

EROSION AND HUMIDITY: A CULTURE 2000 PROJECT FOR THE STUDY OF BUILDING MATERIALS BY SCIENTIFIC METHODS. AN INTERIM REPORT

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Kivonat

Az Európai Unió Culture 2000 programjának keretében osztrák, olasz, német és magyar résztvevőkkel egy éves kutatási programot indítottunk műemléki építőkövek és más, műemléki környezetben előforduló építőanyagok kutatására. A program 2004. szeptemberében indult. A projektindító találkozót Bécsben rendeztük, a munka jelenlegi állásáról Modenában, 2005. január 28-án adtak számot a résztvevők. A program részeként áprilisban az Archeometriai Műhely a műemléki kőanyagok kutatásának külön vitaulést rendez a Magyar Nemzeti Múzeumban; az eredményekről pedig részletes tájékoztatót adunk folyóiratunk őszi számában.

In General: aims of the project

Erosion and humidity are still the two most important factors damaging our architectural heritage. Strategies of safeguarding are a) replacing damaged materials and b) applying chemical, physical and/or biological conservation systems.

The replacement of construction material requires information on the historic materials, on their characteristics and the sources (mines, quarries, clay pits) they were taken from.

The application of new protective systems requires serious research and long term observation. As experimental examinations on site are quite expensive, they often exclude the specific local impacts (underground conditions, climate and microbiology). As a consequence, protective systems well tested under laboratory conditions may fail causing additional damages, at least more cost.

Activities

In this laboratory project submitted, we are combining the research on materials with tests-in-field to assess the effectiveness of innovative material conservation systems, especially masonry and brickwork. Here, the focus is on masonry and brickwork, which are the basic construction materials of our architectural heritage.

In the current project, we carry out practical tests on a test station on the premises of the Austrian Bundesdenkmalamt and additionally on historical buildings in the area of Wismar, in Italy and in the Centre of Vienna (please note: The City of Vienna has been recently accepted as a UNESCO “World Culture Heritage” like Wismar, parts of Budapest and - of course - a considerable number of Italian sites).

The test in field will be carried out by the Austrian and the German partner. The partners in Italy and Hungary focus on the historical material research.

Objectives

The objectives of the project are

- To exchange experience and enhance research activities on original (“authentic”) construction materials, their characteristics, their origin and the availability to provide similar materials for modern conservation measures.
- to explore the impact of local erosion and humidity on the historical constructions with a direct reference to important sites in the participating countries
- to predict the effects of state-of-the-art systems for conservation and protection
- to create dissemination (via fairs) and to provide practical advice for experts, conservators and restorers including guidelines and leaflets to be downloaded from the internet
- to gain methodical experiences which are to be disseminated to and discussed with foreign authorities for monument preservation via the BDA

Result at a long-term level

At best, through effective technology, it can achieve that:

- the maintenance of historical buildings will be improved
- the cost of maintenance will be optimised
- the benefits for the users will be increased

Methods and co-operation

In our project, expert institutions from 4 European countries co-operate closely and create practical results. The results will be finally available (?) applicable to? the restorers and conservators all over Europe via the website of the Italian partner.

A: The Applicant OFI provides its Institute IBF which will be directly supported by BDA-Mauerbach which is part of the “Austrian Authority for the Care of Monuments (Bundesdenkmalamt)” responsible for providing practical state-of-the-art

conservation methods. IBF-Institut für Bauschadensforschung (Institute for Research in Damages to Buildings) will also co-operate in the project with Technische Universität Wien / Institut für Ingenieurgeologie (Vienna Technical University for Engineering Geology) and ARGE Naturstein (a research group of three Austrian stonemason companies) forming a cluster practically dealing with naturalstone used in the historical buildings in the centre of Vienna.

D: [Hochschule Wismar](#) (University of Applied Sciences) has a research partnership with DIW-Dahlberg-Institute e.V. Wismar in the field of protecting historical walls against moisture damages. Their special field of experience is impedance-tomography analysing the effects of protective substances injected into the construction material

I: [Alchimia](#) in Cavezzo/Modena is a large Italian restoration company with long-time experience in practical restoration works. Alchimia has recently established their new analysis centre providing laboratory resources and comparative material from Italian origin. They already have established a large database on historical quarries, mines and other sources of material and colours. Their research will focus on Italian sites of European significance.

H: The [Hungarian National Museum](#) extended research co-operation with ELTE to the field of historical quarries and mines in the past and present territory of Hungary. Partly, the existing remains of the 1904 systematical sample collection ([Schafarzik-Collection](#)) are surveyed and registered; old mines mentioned in the Schafarzik-Catalogue are visited and documented, on photos and GIS platform. Samples from the old mines are being collected and analysed by various petrographical and geochemical methods. Special attention is paid to quarry sites the utilisation of which can be dated back to prehistoric times; comparable samples of archaeological material are simultaneously analysed, with focus on Neolithic and Copper Age lithic materials (**Fig.1.**). Early prehistoric construction materials like daub, whattle are also investigated simultaneously, compared them to local fired clay (i.e., pottery) samples.

Beneficiaries

- The owners and the responsible persons and institutions who are responsible for the buildings and monuments which are under protection
- Monument preservers, restorer and conservators
- Private, public and clerical funds supporting financially the maintenance of historical constructions
- People living or working in historical buildings
- Culture and tourism industry
- The institutions participating in the project
- The general public and the institutions caring for our historical heritage on the local, national or international level.

European added value

The already existing expertise of the different partners (I and H: materials, D: analysis of humidity: A: application of consolidating and protective systems) will complete the team's capacity to achieve the objectives of the project

The project will support the exchange of experience between Austria, Hungary, Italy and Germany

The dissemination of the project results will be done in three different parts of Europe (Central Europe, Southern Europe and the area of the accession countries)

The benefits of the project are not limited to the areas where the co-organizers are located. From the methodical point of view, the technology of monument preservation in general will be promoted by the project on the European level.



Fig.1. Basalt one of the materials preferentially quarried and used for the production of stone axes

