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Neoarchean Supercontinent Kenorland: paleomagnetic and geologic evidence

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In recent years the study of Archean cratons as a part of the Neoarchean supercontinent Kenorlend has remained under discussion. At least three principal models for reconstruction of position of the ca. 35 Archean cratons have been proposed (Bleeker, 2003). To come nearer to the solution of the Neoarchean supercontinent construction requires integration of complex geological and paleomagnetic data.
For analysis of paleomagnetic data (to find evidence for differential motions between pairs of Precambrian cratons), we follow the method of Evans and Pisarevsky (2008) which calculates and compares the great-circle arc distances between paleomagnetic 'key' poles through isochronous intervals for pairs of cratons. The method constrains the relative longitudinal separation between the cratons. Our analyses were focused on the similar aged paleomagneic poles of the Kaapvaal (Wingate, 1998; Lubnina et al., 2010), Pilbara (Strik et al. 2003), Karelia (Lubnina and Slabunov, 2009) and Superior Cratons (Halls and Davis, 2004). These comparisons allow testing of existing models of the Neoarchean supercontinent and the alternative:"Supercraton solution", which postulates three supercratonic cores- Vaalbara, Superior and Sclavia (Bleeker, 2003). Our new paleomagnetic data from the Kaapvaal Craton (Lubnina et al., 2010) and Karelian Craton (Fennoscandian Shield) (Lubnina and Slabunov, 2009) reveal southern and northern tropical latitudes, respectively, and our preferred configuration of the Neoarchean supercraton Vaalbara is a somewhat different than offered by M. deKock et al. (2009). We show that common motion between these cratons is allowable for this time interval. A new Neoarchean to Paleoproteroozic reconstruction of Superior and Karelian Cratons has also been proposed based on the new paleomagnetic data. Such reconstruction is better correlated with the important accretion-collisional event recognized on the eastern part of the Fennoscandian Shield (Karelia, Kola and Belomorian provinces) which is matched with the eastern part of the Canadian Shield (Superior Craton). It should be noted that the early phases of subduction is directed from the east to west and at later times, other way (Percival, 2010). We conclude that all these cratons could have traveled together throughout this entire Neoarchean to earliest Paleoproterozoic interval of time, supporting the concept of a single supercontinent rather than three separate supercratons.
Furthermore, comparison of the great-circle arc distance between similarly age poles from the Kaapvaal-Pilbara and Superior-Karelia Cratons suggested the same motions in Neoarchean and indirect consequence to the 'Kenorland solution".

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