P16-1 NEOTECTONIC STRUCTURES AND THEIR DYNAMICS IN THE SOFIA COMPLEX GRABEN, BULGARIA

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There are no special investigations on the Neogene-Quaternary structures in the Sofia complex graben. This is due to the existing till now conceptual bases on the one hand and on the very complicated geological-tectonic (inherited and newly formed) situation on the terrain on the other hand. The developed tectonic map lays the beginning of future detailed investigations and on their kinematics. Rapid growth and stage differentiation of the block structures of the Stara Planina (the Balkan) and the Kraishte-Sredna Gora type took place during the neotectonic stage under conditions of extension. As a result of the different processes the Sofia complex graben was formed. The block structures and the total values of the collective movements are reflected in the map, as well as the traces of the pre-Neogene and Quaternary deformations.

The total deformation values of the collective movements during the Neogene and the Quaternary for the Sofia complex graben and for its surrounding horst structures is very different - from 0 to +3400 m, calculated according to the pre-Neogene benchmark, the boreholes near Ovcha Koupel (Sofia) and Elin Pelin, the map of the thickness of the Neogene-Quaternary deposits, the geomorphological and the structural-geomorphological maps.

It has been established from the investigations of the graben bottoms of the Sofia kettle that they changed their basic axes in the course of time and space, and that satellite graben structures were included to the basic graben one. Models of the stage development of the Sofia complex graben are shown.

The fault structures of older embedding are described n the neotectonic map (the most clearly expressed ones are those from the Alpine structural plan). Only the values of the vertical movements and their behaviour during the Neogene and the Quaternary are shown in the neotectonic map. More special attention is paid to their Quaternary activation, their differentiated character being reflected in the general synthesis map.

The performed analysis of the relief, its structural specificities and the tectonic control on the sediments in the graben provide the grounds to establish that the dynamic peculiarities of the Sofia complex graben are controlled by differing in range structures at the boundary between the two block-chain systems simultaneously with their increase and differentiation during the Quaternary. Some of them are inherited but considerably deformed. Their formation started during the Meotian, when the eastern, middle and northern parts of the graben subsided and a bilateral graben was formed. Remains from this primary structure had been preserved till the present day in the deepest parts of the Sofia complex graben. The 400 m thick sediments of the Variegated Terrigenic Formation are correlated with the primary tectonic impulse.

In the beginning of the Pontain widening of the graben took place and the existing and newly formed fault structures worked together with the sedimentation. The predominating movements were negative and the bottom was movable. During the Middle Pontain lake conditions were created in almost the whole complex graben (the correlatives are the Gnilyane Formation with the Balsha member and the Novi Iskar Formation). The contacts are tectonic ones in their greater part. The greatest thickness of the Gnilyane Formation reaches 150 m, and of the Novi Iskar Formation - 400 m.

At the end of the Pontain and the in the beginning of the Dacian, as a result of a new tectonic impulse, the decreasing of the Sofia lake area was started in south-north and east-west direction. During the Pliocene the eastern fault structures were activated and thick alluvial sediments were accumulated. The correlatives of those tectonic processes are the sediments of the Losenets Formation with a maximum thickness of about 400 m. At the end of the Pliocene and during the Lower Quaternary intensive movements were displayed in all the systems of fault structures, which affected almost the whole graben system and its periphery. This tectonic impulse was the basic one that had formed its present appearance. The stage development of the Sofia complex graben during the Quaternary is described very well by the differentiated fault structures, reflected in the general map, the geomorphological map and the total Quaternary deformations, shown in the neotectonic map. The total values of the vertical movements are presented in the neotectonic map and in the text to the structural-geomorphological map. The contemporary movements in the kettle belong to the 0 isoline, although they exhibit differentiation for the single blocks.