Late Proterozoic global supercontinent: the Siberian craton as a case study

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The Siberian craton displays a good fit for Laurentia that determines position of the Baltica, Amazon and some other Late Proterozoic cratons. In the eastern Siberian craton main part of juvenile mantle matter of ancient terranes (about 60 % of crust, T(Nd)DM statistics on 101 ss) rose at 3.3-2.7 Ga. That probably resulted from the first global episode of the supercontinent formation under the whole-mantle convection and the juvenile matter supply (K.C. Condie, 1998). Geological situation is not clearly known however relics of granulite grade metamorphism of 2.7 Ga probably point out the collisional crustal thickening.

Next the mantle convection presumably changes to a layered mode resulted to a supercontinent break-up to individual microcontinents (terranes) and supply of new juvenile matter. At that stage the Siberian terranes were separated one from another and developed in different ways, being covered by various volcano-sedimentary sequences at 2.4-2.1 Ga.

Afterwards at the second episode of whole-mantle convection, accretion of sialic crustal masses (terranes) recurred to form another supercontinent at the Late Paleoproterozoic. In it's Siberian part the collison shear zones at 1.9-1.8 Ga were accompanied with granite melt out and coeval areal granulite grade impression over adjacent large ancient terranes collided. That both processes were resulted from overheating in the thikcening collisional crust. Collisional granite magmas have been derived from the ancient crustal source whereas inflow of juvenile mantle matter appears to be absent at that epoch.

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