



Deterioration and preservation of limestone and ceramics used in the construction of the building of the Hungarian Academy

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The central building of the Hungarian Academy is located on the riverside of Danube in Budapest. It was constructed in between 1865 and 1872. In the past nearly hundred-fifty years the building has suffered from war damages and has been restored several times. The façade of the building was mostly built of porous Miocene limestone and travertine. A special type of ceramics pyrogranite was also applied. Despite the fact that the last reconstruction was only 20 years ago, both stone structures and ceramics now shows signs of decay. The paper focuses on the site survey and laboratory tests of construction materials and also suggests solutions of future restoration. On site tests included moisture content measurement and non-destructive strength tests (Schmidt hammer). Lithologies and decay forms were mapped and small samples were gathered from limestone, from various types of replacement materials and from ceramics for laboratory analyses. Physical properties such as water absorption and densities were measured, while polarizing microscopy, SEM-EDX techniques were applied to identify fabrics of limestone and ceramics, as well as to identify main mineral phases and elements. High water content was measured at zones below cornices where severely damaged ashlar were found. Main mineral phases related to decay forms are gypsum and potassium-nitrates, related to air pollution and to bird droppings, respectively. The ceramics has a very unique micro-fabric with micro-pores and vitreous nature. Micro-cracks are the major damage forms observed in ceramics. The compatibility of natural stone and ceramics is also discussed in the paper.