interpretations based on calcite and dolomite twin lamellae and on phenomena of internal rotation give the most reliable and meaningful results when studied in slightly and moderately deformed rocks.

Experimental kink banding in biotite crystals provides another criterion for dynamic inferences. In biotite the kink band boundaries are initially oriented at high angles to the greatest principal compressive stress.

In experimentally deformed quartz crystals and sands, deformation lamellae which resemble the natural counterparts lie only in planes of high resolved shear stress. This laboratory observation is valid in the field as well where the angle between the deformation lamellae and the greatest principal stress is evidently less than 45 degrees. Principal stress directions derived from the quartz deformation lamellae on this basis agree well with those located from extension fractures and calcite twin lamellae.

Experimental syntectonic recrystallization of dry calcite suggests that in the most stable orientation the c_v tend to parallel the greatest principal compressive stress. This agrees with the Gibbs-Kamb[167] thermodynamic prediction for recrystallization in the presence of solutions, but the theory is still controversial. Application of the experimental results to marbles implies that the greatest principal stress is characteristically oriented at high angles to the observed foliation during recrystallization. The random calcite c_v subfabrics common in recrystallized sedimentary rocks may be evidence that the state of stress due to simple overburden pressure is nearly hydrostatic.

It has been emphasized repeatedly that some petrofabric techniques serve to map the principal stresses in rocks at the time of their deformation. Future research will have to determine the relationship, if any, between these stresses and the present state of stress in the rocks.

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