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Geologic Evolution of the Gyala Peri Massif, Southeastern Tibet

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AB At both the eastern and western terminations of the Himalaya, strong coupling between surface and tectonic processes is manifested in the development of active antiforms in close proximity to large river gorges. In southeastern Tibet the peaks Gyala Peri and Namche Barwa occupy a metamorphic massif that shows remarkable similarities to the Nanga Parbat massif in NW Pakistan, including exposure of high-grade gneisses intruded by Plio-Pleistocene granites. Nanga Parbat has been proposed to constitute a 'tectonic aneurysm' involving erosionally focused strain and related metamorphic reworking. As the Namche Barwa/Gyala Peri massif appears to be quite similar to Nanga Parbat in its geology and geologic setting, we suggest it has a similar origin. Most information to date has been reported from Namche Barwa, with Gyala Peri remaining

largely unexplored. Here we report observations from a well-exposed section along the western margin of Gyala Peri. In the west near the Lulang River, a brittle fault zone up to ~1 km wide juxtaposes a metasedimentary/mylonite section on the east against Lhasa/Gandese gneisses and granitoid rocks to the west. The steeply dipping fault zone shows a dominantly east-up (reverse) sense of brittle motion. The lower portion of the Lhasa/Gangdese metamorphic section is cut by dikes of at least two granite phases, a medium-grained Gangdese-like granite, and a leucocratic pegmatite. East of the brittle fault zone, and the metasediments and planar foliated mylonites, there is an ~500 m thick section of S/C mylonites having a dominant reverse and subordinate dextral sense of shear. East of, or possibly in the eastern part of this ductile fault, grey gneisses [presumed basement] are intruded by a syntectonic(?) muscovite granite. Ar-Ar K-feldspar data from Gangdese rocks just west of the brittle fault zone drop to ages of 4 Ma, substantially younger than the pattern seen further to the west at Bayi. Overall, the geology of this section is quite similar to the western margin of the Nanga Parbat massif and, like it, represents progressive displacement and exhumation on a significant thrust sense shear and fault zone bordering the Gyala Peri massif. U-Pb analyses of the granites and the mylonite will be reported along with data from a pilot seismic study that had stations located in proximity to Gyala Peri.

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