



The Neoproterozoic-Paleozoic Arctic Margins: early stages of geodynamic evolution and plate reconstructions

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Available data on the existence of Precambrian metamorphic complexes among the main structures of the Arctic led to the suggestion that a large continental mass existed between Laurentia, Baltica and Siberia – an Arctic continent, more often called Arctida (Zonenshain, Natapov, 1987). It is inferred that as an independent continental mass Arctida was formed after the breakup of Rodinia, and in general it can have a pre-Grenvillian (including Grenvillian) basement age. The breakup of this mass and the collision of its fragments with adjacent cratons led to the formation of heterochronous collisional systems. Arctida probably included the Kara, Novosibirsk, Alaska-Chukotka blocks, the blocks of northern Alaska and the submerged Lomonosov Ridge, small fragments of the Inuit fold belt in the north of Greenland and the Canadian archipelago, the structures of the Svalbard and maybe the Timan-Pechora plates. However the inner structure of this paleocontinent, the mutual configuration of the blocks and its evolution in the Neoproterozoic-Paleozoic is still a matter of discussion.

The most accurate way of solving these issues is by using paleomagnetic data, but those are nonexistent for most of the defined blocks. Reliable paleomagnetic determinations for the Neoproterozoic-Paleozoic time interval we are concerned with are available only for fragments of an island arc from Central Taimyr, which are 960 m.y. old (Vernikovskiy et al., 2011) and for which the paleomagnetic pole is very close to the pole of Siberia from (Pavlov et al., 2002), and of the Kara microcontinent. This includes three paleomagnetic poles for 500, 450 and 420 Ma (Metelkin et al., 2000; Metelkin et al., 2005).

It is those data that made up the basis of the presented paleotectonic reconstructions along with an extensive paleomagnetic database for the cratons of Laurentia, Baltica, Siberia and Gondwana. The paleogeographic position of the cratons is corrected (within the confidence levels for the paleomagnetic poles) according to the general model and the available global reconstructions that include the structures of the Arctic (Scotese, 1997; Lawyer et al., 2002; Golonka et al., 2003, 2006; Cocks, Torsvik, 2002, 2007). The position of those Arctida blocks that lack paleomagnetic data is reconstructed based on geological data.