

## METAMORPHISM, DEFORMATION, AND GEOTHERMOMETRY OF PROTEROZOIC ROCKS ALONG SOUTH HARDCRABBLE CREEK, WET MOUNTAINS, COLORADO

NOBLETT, Jeffrey B., Geology Dept., BOWER, Nathan W., Chemistry Dept., Colorado College, Colorado Springs, CO 80903.

Proterozoic rocks in the Wet Mountains on the east side of the northwest trending Ilse fault have undergone a complex history of deformation and metamorphism. Amphibolites of tholeiitic basalt and gabbroic origin, biotite gneisses of probable shale and greywacke origin, a sillimanite-bearing quartzite, and a biotite-garnet schist were intruded by granite. The granite is a two-mica, corundum-normative, light Ree-enriched, Eudepleted intrusion of probable crustal origin; though it was not derived through in-situ melting of the host rocks. It contains xenoliths of the amphibolite, but is both foliated and folded concordantly with them, suggesting that it intruded during the latter stages of deformation. A U-Pb (zircon) age will be available at the meeting.

An early deformation is hinted at by the presence of a minor cross-cut foliation in the amphibolites. The primary deformation was an isoclinal folding event with fold axes trending north, plunging at a shallow angle. A later minor concentric folding produced a set of fold axes with a northwest trend, which are also subhorizontal.

Metamorphism reached the upper amphibolite facies. Two estimates of thermal conditions are in reasonable agreement with each other. The muscovite-quartz to sillimanite-Kspar reaction preserved in a rock that had not undergone partial melting suggests temperatures of about 650°C and pressures of about 3.5 Kb. Microprobe analyses of the garnet-biotite schist indicate a temperature of 558°C (assuming 3.5 Kb, increase of actual pressure by 1 Kb increases this temperature by only 4°C). Some zoning of the garnet suggests that sub-solidus re-equilibration of Fe and Mg may have occurred, producing a temperature estimate which is below the thermal maximum. The sillimanite-bearing rock also occurs closer to the nearby San Isabel batholith, suggesting that this 1360 m.y. granite may have reheated the nearer metamorphic rocks.