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The Late Proterozoic - Paleozoic history of the Timan-Pechora –

Polar Urals – West Siberian region

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The history of the Timan-Pechora – Polar Urals – West Siberian region began with the formation of the Paleoasian Ocean. Island-arc systems similar to the South Fiji Basin - Tonga–Kermadec arc subduction system were formed in the Paleoasian Ocean in the range of 670-565 Ma [1, 2, 3]. Island arc magmatism in the basement of the Timan-Pechora Plate is gradually becoming more ancient in the direction from Timan to the Polar Urals. This system successively joined to the Timan-Urals passive margin and formed the basement of the Timan-Pechora Plate. Collisional granites successively rejuvenate from Timan to the Polar Urals within the interval 560-535 Ma. The authors consider the Korotaicha block as an oceanic plateau, a fragment of which is present in the composition of the Kharbey allochthone in the Polar Urals.

Further development of the region was associated with emplacement of the subduction zone under the Timan fold belt in the Ordovician as well as formation of the Urals island-arcs and back-arc basins. An early episode of the subduction zones formation is fixed by the age of Kershov gabbro (450 MA [4]) and Lagartayu plagiogranites (490 [5] or 450 [6] Ma). The development of the island-arc process in the Voikar arc is traced back to the Late Devonian (385 MA [7]). Our analysis of the Polar Urals seismic profile shows a wide development of fragments of these basins in the West Siberian basement and the lack of Early Precambrian basement under the Polar Urals. Crushing along the edge of the Timan-Pechora Plate led to the fragments appearance within and near the Baltica's passive margin in the Polar Urals. They became a part of the Urals structure as ancient zones during the Late Paleozoic collision.

The basement of the West Siberian Plate was uncovered by the Yangi-Yugan parametric well. Two geodynamic rock complexes are distinguished there. The lower complex consists of oceanic island arc

magmatites probably of the Devonian age. It is tectonically in contact with the upper complex through the *mélange* zone. Upper volcanic complex represents an oceanic plateau, formed on the oceanic crust in the Early Carboniferous. Carbonate and carbonaceous shales were formed on the denudation surface of the Yangi-Yugan Plateau. They were dated from algae and foraminifera as sediments of Early Carboniferous (Visean) to Middle Carboniferous (Bashkirian) age [8]. These data are consistent with isotopic dating of zircons for rock overlapping the *mélange* zone. The age was obtained for three concordant dates in the interval 337 – 352 Ma (Tournasian – Visean Age). In the carbonaceous shale deposits, overlapping the Yangi-Yugan Plateau, clastic quartz grains are absent. This fact indicates the existence of a vast ocean space around the plateau in the Visean Age. Thus, in contrast to previous views, it is assumed that during the formation of the Western Siberia basement blocks of the Early Precambrian continental crust in the oceanic space were absent.

References:

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