

EAC10

Experimental Archaeology Conference

20 to 22 April 2017

EXARC

Archaeological Material Culture Studies
Faculty of Archaeology
Leiden University (NL)



Universiteit
Leiden
Archeologie

Papers | Presentations | Posters | Networking | Excursions

The International Experimental Archaeology Conference encourages the exchange and sharing of new work in experimental archaeology. It facilitates the discussion of recent developments within the ever-growing community of experimental archaeologists, archaeologists, primitive technologists, interpreters, open-air museum affiliates, and interpreters.

Experimental archaeology encompasses controlled scientific experiments as well as a vast array of other closely related activities. Although an archaeological experiment must be hypothesis driven, the insight gained through activities that are not as scientifically structured including experiential archaeology and primitive technology can be equally informative. The true value is realized when the results of research are related back to the archaeological record, enabling the creation of a cohesive and insightful interpretation which would be impossible to obtain solely from original artefacts.

EXARC has been publishing about experimental archaeology for almost 15 years. The proceedings of this conference too will be published through EXARC. All articles will be reviewed, edited and published online in the EXARC Journal. We look forward to receiving manuscripts through info@exarc.net before 15 July 2017.

All Information in this booklet is subject to change.



**Universiteit
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EXARC



Leiden

Thursday 20 April 2017

(Faculty of Archaeology, Leiden University, Einsteinweg 2, Room E0.04)

08:00h **Registration**

09:00h **Opening** by Prof. Annelou van Gijn, Leiden University (NL)
and Prof. Dr Bill Schindler, EXARC Chair (US)

09:15h **Session 1 - Key note speeches**

09:15h **#1 (Paper)** - *The Gislinge Boat Open Source Project: Reconstructing a Medieval Boat in a Digital Age*
by Martin Rodevad Dael and Triona Sørensen;
Viking Ship Museum in Roskilde (DK)
See Abstract page 20

09:50h **#2 (Paper)** - *Experimental Archaeology at Leiden University: from the Macro to the Micro*
by Prof. Annelou van Gijn, Diederik Pomstra, Annemieke Verbaas, Dennis Braekmans, Loe Jacobs, Paul Kozowyk, Geeske Langejans and Femke Reidsma;
Leiden University (NL)
See Abstract page 21

10:30h **Coffee & Tea**

10:45h **Session 2 - Papers (15 min)**

10:45h **#3 (Paper)** - *(Re)constructing Early Medieval Roundhouses: Entangling Yourself in History, Archaeology, Ethnology and Experimental Archaeology*
by Prof. Aidan O'Sullivan, Brendan O'Neill and Dr Eileen Reilly;
University College Dublin, School of Archaeology,
UCD Centre for Experimental Archaeology and Material Culture (IE)
See Abstract page 22

- 11:00h **#4 (Paper)** - *Learning It the Hard Way: Insights in Continental Turf Building Techniques*
by Daniël Postma PhD;
 Archaeo Build / University of Groningen (NL)
See Abstract page 22
- 11:15h **#5 (Paper)** - *Some Aspects of Reconstructing Bronze Working Technologies in the Context of Eastern Baltic Bronze Age Archaeology Problems*
by Dr hist. Artūrs Tomsons;
 Latvian National History Museum (LV)
See Abstract page 23
- 11:30h **#6 (Paper)** - *Hardening Small Metal-Working Tools*
by Prof. Jonathan Thornton;
 Buffalo State College (US)
See Abstract page 24
- 11:45h **#7 (Paper)** - *From Galena to Silver 2.0. New Results of an Experimental Research*
by Luca Bartoni MA and Yuri Godino MA;
 University of Siena (IT)
Lorenzo Teppati Losè MA;
all: ARES-Archeologia, Reenactment e Storia (IT)
See Abstract page 24
- 12:00h **#8 (Paper)** - *Where Have all the Moulds Gone? A detailed Investigation of Early Medieval Bi-Valve Clay Moulds*
by Brendan O'Neill;
 University College Dublin, School of Archaeology,
 UCD Centre for Experimental Archaeology and Material Culture (IE)
See Abstract page 25
- 12:15h Session 2 - Posters (5 min)**
- 12:15h **#9 (Poster)** - *Manufacture of Roman Silver Coinage AD193-260*
by Nicola George;
 University of Liverpool (UK)
See Abstract page 25

- 12:20h **#10 (Poster)** - *The Marks of Metal: An Experimental Project Using Microwear Analysis to Investigate Prehistoric Amber Beads from North Holland*
by Matilda Sebire MA;
Leiden University (NL)
See Abstract page 26
- 12:25h **#11 (Poster)** - *It's Complicated: An Experimental Approach towards Understanding the Production Sequence of Dark-Patinated Copper Alloys from the Eastern Mediterranean Bronze Age*
by Marianne Talma cand. PhD;
University Kiel (DE)
See Abstract page 26
- 12:30h **#12 (Poster)** - *Of Fire and Steel: A Case Study on the Blacksmiths Tools from Garton Slack*
by Zechariah Jinks-Fredrick, cand. PhD;
University of Hull (UK)
See Abstract page 27
- 12:35h **#13 (Poster)** - *Palaeolithic Complex Technology: Comparing Three Aceramic Birch Bark Tar Production Methods*
by Paul Kozowyk;
Leiden University (NL),
Diederik Pomstra;
Het Stenen Tijdperk (NL),
and Geeske Langejans;
Leiden University (NL) and University of Johannesburg (RSA)
See Abstract page 27

- 12:45h **Lunch Break**
- 13:00h **Tour through labs**

Simultaneously - on Invitation ONLY:

**Lunch Break Session for University Departments
working with Experimental Archaeology**
(Room F0.06)

14:15h Session 3 - Papers (15 min)

- 14:15h **#14 (Paper)** - *Did You Hear About Rolling Stones? Experimental Approach to Lithic Tools Alteration and Its Influence in the Technological Reading*
by Prof. Dr Javier Baena Preysler, Guillermo Bustos, Concepción Torres Navas and Sara Pérez Díaz;
Universidad Autónoma de Madrid (ES)
See Abstract page 28
- 14:30h **#15 (Paper)** - *How the Technology of the Bow Changes During the Mesolithic and Neolithic*
by Silvester Ladanyi MA;
Cambridge University (UK)
See Abstract page 29
- 14:45h **#16 (Paper)** - *From Notches to Combat. Experimental Archaeology and Use-Wear Analysis Applied to the Reconstruction of Prehistoric Swordsmanship*
by Valerio Gentile MA (Res);
Leiden University (NL)
See Abstract page 29
- 15:00h **#17 (Paper)** - *Animal Teeth in a Late Mesolithic Woman's Grave, Reconstructed as a Rattling Ornament on a Baby Pouch*
by Riitta Rainio and Annemies Tamboer (NL)
See Abstract page 30
- 15:15h **#18 (Paper)** - *Ashes to Ashes: Using Modern Analogues to Identify Fuels from the Past*
by Gregg Griffin;
University of Bradford (UK)
See Abstract page 30
- 15:30h **#19 (Paper)** - *Experimental Archaeometallurgy of Early-Middle Bronze Age Cyprus: Pilot Experiments of Copper Smelting at Pyrgos-Mavroraki*
by Marco Romeo Pitone;
Newcastle University (UK);
Centro Studi di Preistoria e Archeologia, Milano; Centro di Archeologia Sperimentale Antiquitates, Blera (IT)
See Abstract page 31

15:45h Session 3 - Posters (5 min)

- 15:45h **#20 (Poster)** - *Chalcolithic Flint Hammers? Testing the Hypothesis through Experiments and Micro-Wear Investigations*
by Diana-Măriuca Vornicu PhD;
Institute of Archaeology, Iași, Romanian Academy (RO)
See Abstract page 32
- 15:50h **#21 (Poster)** - *On the Origin of the Plane: The Reconstruction of the Two-Handled Adze – a Practical Approach to Graeco-Roman Woodworking Tools*
by Rüdiger Schwarz, BA MA;
Römerkastell Saalburg (DE)
See Abstract page 32
- 15:55h **#22 (Poster)** - *Using Experiment to Determine the Sex of Hand Images in Palaeolithic Art*
by Dr Anthony Sinclair, Jason Hall, Emma Nelson;
University of Liverpool (UK)
and Patrick Randolph-Quinney;
University of Central Lancashire (UK)
See Abstract page 33
- 16:00h **#23 (Poster)** - *New Grounds: "Archaeobeekeeping"*
Dr Sonja Guber;
Immenzit (DE)
See Abstract page 33

16:15h **End / leaving the building**

Bus transfer to the centre of Leiden

17:00h



Leiden

**Reception offered by
Leiden Municipality**
(at City Hall Leiden)

19:00h **Dinner** (own booking required)

Friday 21 April 2017

(Faculty of Archaeology, Leiden University, Einsteinweg 2, Room E0.04)

08:00h **Registration**

9:00h **Session 4 - Papers (15 min)**

9:00h **#24 (Paper)** - *From Little Seeds Grow Mighty Trees: Reflections on Experimental Archaeology in College Classrooms*

by Prof. Tim Messner;

State University of New York at Potsdam (US)

See Abstract page 34

9:15h **#25 (Paper)** - *Learning To Recreate, Recreating To Learn. Teaching Experimental Archaeology*

by Beatriz Comendador PhD, Aaron Lackinger BA;

Universidad de Granada (ES),

Elin Figueiredo;

CENIMAT/i3N, Universidade Nova de Lisboa (PT)

all: Grupo de Estudos de Arqueoloxía, Antigüidade e Territorio (GEAAT) & Universidade de Vigo (ES)

See Abstract page 35

9:30h **#26 (Paper)** - *Experimental Archaeology as Applied Archaeology: Using Food to Close the Gap*

by Prof. Dr Bill Schindler;

Washington College, MD (US)

See Abstract page 36

9:45h **#27 (Paper)** - *The Experimental Building of a Wooden Watch-Tower in the Carolingian Southern Frontier*

by Prof. Imma Ollich, Albert Pratdesaba, Montserrat de Rocafiguera, Maria Ocaña and David Serrat;

l'Esquerda (ES)

See Abstract page 37

10:00h Session 4 - Posters (5 min)

- 10:00h **#28 (Poster)** - *Using Experiment to Enhance Undergraduate Academic Research Skills*
by Dr Anthony Sinclair and Jason Hall;
University of Liverpool (UK)
See Abstract page 37
- 10:05h **#29 (Poster)** - *Popularization and Experiment in Prehistoric Village, Pilsen (Czech Republic)*
by Eliska Ventrubova and Jaroslav Novak (CZ)
See Abstract page 38
- 10:10h **#30 (Poster)** - *Silk, Teutonic Great Masters, Reconstructions*
by Prof. Dr Małgorzata Grupa;
Instytut Archeologii UMK, Toruń (PL)
See Abstract page 38
- 10:15h **#31 (Poster)** - *Making Medieval Food: Experimental Archaeology as Experiential Learning*
by Scott D. Stull PhD;
Ithaca College, New York (US)
See Abstract page 39
- 10:20h **#32 (Poster)** - *Prosthesis in the Long 19th Century*
by Charlotte Waller-Cotterhill;
University of Sheffield (UK)
See Abstract page 39
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10:30h **Coffee & Tea**

10:45h Session 5 - Papers (15 min)

- 10:45h **#33 (Paper)** - *Experimental Crop Cultivation on Salt Marshes*
by Mans Schepers cand. PhD;
Groningen Institute of Archaeology, Terp Research Group (NL)
See Abstract page 40
- 11:00h **#34 (Paper)** - *The Intersection of Experimental Archaeology
and the Chaîne Opératoire Approach in Ceramic Study*
by Caroline Jeffra PhD;
Universiteit van Amsterdam (NL)
See Abstract page 40
- 11:15h **#35 (Paper)** - *Firing Pits and Pottery Production at Lugo di
Grezzana (VR)(IT): Using Experimental Archaeology for the
Interpretation of Archaeological Processes*
by Annalisa Costa, Fabio Cavulli and Annaluisa Pedrotti;
Università di Trento (IT)
See Abstract page 41
- 11:30h **#36 (Paper)** - *Hide Processing in Prehistory, an Experimental
Approach to Prehistoric Tanning Technologies*
by Theresa Emmerich Kamper PhD;
University of Exeter (UK)
See Abstract page 42
- 11:45h **#37 (Paper)** - *Testing the Accuracy of Clinical Imaging for
Wrapped Animal Mummies: an Experiential Approach*
by Dr Stephanie Atherton-Woolham;
Manchester Museum (UK)
and Dr Lidija M. McKnight;
KNH Centre for Biomedical Egyptology, the University of
Manchester (UK)
See Abstract page 43

12:00h Session 5 - Posters (5 min)

- 12:00h **#38 (Poster)** - *Popularisation of Archaeological Reconstructions
with the Public. Modern Fashion Straight from a Grave*
by Dawid Grupa;
Instytut Archeologii UMK, Toruń (PL)
See Abstract page 43

- 12:05h **#39 (Poster)** - *'Re-rolling' a Mummy: an Experimental Spectacle*
by Dr Lidija M. McKnight;
KNH Centre for Biomedical Egyptology, the University of
Manchester (UK),
Dr Stephanie Atherton-Woolham;
Manchester Museum (UK)
and Campbell Price;
the University of Manchester (UK)
See Abstract page 44
- 12:10h **#40 (Poster)** - *An Experimental Approach to the Analysis
of Morphological Features on Archaeobotanical Carbonized
Barley Grain Kernels*
by Linda Smit;
Groningen University (NL)
See Abstract page 44
- 12:15h **#41 (Poster)** - *Understanding the Archaeological Record:
Reconstructing a Warp-Weighted Loom*
by Tena Karavidović;
Centar za Eksperimentalnu Arheologiju (HR)
and Dr sc. Tajana Sekelj Ivančan;
Institut za Arheologiju, Zagreb (HR)
See Abstract page 45
- 12:20h **#42 (Poster)** - *The Production of Combs and their Life
Biography*
by Nathalie Pil MA;
Vrije Universiteit Brussel (BE)
See Abstract page 45
- 12:25h **#43 (Poster)** - *Determining Time and Material Cost of Reed
Boat Construction in the Mid-Atlantic*
by Pamela Holland;
Washington College, MD (US)
See Abstract page 46

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- 12:30h **Lunch Break**
Tour through labs
Outside the building: Picardt Experimental Event
-

14:00h Session 6 - Papers (15 min)

- 14:00h **#44 (Paper)** - *Experiment on Roman Cremation Burial from Viminacium*
by Milica Tapavički-Ilić PhD;
Institute of Archaeology,
Serbian Academy of Sciences and Arts (RS)
See Abstract page 46
- 14:15h **#45 (Paper)** - *Kicking Ash - Thoughts Following a Pilot Experiment with a Viking Era Bead Furnace*
by Neil Peterson (CA)
See Abstract page 47
- 14:30h **#46 (Paper)** - *Scientific Profit through Daily Routine: Examples from a 9th Century Potter's Workshop as Presented in "Campus Galli", a Medieval Construction Site in Southern Germany*
by Martin Rogier M.A. and Dr Hannes Napierala (DE)
See Abstract page 47
- 14:45h **#47 (Paper)** - *Relight my Fire. The Experimental Reconstruction of Roman Heating Tiles (Tubuli) Based on Archaeological Evidence*
by Tim Clerbaut, Sadi Maréchal and Nathalie De Haan;
Ghent University (BE)
See Abstract page 48
- 15:00h **#48 (Paper)** - *Will We Ever Be Able to Reconstruct Prehistoric Pottery Production Processes – The Role of Experiments*
by Andreja Kudelić;
Institute of Archaeology /
Centar za Eksperimentalnu Arheologiju, Zagreb (HR)
See Abstract page 49

15:15h Session 6 - Posters (5 min)

- 15:15h **#49 (Poster)** - *Of Kilns and Fuels. Experimental and Ethnoarchaeological Approaches to Chalcolithic Pottery Technology*
by Felix Adrian Tencariu PhD;
'Alexandru I. Cuza' University of Iași (RO)
See Abstract page 50

- 15:20h **#50 (Poster)** - *Fondation Roi Baudouin - Fonds Comhaire. Qubbet el-Hawa casting moulds (Aswan, Egypt): Experimental Archaeology of the Process of Antique Lost Wax Technique*
by Prof. Dr Georges Verly;
Musées royaux d'Art et d'Histoire de Bruxelles – EACOM (BE),
Dr Johannes Auenmüller M.A.;;
Research Center 'Old Sudan', Institute of Egyptology and
Coptology, Westfalian Wilhelms-University Münster (DE)
and Dr Frederik Rademakers;
KU Leuven – EACOM (BE)
See Abstract page 50
- 15:25h **#51 (Poster)** - *The Many Uses of Experiment in the Investigation of Erasmus' Bonnet*
by Geeske Kruseman (NL)
See Abstract page 51
- 15:30h **#52 (Poster)** - *Prehistoric Dances - Possibilities of Reconstruction*
by Ivana Turčin;
Centar za Eksperimentalnu Arheologiju, Zagreb (HR)
See Abstract page 51
- 15:35h **#53 (Poster)** - *The Freshwater Bivalves and the Eneolithic Community from Sultana-Malu Roşu Site (5th Millennium BC, Romania). Experimental Researches*
by Valentin Radu, Adrian Bălăşescu and Cătălin Lazăr;
Muzeul Național de Istorie a României, Bucureşti (RO)
See Abstract page 52

15:45h **Coffee & Tea**

16:00h Session 7 - Papers (15 min)

- 16:00h **#54 (Paper)** - *The Effect of Discipline Bias on the Accuracy of Reconstruction: a Case study of Dyeing in Pompeii*
by Heather Hopkins PhD (UK)
See Abstract page 52

16:15h **#55 (Paper)** - *Sharing the Knowledge: Collaboration between Prehistoric Experimental Archaeology and Primitive Technologists*
by Natalya Solodenko;
Tel Aviv University,
Michael Khorosh, Semion Smetanikov and Evgeny Gasin;
all: the Jerusalem Traditional Archery Club (IL)
See Abstract page 53

16:30h **#56 (Paper)** - *Experimental Archaeology: the Scope and Scale of Experimental Archaeology*
by Prof. Linda Hurcombe;
University of Exeter (UK)
See Abstract page 54

16:45h **Conclusion of the conference**

17:00h EXARC Annual General Meeting

(all welcome)

Presentations in the hall (for non members)

18:00h Pizza night & drinks

21:30h **End - leaving the building**



Tables and Presentations

(in the Hall)

Conference & EXARC info

EXARC

Experimenting with the Production of Roman Heating Tiles (Tubuli)

Tim Clerbaut

Prehistory Alive Worldwide

Lucia Ros

Manufacture of Roman silver coinage AD193-260

Nicola George

Prosthesis in the Long 19th Century

Charlotte Waller-Cotterhill

Determining Tannage Technologies in Prehistory

Theresa Emmerich Kamper PhD

Experimental Archaeology at Exeter University

Prof. Linda Hurcombe

Making Experimental Type Models of Whistles and Animal Calls

Annemies Tamboer and Riitta Rainio

Tools of the Trade: The Iron Age Smelter

Zechariah Jinks-Fredrick

Experimental Archaeology at UAM Madrid

Concepción Torres Navas and Prof. Dr Javier Baena Preysler

Experimental Archaeology at UCD Dublin

Prof. Aidan O'Sullivan

Archaeology Bookstore

Sidestone Press

You Can Find at EXARC's Table:



EuroREA

Issues 3 to 7 were published over the years 2006-2010, this was EXARC's Yearbook: 388 pages, 91 articles.

SET 5 Journals: EUR 35,00



EXARC Journal Digest

Ten issues published over a period of 6.5 years: 2011-2017; with a selection of the best articles published in the online EXARC Journal: 368 pages, 108 articles

SET 10 Journals: EUR 60,00

Note: Several Digests are also available as single issues.



***The Value of an
Archaeological Open-
Air Museum is in its Use***

R. Paardekooper | 2013

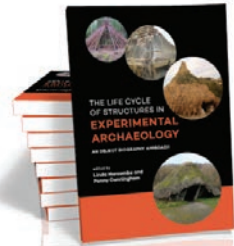
EUR 40,00



Experiments Past

Edited by J. Reeves Flores
& R. Paardekooper | 2014

EUR 35,00



***The life cycle of structures
in experimental
archaeology***

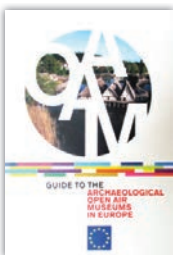
Edited by L. Hurcombe
& P. Cunningham | 2016

EUR 40,00



Communication Strategy for Archaeological Open-Air Museums (56 pages);
Guidebook for Live Interpretation in Archaeological Open-Air Museums (44
pages); ***Archaeological Open-Air Museums and the Dialogue with the Museum
Community*** (44 pages); ***Management of Open-Air Museums*** (132 pages)

SET 4 Manuals: EUR 40,00



Guide to the Archaeological Open-Air Museums in Europe

With presentations of about 220 such museums
Published in English and German, 200 pages

Edited by A. Pelillo et al. | 2009

EUR 10,00

Saturday 22 April 2017

Excursion day (separate booking required, maximum 60 people)

- 08:00h Gathering at the Central Station Leiden Bus Platform
- 08:30h Coach leaves
- 10:30h Arrival at the **Prehistorisch Dorp** (Eindhoven)
with coffee & tea,
welcome by the Museum Director, Dr Ward Rennen
- 11:00h Guided tour, workshops & demonstrations
- 13:00h Lunch
- 14:30h Departure from Eindhoven to Vlaardingen
- 16:00h Arrival at **Vlaardingen**
with coffee & tea,
guided tour & small program
- 18:00h Departure to Leiden
- 18:45h Arrival in Leiden

Times are subject to change!

If you have time after the conference and stay a little longer in the Netherlands (or do not join us for the Excursion), we suggest you visit:

- > **The National Museum of Antiquities**, Leiden
- > **The National Museum of Ethnology**, Leiden
- > **The Bulbflower Parade**: on Sunday April 23 beautiful parade floats will be on display in Haarlem (20 minutes by train from Leiden)
- > **The Keukenhof** (the world's largest tulip garden, 30 minutes by bus from Leiden)
- > **Archeon**, Alphen a/d Rijn (20 minutes by train from Leiden)



The Prehistorisch Dorp in Eindhoven

is one of the oldest archaeological open-air museums of the Netherlands, started in 1982 by Anneke Boonstra. They have an Iron Age part with two large farms, a smithy and several smaller buildings on the waterfront. Besides that, they have a medieval part with a

pub and three other large buildings. All buildings are based on local/regional archaeological examples. Both parts are used for educational programs as well as craft demonstrations and living history. The director will welcome us, following on which we will do some of the programs with enough chance to ask about the backgrounds and the why. The lunch which they will serve us will be made of local products. After this there is enough chance to explore the museum on your own.



Broekpolder Vlaardingen is near the Rotterdam harbours. Here we will get coffee / tea. We will visit a large park where one plans an archaeological open-air museum with buildings from all periods of the local past. The first building, a Stone Age house, was built in close cooperation with Leiden University. Colleagues

from university will explain all about that, but equally important is the story about this unique initiative: it is coming from the local population itself, a community initiative. At this moment, only volunteers are involved, and many of them are very active. Vlaardingen shows how a museum can be successful by being relevant to the local people.

Session 1
Key note
speech

#1 (Paper)

*The Gislinge Boat Open Source Project:
Reconstructing a Medieval Boat in a Digital Age*
by Martin Rodevad Dael and Triona Sørensen;
Viking Ship Museum in Roskilde (DK)

In 1993, the remains of a boat were discovered during drainage works near Gislinge in Denmark. Dating from ca. 1130 AD, the boat was remarkably well preserved and from 2015 - 2016, the Viking Ship Museum built two reconstructions of the Gislinge Boat as the focus of a multi-disciplinary project.

This collaboration between specialised craftspeople and academics has long been a central element of the experimental archaeological method. Both parties bring a specific set of skills to the table and have different, but complementary, roles to play in the processes of reconstruction and research, and the communication of the same.

Using the reconstruction of the Gislinge Boat as a case study, the first part of this paper will explore the experimental archaeological process from the perspective of the boatbuilder, looking at practical issues such as the selection of materials, and the various tools and techniques involved in reconstructing a 7.7m long clinker-built boat from the early Middle Ages. The second part will look at how the intricacies of maritime experimental archaeology were investigated, documented and communicated digitally within this multi-disciplinary context, examining the impact this had on the public's engagement with the project.

*Photo - The
Gislinge Boat Open
Source Project:
Reconstructing
a Medieval Boat
in a Digital Age.
By: Werner
Karrasch: Viking
Ship Museum
in Roskilde*



*Experimental Archaeology at Leiden University:
from the Macro to the Micro*

by Prof. Annelou van Gijn, Diederik Pomstra,
Annemieke Verbaas, Dennis Braekmans, Loe Jacobs,
Paul Kozowyk, Geeske Langejans and Femke Reidsma;
Leiden University (NL)

Session 1
Key note
speech

#2 (Paper)

Experimental archaeology is key to material culture studies.

From a better understanding of the properties of building materials, testing the performance of materials in laboratory context, examining technological processes and tools, or creating a reference collection for microwear analysis, experimentation is essential. Some examples of the range of experiments, from macro to micro, conducted at or in cooperation with the Leiden Laboratory for Material Culture Studies will be presented.

Annelou van Gijn, Diederik Pomstra and Annemieke Verbaas have conducted two house construction experiments in the past years, at Horsterwold and at Vlaardingen Broekpolder, based on the same Late Neolithic house plan. Aim was to quantify the entire chaîne opératoire (tool use, labour and building materials).

Repeating the experiment allowed us to make and subsequently assess different technological choices. Another aim was to create a house construction toolkit for the reference collection for microwear analysis. Especially the Broekpolder project is strongly embedded in the local community.

Dennis Braekmans and Loe Jacobs have conducted a series of pottery manufacturing experiments to test the performance of basalt tempered Iron Age cook wares. Paul Kozowyk has experimentally studied the influence of the production process of pine and birch bark adhesives on performance. He conducted a series of laboratory based lap shear and impact tests following modern adhesive testing standards at three different temperatures to measure the strength of these adhesives. Femke Reidsma addresses the geochemical preservation of organic fire traces in the Palaeolithic record. Her research lies at the intersection of archaeology, geology and organic chemistry and aims to use laboratory-based experimentation combined with a wide range of analytical techniques in order to better understand how fire affects different organic materials.

Session 2

#3 (Paper)

*(Re)constructing Early Medieval Roundhouses:
Entangling Yourself in History, Archaeology, Ethnology
and Experimental Archaeology*

by Prof. Aidan O'Sullivan, Brendan O'Neill
and Dr Eileen Reilly;

University College Dublin, School of Archaeology,
UCD Centre for Experimental Archaeology and Material
Culture (IE)

This paper will explore the reconstruction of an early medieval roundhouse (c.AD 700) at the UCD Centre for Experimental Archaeology and Material Culture (CEAMC) at the School of Archaeology, University College Dublin. It will investigate how experimental archaeology enables us to make a material reading of obscure texts, and provides challenges to our normative understanding of the archaeological record, while worrying us too about our incautious uses of ethnological sources. We can certainly use a range of historical, archaeological and folklife sources to try and understand how houses were built, organised and used in practical terms, while scientific testing enables us to explore aspects of light, smoke, heat, humidity and other environmental factors. However, most attractive of all is the capacity to challenge our own views of “what life was like in the past” and to glimpse how houses acted in social, ideological and gendered terms.

Session 2

#4 (Paper)

*Learning It the Hard Way: Insights in Continental
Turf Building Techniques*

by Daniël Postma PhD;

Archaeo Build / University of Groningen (NL)

From 2012 till 2015 the University of Groningen conducted an ambitious archaeological experiment in the north of the Netherlands. The aim was to build an early medieval byre with load-bearing walls of turf ('sod') blocks. The initial building process provided a steep learning curve, involving major structural concerns during construction and a disastrous collapse shortly after the first building's completion in 2013. In the years after, the building was entirely rebuilt with an improved design. This paper presents an overview of the technological insights gained in this exercise and argues that turf walls can be very strong, if their weaknesses are avoided.

*Some Aspects of Reconstructing Bronze
Working Technologies in the Context of Eastern Baltic
Bronze Age Archaeology Problems*
by Dr hist. Artūrs Tomsons;
Latvian National History Museum (LV)

Session 2
#5 (Paper)

Bronze Age in the Eastern Baltic started in second millennium BC (circa 1800 BC). As this region during the Bronze Age was quite far from main bronze sources of the time, there still is a plenty of evidence about local bronze working in hillforts and settlements, where working with imported metals and involvement in the network of resource exchange (assumably amber exchange and waterways played the most important role here) took place.

The problem of fully understanding the metallurgy problems of East Baltic Bronze Age is relatively small number of metal artefact findings comparing them with the relatively higher amounts of fragments of clay moulds and crucibles, which is statistically much more significant.

During this research, focus was on analysing and testing of available local materials for the production of the casting moulds. Several experiments were organized, where focus was on different quickly decaying materials like wood. Afterwards comparing the imprints on the surfaces of the actual metal artefacts and fragments of the moulds themselves afterwards was undertaken. Acquired data will help identifying particular features to pay attention in future archaeological investigations.



*Photo - Learning
It the Hard
Way: Insights
in Continental
Turf Building
Techniques*

Session 2 *Hardening Small Metal-Working Tools*
#6 (Paper) by Prof. Jonathan Thornton;
Buffalo State College (US)

This paper explores medieval methods of hardening small tools made of iron. Though small metal-working tools are currently made entirely of steel, effective results can be obtained by the surface hardening of soft iron tools. Techniques described in the early medieval treatise by “Theophilus” *On Divers Arts*, will be discussed and replicated where possible. Commentaries on these passages assume that they either would not have worked at all, or work due to the absorption of carbon to create a steel jacket on the tool (“case-hardening”). Generally ignored is the role of nitrogen in hardening. All of Theophilus’ methods could introduce nitrogen. The modern term for this is “nitro-carburization,” and it produces good results at lower temperatures than straight carbon absorption, and over shorter durations at critical temperatures. Microscopic study of cross-sections will be undertaken to look for the nitriding effect. Replication experiments already undertaken (small files) show good practical results, and produce “metallurgical ceramics” that have been found and published from metalworking sites roughly contemporaneous with the treatise. Preliminary results indicate that the techniques described by Theophilus were both entirely practical and widely understood at the time.

Session 2 *From Galena to Silver 2.0. New Results of an*
#7 (Paper) *Experimental Research*
by Luca Bartoni MA and Yuri Godino MA;
University of Siena (IT)
Lorenzo Teppati Losè MA;
all: ARES-Archeologia, Reenactment e Storia (IT)

The research proposed here follows the work presented, in the form of a poster, at the 9th EAC, held in Dublin in the January 2015: the experimental study aims to understand the transformation of the argentiferous lead, starting from the ore to obtain an impure alloy of silver and lead. In the last year, the authors have finalized the first experiments, improved the collection of data and reached new conclusions. We completed the bibliographical research about the archaeological sites of the early medieval Piedmont that presented traces of this process, carried out several other test and were able to obtain an almost “pure” silver.

Where Have all the Moulds Gone? A detailed Investigation of Early Medieval Bi-Valve Clay Moulds

by Brendan O'Neill;

University College Dublin, School of Archaeology,
UCD Centre for Experimental Archaeology and
Material Culture (IE)

Session 2

#8 (Paper)

Mould fragments and non-ferrous artefacts provide clear evidence that metal casting during the Irish early medieval period was conducted using two part (bi-valve) clay moulds. Yet there are relatively few moulds/fragments if compared against the number of non-ferrous objects. While different mould types that would leave little direct archaeological trace have been suggested, analysis of cast objects has failed to supply even indirect evidence to support these.

This research programme has instead explored the hypotheses of whether low fired or unfired clay moulds were used, examining their *chaîne opératoire*, the effectiveness of different firing temperatures, the impact of casting and exposure / disintegration.

In this presentation production processes, final results and a revised interpretation will be discussed, as well as the implications of these results for different time periods and regions.

Manufacture of Roman Silver Coinage AD193-260

by Nicola George;

University of Liverpool (UK)

Session 2

#9 (Poster)

I am currently undertaking a PhD at the University of Liverpool looking at the manufacture of Roman silver coinage AD193-260. The suggested poster will discuss the results of the experimental research from my thesis.

The research will look at the possible materials for Roman flan moulds, focusing on those used to create the silver coinage AD193-260. Three materials are to be tested (clay, limestone and bronze) and the micro-structural features of the resultant silver-copper alloy flans will be compared to the Roman silver coins. The objectives being to confirm the mould materials used, determine how different cooling rates dictated by the mould material can create surface effects such as inverse segregation (artificial enrichment) and analyse rates of oxidation in different moulds.

Session 2

#10 (Poster)

*The Marks of Metal: An Experimental Project
Using Microwear Analysis to Investigate Prehistoric
Amber Beads from North Holland*

by Matilda Sebire MA;
Leiden University (NL)

A current assumption within archaeological discourse is that the origin of metalworking in the past cannot be based on the presence of metal objects within the archaeological record due to their recyclable properties. In order to address this problem, many studies have instead investigated the microwear traces left by different tool materials in order to determine whether certain traces can be considered characteristic of metal tool use. The present study utilises experimental archaeology complemented by microwear analysis to investigate traces left by stone, antler, and metal tools during the production of amber beads, focusing particularly on the cutting and drilling stages of bead production.

Session 2

#11 (Poster)

*It's Complicated: An Experimental Approach towards
Understanding the Production Sequence of Dark-
Patinated Copper Alloys from the Eastern
Mediterranean Bronze Age*

by Marianne Talma cand. PhD;
University Kiel (DE)

Dark-patinated copper alloys appear in various time periods and regions worldwide and are characterized by the presence of minor amounts of gold, silver and other elements. The modern secretive Japanese process requires insider knowledge and practice to master. By using references and insights from goldsmiths, a humble attempt was made to isolate possible patination methods and agents available in the Bronze Age by analogy with the Japanese process. SEM-analysis was used to confirm or reject samples where cuprite and/or tenorite was not formed in the patina. A case is made for collaboration between experts of related disciplines and scholars working on the subject.

*Of Fire and Steel: A Case Study on the
Blacksmiths Tools from Garton Slack*
by Zechariah Jinks-Fredrick, cand. PhD;
University of Hull (UK)

Session 2
#12 (Poster)

While it is easy to see the ritual significance of both examples, the interpretation need not be so limited. Often in archaeology, the social implications and interpretations of ritual activity are merely on the surface, providing analysis of only relationships and associations but neglecting the physical and tangible importance of the technology and social structure behind the formation of the objects themselves. In the case of the Garton Slack pokers, they represent a very specialised and deliberate twisting pattern to the handle. This pattern would have required significant skill and knowledge on the smith's part to create. This paper will explore the technical process behind the formation of the set of blacksmith's tools at Garton Slack by an experienced blacksmith. Given certain restrictions in period materials, these tests will serve as a control for future test utilizing a modern forge with variation in fuel and airflow.

*Palaeolithic Complex Technology: Comparing Three
Aceramic Birch Bark Tar Production Methods*

Session 2
#13 (Poster)

by Paul Kozowyk;
Leiden University (NL),
Diederik Pomstra;
Het Stenen Tijdperk (NL),
and Geeske Langejans;
Leiden University (NL) and University of Johannesburg (RSA)

In Palaeolithic archaeology, the production of birch bark tar forms one important line of evidence for the use of complex technology, and thus complex cognition, by Neandertals. However, this critical debate is hampered because we do not know how tar was produced aceramicly. Here we report on successful field experiments applying three methods of birch bark tar production. By comparing the time investment, fuel consumption, raw materials, tar yield, and complexity of each method, we show that high and low tech production methods may have been used. These results are the first step in understanding the complexity of adhesive technology.

Session 3
#14 (Paper)

Did You Hear About Rolling Stones?
Experimental Approach to Lithic Tools Alteration and Its Influence in the Technological Reading
by Prof. Dr Javier Baena Preysler, Guillermo Bustos, Concepción Torres Navas and Sara Pérez Díaz;
Universidad Autónoma de Madrid (ES)

The lithic technological reading along with refitting is two of the main procedures/systems to understand human behavior recorded in lithic tools. During the last decades, several contributions have provided different methods to understand the reduction process and to define the particular stigmata used to build a reduction sequence. The technical and technological reading is one of the best resources to create diacritic schemas of the lithic configuration and exploitation. For this purpose, the recognition of technical and technological attributes is a basic tool.

But the post-depositional process usually hides the technical and technological traces due to surface alterations. One of the most common examples is the case of the fluvial / terrace deposits that contain a wide amount of the Paleolithic collections of all Europe.

In this contribution, through some experimental protocols that reproduce the effects of fluvial mechanical alterations in several conditions, we study the effect of different rounding processes, and their effect in the technical reading. As a result of the experimental protocol, we document the mechanical alteration process, and at the same time, hierarchized the value of each attribute in order to conclude which ones are the best for reading in each post-depositional process.

Photo - Did You Hear About Rolling Stones? Experimental Approach to Lithic Tools Alteration and Its Influence in the Technological Reading



the Mesolithic and Neolithic
by Silvester Ladanyi MA;
Cambridge University (UK)

Session 3
#15 (Paper)

My undergraduate dissertation focussed on shifts in prehistoric bow design and performance from the European Mesolithic to the Neolithic Age. Based on reconstructions, technological experiments and ethnographic analogies it looks at the transformation of the bow from a hunting implement to becoming a specialized weapon dedicated to inter-human conflict. In addition, it explored how such technological changes relate to materiality- symbolism, rock art and the emergence of warrior cults; all with the backdrop of first permanent settlements, the concept of ownership, accumulation of wealth, specialisation and social hierarchies.

I plan to build upon my past work and research comparable projectile technologies in Central Asia or Siberia. I am drawn to questions on how production/usage of tools and weapons have been determined by climate, availability of raw materials and pastoralism, and how this would have contrasted with the projectile technologies of previous hunter gatherer groups inhabiting Inner Asia.

From Notches to Combat. Experimental Archaeology and Use-Wear Analysis Applied to the Reconstruction of Prehistoric Swordsmanship
by Valerio Gentile MA (Res);
Leiden University (NL)

Session 3
#16 (Paper)

In the southern Netherlands, throughout the Bronze Age and Early Iron Age, several swords were selected to be deposited into rivers. In order to assess whether these objects had been used in combat before their deposition, and gain insights on the significance of their dismissal, an approach based on use-wear analysis and experimental archaeology is employed. This research proposes a methodology of identification of the traces of use on bronze swords based on an experimental approach that aims to conciliate the execution of realistic combat movements with a high degree of control over the possible variables.

Session 3

#17 (Paper)

Animal Teeth in a Late Mesolithic Woman's Grave, Reconstructed as a Rattling Ornament on a Baby Pouch

by Riitta Rainio;

University of Helsinki (FI)

and Annemies Tamboer (NL)

In one of the Late Mesolithic graves in Skateholm (Sweden) dating from c. 6000-4300 BC were buried a mother together with her newborn baby. 32 perforated wild boar teeth and traces of pigment were found in this grave as well. These were interpreted by us as a rattling ornament decorating a baby pouch of leather coloured with red ochre. We made an experimental reconstruction, and found the teeth function well as a rattle when moving the carrier. The reconstruction currently is on display in the European Music Archaeology Project's travelling exhibition on archaeological instruments.

Session 3

#18 (Paper)

Ashes to Ashes: Using Modern Analogues to Identify Fuels from the Past

by Gregg Griffin;

University of Bradford (UK)

Understanding how past people have dealt with scarcity of fuels is important in research into the economic structure and technology of ancient communities. This paper will discuss the use of fuel by people in the marginal environment of Orkney, and present methods developed to identify fuel material within archaeological deposits. This project produced ash from modern analogues to compare the properties of fuel including peat, willow, hazel, driftwood, heather, animal bone, animal dung, seaweed, and grasses. These modern analogues created a database for comparison with archaeological deposits. The ashes were characterized using SEM/EDX, magnetic susceptibility, pH, and soil color and the archaeological samples drawn from excavations in Orkney including Ness of Brodgar, Knowe of Swandro, and Smerquoy/Muckquoy.

Experimental Archaeometallurgy of Early-Middle Bronze Age Cyprus: Pilot Experiments of Copper Smelting at Pyrgos-Mavroraki

by Marco Romeo Pitone;

Newcastle University (UK);

Centro Studi di Preistoria e Archeologia, Milano; Centro di Archeologia Sperimentale Antiquitates, Blera (IT)

Session 3

#19 (Paper)

Pyrgos-Mavroraki, an early 2nd millennium BC proto-industrial settlement, is an excellent case-study on which to apply Experimental Archaeometallurgy because it presents many different elements connected to the *chaîne opératoire* of copper metallurgy, typical of Early/Middle Bronze Age Cyprus.

The site, excavated by the Italian Archaeological Mission of the ITABC-CNR of Rome (Institute for Technologies applied to the Cultural Heritage of the Italian National Research Council), revealed different metallurgical areas and a blacksmith workshop.

Among the metallurgical evidence of the entire copper processing (crucibles, moulds, anvils, stone tools), the huge presence of non-tapping slags all over the site and the identification of several structures interpretable as furnaces, suggested that some sort of smelting process took place at Pyrgos-Mavroraki.

In order to design an accurate protocol for the systematic experimental studies of the archaeometallurgy of this site (object of a Northern Bridge Training Partnership funded PhD at Newcastle University) some pilot experiments have been preliminary carried out to test the shape of the furnaces and different fuels.



Photo - Experimental Archaeometallurgy of Early-Middle Bronze Age Cyprus: Pilot Experiments of Copper Smelting at Pyrgos-Mavroraki

Session 3

#20 (Poster)

Chalcolithic Flint Hammers? Testing the Hypothesis through Experiments and Micro-Wear Investigations

by Diana-Măriuca Vornicu PhD;

Institute of Archaeology, Iași, Romanian Academy (RO)

The poster presents recent systematic experiments aimed to test the hypothesis (launched half a century ago) that the round / elongated flint artefacts displaying wear in form of fissures and chipping were used, in Prehistory, as hard hammers for knapping. This kind of artefacts is ubiquitous in the Chalcolithic settlements from the Moldavian Plain (Eastern Romania) where flintknapping activities were performed. The experiments consisted in using flint nodules of various morphologies, as hammers, in flake production. The micro-wear developing on the experimental items proved to be similar with the one from the archaeological pieces only after prolonged use.

Session 3

#21 (Poster)

On the Origin of the Plane: The Reconstruction of the Two-Handled Adze – a Practical Approach to Graeco-Roman Woodworking Tools

by Rüdiger Schwarz, BA MA;

Römerkastell Saalburg (DE)

The woodworking plane is obviously a Roman invention and can be found from the 1st century BC onwards. International treatises on the development of woodworking tools do not present convincing theories on the origin of the plane.

A less known ancient woodworking tool with two handles and a flat blade, depicted on several Hellenistic and Roman monuments, has been suggested as a possible link between adze and plane. Wolfgang Gaitzsch called it “adze-plane” (ascia-Hobel), a term that is still used in archaeological literature. Hartmut Matthäus has given a detailed account of depictions and archaeological finds of iron blades of the tool in question.

Based on the archaeological sources the author built a reconstruction of the “adze-plane” and used it for practical woodworking. It turned out to be equally suitable for chopping and carving. So he concludes that it is a specialized combination tool rather than an intermediate between adze and plane. As the tool lacks specific technical features of a proper plane, an alternative for the misleading term “adze-plane” is suggested: two-handed adze.

*Using Experiment to Determine the Sex of
Hand Images in Palaeolithic Art*

by Dr Anthony Sinclair, Jason Hall, Emma Nelson;
University of Liverpool
and Patrick Randolph-Quinney;
University of Central Lancashire (UK)

Session 3

#22 (Poster)

Hand images are the most commonly produced images in the European Upper Palaeolithic. As direct representations of the human body, many attempts have been made to determine the sex and age of the individuals whose hands were imaged. This determination is necessary if we hope to interpret the contexts and activities in which such images were made. The poster presents results from a study of experimentally produced hand stencils to develop reliable techniques for estimating sex. It will discuss levels of authenticity in experimental research as well as describing a new approach offering a reliable interpretation of the sex of hand images.

New Grounds: "Archaeobeekeeping"

Dr Sonja Guber;
Immenzitz (DE)

Session 3

#23 (Poster)

There is a huge gap in the knowledge about beekeeping for the prehistory of Central Europe. But there are a few finds giving evidence about beekeeping activities: Wooden objects interpreted as log hives (Neolithic and Bronze Age), a bee-skep out of rods (Germanic peoples 1st cent. AD) and finds of mead and/or honey throughout the prehistory. Also the necessity of beeswax is obvious for the bronze casting process. My aim is to rediscover "archaeobeekeeping", in research as well as practical. At the "Zeiteninsel" (Germany) I am going to successively build beekeeping material for five prehistorical time periods, show beekeeping in this ancient type beehives and try to rediscover ways to harvest and process honey and wax.

Session 4
#24 (Paper)

From Little Seeds Grow Mighty Trees: Reflections on Experimental Archaeology in College Classrooms

by Prof. Tim Messner;

State University of New York at Potsdam (US)

Over the last half-decade, applied learning has become a powerful tool used inside (and outside of) the college classroom. It is widely recognized that these initiatives provide students with opportunities for hands-on learning that reinforce concepts and ideas presented in a textbook or lecture. In this presentation, I explore the role experimental and reconstructive archaeology can play in accomplishing these pedagogical goals. While building on the foundation of existing scholarship relating to the use of experimental archaeology in higher education, this talk will push the focus forward by highlighting the different scales of impact these projects can take. Greater emphasis is placed on the efficacy of this pedagogical strategy in connecting students with higher level learning outcomes that only emerge through “high-impact” opportunities such as experimentation. To demonstrate these ideas, I draw on examples of student and faculty research conducted at the State University of New York at Potsdam.



Photo - From Little Seeds Grow Mighty Trees: Reflections on Experimental Archaeology in College Classrooms

*Learning To Recreate, Recreating To Learn.
Teaching Experimental Archaeology*

by Beatriz Comendador PhD, Aaron Lackinger BA;
Universidad de Granada (ES),
Elin Figueiredo;

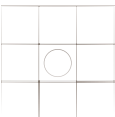
CENIMAT/i3N, Universidade Nova de Lisboa (PT)
all: Grupo de Estudos de Arqueoloxía, Antigüidade e
Territorio (GEAAT) & Universidade de Vigo (ES)

Session 4
#25 (Paper)

Improving ways of promoting experimental archaeology in
academic research.

This paper aims to present and discuss ongoing activities that
combine Experimental Archaeology and Ethnoarchaeology
developed in the scope of a master degree, a post-doctoral
and other research projects in University of Vigo (Spain), in
collaboration with open-air museums and educational centres.

Actions have focused on teaching about materials properties
and transformations, as well as on the design and application
of experimental protocols. Within this framework, we have
promoted the interest of students of archaeology on this subject,
as well as other-specialised public. Also, a richer transfer of
acquired knowledge to academia besides to the more general
public has been reached.



Session 4 *Experimental Archaeology as Applied Archaeology:
#26 (Paper) Using Food to Close the Gap*

by Prof. Dr Bill Schindler;
Washington College, MD (US)

Experimental archaeology is now viewed by much of the professional archaeological community as both an effective research tool and engaging form of public archaeology. It fills gaps in the vastly incomplete archaeological record and is an extremely visual and immersive way to inform the public about our shared ancestral past. However, the full value of experimental archaeology has not yet been reached; there is still so much more we can do. I believe experimental archaeology can also be a form of applied archaeology through which we can leverage our enhanced understanding of the past and the experimental process itself to address modern problems. Here, I will explore the possibilities of taking experimental archaeology to a new level by combining our increased understanding of ancient foodways with experimentation with modern culinary techniques in an effort to simultaneously reconnect people with their past and transform their relationship with their food and their environment.



*Photo - The
Experimental
Building of a
Wooden Watch-
Tower in the
Carolingian
Southern Frontier*

*The Experimental Building of a Wooden Watch-Tower in
the Carolingian Southern Frontier*

by Prof. Imma Ollich, Albert Pratdesaba,
Montserrat de Rocafiguera, Maria Ocaña
and David Serrat;
l'Esquerda (ES)

Session 4

#27 (Paper)

We present all the process and results of the experimental building of a wooden watchtower in the Experimental Area of l'Esquerda, in Catalonia. The project was approved and funded by Spanish Ministry of Culture.

The hypothesis is based on the archaeological remains of a tower basis carved in the rock found in the site of l'Esquerda, and some post-hole structures found along the river Ter. All these remains have been associated with the wooden structures built by the Carolingian army at the end of 8th century in the boundaries of the southern march of his empire.

The result is a 7.5 meters high tower over the river Ter, built in the rock without any metal and surrounded by a wooden defensive fence. The project is currently under experimental observation, and it is expected to be used as a part of the Archaeological Museum of l'Esquerda in the future.

*Using Experiment to Enhance Undergraduate
Academic Research Skills*

by Dr Anthony Sinclair and Jason Hall;
University of Liverpool (UK)

Session 4

#28 (Poster)

Undergraduates and Postgraduates have been studying Palaeolithic art for 10 years at the University of Liverpool. In that time, we have encountered significant problems in enabling our students to develop good academic research projects on this topic. Their experience of how such Palaeolithic art might have been made and viewed at the time limits their critical research thinking. This paper will discuss the design and development of a new range of experimental materials including a replica cave that we have developed at Liverpool and how they now support student research skills and self-designed experimental projects in this area.

Session 4 *Popularization and Experiment in Prehistoric Village, Pilsen (Czech Republic)*
 #29 (Poster)
 by Eliska Ventrubova and Jaroslav Novak (CZ)

A Prehistoric Village was built in the area of ZOO and Botanic Garden in Pilsen in 1999. The chosen site, between the enclosures of brown bears and grey wolves, presents appropriate environment for the reconstruction of the prehistoric settlement. In the next years there was no activity in the village. It ran to seed. However since 2011 the activities increase thanks to the Association "Oživená (pre)historie" – "Alive (Pre) history". Main interest is focused on the experimental reconstruction of the village, especially settlement and metallurgy area, pottery and textile production. The goal is to use original technologies in maximum. Small fields with the old species of wheat and many others are the integral part of the site. As the popularization of archaeology and Prehistory within the wide public is also very important, the results of the experimental activities are presented during so called "Days of Prehistoric technologies". Those take place eight times per year. Each of them is the interactive event targeted mainly on children and their parents. They can try many of the daily activities of prehistoric people and learn about life in Stone, Bronze and Iron Age. The actual information about archaeological activities in the region are available as well. Thus children can discover archaeological work and the history of our ancestors in the same time.

Session 4 *Silk, Teutonic Great Masters, Reconstructions*
 #30 (Poster)
 by Prof. Dr Małgorzata Grupa;
 Instytut Archeologii UMK, Toruń (PL)

The crypt of Kwidzyn cathedral (Poland) contained relics of three men buried there and 30 silk kinds from 14th c. Research proved that the remains belonged to Teutonic Great Masters who had been buried the same way as all the other rulers of those times - in court ceremonial clothes. Textile dye analyses enabled to establish the textile colors and on the base of preserved relics copies of garments were made. One of the cloaks was prepared of at least 14 kinds of different silk fabrics and does not remind a typical white cloak with a black cross.

*Making Medieval Food:
Experimental Archaeology as Experiential Learning*
by Scott D. Stull PhD;
Ithaca College, New York (US)

Session 4
#31 (Poster)

In 2016, two medieval dishes were created at Indiana University East following recipes from medieval cookbooks, using cooking vessels modelled after cook pots found at a tavern site from early 15th century Nuremberg. The recipes were drawn from 14th and 15th century German and French cookbooks. This project engaged students and faculty from departments of Art, Anthropology, History, and World Languages and Cultures. This interdisciplinary project provided students the opportunity to engage with historical practice and culture as a direct experience.

Prosthesis in the Long 19th Century
by Charlotte Waller-Cotterhill;
University of Sheffield (UK)

Session 4
#32 (Poster)

Examination of surviving post-medieval prosthetic devices offers insight into the origins of the state-of-the-art engineered prosthetics used today. The lack of written information about production methods and manufacturers of these devices leaves scope for further research to illuminate cognitive themes for producer, wearer and wider society. Production, distribution and use of two nineteenth-century lower-limb prosthesis – the Anglesey and Peg Leg – are the subject of this ongoing interdisciplinary PhD. Re-constructive experiments highlight skills, technical knowledge and chaine-opératoire needed for production, revealing dynamic relationships between craftsmen and environment. Despite increasing craft specialisation during this period, prosthesis production remained a ‘group-effort’ with cobblers, blacksmiths and woodcarvers all playing their part. It’s hoped engagement with living-history ideology can be utilised for exploring group-dynamics, subtleties within the crafting community and how these shaped craft and skill. This poster will present a background to this new research topic, experimental methodology and key archaeological implications under consideration, it will also present preliminary findings into collaborative craft effort.

Session 5

#33 (Paper)

Experimental Crop Cultivation on Salt Marshes

by Mans Schepers cand. PhD;

Groningen Institute of Archaeology,

Terp Research Group (NL)

Man-made mounds known as terps were built on salt marshes along the Wadden Sea coast from 600 BC-1200 AD. Excavations have shown that people grew crops on these marshes. Permanent dikes were not yet constructed, but various 'landscape modifications' have been identified. One of the theories behind these modifications, small dikes and ditches, is that they affected the properties of the fields. These theories are being tested experimentally on the Dutch marshes. The presentation will both deal with the preliminary outcomes, and the challenges rising while carrying out experiments in a world heritage landscape.

Session 5

#34 (Paper)

The Intersection of Experimental Archaeology

and the Chaîne Opératoire Approach in Ceramic Study

by Caroline Jeffra PhD;

Universiteit van Amsterdam (NL)

The *chaîne opératoire* approach, long established in lithic studies, has begun to gain more traction within ceramics. This time delay between maturation in one material class prior to another is in part attributable to the polysemic nature of surface features on ceramics; in some cases specific surface features may be the result of different techniques, in others a single technique may produce different surface features on different vessels.

The targeted use of experimental archaeology has begun to surmount this obstacle, aiding with identification of macroscopic surface features. This paper explores the intersection between experimental archaeology and the *chaîne opératoire* approach to demonstrate the potential for a broader-ranging understanding of not just the ceramics, but also the social interactions between the people making them. Through this explicit connection, we as experimental archaeologists are empowered to address issues of the socially bounded technical practices of potters (whether during periods of stability or change), as well as the character of social interaction among communities of craftspeople in prehistory.

Firing Pits and Pottery Production at Lugo di Grezzana (VR)(IT): Using Experimental Archaeology for the Interpretation of Archaeological Processes
by Annalisa Costa, Fabio Cavulli and Annaluisa Pedrotti;
Università di Trento (IT)

Session 5
#35 (Paper)

Several firing pits were found at the Early Neolithic site of Lugo di Grezzana (VR) in Valpantena, which relate to the Fiorano culture (5500-4900 cal BC). Pits are clearly characterized by charcoal and ash remains, strong rubefaction of the walls, oxidised sediments, artefacts and ecofacts modified by fire such as burnt clay, and burnt beams. One of the functional hypothesis evaluated is they were associated with ceramic production. In order to test this idea and to understand the processes that created the fire traces visible in this pits, experiments were carried out by firing pottery in similar features to those found on site. Through the results and observations achieved, it has been possible to compare the traces obtained with those of archaeological record and rebuild the steps that could led to their formation.

The paper aims to describe the methodological approach used and some of the effects that firing processes had on the Neolithic pits. Experimental archaeology strongly claims its importance in testing hypothesis for the interpretation of archaeological data.



*Photo - Firing
Pits and Pottery
Production at
Lugo di Grezzana
(VR)(IT): Using
Experimental
Archaeology for
the Interpretation
of Archaeological
Processes*

Session 5

#36 (Paper)

Hide Processing in Prehistory, an Experimental Approach to Prehistoric Tanning Technologies

by Theresa Emmerich Kamper PhD;

University of Exeter (UK)

The importance of skin processing technologies, in the history and dispersal of humankind around the planet cannot be overstated. This presentation outlines a systematic analysis methodology targeted at this specific material type, with the goal of determining the tanning technologies in use during prehistory, from extant archaeologically recovered processed skin objects. The methodology is a product of macroscopic and microscopic observations of a sample reference collection containing over 200 samples. Which were used to produce a database of defining characteristics and tendencies for each of six tannage types; wet and dry scrape brain tan, bark tan, alum taw, urine tan and rawhide. The sample collection is made up of twenty-two economically important species from both Europe and North America, as well as a collection of well used clothing and utilitarian items, made from traditionally processed skins. This research has demonstrated that archaeologically preserved objects made from processed skin can provide information about the tannage technologies in use prehistorically, as well as more detailed information such as manufacturing sequences and the conditions of use to which the object was subjected.

Photo - Hide Processing in Prehistory, an Experimental Approach to Prehistoric Tanning Technologies



*Testing the Accuracy of Clinical Imaging for Wrapped
Animal Mummies: an Experiential Approach*

by Dr Stephanie Atherton-Woolham;
Manchester Museum (UK)

and Dr Lidija M. McKnight;

KNH Centre for Biomedical Egyptology, the University of
Manchester (UK)

Session 5

#37 (Paper)

Getting accurate zooarchaeological data for wrapped ancient Egyptian animal mummies is problematic. For museum specimens, this is best achieved using non-invasive imaging (X-ray and CT); however, incomplete and fragmentary skeletal remains, accompanied by the likelihood of remains belonging to multiple individuals, can exacerbate the task further. A number of modern unidentified avian assemblages containing multiple incomplete individuals were mummified and imaged, before being unwrapped and the skeletal elements macerated. Identification of taxa using clinical imaging and 'bone-in-hand' techniques were undertaken and assessed to investigate their accuracy in the study of material of this kind.

*Popularisation of Archaeological Reconstructions with the
Public. Modern Fashion Straight from a Grave*

by Dawid Grupa;

Instytut Archeologii UMK, Toruń (PL)

Session 5

#38 (Poster)

The past years have reported numerous historical reconstruction groups created to familiarize various aspects of our ancestors' everyday life, basing on archaeological finds as signs of material culture. Because of practical reasons, preserving historical truth in reconstructions is a splendid didactic tool. It allows to depict past epochs combining simultaneously education and play by interactions between a reconstruction group and spectators. To obtain this effect we can use reconstructions made on the grounds of archaeological finds, excavated from graves of people living from the 16th till the 19th century.

Session 5

#39 (Poster)

'Re-rolling' a Mummy: an Experimental Spectacle

by Dr Lidija M. McKnight;

KNH Centre for Biomedical Egyptology,

the University of Manchester (UK),

Dr Stephanie Atherton-Woolham;

Manchester Museum (UK)

and Campbell Price;

the University of Manchester (UK)

Ancient Egyptian animal mummies and votive statuettes were often wrapped in linen, concealing the contents and providing sanctity to the remains. Many were unwrapped at the point of excavation to reveal the contents, but modern radiographic techniques allow researchers to virtually unwrap the objects and shed light on the wrapping methods used.

Experimental research at Manchester has successfully mummified animal cadavers, yet how mummies were wrapped, often elaborately, remains unknown. In February 2016, combining the expertise of conservators, textile specialists and artists, a modern mummy was 're-rolled' at Manchester Museum, marking the 40th anniversary of the unwrapping of Mummy 1770.

Session 5

#40 (Poster)

An Experimental Approach to the Analysis of

Morphological Features on Archaeobotanical Carbonized Barley Grain Kernels

by Linda Smit;

Groningen University (NL)

Using a combination of carbonization and burial experiments (in Paesens-Moddergat (the Netherlands) and Amaliapolis (Greece)), this pilot study analyzes the influence of the processes of carbonization, burial and excavation on the morphology of carbonized barley grain kernels (2- and 6-row; naked, hulled, polished and germinated). The resulting reference collection is used to re-evaluate carbonized barley grain kernels from Tell Chuera (Bronze Age; Northern Syria) in order to derive additional information on crop- and food processing in this site.

*Understanding the Archaeological Record:
Reconstructing a Warp-Weighted Loom*

Session 5

#41 (Poster)

by Tena Karavidović;

Centar za Eksperimentalnu Arheologiju (HR)

and Dr sc. Tajana Sekelj Ivančan;

Institut za Arheologiju, Zagreb (HR)

The paper deals with a reconstruction of a warp-weighted loom based on a rare find of 36 in situ loom weights in an object interpreted as a weaving hut at an archaeological site Virje-Sušine in Northern Croatia dated in late iron age (LtC 2/2 3rd - 2/2 2nd century BC). The case study includes theoretical framework for warping based on defining functional elements of different types of loom-weights (thread density, what yarn to use) and study of wear marks on weights which defined the way of usage. Series of experiments were carried out to define possible distribution of weights in the same loom setup, characteristics of woven cloth and wooden loom construction.

Linear distribution of different types of loom-weights and weights with incised signs within optimal loom setup showed some regularities which can be connected with technological requirement of producing cloth on a warp-weighted loom but also with design/pattern making.

The Production of Combs and their Life Biography

Session 5

#42 (Poster)

by Nathalie Pil MA;

Vrije Universiteit Brussel (BE)

Through experimental research followed by laboratory work, we try to reconstruct the production of combs and their life biography.

A reference collection is established through an experimental program. Then, traces, developed on the experimental samples and archaeological samples, are recorded with low and high power magnification. Finally, the traces on these objects are compared. The interpretation of the production techniques in chronically and regional different contexts can so confirm or refute typological subdivisions. The maintenance of local techniques can be explored, distinct ruptures in used techniques may be associated to other context-based roles.

Session 5 *Determining Time and Material Cost of Reed Boat Construction in the Mid-Atlantic*

#43 (Poster)

by Pamela Holland;
Washington College, MD (US)

Reed boats allow populations to reach food sources that would normally be inaccessible, but what were the time and material cost of these tools? The time and material cost for these vessels would affect which populations could afford to build them. By enacting an experiment in which a reed boat is built using locally available materials we can find out the answers to these questions. The implications of the data being gathered could be far-reaching and useful to many fields within anthropology.

Ms. Holland is an undergraduate student at Washington College in Maryland majoring in anthropology and history with a concentration in archaeology under the mentorship of Dr Bill Schindler.

Session 6 *Experiment on Roman Cremation Burial from*

#44 (Paper)

Viminacium

by Milica Tapavički-Ilić PhD;
Institute of Archaeology,
Serbian Academy of Sciences and Arts (RS)

During the Roman Era, Viminacium used to be the capital of the province of Upper Moesia and a legionary fort. It is situated at the right Danube bank in eastern Serbia. The excavations of this huge site have been conducted for several decades, revealing remains of city structures, but also of several large cemeteries.

Until now, more than 13,000 graves have been unearthed. Approximately one half of graves include skeletal burials, while the other half includes cremations. During excavations, the question arose whether the cremated deceased were burned on a common stake (*ustrina*) or above actual grave-pits (*bustum*).

This is why in March 2013 an experiment was conducted, aiming to solve this issue. The experiment included a Roman cremation of the Mala Kopašnica – Sase type, typical for the area of the Middle Balkans from the 1st to the 3rd century AD. It simulated a *bustum* (cremation directly above the actual grave-pit). Although much was learned and understood, many of the questions still remained unanswered and need to be investigated further.

*Kicking Ash - Thoughts Following a Pilot Experiment
with a Viking Era Bead Furnace*
by Neil Peterson (CA)

Session 6
#45 (Paper)

Experiments to construct Viking Era bead production equipment from Ribe (DK) have faced numerous problems over the years. One consistent problem in my experiments has been an excess of ash embedded in the glass. The next experiment sequence is designed to enable testing of a variety of chimney and furnace top shapes to determine their impact on ash in the working area. The initial run was made to test the measuring equipment and experimental process. This session will cover preliminary considerations coming out of that pilot experiment.

*Scientific Profit through Daily Routine:
Examples from a 9th Century Potter's Workshop as
Presented in "Campus Galli", a Medieval Construction
Site in Southern Germany*
by Martin Rogier M.A. and Dr Hannes Napierala (DE)

Session 6
#46 (Paper)

The open-air museum called "Campus Galli" (=court of St. Gall) is a construction site thought to demonstrate 9th century life and technology to the public, as well as to test archaeological hypotheses by an experimental approach. Within a period of several decades an entire monastery will be built, following the "Plan of St. Gall". After temporary workshops have been set up in 2013, work has focused on a wooden church to act as a predecessor for an abbey church to be built from stone later. Further buildings are being constructed as the project progresses.

This paper aims to demonstrate how the potter's workshop has been laid out, how the pottery kiln has been built, and what scientific profit has yet been achieved from daily routine in the potter's workshop.

Session 6

#47 (Paper)

Relight my Fire. The Experimental Reconstruction of Roman Heating Tiles (Tubuli) Based on Archaeological Evidence

by Tim Clerbaut, Sadi Maréchal and Nathalie De Haan;
Ghent University (BE)

One of the most widespread Roman architectural innovations is floor heating by means of the *hypocaustum* system. Essential parts of this system are the box tiles or *tubuli* who arrange for the hot air to travel through the walls towards the chimneys. Archaeological observations towards tubuli in different part of the Roman Empire led to a good understanding of their use and function. Recent material study added interesting elements on the understanding who these ceramic elements were made and mass produced. To prove their hypothesis an experiment was conduct with the goal to shape and fire Roman *tubuli* on a 1 to 1 scale. Results, new insides and potential pit falls will be presented during the paper.

*Photo - Relight
my Fire. The
Experimental
Reconstruction of
Roman Heating Tiles
(Tubuli) Based on
Archaeological
Evidence
Tapse tubulus (c)
Philippe Debeerst -
Photoeil*



*Will We Ever Be Able to Reconstruct Prehistoric Pottery
Production Processes – The Role of Experiments*

by Andreja Kudelić;

Institute of Archaeology /
Centar za Eksperimentalnu Arheologiju, Zagreb (HR)

Session 6

#48 (Paper)

Within the research program, Bronze Age pottery from several archaeological sites in NW Croatia is being systematically studied from a technological and archaeometrical point of view, and the results of these studies enable us to discuss about their significance in the context of a society or culture. However, these analytical methods are not always sufficient for a complete interpretation of the pottery production process. For that reason a research program that includes implementation of systematic experiments related to the different segments of the chain of operations in the process of pottery production is carried out since 2012. The experiments were designed to answer two basic questions: (1) which clay paste recipes (especially organic matter tempered clay paste) correspond to a paste that was used for pottery making in the Bronze Age and (2) is the destruction pattern of the hypothetically reconstructed firing structure (horizontal pottery kiln) comparable with the archaeological feature excavated at the Bronze Age site Kurilovec in NW Croatia. Pottery technology is a complex social phenomenon and it reflects a complex social behaviours, so possibilities of its reconstruction can be very limited. However, preliminary results of this research show that experiments have a very important role in the reconstruction of temper material preparation process, in the reconstruction of firing strategy and in the interpretation of the archaeological record.

Session 6 *Of Kilns and Fuels. Experimental and Ethnoarchaeological Approaches to Chalcolithic Pottery Technology*
#49 (Poster)
by Felix Adrian Tencariu PhD;
'Alexandru I. Cuza' University of Iași (RO)

While typology remained the favourite topic in studying the Cucuteni pottery (Eastern European Chalcolithic) for decades, still there are several poorly known aspects of the *chaîne opératoire*, like firing installations, fuels, etc. These gaps are caused primarily by the scarcity of the archaeological discoveries. This paper presents an integrated approach aimed to partially compensate them. On the one hand, a series of systematic experiments on pottery firing (using both archaeologically and ethnographically attested installations and fuels) were performed. Additionally, a short-term ethnoarchaeological fieldwork on the subject of traditional pottery in eastern Romania was conducted, with focus on the firing techniques.

Session 6 *Fondation Roi Baudoin - Fonds Comhaire. Qubbet el-Hawa casting moulds (Aswan, Egypt): Experimental Archaeology of the Process of Antique Lost Wax Technique*
#50 (Poster)
by Prof. Dr Georges Verly;
Musées royaux d'Art et d'Histoire de Bruxelles – EACOM (BE),
Dr Johannes Auenmüller M.A.;
Research Center 'Old Sudan', Institute of Egyptology and Coptology, Westfalian Wilhelms-University Münster (DE)
and Dr Frederik Rademakers;
KU Leuven – EACOM (BE)

The Egyptian Museum of Bonn University (Germany) houses a unique collection of artifacts, remains of an ancient Egyptian casting workshop (Late Period, around 500 BC). The casting moulds were discovered in 1969 by Bonn Egyptologists under Prof. Elmar Edel in rock-cut tomb QH 207 at the Qubbet el-Hawa necropolis opposite of Aswan (Egypt). Those artifacts are currently studied by Egyptologists (Bonn Egyptian Museum-BAM and EACOM), experimental archaeologists (EACOM) and natural scientists (KU Leuven and UGent). The data and results gained enable the researcher to recreate the whole casting process by applying experimental archaeological materials and methods.

*The Many Uses of Experiment in the Investigation
of Erasmus' Bonnet*
by Geeske Kruseman (NL)

Session 6
#51 (Poster)

Of Erasmus, prince of humanists (1466?-1536) no less than eight portraits from life survive – all eight in the exact same bonnet. A full investigation of this iconic garment involved establishing a 250-year typology of the bonnet from iconographical sources, compiling technological and economic data from archival sources – and highly systematic experiments to answer numerous, various and fundamental questions, from determining yarn characteristics in archaeological knitted textiles to the use (or not) of hatter's forms in the finishing of bonnets. This paper presents experiments which relate directly to archaeological evidence and which could not be included in the published investigation.

Prehistoric Dances - Possibilities of Reconstruction
by Ivana Turčin;

Session 6
#52 (Poster)

Centar za Eksperimentalnu Arheologiju, Zagreb (HR)

Dancing has always been and still is an integral part of the lives of individuals and communities - not only as a form of entertainment, but also as one of the important means of communication. In this sense, it forms part of the cultural identity and traditions, and this particularly refers to the communities from the ancient and recent past. However, due to its intangible nature, dance is a fairly rare topic in the archaeological research. As a part of the project "Forgotten movement" research was carried out based on several sources: archaeological, historical and ethnological. The project aims to examine the possibilities of this type of research and to ultimately try to reconstruct the dance movement of the past. The results of the research were shaped into three choreographies or dance constructions that were combined into a dance performance designed for the general public, as well as for the professional audiences. Three thematic dances were set in three periods of prehistory, based on the archaeological indicators which originate from the area of the northern Croatia. The aim of that program is to popularize archaeological heritage through educational dance program which proved to be a good example reenactment of the past, with opportunity for further upgrading.

Session 6 *The Freshwater Bivalves and the Eneolithic Community from Sultana-Malu Roşu Site (5th Millennium BC, Romania). Experimental Researches*
#53 (Poster)
by Valentin Radu, Adrian Bălăşescu and Cătălin Lazăr;
Muzeul Naţional de Istorie a României, Bucureşti (RO)

Macroscopic analysis of freshwater bivalves (*Unio* sp.) identified from Sultana-Malu Roşu site (5th millennium BC) allowed the identification some traces resulting from the voluntary actions of opening the shells for consumption.

We initiated an experimental study aimed to identify all activities employed, tools and materials used, and to inventory all the various traces resulted from opening the bivalves shell.

The information obtained in this experiment was used to realize the theoretical scenarios for the opening and consumption of these mollusks and highlight certain patterns in human-animal relations.

This work was supported by project no.
PN-II-PT-PCCA-2013-4-2302.

Session 7 *The Effect of Discipline Bias on the Accuracy of Reconstruction: a Case study of Dyeing in Pompeii*
#54 (Paper)
by Heather Hopkins PhD (UK)

The scale of the dyeing industry of Pompeii was reconstructed through classical archaeology, experimental archaeology, engineering principles and computer simulation. When introducing each new discipline it was realised that each one defined the same words differently. This exposed the subject bias in each approach, revealing unforeseen flaws and gaps in the understanding of the apparatus. Combining subjects allowed movement between experiment and experience, keeping integrity with the original artefacts. Dialogue with other disciplines allowed the study to evolve and expand further. Consequently the findings provide a more robust foundation for future preservation and reconstruction, while also demonstrating a new approach.

*Sharing the Knowledge: Collaboration between
Prehistoric Experimental Archaeology
and Primitive Technologists*

Session 7
#55 (Paper)

by Natalya Solodenko;
Tel Aviv University,

Michael Khorosh, Semion Smetanikov and Evgeny Gasin;
all: the Jerusalem Traditional Archery Club (IL)

Experimental archaeology is an integral part of everyday use-wear studies, which is designed primarily at identifying the function of tools, the way they were handled, and the materials they were used on. In order to deliver this knowledge to the wide audience, a collaboration between the academic community, primitive technologists and open-air museums is essential.

In this paper I'll present a sheep butchering experiment held in conjunction with Jerusalem Traditional Archery Club (Idanim – An Israeli Association of Historical Reconstruction). The results of this experiment shed light over the function of certain Prehistoric tools. Furthermore, the experiment is aimed at accomplishing not only academic goals, but also educational aspects and insights about technologies from different periods.



*Photo - Sharing
the Knowledge:
Collaboration
between Prehistoric
Experimental
Archaeology
and Primitive
Technologists*

Session 7

#56 (Paper)

*Experimental Archaeology: the Scope and Scale of
Experimental Archaeology*

by Prof. Linda Hurcombe;
University of Exeter (UK)

Experiments have proven to be one of the most adaptable and valuable methods applied in archaeological research and in public presentation. In scientific terms ideas can come from anywhere: what matters is a testable theory. In practice, the issue of experience as a research resource runs throughout discussions of the scope of experimental archaeology. It is a method which allows theory and practice to intertwine and this engagement of mind and body is what makes experimental archaeology such a valuable tool. The research activities range widely; from a simple two day experiment to a 10 year taphonomic study in order to understand the formation and erosion processes of the archaeological record within a landscape; from the multiple experiments necessary to build a usewear reference collection to building the first boat of its kind for 4,000 years within a maritime museum using mostly volunteer labour; from working with Archaeological Open-Air Museums in the five year Openarch project to 'Living Mesolithic' for eight weeks; from low tech to high tech by presenting traditional crafted replicas and 3D prints to assess methods to build a multi-sensory touchable experience in traditional museums and discovering new insights into the perception of experiences and questions of authenticity. Defining the strands of experimental archaeology clarifies its value for different purposes.

In such a diverse field there is a long list of beneficiaries. These range from the archaeologists who use experimental archaeology to the skilled craftspeople who so often help; from the volunteers who are drawn into the open-air museums which present intangible heritage in such tangible ways, to the public who enjoy a multi-sensory experience in those museums; from the popular accounts in the press reaching a wide audience to the research papers publishing the results for the scientific community. All these aspects help to generate and expand archaeological knowledge but there is another valuable contribution made by experiments and experiences when mind and body are engaged – learning to ask new questions.

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