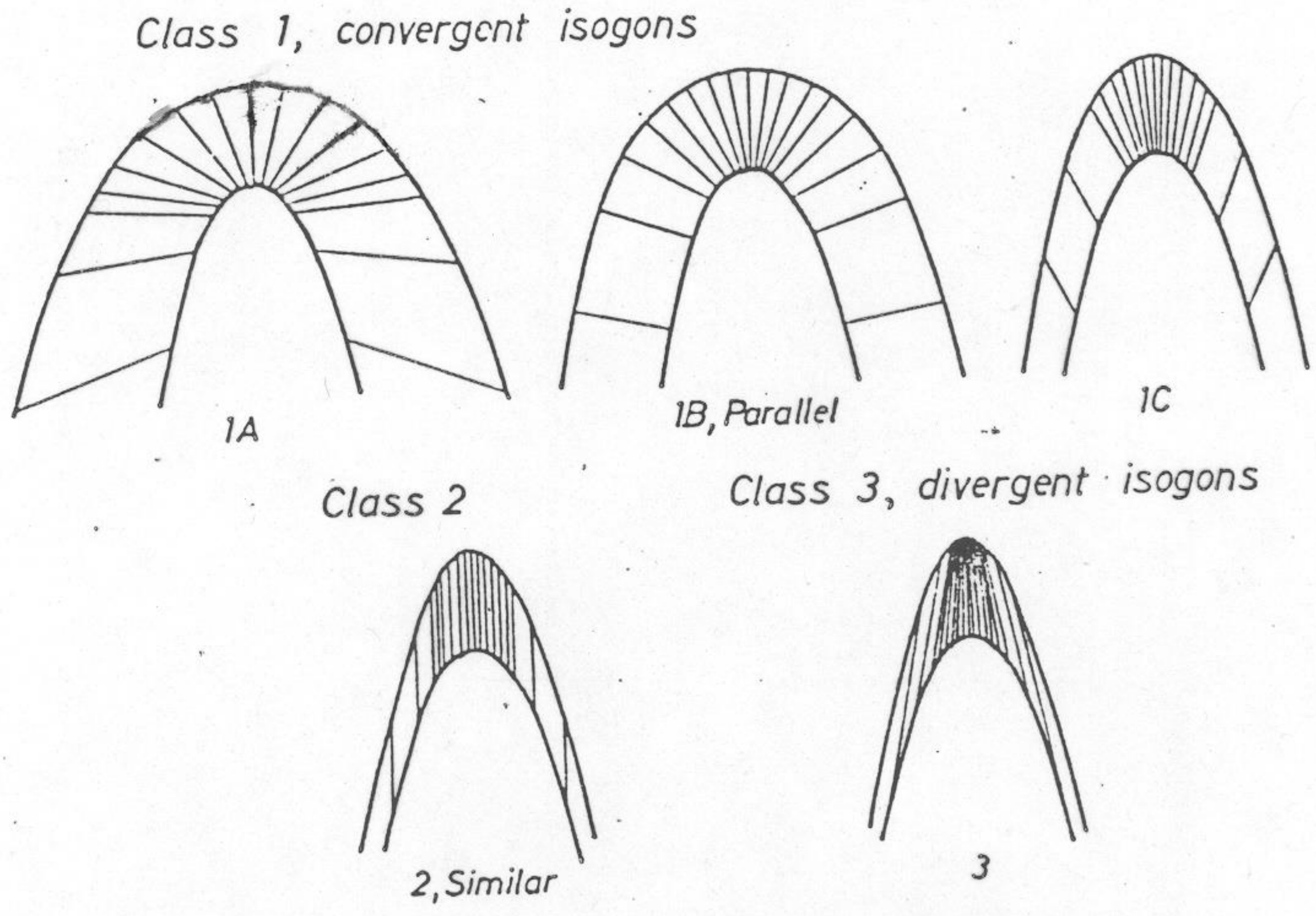
Method of determining the orthogonal layer thickness t_α at angle of dip α. In A, h_A, h_B, i_A and i_B are the hinge lines and inflexion points defining the quarter wavelength domain, respectively. B illustrates an overlay method for measuring t_α. C shows the relationships between orthogonal thickness t_α and thickness T_α measured parallel to the axial plane.

RAMSAY'S FOLD CLASSIFICATION



Graphical plot of standardized orthogonal thickness t'_α plotted against angle of dip α and the in types of fold classes.

RAMSAY'S FOLD CLASSIFICATION



The dip isogon characteristics of the main fold lasses.

Convergent Isogons:-

Folds in which adjacent dip isogons converge when traced from the outer to the inner fold arc.

→ **Strongly Convergent (Class 1A)**
Isogons are rotated in the same rotation sense as the bed perpendiculars.

→ **Parallel Folds:- (Class 1B)**
Where isogons are perpendicular to the layering.

→ **Weakly Convergent:- (Class 1C)**
Where isogons are rotated in the opposite rotation sense to the bed perpendiculars.

Similar Folds (Class 2)

Folds with parallel dip isogons implying that the bounding surfaces of the folds are geometrically identical.

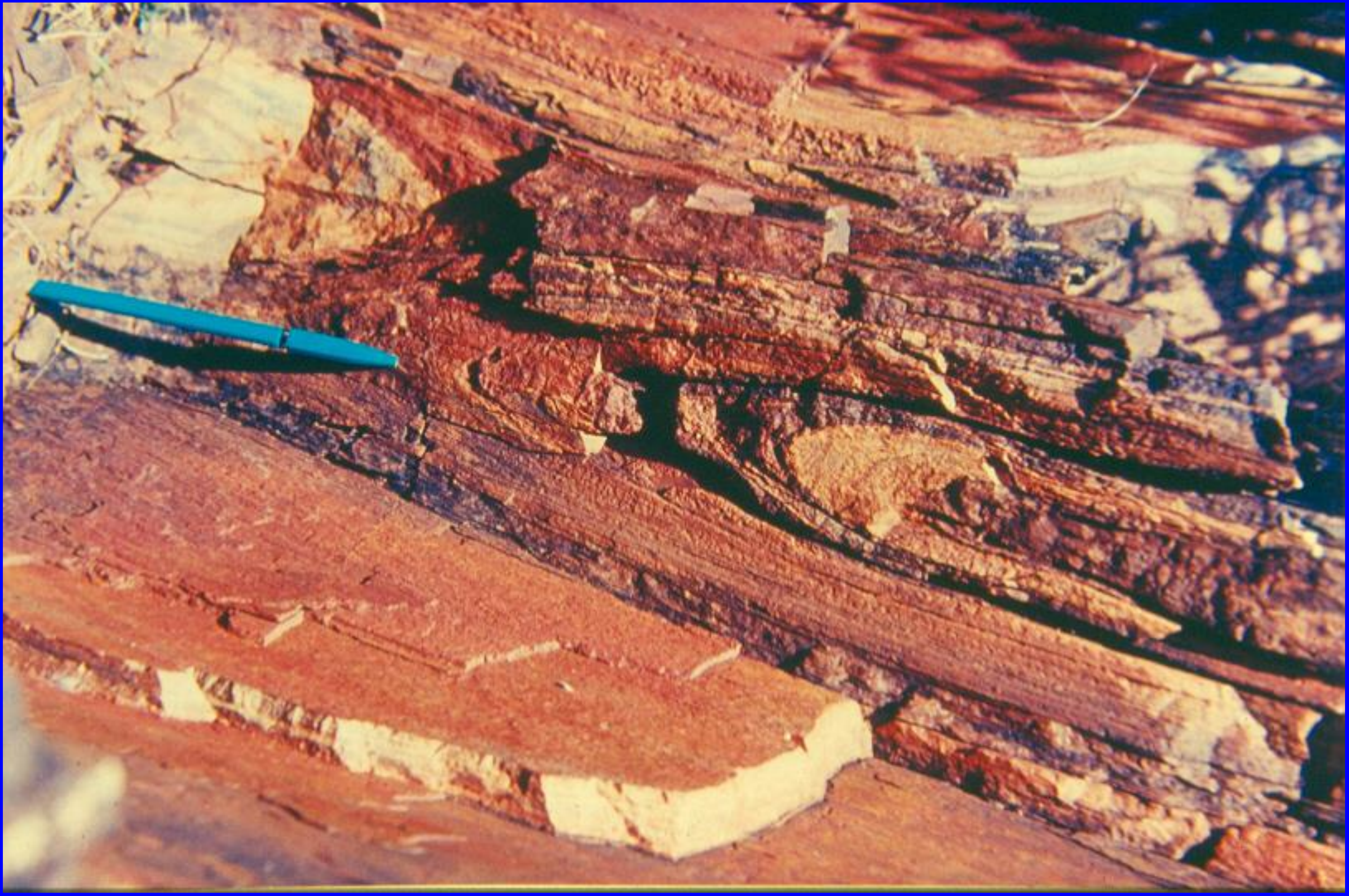
Divergent Isogons Folds (Class 3)

Folds in which adjacent dip isogons diverge when traced from outer to inner fold arc.

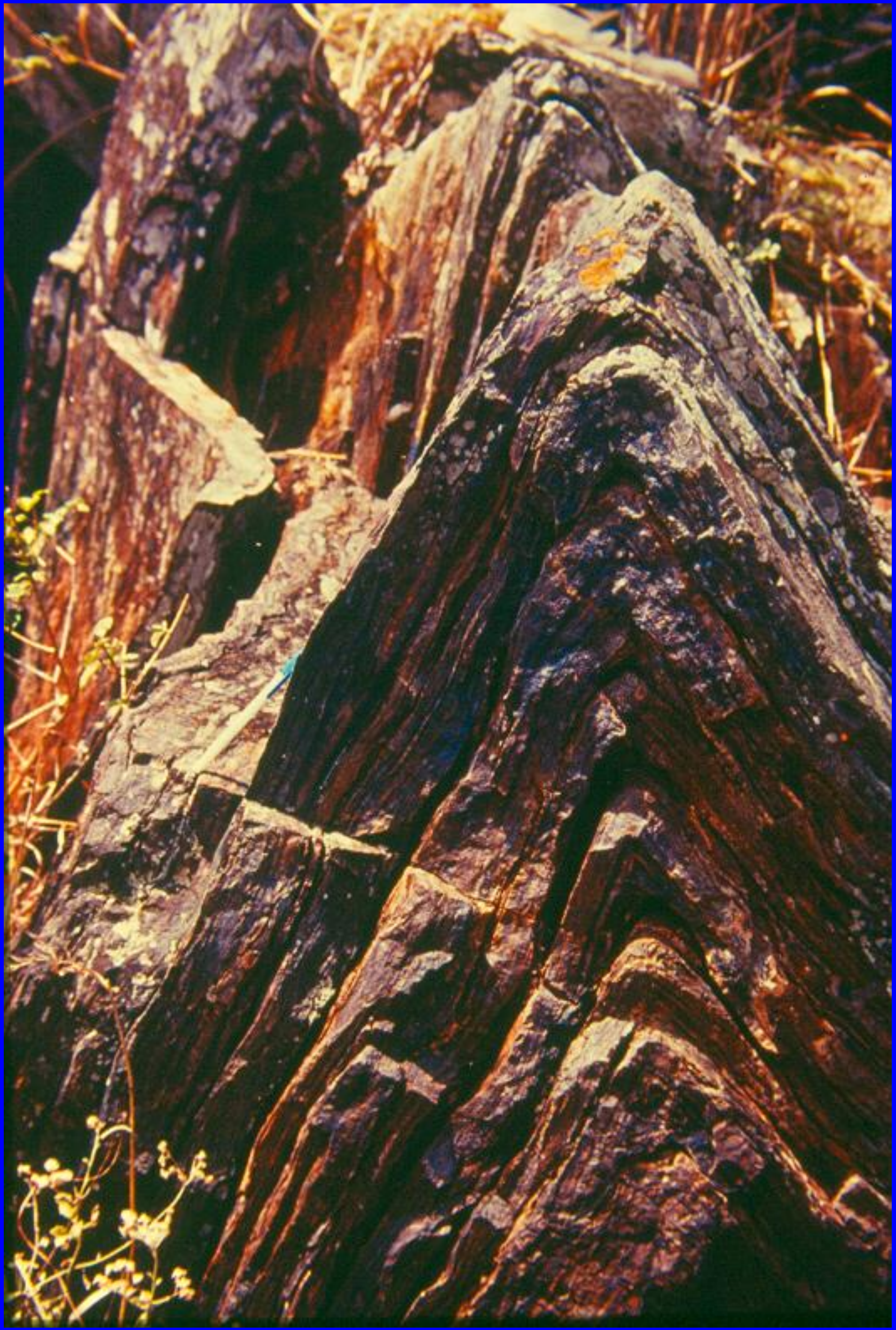
Flattened Folds:-

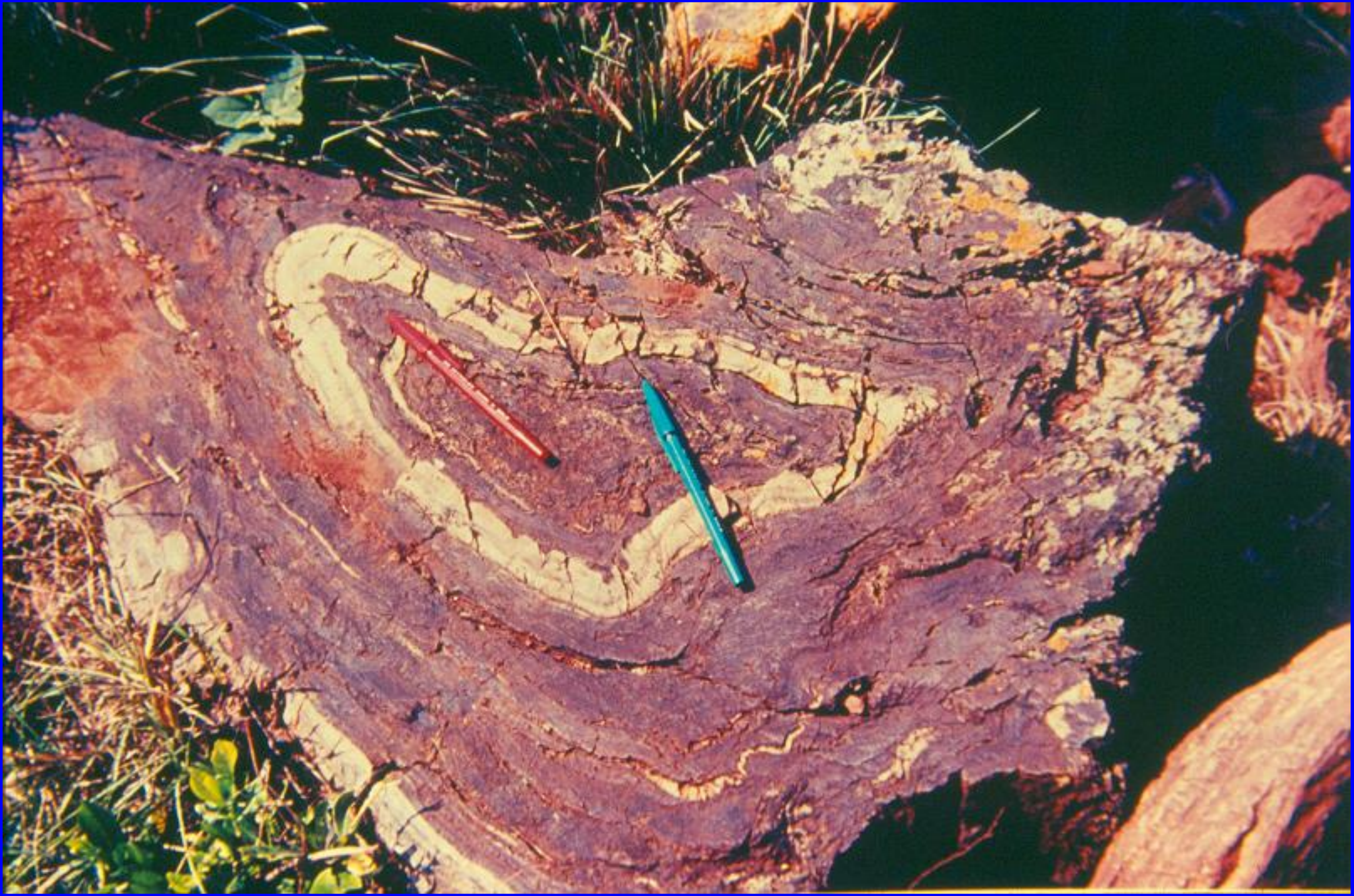
Folds of any class which have undergone a homogeneous strain over the whole field of the fold.

Field photographs




0 1 2 3 4 5cm





STRUCTURAL MAPPING

THROUGH

REMOTE SENSING

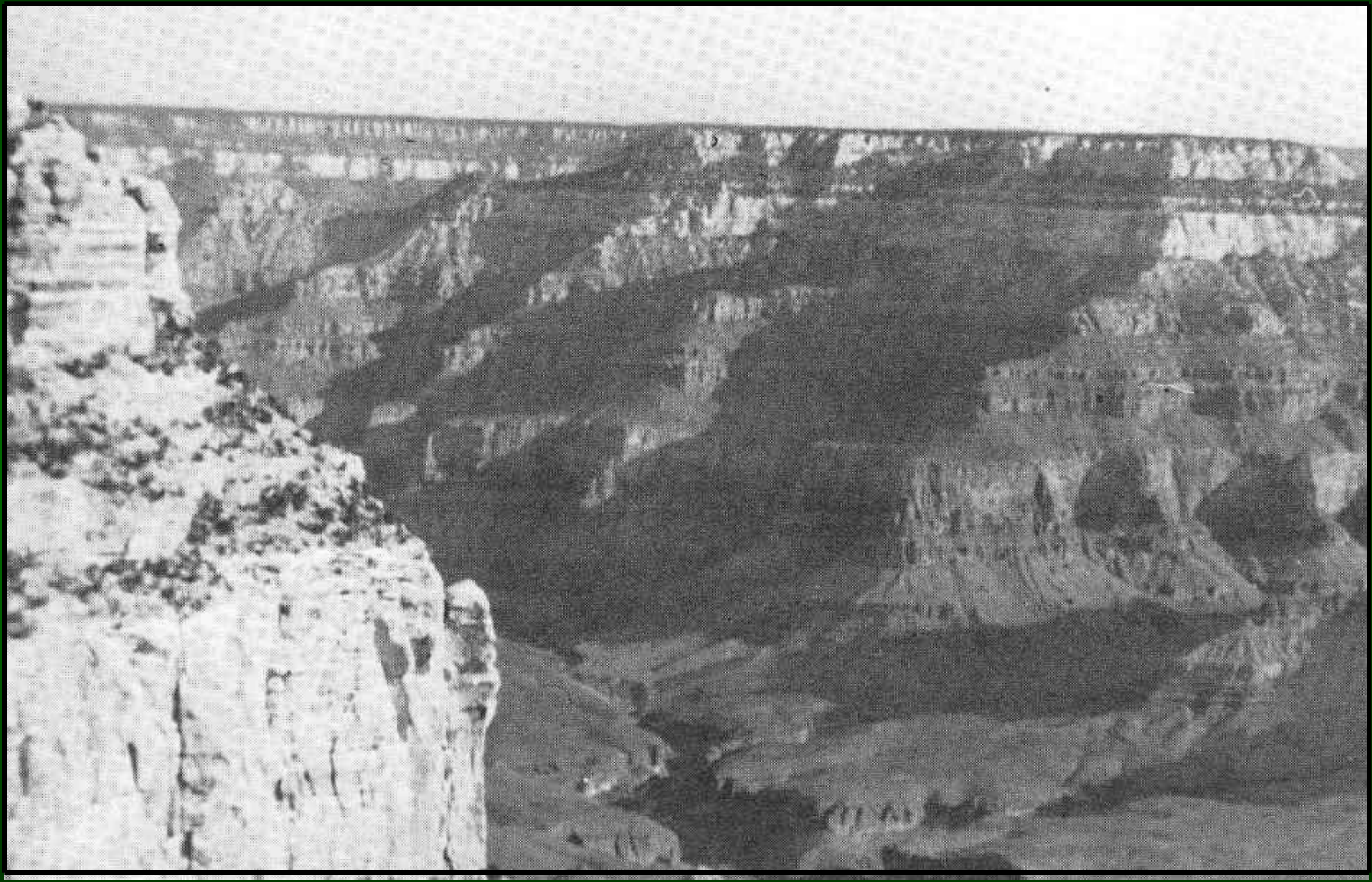
STRUCTURAL STUDIES

PHOTO SIGNATURES OF STRUCTURAL FEATURES

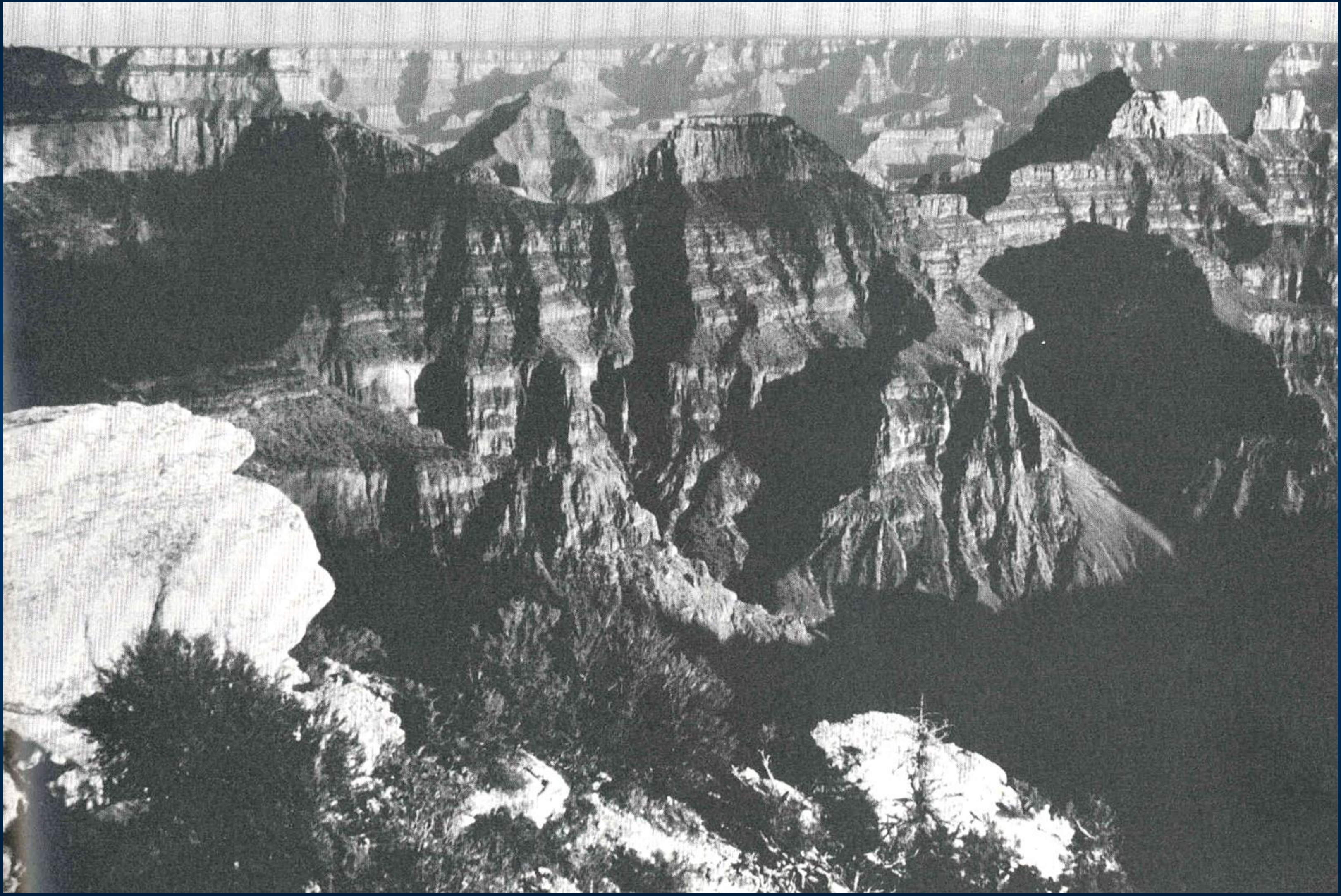
FLAT LYING BEDS:

- Different layer – alternating tonal variation
- Alternate Resistant & Non Resistant units
    - Step cliff for Non resistant
    - Gentle slope for resistant
- Dendritic drainage(if no joints & fractures controls)

GRAND CANYON PLATEAU



GRAND CANYON PLATEAU



IRS – PAN STERIO DECCAN PLATEAU

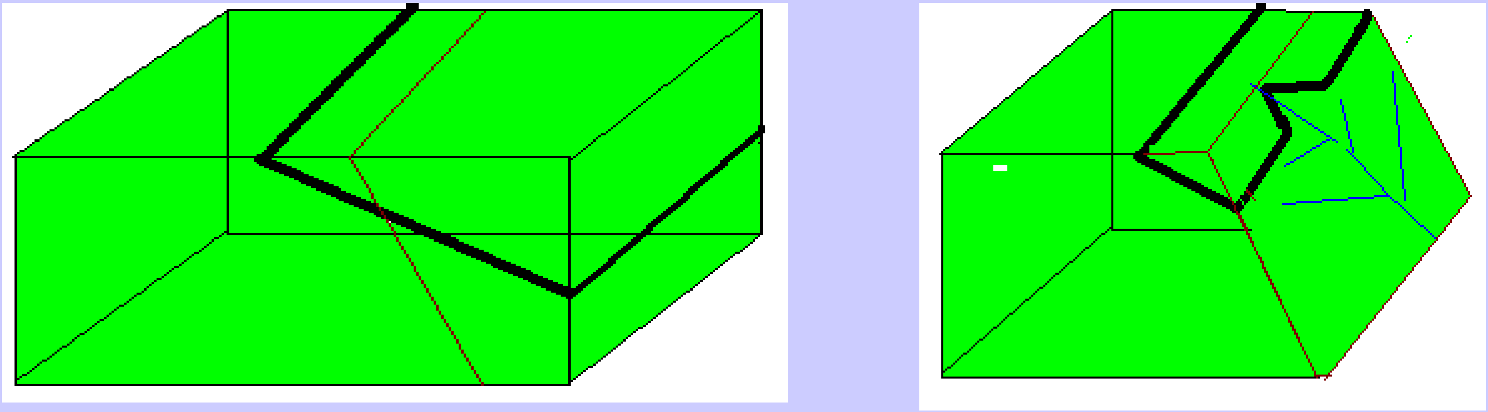
DIPPING BEDS:

Out crop pattern

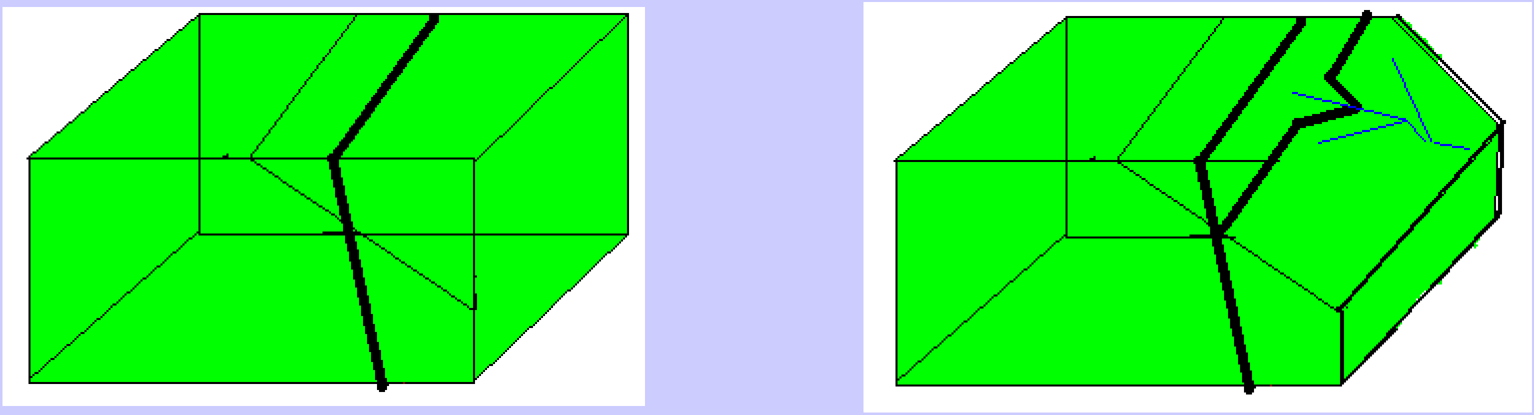
- –Bed dip & topographic slope coincide-tree crown character

- – If bedding by tonal variation is seen then the “V” of the drainage valley with bedding is criteria.
  - ❖V*point toward dip direction-if the surface gradient is gentler than dip of bed.
  - ❖V*point opposite to dip direction – if the surface gradient is steeper than dip of bed.

V*point opposite to dip direction – if the surface gradient is steeper than dip of bed.



V*point toward dip direction-if the surface gradient is gentler than dip of bed.



DIPPING BEDS: (Contd.) [Drainage Character]

a (i) Relatively long drainage in the dip direction → Gentle Slope

(ii) Short drainage opposite to dip

b. (i) Relatively short drainage in the dip direction → Dips $>45^0$

(ii) Longer drainage opposite to dip

c. Long linear beds trends → Vertical bed

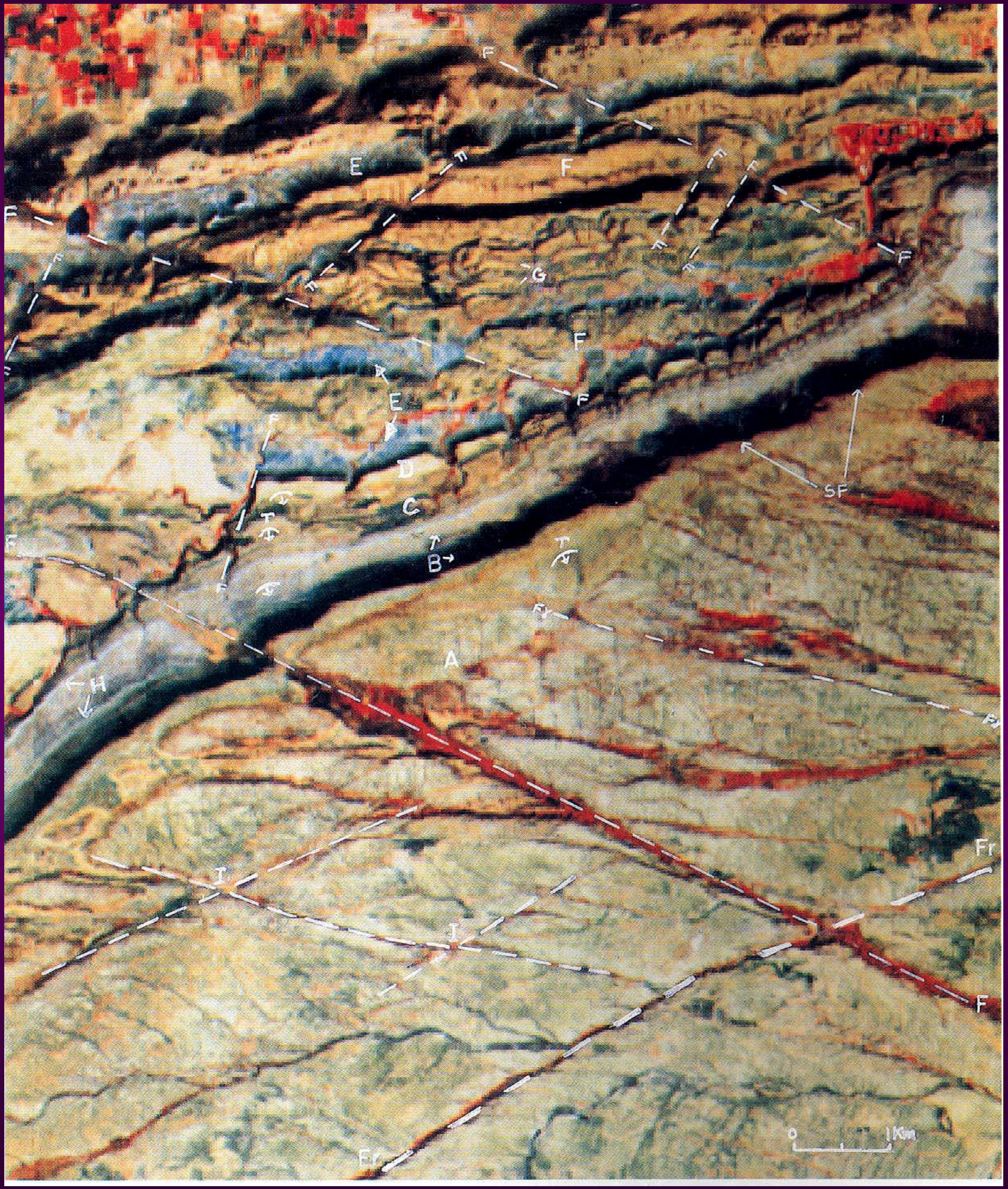
Initial dip → Wavy pattern

Secondary dip → Regular pattern

CUESTA – CANADA

CUESTA

CUDDAPAH BASIN



FOLDS:

EXPOSED ONES - Easy to identify & understand

COVERED / BELOW THE SURFACE - Not easy – take help of drainage pattern

LIMBS : Parallel drainage

Plunging folds : Closure- points the direction of plunge

Antiformal : Two set of parallel drainage flowing in opposite direction.

Synformal : Two set of parallel drainage flowing towards each other

Overturned folds : Difficult – No Photo signatures

Isoclinal folds : Closely spaced parallel structural trends

Open folds : Structural trend lines equally spaced – wide apart.

Closed folds : Unequal disposition and frequent trend line

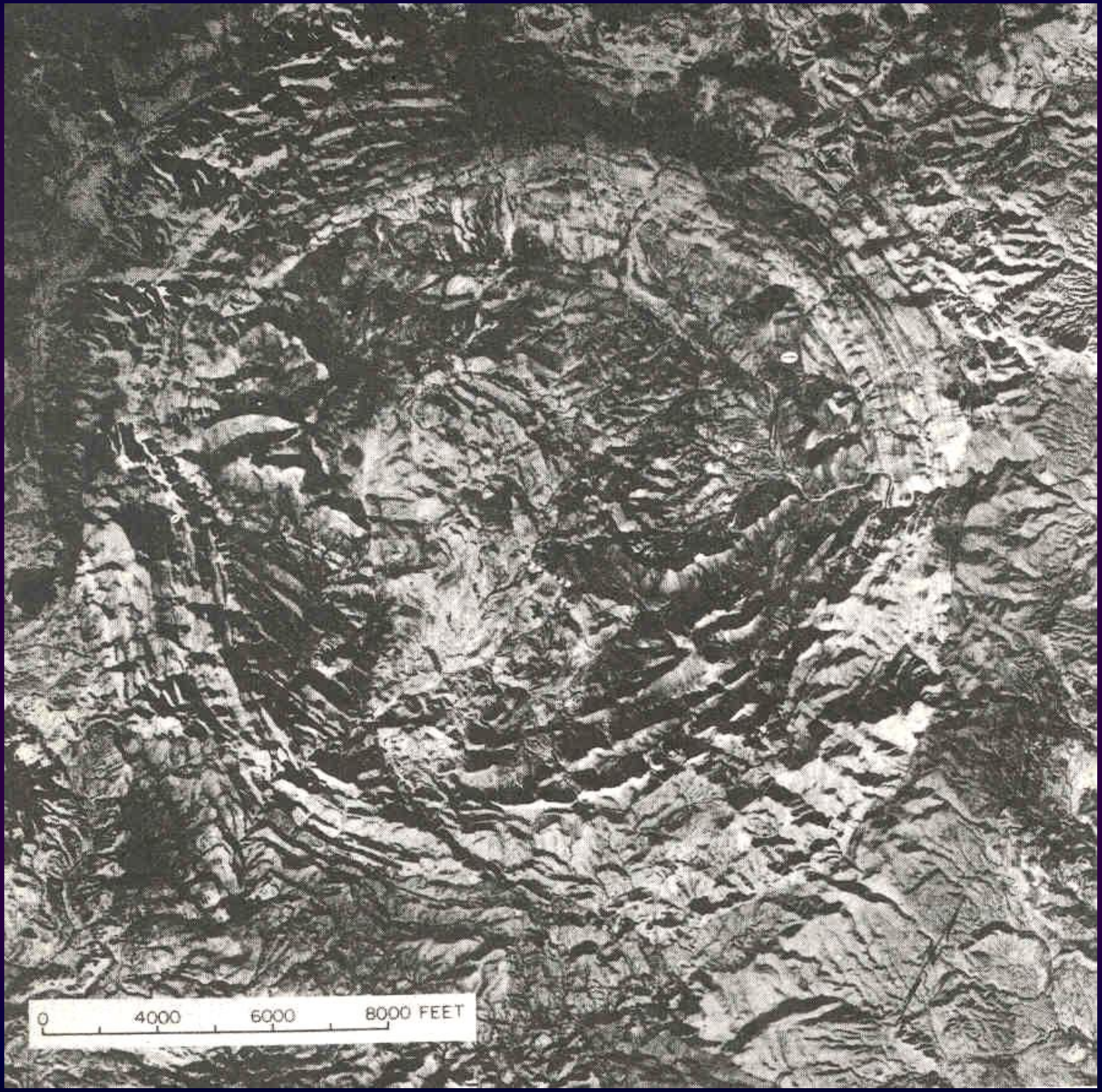
Parallel folds : Parallel anticline cliffed syncline – at zones of less erosion.

HOMOCLINAL :	Parallel drainage
MONOCLINAL :	Parallel drainage with offset
SYMMETRICAL FOLDS :	(I) Two set of drainage flowing opposite or inward (ii) Equally spaced structural trends with central gap
ASYMMETRICAL FOLD :	(I) Two sets of parallel drainage opposite & inward (ii) Their lengths are unequal (iii) Unequally spaced structural trends

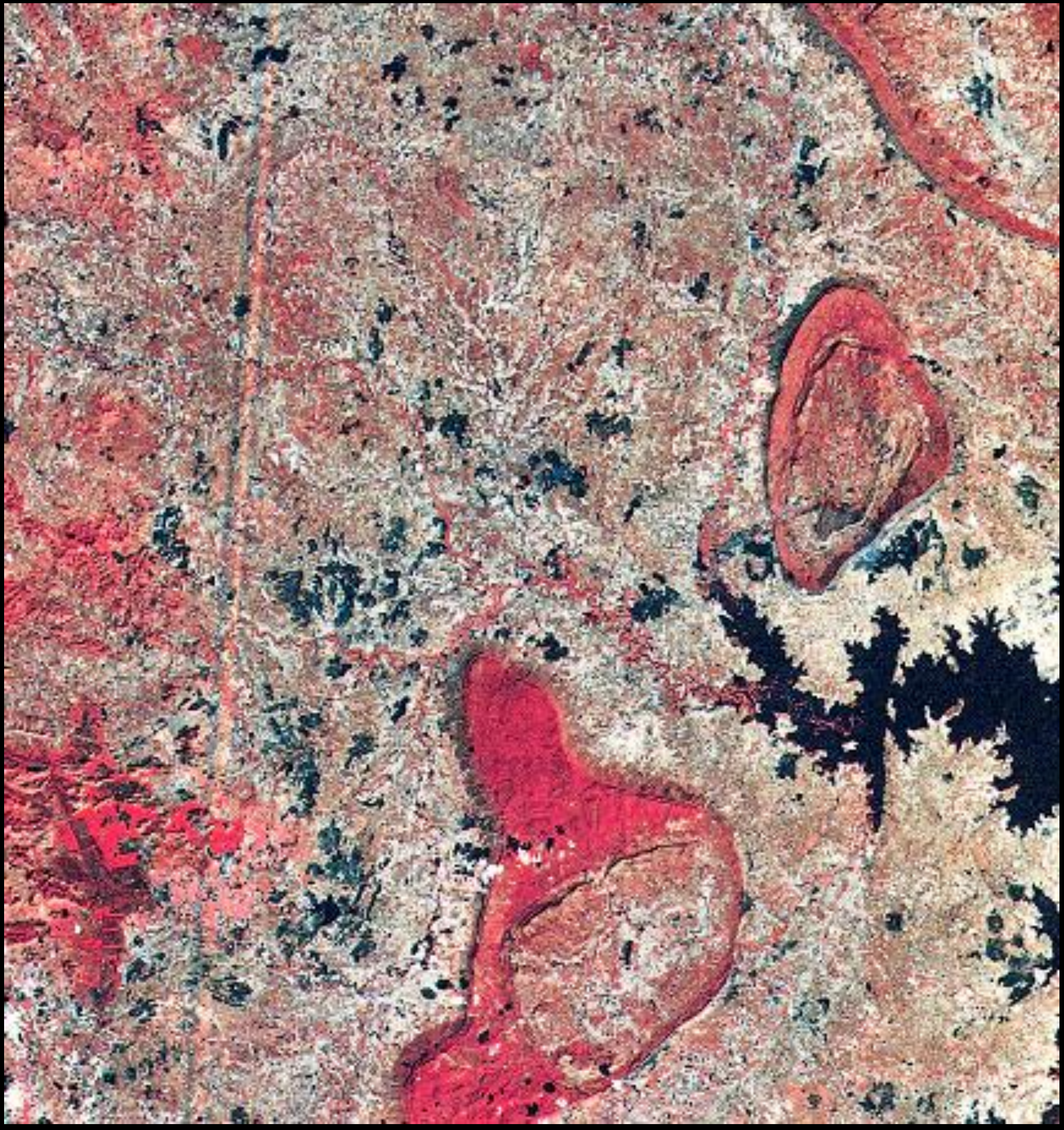
DOMES & BASINS	: Circular outcrop with radial drainage
FOLDS DUE TO HORIZ_ COMPRESSIVE FORCE	Tight folds with conjugate fractures
FOLDS DUE TO TANGENTIAL MANNER	"S" or "Z" shaped folded hills & beds
FOLDS DUE TO IGNEOUS INTRUSION	Structural trends envelopes Igneous bodies

APPALACHIAN FOLD

TEXAS

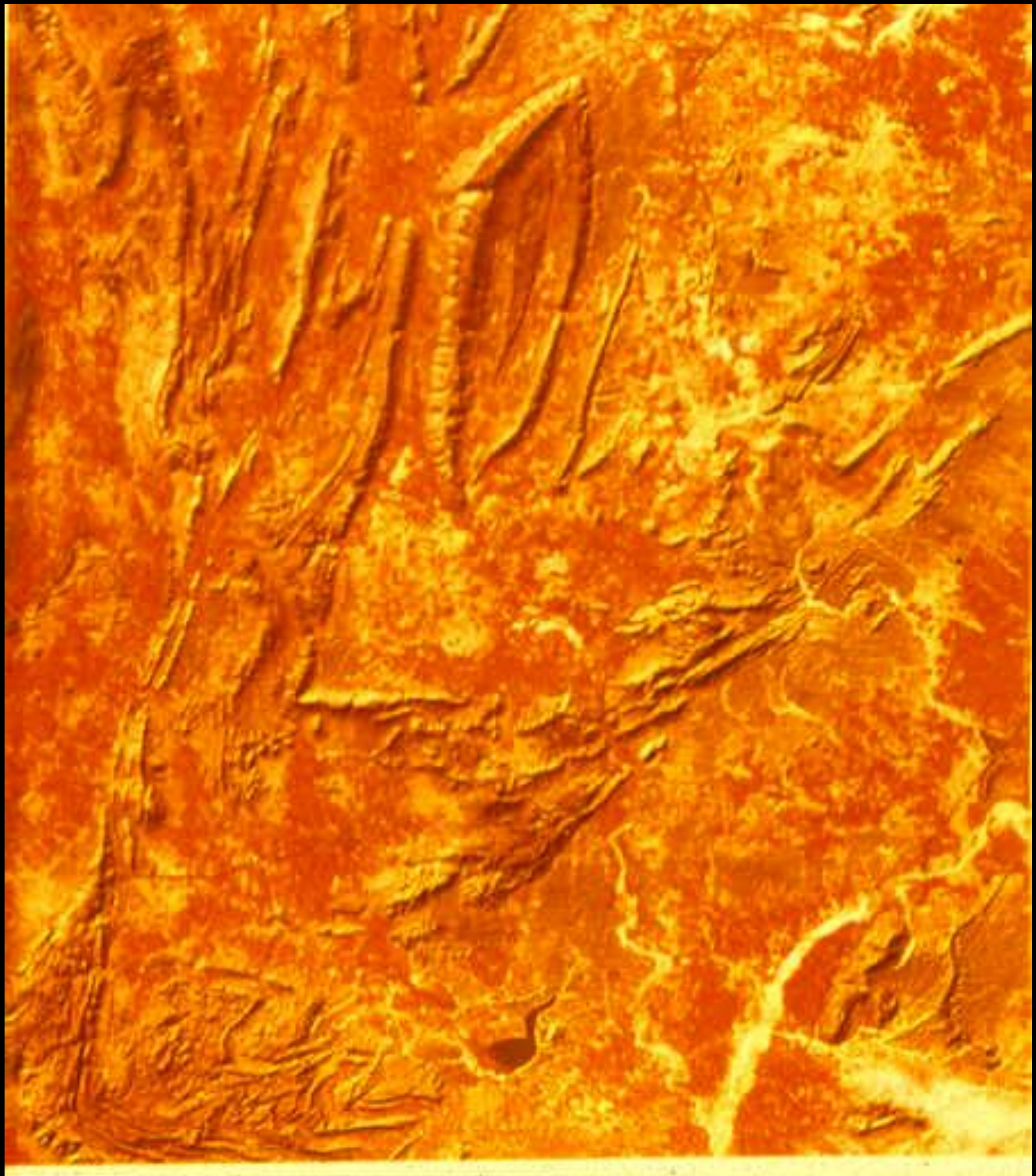


LISS III - BURMA



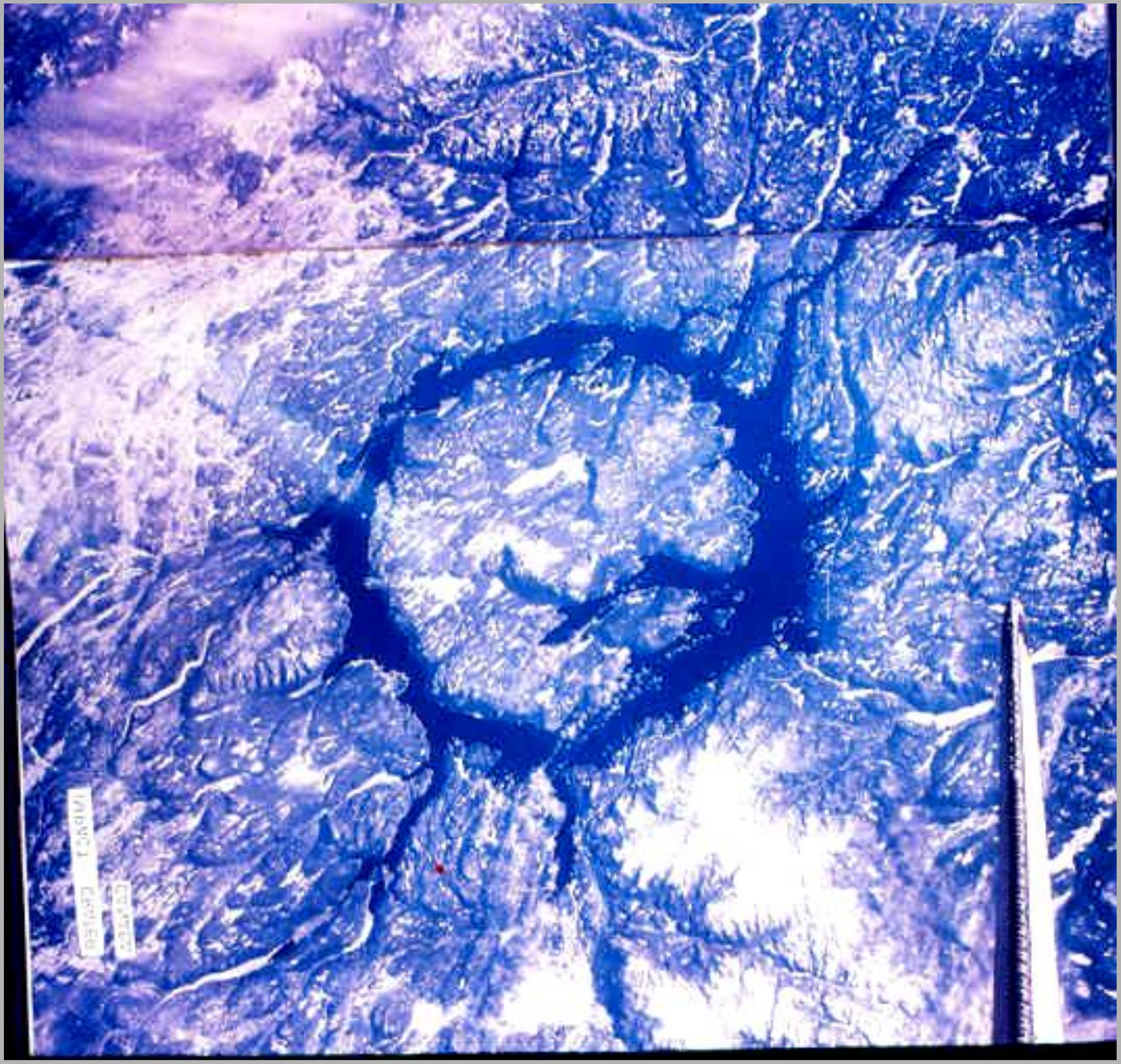
IRAN FOLD

Eastern ghats



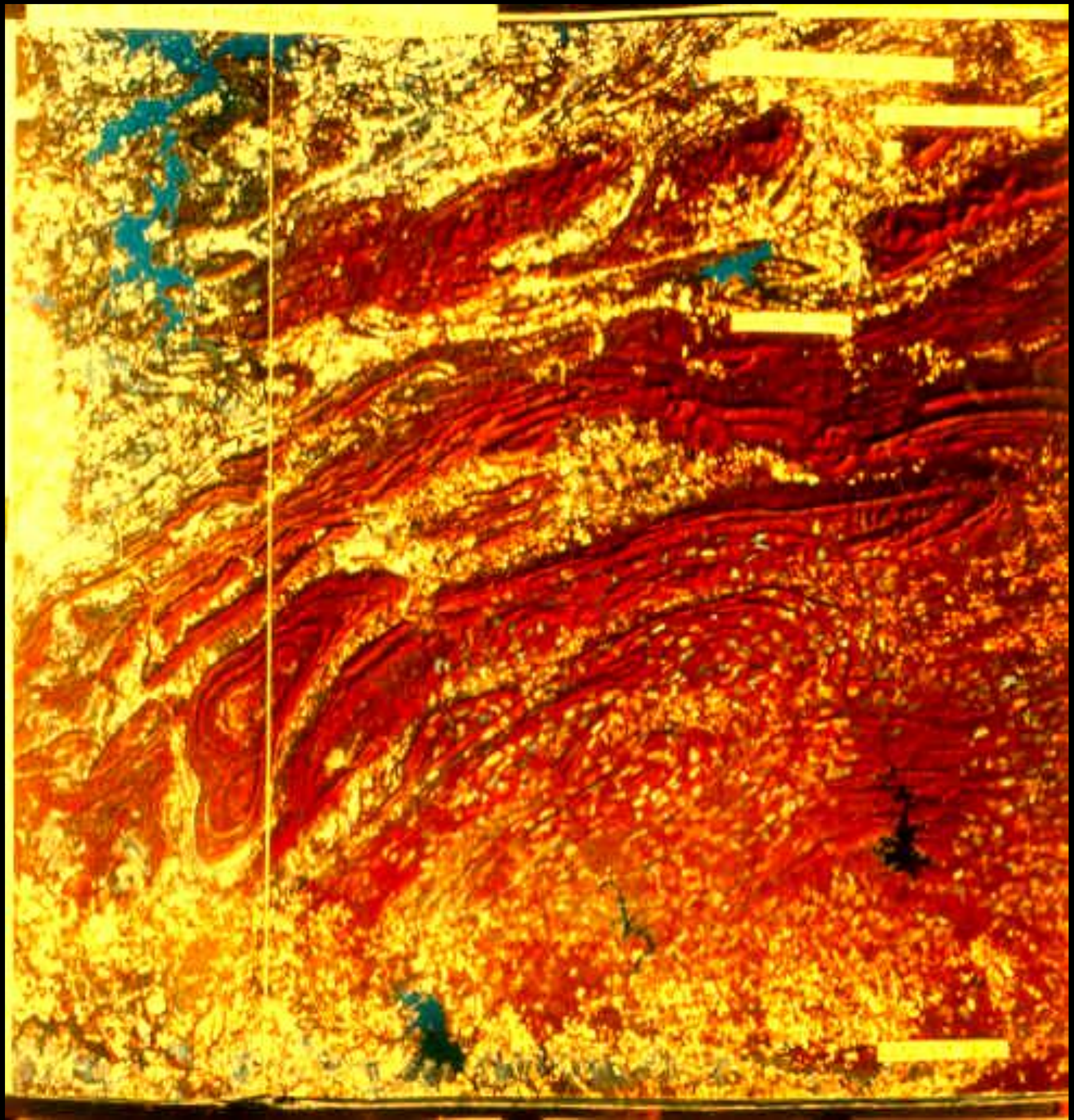
ALWAR
Quartzites

CIRCULAR DRAINAGE



Radial & Annular drainage

FOLDS OF U S A



Structural mapping Through Remote Sensing:

- Interpretation & tracing of Structural Trend Lines from satin
  - Linear and curvilinear Ridges
  - Colour or textural linearity
  - Bedding and foliation
  - Structural hills
- Possible dip direction of these trend lines
- Constructing fold pattern by connecting trend lines
- Tracing of fold styles
- Marking the axial traces of these fold styles
- Demarcation of domains based on the orientation of axial traces and fold styles
- Constructing entire fold pattern of the area under study
- Constructing the structural history

LANDSAT TM IMAGERY SHOWING STRUCTURAL TRENDS

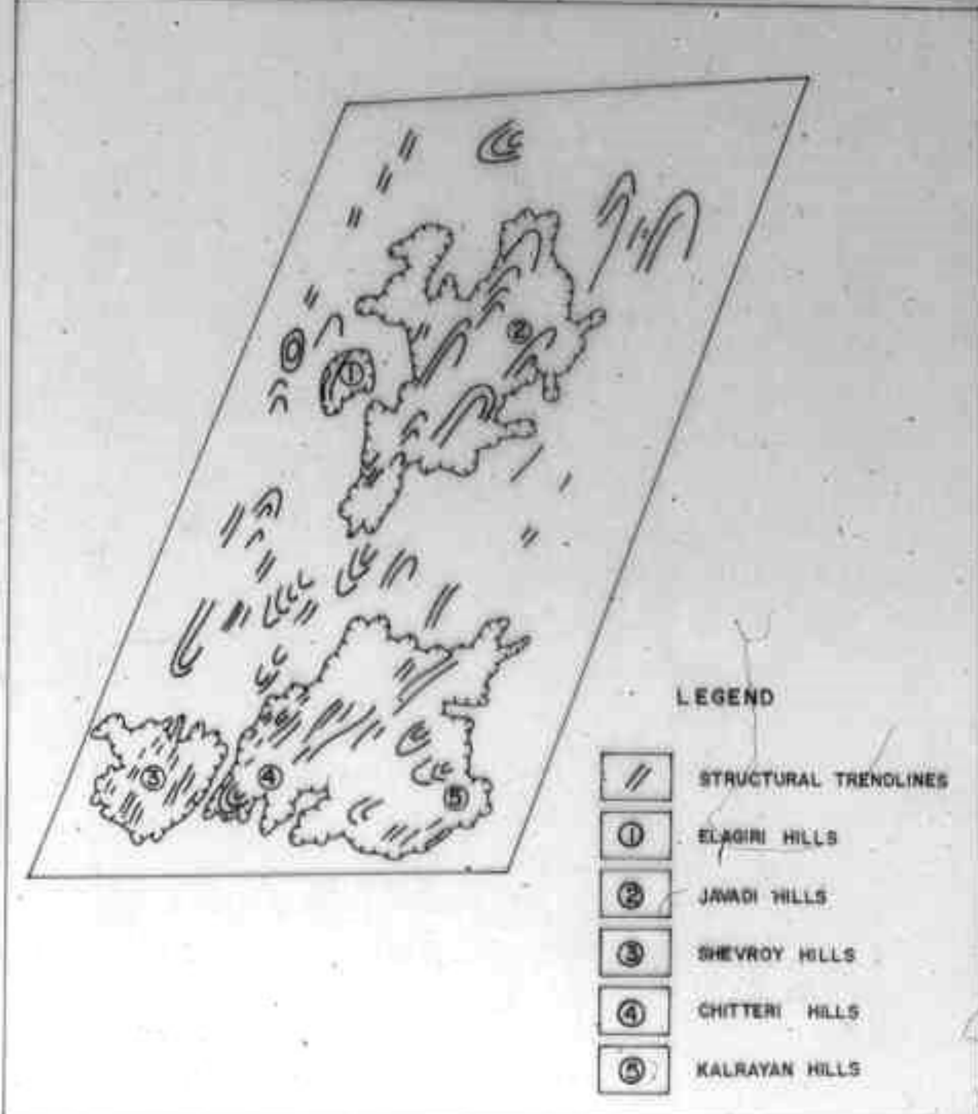
(NOT TO SCALE)

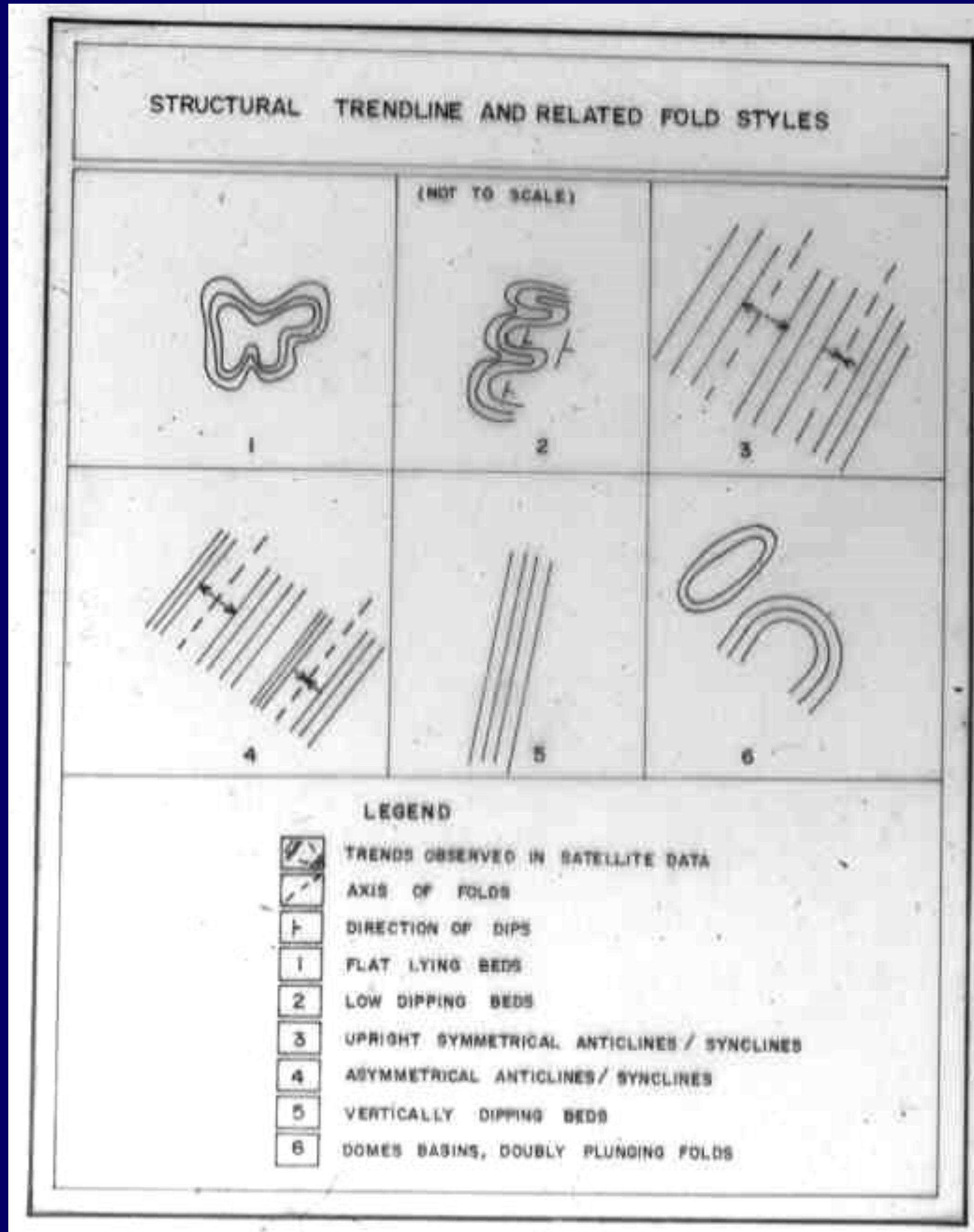
LEGEND

STRUCTURAL TRENDS

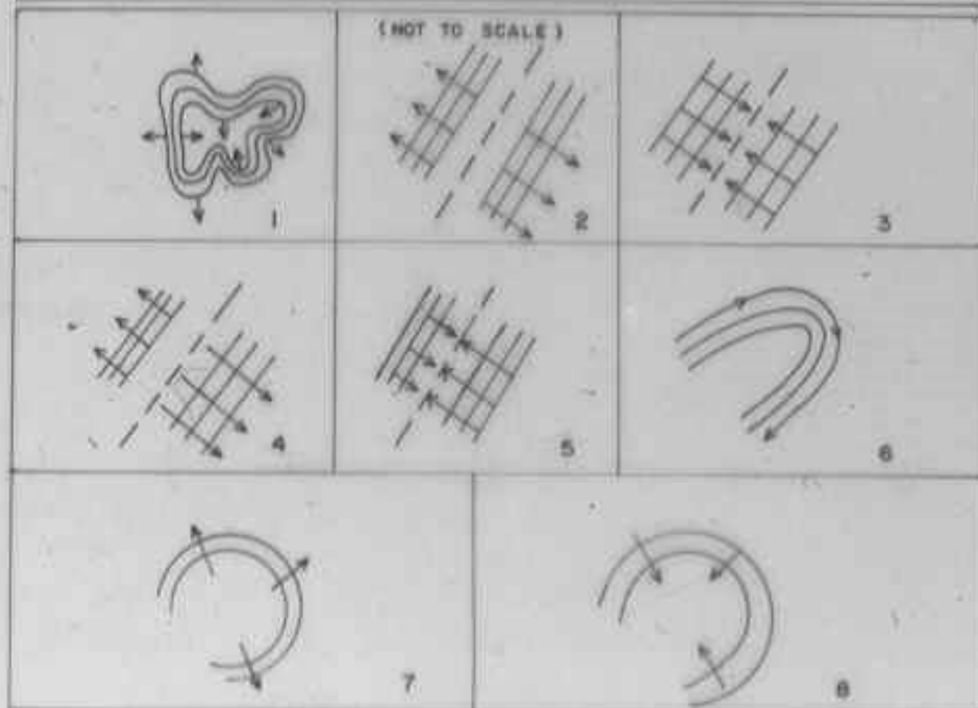
N.B: Type of imagery: TM Thermal band - Sobel filter

STRUCTURAL TRENDLINE MAP OF JAVADI - SHEVROY CHITTERI - KALRAYAN HILLS




STRUCTURAL TRENDLINE AND RELATED FOLD STYLES
(NOT TO SCALE)
1
2
3
4
5
6
LEGEND
TRENDS OBSERVED IN SATELLITE DATA
AXIS OF FOLDS
DIRECTION OF DIPS
1 FLAT LYING BEDS
2 LOW DIPPING BEDS
3 UPRIGHT SYMMETRICAL ANTICLINES / SYNCLINES
4 ASYMMETRICAL ANTICLINES/ SYNCLINES
5 VERTICALLY DIPPING BEDS
6 DOMES BASINS, DOUBLY PLUNGING FOLDS

STRUCTURAL TRENDS, DRAINAGE PATTERN AND FOLDS



LEGEND

STRUCTURAL TRENDS

DRAINAGE CHARACTERISTICS

- DRAINAGE ALONG WITH THEIR DIRECTION OF FLOW
- 1 INNER CONTRIPETAL AND OUTER CENTRIFUGAL - PLATEAU
- 2 PARALLEL DIVERGENT - SYMMETRICAL ANTICLINE
- 3 PARALLEL CONVERGENT - SYMMETRICAL SYNCLINE
- 4 PARALLEL DIVERGENT WITH INEQUAL LENGTHS - ASYMMETRICAL ANTICLINE
- 5 PARALLEL CONVERGENT WITH INEQUAL LENGTHS - ASYMMETRICAL SYNCLINE
- 6 ANNULAR / ARCUATE - ANTICLINE / SYNCLINE CLOSURE
- 7 RADIAL CENTRIFUGAL - DOME
- 8 RADIAL CENTRIPETAL - BASIN

Fig. 1·6

SATELLITE IMAGERY SHOWING STRUCTURAL TRENDLINES AND SHADOWS

(NOT TO SCALE)

LEGEND

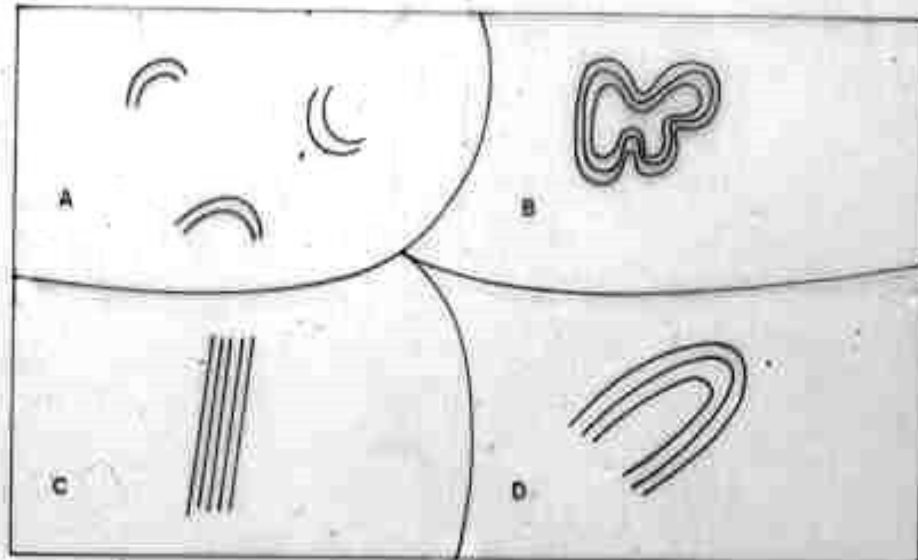
STRUCTURAL TRENDS

DIRECTION OF DIP OF BEDS

Fig. 1.7

DEMARCATION OF STRUCTURAL DOMAINS - CONCEPTUAL MODEL

(NOT TO SCALE)



LEGEND

A-D - DIFFERENT STRUCTURAL DOMAINS

A - DOMAINS OF DOMES AND BASINS

B - DOMAINS OF FLAT LYING BEDS

C - DOMAINS OF TIGHT FOLDS

D - DOMAINS OF MARGINAL TIGHT FOLDS

Fig. 1·10

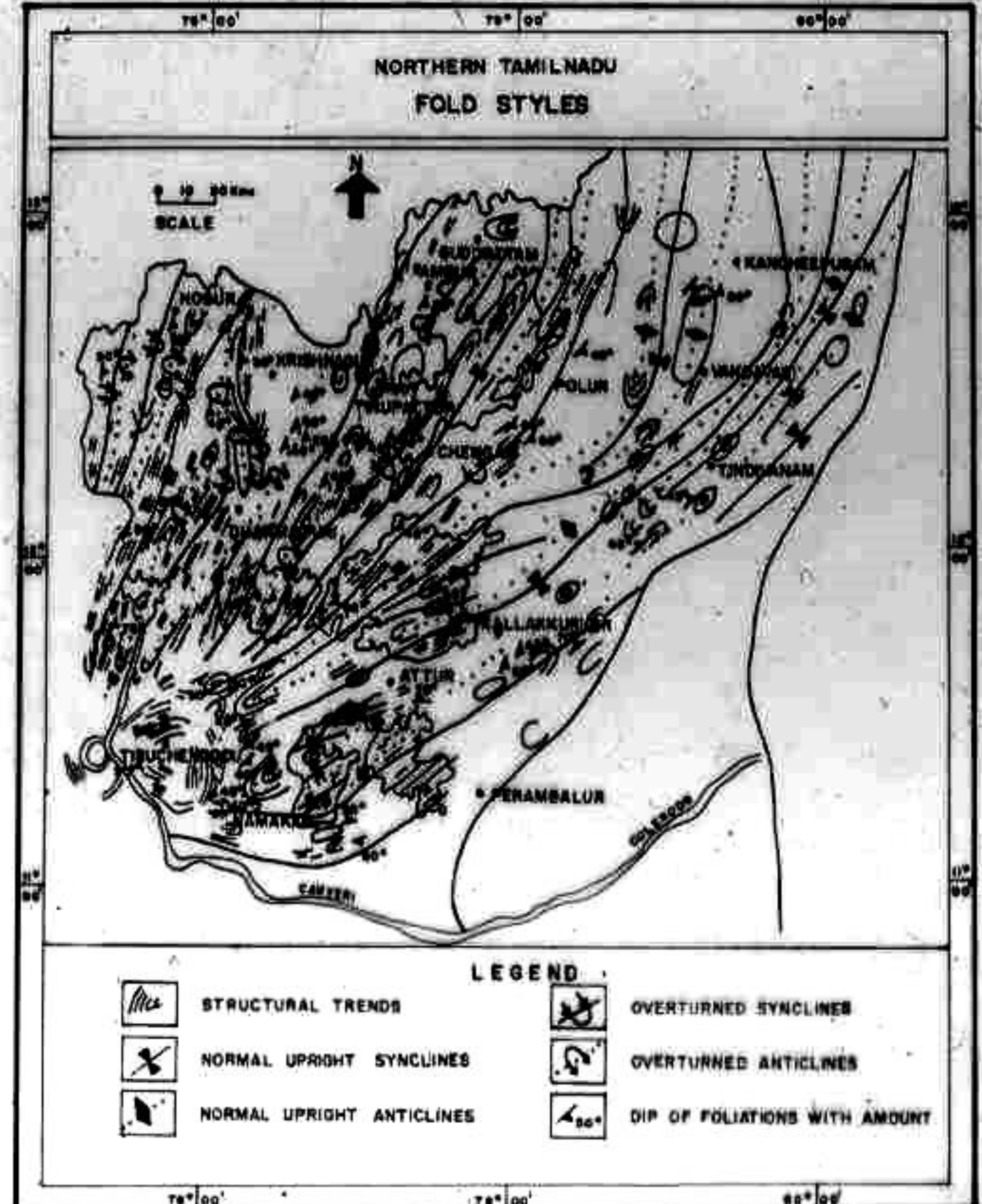
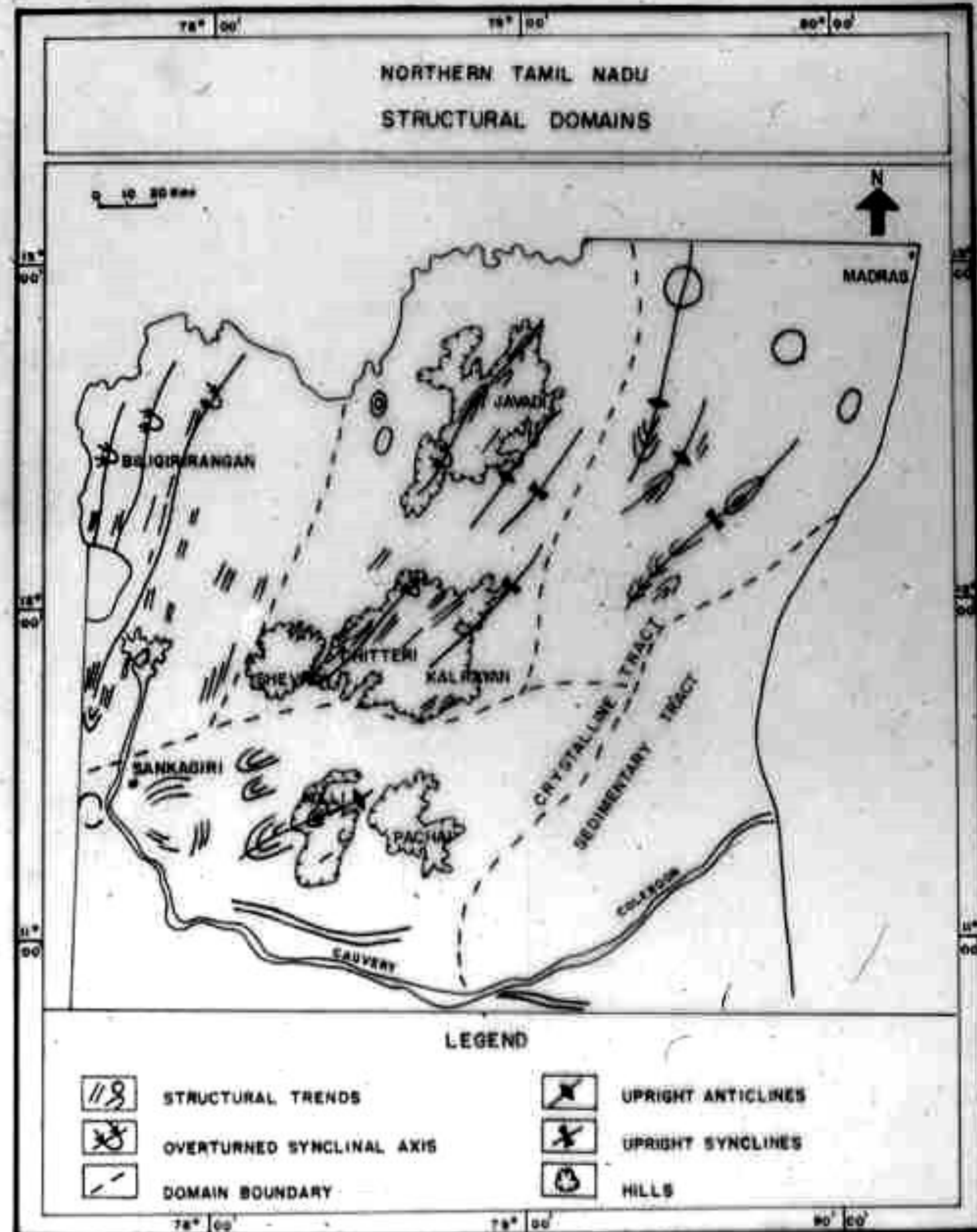
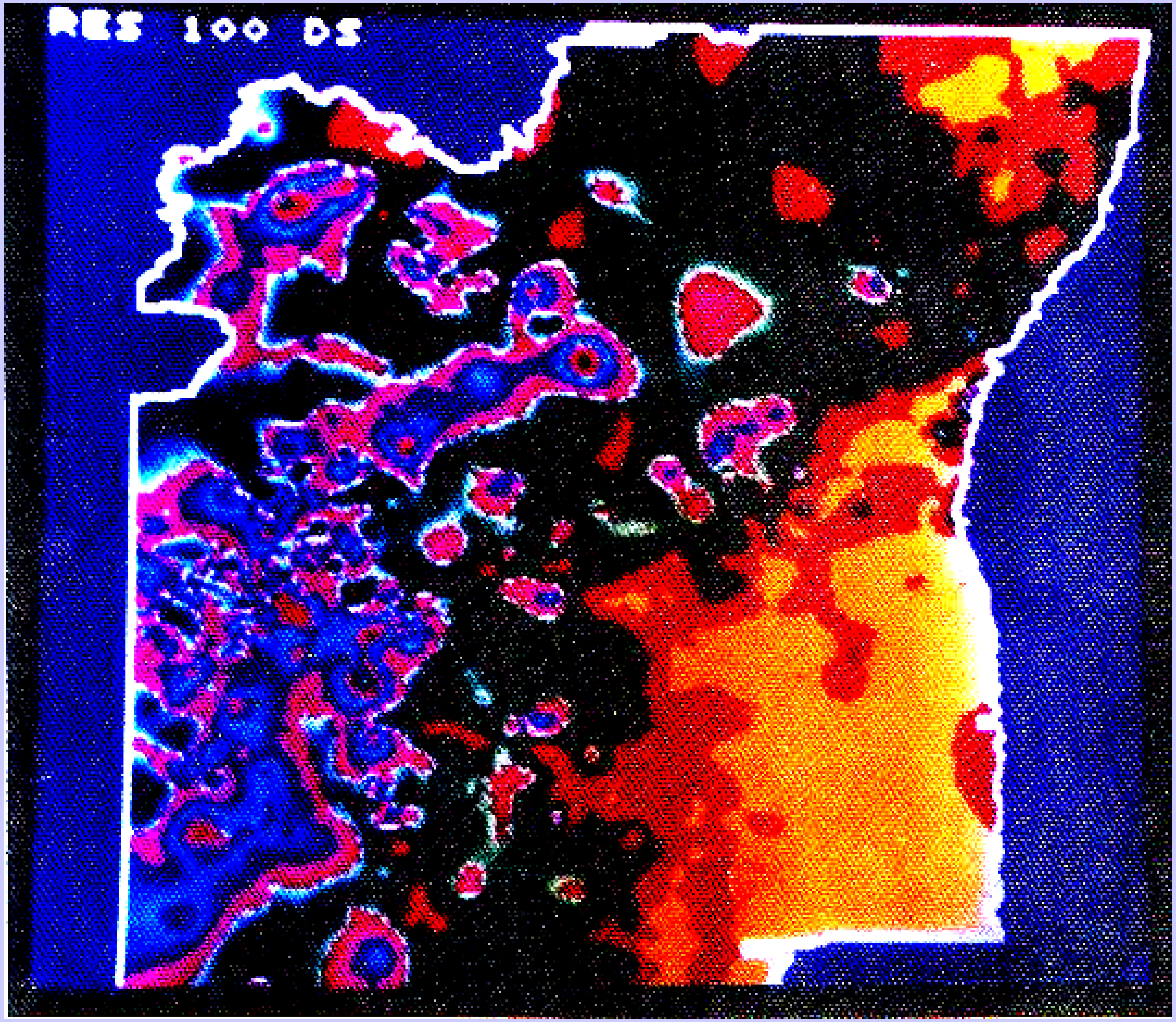

NORTHERN TAMILNADU
FOLD STYLES
SCALE
N
HOSUR
KRISHNAGIRI
POLUR
KANCHEEPURAM
VANDAVASI
CHENGAM
TINDIVANAM
KALLAKKURICHI
ATTUR
TIRUCHENGODE
NAMAKKAL
PERAMBALUR
CAUVERY
COLEROON
LEGEND
STRUCTURAL TRENDS
NORMAL UPRIGHT SYNCLINES
NORMAL UPRIGHT ANTICLINES
OVERTURNED SYNCLINES
OVERTURNED ANTICLINES
DIP OF FOLIATIONS WITH AMOUNT

Fig. 3·8


NORTHERN TAMIL NADU
STRUCTURAL DOMAINS
N
MADRAS
BILIGIRIRANGAN
JAVADI
SHEVAROY
YELAGIRI
KALRAYAN
SANKAGIRI
PACHAI
CRYSTALLINE TRACT
SEDIMENTARY TRACT
COLEROON
CAUVERY
LEGEND
STRUCTURAL TRENDS
OVERTURNED SYNCLINAL AXIS
DOMAIN BOUNDARY
UPRIGHT ANTICLINES
UPRIGHT SYNCLINES
HILLS

Evaluation of Depth Extension of Folds Using Multi Depth Satellite Data

Resistivity Image of 100m Depth



Sub surface Structures study –Depth Probe:

Electrical Resistivity Data Analysis

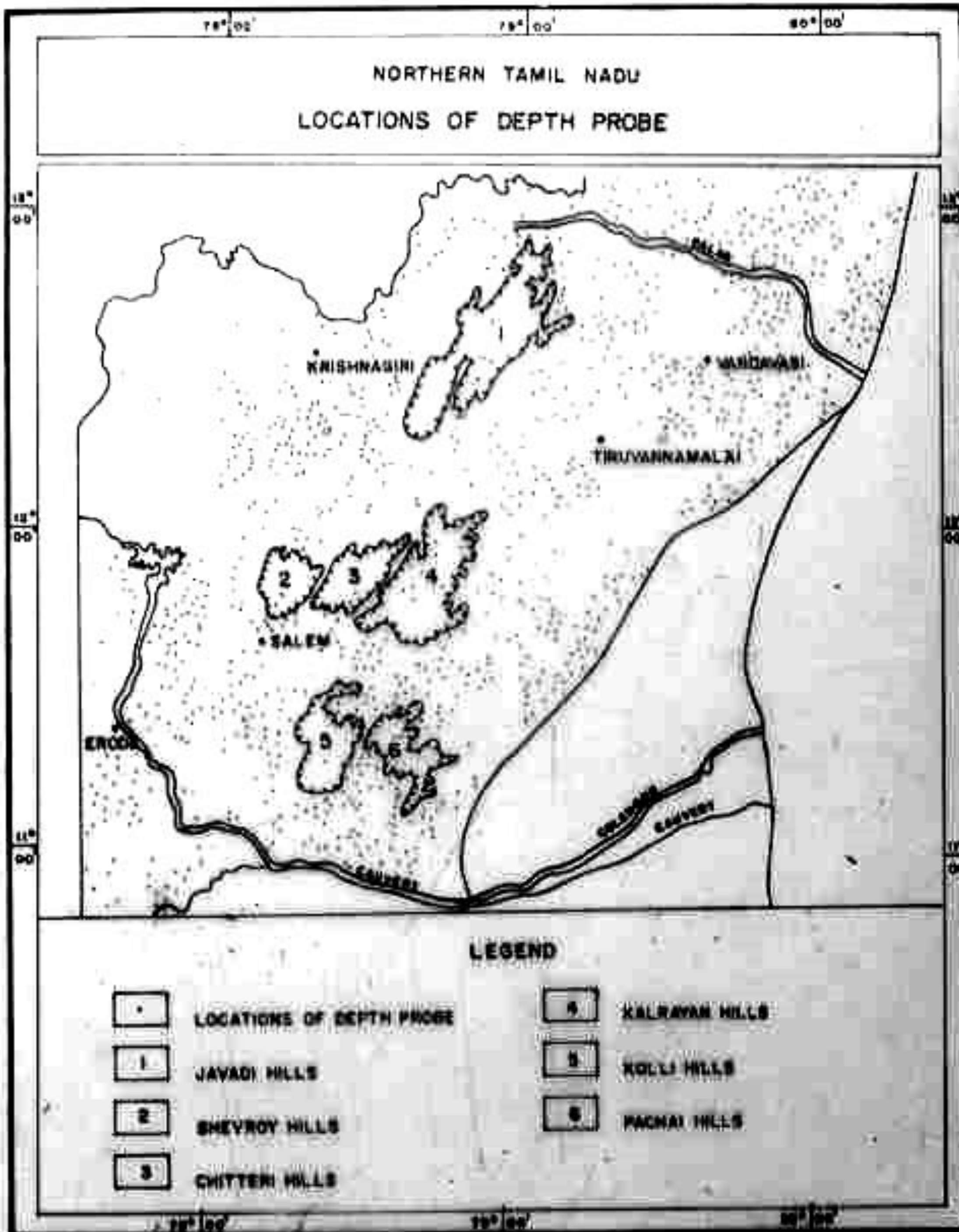
- ❖ **Apparent resistivity for each location**
- ❖ **At different depth (26,50,75 and 100 meters)**
- ❖ **Preparation of Isoresistivity contours**

Interpretation:

- ➢ **Types of fold styles on the nature of shape, pattern and resistivity values**
- ➢ **Higher resistivity at the centre / core – Hard and solid rock at its core**

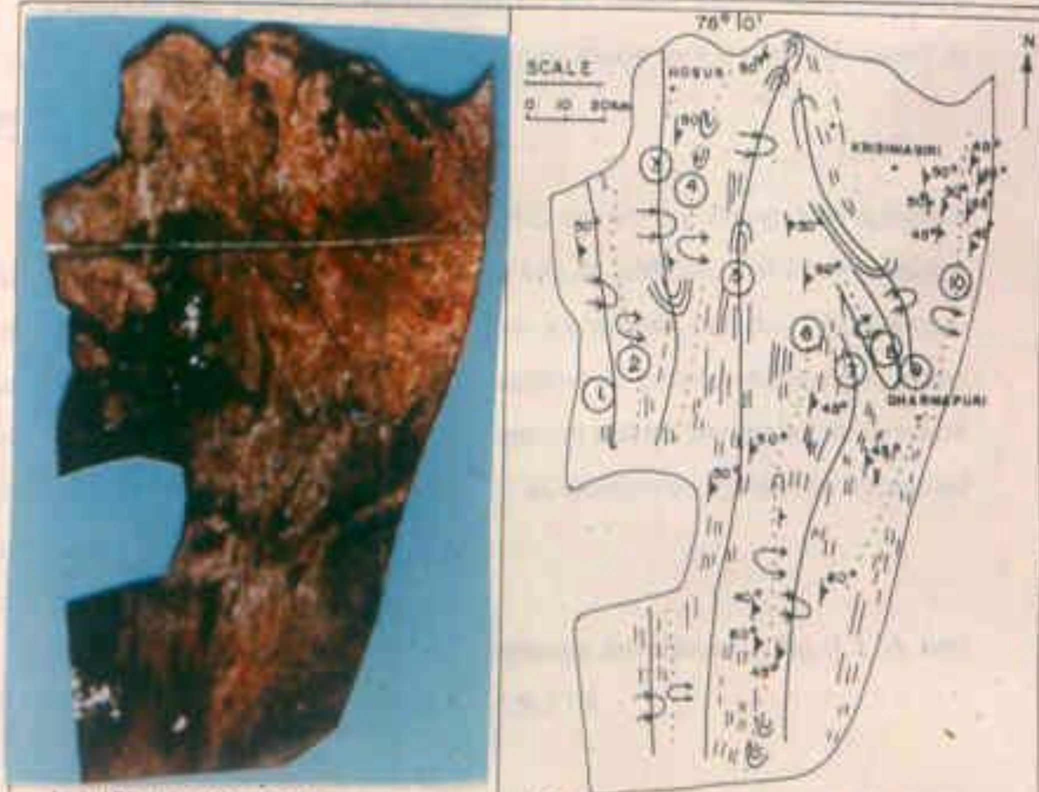
(Dobrin and Savit 1988)

- ❖ **Anticline : Elliptical contour with central high value**
- ❖ **Syncline : Elliptical contour with central low value**


NORTHERN TAMIL NADU
LOCATIONS OF DEPTH PROBE
KRISHNAGIRI
TIRUVANNAMALAI
SALEM
CAUVERY
LEGEND
LOCATIONS OF DEPTH PROBE
1 JAVADI HILLS
2 SHEVROY HILLS
3 CHITTERI HILLS
4 KALRAYAN HILLS
5 KOLLI HILLS
6 PACHAI HILLS

SURFICIAL EXPRESSION OF FOLDS IN BILIGIRIRANGAN DOMAIN

(Deduced from satellite imagery)



(A) IRS-IA FCC imagery

(B) Structural trends and fold styles

LEGEND

- STRUCTURAL TRENDS
- OVERTURNED SYNCLINES
- OVERTURNED ANTICLINES
- 80° DIP OF FOLIATIONS WITH AMOUNT

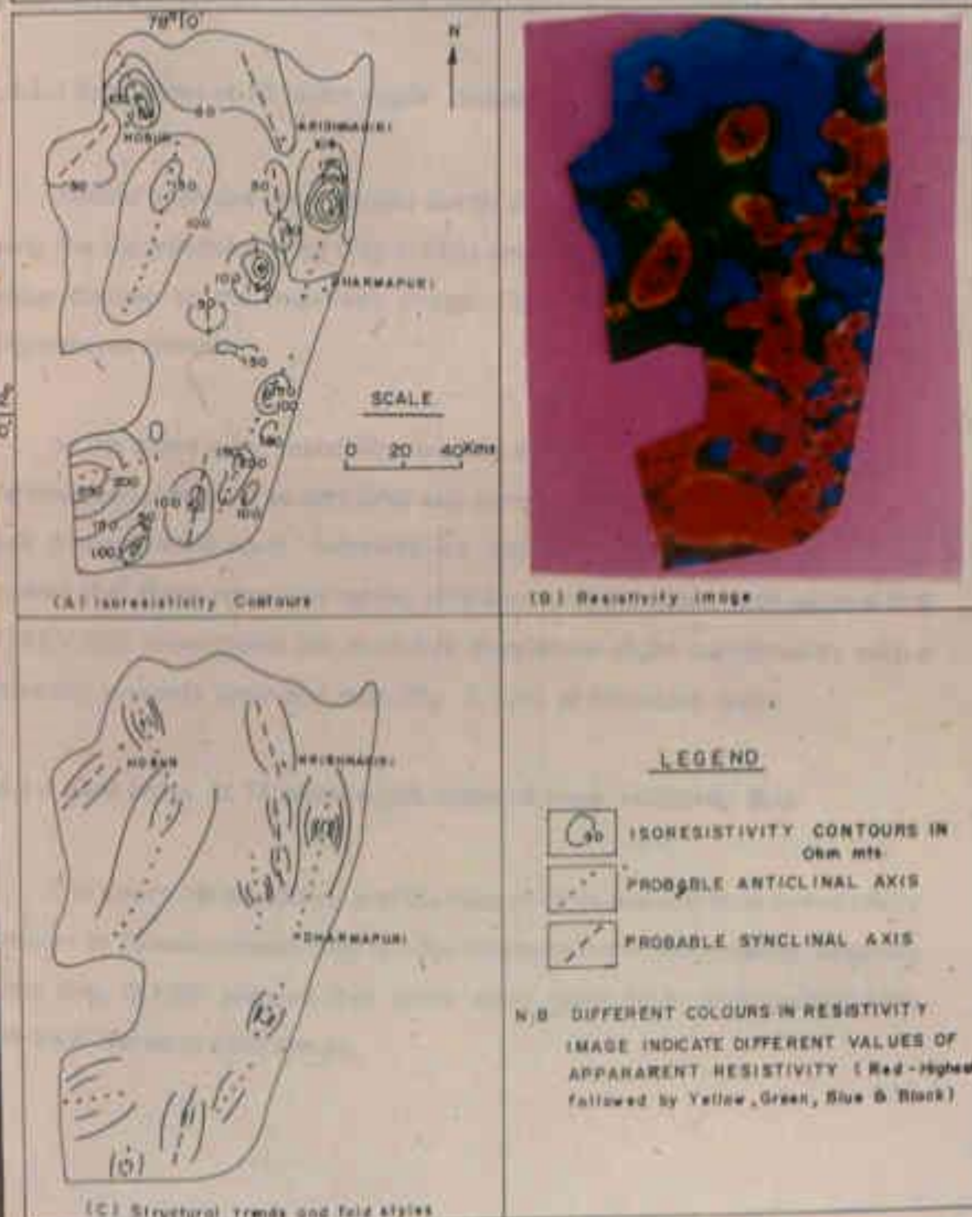
1, 3, 5, 7 AND 9 SYNCLINES

2, 4, 6, 8 AND 10 ANTICLINES

FIG. 3.10

EXPRESSION OF FOLDS AT 26 METRE DEPTH IN BILIGIRIRANGAN DOMAIN

(Deduced from resistivity data)



EXPRESSION OF FOLDS AT 50 METRE DEPTH IN BILIGIRIRANGAN DOMAIN

(Deduced from resistivity data)

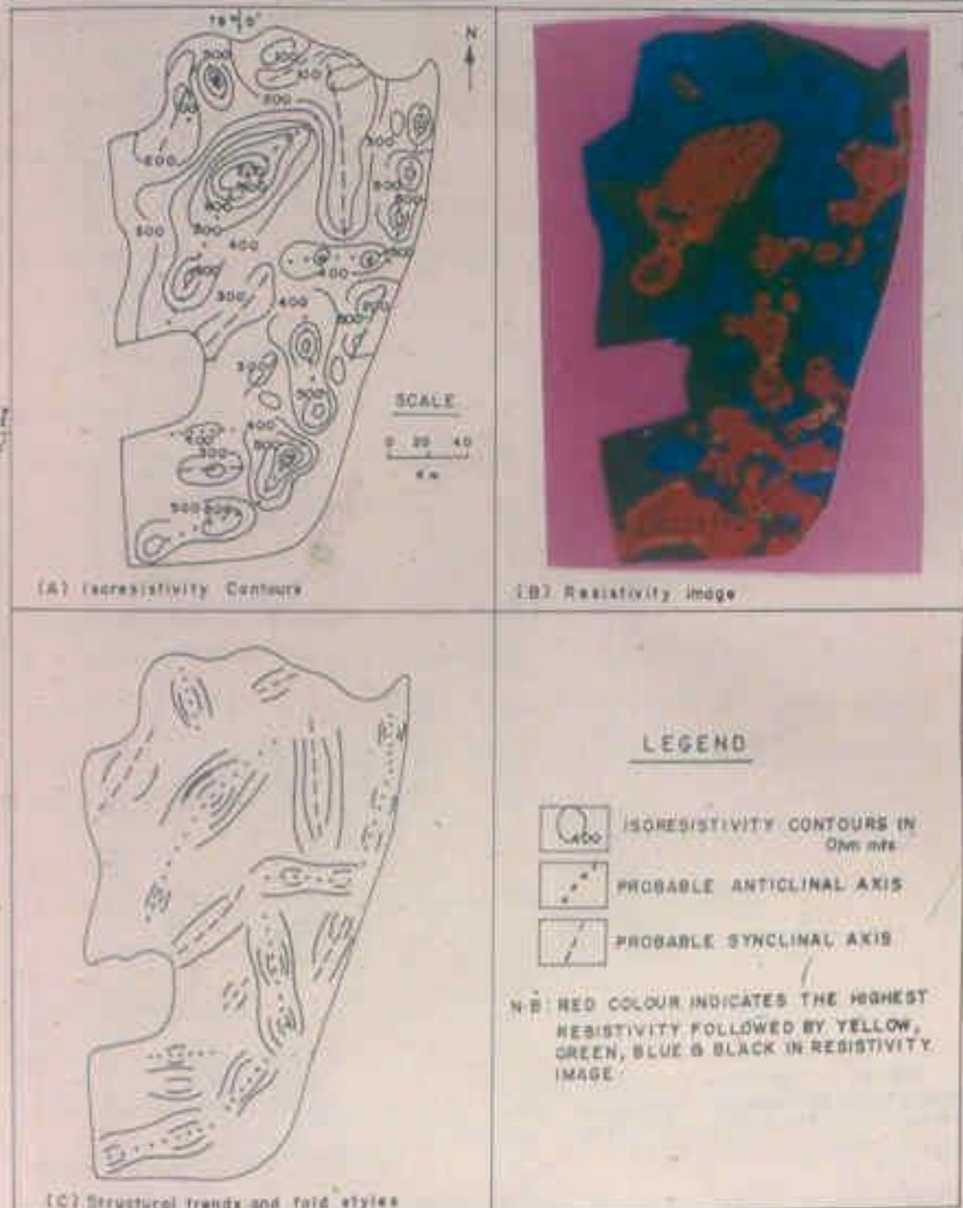
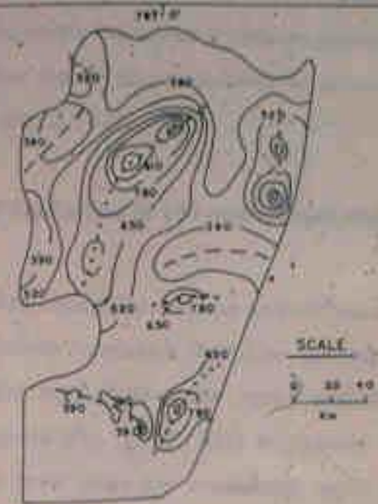


FIG. 3.12

EXPRESSION OF FOLDS AT 75 METRE DEPTH IN BILIGIRIRANGAN DOMAIN

(Deduced from resistivity data)



(A) Iso resistivity contours

(B) Resistivity Image

(C) Structural trends and fold styles

LEGEND

ISORESISTIVITY CONTOURS IN Ohm mts

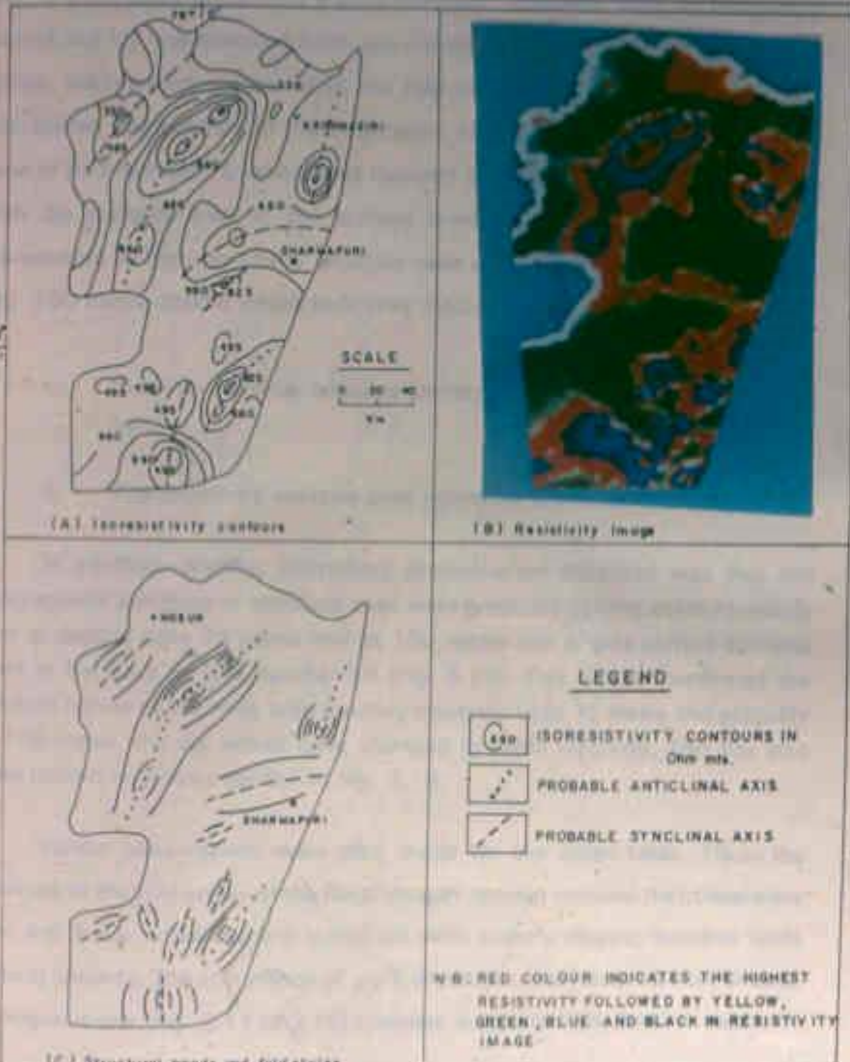
PROBABLE ANTICLINAL AXIS

PROBABLE SYNCLINAL AXIS

N.B. RED COLOUR INDICATES THE HIGHEST RESISTIVITY FOLLOWED BY YELLOW,GREEN, BLUE AND BLACK IN RESISTIVITY IMAGE

EXPRESSION OF FOLDS AT 100 METRE DEPTH IN BILIGIRIRANGAN DOMAIN

(Deduced from resistivity data)



(A) Isoresistivity contours

(B) Resistivity image

(C) Structural trends and fold styles

LEGEND

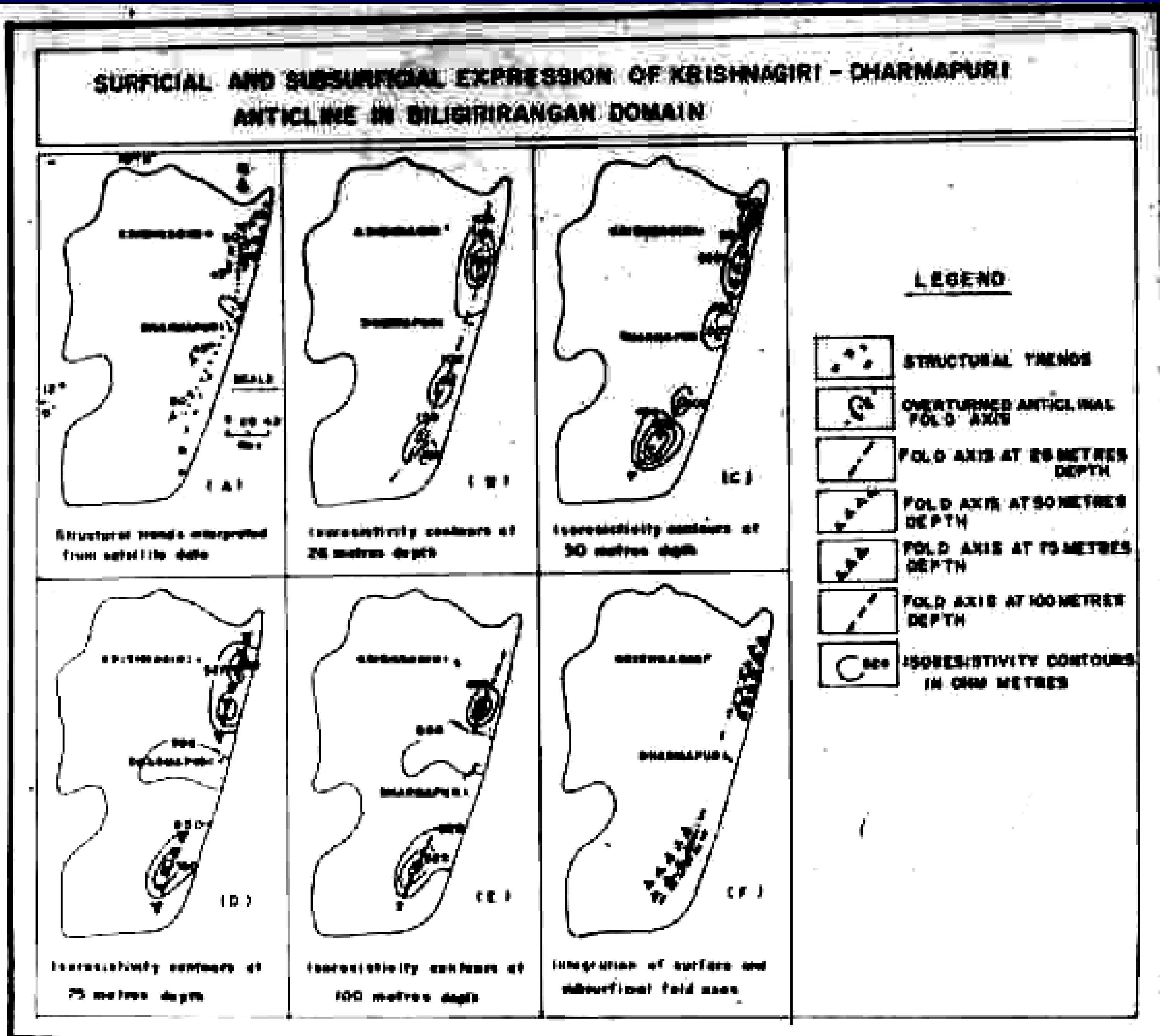
ISORESISTIVITY CONTOURS IN Ohm mts.

PROBABLE ANTICLINAL AXIS

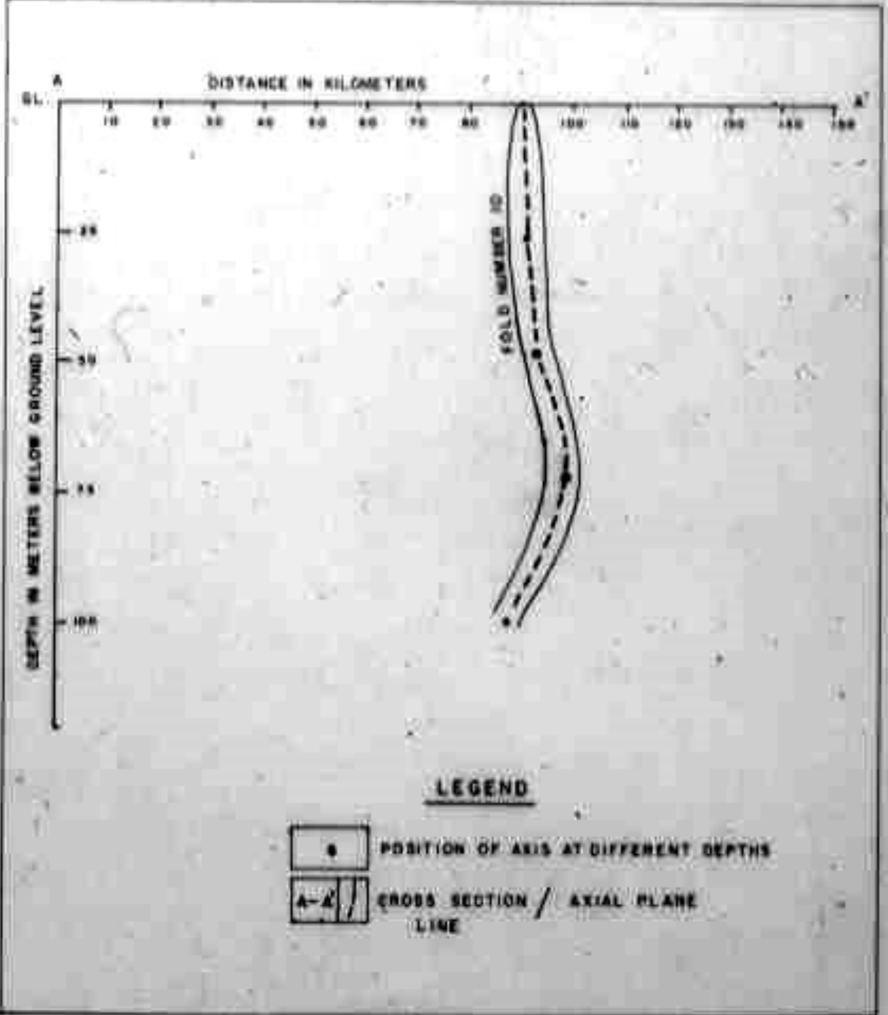
PROBABLE SYNCLINAL AXIS

N.B. RED COLOUR INDICATES THE HIGHEST RESISTIVITY FOLLOWED BY YELLOW, GREEN, BLUE AND BLACK IN RESISTIVITY IMAGE

FIG. 4.14

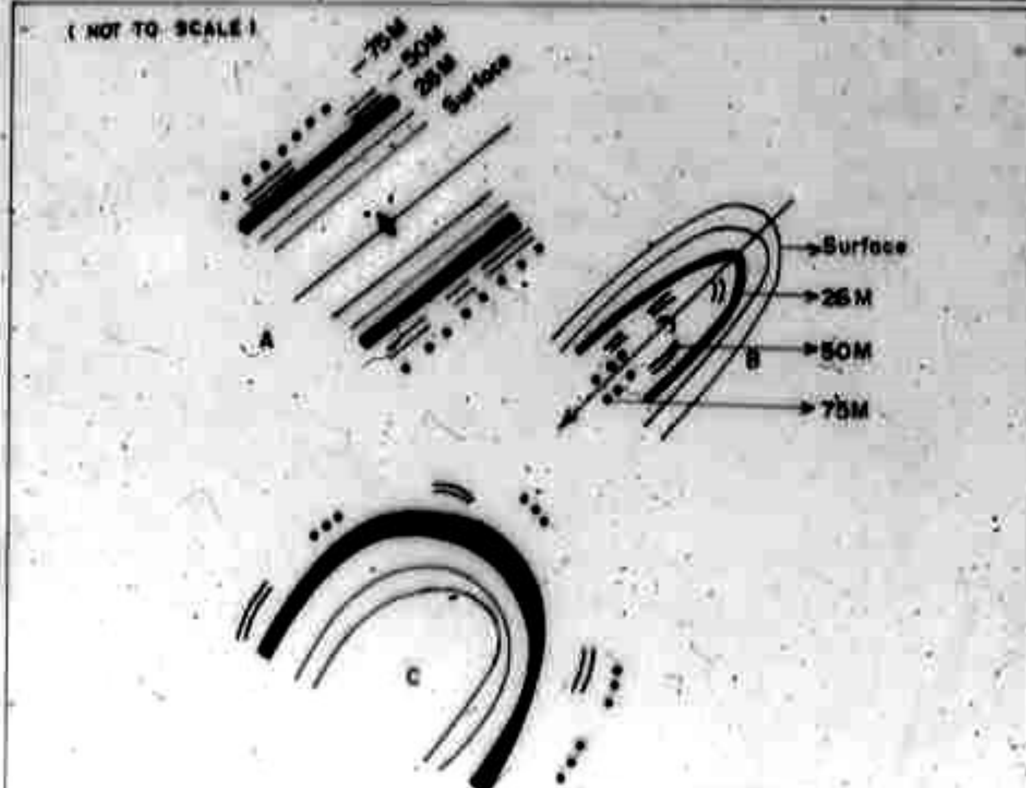

SURFICIAL AND SUBSURFICIAL EXPRESSION OF KRISHNAGIRI - DHARMAPURI
ANTICLINE IN BILIGIRIRANGAN DOMAIN
LEGEND
STRUCTURAL TRENDS
OVERTURNED ANTICLINAL FOLD AXIS
FOLD AXIS AT 25 METRES DEPTH
FOLD AXIS AT 50 METRES DEPTH
FOLD AXIS AT 75 METRES DEPTH
FOLD AXIS AT 100 METRES DEPTH
ISORESISTIVITY CONTOURS IN OHM METRES
KRISHNAGIRI
DHARMAPURI
(A)
(C)
(D)
(E)
(F)

CROSS SECTION OF FOLD NUMBER 10 IN BILIGIRIRANGAN DOMAIN



FIG·3·16

SUBSURFACE MORPHOLOGY OF FOLDS
CONCEPTUAL FIGURE



LEGEND

STRUCTURAL TRENDS AT SURFACE LEVEL

STRUCTURAL TRENDS AT 25 METRE DEPTH

STRUCTURAL TRENDS AT 50 METRE DEPTH

STRUCTURAL TRENDS AT 75 METRE DEPTH

AEROMAGNETIC SURVEY:

Advantages:

- Greater depth information than the thickness of surface deposits
  (>10kms under ideal conditions)
- Uniform picture of large areas
- Differentiates rocks with 0.5% - 1% difference in magnetic contents
- Large structures – subsurface or unrecognizable on ground – are revealed
- Discriminates between major (regional) and minor (local) structures
- Provide continuity of information
- Can be presented in contour maps
- Amenable to digital processing

Causes for magnetic anomalies:

- Various lithologies
- Various structures:
  - Strike and dip of conformable horizons
  - Folds (with marker beds)
  - Faults
    - Abrupt change in strike
    - Abrupt disappearance of horizon
    - Displacement of horizon

Magnetic Anomaly Interpretation:

- **QUALITATIVE**
- **QUANTITATIVE**

Factors affecting interpretation:

- **Line spacing**
- **Line direction**
- **Flight height**
- **Topographic relief**
- **Environment (Geological)**
  - **Structural complexity**
  - **Magnetic content**

QUALITATIVE INTERPRETATION

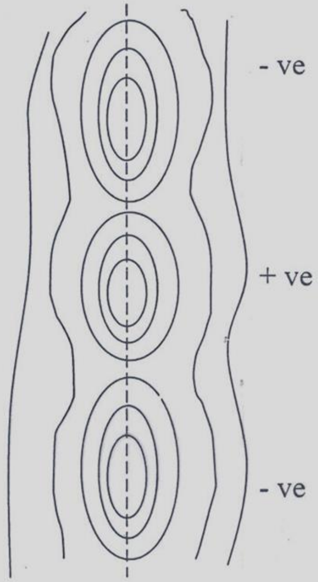
- **Size**
- **Shape**
- **Magnitude**
- **Attitude**

of magnetic anomaly depends on

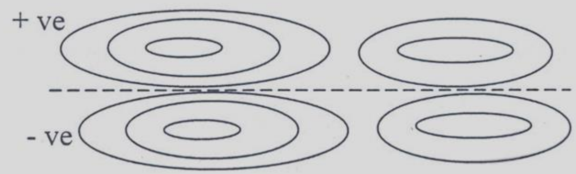
Latitude

Shape of the causative body

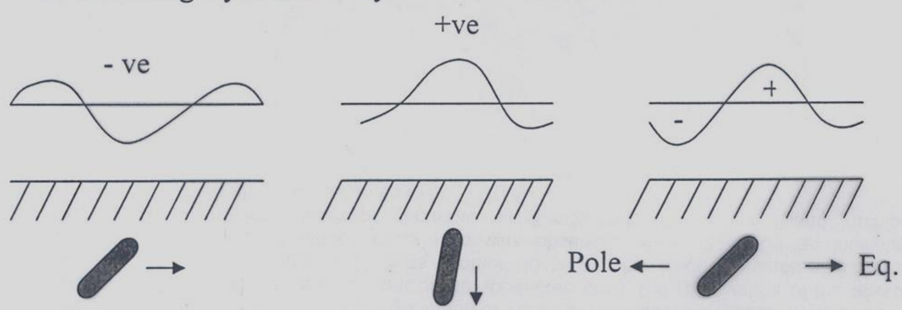
Orientation



N-S striking Dyke like body



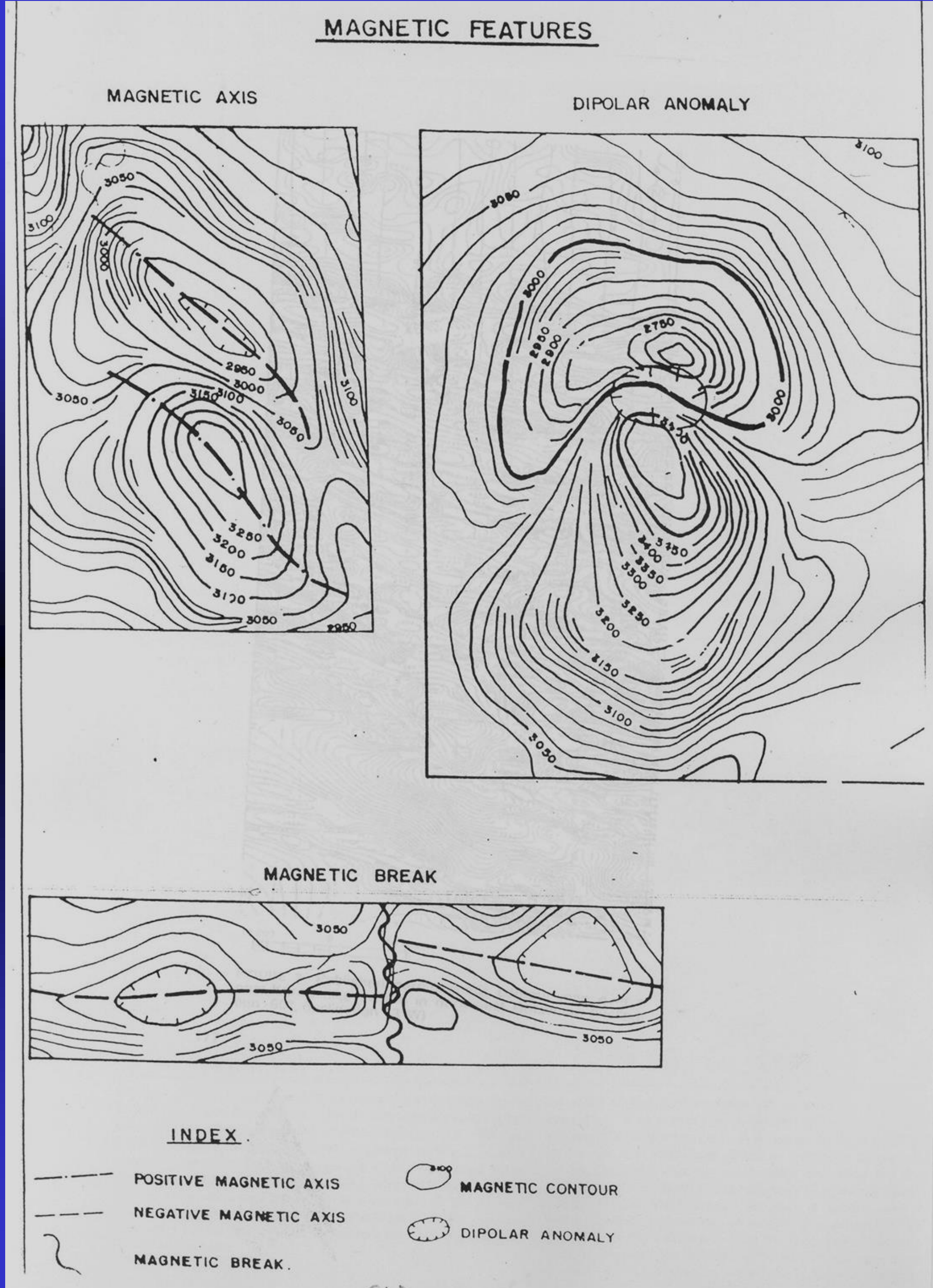
E-W striking Dyke like body



At magnetic equator
Mag. Incl = 0
Anomaly = -ve

At magnetic pole
Mag. Incl = 90^0
Anomaly = +ve

Between magnetic equator & pole Mag. Incl = 0 - 90^0
Anomaly = -ve
+ve towards equator
-ve towards pole



MAGNETIC FEATURES
MAGNETIC AXIS
DIPOLAR ANOMALY
MAGNETIC BREAK
INDEX.
POSITIVE MAGNETIC AXIS
NEGATIVE MAGNETIC AXIS
MAGNETIC BREAK.
MAGNETIC CONTOUR
DIPOLAR ANOMALY

QUALITATIVE INTERPRETATION

- **Size**
- **Shape**
- **Magnitude**
- **Attitude**

All these above magnetic anomalies depends on

- **Latitude**
- **Shape of the causative body**
- **Orientation**

QUANTITATIVE INTERPRETATION

- **Contour maps**
- **Magnetic profiles**
- **Standard curves**

Calculation of depth, size, shape, magnetic susceptibility etc using magnetic profiles

Comparison of magnetic profiles with -- Mathematical models & Standard profiles

Magnetic susceptibility tests conducted and compared with calculated susceptibility values

Structural Features

- ✓ Fold
- ✓ Fault
- ✓ Fracture / Lineament
- ✓ Shear Zone
- ✓ Thrust
- ✓ Joints

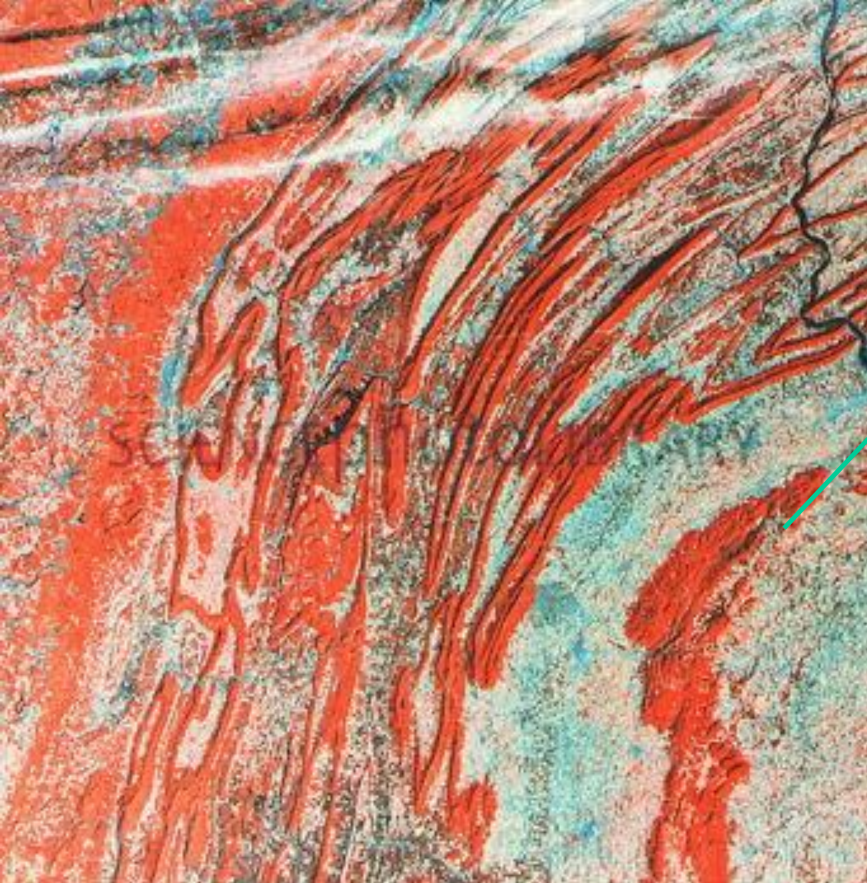
Intrusive Bodies

- ✓ Quartz Reef
- ✓ Pegmatite / Aplite vein
- ✓ Basic Dyke
- ✓ Basic Sill ridge

Mapping of structures from satellite imagery

Folds –

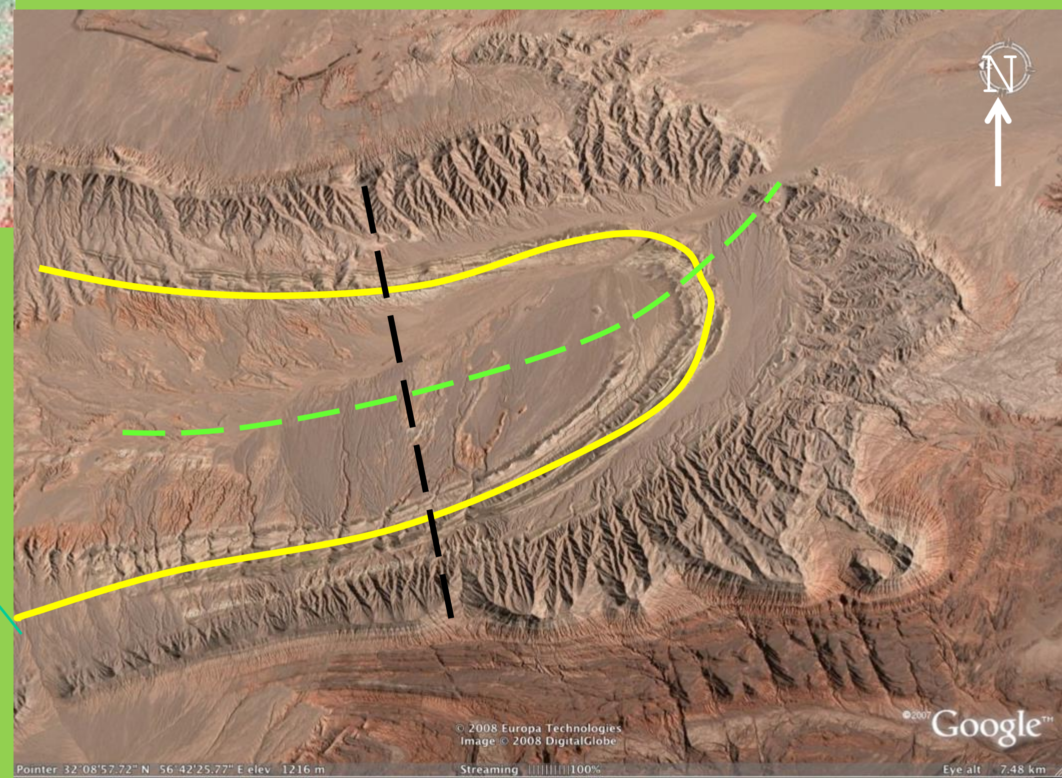
Folds may be defined as **undulations** or **bends** or **curvatures** developed in the rocks of the crust as a result of stresses to which these rock have been subjected from time to time in the past history of the earth.



How many fold generations can we interpret from this image?

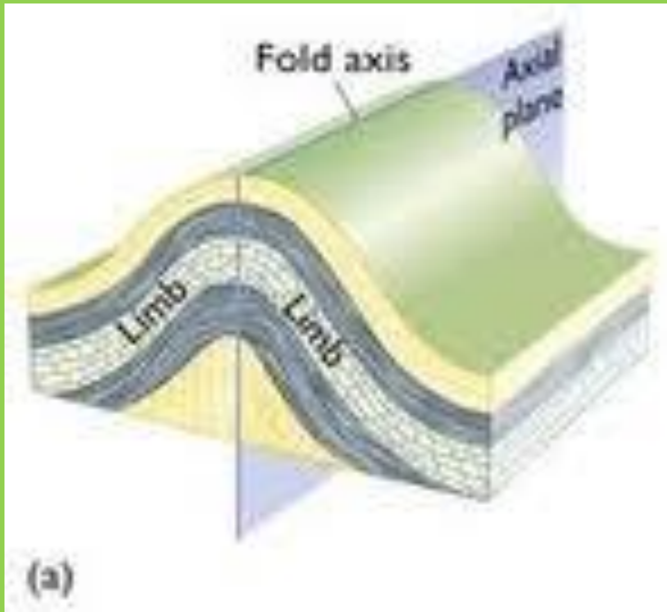
Find out the rock type?

Find out fold axis and axial plane from this Google image.



What type of structure present in this picture?

Is it possible to identify plunge from this picture?



Landsat Imagery showing fold

1. Fold
2. Fault
3. Dyke (generally follow the weak zone)
4. Lineament (linear and curvi-linear)is surface expression of zone of weakness

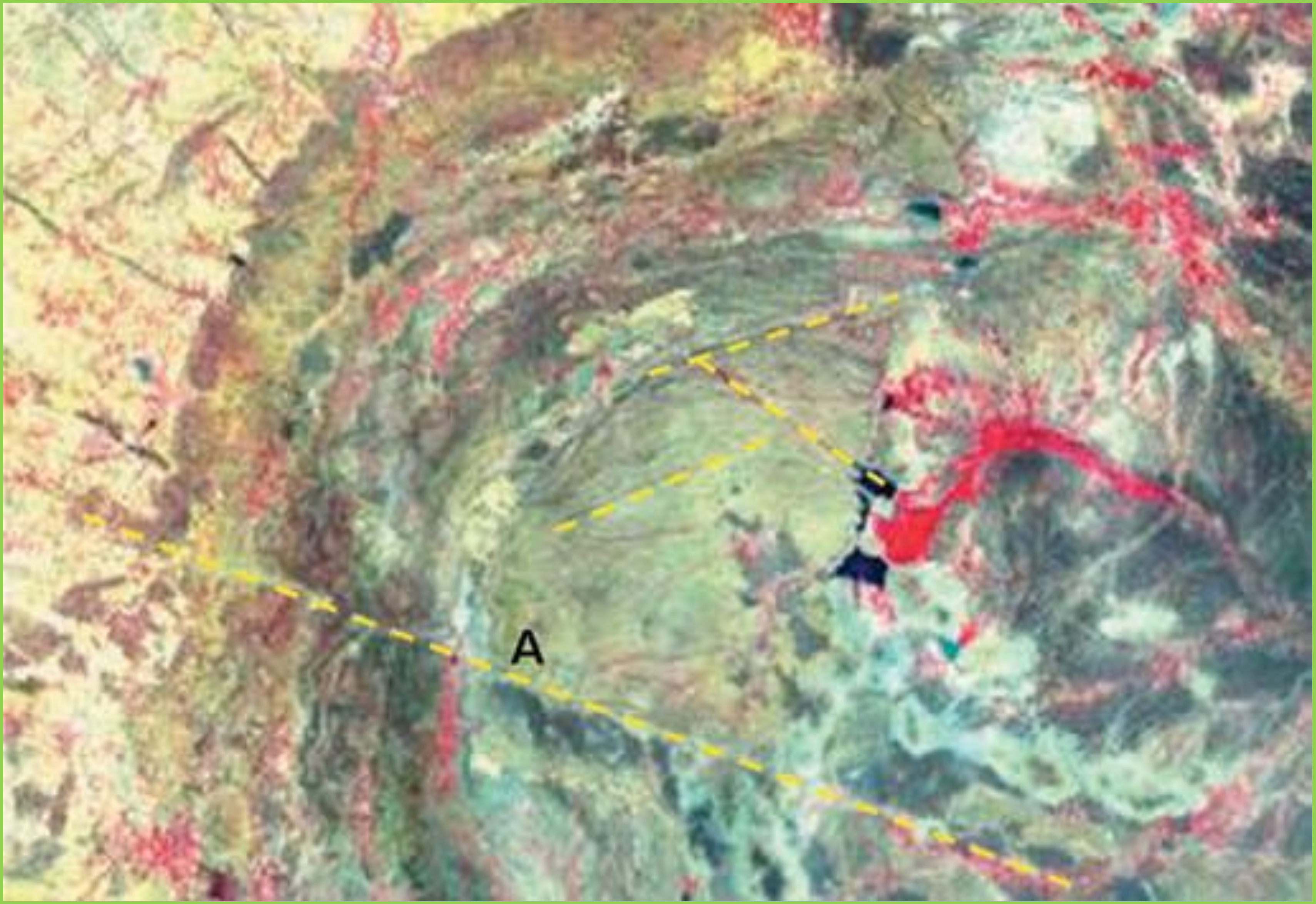
Yachavaram
Magaturu
Ardhaveedu
Donakonda
Kakarla
Near Cuddapah basin, A.P
Jangamguntla
Nagulavaram
Mohiddinpuram
4.75 km
© 2013 Google
© 2013 Cnes/Spot Image
Image © 2013 DigitalGlobe
Google earth
Imagery Date: 2/18/2012 15°39'38.52" N 79°03'33.16" E elev 232 m eye alt 20.75 km

Which one is Younger? Dh1 or Dh2

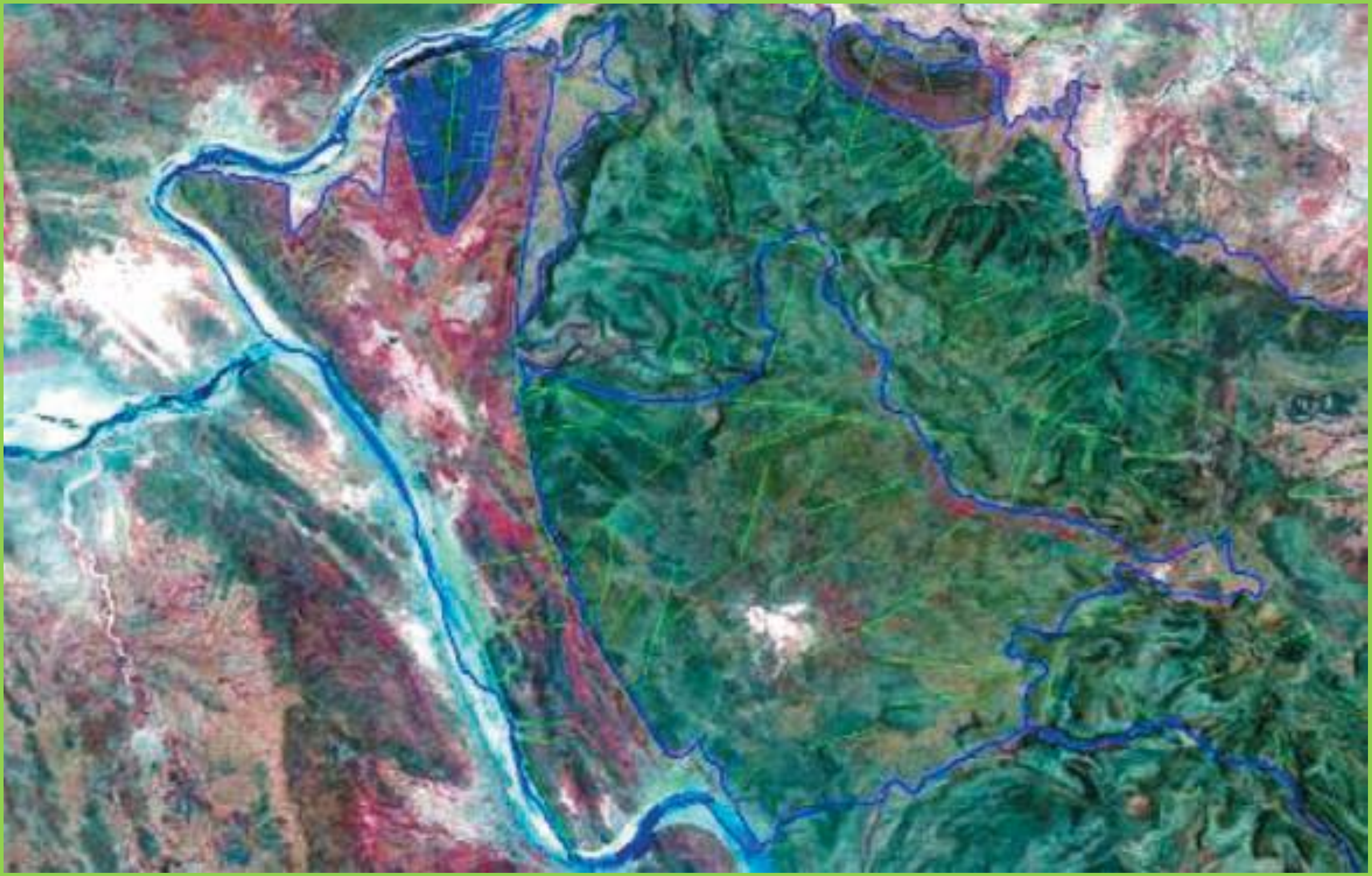

Cajon Pass
Spring
Valley Lake
San Andreas Fault
San Gabriel Mtns
San Bernardino Mtns
Los
Angeles

Paleo path can be established using meander scars and oxbow lakes

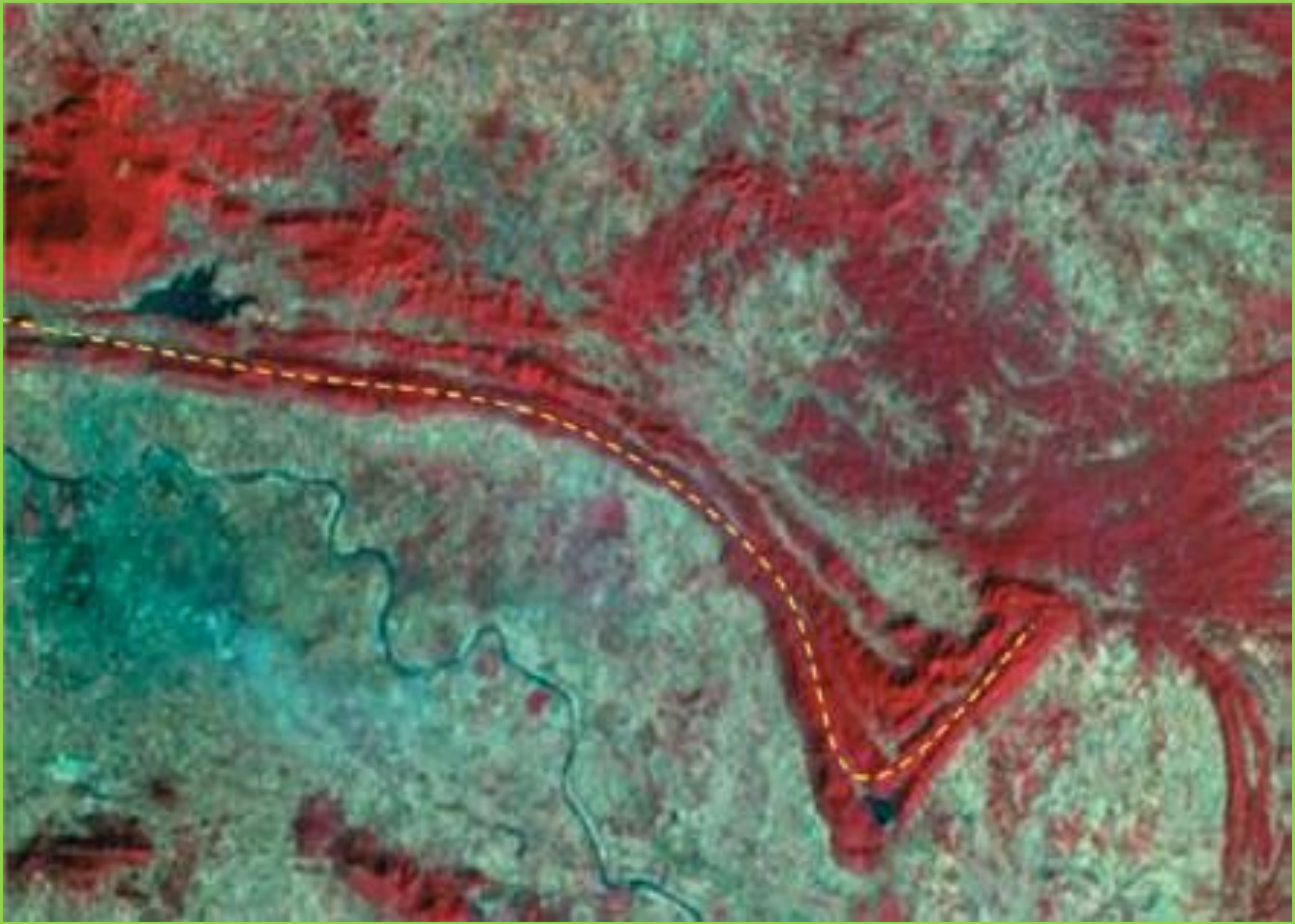
Oxbow Lake can be identified based on the crescent shape and associated features such as meanders using satellite imagery



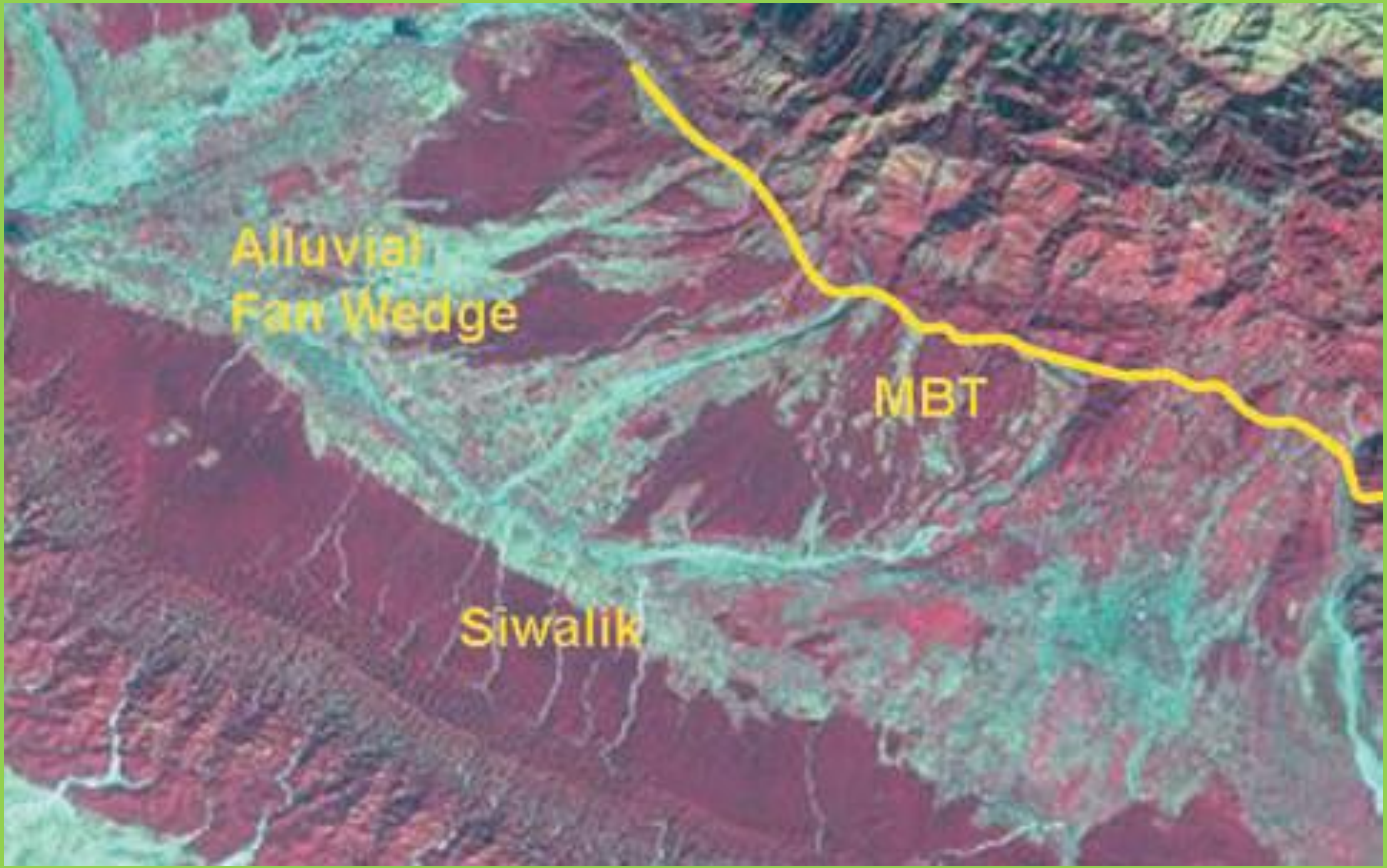
Fracture marked by yellow colour in parts of Kurnool basin. A mega fault with length more than 3 Km is marked at ‘A’.



Structural hills (SH) in part of South Bastar district, Chhattisgarh state. The structural hills are made up of various lithounits viz., phyllite/schist (Phy), sandstone (SSt) and quartzite (Qtz). Granite gneisss (Gr-Gn) form the pediplains seen in the NE corner of the image. Number of geological structures, viz., folds, faults & lineaments/fractures are mapped in the SH.

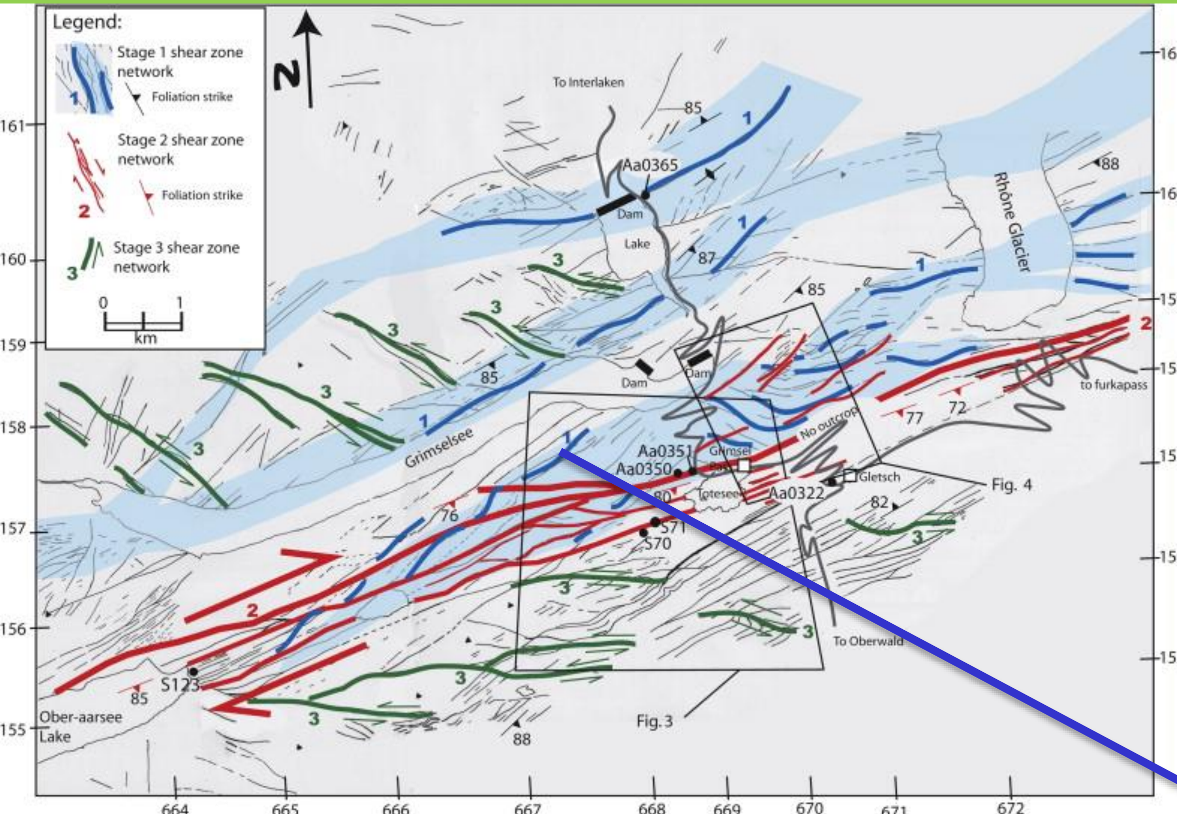


Singhbhum thrust zone marked in yellow colour. It’s a mega thurst.



Main Boundary Fault (thrust fault) in IRS P6 LISS III data.

Shear Zone


Legend:
Stage 1 shear zone network
Foliation strike
Stage 2 shear zone network
Foliation strike
Stage 3 shear zone network
km
N
To Interlaken
Dam
Lake
Rhône Glacier
Grimselsee
Grimsel Pass
Totesee
No outcrop
Gletsch
to furkapass
To Oberwald
Fig. 4
Fig. 3
Ober-aarsee Lake
Aa0365
Aa0351
Aa0350
Aa0322
S71
S70
S123

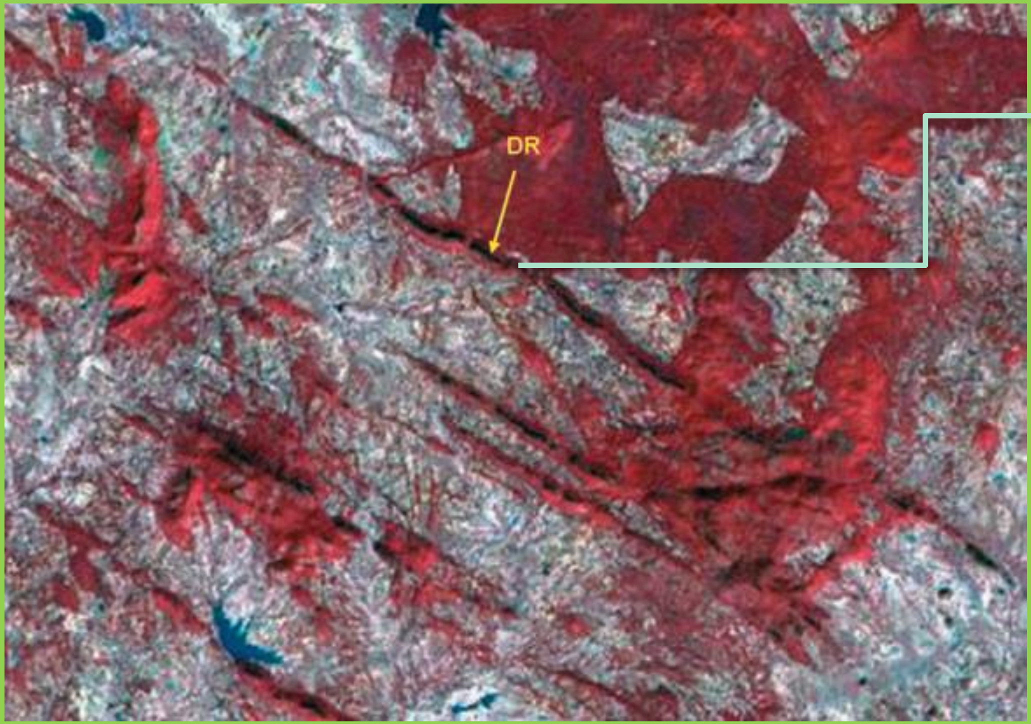
This is a peak in the Snowy Mountains of Wyoming. It is composed of very old quartzites (once quartz rich sandstones) that have been deformed and metamorphosed. The quartzite layers form the large relatively flat cliff faces steeply dipping toward the viewer. They are intensely cracked by relatively straight fracture sets known as joints. Climbers are especially attuned to these joint sets. The form of this mountain is due to fracture controlled erosion

DYKES

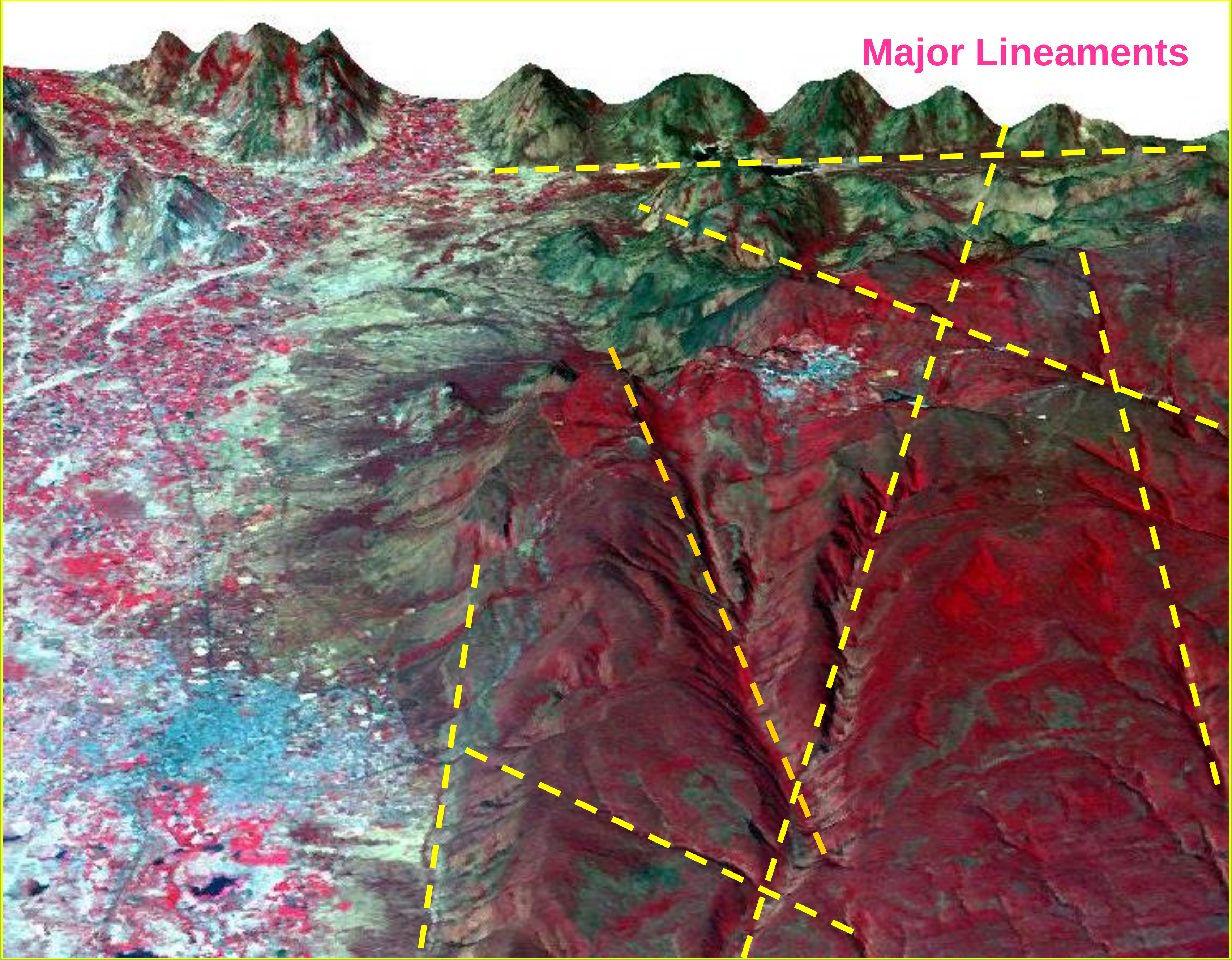
Pegmatite vein in granite boulder, Glenwood Canyon

boulder of granodiorite that includes a section of an aplite dike, showing the 3-dimensional nature of a dike. The dike can be seen on the backside of the boulder as well, giving the appearance of a layer of white sandwiched between two chunks of darker rock. (The black spots in the granodiorite are hornblende and biotite.)

Pegmatite is generally similar in composition to aplite but is very coarse-grained. Pegmatite may contain more accessory minerals than aplite. This photo of the planar surface of a pegmatite dike shows (in this case) the difference in color between potassium feldspar (pink) and plagioclase feldspar (white). The very light-gray mineral is quartz and the thin black lines are sheets of biotite (mica).



Dyke ridges (DR) occurring with the granitoid terrain in Kanker district, Chhattisgarh state. Dyke ridges most of the times can be easily identified from the satellite image due to their good contrast from the background litho units as well as their shape/form and mode of occurrence.


Major Lineaments