ual liquids and partly also condensed fluid-phase solutes, and (3) globulae of immiscible melts rich in felsic components and volatiles. The first and second types are common, whereas the third one is rare and dubious in lamprophyres from the Bohemian Massif. Evolution of the first type of ocelli involves development of clinopyroxene, i.e. anhydrous reaction rims (sometimes secondarily amphibolized) and, during final stages of interaction, dense clusters of clinopyroxene crystals. The process is similar to interaction of quartz xenocrysts with alkaline mafic magmas under volcanic conditions where, however, presence of glass is quite common. The second type is typically polycrystalline, composed of quartz, K-feldspar, albite, carbonates, etc., and may or may not be rimmed with tangentially oriented biotite (in minettes; see, e.g., Losert, 1962) or hornblende (in spessartites; see Kašpar, 1930). These rims are typically "wet".

Various structural phenomena in mafic plutonic rocks and microgranular enclaves in granitoids of the CBPC were misinterpreted by several authors as relict varioles, amygdules, quartz-filled pseudomorphs after decomposed olivine phenocrysts, and quartz-rich microxenoliths in recrystallized, significantly older volcanic rocks (see, e.g., Palivcová et al., 1992, Palivcová and Ledvinková, 1997, and references therein). New investigation has shown that these spheroidal structures and their crystallization evolution are well comparable with ocelli of the first and second types in dyke rocks, i.e., xenocrysts and segregation vesicles.

Quartz xenocrysts are common in mafic plutonic rocks along their contacts with those types of granitic rocks that were in the stage of "crystal mush" when the two contrasting magmas came into contact. Typical examples can be observed in the area of the "marginal" granite type of the Central Bohemian Plutonic Complex with relatively small masses of mafic quartz-dioritic to gabbroic rocks and, in some parts, innumerable mafic enclaves.

Polycrystalline felsic segregation ocelli occur frequently in mafic rocks along their primary contacts with granitoids of the same rock association and also of the calc-alkaline rock suite of tonalite-granodiorite and gabbro-quartz diorite, both in the E vicinity of Příbram. In the latter case the quartz xenocrysts are absent as the tonalitic magma did not crystallize quartz early in its crystallization history before coming into contact with mafic magma batches. Less frequent but well developed are felsic segregation ocelli in some varieties of microgranular enclaves in other rock types of the CBPC, namely in the Říčany granite, Sedlčany granite, and in the durbachite (Čertovo břemeno) rock suite.

Both the two types of felsic ocellar structures in mafic plutonic rocks are related to thermal and compositional interactions of (hydrous) mafic magma batches with co-existing granitic magmas and can be well recognized namely in chilled margins and other relatively rapidly cooled parts of the mafic bodies. However, interpretation of similar phenomena may be much more difficult in slowly cooled inner parts of mafic bodies due to prolonged thermal re-equilibration, readjustment of grain boundaries and late-magmatic to postmagmatic replacement of some minerals. Complex ocelli in quartz gabbros from CBPC, well documented by Palivcová and Ledvinková (1997), can illustrate some kind of convergence in petrographic character of reacted quartz xenocrysts and quartz-rich segregation vesicles. However, presence of relics of originally anhydrous mafic rims can reveal the xenocrystic origin of them.

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References

FIALA F., 1967. Algonkian pillow lavas and variolites in the Barrandian Area. *Sbor. geol. Věd, Geol*., G 12: 7-65.

KAŠPAR J.V., 1930. Spessartit od Nezabudic u Křivoklátu. *Věst. Stát. geol. Úst. ČSR*, 6 (3): 117-128.

LOSERT J., 1962. Mandlovcovité lamprofyry z kutnohorských dolů. *Acta Univ. Carol. Geol.*, 1962, (1/2): 107-126.

PALIVCOVÁ M., LEDVINKOVÁ V., 1997. Overgrowths of hornblende into and its microtextural – compositional changes inside the ocelli of the gabbroic rocks, Central Bohemian Pluton. *Krystalinikum*, 23: 117-149.

PALIVCOVÁ M., WALDHAUSROVÁ J., LEDVINKOVÁ V. and FATKOVÁ J., 1992. Říčany granite (Central Bohemian Pluton) and its ocelli- and ovoids-bearing mafic enclaves. *Krystalinikum* 21: 33-66.

PHILLIPS W.J., 1973. Interpretation of crystalline spheroidal structures in igneous rocks. *Lithos*, 6: 235-244.

Ground Penetrating Radar Profile Measurements above the Seismoactive Area at the Eastern Margin of the Cheb Basin, Western Bohemia

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The West Bohemia geodynamically active area is characterized, among others, by the occurrence of earthquake swarms concentrated namely in the focal zone Nový Kostel near the eastern margin of the Cheb basin. Recent seismic studies show that the earthquake hypocenters are situated on a narrow fault zone striking N-S and dipping steeply toward west. Most of the events were localized to the depth interval 6–11.5 km (Fischer and Horálek, 2003, Nehybka et al., 2003). Based on the focal mechanism studies, sinistral movement is assumed along the N-S running seismically active structure (Havíř, 2000).

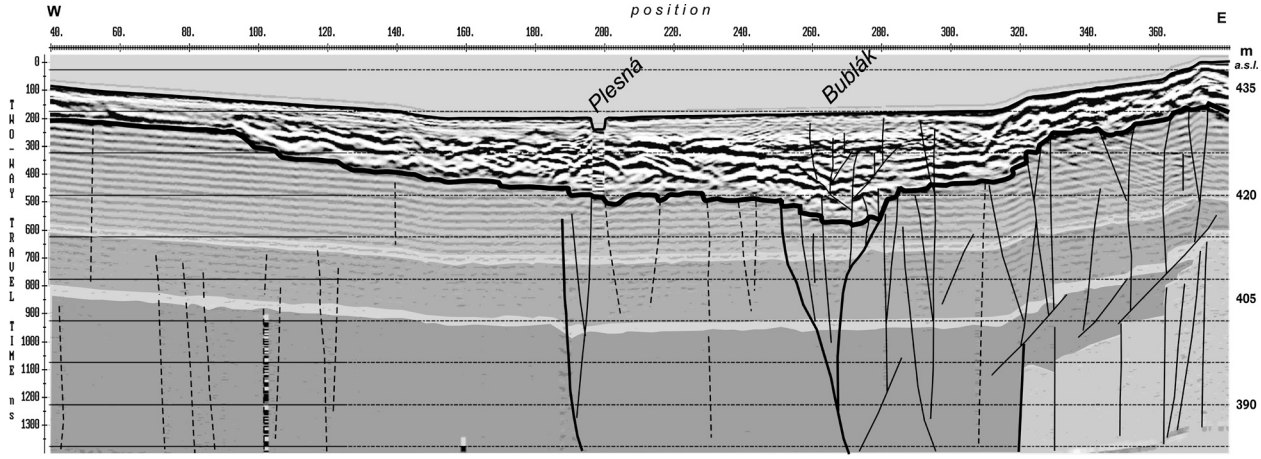

Fig.1. Interpretation of the W-E georadar profile across the alluvial plain of the Plesná river. The young (Quaternary?) basin structure overlying the Upper Pliocene clays of the Vildštejn Formation of the Cheb Basin is highlited. The central part of the young basin depression beneath the Bublák moffete seems to be bounded by fsurcated fault structure. Vertical exaggeration 1:2.

To contribute to the investigation of recent crustal movements above the Nový Kostel focal zone, eight ground penetrating radar profiles of the total length of 1700 m were measured in the region in question in October 2003. The measurements were done by georadar instrument Pulse Ekko 100A system using 50 MHz antennae and 4 m source-receiver offset. To provide sufficient horizontal resolution of recorded data, 0.5 m recording interval was used for the survey. The data were processed using Ekko commercial software with signal saturation correction, trace stacking and point stacking and corrected for topography. The average near-surface velocity was determined from common mid-point surveys. The effective velocity used for the depth conversion was 0.08 m/ns.

Figure 1 shows the data of one of the two-dimensional georadar profiles – that across the Bublák moffete. The length of the profile is 380 m. The data visualize an approximately 200 m wide and 10 m deep depression centered on the river Plesná. Beneath the Bublák moffete, the depression reaches its maximum depth of 15 m and the data indicate diffraction of electromagnetic waves on a faulted structure. The fault pattern beneath Bublák could be interpreted as a negative flower structure. The two white strips running along the whole profile were interpreted as sandy horizons.

The relatively large penetration depth of the measurements and sufficient contrast in dielectric properties of the shallow sediments of the Cheb basin justify our plan to measure a denser set of georadar profiles above the Nový Kostel focal zone with the aim to construct a three-dimensional data cube. The time slices across such a data cube enable visualization of the electromagnetic reflection strength across the whole zone of interest.

References

FISCHER T. and HORÁLEK J., 2003. Space-time distribution of earthquake swarms in the principle focal zone of the NW Bohemia/Vogtland seismoactive region: period 1985-2001. *J. Geodynamics*, 35/1-2: 125-144.

HAVÍŘ J., 2000. Stress analyses in the epicentral area of Nový Kostel (Western Bohemia). *Studia Geophys. et Geod.*, 44: 522-536.

NEHYBKA V., TILŠAROVÁ R. and ŠPAČEK P., 2003. The Nový Kostel earthquake swarm 2000 – Krasnet measurements. *Acta Montana, 22*, (129): 21-31.

Methane Degassing and Exhumation of the Tertiary Accretionary Complex and Fore-arc Basin of the Western Carpathians

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Cretaceous-Oligocene flysch of the Western Carpathians contains mineralised joints filled with several generations of calcite and quartz. Composite textures of the mineral infillings reflect a multi-stage development coincidental with diagenesis, syn-sedimentary folding, thrusting, and regional collapse of the Outer Carpathians (Świerczewska et al., 1999, Świerczewska et al.,