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ROMAN CEMENTS: AN OUTLINE OF RAW MATERIALS, PRODUCTION AND USE OF NATURAL CEMENTS IN AUSTRIA

Stingl, K.[1], Mayr, N.[2] & Weber, J.[2]

[1]Karl Stingl, Bahnhofstrasse 16, A-8054, Graz, Austria
[2]Institute of Conservation Sciences and Restoration Technology, University of Applied Arts Vienna, Salzgries 14/1, A-1013 Vienna, Austria
e-mail:. k.stingl@limeplaster.net, nina.mayr@uni-ak.ac.at, johannes.weber@uni-ak.ac.at

With the beginning of the industrial revolution, many new binding materials were introduced in civil construction. From the middle of the 19th century until about 1890, Roman Cement dominated the market of hydraulic binders. Besides the well known English production of Harwich and Sheppey cements, which were widely exported, and several French production centres, the Austrian-Hungarian Empire was one of the biggest producers. Typical properties of Roman Cement are rapid setting with nearly no shrinkage. This made the material excellent for hydraulic engineering and production of cast elements. A big portion of historic buildings of the "Gründerzeit"-era have decorated facades made of Roman Cement. Main factories were situated in Tyrol, Salzburg and Lower Austria. The cement was produced by calcination of marlstones at about 900 °C. Since, in contrary to Portland cement, the use of pre-mixed raw materials was not possible, the chemical and petrographic composition of the natural stone had to be within a small range. Most used raw materials in Austria were marls from the Upper Cretaceous and the Neogene.

The presentation gives an overview of the predominantly used Austrian deposits and their mineralogical composition. Investigations were done in the marls of the "Haering Beds" in Tyrol, marls of the Gosau Group (Nierental Formation, Piesting Formation) in Lower Austria and Jurassic marls (Schrambach Formation) in Salzburg and Lower Austria. Additionally, data on microstructure and mineralogical composition of cements and the mortars produced from them are presented.

The herein presented data are the results of the project ROCEM which is funded by the European Union. The ROCEM group consists of scientists and restorers from Poland, Slovakia, Germany, England, the Czech Republic, and Austria. The main aims of the project are to achieve a better understanding of Roman Cement as a natural hydraulic binding material and its production on a small scale for restoration purposes.