

## **EARLY PROTEROZOIC P-T-T EVOLUTION OF WESTERN LAURENTIA: EVIDENCE FOR POLYPHASE TECTONIC BURIAL AND EXHUMATION OF THE NORTHWESTERN WYOMING PROVINCE BETWEEN 1820 AND 1750 MA.**

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Field relations, mineral reactions, thermobarometry, and geochronology of Precambrian metasupracrustal rocks in the northern Wyoming province (Ruby Range, SW Montana) preserve evidence of clockwise pressure-temperature-time (P-T-t) paths associated with discrete episodes of tectonic burial (D1 and D2) and post-tectonic exhumation. Prograde (M1) garnets formed in metapelites between ~1820 and ~1770 Ma (Pb-Pb step-leach ages) during tectonic burial to ~21 km ( $P_{min} = 6$  kbars and  $T_{max} = 665^{\circ}\text{C}$ ). Post-M1 emplacement of gabbroic sills and dikes signifies an interlude of regional extension possibly accompanied by exhumation. Subsequent renewal of regional compression and tectonic burial are indicated by field observations that the sills and dikes are themselves intensely folded and highly metamorphosed (i.e., coronal garnets [M2] on augite signify the gabbro-to-garnet-granulite transition). Post-M2 unroofing is evidenced by cordierite coronas on garnets in magnesian rocks, and the Fe/Mg ratios of coexisting garnet-cordierite rims preserve minimum P-T conditions of ~4.8 kbars and ~530°C along the retrograde unroofing path. Cooling ages for single biotite grains in these rocks range from ~1770 to ~1750 Ma (Ar-Ar, UV-laser) and indicate when the rocks eventually cooled through ~350°C. The garnet and biotite thermochronologic data also bracket the timing of M2 cordierite growth, retrograde closure of Fe-Mg diffusion across garnet-cordierite rims, and the onset of post-M2 unroofing - to within an ~1780-1760 Ma interval. Collectively, these new P-T-t and microtextural data characterize the nature, timing, and duration of ~1820-1750 Ma thermotectonism in the northern Wyoming province, which was probably related to early assembly of the supercontinent Laurentia.