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Experiment and attempts

Nina-Maria Schlösser, Radu Iovita

Exploring Palaeolithic weapon delivery systems using a controlled and realistic experimental set-up: preliminary results

In the last decades, many researchers in the field of lithic use wear studies made an effort in developing solid methods to identify stone artefacts that were used as tips for penetrative hunting weapons (lances, javelins, darts, and arrows). This study focuses on the approach proposed by Karl Hutchings, which relies on secondary fracture characteristics (namely, Wallner lines [WL] and fracture wings [FW]). These features occur on crack fronts of brittle solids, like glass, obsidian and finer-grained chert, and are used to infer the precursory loading rate of the impact that caused the fracture and, consequently, the type of launching mechanism used in the delivery of the weapon.

New experiments were conducted to evaluate the reliability of this method. Since in a previous controlled experiment from Iovita *et al*., only impact velocities were simulated, whereas other similar experiments only reported launch velocities, we aimed to check velocity curves from launch to impact. Using soda-lime glass points and synthetic targets in the same experiment, we wanted to produce a comparative, yet well controlled dataset with a more 'realistic' set-up, using animal targets and a naturally-occurring raw material. We measured the velocities and acceleration of three delivery systems (lance, javelin, and spearthrower dart) to 1) evaluate the magnitude of the distinction between impact velocities (at target entry as well as inside the target) and 2) determine if the pattern observed can be related to a particular delivery system as claimed in the literature.

In total 75 identical glass copies of a Levallois point and 75 knapped obsidian points of the same size were hafted on the spears/darts and thrust/thrown on a complete wild boar carcass by experienced experts (25 per delivery system). The acceleration curve for each shot was measured, including during the actual impact, using an accelerometer mounted to the weapon itself. Projectile velocities were recorded using a video camera. The broken points were analysed under a microscope and WF and FW photographed and fracture speeds calculated.

Preliminary results suggest that the relation between precursory loading rate and the pattern observed is weak and dependent on factors that are difficult to reconstruct archaeologically, such as species hunted and point-type used. The influence of parameters like hide and flesh, which slow down a travelling projectile, play a more important role than previously assumed during impact right up until the moment of crack initiation. Consequently, they should not be underestimated when reconstructing weapon launching mechanisms from artefacts of archaeological origin.

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Markus Wild

Some results from an experiment: Re-analysis of Mesolithic antler frontlets

Supposed Mesolithic antler head-dresses from Star Carr have been interpreted as either shamanic garb and/or hunting disguise. This has had a lasting impact on our interpretation of Mesolithic and hunter-gatherer societies overall. The hypothesis that these objects were worn as a mask or head-dress has not yet been proven. However the recovery of comparable objects from sediments of roughly contemporaneous or slightly earlier age across the Northern European Plain keeps this model alive. Apart from the fact that these comparable artefacts are not yet well defined and their precise use and function still remains unclear and requires more detailed investigation, the apparent significance of the presence or absence of antler frontlets in extensively excavated Early Mesolithic bog sites across Central and Northern Europe is generally still not well understood.

16 out of a total of 37 modified cervid skulls with attached antlers from 8 sites, which have been discussed in the context of the Star Carr antler frontlets, have recently been re-examined morphometrically and technologically by the author. Additionally a red deer was experimentally prepared to an antler frontlet to help understand the processes involved in the manufacturing and use of this kind of objects. The following parameters were recorded for all of the specimens: animal species, minimum age, weight and preservation, abiotic and biotic modifications that include breakage patterns, perforations, cut marks and notches.

The combined analysis of these parameters allows for the division of the group of modified deer skulls into four distinct groups of which one is discussed here: Besides the artefacts from Star Carr already mentioned, only one intensively modified red deer skull each from Hohen Viecheln and from Berlin-Biesdorf and two laterally perforated deer skulls from Bedburg-Königshoven – are classed as belonging to the newly created group of *Hirschgeweihkappen* [deer antler caps].

Hirschgeweihkappen are a rare spatial and temporal occurrence, within the Northern Technocomplexe of osseous material working [/artefacts] during the Middle to Late Preboreal. Their occurrence is biased towards larger Early Mesolithic sites in the vicinity of lacustrine environments, although they are absent from comparable sites like Friesack where the osseous material otherwise shows technological parallels to that of sites with *Hirschgeweihkappen*. This phenomenon should be linked to the still poorly understood function of this latter type of artefact. To further understand this function new experimental work is necessary.

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Jonas Nyffeler

Intentional or accidental? Fire impact on perforated stone axes from Niederwil

Several fragments of perforated stone axe blades made of serpentinite from the neolithic bog settlement Niederwil, (canton Thurgau, Switzerland; 3660-3585 BC) show impact of extreme heat. None of the semifinished products or blades of felling axes from this site shows similar traces. There is also no evidence for a major intrasite fire event causing this impact on the blades. For these reasons, it was assumed that these axes were burnt and destroyed in the fire intentionally in a ritual act.

The presented project wants to falsify or verify this interpretation by an experimental approach. In series of tests serpentinite samples were heated in charcoal under different conditions. The aim was to reproduce the heat traces on the perforated stone axes. Comparing optically the samples heated in the experiment with the original fragments gives evidence about the heating conditions of the prehistoric finds. Additional mineralogical analyses should support the results and should reveal possible influence of soil chemistry on the surface structure of the finds. If the traces can only be reproduced under conditions, which require human manipulation of the heat source, this would be a strong lead to the assumption that the perforated axes were destroyed intentionally.

The project is presented during the current special exhibition 'Einfach tun' in the Museum of Prehistory Zug, Switzerland. New results are updated continuously in the exhibition. At the present time the project is still in progress. The presentation focuses on the questions and the setting of the experiment and on some early results.

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Markus Loges, Anja Probst, Claudia Merthen
Beaver in the wood
New scientific findings from the fourth Ergersheimer Experiments

In March 2014 the fourth edition of the "Ergersheimer Experiments" took place in the central franconian village of Ergersheim. After two years of experiments dealing mainly with the use of band ceramic stone adzes, we - a potpourri of archaeologist, students and free time woodworkers - started to follow the evolution of neolithic tools. So in 2013 and 2014 we increased the experiments with middle and late neolithic tools. Now we added some points like cleaving blanks out of the trunk and doing the fine machining with stone and bone tools to this year's experiments with its usual program of felling an oak (up to a diameter of 0,55 m) with stone adzes, cleavers and flint axes, limbing and trimming the trees.
During the Experiments, we were able to collect reference data of the use wears and chips of the different tools and productions steps beside the various new findings of possibilities and impossibilities of the use of neoltihic woodworking tools. We were able to document transitional steps of the working process by the use of an portable 3D-Scanner during the field work. Thus we can digitally reconstruct the operational procedures afterwards. Besides the analysis of the fabrication wears on the wood, we are also analyzing the use wears on the tools working the wood. These use-wears are compared with those on the Artifacts. This comparison estimates and in most cases confirms our interpretation of the purpose of the tools. While the "right handling" of the tools is getting better with every weekend of the Ergersheimer Experiment, there are still many questions to ask, some of them appear during the experiments itself. For example this year's main questions were of the right binding and the best material for it (like rawhide, lime bast fibres, linen string, etc.). Which Material is best suited for bindings? Which binding technique does not, or barely, loosen while working with the tool. This is particularly important because a good and firm binding assures a constant and efficient work.

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Ralf Laschimke, Maria Burger
The beginnings of metallurgy
Archaeometallurgical experiments for extraction of copper from malachite

There is archaeological evidence that the extraction of copper from malachite began about 7000 years ago. It is generally assumed that the smelting process was carried out in open fireplaces, since shaft furnaces did not yet exist. The smelting technology the early metallurgists had applied is not currently

known. Several researchers have reported about archaeometallurgical experiments with pellets containing crushed malachite, pulverized charcoal, and clay. However, these experiments provided only very small quantities of copper in form of tiny prills. A series of experiments was performed with the endeavor to improve the metallurgical performance. Instead of crushed malachite, malachite pieces of 10 to 20 mm diameter were inserted into charcoal/clay-pellets of about 50 mm diameter. These pellets were heated in the coals of an open fireplace to 950°C. Thereafter, the pellets were cooled down in water. After cooling, the pellets could be easily crushed, since no slag had developed at the temperature of 950°C. The aggregates of metallic copper, generated by reduction process inside the pellets, were separated from the crushed pellets. The copper aggregates show an extremely high porosity, caused by shrinking in volume during the reduction process. The large internal surface makes the porous copper very sensitive to re-oxidation. Intense re-oxidation takes place particularly between 800 and 600°C. In order to rush through this critical temperature range, the pellets were removed at high temperature from the glow of the fire and were quickly cooled with water. The interaction of reduction and re-oxidation are shown in a time-temperature diagram. Both, the malachite and extracted copper were investigated by chemical and metallographic methods. The composition of the experimental copper is indistinguishable from many copper objects of the Chalcolithic period.
The metallurgical procedure demonstrated is appropriate to extract copper from malachite without melting the copper. As a result, it can be concluded that the process of extracting copper from malachite in the Chalcolithic was possibly much easier than assumed until now. The copper aggregates taken from several experimental pellets were melted in a ceramic crucible. The copper melt was used to cast a copy of a Chalcolithic flat axe.

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Gert Goldenberg, Nils Anfinset, Erica Hanning, Nicole Mölk, Markus Staudt, Manuel Windisch
Experimental reconstruction of Bronze Age chalcopyrite smelting

Starting in 2011, archaeometallurgical experiments have been conducted within the FZ HiMAT research program (**Hi**story of **M**ining **A**ctivities in the **T**yrol and adjacent areas – impact on environment and human societies, University of Innsbruck) with the aim to reconstruct Bronze Age smelting techniques by employing traditional methods from the Himalaya region, Nepal. Starting point are well-documented archaeological records of Middle to Late Bronze Age copper ore smelting sites in the Eastern and Southern Alps, mineralogical analysis of smelting products and ethno-archaeological records of contemporary copper ore smelting in Nepal. The applied method combines the up-to-date knowledge of the involved disciplines in order to approach as close as possible the reconstruction and reproduction of Bronze Age smelting technologies.

Smelting and roasting experiments were performed during several two weeks outdoor workshops in Jochberg, North Tyrol. The camp locality has been chosen because of its original situation in the midst of a well-known Bronze Age copper ore mining and smelting district. In preparation of the smelting experiments, a certain amount of local copper ores from historic mining dumps were collected. The smelting “hearth” (rather than “furnace”) was set with local stones in a rectangular form and completely covered interiorly with clay. Several portions of the ore concentrate (10 kg in total) were smelted in the hearth with charcoal, using two leather bellows, each one attached to a bent tuyère. The aim of the first smelting was to produce a certain amount of matte. The matte concentrate was ground into powder with stone tools and mixed with horse dung. The balls were roasted for about two hours in an open wood fire (”roasting bed”) and then left over night until the ongoing reaction was completely terminated and the material showed a dark red color as a sign of successful roasting. The roasted matte was then smelted in the hearth with charcoal under the tuyères. The products were analysed in the laboratory using microscopy and electron microprobe analysis.
The results of the experiments, including the 2014 campaign, are presented in this paper, which also raises the issue of how several methodological approaches may be used in order to better understand ancient copper smelting technology.

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Simon Timberlake

Some recent experimental investigations of the earliest mining, processing, and the smelting of metals

Three preliminary case studies

The method of mining for metal ores using hafted cobble stone mining hammers, antler picks, hand-held stone, wood and bone tools and fire setting has been practically investigated both in Wales (UK) and Georgia in the Caucasus. Meanwhile, the processing and recovery of gold from vein ores using just stone tools and water has been demonstrated at one of these sites (Sakdrisi, Georgia). In Britain copper has also been recovered from a relatively low-grade Bronze Age ore (at Alderley Edge) through hand-picking and concentration, then subsequently crucible smelted and cast into an object. Finally, investigations of the earliest generic 'Chalcolithic-type' smelting process has shown repeatedly how an ore can be smelted within an open fire in a pit of embers, with the help of simple bag bellows, to give metal prills in a conglomeratic slag.
Copper can also be melted together, under the same conditions, inside of a simple crucible. What is being presented here are just interim and brief reports on a series of long-term experiments.

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Sabine Ringenberg

The lead kettles of Pompeji from a technical perspective

An experiment during the Textilforum 2012 was based on the research of Heather Hopkins on the lead kettles of Pompeji and was carried out by Heather Hopkins, Dr. Katrin Kania and Sabine Ringenberg. The focus was on the effects of the kettle material - lead, copper and iron - during the process of mordanting and dyeing of textiles. The European Textilforum offers a platform for archaeologists and craftspeople to share and exchange relevant information from different fields of work. LEA in Mayen

has become a home of the Textilforum and is supporting both the experimental work and the following research. This will introduce both the work of the forum in general and the results of the experiment mentioned.

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Jan Hochbruck

"… and if the wax / be able let it breathe perfume"

(Anakreon, Portrait of His Mistress, translated by Judson France Davidson)

Encaustic – painting with hot wax – was the fine art of antiquity, as compared to tempera: poets, orators and scientists alike use "painted in wax" comparable to "painted in oil" (i. e. made for eternity).
I undertook a series of experiments based on literary sources (below) and images depicting the act of painting, foremost the Kerch Sarcophagus (at the Hermitage, St. Petersburg).
Preparing the paint: Mixing the carrier medium with wax, liquid (!) resin and linen oil in three equal parts (weight) turned out to be the easiest way to prepare the best paint.
Handling: The paint turns wax-like within just 3-4 seconds, hardens within three weeks.
Re-use: Hardened paint within the box can be scooped and reheated anytime.
Mixing colours: The colours are all but non-mixable, which explains the large paint-box on the Kerch sarcophagus and the 29 pots of paint of the painter's burial in Heddernheim.
Glazing vs. opaque painting: The thick paint itself is useless for glazing techniques. The hatching technique found in frescos as well as wax paintings is there for a reason.
Economic aspects: Pliny writes about ships being painted with wax, and I doubt the "artist colours" were being used for this purpose (maybe for some fine details).
Further findings: Wax paint can be enhanced with rose oil just like candles …

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Hannes Lehar

The water flushing of roman latrines

While the private latrines in roman houses mostly accord to our outhouses, the latrines in thermae and in the public sector were in many cases not only elaborately designed, but were also constructed for simultaneous use through multiple persons and were also flushed with. The archaeological literature describes this as flowing water through a canal under the lavatory seats, which comes either from a water pipeline, or the effluent water from the various bathing basins from the thermae that was collected for this purpose and guided into the latrines.
Lately several colleagues voiced doubts about the function of a water flush used in this manner.
Since the water streams were largely unpressurized and probably in small amounts, it appears dubious to the author as well, whether a cleaning of the latrine canal is thus actually possible. Even more so, because the canal in many constructions often contains several 90° corners and hardly any downward slope.
To get clarity, experiments are planned with a replica of a part of the latrine of the small thermae of Cambodunum (Kempten in Allgäu), to find out whether the so far assumed operating mode could have functioned or not.
If the experiment brings a negative result, there are to be continuative investigations, which water amounts and which filling pressure enable adequate purging, or whether an additional mechanical cleaning was necessary anyway. Through this the necessary building measures and the possible

mode of operation, which would be necessary for a satisfactory flush, are to be determined. Possibly these experiments will show that previous and future excavations need to be viewed from a new perspective.

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Arne Döpke
Defending the Roman frontier on the Rhine in late Antiquity

Historical and archaeological research considering the Roman patrol boat *lusoria* recently showed the rise of one particular type of vessel during the 3rd century AD as the centerpiece of a new protective demand that arose from continuous pressure admitted onto the frontiers by neighboring peoples. New practical and cost effective means had to be found to answer to the rising threat, thus enabling the roman troops to rely more on their provincial fleets. Those ships had to cater to several crucial needs regarding building times, maneuverability or the nautical abilities of their local crews.
Using highly exact means of acquiring all necessary data materials, the reconstructed *lusoria Rhenana* (Germersheim 2010) was tested extensively since 2011 during weeks of trials regarding every relevant aspect of her capacities. Additionally, the physical demand to the crews was recorded by researchers from the Westfälische Wilhelms-Universität Münster to have a new basis for the power-speed-ratio calculation. Very recently, the existence of a 3D-model opens up a new method of measuring all the boat´s movements, as well as its resistance inside the water. A smaller version of the *lusoria*, printed and analyzed under close scrutiny in a wind channel is being worked on since 2013. These different angles of analyses lead to a core element of the present research, which is to be able to simulate the ships movement under full sail. The whole project is completed by the use of the human model, a program that is normally used in designing car cockpits and the reachability of every steering gear inside new cars. As every compound of the human model can be adapted to the physique of roman legionnaires, it is capable of depicting the most effective way of rowing such a river patrol boat. Completing and analyzing these different perspectives onto the *lusoria Rhenana* is creating a scientific tool that may enable us to have a closer look on maritime activities under the Roman Empire.

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Saturday October 4th 2014

Experiment and attempts

Andreas Klumpp
PhD Project Culina Historica
Cookery book research and experimental archaeology

The PhD project Culina Historica is being carried out at the executed at the Dept. of Medieval History at Otto-Friedrich-University Bamberg. The project aims to set new impulses in the research and translation of historical culinary recipes. Cookbook research is to date still mainly in the hands of linguists, historians and ethnologists. Therefore, especially transcription, chain of transmission, linguistic aspects and translation are the center of interest. Practical approaches in the form of food

interpretations are also more and more important, but the results are mostly of limited value. Often lacking in detailed documentation, the ways to the interpretations and the conclusions drawn from them cannot easily be retraced or reproduced. Additionally, this kind of research is seldom published under scientific criteria. In this respect, the project is thought to build a bridge between study of historical sources and experiment. At the basis are transcription, translation and detailed analyses of the content of three manuscripts roughly from the 14th century. Data is collected for ingredients, kitchen utensils and equipment, cooking methods and duration, intended consistency and appearance. Using this information, it is intended to examine some recipes from each manuscript for possibilities of interpretation and to test these in experiment. In the center of this procedure is a detailed written and photographic documentation using a specially developed documentation sheet. For the practical experiments, modern kitchen equipment, a portable fireplace inspired by historic drawings and the reconstructed kitchen of a 14th century farm house at the open-air museum Bad Windsheim are used. Due to temporal and financial reasons, replicas of medieval cooking implements are only used when a significant difference for the end result is to be anticipated. The ingredients also influence the consistency and taste of the dishes. That is why, in cooperation with the Institute of Plant Genetics and Crop Plant Research Gatersleben, a number of vegetable cultivars thought to be comparable with medieval kinds have been selected for home growing. Furthermore, it is intended to try a comparison between modern fattened pig and Iberian pigs still held in oak-wood pasture similar to historic practice.
Because of the thesis is being executed at the Dept. of Medieval History, the main focus is on manuscript analysis. Nonetheless, the exemplary cooking experiments and the detailed documentation build an important part, too, and are thought to give new inspiration into this field of research.

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Maren Siegmann
zuku, busu, tersitu. The art of making coloured glasses
It all started harmlessly enough: to show how to make late Bronze Age glass beads in Unteruhlingen. Then: can you give us a paper, so our team knows the basics concerning Bronze Age glass? And by now, one is stuck up to the eyebrows in Mesopotamian clay tablets and cuneiform texts. Recipes describing the art of making coloured glasses. Short abstracts of these recipes are known within glass-making literature. Regarding the complete thesaurus of recipes (excellent edited and translated), it becomes clear that the known "texts" are unacceptably reduced or are a hodgepodge out of separate recipes. The recipes, the small steps from raw materials via semi-processed substances to the glass desired and the technical difficulties met (and solved) are topic of the lecture.
Furthermore, the processes described in the recipes are compared to archaeological finds such as Ulu Burun and Amarna, and to glass-melting experiments.

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Analysis

Stephan Patscher
The Language of Traces, Remains and x-ray Documentation
The role of the scientific archaeological conservation for the readability of archaeological objects.
The role of the scientific archaeological conservation is not only the preservation of archaeological artefacts as a witness to human action and thinking, but is also the systematic exploitation of all information, which give evidence to how an object was crafted, how it was used, in which context it belonged to and which fate it had to suffer. Therefore conservators do not only rejoin broken objects, they also expose ancient surfaces as a main source of information and reject to do so, when the surface is covered by all sort of remains, which are important for the understanding of the objects and their context. Supported by material analysis, x-ray investigation, craftsman experience and archaeological expertise, it is often possible to give creditable interpretation of the objects. This presentation will give a look at this using selected examples of different finds.

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Reconstructing Archaeology

Wolfgang F. A. Lobisser
The reconstruction of a Bronze Age warrior chariot according to archaeological findings of the Sintašta-Culture in Transural
The appearance of two wheel warrior chariots that were pulled by horses changed the lives of Bronze Age people greatly, especially concerning social, economical, but also spiritual aspects. These chariots spread over a wide area quite fast and reached the Balkan-Danube region and the near east, as well as regions in eastern Asia.
In Sintašta in southern Ural, 16 graves were excavated, which each contained a two-wheeled chariot. The graves could be dated to between 2100 and 1700 BC. The spooked wheels had been placed in special pits in the graves so that the exact impressions of their form could be documented. We also know the distance between the wheels and other details concerning their construction.

For the exhibition “Unknown Kasachstan – Archaeology in the very core of Asia” at the German Mining Museum in Bochum, the author was invited to reconstruct a model of such a warrior chariot in scale 1:1 according to the findings of that time. This gave the chance to carry out some practical experimental studies concerning building materials, tools and mounting techniques that could have been used in Bronze Age.

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Thomas Flügen
The antique stone turning lathe
A forgotten machine reconstructed

On more than 70 roman stone monuments from the collection of the Archaeological Museum Frankfurt, distinct traces of tools were found that lead to the conclusion that the stones were worked on a turning lathe. Unfortunately nothing is known of the appearance of such a “machine”, because there exist neither an antique illustration, nor an exact description, nor an archaeological find of it. On the basis of the stone monuments, the essential elements that a stone turning lathe should possess could be gathered. During several experiments, these elements were checked and optimized, so in the end a stone turning lathe could be reconstructed. Different forms and sizes of turned stones shall be produced in the near future to further investigate this forgotten lithic technology. The lecture will focus, apart from an introduction to the topic, on the current project: the construction of a „roman“ stone table.

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Frank Wiesenberg
The experimental Roman glass furnace project in the archaeological park Roman Villa Borg (Borg Furnace Project)
Glass furnace reconstruction and the first two firings

Inspired by strong evidence for Roman glassworking in the Roman villa rustica of Perl-Borg, a reconstruction of a Roman style glass workshop was made in the summer of 2013. The local finds of furnace daub did not provide enough information for a reconstruction, so the glass furnace and the cooling oven (lehr) were based upon a very compact workshop layout from Trier (Excavation Trier “Hopfengarten” 1999/2000). The upper structures, such as shelves, working holes and dome, needed to be designed according to the „form follows function“ principle, incorporating the dimensions of the Trier excavation and the dimensions of the desired glass pot size and working height. Only Roman roof tile fragments and local daub were used for the reconstruction.
The first „test“ firing of one week at the end of September / beginning of October 2013 proved the general functionality of both kiln structures. The glass furnace was able to exceed temperatures of 1050°C, meaning glass of Roman recipe could be melted, and that even first-time glassblowers could blow glass vessels in front of the working holes. Temperature readings were recorded, as well as the wood consumption, to allow future comparisons with different types of wood. Also, ash and charcoal was collected to provide data for lipid analysis. This first firing and the reconstruction were analysed and published.
Due to severe cracking, the furnace’s dome needed to be completely rebuilt in May / June 2014. The second firing was performed over 10 days of June 2014 in co-operation with the Archaeological

Institute of Cologne University (Archäologisches Institut der Universität zu Köln), and served as a research base for Mark Taylor & David Hill (ROMAN GLASSMAKERS, Andover, United Kingdom), assisted by François Arnaud (Atelier PiVerre, La Plaine-sur-Mere, France). The main objective was to practise and film the operation of reconstructed moulds for Roman mould blown glass, especially those from the ENNION workshop. Publication of this project is in preparation.
Future projects should also involve other universities, institutes, researchers and glassmakers to provide the infrastructure for their research on Roman glass technology, and teach archaeology students the basics of hot glass working. Also reconstructions of other Roman glass furnace layouts are planned. The next projects in the Villa Borg's glass workshop are scheduled for May and October 2015.

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Theory and presentation

Dirk Vorlauf
Experimental Archaeology at the Philipps-University of Marburg (Hessen, Germany)
This lecture will present the main priorities of experimental archaeology lessons given at the Philipps-University of Marburg since 1999 – for example: method, history of experimental archaeology, aims, statements and the results of the students evaluation programme.
In addition some critical reflections about the university reform – bachelor and master – will be mentioned.

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Michael Herdick
Science Wars: Experimental archaeology and version 2.0 of knowledge production
In conjunction with experimental archaeology, so many images confront us that seem to put to question the scientific basis of the methods used. For example, reconstructions of Roman ships in a brewery's corporate design, or staging the event of the construction of prehistoric houses in open air museums as a visitor attraction. Even when looking explicitly at the potential of experimental archaeology for the transference of knowledge, there are some conspicuous alarming developments. In "docutainment", living history actors have been accorded equal status with academic experts. The ZDF television series "Women Who Make History" (Frauen die Geschichte machten) brings this to a whole new level, in that they completely eliminated expert commentary and rely entirely on theatrical performances to convey historical events.
People in the field of experimental archaeology tend to react very defensively and attempt to differentiate their work from such developments. However one issue is rarely discussed: that effective public communication is a requirement for the execution of outstanding large-scale (experimental) archaeological projects. The same is true when working with non-university partners. Rarely, if ever, do we discuss the real or presumed problem fields as crisis phenomena of the established academic activities.
Against this background, experimental archaeology can also be described as applied archaeology, whose characteristics are typical for a modern scientific evolution. Sociologists have dubbed this as version 2.0 of knowledge production.
Evidence, ideas and approaches for these discussions can be taken from a wide range of sources, including experiences gained during the formation of the Laboratory for Experimental Archaeology.

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Andreas Sturm
There's more to interpretation than is dreamt of in your studies!
Some theses on quality assurance of costumed live interpretation

In Germany, recent studies on costumed live interpretation and living history focused on dissecting the mind of the living historians. Meanwhile, the costumed interpreters themselves discussed means of quality assurance, but mostly failed to think beyond the idea of authenticity. It's time for a new understanding of the art of costumed live interpretation.

Authenticity is probably the most overrated quality issue of the living history movement. While its pursuit is essential to the mind-set of any costumed interpreter, there are no means to quantify it. There will always be one who will take it a step further. Yet, a variable that can't be measured is no benchmark at all.

Many graduates launch into the field of live interpretation with little or no understanding of human learning. Conservation and research of relicts of the past would be served best with restricted-access depositories. If an artefact is placed in a museum, communication with the public must be the made prime objective. Because in the end, it's always the people who pay the scholar's bills. Then, it's all but fair when museum programs meet the public's needs.

From a visitor's perspective, learning in the museum is a leisure activity. Therefore, interpretation programs aren't meant to be derivatives of university lectures and research projects. In order to address a wide audience with substantial information, interpreters are required to acknowledge and incorporate the latest neurological findings on learning and intrinsic motivation. While fiercely banned from academic thinking, personal bias and emotional involvement are essential for effective learning here. The key to good-quality costumed interpretation is not a quest for more authenticity, but a change of attitude on behalf of its creators.

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Posters

Arne Döpke
Reconstructing Roman Field Artillery

Since 2012 the universities of Hamburg, Osnabrück and Trier in cooperation with a Bavarian school have constructed and tested four variations of three different types of roman ballistae, dating from the 1st century B.C. until late antiquity. The project, initiated and financed by the Varus-Gesellschaft, focuses on the technical innovation that Roman war machines underwent during the centuries. Each version of the ballistae derives its power from intertwined flexible material forming vertical skeins of ropes made of horsehair. Two unflexible, short arms, inserted into the torsion bundles, propel a fixed sinew forward, driving arrows of two different calibers (1/2 cm) out through the front chamber of the catapult. Various weeks of test trials have been documented and are constantly evaluated.

The main focus lay on the operative use in different combat situations, starting with the regular shooting distances and precision of each catapult version. Here, the use of catapults, either as highly precise artillery or as a means to stop advancing lines of enemies in a barrage, was an initial research question. Furthermore, the amount of arrows one catapult could shoot per minute in comparison with unfortunate weather conditions and the degree of power loss was measured with precise means and under reproducible circumstances, thus offering information about speed, the power needed to draw the weapon and to such aspects as the spreading of arrows at the target.

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Claudia Merthen
Brocaded in Gold. On the Weaving Technique of two Baldrics at the Germanisches Nationalmuseum, Nürnberg

Visiting the depot of the collection of weapons at the Germanisches Nationalmueum in Nuremberg in 2011 I discovered two sabres of probably oriental origin with their original carrier bands. These ribbons had a vibrant green colour. They are tablet woven and brocaded with a thin wire, which is laid in bundles. These are fixed by single threads or thread groups to create very details patterns. There are only a few parallels to this technique so far. The reconstruction of the tablet woven bands can bring interesting insights into the possibilities of tablet weaving. - The lecture introduces the sabres as an ensembles with scabbard and baldric, sumarises the historico-cultural background and illustrate the weaving technique with close ups.

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Lidia Ester Escobar de Diener
Ancient pottery kilns in Argentina. Experimental archaeology

In a spacious region in central east and north Argentina, whose area corresponds to the provinces of Mendoza, San Juan, San Louis, Cordoba and Santiago del Estero, a large amount of mostly oval-shaped kilns were found, with a depth and width of approx. 75-80 cm. Their walls were revetted with a coat of 3-7 cm adobe with organic material. These discoveries were made be Juan Semper (Nature historic museum of London) in 1944, who studied them during the next 14 years, until 1958. Unfortunately, his discoveries didn´t generate too much interest among the archaeologist in Argentina. To be honest, only some of them mentioned this issue, but even so only in passing.
But the minimization of their relevancy towards the other archaeological discoveries means that a part of the history is forgotten and the character of the kilns and the way of life of the people who built these kilns is not honored.
Maybe the answer is that in the past it was commonly accepted to think that these kilns were be used for cooking foods, although only remains of fire and ceramics were found inside them.
Respectively this issue from the point of view of the experimental archaeology is it always a step forward, if you´re working with a model of the original.
The only registered activity of this type was undertaken in 2001 in Mendoza, but unfortunately, it was only a cavity into the soil, without consideration of the original construction and function, and finally only foods were baked inside of it instead of ceramic.
To show the correct functionality, I reconstructed in the course of an archaeological experiment two models of these kilns on the grounds of the Natural Scientific and Museum Faculty of the University La Plata, this was a part of Academic Additional Studies at the University in 2008.
In this poster I´d like to show you the results of that, regardless of different environment conditions, because in the region where the kilns were found, a type of desert climate prevailed, with little condensation, the soil was clayey-sandy, with small-sized vegetation (low forest).

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Sylvia Crumbach

Back to our Cheruscan farm! Picturesque "Kulturhöhe" at the Germanic homestead at Mount Barkhouse, Oerlinghausen

Open air museums with archaeological themes have become an integral part in recent times.
Brought to life through historical performers, these life-size house models, tools and experimental sites have turned into barely more than requisites of an alternative leisure time activity.
Idea and implementation of such museums however mirrors the history of archaeology in public, in the case of the former Germanic homestead in Oerlinghausen the development since its inception in 1936. This poster presentation provides insights into content and concepts and spotlights people as well as ideological topics.

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Jasmin Rauhaus

„Archäologische Schnitzeljagd“ & „Uni on Tour“
Pedagogical projects between university and museum

In 2014, during the Kinder-Uni-Forschertag Tübingen, a pedagogically oriented archaeological workshop was carried out by students from the practical seminar “Public Archaeology” (Prof. Dr. Schöbel, Pfahlbaumuseum). Taking into account the experiences from earlier workshops, children from 6-10 years of age in particular tend to show the most interest in “hands-on activities” (Klaß, Rauhaus 2014). Knowing this, we created a series of stations with both theoretical and practical content, forming an archaeological “Schnitzeljagd”. The children experienced a form of role-playing, in which they had to found a new settlement in a prehistorical context, with the single stations each giving one part of a functioning community. These new elements from the areas of role-play and living history were meant to give the children a closer feeling of the history. As the evaluation shows, it is especially the older children who liked the new approach, which may be attributed to the complexity of the concept. In order to reach a larger public with this kind of pedagogically accentuated projects, another workshop following the “Uni on tour” was designed and carried out by the students at the Pfahlbaumuseum Unteruhldingen. Especially the adult participants enjoyed the opportunity to participate at the different stations along with the children, giving their families a shared experience. All guests gave a positive feedback of the animated, lively presented history, which was strongly influenced by “living history”. All in all, we conclude that this approach is of key importance in creating multi-sense-experiences in form of hands-on activities that positively attract target groups of very different ages and educational backgrounds.

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