



Slope deformations endangering historical objects in the Protected Landscape Area Bohemian Paradise

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The area of interest consists of several partial areas in the Český ráj (“Bohemian Paradise”) natural reserve. These areas rise above terrain as relics of a once uniform sandstone plateau. The current relief developed mainly during the Pleistocene, when the Jizera River carved its present day wide valley and the underlying soft clayey rocks were uncovered. Thus favorable conditions were created for deformation of marginal parts of the sandstone plateaus. The origin of geodynamical phenomena is mainly conditioned by two-bed structure of slopes, because there are two different complexes of rocks with different mechanical properties. But there are also other factors, such as mineral constitution, structure of the rocks, tectonic failure and water. Two basic types of slope failures can be identified in the area; landslides affecting sandy debris and disturbed remnants of Turonian marls and slow block movements and their epiphenomenons (pseudokarst sinkholes, linear depressions and fissures).

One of the above mentioned relics is the Přihrazy plateau. It is a slightly tectonically disturbed sandstone block divided by deep, gorge-like valleys with character of canyons and gorges without permanent water flows (Balatka, 1980).

Research in this locality was initiated by Záruba in connection with the catastrophic landslide occurring in 1926 when part of the municipality of Dneboh was destroyed (Záruba et al., 1966). Recently, the mechanisms and influences on slope deformation and stability are being intensively observed. The relative movements of blocks are measured by tactile dilatometric method and by crack gauge TM 71. The activity of slope movements was successfully confirmed.

Due to continuing activity of slope movements in the area, human settlements and cultural monuments are endangered. In the 15th century, the small rock castle “Drábské světničky” was built on the northwest edge of the Příhrazy plateau. The large landslide in 1926 reached into the area of castle ruins, therefore an influence on the site stability can be expected. The area of Drábské světničky castle is affected by human activity, too. In the past, small mines were run in this area. Nowadays, the stability is affected by the maintenance of orchards on the top part of Příhrazy plateau. Another negative influence is the increasing tourism of Protected Landscape Area Bohemian Paradise. For preservation of Drábské světničky castle ruins, the access for tourists should be limited.

Another locality with similar geological structure is the Trosky hill, where the ruins of the medieval castle Trosky are situated on the top of the hill. The hill slopes are affected by large landslides, but the endangering of Trosky castle ruins has not been confirmed.

Since slope movements were proved, the measurements will continue and more gauges will be installed in these areas.