

Development model of the West Carpathians

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A whole series of new information and changes in valuation of manifestations of sedimentation, magmatism, metamorphism and folding based on principles of global tectonics, permits us to present the model of development of the West Carpathians starting from the Hercynian plan.

1. In the so called Tatroveporic we distinguish in content and structure 3 zones already separated by the Hercynian folding: the Tatríde crystalline, North Veporide crystalline and South Veporide crystalline. Hercynian granitoids are lacking to a larger extent in the North Veporide crystalline and south of the Lubeník and Margecany lines, which fact played an important role in development of the Alpine geosyncline.

2. Unequableness of Hercynian stabilization of crust was reflected in distribution and the types of the Late Paleozoic. In the Tatríde crystalline are only smaller, usually transversal grabens. The longitudinal graben filled up with the Permian is bound to the zone of weak granitization of the North Veporide crystalline. The dissected graben with the Upper Carboniferous and Permian is distributed south of the Veporide crystalline.

The area without Hercynian stabilization south of the Rožňava lineament is characterized by the „Dinaríde“ type of the Permian with the presence of marine facies. A longitudinal graben in the Permian is also supposed north of the „Slovak block“.

3. The majority of Late Paleozoic grabens played a role in dissection of the types of the Triassic. The view of the West Carpathians as a continental plate in the Triassic cannot be accepted, neither the view of the epiplatformic type of the Triassic in the whole region of the West Carpathians and/or Inner Carpathians. Already in the Triassic we distinguish several paleotectonic types:

- a) dissected, perhaps suboceanic, or subcontinental type with ophiolitoides- south of the Rožňava lineament-Dinaríde type;
- b) type of dissected oceanic unstable shelf with limestone facies, partly deeper-water ones-Austroalpine type;
- c) partly type of continental shelf-Carpathian type;
- d) Kysuca — Pieninic graben (connecting the Pieninic graben with the Transylvanian graben in the East Carpathians).

4. In the Liassic rebuilding of the paleotectonic plan took place so that in the Jurassic-Lower Cretaceous stage we distinguish the following geotectonic types in the West Carpathians:

- a) southern elevated oceanic ridge with furrows (e. g. south of the Rožňava fault line and with other deep-seated faults accompanied by protrusions of ultrabasics as the Darnó, Balaton fault lines;
- b) Zliechov trough with subcontinental crust;
- c) Tatríde unstable oceanic ridge accompanied by basins;
- d) Kysuca-Pieninic trench accompanied by narrow ridges-islands;
- e) oceanic trough (in the substratum of the Magura nappe) — Magura type;
- f) northern shelf connected with the platform of the Bohemian massif.

As visible, the southern oceanic trough of the Tethys and Dinarides does

not reach the West Carpathians; they are separated by the Pannonian fragment of the Serbian-Macedonian massif (Mecsek — Villany mts.).

5. Another rebuilding of the structural plan is connected with the period and stage of the Albian-Cenomanian, in which we distinguish the following geotectonic types;

- a) southern areas of intense folding, nappe formation, shortening of basement;
- b) areas of the North Veporides-Tatrides, with subcontinental crust type, at the beginning with preflysch, later with flysch sedimentation affected by more intense folding to the end of the Middle Cretaceous and at the beginning of the Upper Cretaceous;
- c) Klippen Belt with dissected sedimentation and higher dynamics with abundant conglomerates of wildflysch facies. It forms possibly the marginal zone, in which commencing subduction of the adjacent oceanic trough is reflected;
- d) flysch troughs (of subcontinental crust) of the „mature“ flysch stage with abundant coarse flysch.

In the time of the Middle and at the beginning of the Upper Cretaceous in formation of the structural plan with several nappes shortening affected the Inner Carpathians as one unit but unequally the individual zones. Even in the Tatríde crystalline more distinct shortening took place, mainly in zones without larger bodies of granitoids and with more extensive representation of the Paleozoic (e. g. lesser thrusts in the northern part of the Považský Inovec mts.).

The tectonic lines as the Čertovica, Lubeník, Margecany, Rožňava fault lines represented in the first place boundaries of zones of different intensity, different type of shortening of the crystalline basement. It is difficult to judge to what an extent downsucking zones and to what an extent overthrust zones in deep crust levels are concerned.

6. The Klippen Belt underwent multifold and also long-lasting space shortening in the Upper Cretaceous and Eocene — perhaps conditioned by subduction of the oceanic crust of the Magura trough. Its resulting nealpine structure is a consequence of squeezing out of ridge sequences (Czorsztyń and Klape groups) and trench (Kysuca-Pieninic) at the boundary of two blocks with different crust types — the Magura and Central Carpathian (Slovak) blocks.

The Peripieninic lineament we understand as the inner boundary of the basement of the Magura trough-Námestovo line or the zone of gravimetric minimum as the outer boundary of the contact with the Bohemian massif or with the North European platform. At these lines obviously underthrusting of outer zones or overthrusting of inner zones took place.

7. At the beginning of the Eocene longitudinal graben-synclínorii with thinner continental crust formed in the Tatrides, filled up with the Central Carpathian flysch. Also the Pannonian type of the Paleogene is bound to the basement with a thinner crust type, to the zones south of the Peripieninic lineament.

8. The main structural new form in the Miocene are transversal zones of downfaulting: the Vienna, Central Slovakian, East Slovakian-Transcarpathian zones.

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