The Kalahari Craton in the fiery heart of Rodinia

A. GUMSLEY[1,2,3], A. SAŁACIŃSKA[4], M. KNOPER[5], A. MAMUSE[3], D. CHEW[6], U. SÖDERLUND[7], S. KAMO[8], K. SZOPA[9], R. ERNST[10,11]

[1]Institute of Geophysics, Polish Academy of Sciences, Warsaw, Poland
[2]Department of Geology, Lund University, Lund, Sweden
[3]Faculty of Mining and Mineral Processing Engineering, Midlands State University, Zvishavane, Zimbabwe
[4]Institute of Geological Sciences, Polish Academy of Sciences, Warsaw, Poland
[5]Department of Geology, University of Johannesburg, Johannesburg, South Africa
[6]Department of Geology, Trinity College, Dublin, Ireland
[7]Department of Geoscience, Swedish Museum of Natural History, Stockholm, Sweden
[8]Department of Earth Sciences, University of Toronto, Toronto, Canada
[9]Faculty of Earth Sciences, University of Silesia, Sosnowiec,
[10]Department of Earth Sciences, Carleton University, Ottawa, Canada
[11]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia

Mafic dyke swarms in Dronning Maud Land from Antarctica (Grunehogna Craton) and Zimbabwe (Kalahari Craton), were dated using U-Pb on baddeleyite and apatite. The ages reveal similar mafic magmatism at ca. 720 Ma in both continents. This confirms the relationship whereby Grunehogna is a rifted fragment of Kalahari, which was severed during the Jurassic breakup of Pangea into Africa and Antarctica. The possibility that Kalahari was adjacent to north-western Laurentia during the Neoproterozoic should be considered, based on a variety of geological evidence. A reconstruction of various LIPs at 730-710 Ma would make the combined Franklin-Irkutsk-Mutare-Fingeren LIP one of the largest in geological history and an ideal trigger for break-up of Rodinia as well as the Cryogenian to Ediacaran glacial period that followed. Interplay between mantle plumes, LIPs, glaciation and Rodinia fragmentation led to the rise in free oxygen and multi-cellular life toward the Cambrian boundary.

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