

## FORUM FOR CONSERVATORS-RESTORERS 2013

## ABSTRACTS

**The Survey and Conservation of selected Finds from the Lombard Burial Ground in Kyjov, Hodonín district**

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This contribution deals with an application of material analysis and conservation of finds from the burial ground of the Migration Period in Kyjov, where 240 burials were excavated in 2010 belonging to Germanic tribe of Lombards. This is an entirely extraordinary find demanding maximal attention because there are a very small numbers of Lombardic burial grounds at Moravia. For the first time there was an opportunity to research artefacts in Lombardic burials by a number of analytical methods. Scientific analyses of artefacts and ecofacts allow the reconstruction of the life of population in the Migration Period, which is very poorly known until now. Chemical analyses allowed to identify the materials of some artefacts which were impossible to unambiguously determine by macroscopic survey. These methods also widened our knowledge about technologies used during the Migration Period.

**Options for identification of protein additives in historical mortar materials**

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Natural organic additives such as eggs, lard, resins, and oils have been added to mortars since the ancient times as already the ancient builders noticed the positive effect of additives on the quality of mortars. The tradition of adding organic materials to mortars was handed over only verbally for thousands of years. However, the tradition disappeared in 19th century when the use of modern materials started. Today, a renaissance of using natural organic materials and searching of the ancient recipes come along with involvement of the most advanced analytical techniques and methods. This paper focuses on testing the possibility of identification of protein additives in mortar samples taken from historical buildings and on comparison of these mortars with model mortar samples containing organic additives (e.g. blood, animal glue, curd, eggs and gelatine). For the analysis infrared (FTIR) and Raman spectroscopy, gas chromatography mass spectrometry (GC-MS) and MALDI-TOF MS were employed. These methods were applied to mortar samples collected from historical buildings such as the bridge in Roudnice nad Labem, Romanesque rotunda in Znojmo, and from the interior of the castle in Náměšť nad Oslavou.

**Application of modern Materials in Restoration Works in Abu Sir , Egypt**

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New materials have been increasingly employed lately in restoration works in the location under the Czech Institute of Egyptology in Abu Sir, Egypt. These were also used during the last season in the restoration of the particular structural and decorative elements of the Princess Shert Nebti's tomb. Two top-quality materials were used for these restoration treatments. The first were carbon rod composites that have been so far used primarily for applications in the arms industry and the construction of missiles and aircraft, for bonding the individual stone fragments or static locking the damaged pillars or architraves. The second were nanomaterials; structures that have become a scientific trend lately. The latter were used in the restoration works in Abu Sir in the form of lime nanodispersions for the consolidation of structural and decorative Elements from Lime.

**Restoration of a glass beaker dated to 1693**

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In this article, we present a case study of the restoration of a mechanically damaged glass guild beaker from Nymburk. It is a significant artefact in relation to understanding the material culture of the inhabitants of the royal town of Nymburk in the seventeenth century. The beaker is diversely decorated in enamel with a central heraldic theme, in addition to figurative, botanical and geometric motifs. It holds a date, 1693, and an inscription: 'Wherever we butchers be, we are wont to drink fine wine, beer and ...'. We chose taping with adhesive tape and the application of Hxtal NYL -1 epoxy resin into the fracture lines between broken pieces by capillary action for the beaker's restoration. An epoxy filling was made corresponding in shape, size and colouring to the beaker's missing lower part. The aim of the restoration was to achieve certain intelligibility and get closer to the aesthetic function of the glass beaker including those marks that in a fundamental way jointly make up its present-day character. An integral part of the work was an analytical survey by XRF and SEM/EDS methods, which discovered that the beaker had been manufactured from potassium calcium glass. Furthermore, differences between opacifying particles present in the enamels were found and oxides contributing to the resultant enamel colour were determined.

**The domestic small altar made of amber: The Crucifixion with Virgin Mary and St. John**

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*Soukromá restaurátorská dílna*

The domestic amber altar with Little Calvary is a part of inventory of the state castle of Rájec nad Svitavou. Due to its condition, display of the altar was not possible and therefore it was restored. Missing parts of the pedestal, the cross and the figure of Christ were, after consultation with the contracting authority, complemented. After restoring, the altar became a part of the newly installed treasury exhibition of the castle of Rájec nad Svitavou, which is included in the tour route on the first floor of the castle and which leads visitors to appartements of Hugo III, Prince of Salm-Reifferscheidt (1832–1890) and his wife Elisabeth of Liechtenstein (1832–1894). This small amber altar seems to be a unique object of its kind in our country.

**Restoration of jewels containing Czech garnet**

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Czech garnet (Cr-pyrope) as a gemstone occupies a special place among the symbols of the Czech Republic. Unfortunately nowadays, the common commercial practice identifies many different inorganic materials of similar colour as Czech garnets. Nevertheless, Czech garnet is defined by its fixed chemical composition, structure, and crystallographic properties, from which gemmological characteristics are derived. The gemmological research allows us to determine non-destructively whether the examined sample is indeed a Czech garnet or its imitation. The study of inclusions in Czech garnets enables to determine the geographical location of the investigated stone and therefore replacing it by virtually identical material during the restoration process is possible. Almost complete absence of any inclusions or presence of zircons in swarms of tension cracks visually reminiscent of "sprawled flies" is typical for garnets originating from the region of the České středohoří. A characteristic network of rutile needles is typical for garnets from the region around the city of Kolin; on the contrary garnets from Podkrkonoší region usually contain trichitic capillaries or tubes.

### **Cleaning of silver Great Moravian jewellery by pot entiostatic reduction**

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Potentiostatic reduction was used to clean Great Moravian jewellery from Lumbe's garden cemetery, Prague Castle. These artefacts were covered by a thin tarnish layer. Polarisation plots recorded directly on selected objects, and SEM/EDX analysis helped to identify corrosion products present in the tarnish layer and to set adequate parameters for treatment. Objects were successfully cleaned by electrolytic reduction at a constant potential in a sodium nitrate solution.

### **Egyptian statuettes; original or fake?**

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This work deals with material investigation of Egyptian statuettes of gods Amon, Bastet and Isis dated to the end of the Ancient Egypt. Statuettes of gods were often included in graves of deceased Egyptians. Due to their unclear origin, the aim of this work was to decide whether the statuettes are originals or fakes. The statuettes were made from single-phase brass. A high amount of chloride anions was determined in the corrosion products of all investigated statuettes. The layer of the corrosion products was very thin considering the presumed age of the statuettes. The typical corrosion damage of the statuettes' metallic substrate caused by the chloride anions and air humidity was not observed on the prepared metallographic samples. Figures of Amon the God and Bastet the Goddess do not correspond with the typology of Ancient Egypt original statuettes. Based on the material investigation and the typology of the figures, it is possible to claim with near certainty that the examined statuettes of Amon, Bastet and Isis are relatively unsuccessful fakes.

### **Permeability of acrylic surfaces by water**

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Acrylate coatings are used in conservation practice as top coatings reducing access of pollutants to an artefact surface. Suitable properties of acrylic resins are used also for consolidation of artefacts as well as a glue agent. Barrier effect of acrylate coatings depends on the quality and morphology of the formed layer. Two acrylate copolymers are compared in this work: Paraloid B72 and Paraloid B48N. Water permeability and the porosity of the coatings were evaluated by means of electrochemical impedance spectroscopy, resistometry, and electron microscopy. Influence of solvent was observed too (acetone vs. xylene). A three-layer coating of Paraloid B72 dissolved in acetone reached the lowest values of porosity and permeability by water.

### **Painter triptychs from the Spiš region of the late 15th century**

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This paper presents the technological structuring of selected art works from the Spiš region dating from the last 20 years of the 15th century. In terms of materials, the study is based on the research carried out by the Chemical and Technological Department of the Monuments Board of the Slovak Republic. The limiting aspect for the selection of the investigated works was the number of selected archived samples where original painting was evident. The following late gothic retable (triptychs) with moving panel wings with paintings on both sides were selected to be compared:

1. Arnutovce, r. k. Kostol sv. Heleny, Oltár P. Márie (1485) [Roman-Catholic Church of St Helena, Altar of Our Lady]
2. Kežmarok, r.k. Bazilika sv. Kríža, Oltár sv. Kataríny (1493) [Roman-Catholic Basilica of St Cross, Altar of St Kathrine]
3. Levoča, r.k. Kostol sv. Jakuba, Oltár sv. Alžbety (1493) [Roman-Catholic Church of St. Jacob, Altar of St Elizabeth]

**Gerard Dou: Young Lady on a Balcony. The transformation of a painting**

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The paper deals with the examination of a painting by Gerard Dou, Rembrandt's pupil and founder of the Leiden school of "fine painting". The panel *Young Lady on a Balcony* (National Gallery in Prague, Inv. No. O 650) was restored and scientific examination of was carried out between 2006 and 2011. The investigation conducted during restoration sought to answer questions related to the gradual birth and transformation of this unusual painting. It sought to identify the materials used, the original painting and later interventions and to find out why the panel was mounted in such an unusual way. The results of the detailed examination using visualization (CT, RTG, VIS, UV, IRR) and instrumental methods on micro-samples (SEM/EDAX, microscopic analysis) were evaluated in the context of results obtained by noninvasive X-ray fluorescence analysis (RFA) and microanalysis ( $\mu$ RFA) methods. Thanks to the multidisciplinary approach of the research team comprising an art historian, a restorer and scientists, a time sequence of the layers and their mutual relations could be identified and evaluated.