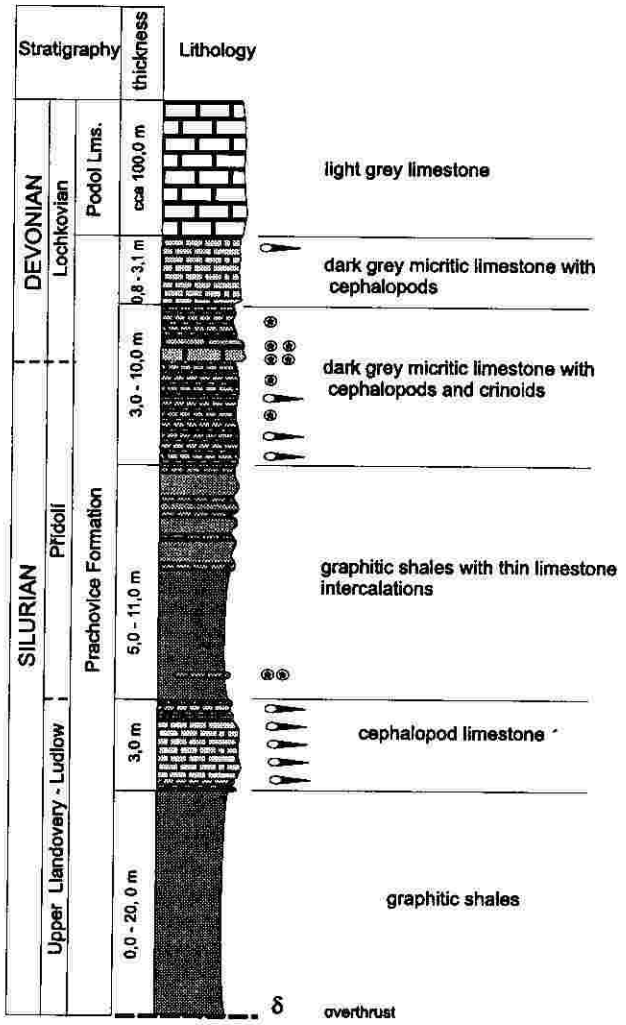


**Fig. 1.** Idealized lithological section through the Silurian and Devonian in the Prachovice quarry

Layers of black graphitic shales and of dark grey limestones of variable thicknesses are extensively foliated and folded; or, the graphitic shales may anastomosingly embed individual blocks of dark grey limestones. The foliations dip S at moderate to very steep angles (25°–85°). Fold axes show highly variable trends and lie mostly subhorizontal. The cleavage dips E and W at moderate angles or lies subhorizontal.

Light grey limestones of the Podol Mb. display the original sedimentary bedding characterized by changes in lithology. The bedding is affected by all subsequent deformation processes. The deformation event associated with the formation of metamorphic foliation and lineation probably transposes the original bedding, since no angular changes were observed. Isoclinal folds locally developed in the limestones. Bedding and foliation planes dip S at 40°–90°, generally very steeply. Lineation, as defined by the orientation of calcite, shows gentle and flat plunges to the SE. Both the axes and the axial planes of the folds are flat and orientated to the SE.

The faults in the quarry are characterized by brittle shear zones filled with breccia and coarse-grained calcite. These structures are mostly steep to subvertical, striking NW–SE. Joints are mostly developed in the limestones. They were produced by brittle deformation, are very steep to vertical and strike N–S. The cleavage dips SE and E at medium angles or lies subhorizontal.

## Discussion and conclusions

From the viewpoint of the deformation mechanism, rocks in the quarry were divided into two types: i) limestones, ii) black graphitic shales. The limestones were folded to form isoclinal folds and show a complicated joint system resulting in considerable degree of brittle deformation. Graphitic shales were more plastic than limestones, were more intensively folded, and anastomosingly embed the blocks of dark grey limestones.

All the above mentioned findings indicate that the complicated tectonic evolution of the Prachovice section of the Vápenný Podol Syncline was dominated by overthrusting, i.e., the isoclinal structure of the study area can be excluded.

# Indications of Recent Vertical Crustal Movements in the Nový Kostel Focal Area

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Significant contribution to the study of crustal dynamics is provided by geodesy. In the last decade the classical geodetic methods (triangulation) were replaced by the revolutionary GPS system (Global Positioning System). This satellite technique of position determination eliminated time-consuming geodetic measurements and enabled to install large-scale networks even in extremely difficult conditions. The disadvantage of the GPS is a relatively lower precision in vertical component (height), as even many hours of recording do not provide an accuracy better than 1 centimetre. From this reason, a precise levelling method has to be applied in some cases of vertical movements investigation.

Since 1994 annual campaigns of precise levelling have been performed on the network established in the surroundings of Nový Kostel. The network covers the most dynamic part of the West Bohemian seismoactive region with a total of 70 points in 1999. The measurements are connected to a reference point of the national levelling system and to our GPS-gravity network. It was proved by the error and confidence level of the data that small displacements of three and more millimetres can be recognised.

The analysis of data showed that all points of our network could be divided into several groups according to changes in height through time. Mutual comparison of these changes enabled to detect both general and very local short-term movements. It appeared that, in general, the involved part of the mountain block is subsiding relative to the Cheb Basin. This is in contradiction to the Recent uplift of the Krušné hory Mts.

The correlation between vertical displacements and earthquake swarms was examined with the conclusion that the movements have special homogeneous pattern during swarm periods, contrary to inter-periods. A division line of different displacements (a fault zone?) for the swarms of 1994 and 1997 was determined. This line is subparallel to the epicentral axis of the main seismoactive zone in Western Bohemia (Nový Kostel–Kraslice). A long-term detailed study could contribute to the determination of local tectonic setting and define the character of vertical movements in relation to seismic activity.

Some indications can be also derived from levelling measurements on national networks in adjacent regions (Vyskočil 1986). Unfortunately, the frequency of these campaigns is very low and irregular. Some levelling sections have been measured only two or three times till now.

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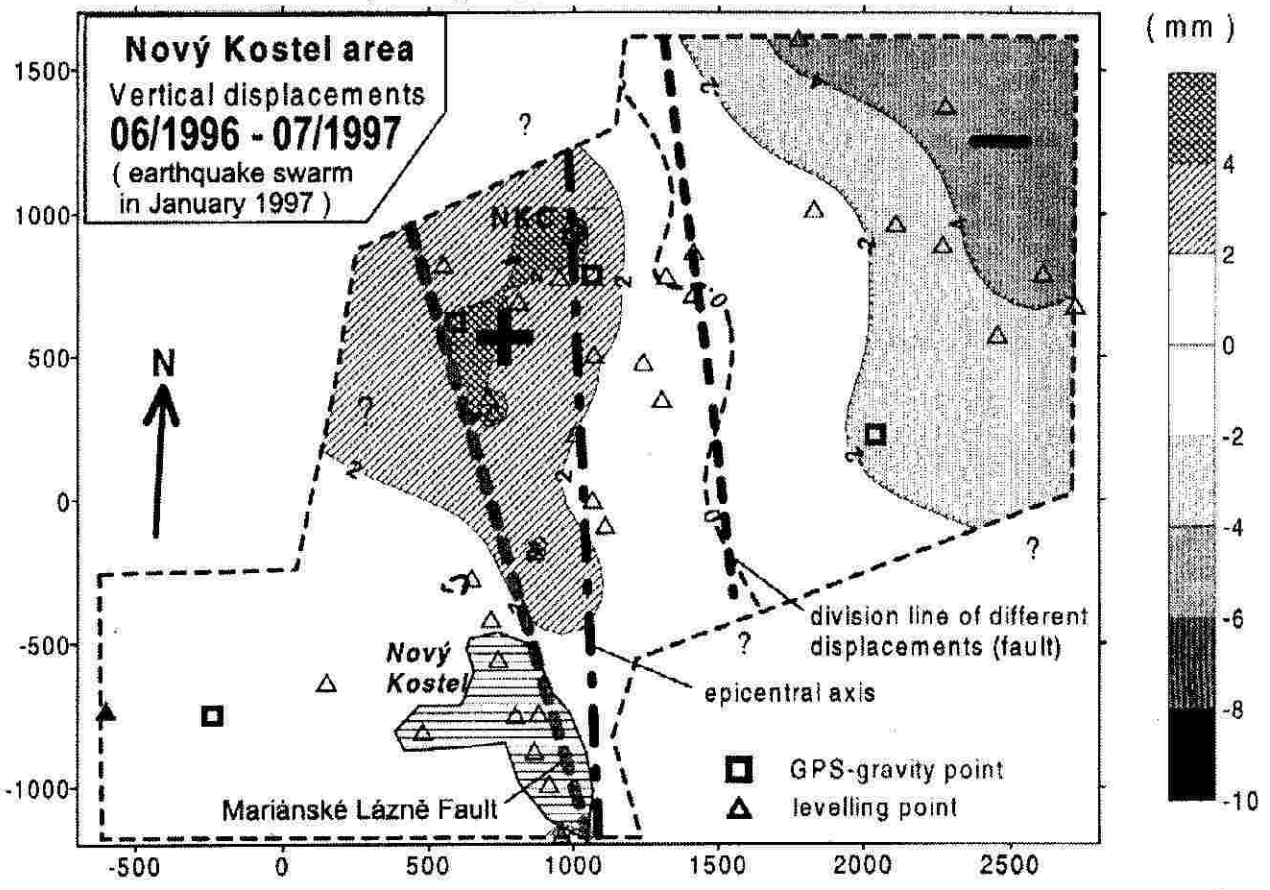


**Fig. 1.** Position of levelling points in the Nový Kostel network. The difference in height from June 1996 to July 1997 indicate relative vertical movements between the two blocks, which are separated by a line (fault) parallel to the axis of the main seismoactive zone. The earthquake swarm occurred in January 1997. NKC = Nový Kostel seismological station.

# Sarmatian Volcaniclastic Supply Dominated Sea-Shore Variations (Danube Basin, Slovakia)

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The study area is situated at the eastern margin of the Danube Basin at the transition of the Komjatice and Želiezovce depressions.

The outcrop-based sedimentological study of the Sarmatian (Middle Miocene) seashore deposits allowed to reconstruct relative sea-level changes, strongly influenced by volcaniclastic supply. As a result of the eustatic sea-level changes, the Badenian/Sarmatian boundary is widely transgressive.

The Sarmatian volcanic activity at the basin margin caused an enormous volcaniclastic supply, as well as periodical earth-