tensive erosion and redeposition during high-discharge events, when lateral channel shifting and avulsions took place. Frequent reactivation surfaces reflect high discharge fluctuations. Hence, the channel belt development was most probably controlled by climatic conditions, namely seasonal oscillations under overall rather colder climate. Within 3–5 km wide channel belt the individual channels migrated mostly NE ward while the SW part remained gradually abandoned with oxbow lakes formation as shown by frequent occurrence of thick clayey lenses (Váně 1985). Distinct vertical changes, such as thinning of depositional elements, decreasing of erosional relief, increasing of width/depth ratio and upward fining grains could be recognized. Depositional architecture at lower parts show to aggrading braided river system formed by deep, relatively stable and laterally slightly migrating channels. Depositional framework of upper parts of the relict suggests laterally more extended channel belt formed by far shallower mobile channels with reduced transport capacity, where the transport prevailed over deposition (degrading river system). During fractional deposition the vertical and downstream accretion of low-relief bedload sheets prevailed.

The reasons of change in fluvial style are still uncertain, but the autocyclic causes are the most probable. Similarly the nature of braiding remains questionable. The braided rivers occur in poorly vegetated preferably high-gradient areas and fluctuating discharge is a crucial for braiding pattern creation. Evidences of riparian forest and highly improbable high-gradient relief of western Bohemia in Neogene times suggest that the braided pattern evolved mainly due to high discharge fluctuations.

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Origin and Orientation of Microporosity in Eclogites of Different Microstructure

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Crystalline rocks of metamorphic and magmatic origin are usually of very low porosity (below 1 %). Porosity corresponds to grain boundaries, cleavage planes of rock forming minerals and microfractures of different length that can be either sealed or open. Orientation and connectivity of microporosity in these rocks and its closure with respect to increasing confining pressure is of great interest as they are suitable for dangerous waste disposal. However, there is limited number of methods how to measure it. In this work, we examine origin and spatial orientation of microporosity in two eclogites of similar lattice preferred orientation (LPO) of omphacite, but different microstructure and grain size using:

1. subtraction of velocities of acoustic P-waves ($\Delta Vp(\Delta p)$) experimentally measured in 132 directions at different confining pressures on spherical sample (pulse transmission technique of Pros and Babuška (1968) and Pros et al. (1998)),
2. measurement of lattice preferred orientation using SEM-EBSD method and
3. quantitative microstructural analysis of grain boundaries orientation in three thin sections that are oriented parallel to xz, xy and yz planes of finite strain ellipsoid (polyLX of Lexa (2003).

We choose eclogites as a relatively simple bi-mineralic rock type composed of omphacite and garnet as cleavage-bearing anisotropic and cleavage-free isotropic minerals, respectively. The first sample (JK1b) is dynamically recrystallized crustal eclogite that consists of fine-grain clinopyroxene grains having mean Ferret diameters of 41 µm. Garnet grains have idiomorphic shapes and mean Ferret diameters of 87 µm. The second sample (SNW3) belongs to the population of coarse-grained mantle xenoliths. Sample consists of clinopyroxene and slightly elongated garnet grains that define well-developed macroscopic foliation. Mean Ferret diameter of clinopyroxene and garnet is 1.31 mm and 2.20 mm, respectively.In the sample JK1b, two main fields (A and B) of directions of high P-wave velocity difference values characterize spatial distribution of microporosity. Third less significant field of directions of high values of P-wave velocity differences (field C) occurs in the foliation plain at eastern pole of diagram.

Partial subtractions between increasing hydrostatic pressure steps show that most microcracks from the set corresponding to the field A were progressively closing down between confining pressures of 0.1 and 20 MPa. Most microcracks corresponding to fields B and C were progressively closing from 0.1 up to 50 MPa of confining pressure. The electron back-scattered diffraction (EBSD) method showed that poles (110) of omphacite cleavage planes fit well with field B. Comparison of results from all three applied methods showed that 1) oriented microporosity characterised by field A maximum corresponds mainly to grain boundaries parallel to foliation plane, 2) field B maximum most probably corresponds to omphacite cleavage planes and 3) field C maximum corresponds very likely to intersection between two sets of cleavage planes or/and grain boundaries in the strongly linear microstructure of the sample JK1b. In the sample SNW3, the partial subtractions of P-wave velocities measured at individual pressure levels shows neither clear concentration of directions of high P-wave velocity difference values nor systematic progressive closure of microporosity in any direction. However the bulk subtraction of measured P-wave velocities between 400 MPa and 0.1 MPa shows three maxima of directions of important values of P-wave velocity differences. These maxima correspond well to orientation of clinopyroxene cleavage planes.

Results show that grain boundaries are the most important contributors to the bulk microporosity in studied rocks. The mean of ΔV_P has been calculated in order to assign the relative amount of open space and the anisotropy of P-wave velocity differences. It shows that microporosity in the sample JK1b is relatively large and strongly preferentially oriented, whereas it is significantly lower and less preferred oriented in the sample SNW3. It implies that grain size of rock forming minerals controls amount of microporosity. Also, orientation of microporosity depends mostly on preferred orientation of grain boundaries and somewhat less on orientation of cleavage planes. This study showed that experimental pulse transmission technique is useful tool for visualization of oriented microporosity in 3D and provide important basis for further study of permeability anisotropy through studied rocks.

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Limestone Microstructures and Strain Patterns as Metamorphic Indicators of Low-Temperature Deformation in the Eastern Part of the Bükk Mountains (NE Hungary)

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The (North) Bükk Parautochton is a major tectonic unit of the Bükk Mountains, consisting its central, eastern and northern parts. It is composed of a rock sequence from Middle Carboniferous to Upper Triassic, predominantly of metacarbonates intercalated with metapelites, metapsammites and metavolcanics. The most exposed rock types are platform and basin facies limestones.

The whole sequence was affected by the Alpine dynamothermal metamorphism (e.g. Lelkes-Felvári et al. 1996). This metamorphism in the eastern part of the Bükk Mts. reached the greenschist and pumpellyite-actinolite facies, represented first of all with higher anchizonal metasediments (Árkai 2001). The metamorphic grade was determined by mineral assemblages from Paleozoic and Mesozoic metasediments and Middle Triassic metavolcanics, as well as by analytical methods such as illite crystallinity (IC) data from metapelites and metavolcanics, vitrinite reflectance from metapelites. Based on minerals, occurring in the Upper Triassic metabasalts, the maximal fluid pressure is estimated for 300 MPa, while the temperature could reach 350 °C.

The Mesozoic limestones of the Parautochton are generally neomorphosed and have medium to strong shape preferred orientation (SPO). The macro- and microscopic features show multiphase deformation. The first, recognizable deformation phase (“early phase” in Németh and Mádai 2003) is characterized by ductile forms and textures, showing cleavage (“main cleavage” in Csontos 1999) and multi-order folding on the macro-scale, SPO and other ductile strain patterns on the micro-scale. Later deformation phases resulted predominantly in brittle deformation in the limestones, however the less competent metapelites and metavolcanics could form ductile strain patterns also in later phases.

Having been an entirely ductile deformation phase, it is believed that the early deformation phase took place during the peak of the Alpine dynamothermal metamorphism (Csontos 1999, Németh and Mádai 2004). The aim of this study is to correlate the available data on metamorphism with the stress-temperature conditions of the most ductile (early) deformation phase, by means of limestone microstructure and strain pattern analyses and interpretation of foreign analogies (Groshong et al. 1984, Ferrill 1991). The investigated strain patterns comprise the type and intensity of crystal preferred orientation (CPO), development of