KINEMATICS (1)

I Main Topics
   A Definition and use
   B Relative ages
   C Displacements vs. relative displacements

II Definition and use
   A The study of the position of bodies through time without regard to
      the forces causing motion
   B Used to describe how a body changes position, orientation, shape,
      and/or size through time

III Relative ages
   A Cross-cutting relationships
      1 Younger features can cut older features; older features cannot cut
         younger ones
      2 Examples
         a Unconformities
            a Angular unconformities
            b Nonconformities
         b Dikes
         c Joints
         d Faults
         e Plutons (can cut older deformed rocks)
      3 "Pathologic" examples
         a Pay careful attention to relative displacements, what you don't
            know, and stay sharp
         b Einstein: "I had to divest myself of intuition - then I could
            think clearly (Press and Siever, 1978, p. 133)
B Inclusions
1 Older material (e.g., xenoliths) can be incorporated in younger rocks
2 Examples
   a Igneous inclusions
   b Sedimentary inclusions (e.g., shale rip-up clasts)
C Interaction of structures
1 Older structures can affect the initial formation of younger structures, but younger structures cannot affect the origin of older structures
2 Examples
   a Tee-shaped intersections: the "crossbar" is older
   b Curving fractures
D Paleomagnetic phenomena: paleomagnetic poles can predate or post-date folding (for example)

IV Displacements vs. relative displacements
A Most of the displacements geologists measure are relative displacements (GPS is sort of the exception)
B A lack of relative displacement does not equate to a lack of absolute displacement (examples: joints and faults)
C Structural geologists usually cannot measure displacements relative to an undeformed initial state; we only see the final deformed state
D Models influence what we measure, where we measure, and how we interpret our measurements
1 Faults and joints (see B)
2 Dependence on our concept of the initial state: is it deformed or undeformed?
"PATHOLOGICAL" EXAMPLES

Is this a dike or a fault?

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