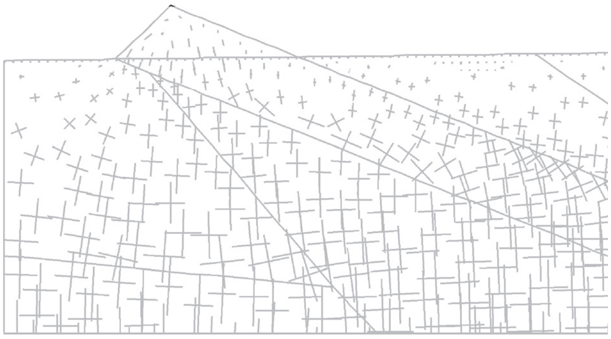

Fig. 3. Principal stress orientation.

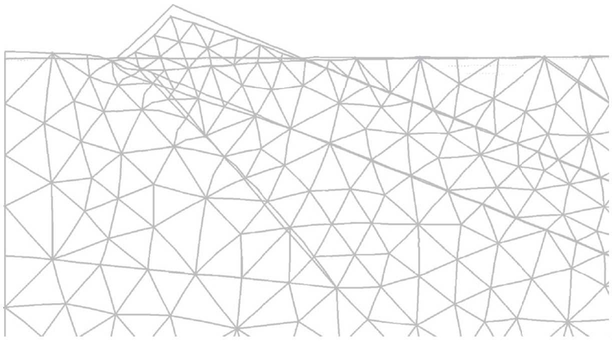

Fig. 4. Influence of rigid limestone desk on soft rocks.

Early Cretaceous (Hauterivian) age (Eliáš 1992). It is crosscut by a set of faults striking mostly W–E to SW–NE. The faults divide the limestone body into several morphological blocks. Inverse stress analysis indicates the presence of several phases of fault development. Older faults are characterized by striae on their surfaces, up to several tens of centimetres wide. Younger striae are finely spaced and oblique. Up to 5 different generations of striae on one fault plane could be distinguished.

Samples of the Ernstbrunn Limestones from the Mikulov surroundings were mechanically tested using the ZD10/90 VEB-TIR Rauenstein testing machine (DDR). The tested bodies were 9 cm high with cross-sectional area of 5×5 cm. The averaged rock strength under axial loading is 162.1 MPa with coefficient of internal friction 65.2°. Specific gravity of the rock is 2.65 g/cm^3.

The late tectonic deformation (loading) was studied by the finite element method (FEM) using the Plaxis 7.0 PC program. The cross-section of the studied area was divided in a set of elementary triangles (Fig. 1) and the whole matrix of deformation was obtained. The data can be visualized as decomposed stress (Fig. 2) or as principal stress orientation (Fig. 3). Subvertical loading after the thrusting of limestones over soft bedrock yielded a special strain effect (Fig. 4) in which the old inverse fault planes could be reactivated in normal sense of shear. These theoretical results are in agreement with the movements on the fault planes observed in the field.

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Structural and Metamorphic Evolution of Pro-Wedge Moldanubian Structures Associated with Underthrusting of Brunovistulian Foreland

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We investigate the orogenic fabric along the E-W cross-section at the eastern margin of the Moldanubian Zone in order to understand the mechanical behaviour during the formation and exhumation of this part of the orogenic root. The cross section is running from the Raabs lower crustal unit in the west, across the underlying Varied unit and the Podhradská unit to the easterly-situated Moravian Zone.

The structural observations show the succession of four fabrics. The relics of the first foliation S1 with unknown original orientation are preserved in form of tide to isoclinal folds within the steeply NW–dipping foliation S2 in the Varied and Podhradska units. The steep NW- dipping S2 fabric is reworked by E-verging close to isoclinal F3 folds with westerly dipping axial planes and subhorizontal axes. This late folding results in places to almost complete transposition into the moderately west-dipping S3 foliation, developed with greatest intensity in the Raabs unit. The latest locally developed structure is a flat S4 fabric represented by LT shear zones.

In order to correlate the structural observations with P-T conditions, we have used the average P-T calculations to obtain absolute P-T conditions for the peak metamorphic assemblages. The qualitative PT-paths of the rocks from individual units ware deduced from PT-pseudosections constructed in the NCKF-MASH system for selected samples: migmatite from the Raabs unit (Kfs+Plg+Qtz+Grt+Ky/Sill+Bt), metapelite from the Podhradska unit (Bt+Grt+Qtz+Plg+Kfs+Sill/Ky±St) and one sample from the granulitic body at the eastern border of the Podhradska unit (Grt+Kfs+Plg+Qtz+Ky+Bt). The PT-paths were determined on the basis of the succession of mineral assemblages and zoning of the minerals.

On the basis of the structural observations correlated with the PT estimates we propose two major thrust-zones to have originated at in the deep lower crustal levels. The sheet of amphibolites whith eclogite relics indicates the thrusting of the lower crustal Raabs unit over the middle-crustal Varied group. The second major thrust marked by Ky-Kfs granulites brings the lower crustal Podhradska unit over the foreland basement units of the Moravian zone. These thrusts were later reworked under the mid-crustal conditions. Our structural observations are consistent with the results of numerical modelling of structural evolution of the continental wedge by Beaumont et al. (2000). In agreement with their numerical model P3, which involves inherited weak lower crustal horizon, we put the first pro-wedge thrust at the bottom of the Raabs unit. This thrusting is connected with extreme deformation of the eastern part of the Varied unit and steep folding of remote eastern part of this unit. Subsequently, a new pro-wedge thrust develops at the lower crust level and the whole sequence is thrust over the Brunovistulian foreland. This thrusting is accompanied with gravitational sliding of hangingwall Varied group and vertical gravitational collapse of steep fabrics.

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Syn- and Post-Sedimentary Tectonics of the Most Basin (Ohře Rift, Czech Republic); Insights from Reflection-Seismic Data

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The Most Basin located in the Ohře Rift (Eger Graben) Zone in NW Bohemia, is a relict of the largest sedimentary basin of this Cenozoic extensional province. During the syn-rift filling of the basin by volcanics and sediments during late Oligocene-early Miocene, the basin geometry was controlled by E-W (WSW-ENE) -striking normal faults, arranged in an en-echelon pattern, due to oblique NNE-SSW extension (Rajchl and Uličný 2000). In the present-day topography, it is difficult to recognize this syn-depositional fault system, because (1) the E-W fault system was strongly overprinted by younger NE-SW fault systems (e.g. Krušné hory Fault system) formed under later NW-SE extension (Adamovič and Coubal 1999, Rajchl and Uličný 2000) and (2) thick accumulation of peat is likely to have accommodated much of the brittle deformation. In spite of the abundance of borehole data and extensive open-cast coal mines, precise localization of many syn-rift tectonic features, and unequivocal discrimination of syn- and post-depositional activity of individual structures has commonly been difficult.

To clarify the problem of expression of syn- versus post-depositional tectonic deformation in the architecture of the present-day basin fill, 2-D reflection-seismic data acquired in early 1980 (Jihlavec and Novák 1986) were reprocessed and reinterpreted. The reflection-seismic lines 21/81, 22/81 and 68/83 are located in the central, deepest depocentre of the Most Basin.

The interpretation of the seismic data confirmed synsedimentary activity of small-displacement normal faults, active during the intitial phase of basin opening and largely covered occurred under coal seam. Upward propagation of these normal faults was mostly accommodated in the coal seam, resulting in its local flexure. During the early stage of basin evolution, a low-relief (c. 100 m total relief) extensional horst structure separated the depocentre into two shallow grabens. This tectonic style corresponds to models of oblique extension (McClay and White 1995) and is in agreement with the interpretation of early basin geometry by Rajchl and Uličný (2000). The architecture of clastics overlying the main coal seam suggests, however, that in a later stage of basin filling, subsidence was controlled by major basin-bounding faults located outside the margins of the seismic profiles. Within the basin, the geometry of clastic infill was controlled predominantly by compaction of thick accumulation of peat, corresponding to the main seam. The profile 21/81 helped to precisely localize a synsedimentary transfer zone which bounded the central depocentre from NE. This syn-depositional structure was characterised by relatively low subsidence resulting in reduction of thickness of the coal seam and underlying deposits.

Onlap of lacustrine clays on the surface of the main coal seam close to the present-day Krušné Hory Fault Zone (KHFZ) suggests a relatively flat synsedimentary relief of NW-margin