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The mirror crack'd from side to side: an Indo-Antarctic continent at the end of the Archean

DR. DANIEL J. DUNKLEY, PHD[1], MR. PIOTR KRÓL[1], MARTIN J. WHITEHOUSE[2], SIMON A. WILDE[3], SAJEEV KRISHNAN[4], MONIKA A. KUSIAK[5], DANIEL E. HARLOV[6], P. V. THANOOJA[7], A. P. ANU-SHA[8], JUSTINE K. ANTHONY[9] AND RATHEESH KUMAR[10]

[1]Institute of Geophysics, Polish Academy of Sciences
[2]Swedish Museum of Natural History
[3]Curtin University
[4]Indian Institute of Science
[5]3) Institute of Geophysics, Polish Academy of Sciences
[6]GFZ German Research Centre for Geosciences
[7]Centre for Water Resources Development and Management
[8]Centre for Earth Sciences, Indian Institute of Science
[9]Dept of Materials Engineering, Indian Institute of Science
[10]Cochin Univ. of Science and Technology

The boundary commonly known as 'the Fermor line' between the Southern Granulite Terrain (SGT) of the Indian peninsula and the Archean Dharwar craton is, in large part, non-tectonic – rather, where shear zones are absent, it is defined by a change from predominantly TTG and granitic gneisses in the craton to charnockitic gneisses in the south. The timing of charnockite formation down the SGT is varied, with such rocks being associated with 2530-2500 Ma zircon growth in the north along the Fermor line, 2490-2450 Ma in the complex shear zones that split the Madurai Block from others attached to the Dharwar Craton, and 600-500 Ma in the south. Although the northern part has been interpreted as an assembly of unrelated arcs at ca. 2480Ma that sutured along shear zones, partly on the presence of metagabbro and anorthosite complexes in the shear zones, such associations could be produced by the concatenation of rifted continental crust already assembled in the Neoarchean. A reassessment of zircon U-Pb and Hf systematics in charnockitic rocks reveal a shared history of extreme metamorphism just before and after the end of the Archean, not only in the southern charnockitised part of the Dharwar craton but also in most of the Madurai Block, as well in the Napier Complex of east Antarctica, which is adjacent in reconstructions of Gondwana. Within each there is an assemblage of crustal units that extend back to the Paleoarchean, as well as remnants of Eoarchean crustal growth across the Napier Complex. The shared histories point towards a single continent at the end of the Archean, rather than assembly during the Proterozoic, and multiple rifting events that produced intracontinental sedimentary basins, alkaline plutons and anorthosite-gabbro complexes, rather than unrelated Proterozoic terranes.

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