Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05598, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05598
EGU General Assembly 2008

Influence of Deep Processes in the Lithosphere on Features of Development of the Sedimentary Basins

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According to the data of T.A. Lapinskaya, S.V. Bogdanova, A.V. Postnikov and other experts, the composition and other characteristics of structural and compositional units of the crystalline basement have been produced by three major tectonomagmatic cycles in the Early Precambrian stage of the evolution of the East European platform. The granulite metamorphism of the first Late Archaean tectonomagmatic cycle took place throughout the region. It has been produced by the endogenous heat flow of gigantic scale that triggered metamorphic processes over the whole area of the Middle Volga megablock with the exception of the earlier formed individual enderbitic relict masses. The second Late Archaean tectonomagmatic cycle occurred in spatially limited zones. The dimensions of the endogenous flow substantially decreased, but the palingenic granite formation took place in the zones with an active fluid regime. This process was most active in the domal granite-gneiss structures enveloped by migmatite fields. The scale of the third Early Proterozoic tectonomagmatic cycle was even more limited. The volcanic and sedimentary formations of this period developed only in some tectonic zones of the eastern portion of the Russian plate. In Tatarstan, this stage is associated with the formation of migmatites, veins and large granitoid masses of the granodiorite-granite series of the Late Bakali complex, and aluminous microcline granites of the Aznakaevo complex. The formation of granitoids of the potassium series 1.9 Ma ago closed the volumetric growth of the continental crust in the Volga-Ural region during the Early Precambrian. Thus, each of the subsequent stages of metamorphism through Early Proterozoic times was defined by fluid dynamic activities in the most permeable portions of the Earth's crust. The eastern part of Tatarstan has been repeatedly and heavily affected by metamorphic processes. It is this region that

was a stage for the formation of the Bolshecheremshanskaya series, the subsequent active potassium granitisation and superimposed hydrothermal processes that accompanied the development of the earlier formed systems of tectonic faults. And it is this part of Tatarstan that is characterised by the high compositional heterogeneity of the crystalline basement that is much less distinct in other portions of Tatarstan or in the adjacent areas. Thus, the ancient platforms - although widely believed to be geodynamically stable - may contain local zones of fluid dynamic activity that is still taking place. One of such zones is expected to exist within the South Tatarstan Arch of the Volga-Ural Anteclise located on the East European Platform.