

EXAR meeting 2019
Museum of Natural History Vienna
Abstracts of lectures and posters

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Lectures

Education and theory

Tobias Schubert, *Correct yet wrong?!*

In recent years we heard different lectures by Fabian Brenker, Thomas Lessig-Weller, Rüdiger Schwarz and Andreas Sturm et al. about the presentation in a "Living Museum" as well as in "Living History". They covered different, partly controversial points of view and offered various options. This lecture should point out that an exact replication of archaeological goods in Living History and Living Museum may bear the danger to create an incorrect "picture of the past".

Literature

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Lessig-Weller, T., Zwischen Fakt und Fiktion – Überlegungen zur rekonstruierenden Archäologie. Experimentelle Archäologie in Europa. Jahrbuch 2014, 166-176.
Sturm, A., Aufreger Authentizität. Antrieb der Performativen Geschichtsdarstellung. Experimentelle Archäologie in Europa. Jahrbuch 2016, 198-207.

Daniel Modl, *"Ploughing as in the Stone Age is troublesome" – Archaeotechnique and Experimental Archaeology at the Universalmuseum Joanneum*

Archaeotechnique and Experimental Archaeology are important components in the cultural mediation and scientific research of the Department of Archaeology & Coin Cabinet at the Universalmuseum Joanneum in Graz, Austria. These two methods are used in museum pedagogical activities, events, exhibitions, research projects and in the development of tourism products and are always a special experience for the public, as well as for museum employees and scientific researchers. The presentation tries to give an overview of the numerous activities at the Joanneum and reflects on the resulting challenges and questions.

In particular, the project "The paleo-landscape of Styria and their biodiversity from prehistory to the discovery of the New World", in short PalaeoDiversiStyria, was carried out by the Universalmuseum Joanneum with Slovenian and Austrian partners and was funded by the Interreg programme SI-AT 2014-20. The main aim of the project, which runs from October 2016 to October 2019, is to support the understanding of cultural heritage and agricultural, gastronomic and craft traditions of the Styrian-Slovenian border region. As part of the project, numerous historical crafts-, agricultural-, hunting- and cooking techniques were examined and recreated for the public. Furthermore, the experiences gained from the experiments helped local businesses to develop tourism products, which relate to the local archaeological heritage.

Literature

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Yannick de Raaff, *(De)constructing the Mesolithic: A history of reconstructions of huts in the Netherlands*

(Re)constructions and life-size models of prehistoric dwellings can be seductive – they may seem overly realistic and can fool even hardened professional archaeologists into believing what they see is true. Because reconstructions can lead lives of their own, it can be reasonably assumed they contribute to and have an influence on our perception of prehistory.

To explore the issue of perception, I will use the life-size reconstructions of Mesolithic huts built in the Netherlands, whose scientific basis turns out to be problematic, as a case study. These have been built repeatedly in the same way over the last 35-40 years, with little to no innovation. I will show that, remarkably, our perception of these Mesolithic dwellings as (re-)built over the last thirty years has, for a large extent, been rooted in fantasy and misinterpreted excavations. The intricate origins of this archetypal view will be traced, as well as how this was refined and how it managed to persist all these

years.

The goal is not to provide mere criticism. Rather, I would like to use the Dutch Mesolithic hut reconstructions as a case study to show (i) how perceptions of prehistory can take form and (ii) the importance of tracing back the sources of such a perception. In extension, I argue that, while reconstructions are great backgrounds for teaching about prehistory, more attention should be paid to the interpretive and reconstructive process in teaching.

Literature

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Hans Reschreiter, *Virtual Reality for the Hallstatt salt mines*.

Experimental Archaeology has been an integral part of the research program accompanying the archaeological excavations in the Hallstatt salt mines for decades. Reconstitutions of the prehistoric mining equipment were systematically field tested and form an important part of the wide array educational and outreach programs developed by the Natural History Museum. Currently the output of these research and outreach efforts is integrated into the new dimension of Virtual Reality shaping a new way of "hands-on" experience for the public and the research community.

Helga Rösel-Mautendorfer, *From the fragment to the model - Methodical considerations for the reconstruction of (pre-) historical garments*.

Reconstructions of garments from (pre-) history are a central part of experimental archaeology, textile archaeology and knowledge transfer in museums. Due to the small number of garments that have been completely preserved, the reconstruction of clothing requires gathering information from various sources, such as textile finds, images of clothing, the position of the jewellery in graves and textual sources. Also results of scientific analyses of archaeometry e.g. fibre analyses, colour analyses and knowledge of economic and social conditions, e.g. regulations of clothing, social norms, sources of raw material, etc. and crafting techniques provide additional information on clothing. In summary, scientific modelling of garments requires an interdisciplinary approach combined with applied source criticism in the various disciplines.

A model of a piece of clothing, as far as this is not obtained as a complete original find, it can only approximate the actual clothing and shows a possibility that does not reflect the historical reality due to lack of information and contexts. With new finds a model is falsifiable at any time and should be regularly adjusted through a scientific discourse. The scientific discourse of reconstructions requires the presentation of the development process and the considerations and decisions that led to the reconstruction. Equally important is the visualization of the reconstruction process in the exhibition.

Literature

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Ines Bogensperger, *Ancient Textiles – Modern Hands*

Several thousand fragments of late antique textiles from Egypt arrived in world museums and collections by the late 19th – early 20th centuries. The colourful designs and elaborate executions were especially of interest then, whereas the archaeological context or exact provenance of these artefacts were less important and are often lacking.

In Vienna, comprehensive collections of these late antique textiles are found at the Museum of Applied Arts (MAK), Papyrussammlung of the Austrian National Library, or at the Kunsthistorisches Museum.

Even after being thoroughly recoded and catalogued, several questions remain unanswered, in particular with regard to ancient and late antique textile production.

In addition to contemporaneous documentary papyrus texts from Egypt, the initiative 'Spiraltextile: Ancient Textiles – Modern Hands' aims to examine the extensive practical knowledge of ancient weavers and craftsmen (<https://spiraltextile.com/>). The citizen science project invites 'modern' practitioners from the international community of textile weavers and fibre artists to reproduce the ancient spiral design of papyrus P.Mich. inv. 5143c of the University of Michigan Papyrus Collection using ancient textile techniques. The submitted textiles, as well as data and experience collected in a project's questionnaire form substantial information for textile researchers.

This paper aims to present citizen science in the broader framework of experimental archaeology as a tool to consider and implement practical knowledge from external, non-academic experts. The results of the two-years project Spiraltextile and also our personal learning curve ("lessons learned") shall be frankly discussed.

Reconstructing archaeology

Andrea Koppel, *A glance behind the curtain: Roman rituals of beauty treatments and personal hygiene in terms of reconstruction and conveying.*

Numerous Roman doctors, scientists and writers also cover cosmetics, a topic which was of particular importance to Roman society. Roman lifestyle and self-conception were based on rituals of beauty treatments and personal hygiene. Even if a clean, cultivated person with a well-groomed appearance served as an ideal of Roman antiquity, primary literature offers in comparison little details about recipes and the ways of processing ingredients. Completely preserved recipes of cosmetic products are viewed as exceptional. Only contemporary chemical analysis of remains in antique vessels provide us with important hints on popular ingredients (e.g. Londinium Cream).

Different aspects of Roman everyday life are already presented within reenactment, whereby a tendency to overrepresenting Roman military on festivals seems to be obvious. Currently reenactment pays even less attention to the female habitat, which is mostly located at home. Hidden subject areas like cosmetics and personal hygiene fade nearly entirely from the spotlight of reenactment and presentation.

Based on an analysis of Roman primary literature, the current article addresses the reconstruction of Roman cosmetic products. Ingredients are selected according to Roman literature of 1st until 4th centuries AD, limited to those without health risks.

Moreover, the article is comparing the Roman perspective on effect and practicality of preparations with the results of reconstructed cosmetic products. Due to the lack of detailed sources experiments are the cornerstone for an approach as close as possible to the original preparations. The experiments are linked with a detailed documentation concerning quantity and proportion of ingredients, quality and endurance of optical durability on the skin and thus offer conclusions about preferred antique preparations, as well as the reasons for their popularity.

The range of cosmetic products, described in this article, covers a comprehensive process of personal care and make-up, applied by a wealthy Roman lady, leading to an entirely painted face.

As conclusion the article describes the possible ways of conveying the topic of Roman cosmetics within a museum environment. Two ways of presentability fit the context at best according to the author's opinion: an interactive approach integrating visitors and enabling them to produce a even nowadays useful cosmetic preparation like the Cold Cream of Galenus makes this topic tangible and coming alive. Furthermore, the reenactment of daily routines of a Roman lady from the morning until the evening provides visitors with the opportunity of integrating details into an overall context.

Literature

Titus Petronius Arbitr, *Satyricon*

Decimus Iunius Iuvenalis, *Sartiren*, Übersetzung von Harry C. Schnur, Reclam, 2015

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Publius Ovidius Naso, *Ars amatoria* Übersetzung von Michael von Albrecht, Reclam, 2014

Publius Ovidius Naso, *Medicaminum Faciei*, Hrsg. v. Burkhard Mojsisch, Hans-Horst Schwarz, Isabel J. Tautz und Dominique Kappert, Reclam, 2010

Sextus Propertius, *Elegien*

Quintus Septimius Florens Tertullianus, *De cultum feminarum*

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Saiko, M., *Cura debet faciem*. *Kosmetik im Altertum*. Literarische, kulturhistorische und medizinische Aspekte. Trier 2005.

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Ines Roth, *Oldenburger Vehnemoor textile find*.

In 1880, several fragments of textiles were found during peat cutting, which can now be seen in the Museum Oldenburg (Germ). The artefacts have already been examined and described several times by historians and archaeologists. These finds were dated to the 2nd century AD. The basic fabric was described as 2/2 twill and is considered to be wool fibre. These approx. 29 fragments are very impressive, since a very unusual broad fabric edge is present on some of the textile remains. It is to be assumed that the textile fabric edge was around the whole textile fabric. It should be mentioned here that the threads of the fabric edge used for this purpose are visible on an approximately four times thinner thread diameter, to the rest of the single textile thread. By the additional colour play pattern in the edge/border, described in detail by Karl Schlabow (1952-53), the dyed threads and with every second twisted thread, the fabric selvedge gets again completely special meaning which decorates and/or embellishes the textile. In 2017 another fibre analysis showed that the textile fibres were goat hair. The evaluation of different goat hair analyses showed that the underhair (cashmere) of the screw goats could probably be more important. The manufacturing technique of the tissue edge still leaves room for discussion. However, there are indications against a previously assumed tablet weaving technique, as the degree angle of the fibre does not correspond to the original fibre angle.

Literature

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Experiment and trial

Roman Lamprecht, *Eastern Alpine handstones and Bronze Age copper mining: Recreating production and use through Experimental Archaeology*

Handstones are one of the oldest tools known to humans, commonly used in combination with netherstones to grind food or minerals into particles of smaller size. For example, a special form of mounted handstone was employed for processing copper ores into a fine powder. In the course of the research executed by the HiMAT research centre (The History of Mining Activities in the Tyrol and Adjacent Areas - Impact on Environment & Human Societies), a great quantity of Eastern alpine handstones have been discovered at prospections and excavations in Bronze Age mining sites. We subsequently initiated an experiment to illuminate production and hafting methods, and the usability of mounted handstones. Consequently, insights into the production of the stone tool using the "pecking method", and various grinding processes themselves, have been gathered.

Literature

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Ralf Laschimke, *Archaeometallurgical experiments for the making of copper age shaft hole axes*.

Metal copper was already used by humans about 10,000 years ago. The Neolithic period known as the Chalcolithic or Copper Age ended with the beginning of the Bronze Age in the middle of the 3rd millennium B.C.

Originally only native copper found in nature was available which was hammered into jewelry beads, needles and fishhooks. At the beginning of the 4th millennium B.C. copper was extracted from copper

ore malachite. The earliest evidence of extractive copper metallurgy comes from eastern Anatolia and the highlands of Iran. One of the oldest metallurgical devices found in Iran is a chalice-shaped crucible. From the shape of this type of crucible, we deduce the existence of a technology of melting copper, which we have called „melting down process“ (Einschmelzverfahren). Our experiments demonstrate that with the “melting down process” not only can flat axes be produced, but also shaft hole axes, the production of which has hitherto been considered puzzling. We published a part of our experiments already in 2018 in the technical journal METALL.

Literature

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Michael Konrad, Michaela Fritzl, *Rituals matter*.

Rituals accompanying death and dying can be manifold and expressed in quite different ways. However, only very few leave traces in the archaeological record, which is often additionally distorted, selected and superimposed.

Late Bronze Age cremation burials provide the opportunity to juxtapose and compare two different death-ceremonial sub-steps, namely the cremation and the burial ritual. However, when trying to analyse the grave context and the findings in that specific way, we often have to realise that the various sub-rituals are hard to identify, due to the fact that frequently, the findings cannot be easily attributed to a particular step.

To tackle this problem, we started to conduct a series of experimental cremations as part of the course “Experimental Archaeology in practice” of the University of Vienna in 2018 and 2019 to analyse how and why specific bronze, ceramic and textile artefacts change and influence each other under the particular circumstances on the pyre and while being interred.

On the archaeological basis of the Urnfield Period cemetery of Inzersdorf ob der Traisen in Lower Austria we tackled the following questions:

- Which temperature and which exposure time has to be assumed in order to alter the surface of bronze and ceramic artefacts?
- Why and when does the shape of objects change?
- Moreover, to what extent can the degree of destruction be explained by certain utilizations during the preceding cremation ritual?

Furthermore, the results will provide a database, which in turn offers the means to assign specific alterations to particular conditions that should allow us to infer possible utilizations of various original findings during specific rituals.

Karina Grömer, *How much textile material remains in a pyre? Experimental cremations Inzi18 and Inzi19*.

The cremation experiments have been carried out as part of the lectures Experimental Archaeology (University of Vienna, Institute for Prehistory and Historical Archaeology). Within these experiments, a Late Bronze Age burial from the Traisental in Lower Austria has been reconstructed, with all metal and clay items in the grave, as well as many textile layers. A “maximal setting of garment pieces and shrouds have been used to clarify fundamental question in textile archaeology.

The Inzi18 and Inzi 19 experiments, together with the 2012 pre-experiment, can provide important insights into the interpretation of textile artefacts found in cremation burials. Traditionally, fabric remnants corroded to metal objects are interpreted as subsequent wrapping of objects deposited in the cremation graves. Although this may be the conclusive way of interpretation of the respective finds, we want to postulate another possibility based on the present experiments:

The experiments in 2012, 2018 and 2019 in Asparn an der Zaya clearly show that garments on a body and shroud burnt in certain cases can maintain some substance that they can also be collected afterwards and be put into an urn together with cremated remains of the corpse and metal objects. This

especially applies to textiles that fell down in an early stage of the cremation and stayed in charred condition next to the pyre. Then, if collected, put into an urn and stored in the vicinity of metal objects, they can certainly be preserved.

So, from our experience with the cremation experiments, we postulate that textiles which have been used as garments or shrouds during a cremation, could also appear as mineralized textiles in the archaeological evidence of cremation graves. However, this requires particularly good conditions.

Literature

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Stefan Stadler, Daniela Lentsch, *The hourglass cast – possibly a prehistoric casting process?*

There are many variations of prehistoric casting processes for non-ferrous metals. At museums, lectures and in literature you can find techniques such as; sand casting, lost-wax casting, open system casting or "Überfangguss" (a technique which allows casting two artifacts together or repairing artifacts by casting something onto them). Less commonly seen is the process of casting in a lost and closed mould. The German literature describes this casting process ethnographically and refers to this process as "Gelbguss" or "Hohlform mit Gussmetal" (Förster 1987, 132 ff.) and "cast in closed system" (Armbruster 1993, 290 f.). We call it hourglass cast.

The hourglass cast is similar to the lost wax technique. The desired artifact is created with beeswax and coated with lean clay. The mouth of the mould is designed in a funnel shape. Once the clay mould has dried it is then baked which sets the clay and melts the bees wax, leaving behind the artifact's form. Unlike the lost wax technique, the obtained mould is not directly casted, instead the metals are placed in a sheet of cotton cloth which is tied to form a bag. This is then placed at the funnel shaped mouth of our mould. The cotton cloth will prevent blending of the non-ferrous metals and clay and will separate the metal from the negative. The mould is then coated and fully sealed in a further layer of treated clay. After drying and examining the mould, the process of melting the metals is performed in a suitable furnace. As soon as the melting of the metals has taken place, the mould is turned upside down, like you would an hourglass, allowing the melted metals to fill the negative. Once it has cooled, the mould is smashed, freeing the freshly cast artifact.

We, D. Lentsch, j. Krempl, M. Lorenz and S. Stadler, have investigated this technique in an experimental archaeological manner. Analogical to the ethnological source, the technique was imitated 14 times and confronted with archaeological issues. The conditions for performing a successful hourglass cast and the material requirements of the technique have been documented, distinctions to known casting processes have been acknowledged and discussed. We can support our initial hypothesis as to whether the hourglass cast is eligible for the creation of prehistoric metal items, and answer to it with yes.

Literature

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Klemens Maier, Christian Hörtnagl, *Development of a recipe of Opus Caementitium for use in a hypocaust, recipe for practical use*

Various deliberations and attempts to replicate a recipe of Opus Caementitium for use in a hypocaust showed that a variety of factors must be considered. After the first preliminary tests and subsequent analyses and experiments with a wide variety of starting materials, final tests were carried out on practical mixtures.

Attention was paid to the use of various limestones. Best strength values could be achieved by using a pure quicklime. A positive effect was the reduction of the shrinkage behaviour. The recipe based on these analyses and tests is to be used in an actual reconstruction.

The presentation shows the current status of the examinations and the test results of the practicable recipe of a newly reconstructed Opus Caementitium.

Literature

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Rüdiger Schwarz, *Once more on the use of Roman axes ... and questions resulting from the practical tests*

On the occasion of the EXAR-Conference in 2017 in Xanten the preliminary results of the examination and practical tests of Roman axes were presented, which meanwhile have been completed. An extensive examination of the Roman tools in the collections of the Saalburg museum indicated that hafting from the top of the axe head was common, particularly with the heavy wood-axes suited for forest work. This result was also confirmed by comparison with objects from Baden-Wuerttemberg and Xanten. Practical work with axe replicas using hafts made of different types of wood showed the versatility of this kind of axe for felling and chopping as well as splitting timber and firewood. Further questions occur as a consequence of these tests, regarding both metallurgy and the use of tools for different purposes. One of the axes used for the tests was – corresponding to the original archaeological find – provided with a cutting edge made of untempered carbon steel and was fully usable. Is this specimen an exception or common (Roman) craftsmanship? Even the use of axes in interaction with other tools is of interest, for example their efficiency for cutting trunks in comparison with ancient saws. An important aspect in this context is the quality of the metal, which can hardly be estimated due to the absence of metallurgical examinations of early iron saws. A suitable methodological approach once more would be practical work with replicas of these tools.

Literature

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Stefan Krmnicek, *Roman cast coin copies reconstructed*.

Counterfeiting coins with clay moulds is a phenomenon frequently occurring in the north-western Roman provinces with thousands of moulds retrieved during archaeological excavations. Chemical analyses of cast coins provide information about the alloys used – copper and tin alloys imitating denominations (denarii and radiates) made of silver. However, the process of casting coins itself is not well examined. The only experiment studying the casting process dates back to the 1960ies and has not been published in detail.

Recent new finds of moulds in conjunction with further material published from museum collections enables us to revise the 1960ies experiment mentioned above and to conduct new experiments. Drawing from the archaeological evidence, our reconstruction – evolving from an interdisciplinary seminar – for the first time describes and documents all presumed work stages as well as the potentials and pitfalls of varying procedures. The experiment benefits from a collaboration between the areas of numismatics, archaeological object conservation, mineral science, and a blacksmith with museum background. To conclude, the project aims at reconstructing the production process of Roman cast coins and as a teaching tool it enables students to actively contribute to the experiment.

Literature

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Bettina Birkenhagen, *Roman shell vessels made of glass - mould or not mould?*

The lecture will deal with the production of Roman shell vessels made of glass. Basically, there are several possibilities for this: you use shells to bring the glass into the desired shape, you model a mould with the shells and blow the glass into this mould or a mould maker builds a mould in the form of a shell. All three options have been tried and the results can now be presented.

Literature

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Sayuri de Zilva, Josef Engelmann, *Byzantine recipe "about how to make glue for vessels and bath pipes"*.

„Befeuchte ungelöschten gesiebten Kalk und feuchte ihn gut über einige Tage hin an. Hernach hebe seine Blüte von oben her ab. Dann siede schön Füße und Kopf eines vierfüßigen Tieres (bzw. eines Schafes). Und wirf die Brühe in den ungelöschten Kalk und siede die innere Rinde der Ulme; und mische das und auch Eiklar. Und verleime, was du benötigst.“

Recipe no. 36 gives a brief instruction of how to make an adhesive on basis of burnt lime. The glue should be applicable for firmly bonding of ceramic vessels and clay pipes for bath installations.

This recipe is part of the Byzantine treatise "About the Highly Esteemed and Famous Art of the Goldsmith".

The anonymous medieval Greek-Byzantine treatise is the only known treatise from Byzantium, which may partly predate the often-cited opus of Theophilus Presbyter from the 12th century. It contains 65 recipes not only of great significance for technical Byzantine studies and the history of Goldsmithing techniques, it also contains instructions for all kinds of auxiliary means and technical aids.

Considering the addition "pipes in/for bath", recipe 36 seems more like a manual for constructional engineering than an instruction for goldsmith's art. Nevertheless, in former days, it must have been common enough in goldsmith's daily routine to glue different kinds of materials and artifacts - including pots or vessels - with strong adhesives, that the anonymous author/authors felt the need to include this recipe. As the treatise to date received less attention in German speaking scientific archaeological community, it may be assumed, that the treatise is also nearly unknown in history of constructional engineering.

Questions and aims of the presented experiments were:

- 1) Verifying the technical viability of the instructions given in the recipe: practical testing and clarification of "how to make" and the handling of the glue itself.
- 2) Testing and documentation of adhesive properties regarding
 - a) time for processing, application and hardening
 - b) ingredients used and materials to be glued.
- 3) Testing and documentation of durability and quality of adhesive strength after storage.

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Karl Oberhofer, Manuel Fiedler, Constanze Höpken, Szilamér-Péter Pánczél, *A wood-fired bead furnace in antique(?) tradition in Călugăreni/Mikháza, Jud. Mureş*.

The production of glass beads is documented in the find material of the Near East from the 3rd millennium BC onwards. As early as in the mid-second millennium BC, the trade of these goods reached as far as Scandinavia. Unfortunately, the manufacturing workshops and furnaces generally remain unknown, because the apparently overground furnaces left little or no traces. First reconstructions, fired with gas burners, were realized by Dudley Giberson in 1991 and Mark Tylor in 2011. Thomas Risom erected a furnace for the production of Viking age beads using a bellows. A comprehensive series of wood-fired furnaces has been tested by Frank Wiesenberg since 2014. A corresponding bead furnace has been operated in Călugăreni/Mikháza since 2017 with subsequent modifications of the firing

channel. Without regarding species and form of wood an elaborated firing concept guarantees a constant even temperature until 1050°C for a satisfying bead production.

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Poster

Clara Palmisano, Leona Kohl, Manuel Wandl, Karina Grömer, *Experimental Archaeology meets Modern Art*

When it comes to the mediation of archaeology, the past years have shown the importance of expanding the view of traditional academia. Examples of how this can be done are to involve the public with Citizen Science strategies or by collaborating with artists.

The Naturhistorische Museum Wien worked with a school for design where objects from the La Tène period and the techniques that went into creating them were translated into modern design.

Two projects were developed as a graduation work, one concerning pottery, the other using screen-printing on fabric.

An experimental approach was important to the creation of those two distinct yet complementary works.

The subject wasn't just to recreate the La Tène pottery and style periods but to integrate them into modern design and thus pave the way for a fresh interpretation of them.

Both projects attach importance to aesthetic aspects, but also to technical innovation.

The pottery project focuses on the traditional shape of the lentiform clay bottle and graphite slip. Starting point were experiments with the electrical conductivity of graphite. The result is a pattern taken from the Hungarian sword style in combination with one reminiscent of modern circuit plates. This design was then attached to one of the bottles in gilt plating and is able to conduct electricity.

Another is painted with graphite slip and decorated with the animal pattern known from the lentiform clay bottle of Matzhausen.

The fabric was screen-printed and quotes archaeological findings of the La Tène period, reimagined into two-dimensional and continuous patterns.

Inspiration for these patterns were the Basse-Yutz flagons, the Amfreville helmet, a Hungarian scabbard and the bronze mounts of a wooden pitcher found in Brünn. Each of these was chosen to represent one of the La Tène style periods; the patterns thus illustrate the evolution of the La Tène art styles.

Both works, presented by the young artists, are an example of conveying museum pieces and the subject matter of experimental archaeology, but also serve as a starting point for the discussion of how the findings of archaeology can be integrated into today's life and design.

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Wolfgang Lobisser, *Two new Celtic house models in the Archaeological Open-Air Museum Schwarzenbach.*

In 1991, archaeologists of the University of Vienna set out to scientifically investigate the ancient hill fort of Schwarzenbach. So far, the scientists were able to prove two phases of fortification from the late La Tène period. Furthermore, there are findings from the Bronze Age and from the Copper Age. Today we know that the Celts built up a large town-like settlement in Schwarzenbach in the Bucklige Welt in the 2nd century BC. The oppidum of Schwarzenbach has an inner surface of about 15 ha and was protected on all sides by a fortification. It can be assumed that the inhabitants were nobles and merchants, but also artisans and farmers. In all likelihood, the smelted iron ores of Oberpullendorfer Bay were also processed and negotiated here. The end of the settlement is likely to be around 15 BC with the annexation of the Celtic areas by Rome. Among the most notable finds from Schwarzenbach are precious jewelry such as bracelets, rings and pendants made of bronze, belt hooks and costume accessories, big iron knives, lance tips, tools and components of weapons and belt sets. The fragment of a so-called "Tüpfelplatte" indicates that a local tribal lord on the castle hill in Schwarzenbach also had his own coins minted.

Already in the year 2002 the community Schwarzenbach entrusted the VIAS - Vienna Institute of Archaeological Science - with the construction of an archeological open-air area in the sense of Experi-

mental Archeology, in order to rebuild parts of the Celtic city. The open-air site at the hill fort in Schwarzenbach now consists of nine buildings, as well as several other reconstructed objects such as garden and fence systems. These allow the visitor insights into different areas of Celtic everyday life. The reconstruction of the wooden components and wood joining techniques is largely based on the findings of the Celtic settlement of the Ramsau valley on the Dürrnberg near Hallein. In the construction work only, those building materials were used, which were also available in the Iron Age. The close cooperation between the municipality of Schwarzenbach and VIAS enabled the successful organization of scientific festive events. The culmination of this is the annual Celtic Festival since 1998 with around 12,000 visitors annually, where the results of the archaeological research are communicated in a variety of ways for three days at the summer solstice.

The current construction of two new Iron Age house models in the archaeological open-air museum is intended to massively improve the framework conditions for the public presentation of archaeological excavation results. A container complex was installed in a building to create its own archaeological showroom. This gives us the opportunity to show original finds in modern security showcases, as well as to present the history of the castle hill through digital presentations. This showroom is intended to increase the attractiveness of the museum and thus significantly extend the visitor's season. The second building is under construction and will be specially adapted to the needs of the practical cultural mediation and the lived Celt representation by Iron Age reenactors. The interior design should allow use as a multifunctional functional building for all-year events of all kinds. The new buildings are expected to be completed by the autumn of 2019.

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Gunter Schöbel, *Archaeology of the Future – Imparting Knowledge Directly*

"Small subjects" – such as archaeology – had the opportunity to test the transfer of scientifically generated knowledge to teachers and pupils with newly developed modules within the framework of this project funded by the Baden-Württemberg Ministry of Science.

New workshop units and materials were used, and the developed offers were implemented in social media and the Internet.

The result was an innovative networking platform that provides students, pupils, teachers, educational institutions, museums and other extracurricular learning venues with archaeological topics.

Sandra Umgeher-Mayer, *The cattail and its importance in the prehistoric diet – an experiment for processing.*

Due to plant residues on grindstones in Palaeolithic sites in Italy, Russia and the Czech Republic, the plant cattail could be attributed a special importance. Presumably, the prehistoric humans expanded the diet with starchy plants.

Out of interest to prehistoric nutrition, the author decided to produce a small flatbread made from cattail flour.

Kathrin Krüger, *Question of time. Statistical analysis of experimental data – experience report.*

The poster is based on a recently completed master's thesis on the production rate of woollen clothes during the Pre-Roman and Roman Iron Age in Northern Germany and Denmark. Data originating from „experimental archaeology“ (in the broadest sense) and from ethnographic research have been statistically analyzed in order to obtain plausible production rates for the different steps and techniques of the chaîne opératoire. Two questions concerning the statistical usability of „experimental“ data arose in the working process. First: How should data originating from trials and reproductions be treated when only true experiments are generating data under controlled circumstances and are delivering data on a statistically relevant scale? Second: Are experimentally (in the broadest sense) obtained production rates realistic in comparison to ethnographically observed rates? The poster summarizes

the method applied and puts up to discussion the answers to the mentioned questions as they have been developed in the course of the study.

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Maren Siegmann, *Holes, lots of holes, but it sticks*.

Wind hot glass around a metal stick, let it cool - done is a glass bead. Simple. Now to get the finished bead from the stick, preferably undamaged ... To accomplish this task with cylindrical mandrels of small diameter, there is a thing called "separator" – one coats the mandrel with it, and the bead will let go. Otherwise the bead sticks. Firm, solid and unyielding.

The holes in glass beads, mandrels and winding-rods, separating substances and the traces left thereof. These are nagging the author for many years. So, 2016 she started probing around: which substances (other than modern super-hyper-bead-let-go) react how, what works, what not, what do the traces left look like? Since then she had some more try-outs with some more substances. The Poster deals with these.

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