



## **Quantitative porosimetry as an archaeometric tool for provenance study of selected types of natural stone**

Richard Prikryl (1), Zuzana Weishauptová (2), and Martin Ráček (3)

(1) Charles University in Prague, Faculty of Science, Institute of Geochemistry, Mineralogy and Mineral Resources, Praha 2, Czech Republic (prikryl@natur.cuni.cz), (2) Institute of Rock Structure and Mechanics, Academy of Sciences of the Czech Republic, Prague, Czech Republic, (3) Institute of Petrology and Structural Geology, Faculty of Science, Charles University in Prague, Albertov 6, 128 43, Prague 2, Czech Republic

Quantitative porosimetry by mercury intrusion presents well-established technique for characterisation of pore textural properties of porous materials. When applied for constructional geomaterials such as natural stone, it often facilitates evaluation of the degree of decay and presents one of the tools for durability assessment.

In our recent approach, we attempt to test the usefulness of this method for provenance study of natural stone used on monuments. Sourcing of historic quarry areas was conducted by using “opuka” stone, specific kind of sedimentary rock of Upper Cretaceous age from the Bohemian Cretaceous Basin (Czech Republic) that has been used as valuable natural stone for construction, monuments and sculptures in the Central Europe from Romanesque times. Even if sampled from a single bed in one quarry, this stone type is characterised by variable proportions of silica, micritic calcite and clay minerals, the main rock-forming minerals of this rock type. This fact prohibits use of quantitative mineralogy or geochemical data as sourcing criteria. However, porosimetric curves (relative volume of pore throats diameter) of opuka stone varieties are highly consistent; making them valuable archaeometric tool for the determination of source area. Need for very small pieces (approx. 5 mm) of tested material should be appreciated specifically in the case of valuable monuments where extensive sampling is generally impossible.