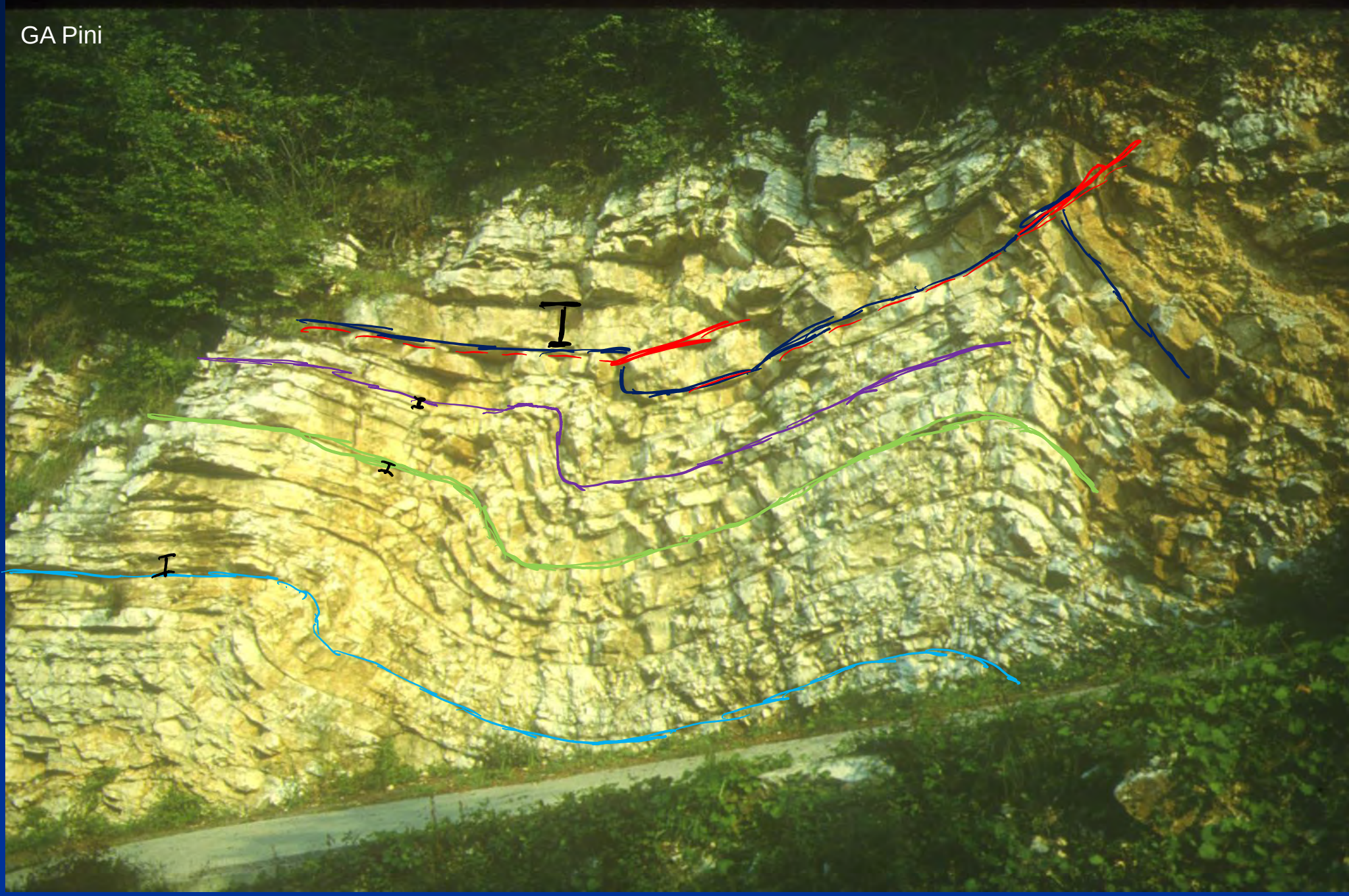
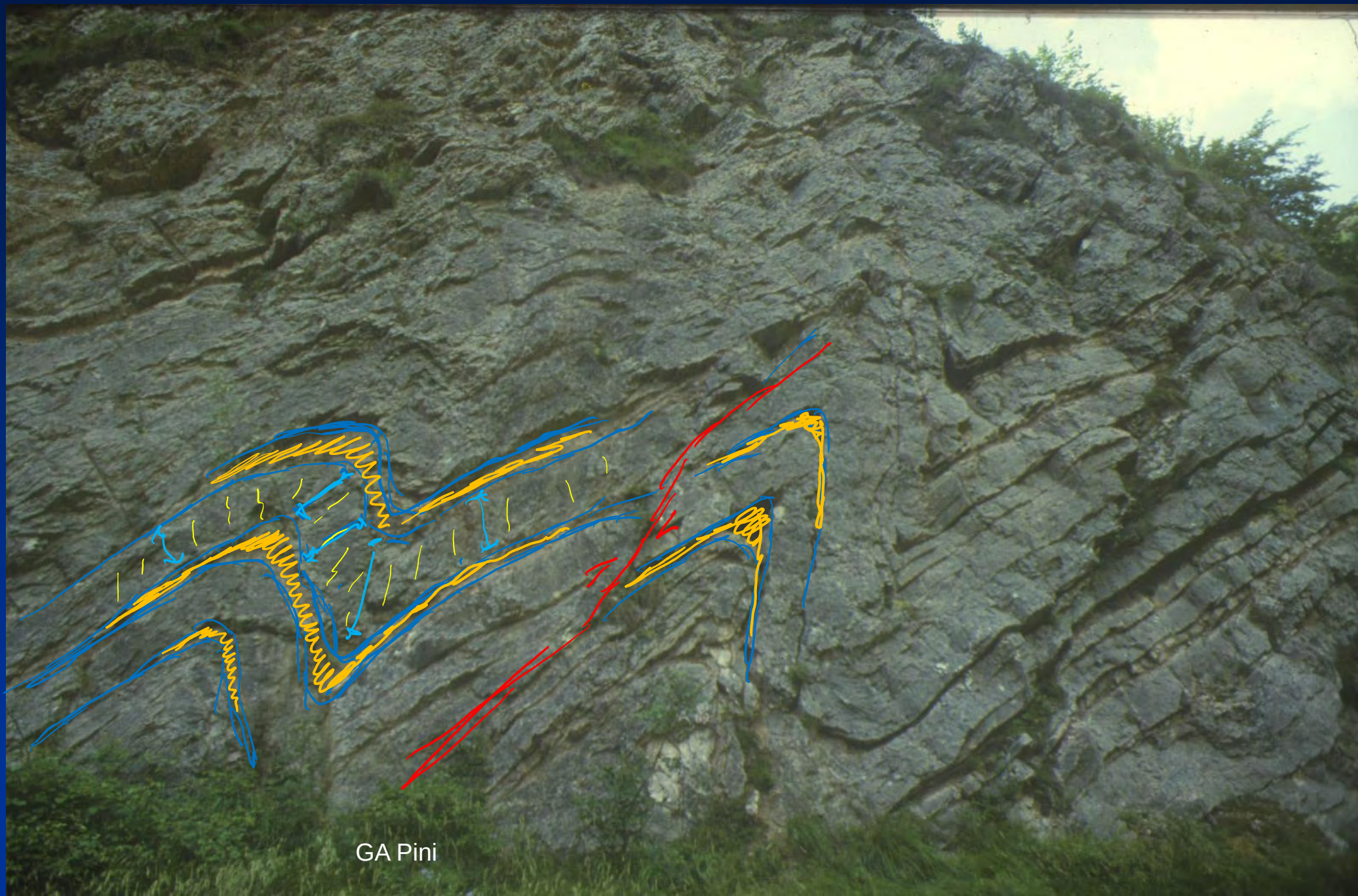
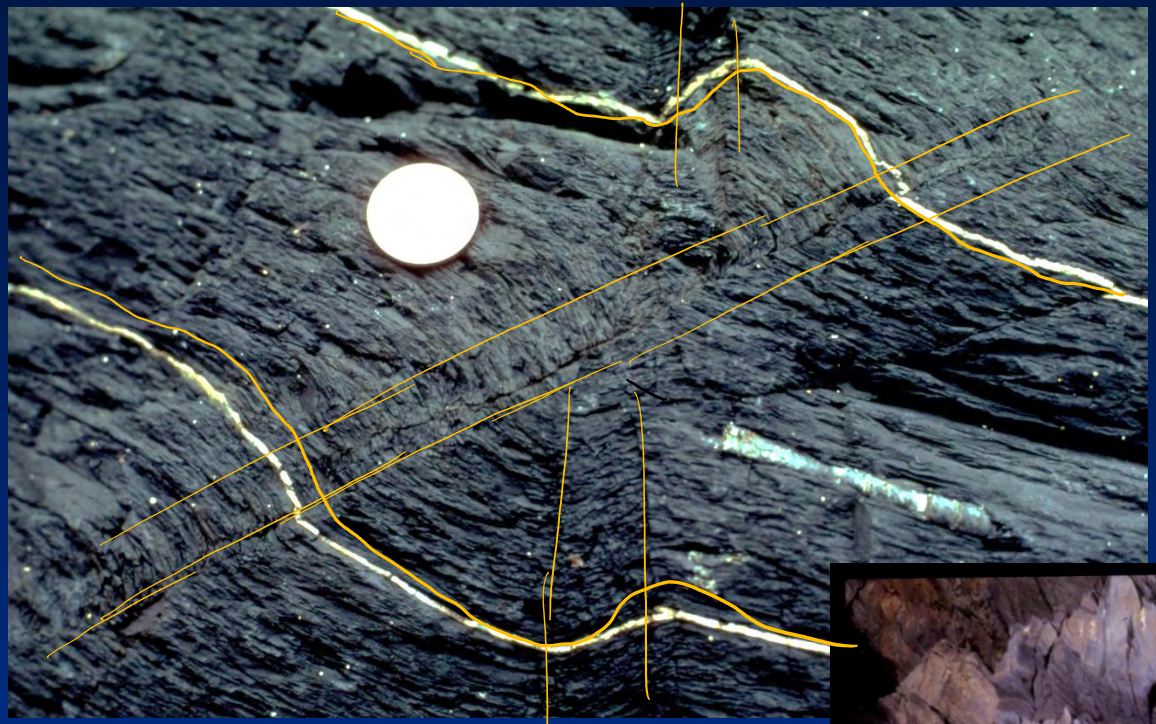
Da Ramsay and Huber, 1987

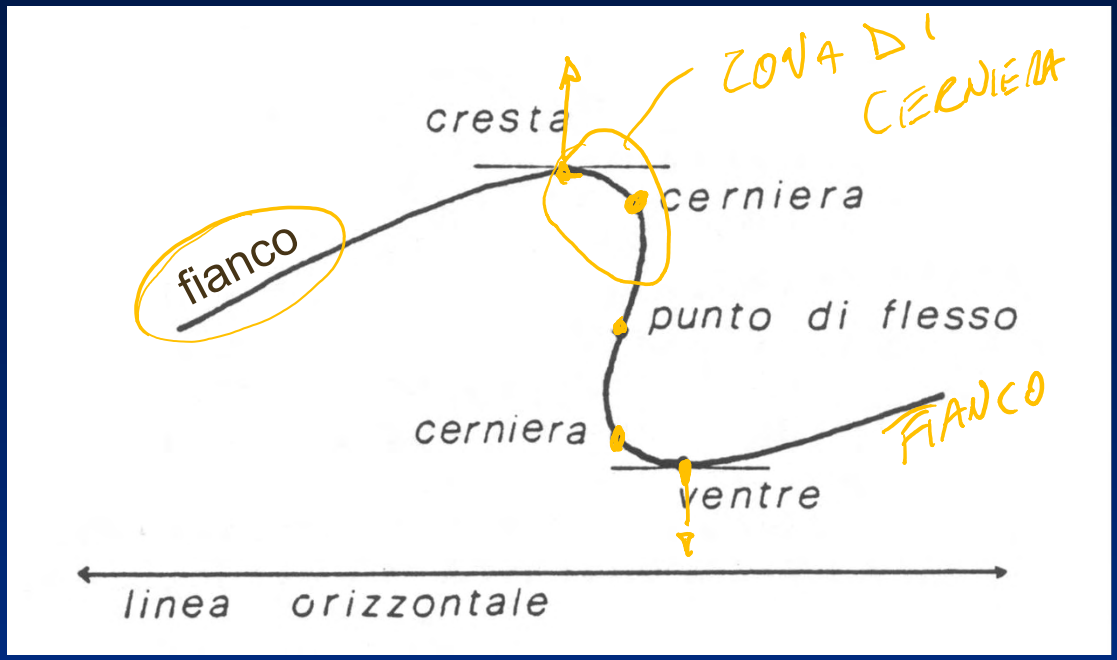

GA Pini


GA Pini



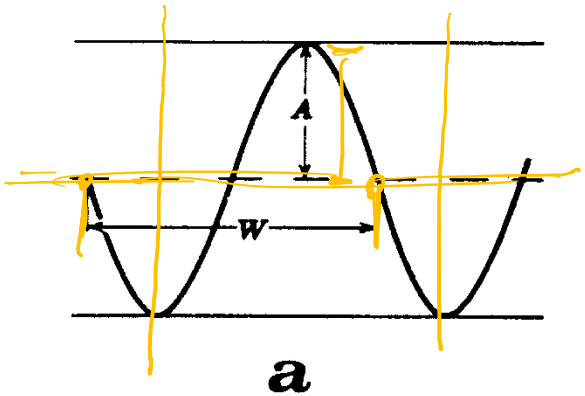
Da Ramsay and Huber, 1987

Da Ramsay and Huber, 1987



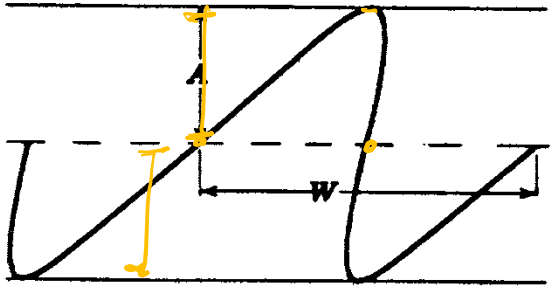
Da Boccaletti & Tortorici, 1987

W=lunghezza d'onda; A=ampiezza



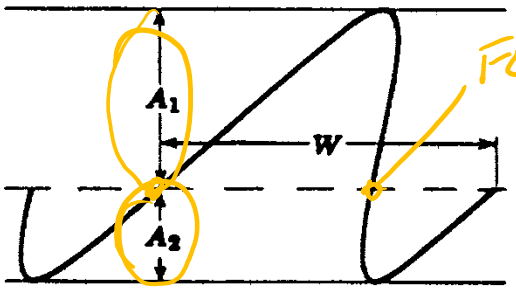
a

Piega simmetrica



b

Piega asimmetrica



c

Da Boccaletti & Tortorici, 1987

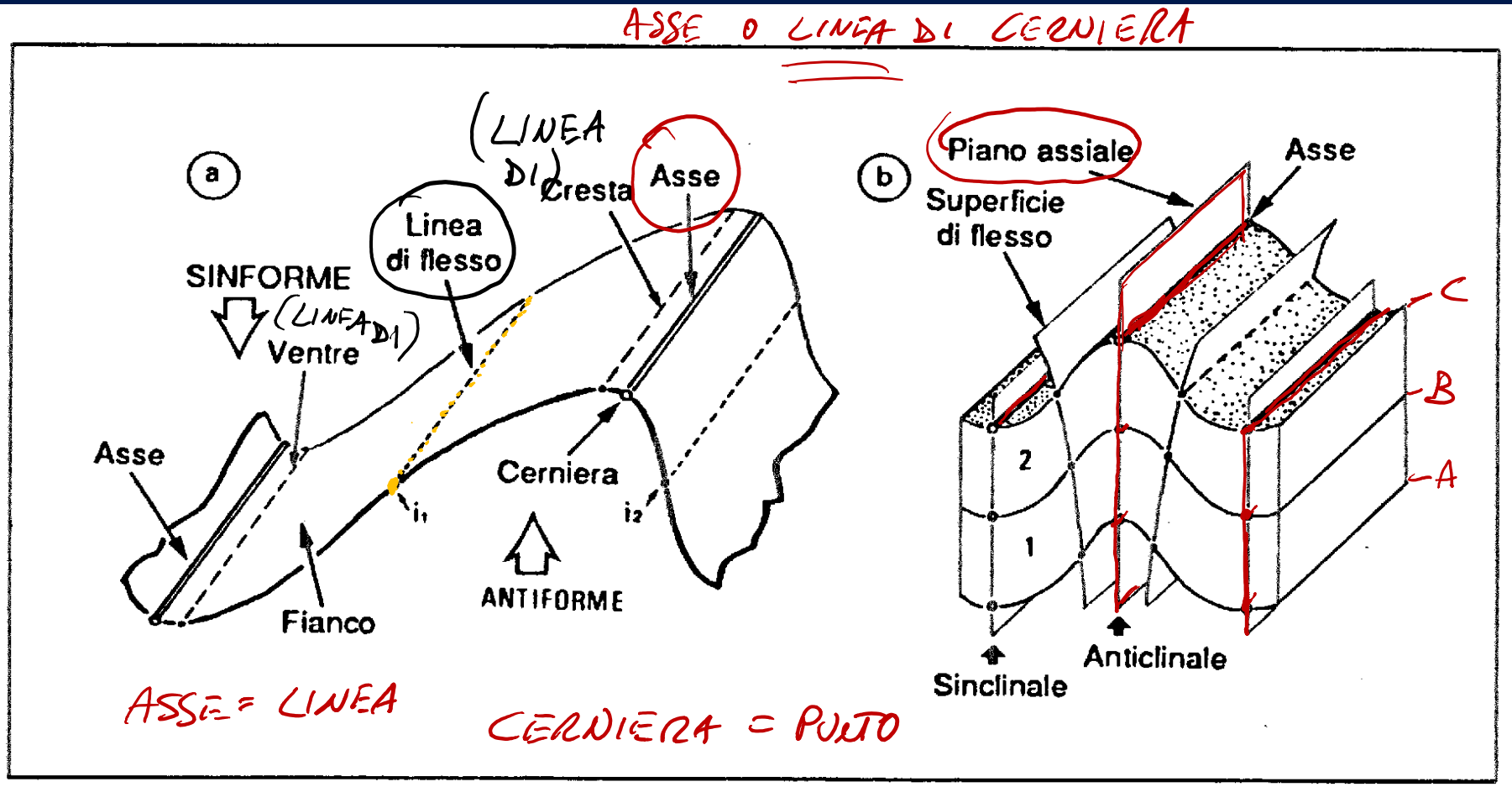
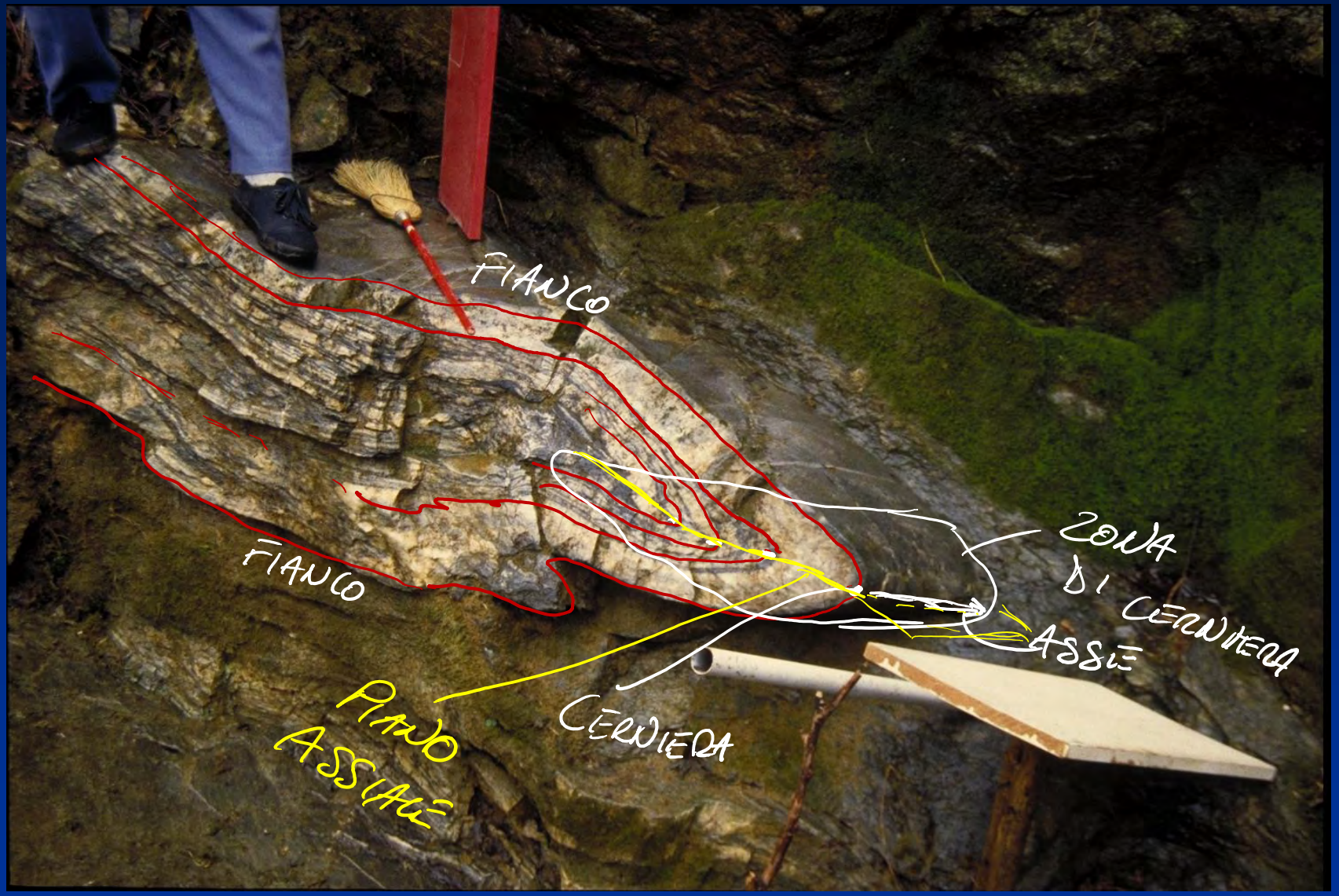


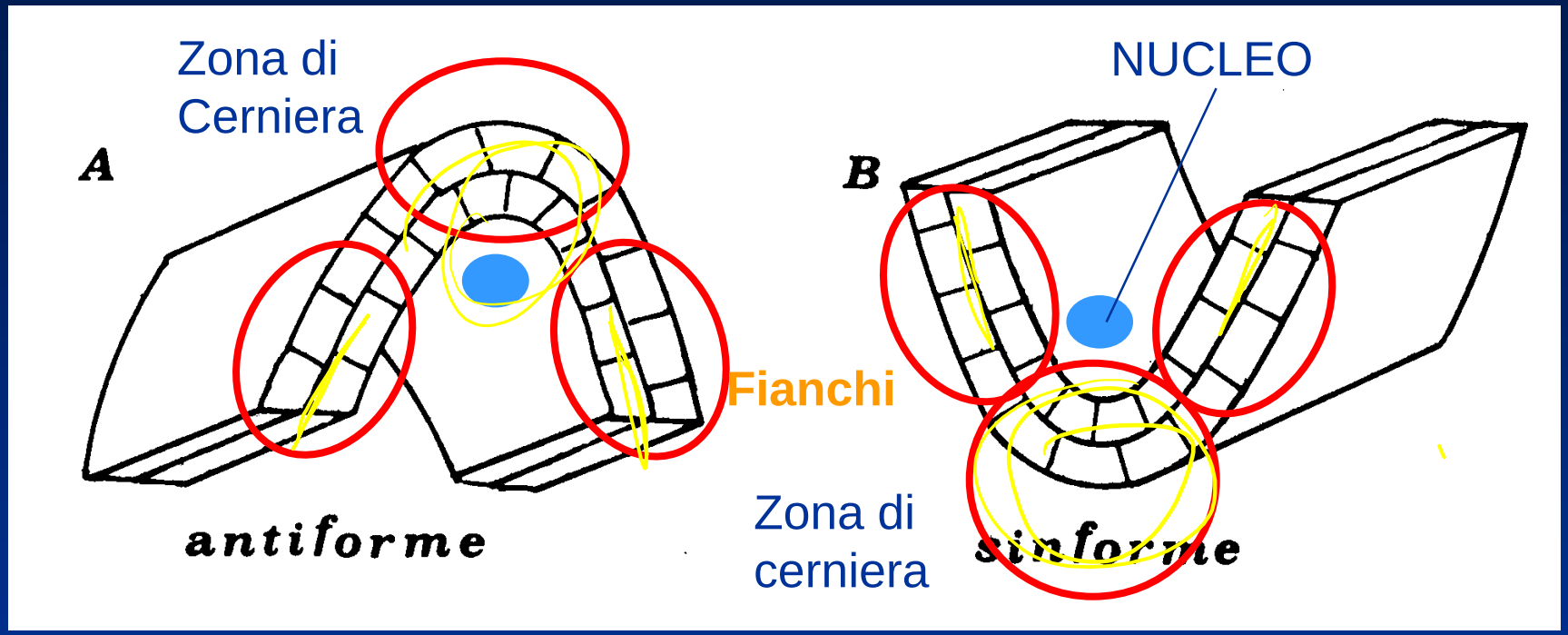
Figura 8.1. Principali termini utilizzati per la descrizione delle pieghe.

Da Mercier & Vergely, 1996


FIANCO
FIANCO
PIANO ASSIALE
CERNIERA
ZONA DI CERNIERA
ASSE

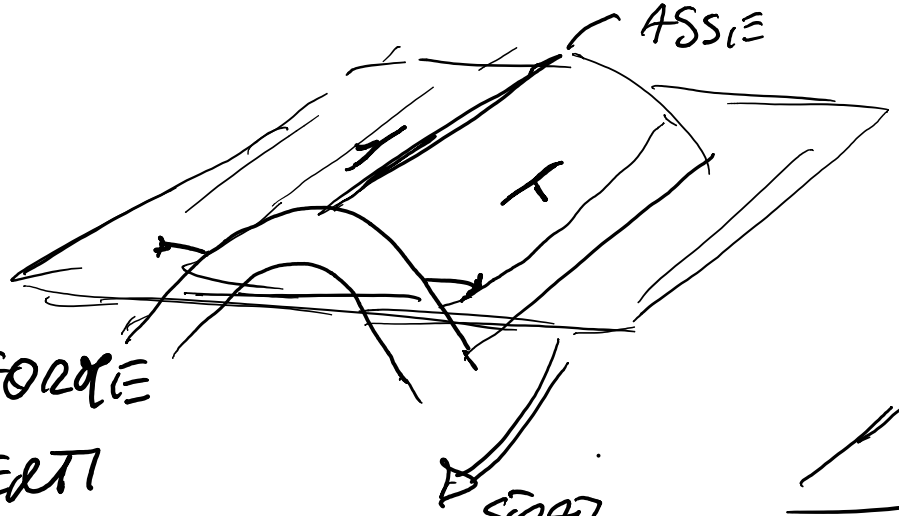
Z.C. ↑↓ ???

F. CORICATA!!



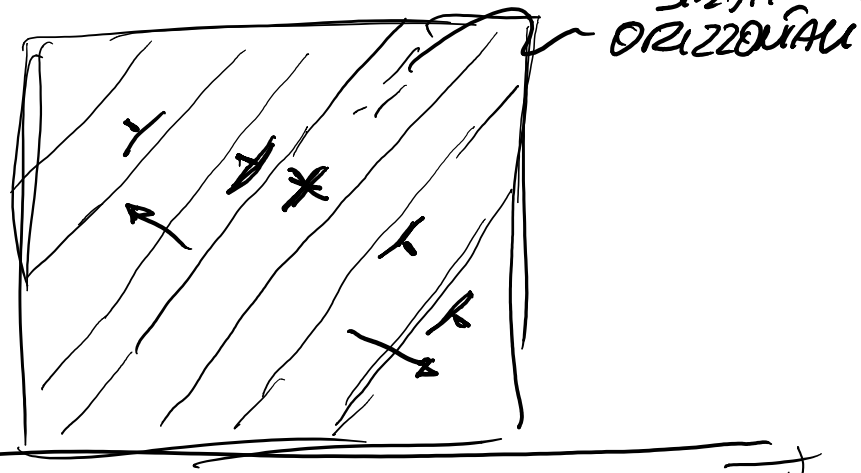
ANTIFORME

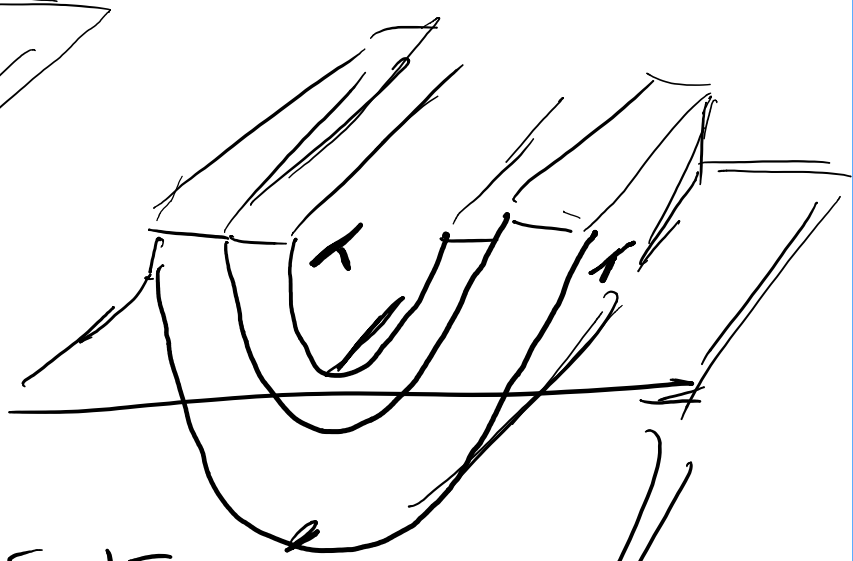
SINFORME



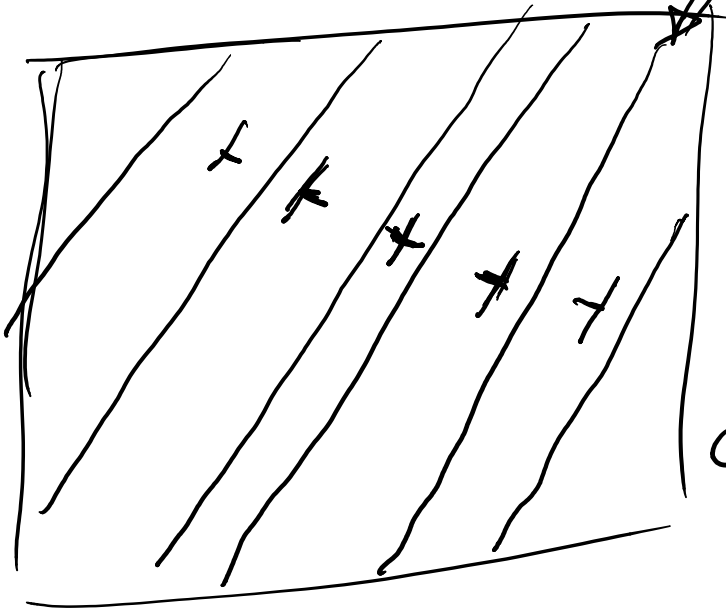
ANTIFORME

ANTIVERGENTI





SINFORME



SIN = VER- GENTI

~~ANTI~~ SIN

PIEGA CORICATA

Anticlinale=rocce più antiche al nucleo
Sinclinale=rocce più recenti al nucleo

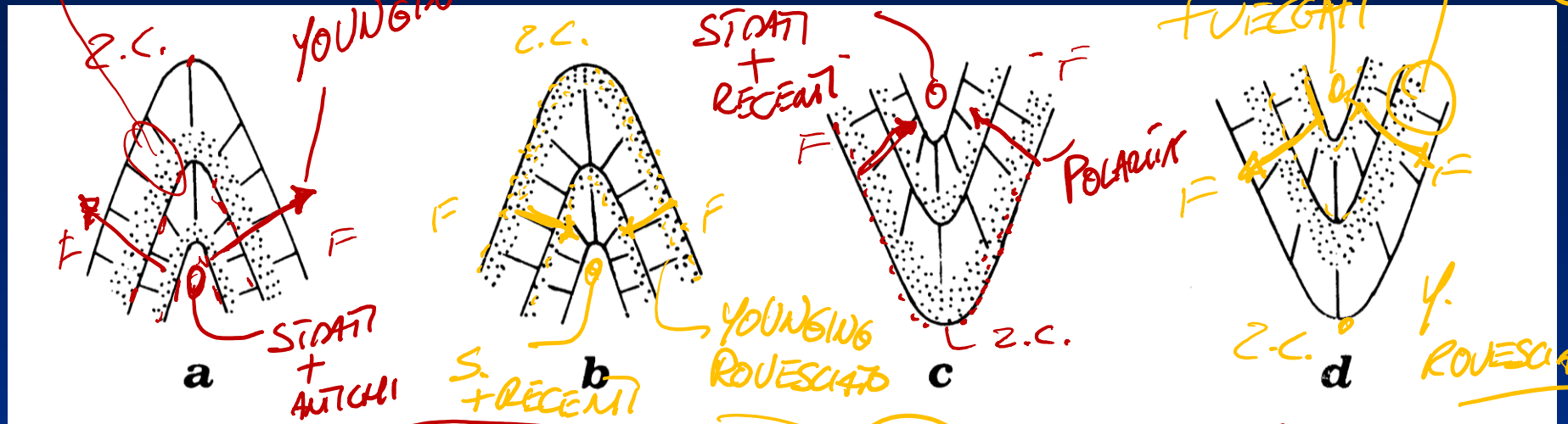
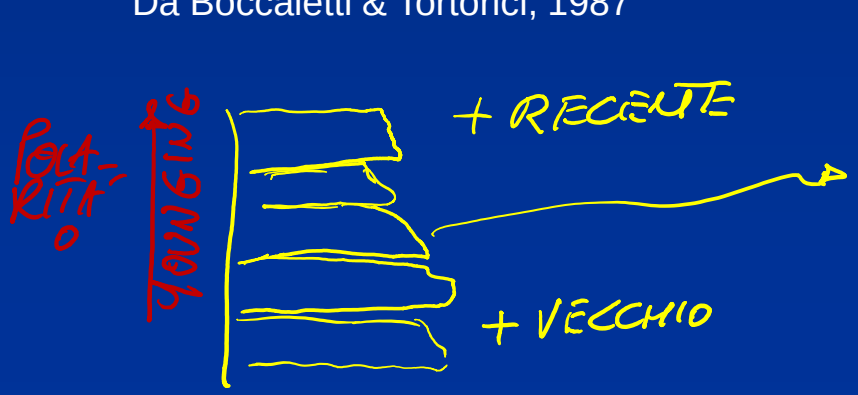
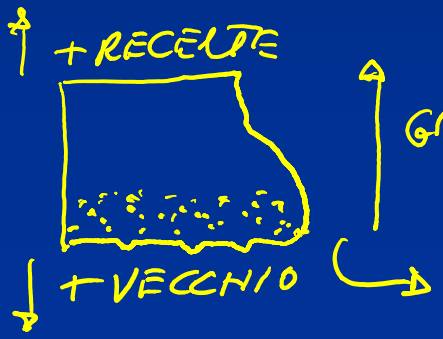


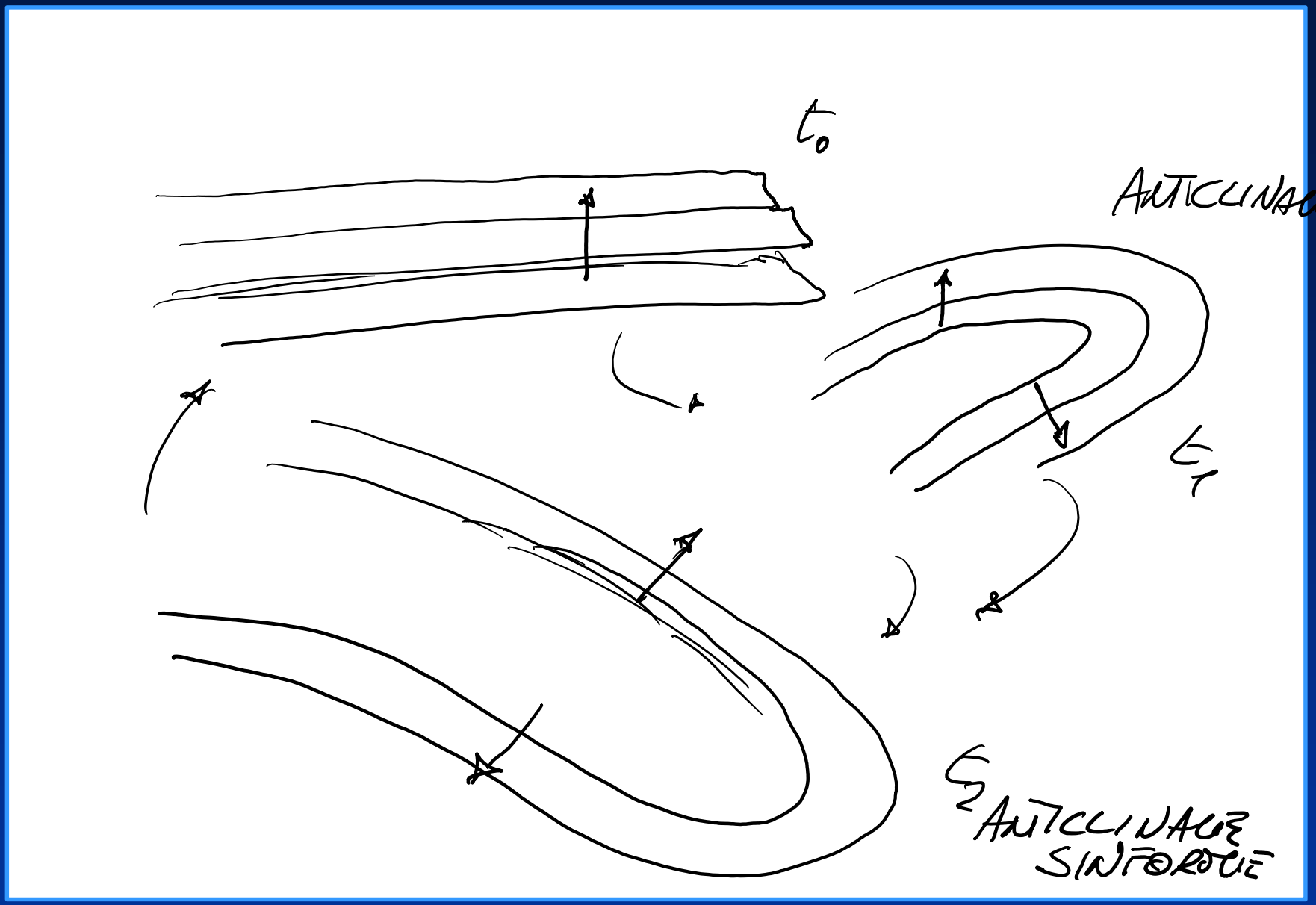
Fig. 50 - Esempi di antiforme anticlinale (a), antiforme sinclinale (b), sinforme sinclinale (c) e sinforme anticlinale (d).

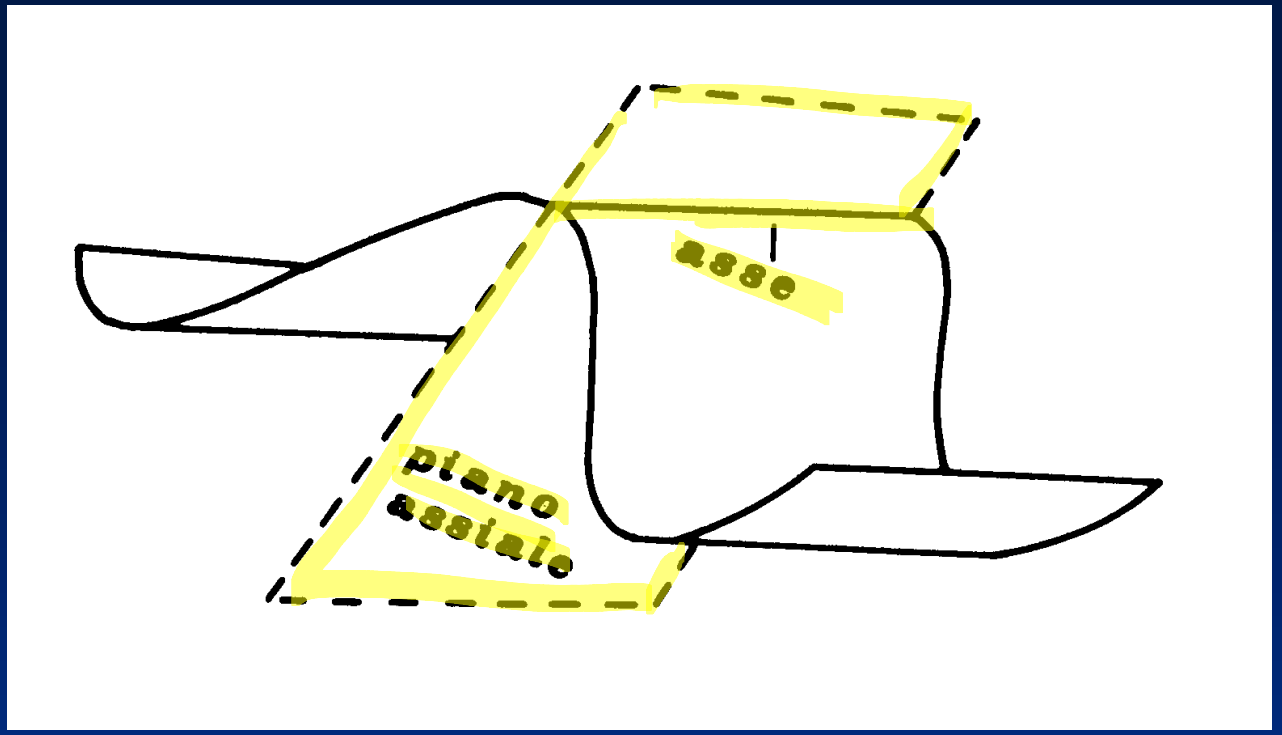
Da Boccaletti & Tortorici, 1987





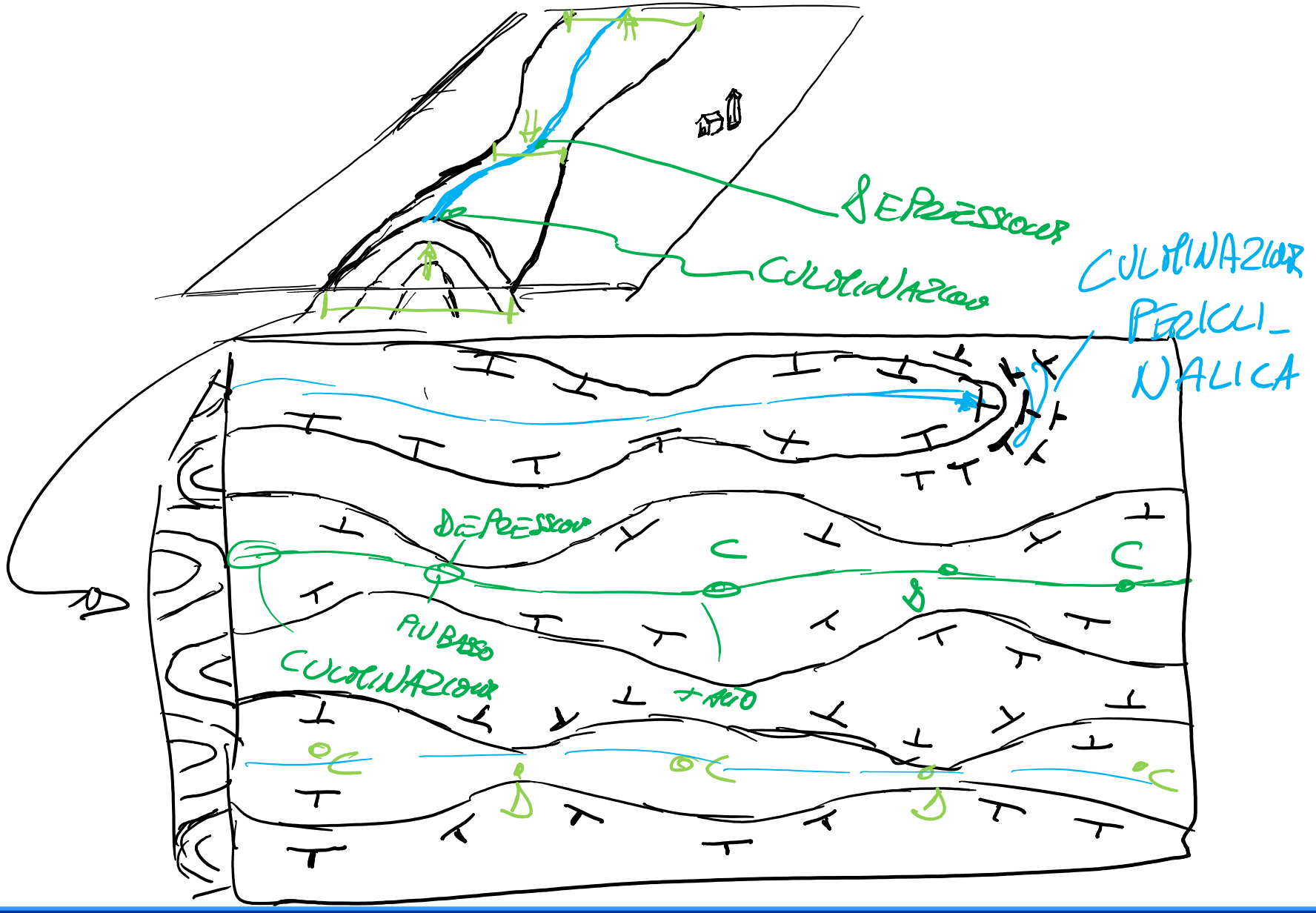
SUCC. STRATIGRAFICA DELLA

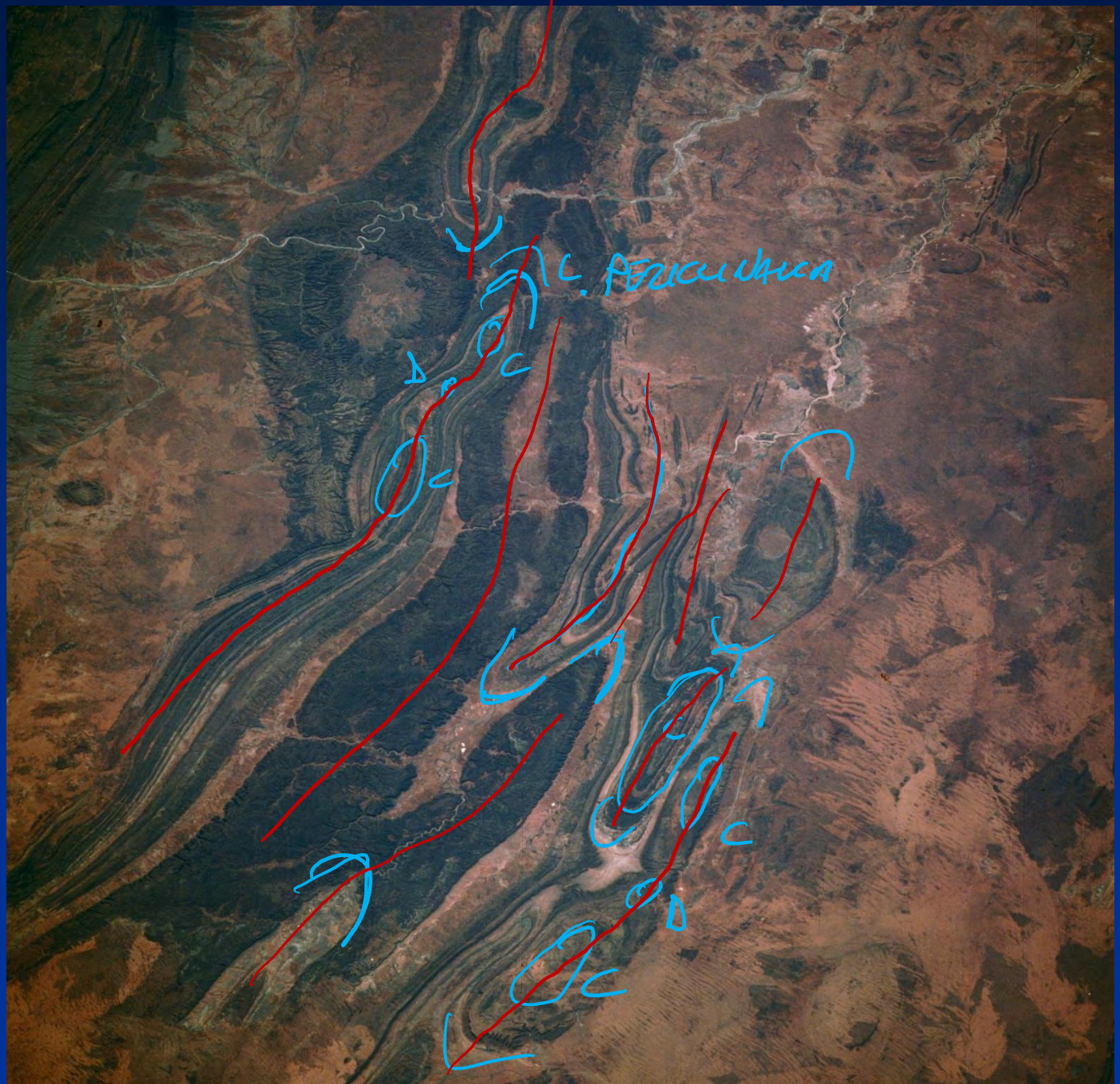

t_0
ANTICLINALE
t_1
t_2
ANTICLINALE
SINTETICĂ



Da Boccaletti & Tortorici, 1987

Da Boccaletti & Tortorici, 1987


DEPRESSIONE
CULLINAZIONE
CULLINAZIONE
PERICLI-
NALICA
DEPRESSIONE
PIU BASSO
CULLINAZIONE
+ ALTO


L. Appalachian

Esempio di culminazioni e depressioni

Makran - Iran

Esempio di “chiusura” periclinalica


Khormooj
© 2010 Europa Technologies
© 2010 Cnes/Spot Image
© 2010 Google
Image © 2010 DigitalGlobe
©2009 Google
Data di acquisizione delle immagini: 1 Lug 2005
28°32'18.73" N 51°31'19.21" E 295 m elev
13.34 km Alt


© 2010 Europa Technologies
© 2010 Cnes/Spot Image
© 2010 Google
Image © 2010 DigitalGlobe
©2009 Google
Data di acquisizione delle immagini: 14 Set 2006
28°36'49.35" N 51°43'13.76" E 1158 m elev
8.15 km Alt

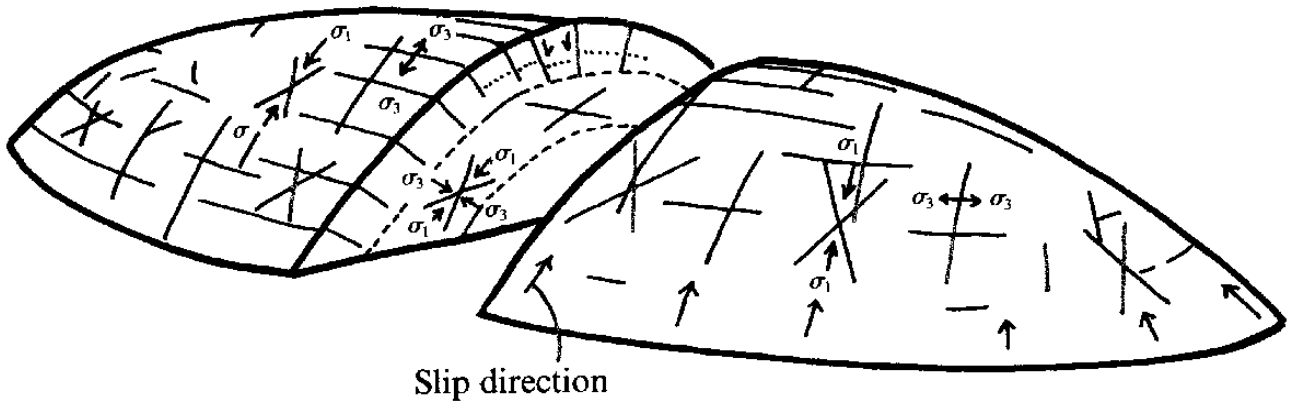
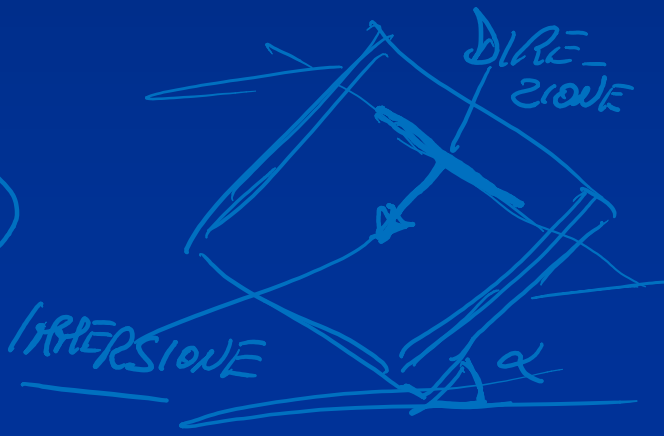
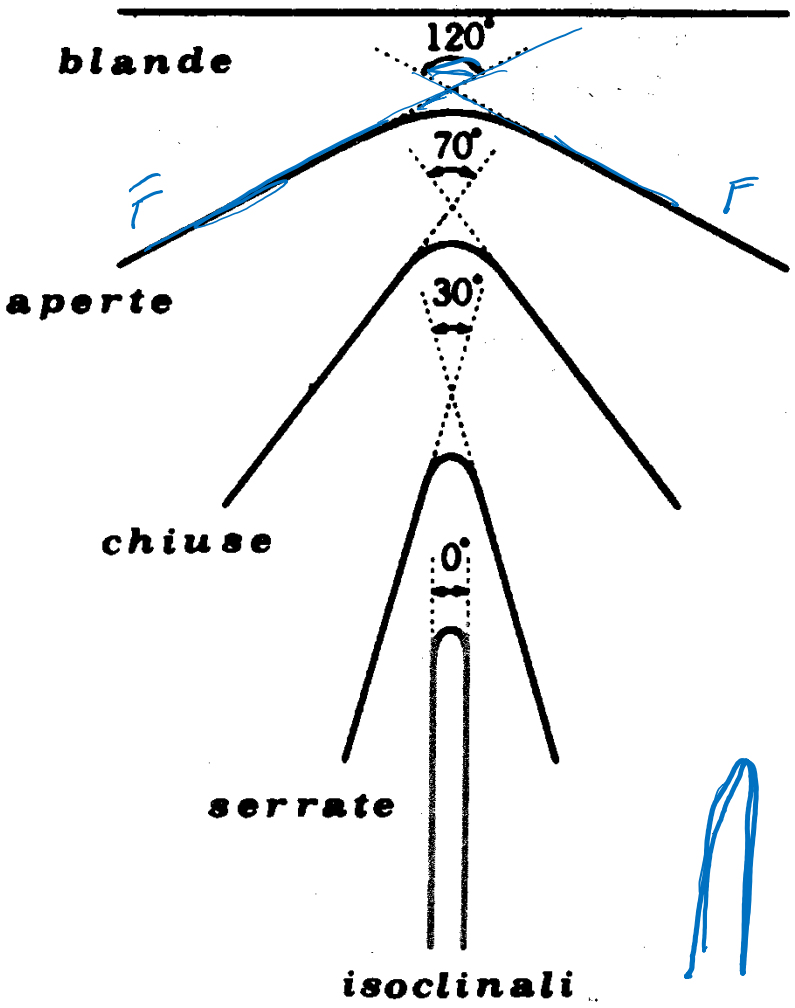
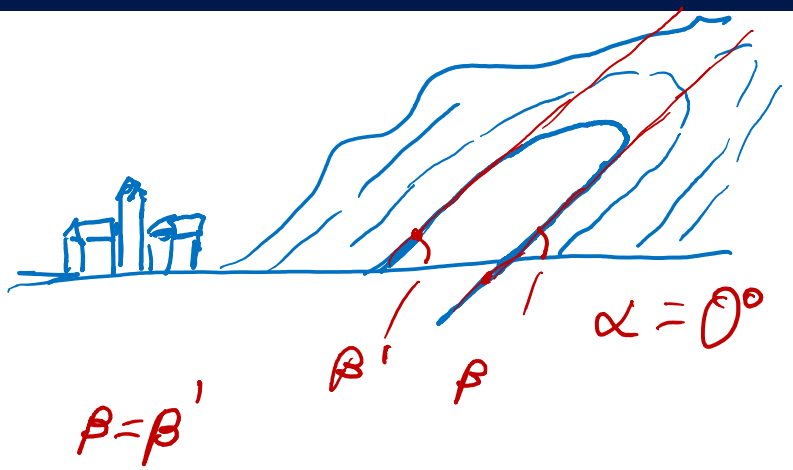


Fig. 14.24. Variations in orientation of fracture patterns in a dome. Inferred slip direction in the dome is indicated. (After Stearns 1964, and other sources.)

Da Price and Cosgrove, 1990

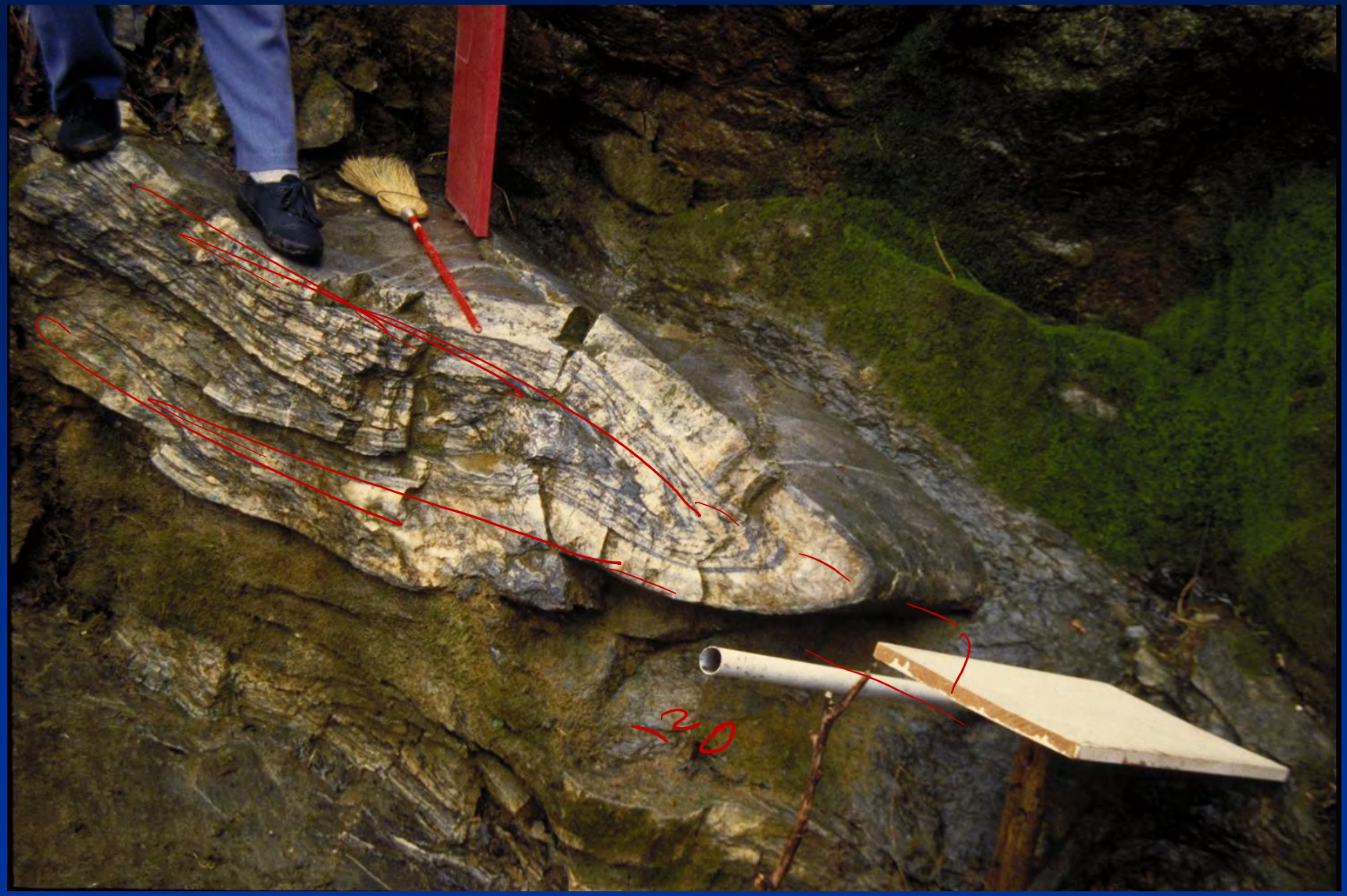






pieghe blande	120°-180°
pieghe aperte	70°-120°
pieghe chiuse	30°- 70°
pieghe serrate	10°- 30°
pieghe isoclinali	0°- 10°

Da Boccaletti & Tortorici, 1987


120

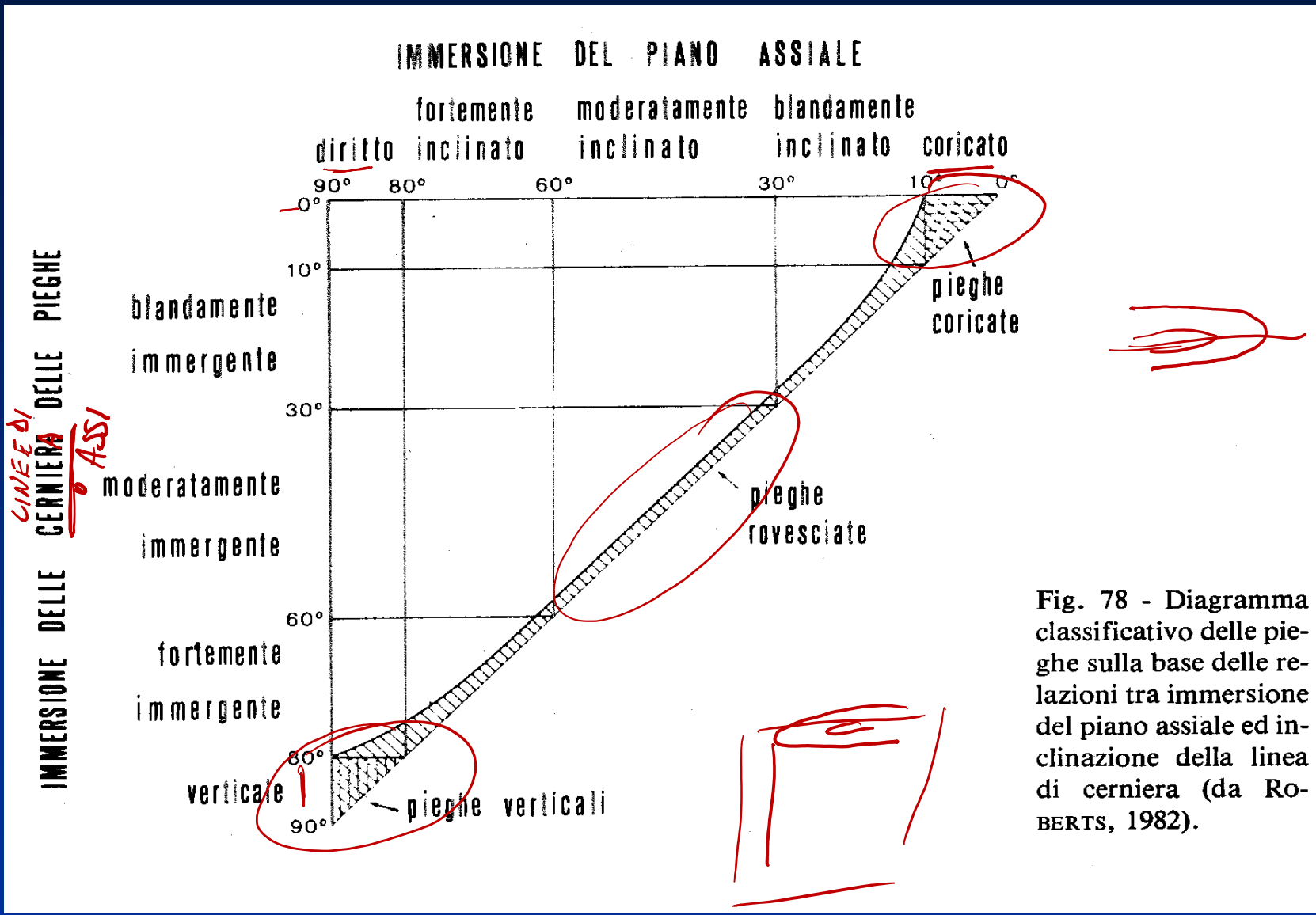


Fig. 78 - Diagramma classificativo delle pieghe sulla base delle relazioni tra immersione del piano assiale ed inclinazione della linea di cerniera (da ROBERTS, 1982).

Da Boccaletti & Tortorici, 1987

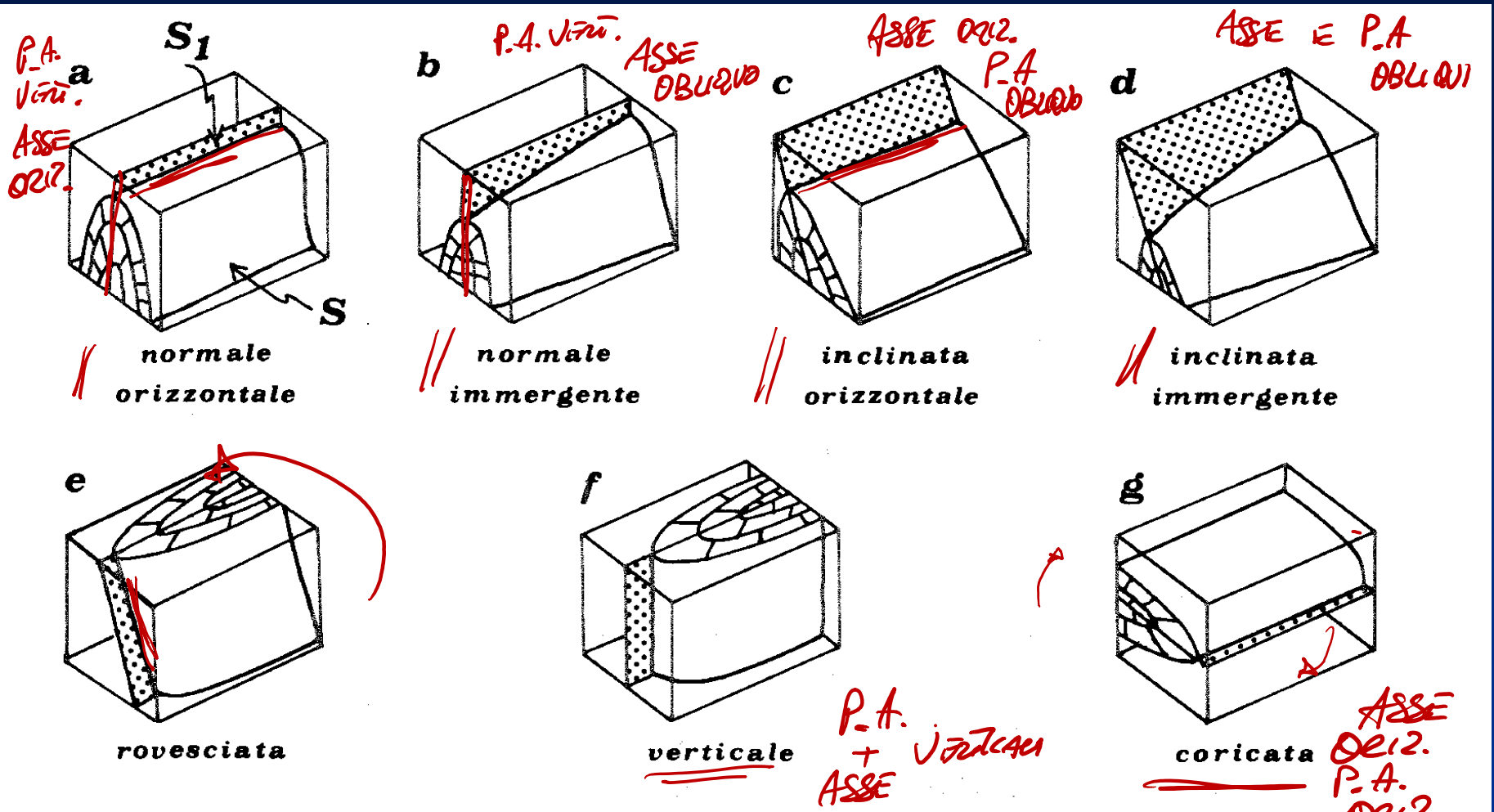


Fig. 79 - Diagrammi tridimensionali di pieghe secondo la classificazione del diagramma di fig. 78.

Da Boccaletti & Tortorici, 1987

C.C. Lucente

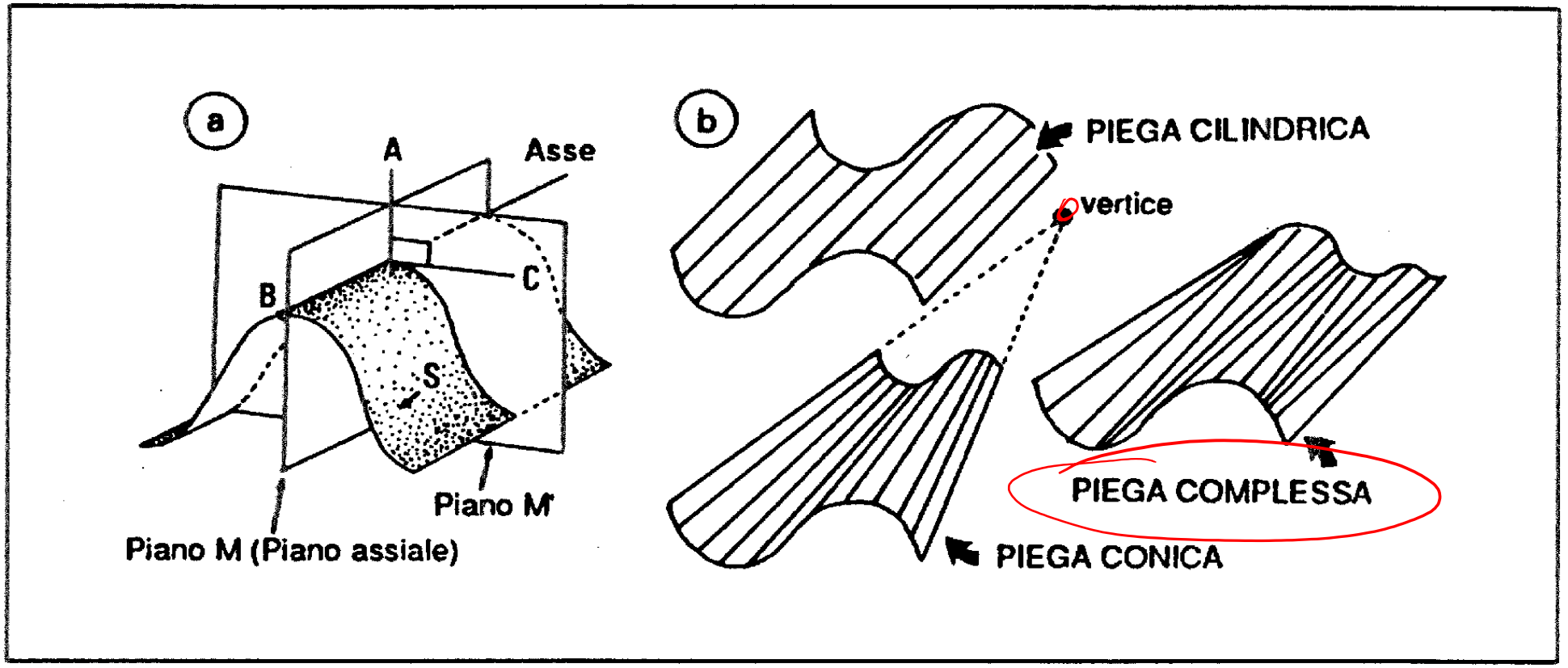


Figura 8.5. a) Piani di simmetria (*M* e *M'*) ed assi geometrici (*A*, *B*, *C*) di una piega; b) superficie piegata descritta secondo le sue generatrici (piega cilindrica, conica e complessa).

Da Mercier & Vergely, 1996

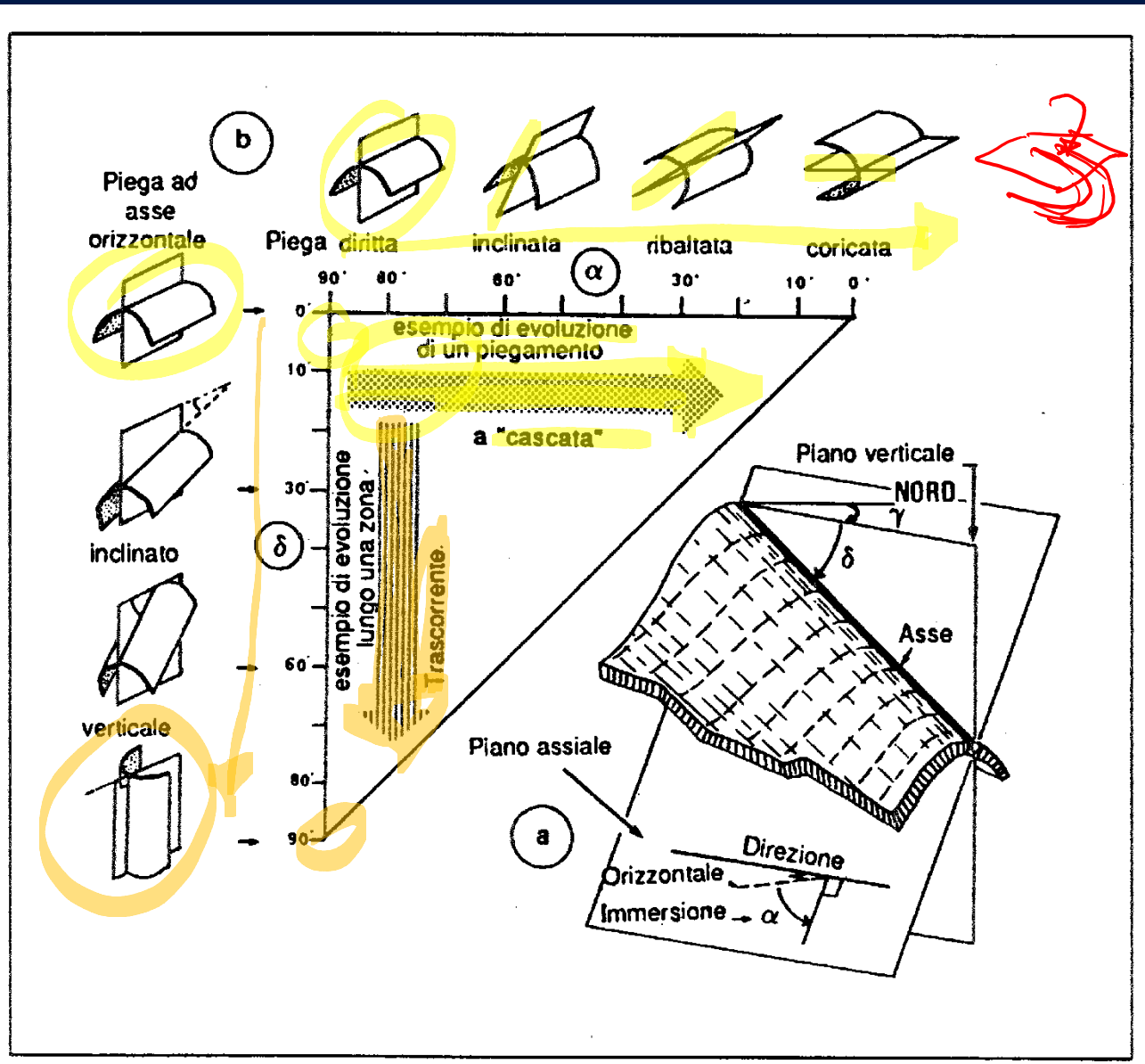


Figura 8.4. Diagramma di Fleuty (1964, Proc. Geol. Ass. Lond., 75, 461-492) che rappresenta le pieghe in funzione dell'immersione (δ) dell'asse e dell'inclinazione (α) del piano assiale.

Da Mercier & Vergely, 1996

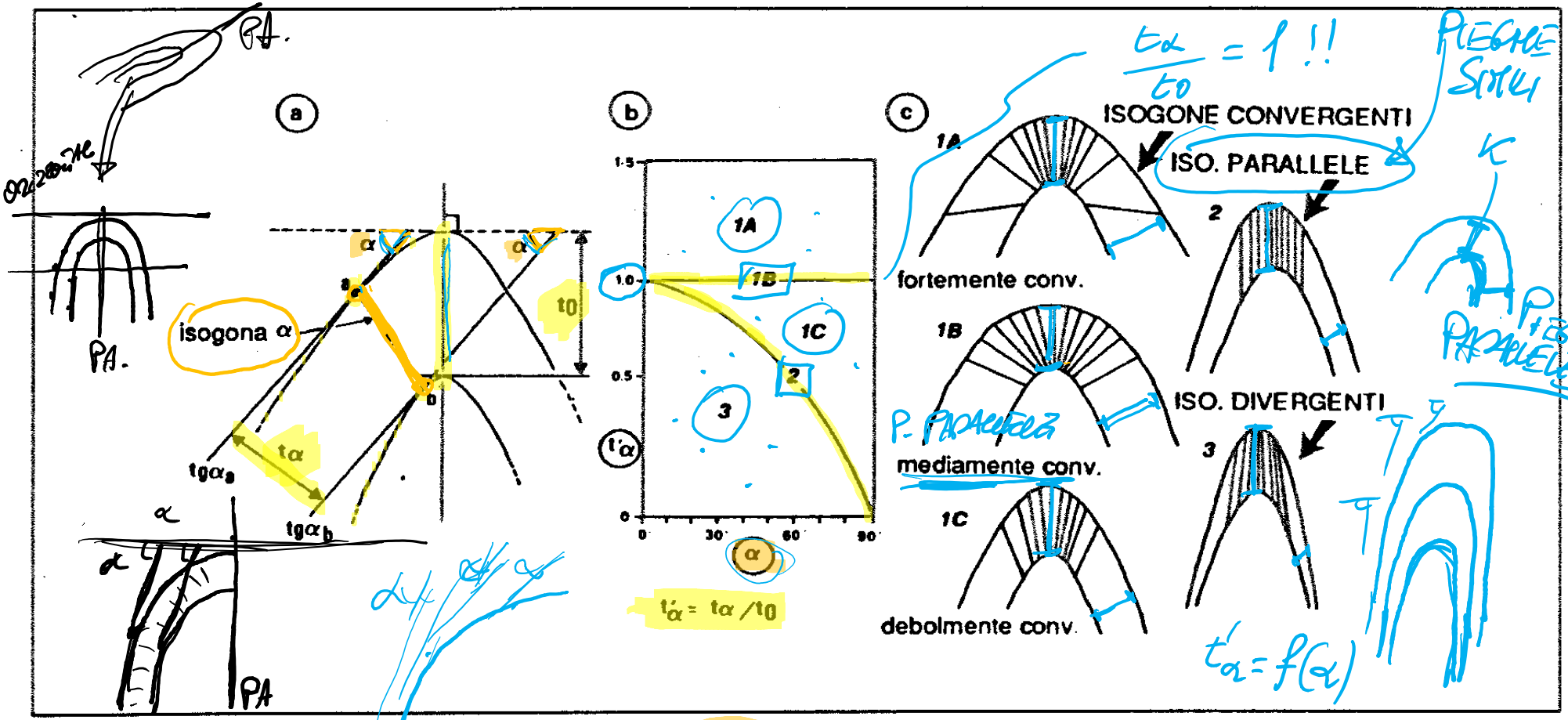
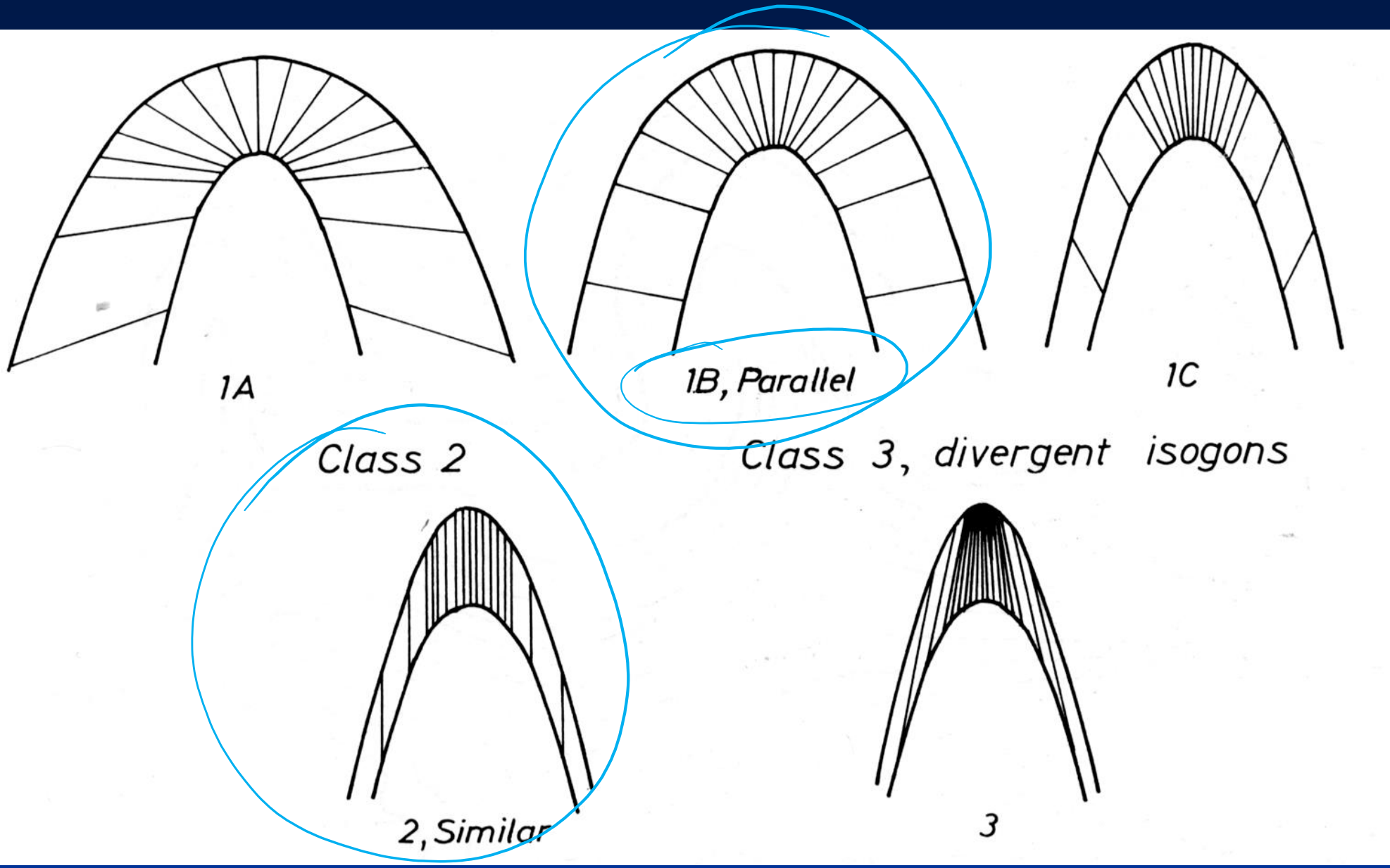
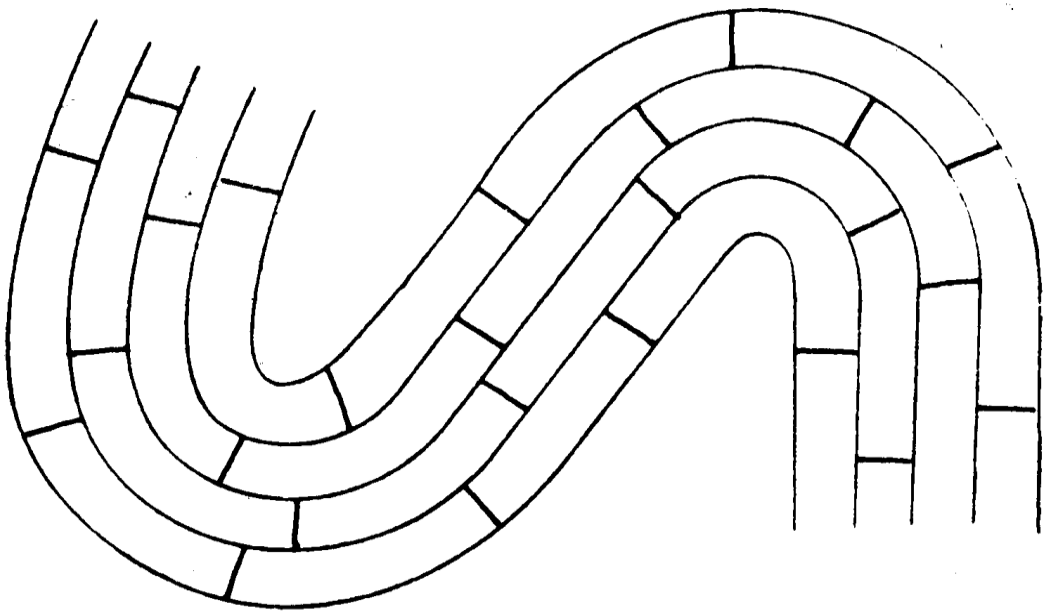


Figura 8.6. Classificazione delle pieghe secondo Ramsay (1967, McGraw Hill, 568 p.): a) determinazione dei valori di t_o e t_α e costruzione dell'isogona *a* lungo una sezione della piega; b) diagramma di t'_α in funzione di i_α che definisce le diverse classi delle pieghe; c) geometria delle isogone delle pieghe di differenti classi.

Da Mercier & Vergely, 1996



Da Ramsay, 1967



Pieghe parallele

Da Boccaletti & Tortorici, 1987

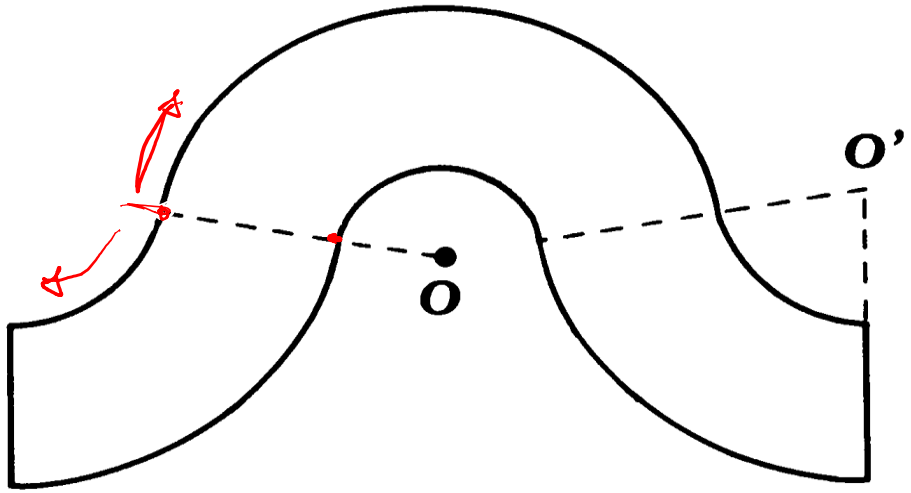
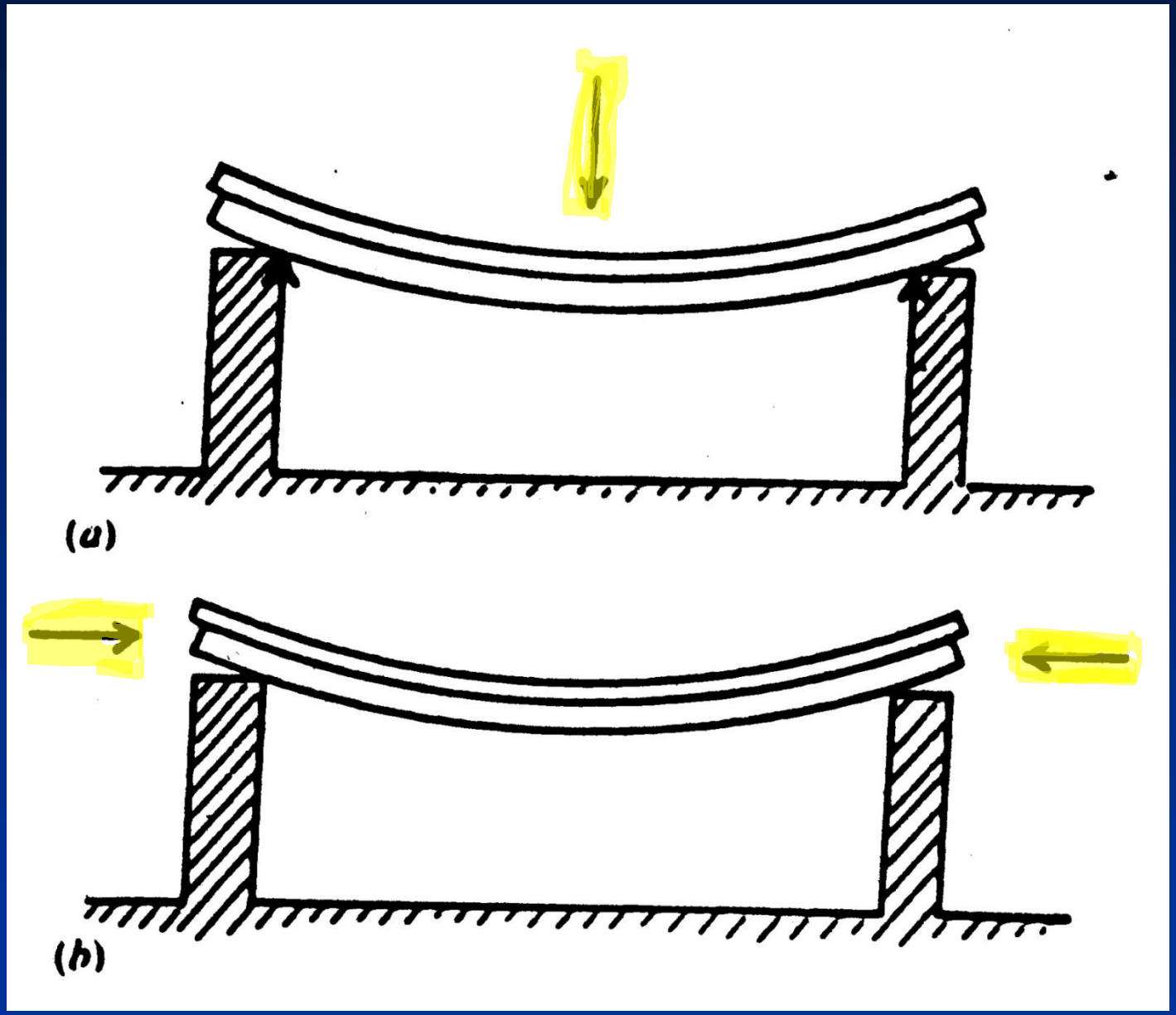


Fig. 66 - Esempio di piega concentrica. I punti O e O' rappresentano i centri origine dei relativi archi di circonferenza.



Bending

Buckling

Da Price & Cosgrove, 1990

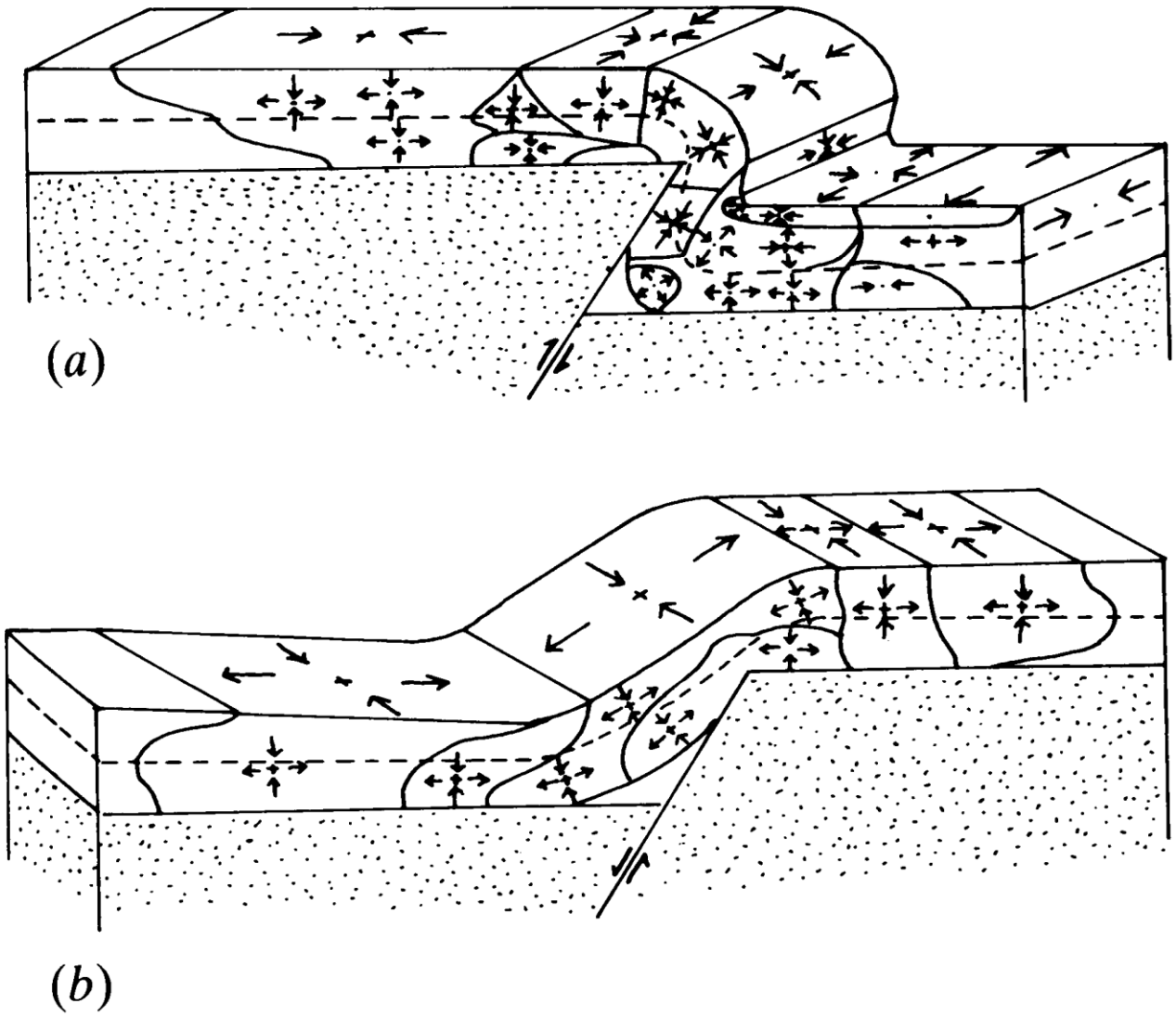


Fig. 10.20. Experiments showing the effects of (*a*) reverse and (*b*) normal faulting in a rigid basement on a layered, ductile cover. (After Ameen 1988.)

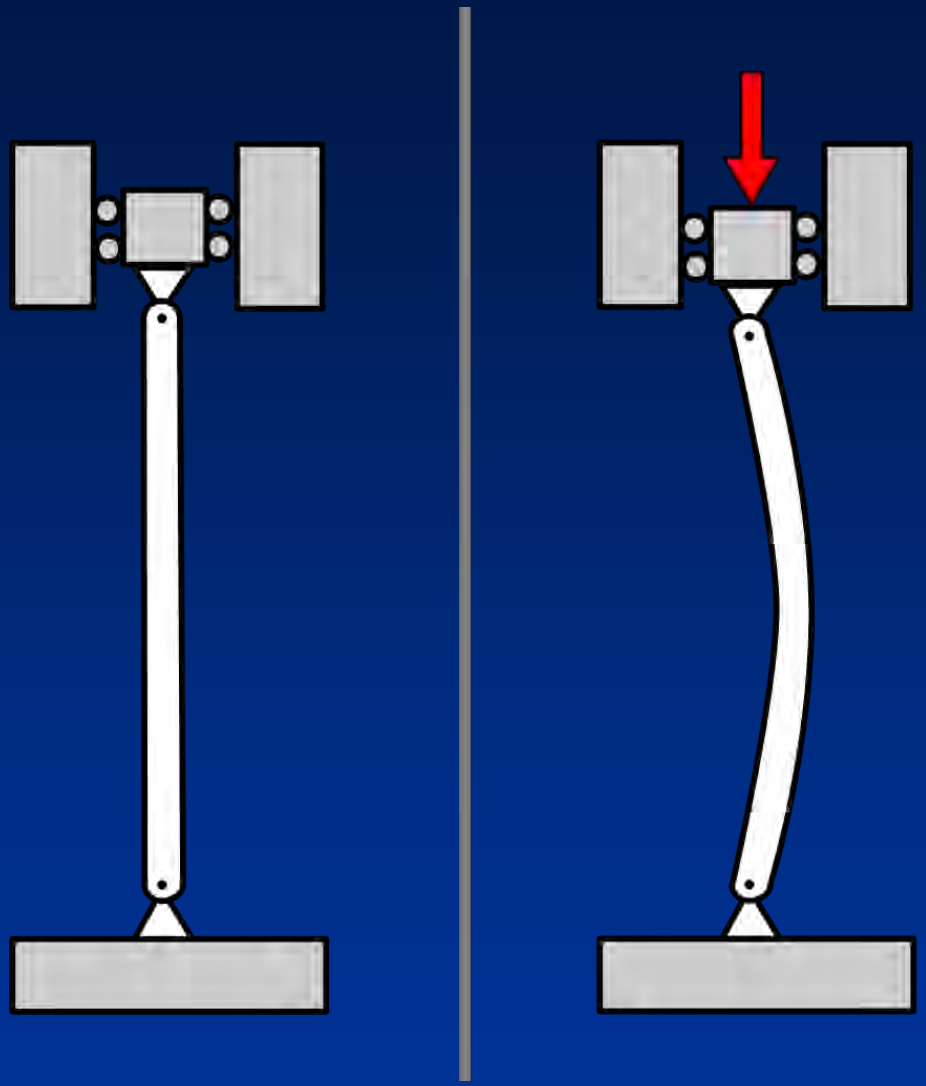
Pieghe per flessione passiva

Bending

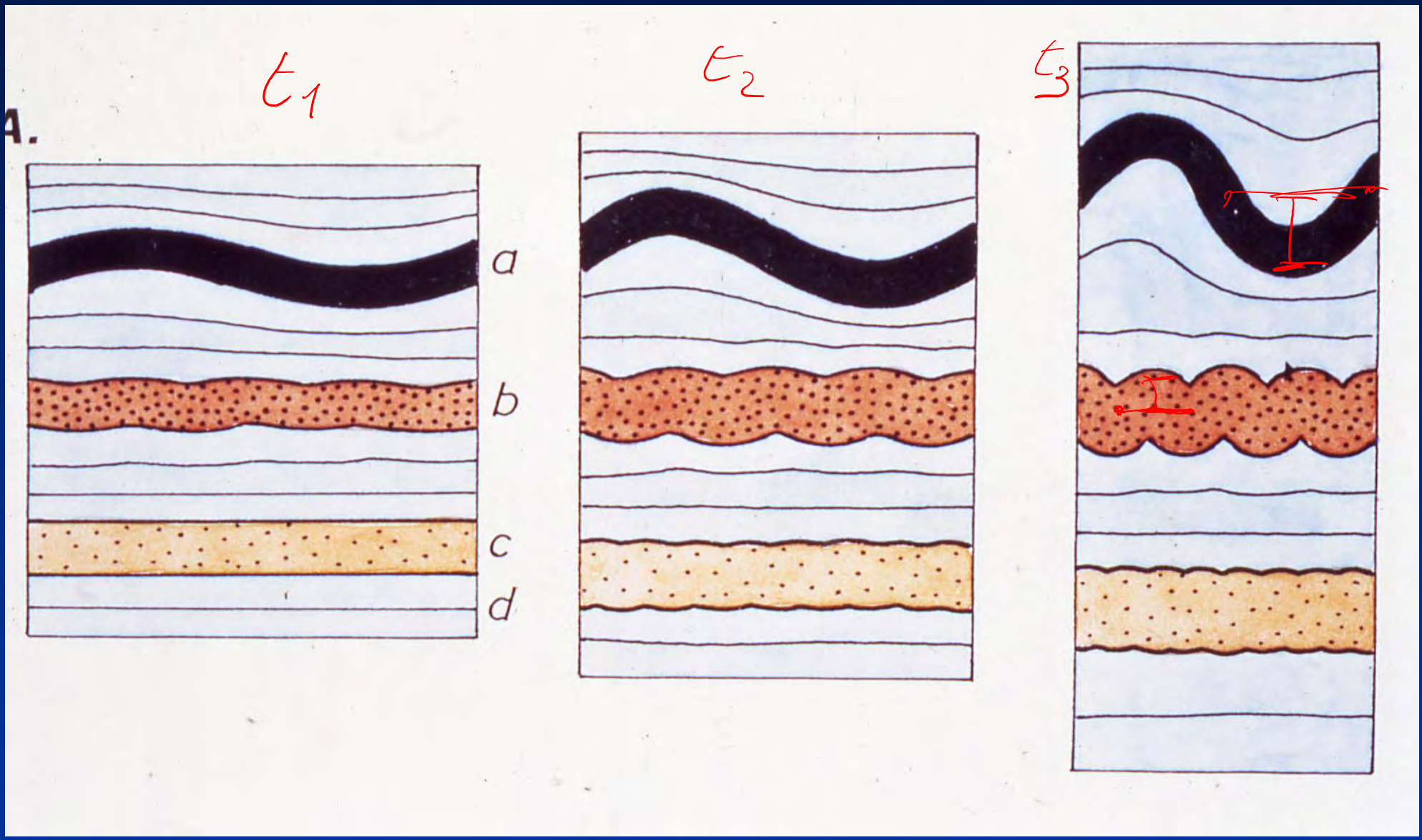
Da Price & Cosgrove, 1990

Buckling

High heat resulted in thermal expansion of these rails, buckling this section of railway. Da U.S. Department of Transportation. Public domain, last modified 2019. https://toolkit.climate.gov/image/1001



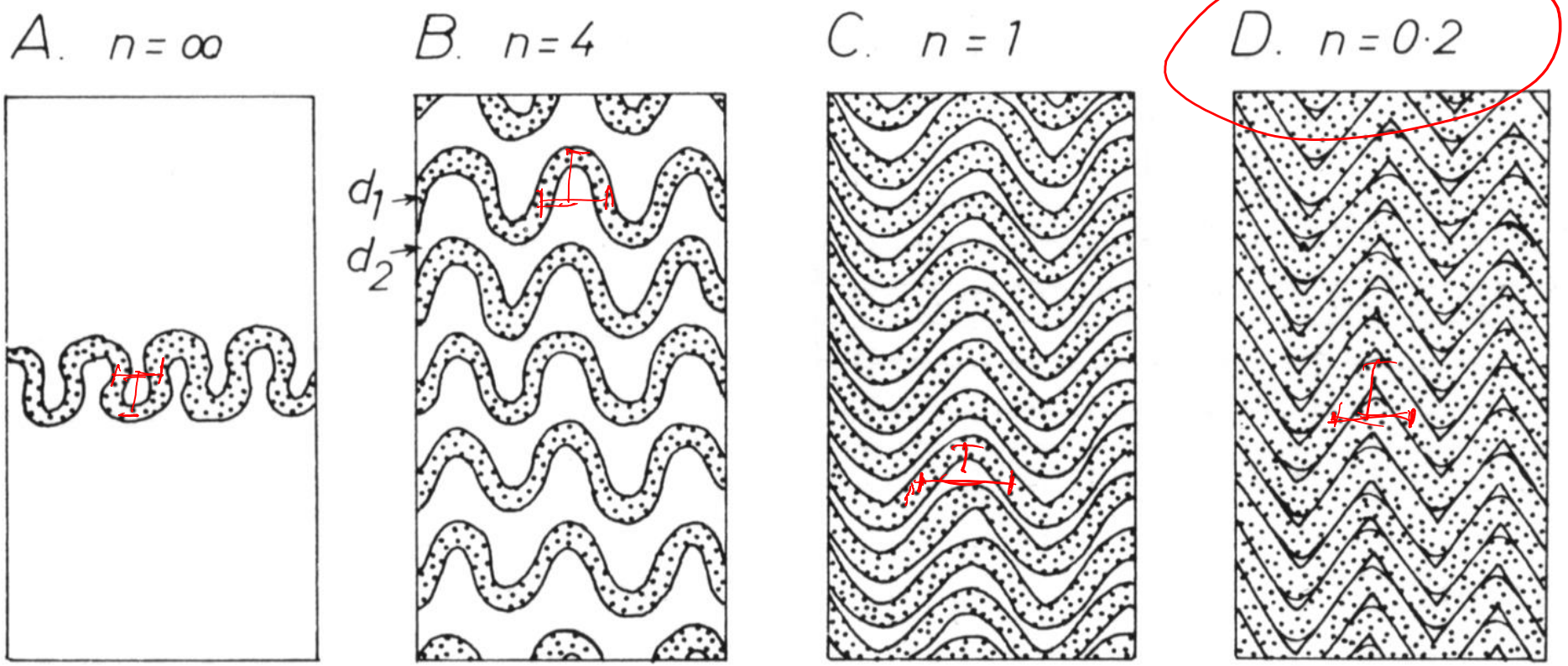
By Buckled_column.png: Original uploader was Spindustrious at en.wikipediaderivative work: Mircalla22 (talk) - Buckled_column.png, Public Domain, https://commons.wikimedia.org/w/index.php?curid=7648435



Da Ramsay & Huber, 1987

Da Ramsay & Huber, 1987

Pieghe ptigmatiche o a elastico



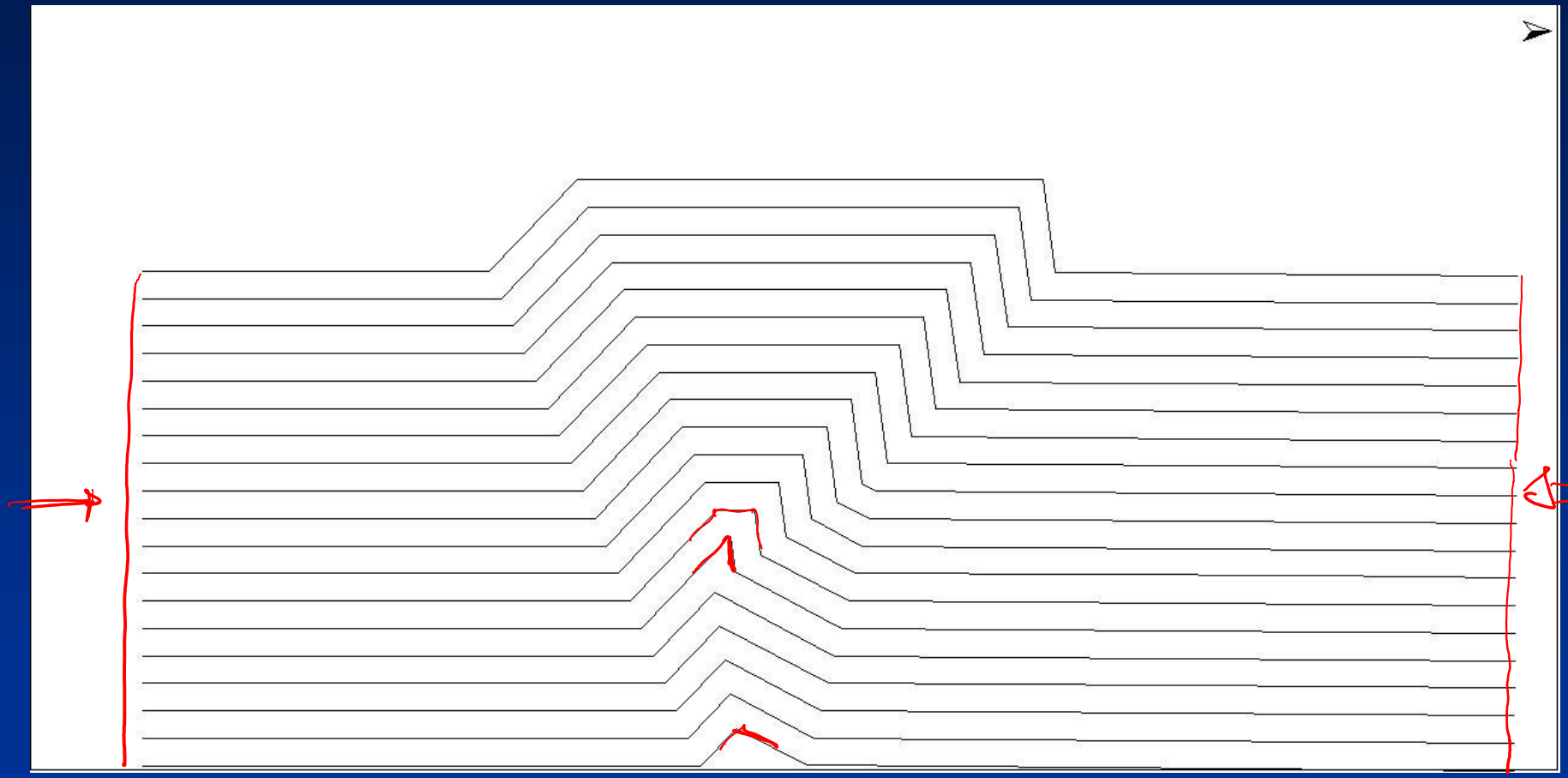
Da Ramsay & Huber, 1987

n = d2 / d1

Rapporto tra gli spessori dei livelli incompetenti e competenti

Pieghe chevron e “a scatola” (box fold)

GA Pini



Semplice modello in forwarding da Move (software licenses by courtesy of Petroleum Expert)

BUCKLING

Fault-related o thrust-related folds

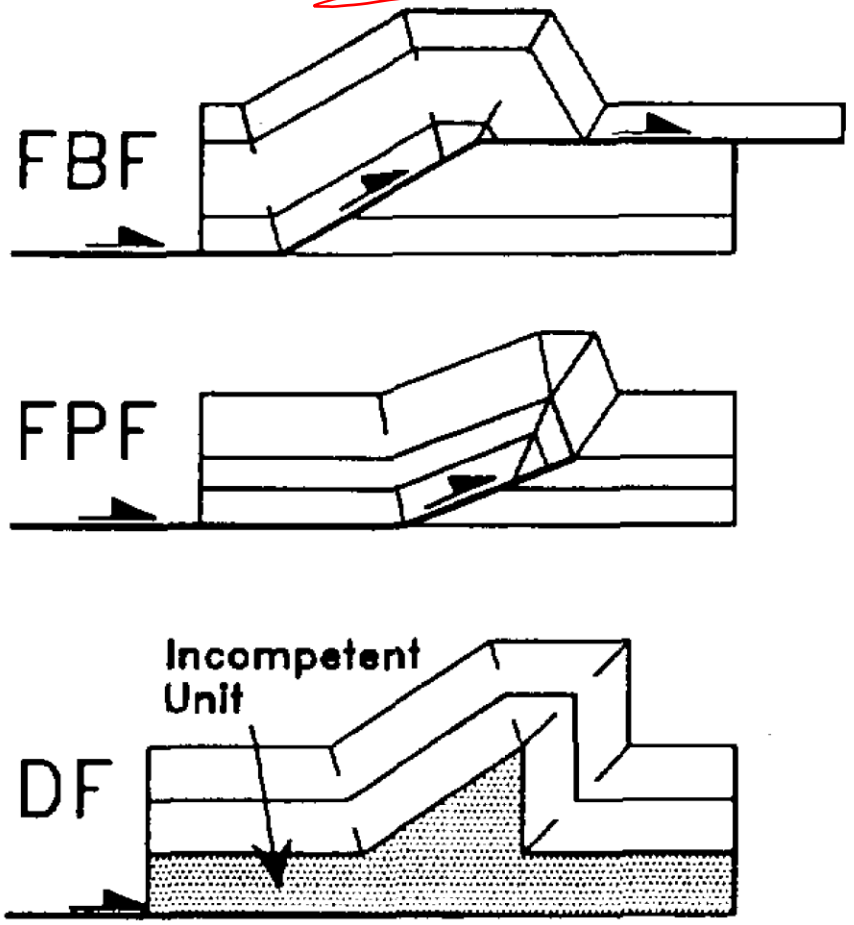


Fig. 1. Three major types of thrust-related folds in fold-and-thrust belts: fault-bend fold (FBF), fault-propagation fold (FPF), and detachment fold (DF).

Da Homza & Wallace, 1995

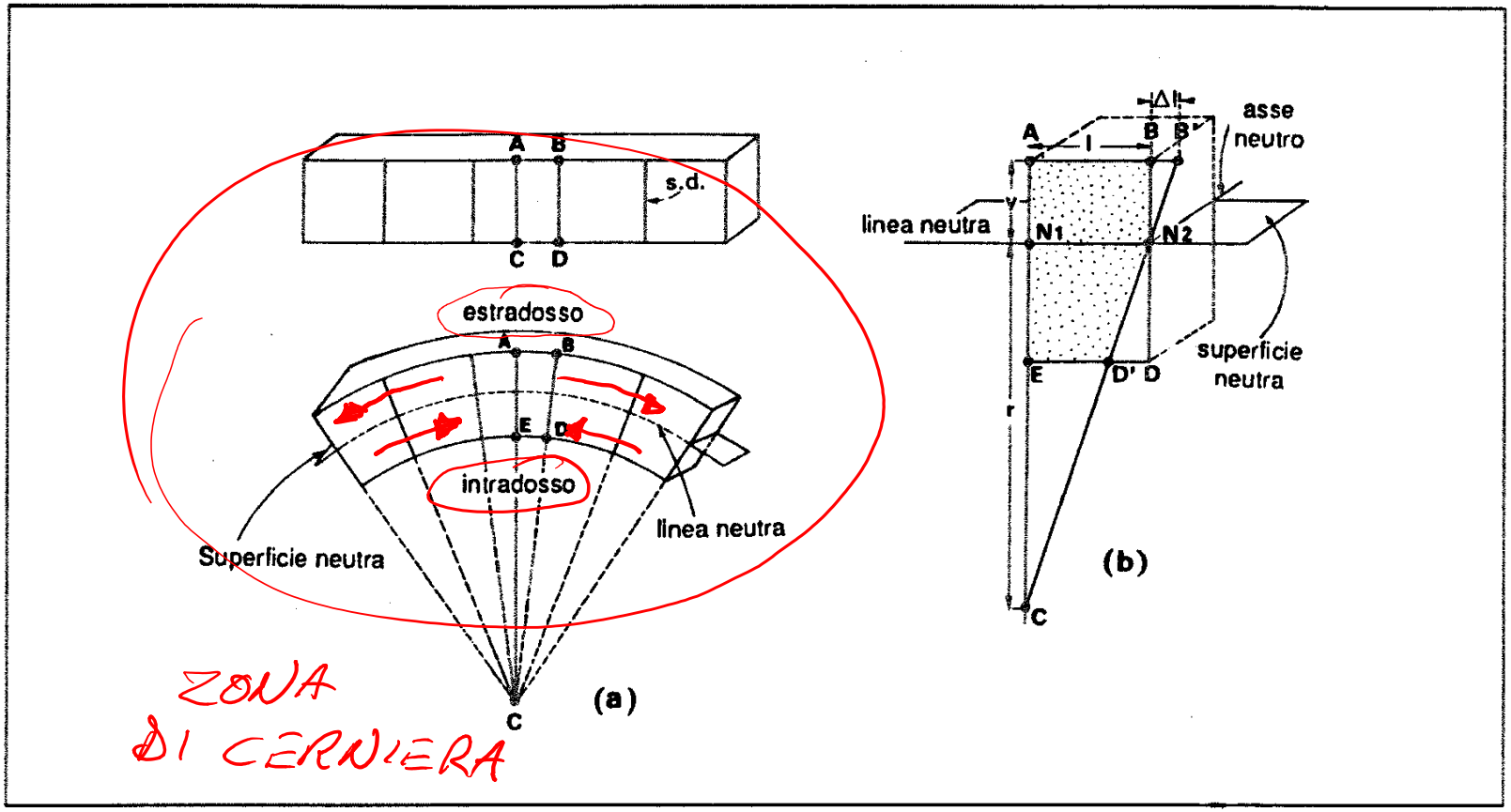


Figura 8.11. Sforzi in una trave in flessione pura (trave in appoggio libero).

Da Mercier & Vergely, 1996

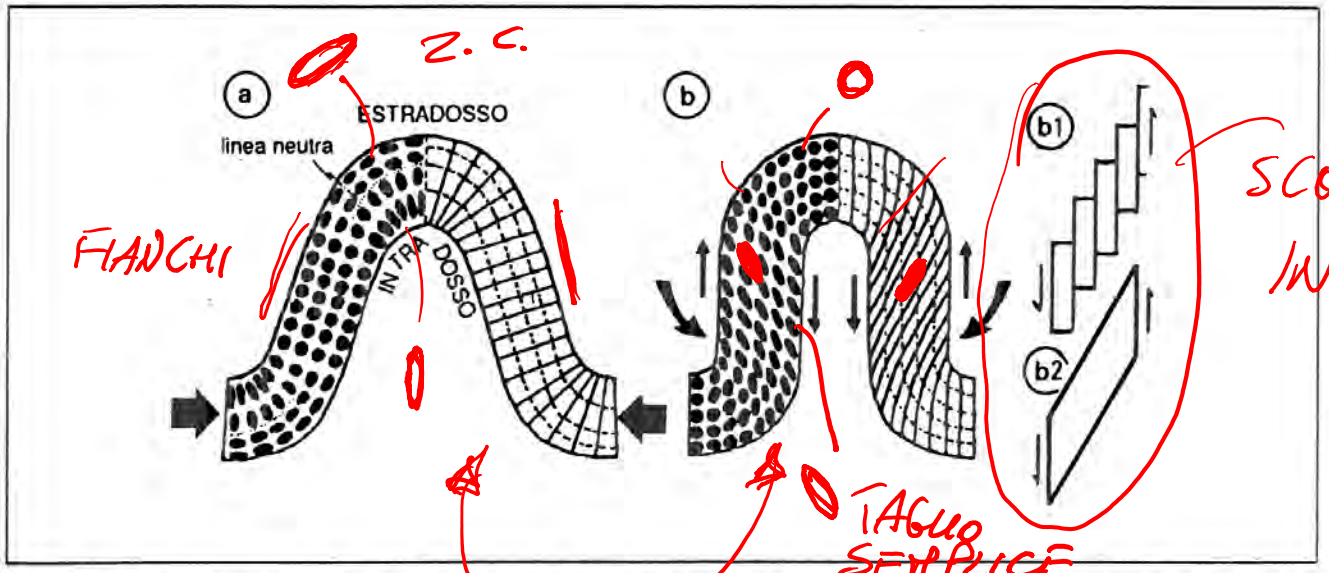


Figura 8.13. Piega monostrato a deformazione di cerniera (a) e dei fianchi (b) con taglio discontinuo (b_1) o continuo (b_2).

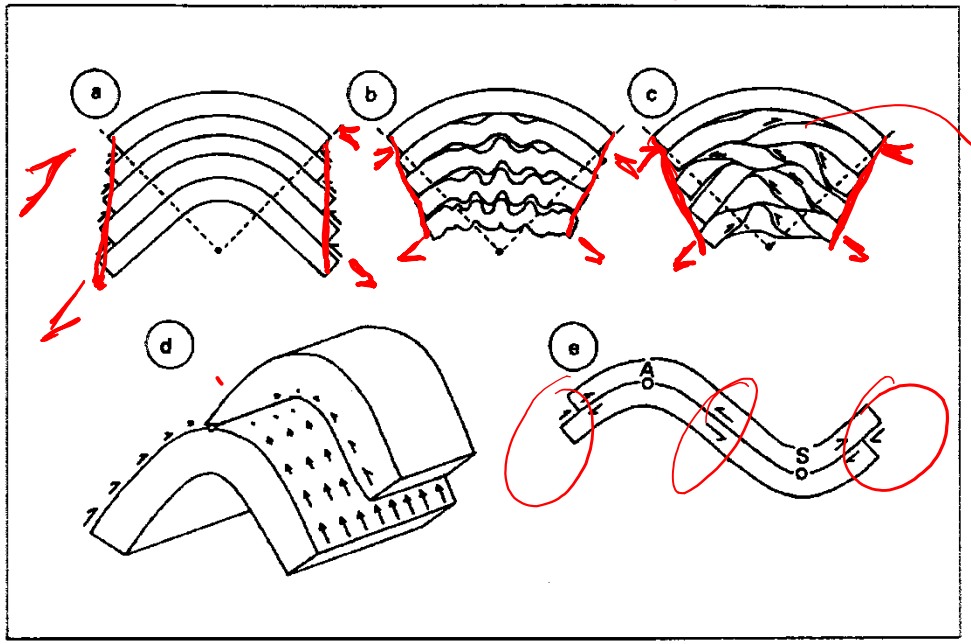


Figura 8.17. Piegamento isopaco di un pacco di strati: a) modello ideale ed accomodamento della deformazione per micropiegamenti b) o per tagli embriciati c), d) ed e) mostrano lo scorrimento banco su banco.

Da Mercier & Vergely, 1995

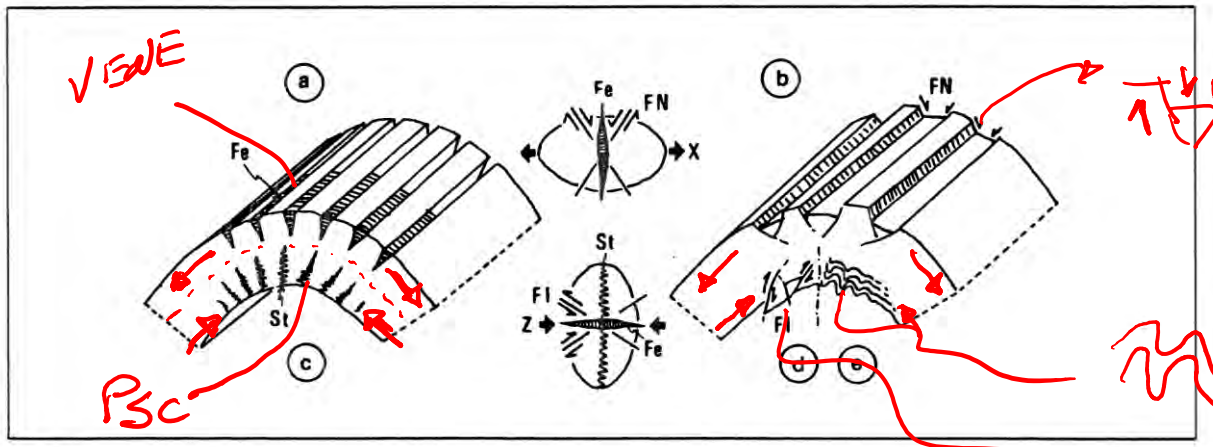


Figura 8.15. Strutture associate alle pieghe a deformazione in cerniera; a) squarci da trazione (*Fe*), b) faglie normali (F_N), c) stiloliti (*St*), d) faglie inverse (F_I) ed e) micropiegamenti; al centro modalità di associazione di diverse strutture.

Da Mercier & Vergely, 1996

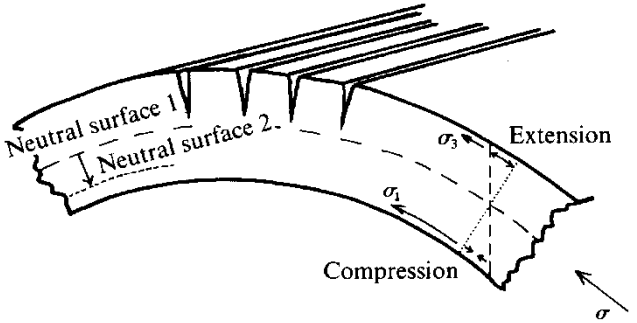
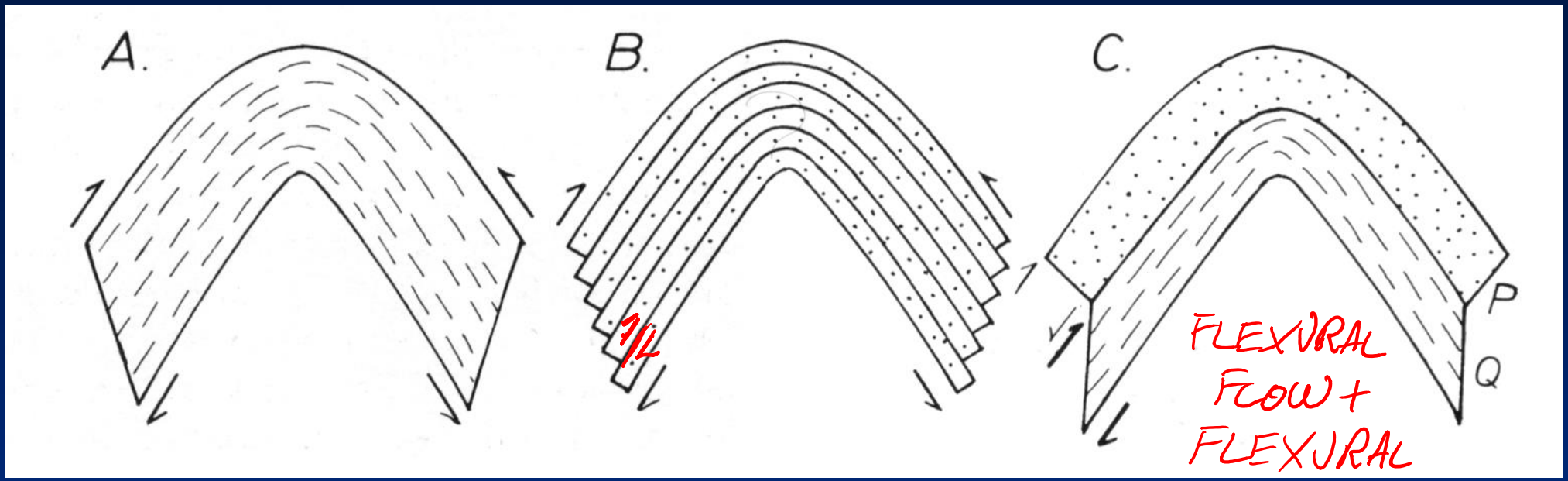


Fig. 14.28. Tangential, longitudinal strain in a thick unit so reduces the stress above the neutral surface that the erstwhile stress σ_1 becomes σ_3 and dilation fractures develop. The fractures reduce the effective thickness of the unit so that the neutral surface (and the fractures) migrate downwards.

Da Price and Cosgrove, 1990



Da Ramsay & Huber, 1987

Flexural flow

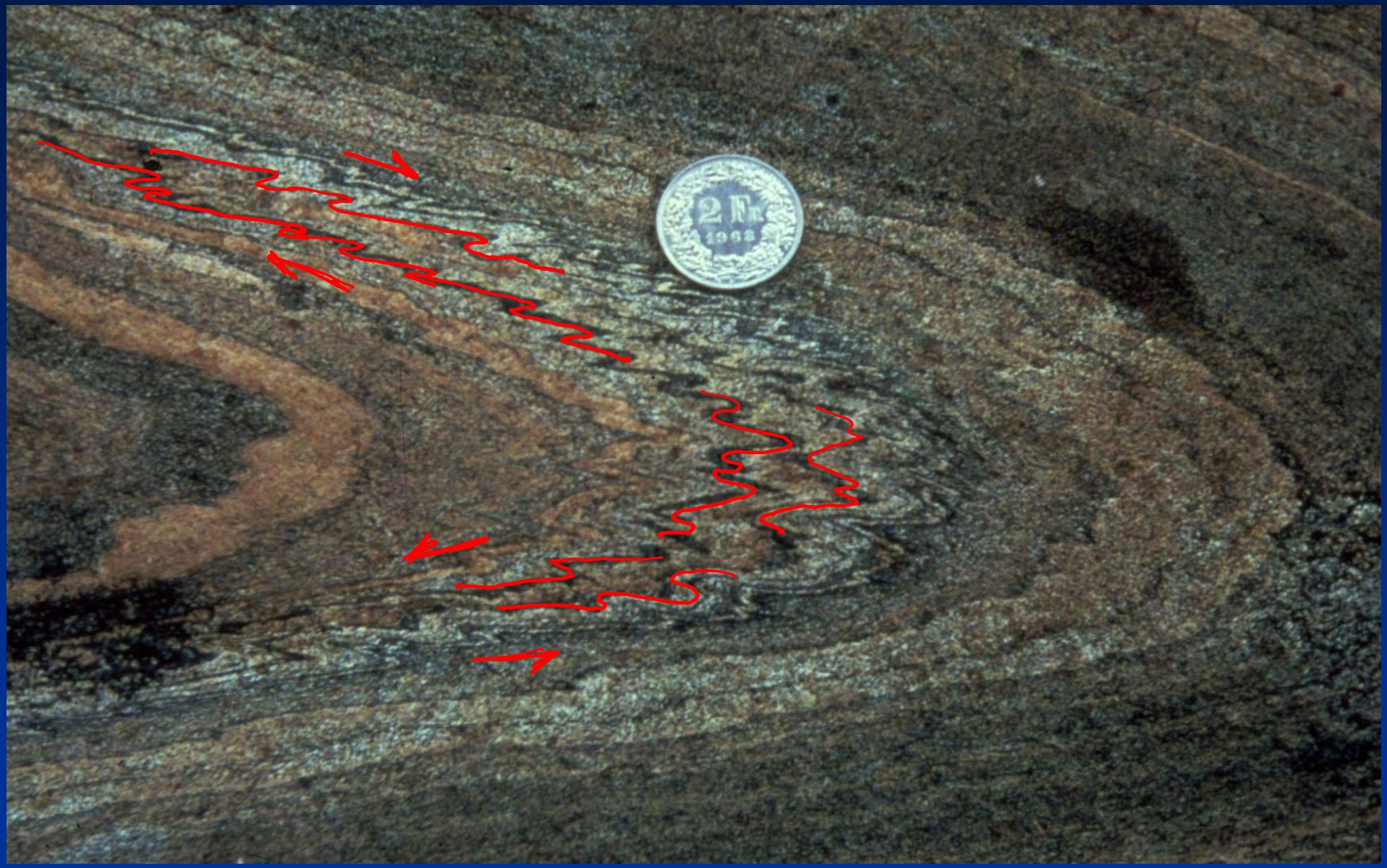
Flexural slip

Misto

SLIP

SCORRIMENTO LUNGO I FIANCHI (FLUSSO)

Pieghe parassite



Da Ramsay & Huber, 1987

Pieghe di secondo ordine
Pieghe parassite

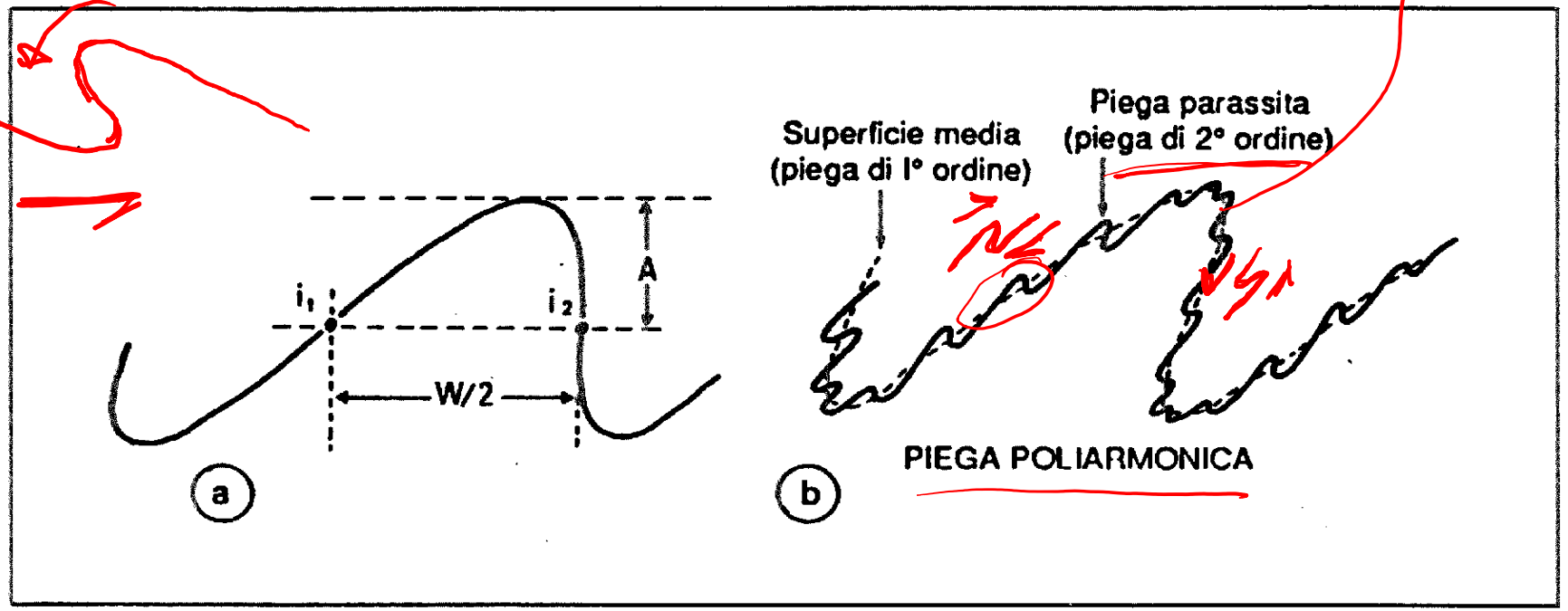
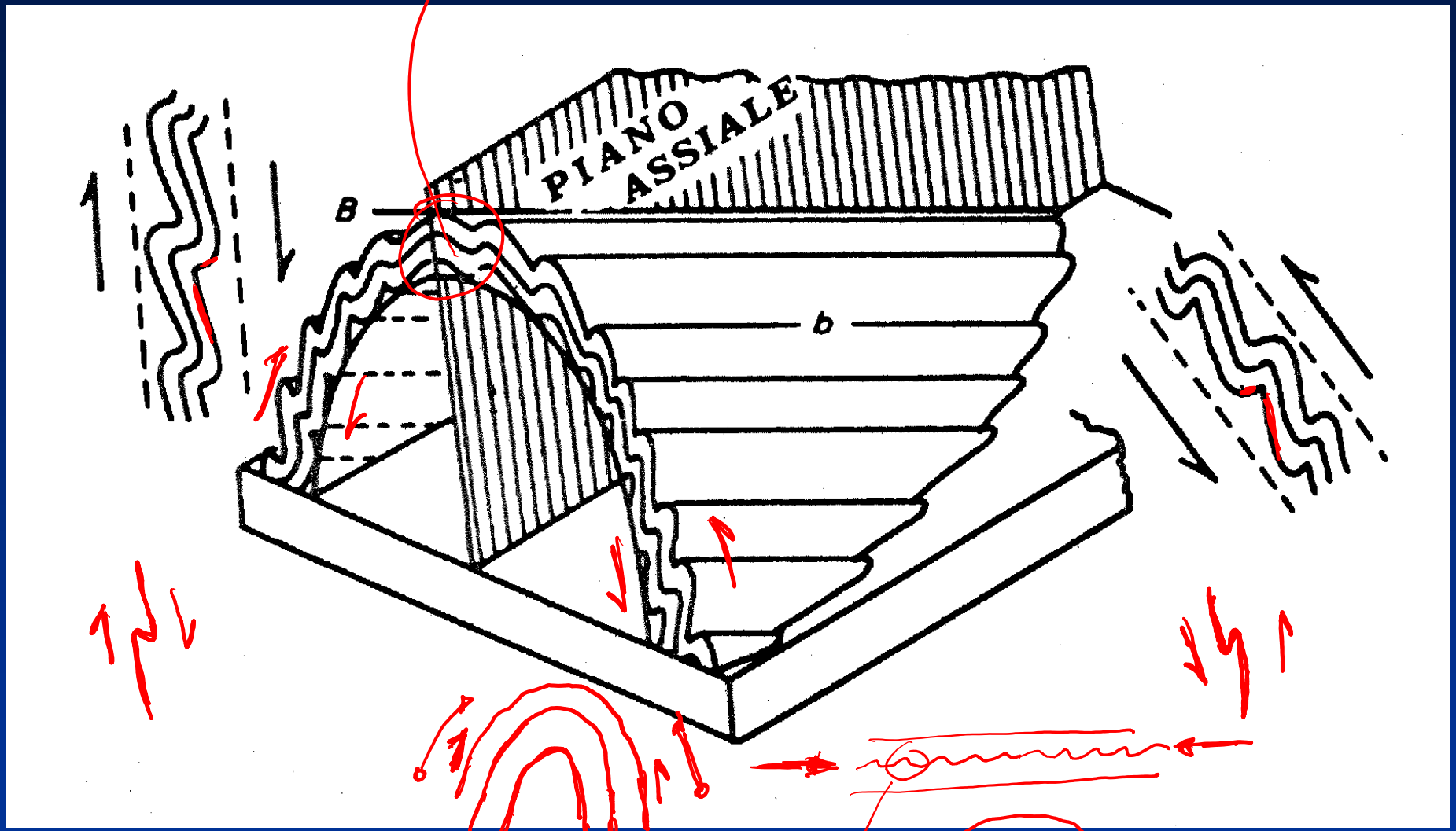
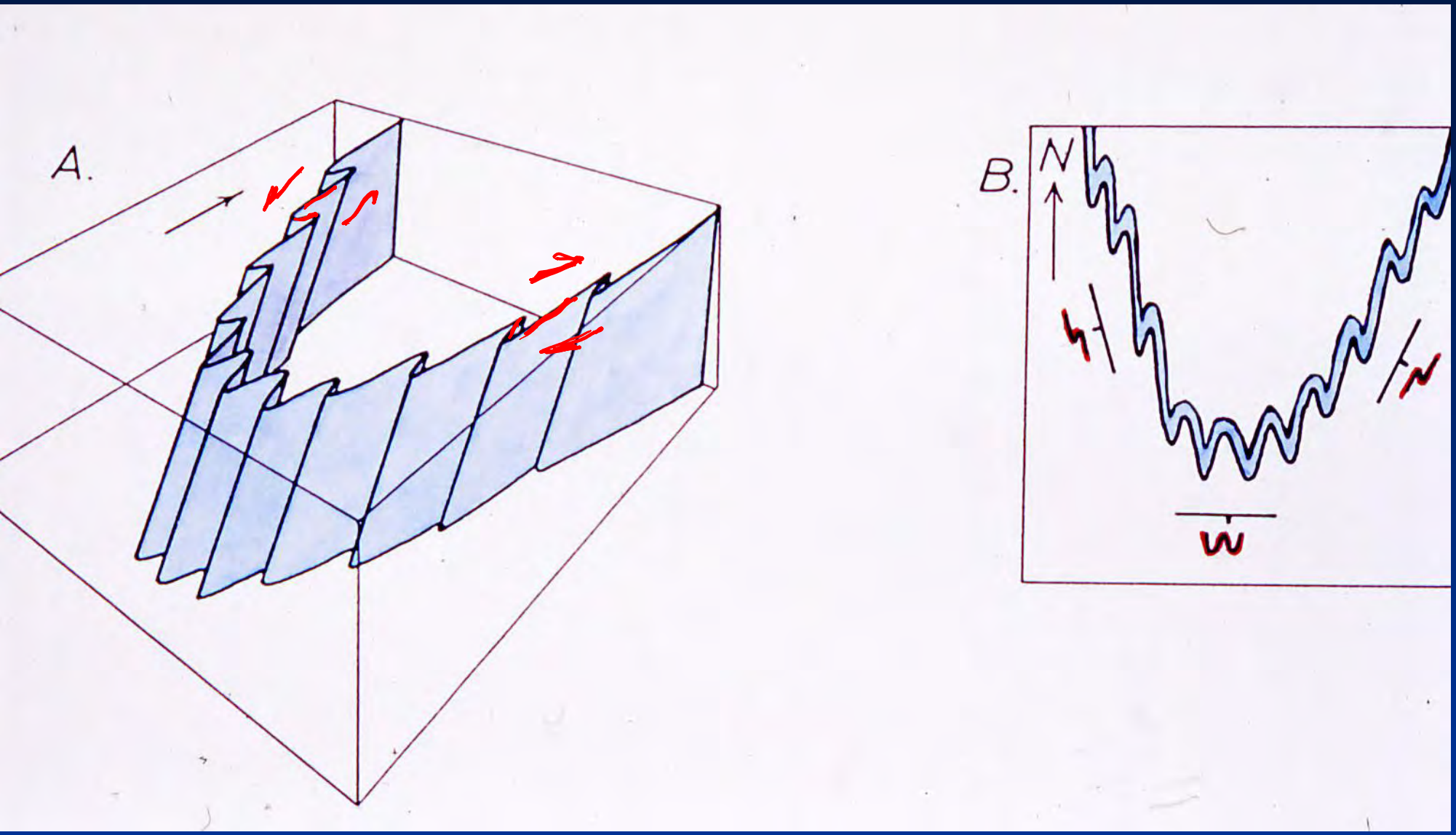


Figura 8.2. a) Ampiezza (A) e semi-lunghezza d'onda (W/2) di una piega; b) superficie media e pieghe parassite di una piega poliarmonica.

Da Mercier & Vergely, 1996



Da Boccaletti & Tortorici, 1987



Da Ramsay & Huber, 1987

Pieghe parassite

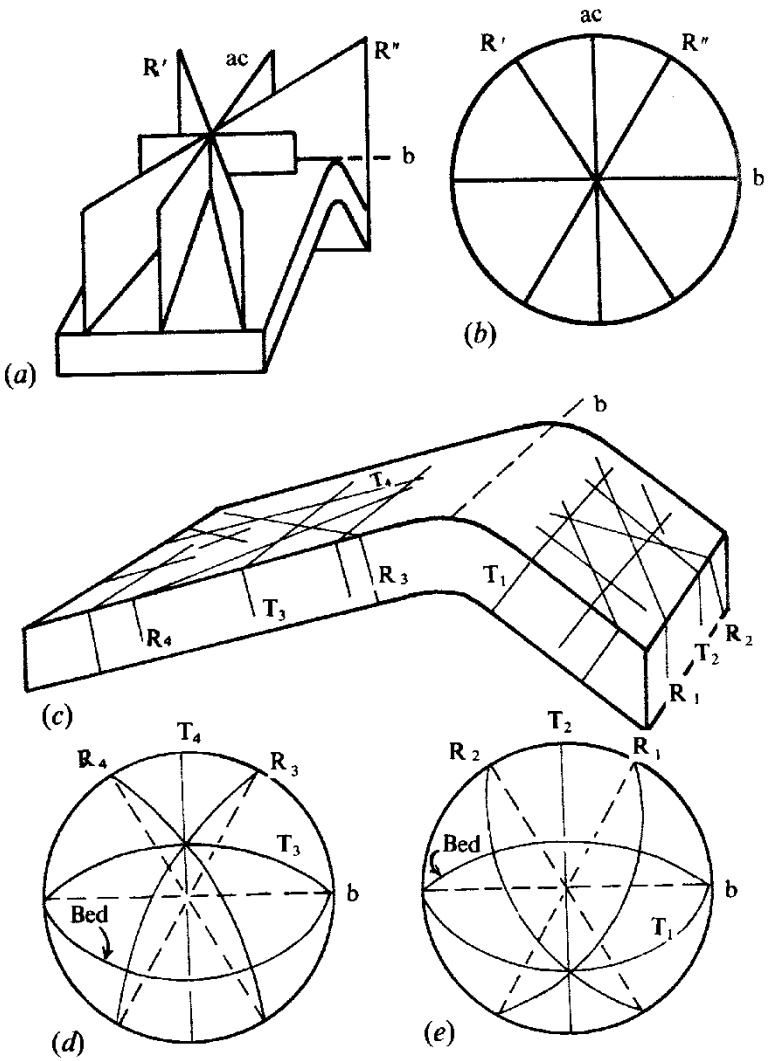


Fig. 14.20. (*a*) Ideal relationship of master joints to a small fold. (*b*) Stereographic plot of fractures shown in (*a*). (*c*) Trends of minor fractures in a folded competent unit. (*d*) and (*e*) Stereographic plots of fractures in the two limbs. R and T are shear and extension fractures respectively. (All after Price, 1966.)

Da Price & Cosgrove, 1990

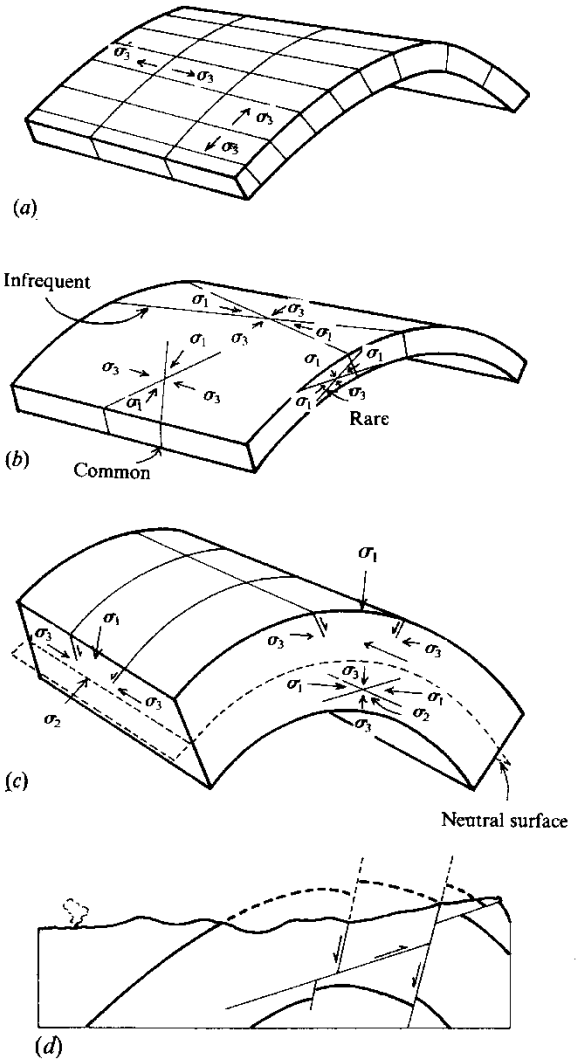
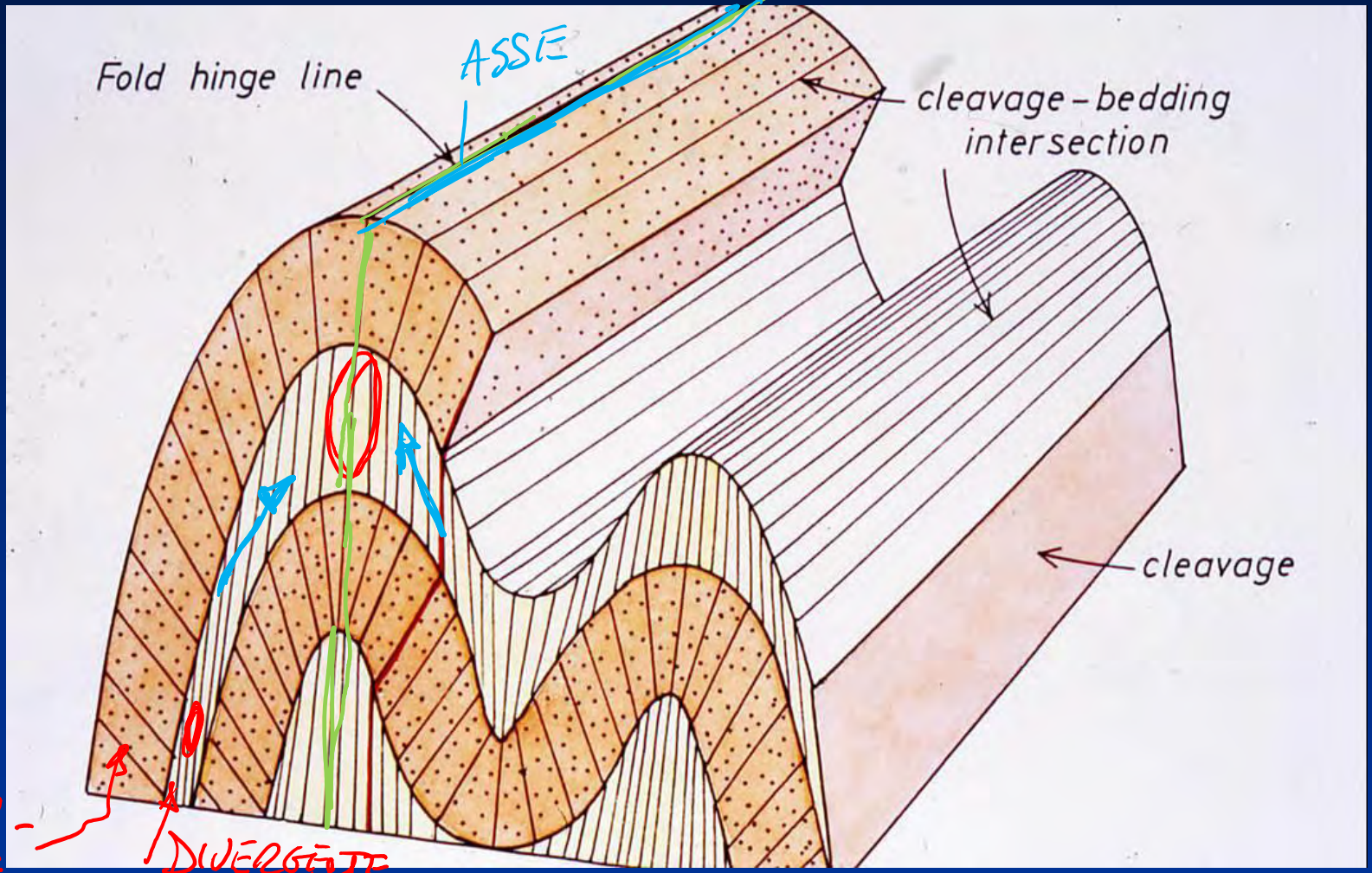


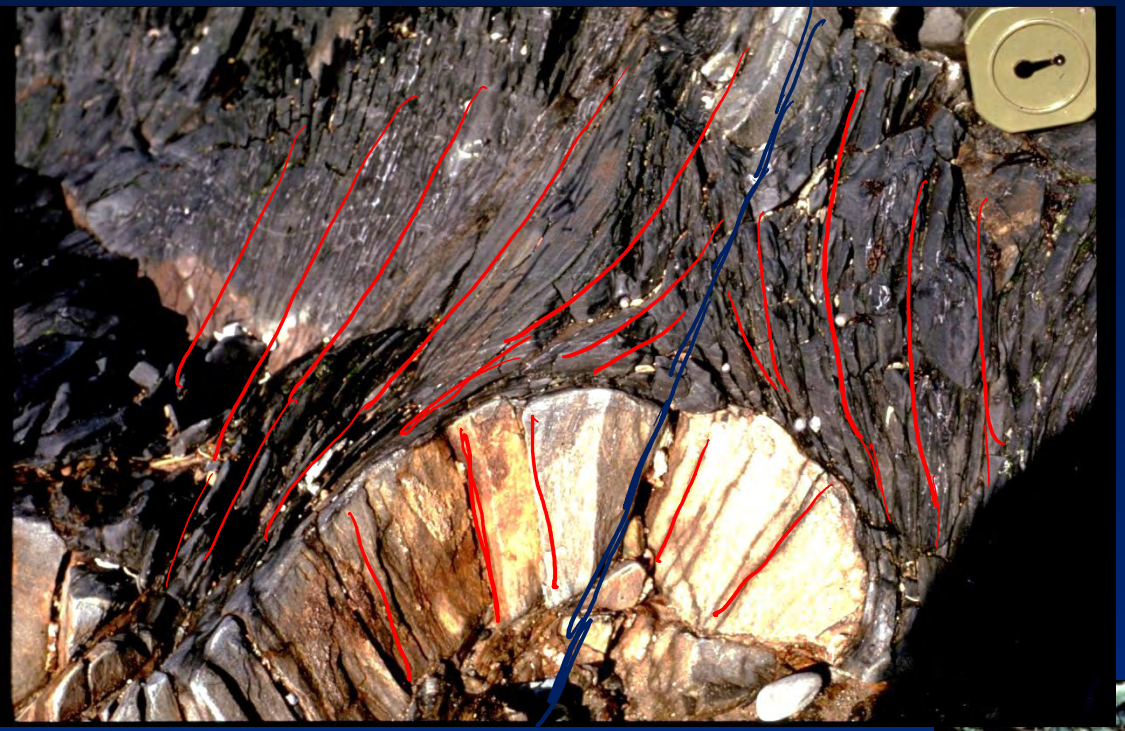
Fig. 14.21. (*a*) Typical relationship of dilational fractures to a fold. The orientation of the least principal stress with the sets (of different ages) is also shown. (*b*) Typical orientation of shear fractures in a thin, bedded layer, with associated stress systems. (*c*) Typical orientation of normal faults and thrusts which may develop in a thick, flexured unit. (See Fig. 14.22 for relationship between shear fractures and stresses.) (*d*) Interaction of thrusts and normal faults.

NO! ISOGONE



Da Ramsay & Huber, 1987

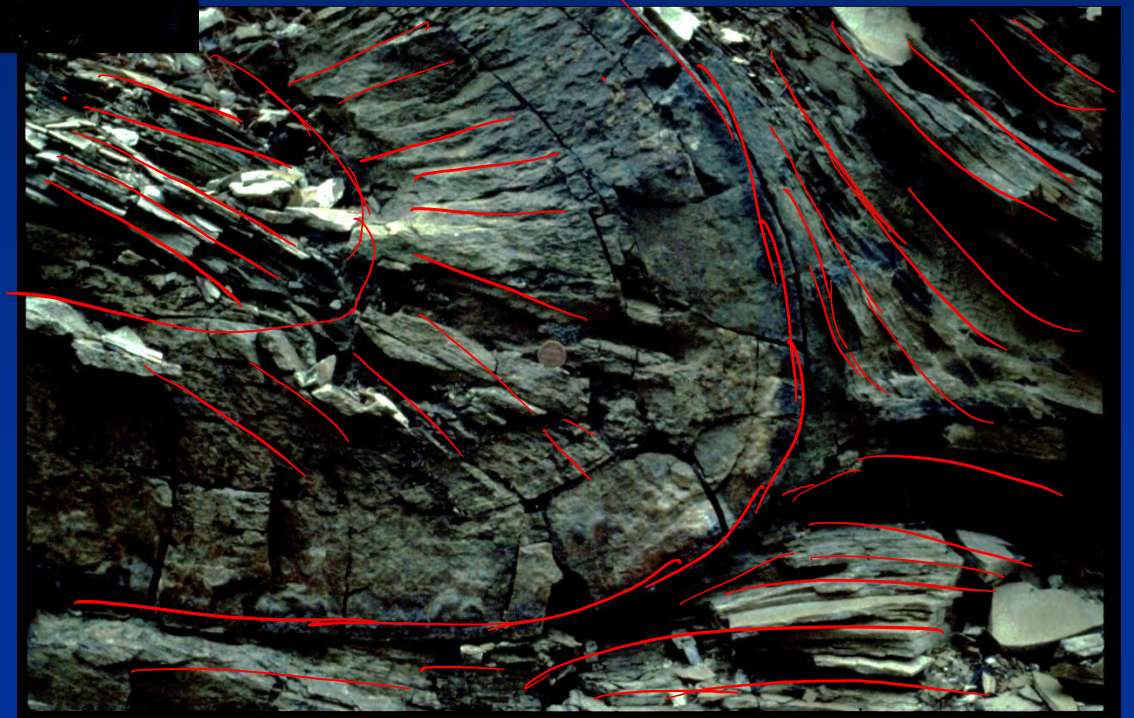
CLIVAGGIO / FOLIAZIONE DI PIANO ASSIALE



Da Ramsay & Huber, 1987

L P.A.

Da Ramsay & Huber, 1987



Foliazione di piano assiale: tipica dei regimi duttili e delle pieghe simili

Da Ramsay & Huber, 1987

Pieghe simili

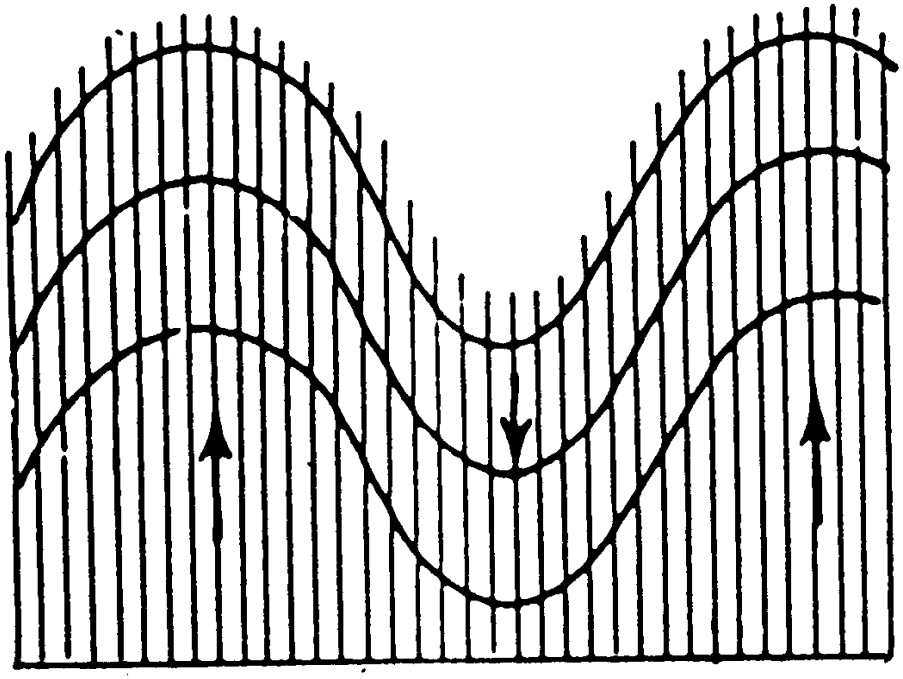
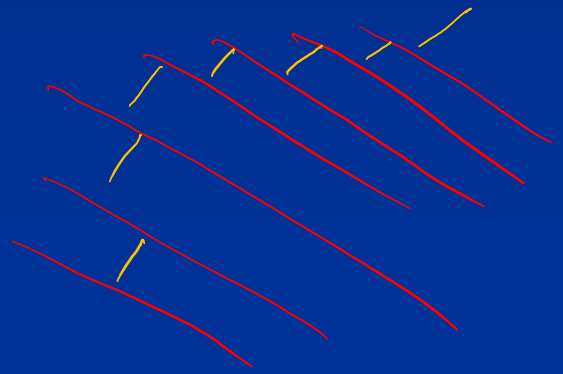
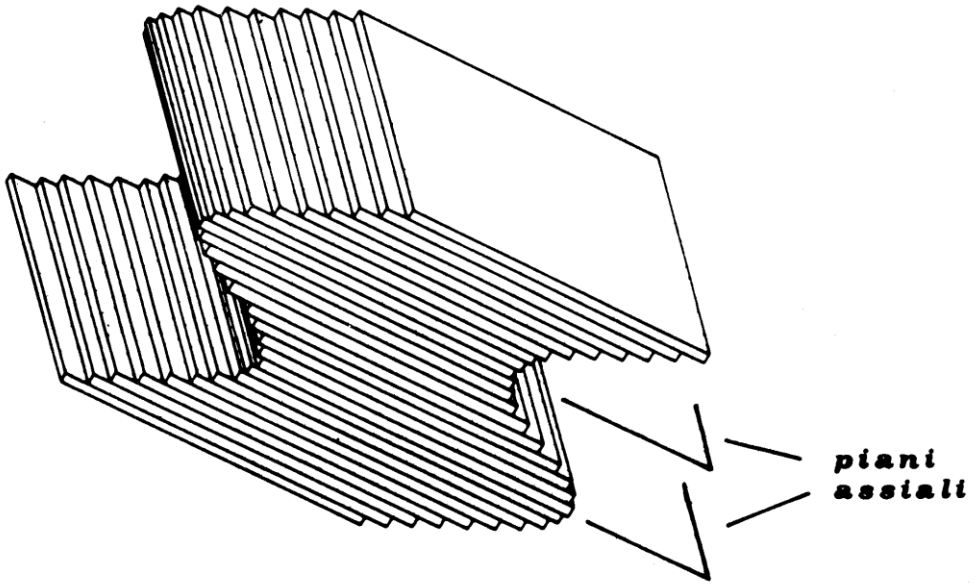


Fig. 68 - Esempio di pieghe simili (da HILLS, 1963).

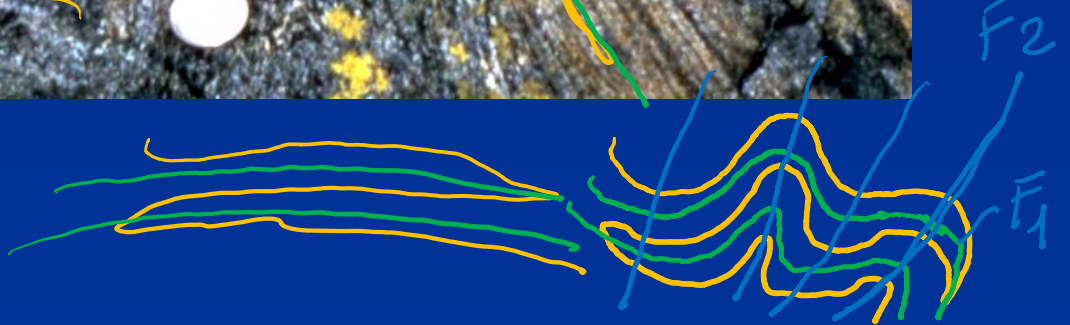
Da Boccaletti & Tortorici, 1987

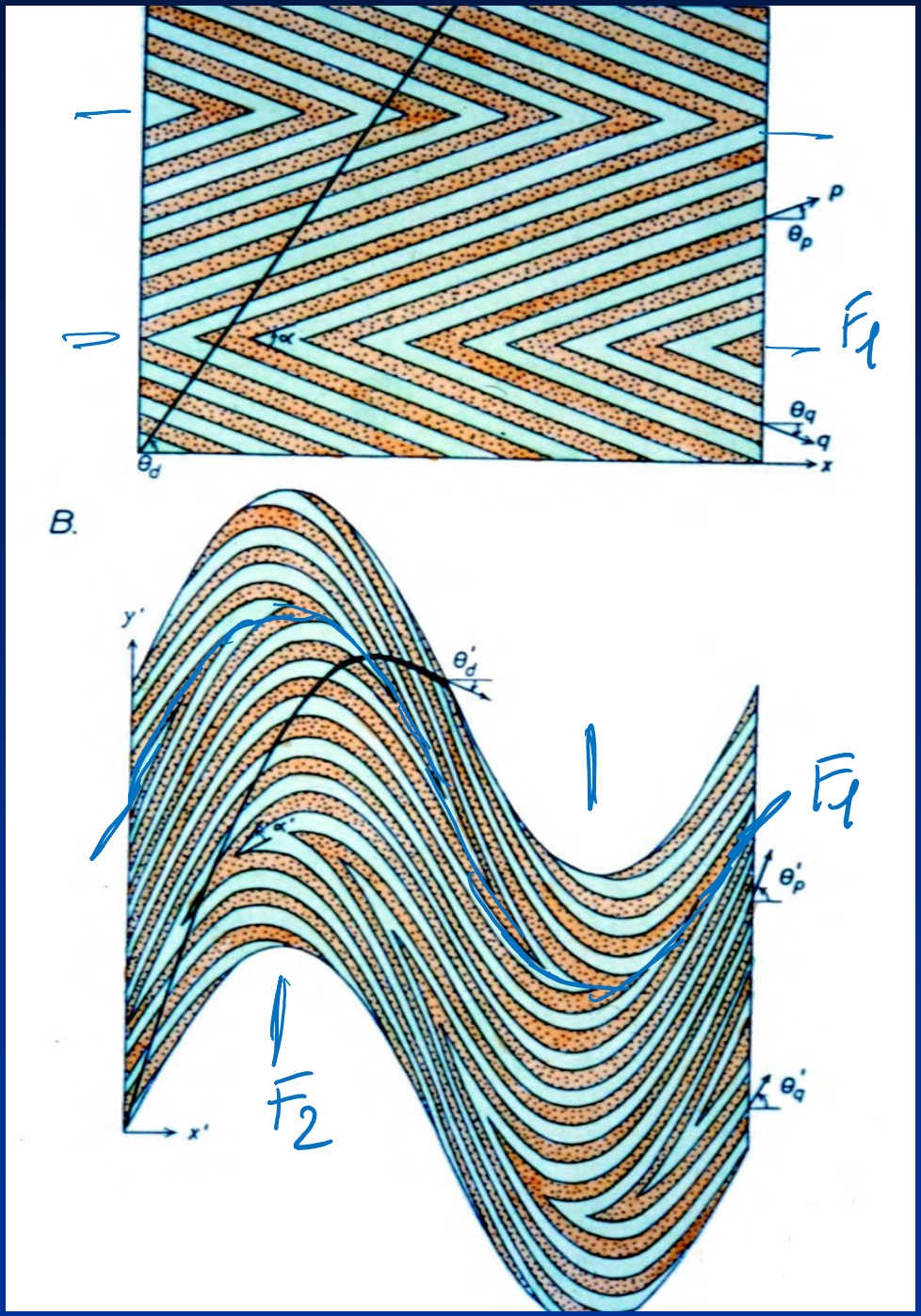




Pieghe ripiegate “strutture di interferenza”

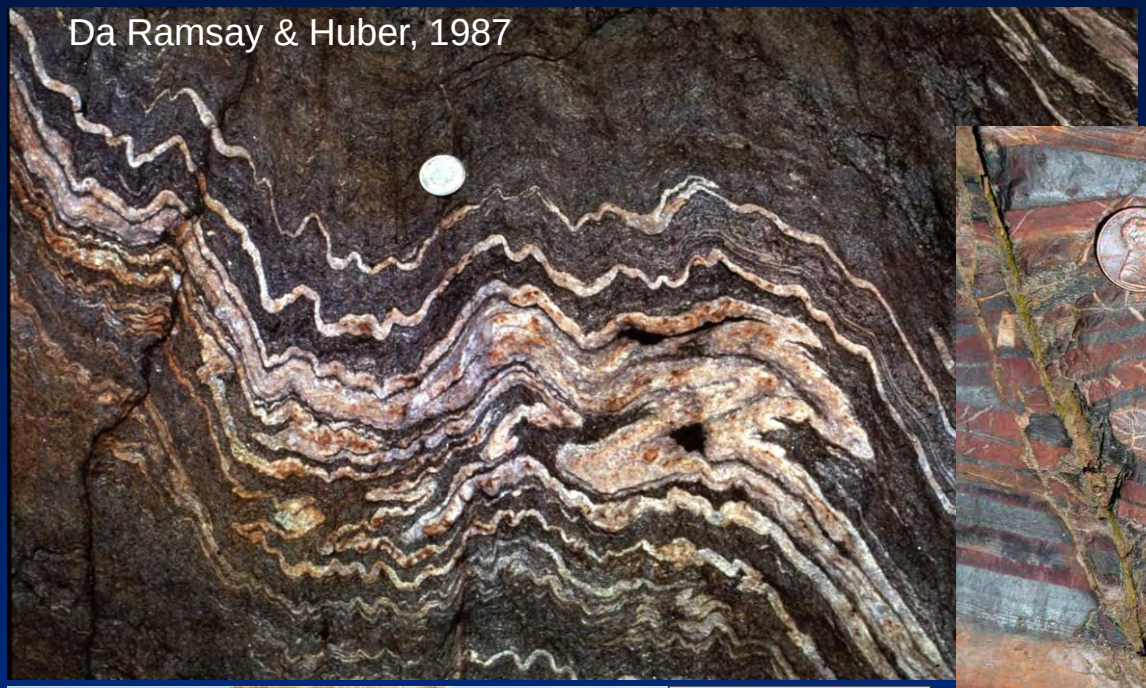
Da Ramsay & Huber, 1987



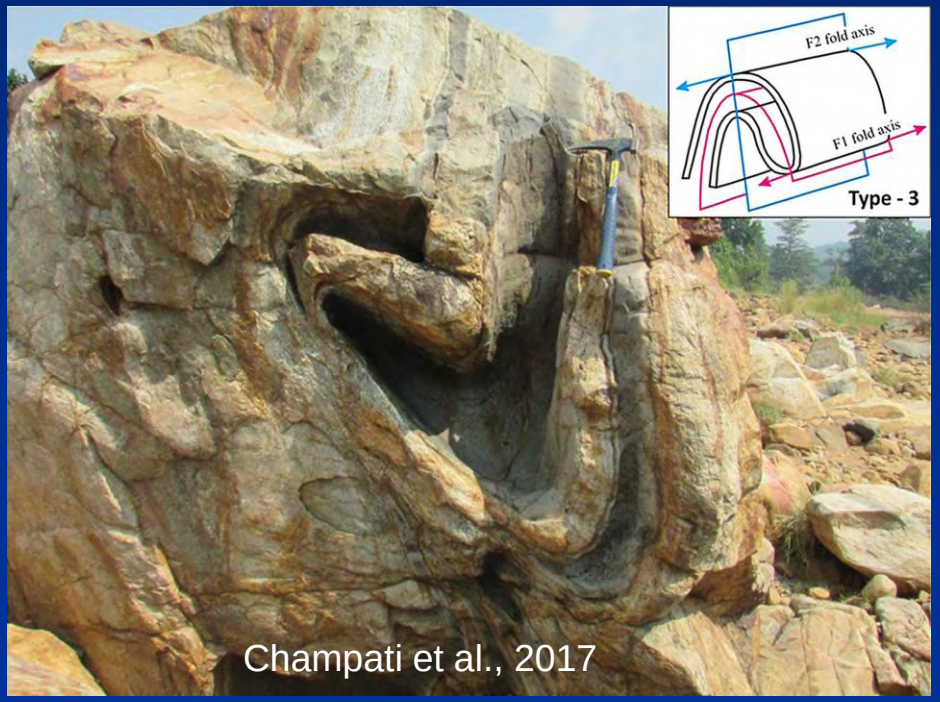


Da Ramsay & Huber, 1987

Da Ramsay & Huber, 1987



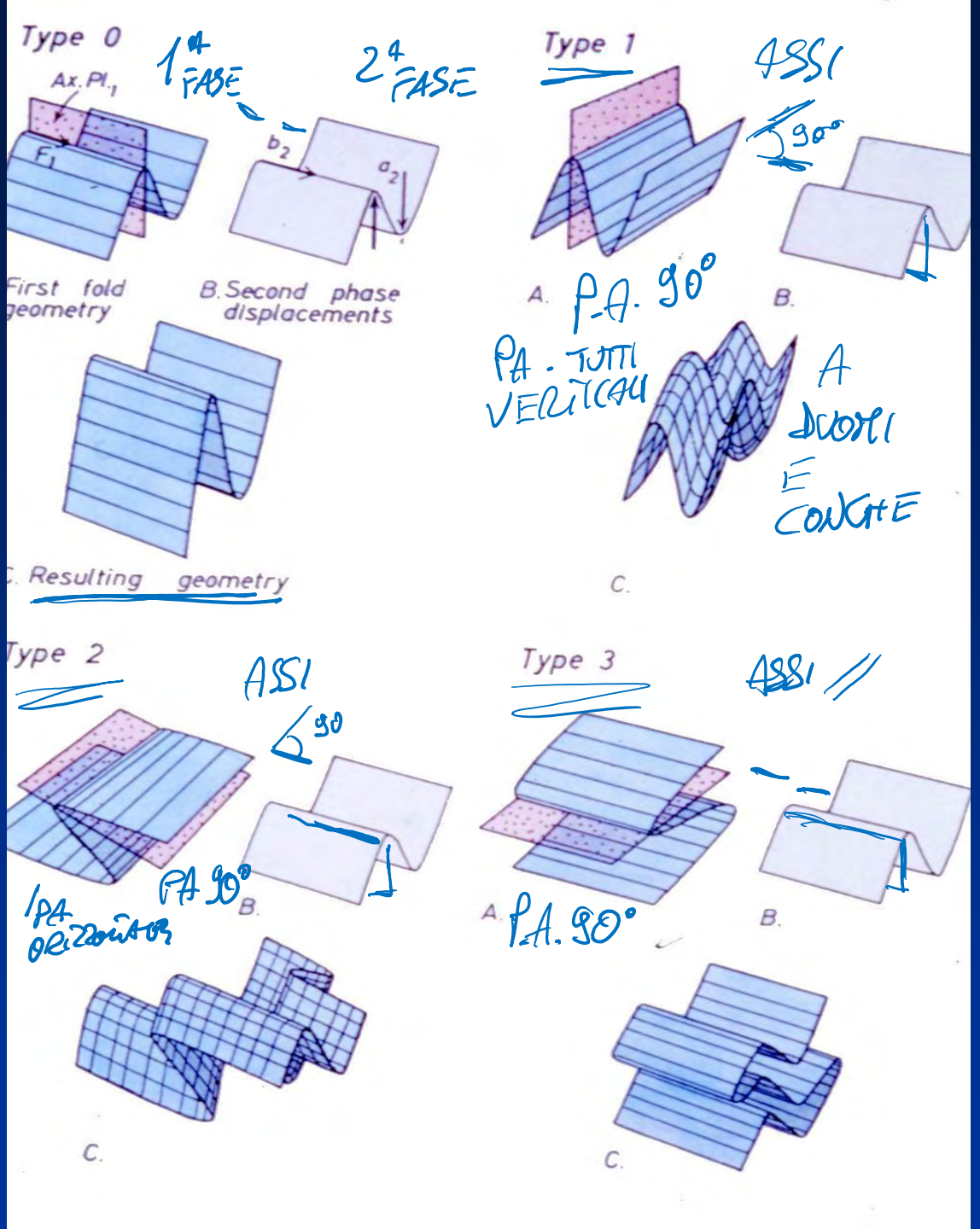
Da Fossen, 2010



Champati et al., 2017

In A DUOMI E CONCHE

Pieghe ripiegate “strutture di interferenza”



Da Ramsay & Huber, 1987

Da Ramsay & Huber, 1987

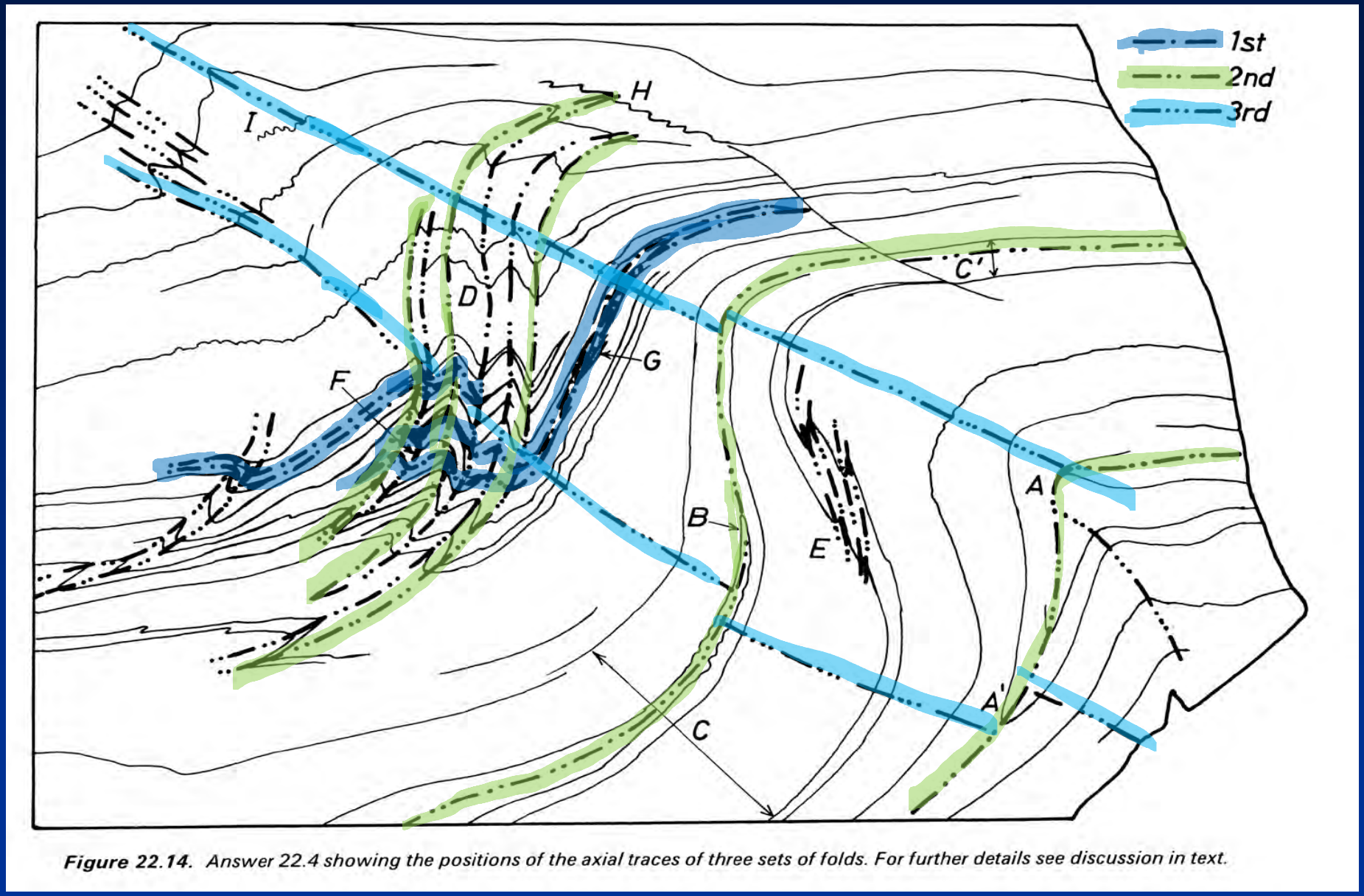


Figure 22.14. *Answer 22.4 showing the positions of the axial traces of three sets of folds. For further details see discussion in text.*

Da Ramsay & Huber, 1987