GEODYNAMIC MODEL OF EVOLUTION OF LUGOSILESIAN OROCLINE OF EUROPEAN VARISCAN OROGENY BELT

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Most of the continental crust of northeasthern marginal area of Bohemian Massif originated during the Variscan s.l. (Caledonian–Variscan) orogeny. Typical Z-shaped structural framework of inflected orogeny belt – orocline – resulted by nearly subequatorial dextral oblique collision of more inner zones of the Bohemian Massif (Moldanubian and Saxothuringian) with southern – peripheral – zone of the Sarmatian (Ukraine) shield (southern-most promontory of the Baltica continent) during the Upper Silurian up to Lower Devonian (late Caledonian stages). System of suspect-like terranes and massifs (Holy Cross Mts. area, Malopolska massif and Cracow fold belt) was accreted to the Sarmatia during this stages of Variscan s.l. orogenesis. Also Brunovistulian foreland of Lugosilesian orocline (Brunia and Upper Silesian Massif) belongs to them.

Mentioned mosaics of accreted terrain end massifs altogether represent so-called East Silesian microcontinent (ESMC). Last mentioned ESMC caused deflection of Variscan s.s. orogeny front, which one had to be moving NNW-ward to the indentation between mentioned microcontinent and London–Brabant massif cropping out NW-ward (Fig.1). Collision of western branch of orogeny front with the indented foreland was retarded due to specified development in relation to the eastern Moravo–Silesian one (coal molasse in Ruhr Coal Basin started in Namurian C while the same in Upper Silesian Coal Basin began in Namurian A).

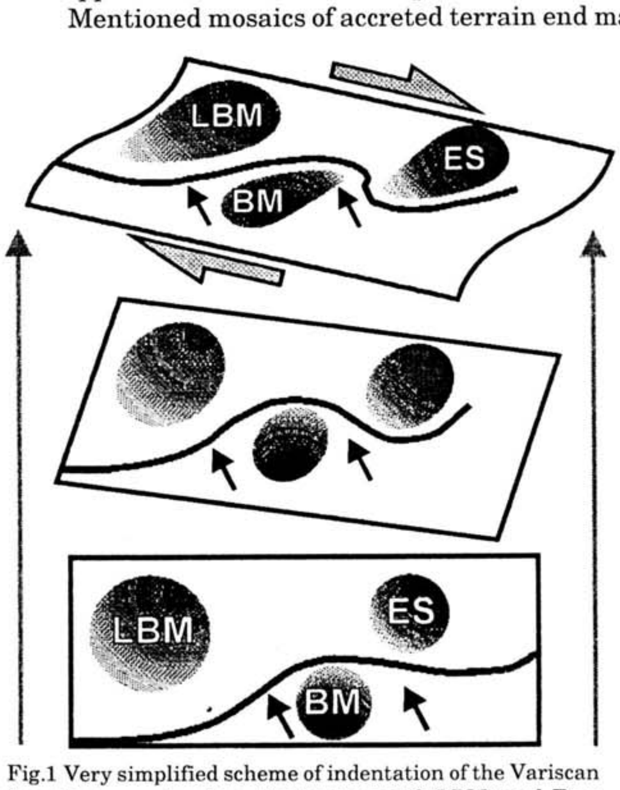

Fig.1 Very simplified scheme of indentation of the Variscan front between London–Brabant massif (LBM) and East Silesian microcontinent (ES). Dextral transpressional development, due to which Variscan front was inflected and Z-shaped orocline between ES and Bohemian massif (BM) had been shaped (upper-most picture), is demonstrated.

Transpressional stress regime generated due to oblique collision of Variscan accretion wedge with ESMC caused NE–SW oriented transtension and activity of WNW–ESE running dextral wrench faults (R-shears), and even more antithetical R'-shears (striking nearly submeridionally). Activity of above mentioned shears caused early Devonian rifting and thinning (stretching) of the Brunovistulian foreland, linked to the bimodal Devonian volcanism and development of volcano-sedimentary facies. Even more R-shears activity led to polyphase dextral separation and shifting of early (during late Caledonian stages) to the Baltica accreted terrain like e.g. Brunovistulian foreland etc.

Brunovistulian drifted passively – along the above mentioned WNW–ESE striking wrench faults – to the W and was gradually overthrusted by the Moravo–Silesian branch of Variscan accretion wedge. Our regional strain analysis of Lugicum and Moravo–Silesian zone supports NNW–SSE oriented orogeny transpressional contraction and genetically associated ENE–WSW transtensional stretching of both – the orocline and its foreland – in the time of the Late Variscan tectogenesis.

For the inner zones of the orocline, especially its middle Moravo–Silesian limb, there are very significant retro-shear zones, with top-to-SE kinematics and dextral strike-slip component, running NE–SW up to ENE–WSW dipping NW-ward. Mentioned ones correspond to the back-thrusts in relation to the main top-to-NNW shearing on the main Variscan trusts. Dome-like structures emerged due to activity of both conjugated front end retro-shears (Krkonoše–Jizera crystalline, Owl Mts. crystalline, Orlice-Sněžník and Silesian crystalline etc.). This stage culminates between the Namurian A and B, when paralic molasse facies of Upper Silesian Coal Basin was transformed to continental one and mentioned coal basin was detached from late-Variscan parallic basins in the north- and NW-ward foreland of Variscan orogeny belt.

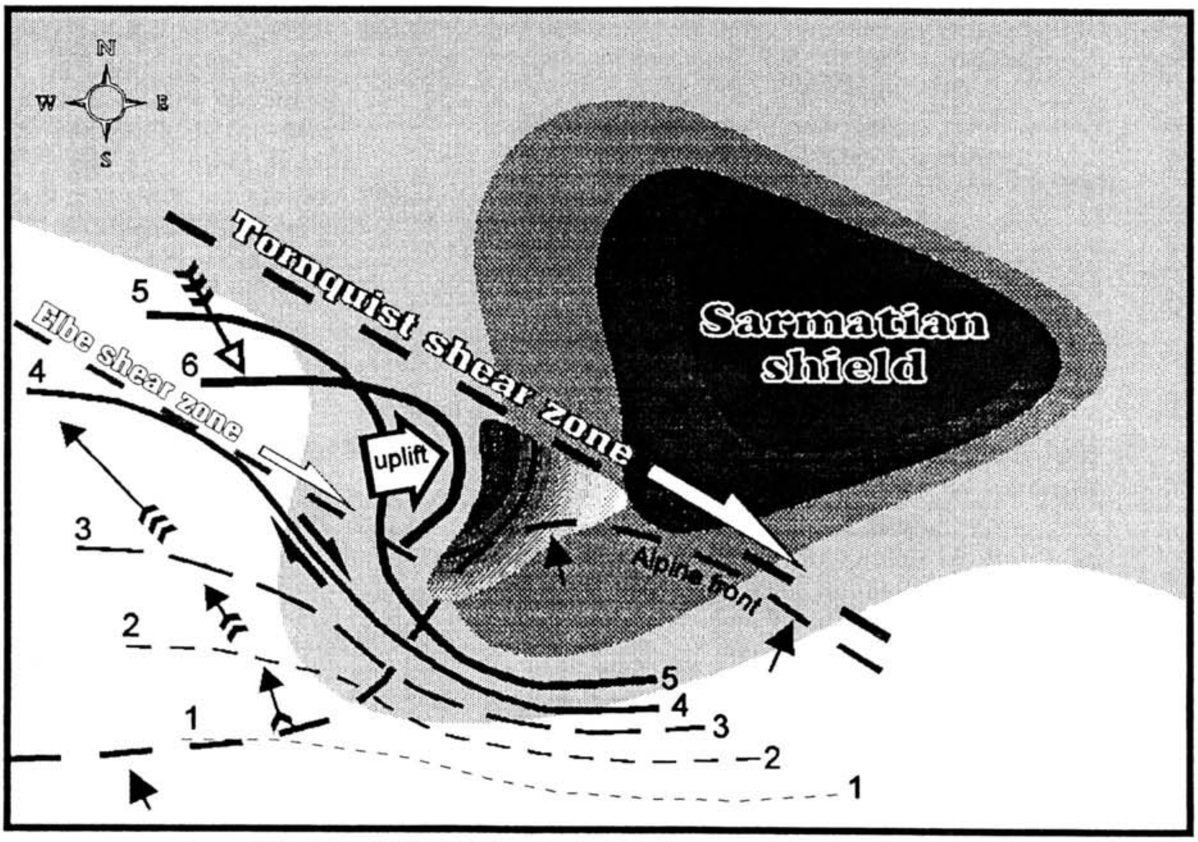

Fig. 2 Simplified scheme of polyphase kinematic development (stages 1 to 6) and bending of the eastern branch of the Variscan front – Lugosilesian orocline – during its Late-Variscan progressive dextral oblique collision with East Silesian terranes accreted earlier (in the time of Late-Caledonian collision) to the Baltica promontory – Sarmatian shield. Shaded subtriangular area in front of the orocline corresponds to the Moravo-Silesian basin.

^{40}AR/^{39}AR AGES OF DETRITAL WHITE MICAS WITHIN THE UPPER AUSTROALPINE NAPPE COMPLEX, EASTERN ALPS, AUSTRIA: IMPLICATIONS FOR TECTONOTHERMAL EVOLUTION AND PALINSPASITIC DERIVATION

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^{40}Ar/^{39}Ar ages have been determined for detrital white micas from different structural units within the Upper Austroalpine Nappe Complex (UAANC), Eastern Alps. Four different nappes have been recognized within the UAANC (Fig. 1). Detrital white micas from Permian cover sequences of the Noric Nappe (Praebichl Conglomerate: loc.1, Fig. 1) yielded a plateau age of c. 303 Ma. Two concentrates have been analyzed from low-grade metamorphic basement of the Noric Nappe. Detrital white micas from Early Silurian schist (Rad Schists: loc. 2, Fig. 1) yielded a plateau age of c. 607 Ma whereas white micas from Upper Ordovician sandstone (Gerichtsgraben Group: loc. 3, Fig. 1) yielded a discordant release pattern with systematically increasing ages (c. 300 – 570 Ma). Muscovite separated from an orthogneiss boulder of the Kaintaleck Nappe (loc. 4, Fig.1) yielded a plateau age of c. 384 Ma. Detrital white micas from a Permian cover sequence of the Silbersberg Nappe (Silbersberg Conglomerate: loc. 5, Fig.1) yielded a plateau age of c. 360 Ma. Detrital white micas within Carboniferous schists of the Veitsch Nappe (post-Variscan molasse sequence: loc. 6, Fig.1) yielded a plateau age of c. 311 Ma.

Together these data are interpreted to reflect the time of post-metamorphic or post-magmatic cooling within respective source areas. This implies: 1) a Variscan source for cover sequences of the Noric Nappe and for molassic sediments of the Veitsch Nappe. This suggests that detrital micas of