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THE KALAHARI AND GRUNEHOGNA CRATONS, AND THEIR PLACEMENT WITHIN NEOPROTEROZOIC RODINIA, DEFINED BY NEW U-PB GEOCHRONOLOGY ON LARGE IGNEOUS PROVINCES

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Keywords: *Fingeren, Mutare, dyke swarm, Neoproterozoic, Rodinia*

The Grunehogna Craton of Dronning Maud Land in Antarctica and the Kalahari Craton of southern Africa are generally accepted to have been contiguous, in either close or far fit configurations, between 1.11 Ga and 0.18 Ga. In this study, dykes of the Fingeren dyke swarm in Grunehogna and dykes of the Mutare dyke swarm in Kalahari were dated using U-Pb on baddeleyite and apatite. The ages reveal similar mafic magmatism at ca. 720 Ma in both areas, which has not been reset by later metamorphic events. 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. It also confirms a close fit between the cratons at ca. 720 Ma. The possibility that Kalahari was adjacent to north-western Laurentia during the Neoproterozoic should be considered, based on geological evidence. This includes shared magmatism at 790-780 Ma between the Gannoukouriep and Gunbarrel large igneous provinces (LIPs) as well as a connection between various LIPs at 730-710 Ma making the combined Franklin-Mutare-Fingeren-Irkutsk LIP one of the largest in geological history (also including Siberia), and an ideal trigger for the Cryogenian to Ediacaran glacial period that followed. Interplay between mantle plumes, LIPs, glaciation and Rodinia fragmentation likely led to the rise in free oxygen and multi-cellular life toward the Cambrian boundary.

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ULKAN-BILYAKCHAN LIP (CA. 1.7 GA), SE SIBERIAN PLATFORM, ASSOCIATED TRIPLE JUNCTION RIFTING, AND ORE DEPOSITS

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Keywords: *LIP, ore deposit, Siberia*

The Ulkan paleorift system (SE Siberia) has characteristics of a three-armed structure indicative of the intense rifting in response to hotspot activity; The triple junction appears as a zone that underwent intense intra-plate A-type alkaline-granitic magmatism in the Late Paleoproterozoic. (Guryanov, 2007; Guryanov et al., 2012; Larin, 2011; Guryanov & Peskov, 2017). The presence of both subalkaline granitoids and volcanic rocks (K-series) and alkaline granites, comendites and pantellerites (Na-series) intensely fractionated, is characteristic of the Ulkan anorogenic magmatism. A specific feature of these granites is that they contain iron-enriched ferromagnesian silicates, and alkaline granites that contain alkali amphibole and pyroxene and astrophyllite.

Globally, A-type granites are often associated with deposits of Sn, W, Be, Nb, Ta, REE, Au, U and Fe, such as Piting in Brazil, Thor Lake and Strange Lake in Canada, Zaiplats in South Africa, Katuginskoe of the Aldan-Stanovoi shield (Larin, 2011).

The Ulkan intraplate alkali-granite magmatism of the Ulkan massif is host to endogenous ore deposits unique in dimensions and diversity (Be, Ta, Nb, Zr, REEU, Au, Li, Sn, W, Mo, Ti and (Pt)) (Guryanov, 2007). Rare metal and rare earth