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The Cenozoic intraplate deformation of the Northwestern Eurasia as a result of active processes at the Eurasian plate boundaries

M.L. Kopp

GIN RAS, Pyzhevsky line, 7, Moscow, Russia (kopp@ginras.ru)

The basic idea that the intraplate deformation was associated with processes at active plate boundaries attracts increasing attention. Many aspects of the concept, however, remain unsolved. Among them are possibility of active stresses transfer through platform lithosphere; interaction of such stresses with those appeared inside the platform lithosphere; position of periferic impact zones of the plate boundaries; interaction of collisional, subduction and spreading processes at different boundaries of the plate.

Intraplate structure of the Northwestern Eurasia was formed in the Cenozoic, simultaneously with the Alpine-Himalayan belt collisions. So, it may be considered as a periferal element of the Arabian indenter dynamic influence zone. This suggestion was tested by the example of gently deformed platform territory of the southeastern East Europe which has long been considered a classic example of fixistic teconics. Formation of neotectonic structure of this territory through the Arabian plate pressure is evidenced by: (1) uniformty of stress fields in the platform and the adjacent Caucasus, shown by macro- and mesotectonic studies (submeridional compression and sublatitudinal extension); (2) similarity of structural pattern: right strike-slips are prevalent in the west whereas the left ones, in the east; (3) normal faulting characteristic of periferal parts of the indentation areas; (4) simultaneity of the Late Cenozoic tectonic phases in the platform territory, Caucasus and the Arabian lithospheric plate.

The collision stresses were transferred through the platform basement as pronounced in increased thrust magnitude with the depth growth and in complicated cover deformations and laterally growing seismicity in rather shallow-seated basement (the

Voronezh massiff – A.A. Nikonov's data). According to the geophysical data (Yu.K. Schukin's data), the neotectonic structural features are traced down to the lower crust whereas remnants of more ancient, the Caledonian and Hercynic, structures are preserved only in the upper crust. Thus, the front of the Alpine stresses plunges and reduces in thickness northward being confined to the lower crust.

Spreading in the North Atlantic and Arctic as a factor of the intraplate deformation. Generalized data on the Pireneic and Laramic intraplate deformation, the Cenozoic wrenchs along the Tornquist line and Urals as well as on some structural features of the spreading zone in North Atlantic-Arctic suggests that the East European craton removed slightly southeastward. After the West European part of the Eurasian plate and corresponding segment of the spreading zone were blocked by the Paleocene collision in Alps-Dinarides, the spreading axis drastically propagated into Arctic. As a result, East Europe and Siberia jointly moved southeastward being truncated from the West Europe by the dextral shear along the Tornquist line. As an independent subplate, the East European platform was separated from Siberia only in the Eocene, most likely due to interlock of the Asia movement by Indostan. In the Pliocene, the East Europe independent movement was stopped by Arabia-Eurasia collision. Thus, the present view of unity and rigidity of the Cenozoic Eurasian plate is far from complete. In fact, the Eurasian plate represented a time-varying kaleidoscope of subplates moving at low velocities from the Atlantic-Arctic spreading axis. However, the greatest acceleration was experienced by Eurasian fragments whose general southeastward motion was at least restrained by the Gondwanian relics

The general conclusion is that the different tectonic processes at opposite boundaries of the Eurasian plate each of their own promoted the intraplate deformation. They proceeded in accordance so that every elementary domain within the plate was simultaneously influenced by forces transmitted from different sources.