and siltstones are thought to record deposition from dilute, low-density turbidity currents. Mudstones represent hemipelagic background fallout of sediment from the water column (Hartley and Otava, in print).

The most distinct markers at the upper levels of the quarry are lenticular bodies of gravel-sized conglomerates. The horizons are slightly dislocated (by less than 1 m) along a steep southerly (194/84) dipping normal fault. The conglomerates reach several metres in thickness at the top of the quarry and pinch out at fourth bench from the top.

Sedimentary petrology:

The fine-grained conglomerates have a typical composition with higher amount of quartz pebbles, volcanoplutonic rocks, metagranitoids and gneisses. The qualitative composition of sand-sized fraction is similar, maybe somewhat enriched in metasediment and sediment clasts. The assemblage of translucent heavy minerals was defined as garnet-dominated with zircons, apatites, tourmaline and rutile. The analysis of detrital garnet assemblage proved high affinity to the Upper Viséan Myslejovice Fm. of the Drahany part of the basin (exposed further SW). This is in accordance with the paleocurrent reconstruction.

Structural geology:

The general structural pattern of the area is well visible on the walls and has been interpreted by geologists many times and in many different ways (Rajlich, Synek, Schulmann, Grygar, Kumpera, Dvořák, Krejčí). The folds are characterized by long intervals (limbs) of strata dipping west at low to medium angles and by short overturned limbs dipping steeply west. The axes of the east-vergent folds mostly dip gently SSW, dips to the NNE are less frequent. The described primary fold structures are often disturbed by westerly dipping distinct dislocations.

The cleavage is relatively indistinct, often missing. The study of magnetic anisotropy in all parts of the folds proved the sedimentary origin of the anisotropy (Hrouda et al., in print).

Paleostress analysis was based on the study of faults with kinematic indicators (striae). Program BRUTTE3 (Hardcastle and Hills 1991) was used for computation of parameters of the reduced stress tensor. A heterogeneous population of fault-slip data was measured and several different paleostress fields were determined by its analysis. One of them, the stress field with s_1 axis dipping NW or NNW and with high dip angles of s_3 axis (50 to 60 degrees), is comparable with the results of paleostress analysis carried out in the quarry at Heřmánky (NW–SE orientation of s_1 axis) west of Jakubčovice (Havíř, in print).

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Lithostratigraphic and Structural Polarity of the Devonian and Carboniferous Formations – Moravosilesian Zone, Bohemian Massif

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The almost west-east structure and litofacies polarity of the Carboniferous formations of the Moravosilesian Variscan foredeep and coal-bearing basins has been largely respected till now (e.g., Kumpera 1983; Dvořák 1994; Dopita et al. 1997 etc.). It is usually presented as an eastward (foreland-ward) lithofacies thinning and eastward decrease in deformation. Easterly polarity trend is very simply derived from the dominant NNE-SSW strike of the main fold-thrust system.

Earlier, we noted (Grygar and Vavro 1995) that thinning polarity of the Lower Carboniferous Culm facies in the area of the Upper Silesian Basin is southeasterly, not easterly (also Havlena 1982), i.e. clockwise rotated by approx. 45° relative to the eastward polarity of the structure. Very similar thinning to the SE can be observed also for the Devonian carbonate facies (e.g., Chlupáč 1994; Hladil 1994). Also the onset of the Culm flysch facies over carbonate one follows approximately a SW-NE to -ENE trend (not the trend NNE-SSW), which can be considered subparallel to the main thrust and fold system. A consequence of this state is the spindle-shaped (subtriangular) framework of the foredeep and coal-bearing molasse, widely open to the NE.

All the above mentioned inconsistencies reflect, in our opinion, a dextral rotation of the Brunovistulian foreland relative to the northeastward thust Variscan accretionary wedge during the Viséan and Upper Carboniferous late-Variscan collision.

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Alpine and Variscan Orogenic Belts Interaction – an Example of the Morphostructural Analysis (Moravosilesian Region of the Bohemian Massif)

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Morphostructural analysis of the Moravosilesian region is based on comparison of the digital elevation models (DEM) with structural maps and structural field mapping, as for paleostress and brittle deformation analysis.

The DEM models of the studied area, based on the detailed digitisation of the topographic maps 1: 25,000, were created using Surfer 7.0 and Arc View GIS 3D visualisation capability (Fig. 1). This was done for the Variscan foredeep (Nízký Jeseník Mts.) with coal-bearing molasse (Upper Silesian Basin) and Alpine Outer Carpathian Belt. The DEM of the buried pre-Alpine autochthon relief (so-called "Carboniferous Buried Mountains") based on results of drilling and mining (Aust in Dopita et al. 1997) was also compiled. This one was merged with Carboniferous relief of the Nízký Jeseník Mts. uncovered westward to obtain complex DEM of the pre-Alpine foreland. This complex DEM displays, among others, significant peneplanisation of the uncovered area of the foreland since the Miocene in comparison to buried Outer Carpathian autochthon buried by Outer Carpathian Nappes.

It is obvious that morphostructures of the autochthon induced dynamic and kinematic development of the Subsilesian and Silesian nappes. Also the Brunovistulian Epihercynian basement was simultaneously modified owing to tectonic loading by the Alpine nappes. Complex morphostructural analysis offers much evidence for structural framework of both the above mentioned units. Tectonic ramps striking W–E are very important structural features of the pre-Alpine foreland basement. They correspond to old Variscan fault systems (however, Cadomian origin cannot be excluded), reactivated by the Alpine tectogeny. The Dětmarovice shear zone (Grygar et al. 1989) is the most significant one. Outer Jeseník Fault with significant neotectonic reactivation represents an internal structure of the above mentioned shear zone. It is also interesting that only this one can be followed W to the area of Variscan foredeep of the Nízký Jeseník Mts. All others terminate at the Morava Gate furrow in the west. The system of the Sub-Beskydy faults displays a very special pattern. We traced this fault system more westward in the Maliník horst structure to the Upper Morava depression. All W–E-striking tectonic zones represent typical hinge faults terminated in the west.

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