Main Features of Morphotectonic Development of a Platform in the Period Between Tectogeneses Exemplified by the Southeastern Margin of the Bohemian Massif

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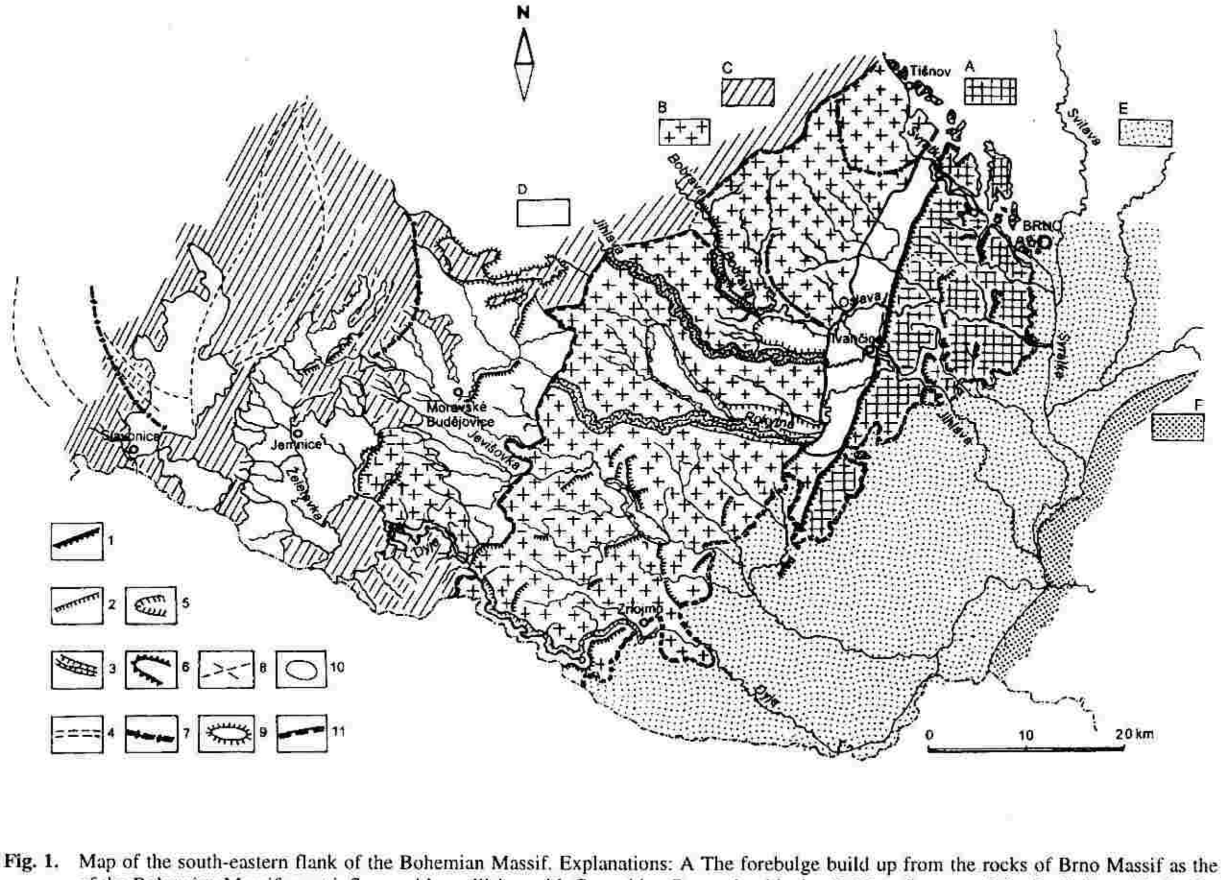

Fig. 1. Map of the south-eastern flank of the Bohemian Massif. Explanations: A The forebulge build up from the rocks of Brno Massif as the part of the Bohemian Massif most influenced by collision with Carpathian-Pannonian blocks. B More flat part of the forebulge with the Znojmo type of levelled surface constituted from eastern part of the Moldanubicum and the Svratka Dome. C The area with features of the stable platform relief development. D The area of basins and depression separating forebulge from less deformed parts of the Bohemian Massif. 1. The most distinct fronts of tilted blocks. 2. Other less distinct fronts. 3. Deep incised valleys. 4. Erosional contact of tilted blocks with Carpathian Foredeep. 5. Synclinal depressions exhumed from cover of Miocene sediments. 6. Tectonic cuestas. 7. Groundplans of the cratonic ring structures. 8.Lineaments. 9. Anticlinal and horst-diapiric structures. 10. Small blocs following in NE part the course of lineament. 11. Rejuvenated structural line of the Bíteš fault.

According to Franke et al. (1995) the Variscan orogen of Europe was a collage of terranes, Gondwana-based microcontinents making up a complex situated between Laurentia and Baltica in the north and Gondwana in the south. A convergence of the Moldanubian continental block with the Moravian-Silesian foreground came about in the southern flank of Variscan folded zone (Fritz and Neubauer 1995). The suture formed between blocks of the collage was overprinted by right lateral strike-slips and in the inner part the blocks were "welded" together by a low-pressure and high-temperature metamorphosis followed by a mild postorogenic extension and magmatism in the Permian-Carboniferous (Franke et al. 1995). Approximately by this kind of development the Bohemian Massif was consolidated into an epi-platform massif, a constituent of the European Platform.

In the postorogenic development since the end of the Carboniferous occurred a vast denudation of the mountains of Variscan orogen. It resulted in the sub-Hercynian planation surface (Ivan 1982), the existence of which is securely confirmed as early as before the Jurassic. In the course of the Mesozoic the surface formed in this way continued to be constituted by processes of deep weathering, in dependence on the prevailing climate, by the Jurassic and the Upper Cretaceous (or also Lower Cretaceous in some cases) marine transgression and subsequently, towards the end of the period, by an exhumation from the platform cover. In this phase the platform surface could be deformed by a responses of late magmatism and, in the following, by granite diapirism, e.g. in the area of the Moldanubian Pluton (Hrádek 1997). The period of levelling and deep weathering is characterised by tectonic stability (Ollier 1981). Since the end of the Mesozoic effects of the Alpine tectogenesis coming from the area of Eastern Alps folding were important. The sub-Hercynian surface modified by the platform-kind development was locally deformed.

The sub-horizontal planation surface modelled by exogenous levelling and weathering acquired features of a structural surface the deformations of which (uplifts, normal faults and flexural bends) can be measured and evaluated as other planar structures. This fact, however, has been taken into considerations only insufficiently so far. Earlier compression phases of the Alpine tectogenesis have brought about thrusts faults, the later phase of extension has resulted in normal faults (Hanžl 1996).

We can find an example of an undeformed sub-horizontal levelled surface in the south-eastern flank of the Bohemian Massif. It is the B te -type of surface situated 500-600 m a.s.l., containing characteristic monadnocks and inselbergs. In the area between the river valleys of Oslava and Dyje, limited westerly by the Bíteš fault zone, this surface underwent deformation by antithetic normal faults. Thus it is defined as the Znojmo type and with inclination from 500 to 250 m a.s.l. constituted, in the Neogene, the outer part of the Carpathian foredeep. On the Carpathian-Lower Badenian divide this surface was flexured and inclined into the present form of a Carpathian forebulge. The flexure of the platform flank consists of individual steps separated by half-graben valleys stretching in the north-south direction which confirms a block character of the deformation (Hrádek 1995, 1997). The south-eastern flank of the Bohemian Massif which was exposed to intense brittle deformation on the border of the Variscan tectogenesis front showed, in the Alpine tectogenesis, an increased susceptibility to a renewal of older deformation system (Grygar et al. 1997).

Some structures, above all the anticlinal, have a long-term tendency to affect the surface morphology. It is not quite clear whether the matter is a protracted slow uplift being in connection with, e.g., the distribution of rather light granitic masses into their "roots" (Suk 1984) or whether we have to do with the consequence of an indirect, differentiated exogenous development. From this point of view it is not even clear whether there is an uplift mechanism of the marginally situated Sudetes mountains which is generally believed to be very young. No discontinuities in structural surfaces have been discovered here so far, however, in their surface morphology, with the exception of the Sudetic and perhaps Lugic Faults.

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Theoretical Models of Magnetic Anisotropy to Strain Considering Triaxial Magnetic Particles

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The movements of individual triaxial particles in the Jeffery (1922) model of strained rocks are much more complex than the movements of the spheroidal particles. However, the degree of anisotropy in the magnetic anisotropy to strain models considering multiparticle systems of triaxial magnetic particles shows very similar values to the models considering spheroidal particles. We explain this observation by assuming that even though the movements of individual particles are very different, the multiparticle system as a whole "averages out" in some way the movements and the resulting magnetic anisotropy tensor does not differ very much from the tensor of the model considering spheroids.