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Geologic map of Mészáros revisited: Pioneering tectonic mapping of the Transdanubian Range in the early 1980s

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Rocks, even in tectonically active areas are very solid compared to the changes within the scientific theories that occured especially in Eastern Europe as the political landscape changed and the separation into socialist and capitalist countries started to fade. While in Western Europe, Wegener's mobilistic approach gained widespread acceptance in the 1960-ies, in the countries of Eastern Europe (partly due to political reasons) fixistic ideas were supported. Despite the fact that most important early concepts in Hungarian tectonics were born about a century ago as a results of exploration of the Lake Balaton and its surroundings conducted by Lajos Lóczy, initiatives to integrate various geodynamic observations were rare exceptions in the second half of the 20th century.
The high priority of economic geologic prospection in order to find raw materials resulted in an enormous amount of observations. In the central Transdanubian Range (TR), hosting bauxite, coal and manganese deposits, extensive surveying was carried out according to fixistic tectonic concepts. Although the recognition of faults was of vital importance in mining, mapped faults were rarely integrated into a global geodynamic model.
A pioneering approach was presented by Mészáros (1983), who compiled a 1: 100 000 scale structural and economic-geologic map of large parts of TR. The map focuses on the Bakony hills that are of key importance for the geodynamic understanding of the formation of PB. TR forms inselbergs with well preserved outcrops, which is rare in PB, thus allowing for direct measurements of fault striations and fault plane orientations.
Prinz (1926) maintained the theory that the TR is a rigid block and named it Tisia block. An alternative to this approach was the monograph of Uhlig (1907) proposing mobilistic concepts. Csontos et al (1991) reviewed the evolution of neogene stress-fields in the Carpatho-Pannonian region observing microtectonic faults in TR. The authors conclude that the faults mapped by Mészáros (1983) coincide fairly well with their microtectonic measurements. TR is nowadays interpreted as the uppermost Cretaceous thrust sheet of the Alpine nappes based on the interpretation of seismic surveys (Rumpler & Horváth, 1988; Horváth, 1993) and microtectonic measurements (Kiss & Fodor, 2007).
We integrated the map into a GIS environment in order to evaluate the spatial accuracy of tectonic features and deformation style in the study area. Georeferencing was based upon control points applying rubber sheeting. Geological formations were digitized as polygons with their respective attributes (colour- or numerically coded). Three different categories of bounding elements are represented on the map: established, supposed and covered by younger geologic formations. Mészáros put a major emphasis on tectonic features, using 21 different line-types for representation. Digital terrain analysis methods using a 10 m DTM reveal a good correlation of the fault pattern with geomorphologic features, especially in the category of confirmed strike-slip faults. The connection of tectonic elements with the topography is a very anticipatory way of thinking for the early 1980s that became widely accepted by the end of the century.

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