The Underhill Thrust Fault at Jerusalem

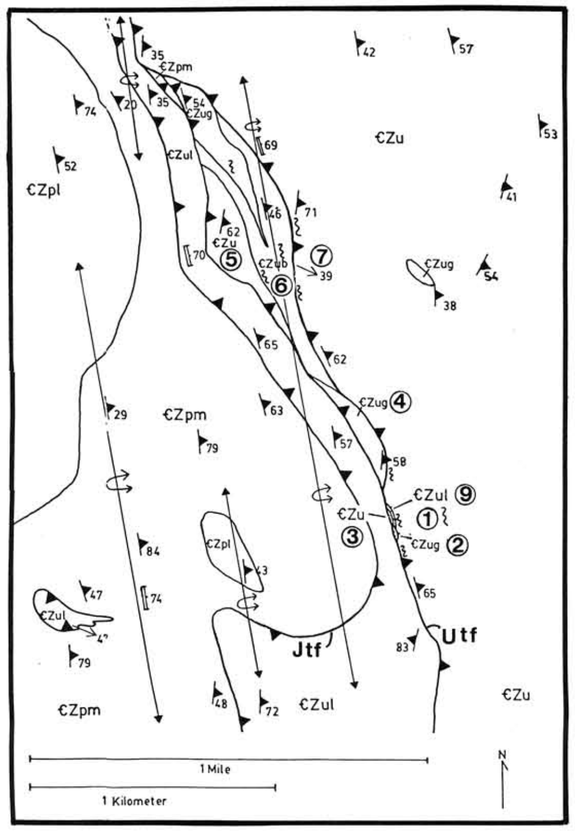


Figure 45. Geologic map of the Underhill thrust fault (Utf) at Jerusalem as mapped by DiPietro (1983). Sample localities are shown by number. The Underhill thrust fault overlies the Jerusalem thrust fault (Jtf) and contains slivers of greenstone (CZug), biotite metagraywacke (CZub), and quartz-sericite schist (CZu).

Figure 46. Mylonitic quartzites occur along the Underhill thrust fault in Jerusalem. The mylonites are strongly foliated and display a well-developed down dip lineation (parallel to 6-inch ruler). These mylonites are interpreted to have originated as schistosity parallel quartz veins which segregated in the early stages of deformation and were subsequently recrystallized during shearing.

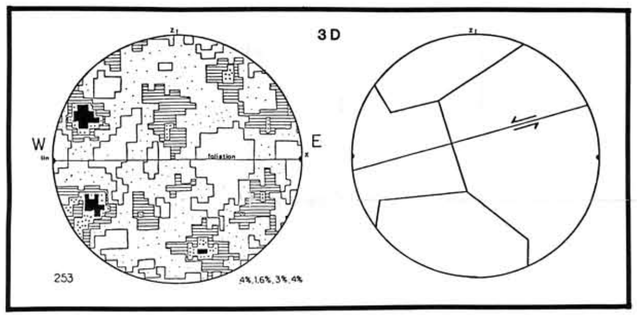
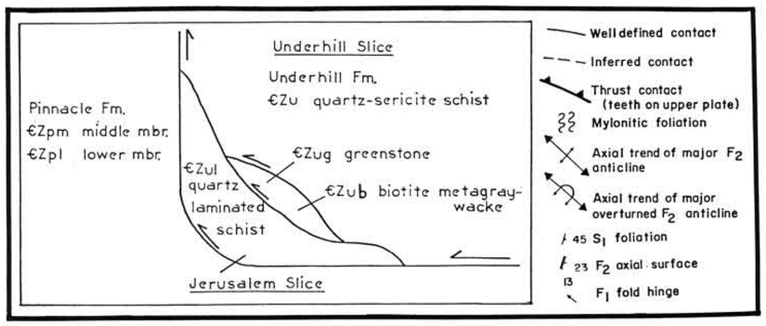


Figure 48. Universal stage analysis of quartz c-axes revealed a distinct asymmetry in the crystallographic fabric (a). Both the distribution intensity and the fabric skeleton (b) indicate an east-over-west shear sense. C-axes are shown as lower hemisphere equal area projections onto the XZ plane. The lineation and foliation are shown on the contoured projection. 253 c-axes, contours are given as the percentage of points per 1% area.



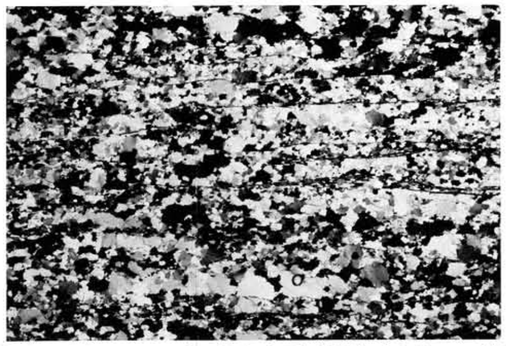


Figure 50. Some of the quartz mylonites within the Underhill thrust fault zone exhibit fabrics which result from grain growth coarsening subsequent to deformation. Grains are much coarser and have blotchy shapes. These grains commonly enclose fine grains of sericite. Sample 5A, XZ section. Crossed nicols. Bar scale is 5 millimeters.

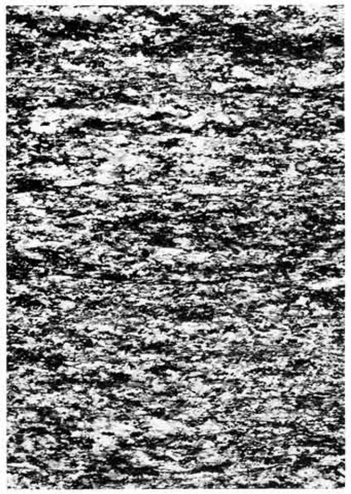


Figure 47. Sample 3D is a mylonite from a sheared quartz vein. Quartz is entirely recrystallized to fine-grained aggregates of new grains that exhibit a strong crystallographic preferred orientation. Crossed nicols. Bar scale is 5 millimeters.

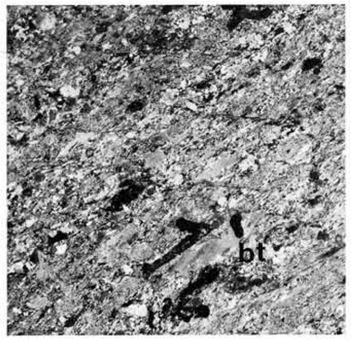


Figure 49. Microstructures were utilized to determine the shear sense. Polyphase rocks such as the metabasites, which consist of coarse-grained biotite, hornblende, actinolite, muscovite and chlorite in addition to finer-grained sphene, quartz, plagioclase, calcite and iron oxides, are well-suited to microstructural shear sense analysis. The deformed biotite indicates an east-over-west shear sense when transformed into a geographic coordinate system. Sample 2D. Crossed nicols. Bar scale is 5 millimeters.

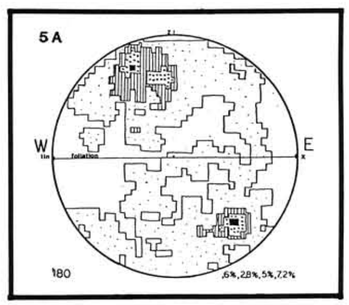


Figure 51. Quartz c-axis analysis of fabrics which exhibit grain growth coarsening also reveal an east-over-west asymmetry. The pattern, however, does not resemble typical distributions such as the crossed girdle obtained for sample 3D. Lower hemisphere equal area projection of 180 c-axes onto the XZ plane. Contours are shown as the percentage of points per 1% area (lower right corner).

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