



Diagnosing of natural stones on monuments: role of a geologist

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Pre-restoration research of natural stones on monuments represents a complex task that is often solved on the multidisciplinary basis. Major questions are related to: (I) types of used natural stones; (II) provenance of these stones; (III) on site properties and properties of fresh rocks; (IV) identification of weathering phenomena, their mapping and quantification; and (V) finding appropriate rocks for replacements.

Evidently, solution of all tasks mentioned above requires participation of specialist(s) experienced in Earth science. Types of natural stones used on monuments can be done using all possible petrographic techniques. Sources of natural stones can be correctly interpreted only if there is solid knowledge of stone types quarried and used in the area. The best solution for this is a lithothèque of building stones that, however, is missing in most of the countries. Properties of natural stones (on site or fresh) require perfect knowledge in petrophysics and rock mechanics whilst weathering phenomena interpretation combines knowledge of physical and chemical processes. Finding appropriate rocks for replacement gives another role to geologists –evaluation of deposit and stone quarried. The fields of geologist's activity in the diagnosing of natural stones on monuments are therefore multiplex – petrography and microscopy, geochemistry, rock mechanics, geophysics, and economic geology.

Although the approach is not often straightforward as indicated above, some practical examples will be demonstrated. These are based on the experience with: (I) establishing of lithothèque of natural stones of the Czech Republic; (II) material research on more than 100 monuments in the Czech Republic; and (III) search for traditional natural stone resources that should be used for replacement.