2005 Salt Lake City Annual Meeting (October 16–19, 2005)

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PRESSURE-TEMPERATURE CONDITIONS AND TIMING OF METAMORPHISM AT NAMCHE BARWA, EASTERN HIMALAYAN SYNTAXIS, SE TIBET

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The eastern syntaxis of the Himalayas is expressed in the crust as a pronounced southward bend in the orogen. The change in strike of geologic features coincides with the high topography of the Namche Barwa region, the exposure of granulite-grade metamorphic rocks, and a 180-degree bend of the Yarlung Tsangpo. Namche Barwa comprises the easternmost termination of the Himalayan orogen, and is tectonically unique in that it represents the transition between thrust fault dominated tectonics in the Himalayas and the strike-slip, extrusion tectonic regime of southeast Asia. Rocks exposed in the eastern Himalayn syntaxis are dominantly migmatitic gneisses (presumably derived from Indian basement rocks), intruded by granitic dikes and sills. We present pressure-temperature data on metapelitic assemblages, combined with U-Th-Pb ages of monazite and sphene in an effort to trace the metamorphic evolution of the eastern Himalayan syntaxis. Metamorphic rocks containing the assemblage garnet-plagioclase-biotite-muscovite-quartz-kyanite ±sillimanite, ±staurolite, ±amphibole were used for thermobarometric calculations. Results indicate that these rocks experienced peak metamorphic pressures and temperatures of 10-15 kbar and 700-900°C in the core of the massif. There is a distinct metamorphic break across the Namula thrust system, separating high-grade rocks to the north from lower-grade rocks to the south. P-T paths generally show an isothermal decompression history within the Namche Barwa-Gyala Peri massif. Monazite and sphene ages of 3-8 Ma indicate that timing of metamorphism is roughly coincident with the age of granitic melt production (<10 Ma) as well as the onset of rapid denudation. This suggests that erosionally mediated high-grade metamorphism and anatexis is a phenomenon that has been operative at Namche Barwa since the Miocene.

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