Multiphase deformations within the Late Permian strata of the Raub Gold Mine, Pahang

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The Raub Gold Mine is one of the rare places along or within the Bentong-Raub Zone where good exposure are found. The exposed Late Permian strata have undergone multiple deformations.

The most common structure seen within the mine are chevron folds with conjugate kink band geometry believed to be among the latest structures to developed. The fold axes trend NNW with variable plunges ranging from moderate to sub-horizontal. Within a 3 m thick reversed fault zone, these folds are tight and developed an axial planar cleavage, (S_2).

The mine is dorminated by an anticlinorium that predates the above folds. Associated minor folds (F_1) are tight to isoclinal, upright to slightly inclined, sinusoidal forms with gentle plunge. These folds have the following characteristics:-

1. Doubly plunging (periclinal form) towards NNW and SSE.
2. Associated with 2 sets of cleavages having a variable angle between them of 5° to 15°. The earliest of the (S_{1a}) is always slaty while the later (S_{1b}) may have a crenulation form with offset according to lithology. On profile plane, S_{1a} is curvilinear and at the zone where S_{1a} is perpendicular to layering it does not coincide with the hinge zone but anticlockwise of it. S_{1b} is superimposed on S_{1a}, axial planar and fans slightly about the axial plane. On the hinge surface S_{1a} transects the hinge line by about 10° clockwise while S_{1b} may be parallel or slightly transecting.
3. Diverging hinges and axial traces, attributed to oblique flattening.

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4. Pyrite crystals in thin sections cut parallel to the cleavages (axial plane) exhibit pressure fringes with 2 main phases of development. The dorminant early fibres are sub-vertical and then succeeded progressively by sub-horizontal fibres suggesting a non-coaxial stretching history involving early vertical extension followed by later sub-horizontal extension.
5. The limbs may be stretched, boundinaged, sedimentary clasts pull-aparted and in places a chocolate-tablet boundinage structure developed, revealing a history of early sub-vertical followed by later sub-horizontal stretching.
6. The limbs may be cut by sub-vertical faults with associated steeply plunging drag folds. Deformed diamictites shows clast aligned in 2 directions parallel to both S_{1a} and S_{1b} and exhibit dextral shear bands suggesting a history of late sub-horizontal extension.

Collectively, all the above characteristics, suggest that D_1 structures developed in a regime that involved early sub-horizontal compression that progressively changes into dextral strike-slip motion. In other words, the early deformations was multi-phased and developed in a dextral transpressive regime.
