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EARLY PRECAMBRIAN CRUSTAL EVOLUTION OF THE BELOMORIAN AND TRANS-NORTH CHINA OROGENS AND SUPERCONTINENTS RECONSTRUCTION

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Comparative analysis of the crustal evolution of the Early Precambrian Belomorian and Trans-North China orogens (Fig. 1) has shown [*Slabunov et al., 2015*] that:

Both belts were formed by the superposition of two Precambrian orogenies. The earth crust of the Belomorian belt was produced during the Mesoarchaean to Neoarchaean Belomorian collisional orogeny [*Slabunov, 2008; Slabunov et al., 2006*] and then was reworked during the Palaeoproterozoic Lapland-Kola collisional orogeny [*Daly at al., 2006; Balagansky et al., 2014*]. The earth crust of the Trans-North China orogen was formed during a Neoarchean accretionary orogeny and then was reworked during a Paleoproterozoic collisional orogeny [*Zhao et al., 2012; Guo et al., 2012, 2005*]. The Lapland granulite belt is the core of the Lapland-Kola Palaeoproterozoic collisional orogen in the Fennoscandian shield and the Khondolite belt occupies the same tectonic position in a Palaeoproterozoic collisional orogen in the North China craton.

The Belomorian collisional orogen began to form in the Mesoarchean (ca. 2.9 Ga); its subduction-accretion complexes were formed at 2.88–2.71 Ga and collision took place at 2.7–2.68 Ga. U-Pb isotope study of zircons from kyanite-orthoclase gneisses and S-type granites,

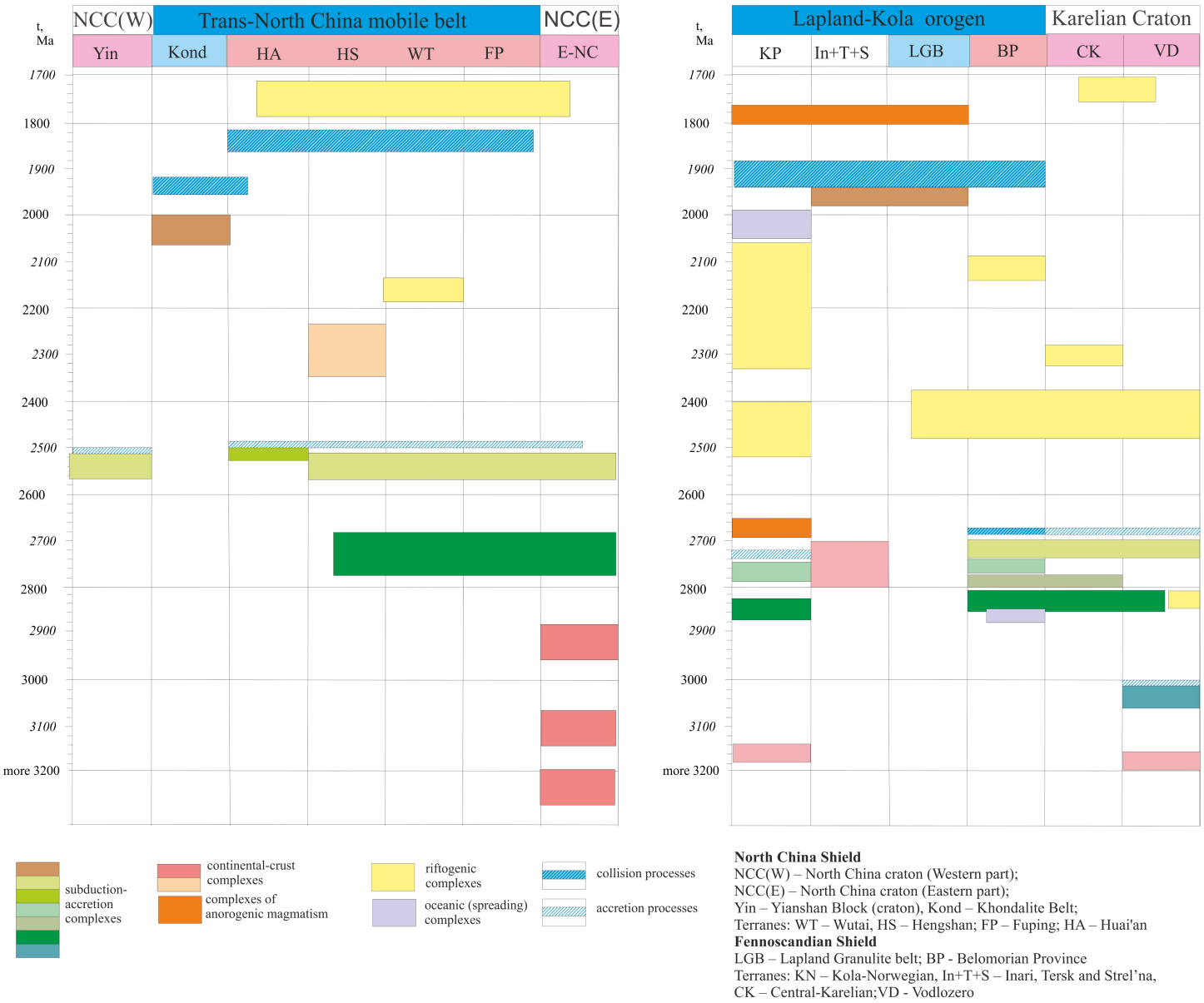

Fig. 1. Correlation of geodynamic processes in the NE Fennoscandian shield and the North China shield.

the formation of which is attributed to collisional processes, yielded an age of 2710–2678 Ma [*Slabunov et al., 2016*], which is interpreted as the exact time of collision. Analysis of geological and paleomagnetic data on the Karelian, Kaapvaal, Pilbara and Superior cratons [*Lubnina, Slabunov, 2011; Slabunov, Lubnina, 2016*] shows that the Belomorian orogen is a part of the large Minnesotan-Belomorian-Limpopo collisional structure, which "sews together" Neoarchean Kenorland Supercontinent (Fig. 2).

The Archean complexes of the Trans-North China orogen are a part of an accretionary orogen which began to evolve in the Mesoarchean (ca. 2.83 Ga); subduction-related complexes were formed most actively in the period 2.75–2.51 Ga, and their accretion took place ca. 2.5 Ga ago. The Eastern block of the North China Craton was probably at the periphery of Kenorland Supercontinent (Fig. 2).

Kenorland began to disintegrate in the early Paleoproterozoic. It was indicated in the Belomorian and Trans-North China belts by 2.5–2.45 Ga mafic dykes: a lherzolite-gabbro-norite complex and Dianmen dykes, respectively (see Fig. 1).

The Kola-Lapland (Fennoscandian shield) and the Khondolite (North China craton) collisional orogens began to evolve ca. 2.0 Ga ago. In the former collisional processes commenced 1.97 Ga ago and ended 1.89 Ga ago [*Azimov et al., 2017*]. The latter was formed during two collisional episodes: the oceanic "closing" resulted in the formation of the Khondolite belt 1.95 Ga ago, and then the newly-formed orogen interacted with the western flank of the eastern block of the North China

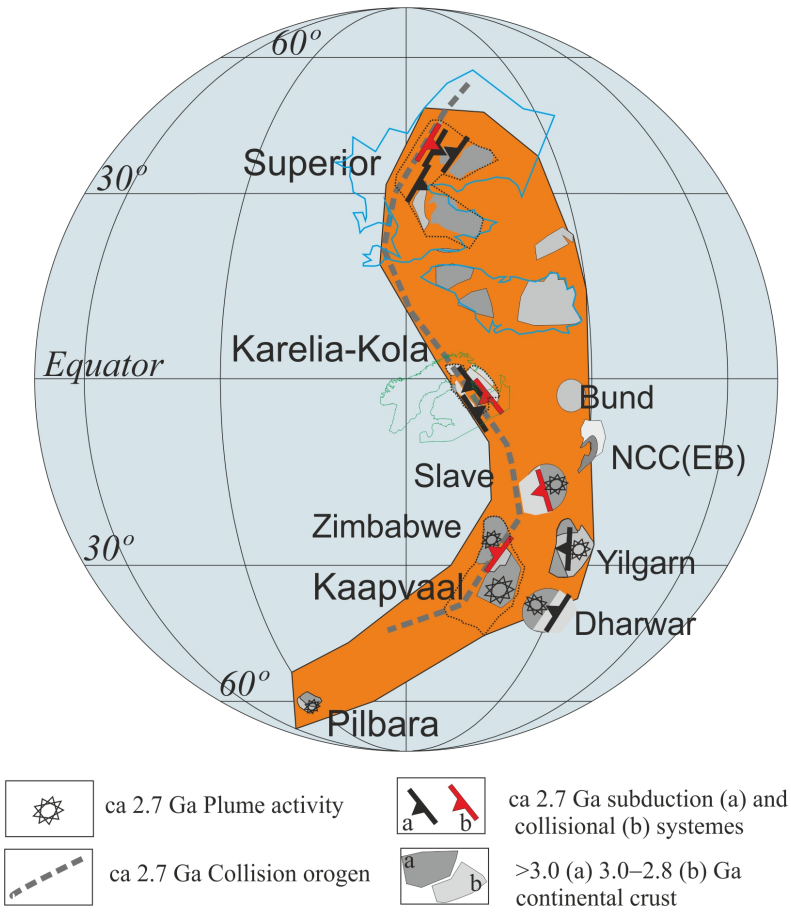

Fig. 2. Configuration of Kenorland supercontinent at ca 2.7 Ga (Bund – Bundelkhand craton, NCC(EB) – Eastern block of the North China craton).

craton 1.87–1.88 Ga ago. As a result, the Trans-North China orogen was formed. About 1.9–1.8 Ga ago the Belomorian and Trans-North China orogens became a part of Nuna/Columbia supercontinent.

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