



New Paleomagnetic and Paleontological Data for the New Siberian Islands (Arctic Ocean)

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The New Siberian terrane is delineated in the Arctic shelf by the New Siberian Islands and the De Long archipelagos and it is one of the key structures of the Arctic. However, many issues related to its structure, margins and formation history are under vivid discussion. During the international expedition in 2011 many structural, paleontological, petrologic and geochronological problems were solved. Special attention was given to the obtaining of paleomagnetic data for the sedimentary and igneous rocks of the archipelago. The Early Paleozoic sedimentary rocks of the Kotelny (Anzhu) and Bennett (De Long) islands were deemed the most important sites from a paleomagnetic viewpoint. The age of Early Paleozoic sedimentary series of the Kotelny and Bennett islands was specified from new samples of graptolites and conodonts. The comparison of newly obtained paleomagnetic directions for the Ordovician series of the studied islands distinctly shows their similarity in stratigraphic coordinates and is an indication of the tectonic unity of the territory of the Anzhu and De Long archipelagos. Their relative position at the beginning of the Paleozoic did not differ from their current position. On the geosphere the calculated virtual geomagnetic poles form a trend line, in which the Middle Ordovician (465 Ma) pole of Bennett Island is located between the Early Ordovician (475 Ma) pole, calculated for the Ayan formation rocks and the Ordovician-Silurian (440 Ma) pole for rocks of the Terutekh and Urasin formations of Kotelny Island. Judging from this apparent polar wander path we can calculate the approximate speed of the drift of the New Siberian block. In the Early Paleozoic the New Siberian block was slowly and steadily drifting in the subtropical area of the Earth with insignificant clockwise rotation (latitudinal drift was less than 4 cm/year, rotation – up to 2 deg./m.y.). These first paleomagnetic data, obtained for well dated Early Paleozoic sedimentary rocks of the Kotelny and Bennett Islands, let us assume that the rocks of the Anzhu and De Long archipelagos formed in the same New Siberian terrane, that is to say, on the same basement at least from the Early Ordovician. The problem of whether the New Siberian terrane belonged to one or another paleocontinent in the Paleozoic is yet unsolved. New data for conodonts and earlier studied faunas of the Ordovician and Silurian on Kotelny Island indicate that they are biogeographically similar to those on the Siberian platform and Taimyr, which possibly indicates that this part of the New Siberian block was close to the Siberian paleocontinent. However the same cannot yet be said based on paleomagnetic data. The coordinates for the poles of New Siberian block that we obtained from new data are different from the corresponding interval of the apparent polar wander paths of the Siberian craton [Metelkin et al., 2012], Laurentia [Torsvik et al., 1996] and the closely located Kara microcontinent [Metelkin et al., 2005]. It cannot be excluded that in the Early Paleozoic the New Siberian block had a terrane history that was independent from these tectonic units.