

# **PROGRAMME & ABSTRACTS**



**African Conference on Experimental Archaeology  
Johannesburg 20th to 22nd March 2018**

THIS FIRST AFRICAN CONFERENCE ON EXPERIMENTAL ARCHAEOLOGY IS ORGANISED BY



AND SUPPORTED BY



AND THE NRF SARCHI CHAIR OF MODERN HUMAN ORIGINS, PROFESSOR CHRISTOPHER HENSHILWOOD

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**Local organizing committee:**

**Silje Evjenth Bentsen**

**Dominic Stratford**

**Tammy Hodgskiss**

**Jerome Reynard**

**Chrissie Sievers**

**Sarah Wurz**

**Sam Challis**

**Kelita Shadrach**

**Joshua Kumbani**

Dear Participants,

## **Welcome!**

On behalf of the local organising committee for ACE2018, I am delighted and honoured to welcome you to the first African Conference on Experimental Archaeology at the University of the Witwatersrand, South Africa. The rich and varied conference program includes welcome addresses from Dr. Molapo Qhobela, Professor Ebrahim Momoniat and Professor Bill Schindler, keynote addresses from Professor Lyn Wadley and Professor Innocent Pikirayi, and the Walking Tall performance from PAST. You can also enjoy 53 posters, papers, and workshops presented by students and researchers from 27 institutions (14 African, 7 European, 3 Asian, 2 American, and 1 Australian).

Ace2018 is co-organised by the Archaeology department, School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand and EXARC, the international organisation of Archaeological Open-Air Museums (AOAM) and Experimental Archaeology. I would like to thank the local committee members for all their hard work and Roeland Paardekooper and Magdalena Zielińska of EXARC for designing and updating our website. Many thanks also to the student volunteers who I am sure will keep the conference running smoothly.

I am grateful to the following (in alphabetical order) for their financial support of the conference:

Bruker South Africa (Pty) Ltd.

DST-NRF Centre of Excellence in Palaeosciences

IFAS-Recherche (Institute Français d'Afrique du Sud – Recherche)

NRF SARChI chair of modern human origins, Professor Christopher Henshilwood

The Palaeontological Scientific Trust (PAST)

Lastly, I would also like to thank YOU for bringing your expertise and engagement to the conference. I look forward to hearing the many interesting perspectives you bring and I hope many of you will also engage with the conference and each other on social media to reach an even larger audience (#ACEJoburg #ACE2018).

Best wishes,

*Silje Eyjenth Bentsen*

# **Scientific programme**

## **Monday 19<sup>th</sup> March**

Origins Centre, Wits Braamfontein East Campus, room 202

12.00-17.00 Registration

## **Tuesday 20<sup>th</sup> of March**

Wits Club, Wits Braamfontein West Campus

8.00 Registration opens

### **8.30-9.30 Conference opening**

Chaired by Dr. Chrissie Sievers

*Welcome addresses from:*

*Dr. Silje Evjenth Bentsen, chair of the local organizing committee*

*Dr. Molapo Qhobela, CEO of the National Research Foundation of South Africa*

*Professor Ebrahim Momoniat, Executive Dean of the Faculty of Science at the University of the Witwatersrand*

*Professor Bill Schindler, Chairman of EXARC, Director of the Eastern Shore Food Lab at Washington College and Visiting Assistant Professor at the University College Dublin*

9.30 Short break

## **10.00-11.30 Keynote addresses**

Chaired by Dr. Chrissie Sievers

**10.00**

**Professor Lyn Wadley**

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**Hot experiments and cool solutions**

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*Evolutionary Studies Institute,  
University of the Witwatersrand*

*Professor Wadley has conducted, published and supervised many experiments to replicate activities observed in the African Middle Stone Age. Her experimental work includes heat treatment of rocks, ochre and seeds, and hafting of stone tools with compound adhesives made from natural products like ochre and plant gum.*

10.30 Questions, discussion

**10.45**

**Professor Innocent  
Pikirayi**

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**Researching Great  
Zimbabwe: experimenting  
with site function,  
rethinking use of space**

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*University of Pretoria*

*Professor Pikirayi integrates his research with community and public engagement approaches with the objective of transforming and decolonising archaeological practice in southern Africa. His main research interest is the complex societies in southern Africa after 1000 AD, and particularly Great Zimbabwe, where he has documented water resources.*

11.15 Questions, discussion

11.30 Coffee/tea

## 12.00-13.00 Poster session

Chaired by Dr. Silje Evjenth Bentsen

12.00

Robert J Thornton<sup>1\*</sup>,  
Jonathan Thornton<sup>2</sup> &  
Njabulo Chipangura<sup>1,3</sup>

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### Zimbabwe furnace reconstruction and experimental use for gold refining and glass bead manufacture

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<sup>2</sup>Art Conservation (objects), Buffalo State College SUNY, USA

<sup>3</sup>Mutare Museum, Zimbabwe

*We reconstructed a furnace of unusual design based on a furnace photographed in 1992 (but probably excavated unsupervised earlier), based on 1992 and 2018 photography. The furnace is located within the Ziwa National Monument, Manica Province, NE Zimbabwe. Since the area hosts other evidence of gold ore processing and use and possible making of beads and raw glass, we explored the possibility that the furnace could have been used in this way. We succeeded in making one glass bead, and partially succeeded in melting gold out of a concentrate. We learned that, in addition to furnace design, fuel size, density, rate of feed, and draft are all critical but subtle factors in achieving sufficiently high temperatures.*

12.05

Kathryn Croll\* & Saireeni Naidu

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### Determining the amount of time taken to construct Group II stone walling in southern Gauteng

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Archaeology and Environmental  
Studies, University of the  
Witwatersrand, Johannesburg,  
South Africa

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*This study aims to estimate the amount of time it would have taken the Sotho-Tswana speakers occupying southern Gauteng during the 18th century to construct the stone walling which defined their settlements on the landscape. This experiment has not been officially conducted in South Africa before. It is difficult to operate this experiment under the exact same conditions and circumstances in which the Sotho-Tswana groups operated hence an approach using uniformitarianism principles has been adopted. We assume the landscape and conditions in the present are similar to that of the past. Specifically, this study aims to investigate the physical stresses and time constraints involved with the construction of stone walled settlements in southern Gauteng. The focus of this study is to determine the distances between the raw material sources and where the settlements were constructed to potentially add evidence to answer the question: Why did the Sotho-Tswana settle in this area? This study will also contribute to the knowledge currently available on the construction of stone walling in southern Gauteng specifically. The primary objectives of this research are to: i) calculate the amount of time it took to move enough stones from the source of the raw materials to the settlement site to construct a sample of 10 sections of walling (of similar dimensions) of Group II walling and ii), the amount of time it takes to construct each of the 10 sections. Both males and females will participate in this study in order for the researchers to determine whether there is an observable difference in the time taken to construct a section of walling between the two sexes and to remain as objective as possible. The researchers also acknowledge that even though the community which would be associated with the stone walling will not be involved in the study, the researchers hope to involve farm workers from the nearby farms and if that is not possible, our involvement of a variety of volunteers should offset not being able to use the local community. The results of the study will be presented at the conference.*



12.10

**Charné Nel\* & Stephanie Edwards Baker**

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**Taphonomic markings of scavengers based on wild feeding behaviour in Gauteng, South Africa**

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Centre for Anthropological Research, Department of Anthropology and Development Studies, University of Johannesburg, South Africa*

*Actualistic taphonomic research thus far has focused primarily on large mammalian primary- and secondary- feeding Carnivora. In order to expand our understanding of the holistic processes of bone modification from death to burial we investigated the taphonomy of lesser scavengers (i.e. scavengers smaller than Hyaenids). This was done using camera traps to record behaviour and analysis on bones collected post-feeding. Originally, the aim was to investigate Cape Griffon (*Gyps coprotheres*) and the White-backed Vulture (*Gyps africanus*) activity on a carcass, however throughout the study, other scavengers added to carcass modification. The results of this research suggest a model for lesser scavenging taphonomy palimpsests.*

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12.15

**Simangaliso Makalima\*, Jayne Wilkins, Ben Schoville, Kyle Brown, Khumo Matlhoko & Jessica Von Der Meden**

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**Evaluating and comparing raw material mechanical properties: An experimental study of raw materials collected from near Gamohana Hill, Northern Cape, South Africa**

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Human Evolution Research Institute, Department of Archaeology, University of Cape Town, South Africa*

*Humans make selective decisions about what raw materials to use for stone tool production based on lithic raw material quality and availability. Lithic artifacts from the Middle Stone Age (MSA) offer an avenue to explore a range of hunter-gatherer behaviors, including mobility, raw material acquisition, trade and exchange. This study focuses on identifying and characterizing the potential sources of raw materials used for stone tool manufacturing at Gamohana Hill North Shelter (GHN), Northern Cape, South Africa. Geological samples were collected as part of a larger regional survey of the area around GHN. After establishing raw material availability and distribution on the landscape, two mechanical properties were investigated: rebound hardness using Schmidt hammer (a proxy for fracture predictability) and abrasion hardness using rock tumbler (a proxy for durability). These tests were applied to three different lithic raw material types available near GHN - banded ironstone, chalcedonic chert, and fine-grained chert, to examine fracture predictability and durability variation that may have influenced decisions regarding raw material transport and discard. Study shows that MSA people were making selection choices based on these mechanical properties. This research contributes to a quantitative and objective approach to understanding lithic raw material quality, selection and use in the MSA of South Africa.*

12.20

Emily C. Watt<sup>1,2</sup>

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**Differential pre- and post-hardening mass of loom weights: a preliminary experiment**

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<sup>2</sup>Department of Archaeology, University of the Witwatersrand, Johannesburg, South Africa

Following the results of Mårtensson et al. (2009) on warp-tension for warp-weighted looms, a question was raised regarding pre- and post-hardening mass of loom weights. The objective of this experiment was to ascertain how much mass the loom weights lost during the hardening process and to suggest how much initial mass of raw material would be required to create the 'optimum' dry weight. Seventy roughly homogenous discoid weights were moulded, with the shape based on Late European Bronze Age loom weights, which are very similar to those found at Umm Muri, Sudan. Traditionally, looms with weights are thought to be a purely European phenomenon, however this could be attributed to poor preservation of the unfired clay weights in an African environment. The results of the experiment show consistent loss of mass across the loom weights. This implies that the loom weights would have had to have been made heavier than required, in order to attain the proper warp-tension once hardened. Future research could investigate how different clay types lose mass through the hardening process.

Reference:

Mårtensson, L., Nosch, M.-L. & Strand, E. A. 2009. Shape of things: Understanding a loom weight. *Oxford Journal of Archaeology* 28: 373-398.

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12.25

Leon Jacobson\* & Willem A. van der Westhuizen

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**How representative of the total compositional profile of a ceramic is a single sherd? An empirical study using XRF**

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Creating a chemical compositional profile of a ceramic suitable for provenance studies depends upon the sample used in the analysis being representative of the whole vessel. Compositional variability can result from a number of factors, i.e., the natural compositional variability of the clay source, mixing of two or more different clays, the addition of temper, usage and post-depositional alteration. In addition, apparent variability can be instrumental. Different sherds from the same vessel, when analysed in separate runs, could produce a different profile as a result of calibration issues. Here, we present the results of experiments to test the degree of variability present in a range of ceramics and their possible influence in a provenance study.

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12.30

Smita Geedh

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**Black & Red Ware Ceramics in Peninsular India: An Experimental Approach**

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Independent researcher

Great attention has been given to the typology, chronology and utilisation of Chalcolithic cultural ceramics in India, despite the fact that our understanding concerning the technology of manufacture of the ceramics remains restricted. Even though experimental archaeology has great potential for throwing light on ceramic manufacturing processes, such studies have been rarely undertaken in Indian archaeology. This study reinvestigates the manufacturing techniques of the ceramic assemblages of Chalcolithic periods in India using a multi-disciplinary approach involving experimental analysis. The focus was mainly on firing technology used for making ceramics and outdoor experimental firings were carried out in bonfires. The study has relevance to global archaeology in Africa and Asia particularly where ceramics are found in the early Neolithic and Bronze Ages. This research can provide methodological insights into experimental pottery replications and for comparative studies of African and Indian pottery technologies.

12.35

**Seminew Asrat<sup>1\*</sup>, Jonathan Reeves<sup>2</sup>, Matthew Douglass<sup>3</sup> & David R. Braun<sup>4</sup>**

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**Using GIS and 3D photogrammetry to understand the formational history of surface lithic assemblages in Koobi Fora, Kenya**

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<sup>1</sup>Cultural Heritage Research Directorate, Authority for Research and Conservation of Cultural Heritage, Ethiopia

<sup>2</sup>Human Paleobiology Doctoral Program, The George Washington University, USA

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<sup>4</sup>Center for the Advanced Study of Human Paleobiology, The George Washington University, USA

Surface scatters provide a way to investigate hominin behaviors over broad spatial scales. The behavioral relevance of such assemblages is heavily dependent on the influence of the post-depositional processes. Continued development of geospatial technology and unmanned aerial systems (i.e. drones) provide new ways to better characterize and describe the role of geomorphic processes on the formation of surface assemblages. In this study, the formational history of lithic surface assemblages from the Koobi Fora Formation, Kenya were characterized, using aerial photography, 3D photogrammetry, and GIS techniques. Subsequently, regression analysis was used to determine the correlation between variables such as artifact condition (i.e. preservation), scatter density, mass, and geomorphic surface characteristics such as slope and erosional potential for two localities from the Okote Member (FxJj 34 and FxJj 46).

12.40

**Bisrat Gebreegziabher<sup>1\*</sup>, Fikeru Mekonen<sup>2</sup>, David R. Braun<sup>3</sup> & Joanne Munga<sup>4</sup>**

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**Measuring skill level and the impact of raw material quality on Oldowan tools**

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The Oldowan stone tool industry can provide substantial information about the technological adaptation of early hominins. Although we currently understand that hominins were able to select certain rock types, we know less about why those rock types were selected. The ways in which Oldowan hominins used different raw materials in the past likely reflects on their technological capabilities. Here, we investigate the possible impact of skill level on hominins stone tool production of a variety of rock types from the Turkana Basin in Kenya. We tested the modulus of elasticity of basalt cobbles from the Turkana Basin using a device called ultrasonic transducer. Knapping experiments were conducted on these rocks, allowing us to independently assess the role of the modulus of elasticity on knapping procedures in freehand hard hammer percussion. We developed specific methods to also vary the skill level of the knappers so that skill level and mechanical properties could be independently investigated. The results of this experiment indicate that different skill levels will be manifested differently in some archaeological contexts. Insights from this experiment are used to interpret the data from Oldowan sites from the Turkana Basin.

12.45

**Misganaw G. Woldetsadik<sup>1\*</sup>,  
Ella V. Beaudoin<sup>2</sup>, David R.  
Braun<sup>3</sup> & Stephen R. Merritt<sup>4</sup>**

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**Experimental approaches in  
identification of used flakes  
through edge damage  
patterns at Koobi Fora,  
Kenya**

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University of Alabama at  
Birmingham, USA

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**Youssef Djellal\* & Abdeljalil  
Bouzouggar**

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**An experimental approach to  
the functional studies on the  
non-flint tools in Morocco**

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National Institute of Archaeological  
Sciences and Cultural Heritage,  
Rabat, Morocco

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**Ismail Ziani\* & Abdeljalil  
Bouzouggar**

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**An ethnoarchaeobotanical  
and experimental approach  
of macro-plant remains in  
the Moroccan Later Stone  
Age**

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*Decades of archeological research have revolved around the use of stone tools. However, our knowledge of individual tool function is still limited. Previous studies of edge damage have focused on microscopic damage patterns and are often limited to a subset of tools, which has methodological limitations. Previous experimental studies were conducted on macroscopic analysis of edge damage and resulted in better ways of identifying taphonomic impacts. Here, we developed an experiment to distinguish flakes used in experimental butchery from flakes that have been experimentally trampled by small ungulates. Through this experiment we accurately assessed tool function and attrition in relation to time used and number of cut marks. Our results indicate that this approach has the ability to distinguish use damage from post-depositional damage, but also that the extent of macroscopic damage does not increase with longer usage time and number of cut marks. There is no significant relationship between duration of use, total amount of edge damage and cut mark count. This may indicate that lithics with a high degree of damage, which were thought to be habitually used, may have had a shorter use life than previously thought.*

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*Use-wear analysis has become important when studying any prehistoric lithic collection. It increases our understanding of several data concerning prehistoric human groups, such as their behavior in response to the environment where they lived, site function and the relation between lithic tool function and climatic changes. We created an experimental protocol of use-wear analysis on quartzite lithic tools and tried to apply results on archaeological lithic tools from the Middle Stone Age/Middle Palaeolithic contexts of Dar es-Soltan I rock shelter in Rabat-Temara region and la grotte des pigeons, Taforalt localized in Beni Snassen massif.*

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*The application of anthracology and the study of crops residue was limited for a long time in environmental reconstructions. By using ethnoarchaeobotany, or ethnoarchaeology and experimental archaeology, one can identify important tendencies that can be used in vegetal macro crops reconstruction. We created a research protocol based on an inventory of vegetal biodiversity of Beni Snassen massif in the Nord-Ouest of Morocco and conducted an ethnographical study of the use of plants and trees as fire wood by the local population. We recorded the tools used to collect the plants and how the plants were collected and treated, and these data were used in experiments. The results are used to understand the Later Stone Age of Taforalt cave, localized in the same region where ethnographical studies were conducted.*

## Notes

13.00 Lunch

**14.00 Paper presentations**  
Chaired by Dr. Jerome Reynard

**14.00**  
**Cuan Hahndiek**

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**Testing the efficacy of ochre grinding as the prime mode of production for archaeological ochre**

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South African Heritage Resources Agency, Cape Town, South Africa

*Ochre production and use in archaeological contexts has been well documented. Its use for the production of paint for the painting of rock surfaces can be seen worldwide. Based on prior research which suggested that the prime mode of production was the grinding of entire ochre nodules into a fine grained powder, this study looks at the grinding process itself to better understand the mechanisms and effects of the process. This study is another step towards bridging the divide between rock art studies and excavated ochre assemblages which remain largely separate fields of enquiry. The study also has implications for the excavation of ochre assemblages and for identifying ochre production areas within archaeological sites.*

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**14.15**  
**Elizabeth Velliky<sup>1,2\*</sup> & Nicholas J. Conard<sup>3</sup>**

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**The ochre that binds: Investigating the effects of intensive water-screening on artefacts with ochre residues and organic binders**

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<sup>3</sup>Department of Early Prehistory and Quaternary Ecology & Senckenberg Center for Human Evolution and Quaternary Ecology, University of Tübingen, Tübingen, Germany

*There are numerous artefacts containing red ochre residues from Hohle Fels (HF) cave, although excavated sediments undergo intensive water-screening. We conducted an experiment to investigate which binders could survive water-screening. Red ochre from a nearby quarry was pulverized then mixed with various organic binders. These mixtures were applied to modern materials replicating HF artefacts, left inside the cave for 6 weeks then water-screened using the same protocol for archaeological materials. The results show that egg yolk and thick fats preserve the best, though the surface matrix also affected the strength of the binders and the appearance of the red ochre residues. Results are pertinent globally in understanding the effects that widely used excavation and sorting techniques have on residues.*

## Notes

14.25

Laure Dayet<sup>1\*</sup> & Cuan Hanhdiek<sup>2</sup>

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**The heating of yellow ochre: new experimental data and improvement of its archaeological detection**

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<sup>1</sup>UMR TRACES, University of Toulouse Jean Jaurès, Toulouse, France

<sup>2</sup>Department of Archaeology, University of Cape Town, South Africa

*Red ochre is the most common red colouring material used by hunter-gatherer societies in Africa. One way to produce red ochre is to heat yellow ochre. It is the chemical transformation of goethite, a yellow iron oxy-hydroxide, into hematite, a red iron oxide, that explains this change of colour. Evidence of this process can be found by using dedicated chemical analyses or microscopic examination. However, diagnostic features were mostly determined from experiments on pure nanocrystalline goethite. We present new results from several experiments done on natural fragments and powder of goethite, heated in an oven under controlled conditions, compared to others heated in an open fire.*

14.40

Tammy Hodgskiss<sup>1\*</sup> & Marine Wojcieszak<sup>2</sup>

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**The heat is on: Experiments to determine if intentional heat treatment of ochre can be identified through use-traces and surface features**

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<sup>2</sup>Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg, South Africa

*Colour change is a known product of heating ochre. Our research aimed to establish how to identify intentionally heated ochre pieces using non-destructive analyses. We used two methods to heat ochre pieces – open fire and a muffle furnace – at a range of temperatures. Pieces were examined and ground before and after heating and all physical features compared. A variety of colour changes were documented while hardness was not affected. Other physical surface features that we found may be important indicators of heating are metallic lustre, the formation of black ‘patches’, micro-fracturing and ‘moat’ formation around quartz crystals.*

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14.55 DISCUSSION

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## Notes

## 15.05

**Silje Evjenth Bentsen<sup>1\*</sup> & Sarah Wurz<sup>1,2</sup>**

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Red alert? The colors of heat-affected quartzite from the Eastern Cape, South Africa

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Behaviour (SapienCE), University  
of Bergen, Norway

*We report on two pilot studies to examine how heat exposure affect the colours of Eastern Cape quartzite. Locally sources quartzite samples were heated on an open fire, and some of the samples were subsequently submerged in water. The colours of the samples were recorded before the experiments and between each heating episode. The experimental samples displayed colours, cracks and breaks that were similar to those recorded in rocks used for cooking. These results have implications for the understanding of heat-exposed quartzite in the archaeological record.*

## 15.10

**Patrick Schmidt**

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**The role of experimental archaeology in interpreting past techniques used for heat treatment**

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Department of Prehistory and  
Quaternary Ecology & Department  
of Geosciences, Applied  
Mineralogy, Eberhard Karls  
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*Heat treatment of stone is commonly understood as one of the earliest efforts of humankind to deliberately alter the properties of naturally available materials. The earliest examples date to the African Middle Stone Age and were interpreted to be a proxy for “modern behaviour” or “complex cognition”. In later periods, heat treatment is often interpreted as marker of high technical skill or specialised craftsmanship. In order to come to these interpretations, archaeologists must know what past people actually did, i.e. they must understand and quantify the used heating technique. This is normally achieved by an approach combining experimental archaeology and the comparison of its results with archaeological artefacts. In this talk, I will demonstrate how this approach is used to interpret the fire-use of past human societies for stone heat treatment, using the results of my own research in South Africa over the last 6 years.*

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15.40 Coffee/tea

## Notes

## 16.00 Paper presentations

Chaired by Dr. Jerome Reynard

16.00

Chrissie Sievers

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**The use of ethnography and experiments to interpret the taphonomy of carbonised marula remains in rock shelters**

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*Carbonised remains of marula, Scelerocarya birrea, are found in many southern African hunter-gatherer and farming community sites. This is not surprising because marula are eaten by people and animals. The flesh is high in Vitamin C, the seeds are very nutritious and a source of protein, fat, and various micronutrients, and the fruits are easily harvested. Ongoing research exploring the presence of carbonised marula remains in caves and rock shelter sites has used experimental archaeology and ethnographic analogy to address various taphonomic issues concerning the presence of marula at the sites, namely whether marula fruits were introduced through natural agency, or by people for food; whether the charred remains represent waste from the processing of marula; whether carbonisation of the remains was deliberate or accidental; or whether the marula were introduced to be used as fuel, possibly for light or heat provided by the oily endosperm. The experimental approach in this research draws on work done in Spain on hazelnuts (López-Dóriga 2015), but is adapted to African circumstances.*

*López-Dóriga, I.L. 2015. An experimental approach to the taphonomic study of charred hazelnut remains in archaeological deposits. Archaeological and Anthropological Sciences 7: 39–45.*

16.15

Tanya Hattingh<sup>1\*</sup>, Marion Bamford<sup>2</sup> and Alex Schoeman<sup>1</sup>

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**Growing phytoliths: Can phytoliths be used as a proxy for domesticated plants at precolonial farming sites in southern Africa?**

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<sup>2</sup>Evolutionary Studies Institute  
(ESI), University of the  
Witwatersrand, Johannesburg,  
South Africa

*Currently, our understanding of the agricultural practices of precolonial farming communities in southern Africa is fragmented. This is, in part, due to a lack of macro-botanical evidence of plant usage at archaeological sites. In the absence of macro-botanical remains, phytoliths could be used as an alternative. Few research projects have, however, explored the diagnostic value of the phytoliths from indigenous crops in southern Africa. Consequently, comparative data is scarce. Growing comparative material in the Bokoni experimental garden was the starting point of this research. We discuss the experimental protocols followed in the cultivation of three African domesticated plants (Eleusine coracana subsp. coracana, Pennisetum glaucum and Sorghum bicolor subsp. bicolor), and in the processing of these plants to obtain phytoliths. Next we describe key diagnostic features of the phytoliths produced by these cultivated plants. This is followed by a brief discussion of the differences between the phytoliths produced by juvenile and adult specimens of each of these plants. Lastly, we argue that noting the various factors that impact on phytolith formation useful comparative phytolith data can only be generated through experimental cultivation.*

## Notes

16.25

Antony Higginson<sup>1\*</sup>, Karl Rumbold<sup>2</sup> & Justin Popescu<sup>2</sup>

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**Use of genetic analyses along with oral evidence to determine the microbial bioprocesses used in the production of ancient beverages in Africa**

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<sup>1</sup>School of Chemical and Metallurgical Engineering, University of the Witwatersrand, Johannesburg, South Africa

<sup>2</sup>School of Molecular and cell biology, University of the Witwatersrand, Johannesburg, South Africa

*Chemical analysis of residues on pottery shards has previously been used successfully to determine the ingredients used in the production of ancient beverages. However, identifying the microbes responsible for the fermentation of these beverages is more difficult as the microbes responsible have long since perished. The oral traditions of many African cultures have preserved the traditional processes used in the production of ancient beverages, with many showing the addition of fermentation enhancers to improve the fermentation by adding specific microbial agents to the beverage for the purposes of fermentation. Using genetic analysis to determine the microbial populations present on fermentation enhancing ingredients, this paper identified potential microbial species used in the fermentation of traditional beverages. Compared to modern processes it was found that no indigenous species of *Saccharomyces* were present on the fermentation enhancers in Southern Africa indicating other genus of micro-organisms were responsible for production of early fermented beverages in Southern Africa.*

16.40

Grant Hall<sup>1\*</sup> & Ceri Ashley<sup>2</sup>

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**What's cooking? The potential of stable carbon and nitrogen isotopic analysis of Iron Age ceramics and organic residues in understanding food preparation methods**

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<sup>1</sup>UP Stable Isotope Laboratory, Mammal Research Institute (MRI), University of Pretoria, South Africa

<sup>2</sup>Department of Archaeology & Anthropology, University of Pretoria, South Africa

*Ceramics are amongst the most common artefacts recovered from Iron Age and early contact sites in southern Africa. Over recent years there has been an increase in the application of chemical methods of ceramic analyses, particularly organic residues either adhering to ceramic surfaces or absorbed due to the porous nature of pottery. Stable isotope ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) analysis of organic residues, lipid extractions and ceramic powder has demonstrated the potential to identify and characterize these materials, providing information on diets, habits, technologies and vessel use. We explore this potential and present a set of bulk isotopic ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) results of residue and ceramic powder samples taken from both interior and exterior surfaces from examples of early contact and early Tswana ceramics from a multiple occupation site (KWH 4) from eastern Ngamiland, Botswana. All isotopic analyses were conducted at the University of Pretoria Stable Isotope Laboratory. Further experimental work is proposed using traditional preparation methods and indigenous food items prepared in modern examples of ceramic vessels. The resulting residues and ceramics will be subject to isotopic analysis and the data used to create a database for future work.*

## Notes

16.55

L. Jacobson\* & W. A. van der Westhuizen

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**The influence of temper on the chemical composition of pottery: An empirical study using XRF**

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, [L.J.heritage@gmail.com](mailto:L.J.heritage@gmail.com)  
Department of Geology, University  
of the Free State, Bloemfontein,  
South Africa

*Clay collected from a traditional potter was mixed with five different tempers consisting of granite, andesite, quartz, charcoal and bone in varying ratios. The samples were analysed by XRF. Theoretical results were also calculated using known values for the clay and tempers. The experimental and theoretical data were then evaluated by Correspondence Analysis.*

17.10

Anders Lindahl<sup>1,2\*</sup> & J. Bergman<sup>3</sup>

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**Optimising Archaeologic Ceramics h-XRF analyses**

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<sup>1</sup>Lund University, Sweden

<sup>2</sup>University of Pretoria, South Africa

<sup>3</sup>Department of Statistics, Lund University, Sweden

*We present the first results of an experiment which is aimed at ultimately producing recommendations for analysing archaeological ceramics specimens using handheld XRF analysis devices. In this experiment we study the effects of different measurement durations, different number of measured points and three different types of surface treatments (breakage, polished, grounded) when analysing ceramics specimens, while controlling for nine different types of clay and three different types of temper (no temper, sand, rock), in total almost 1000 analysed points. For each measurement, the proportions of 36 different elements and all other elements are estimated. In the cases with multiple measurements of a specimen, the compositional centre of the measurements is calculated. A complicating issue in the analysis is the large number of parts found to be below detection limit; 13 elements have more than 50% of the measurements below detection limit and for more than half of those (almost) all measurements are below detection limit. We try nine different strategies for imputing the values. Each estimated elemental composition is compared to a reference estimate using the simplicial distance. The log distances are finally analysed using analysis of variance with main and interaction effects. We find that the different surface treatments have the greatest effect on the distances: grounded specimens yield the most accurate estimates and polished surfaces the least. We also find a significant effect of increasing the number of measured points, but less effect of increasing the duration of the measurements.*



## Notes

# Wednesday 21<sup>st</sup> of March

## Workshops

9.00

**Karin Scott, Mariette Harcombe & Graham Reeks**

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**The ancients had Skills:  
Ancient throwing weapons**

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*HeritageworX*

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Meet at the Archaeology department, 2<sup>nd</sup> floor in the Origins Centre

*African peoples used a variety of weapons for hunting game. The skill involved to accurately use these weapons can only be appreciated through experimentation. This demonstration will involve participants using spears of various lengths and throwing a knobkierie to try and 'kill' our 'Grassy Gazelle' (A gazelle-shaped wooden superstructure covered with rolled grass). In addition, participants can try their hand at using an Atlatl (spear thrower). Although this weapon was not used within the African context, the technique involved is similar to that of throwing a spear by hand. The marks, or taphonomy, left on the ribs of the Grassy Gazelle, the spear's angle of penetration, coupled with the way in which the grass simulates the repelling action of animal hair, will be demonstrated and discussed.*

*Do you have the skills of the ancients?*

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9.00

**Justin & Catherine Pargeter**

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**Using the R software platform for data management and analysis in experimental archaeology**

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*University of Johannesburg & Emory University*

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Meet at the Archaeology department, 2<sup>nd</sup> floor in the Origins Centre

*Archaeology, and its experimental sub-discipline, is fast becoming a data-driven science. This growth has resulted in a growing chasm between practitioners with and without access to the practical knowledge and tools to process, review, and analyse quantitative data. Fortunately, the free and open-source R data analysis platform has emerged as one of the most powerful tools for data processing, visualisation, and modeling. Data analysis skill sets as applied on the R platform are also fast becoming a marketable skill which archaeologist can apply in the private sector. This workshop will cover two topics: 1.) an introduction to the basic structure and language of the R platform and 2.) a step-by-step data processing, visualisation, and analysis case study using a typical experimental archaeology data set.*

*While the workshop is introductory and open to all, it will benefit those who have a basic understanding of statistics and are comfortable operating a computer. **Participants must bring their own laptops with R installed.***

9.00

**Jerome Reynard**

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**Bone tool workshop**

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*University of the Witwatersrand*

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In the experimental area by the Wits Club.

*Bone was a readily available resource in the past and bone tools were thus a key component of Stone Age technology. Much of the research on bone tool production focusses on bone points. Given the durability of bone, it seems reasonable to assume that bone flakes would also be an important tool component. This workshop will focus on experimentally reconstructing bone flakes using knapping and other bone-modifying techniques. It will seek to address some important issues with regard to bone flaking. For example, given the relative ductility of bone in comparison to stone, would fire have been used to knap bone? Equifinality between marrow extraction and tool-making would make it difficult to discern between these two outcomes but are there specific percussion techniques that could be used to differentiate between subsistence patterns and tool-making?*

*This will not be a 'talk shop'; the workshop will involve practical experiments and activities conducted on the venue grounds. We will spend much of our time attempting to reconstruct bone flakes and other tools in an experimental area. Participants are expected to have knowledge of basic knapping techniques and be familiar with actualistic bone tool-making methods. Protective glasses and gloves will be supplied. We will also make available various skeletal elements from different size class animals to be used as bone tool blanks. Due to space limitations, the workshop will be restricted to 10-15 participants.*

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9.00

**Patrick Schmidt**

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**Heat treatment of silcrete**

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*Eberhard Karls University of Tübingen*

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In the experimental area by the Wits Club.

*Demonstration of heating silcrete from the Cape region.*

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13.00 Lunch

Served at Café Fino in the Origins Centre

**14.00**  
**Tammy Hodgskiss**

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**'Oh Ochre?' Workshop**

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*University of the Witwatersrand*

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Meet at the Origins Centre

*Ochre is found at almost all Middle and Later Stone Age sites and is still widely used around the world today. The regular collection and use of bright red ochre varieties, at a time when the first undisputed indicators of behavioural complexity are evident, have made it a significant interpretative tool in archaeological assemblages. However, there are inconsistencies in how to categorise and define ochre pieces, use-traces and ochre powder applications; which can make inter-site comparisons and understandings problematic.*

*This workshop will deal with issues of the discrepancies in ochre terminology, geological categorisation and use-trace identification. We will present a range of geological ochre varieties, and issues of identification and labelling will be discussed. The pieces will then be processed in multiple of ways by the workshop participants, during which technique and use-trace variations will be noted and debated. Pooling our collective knowledge on the topic (and related themes), we aim to gain a better understanding of the diverse ways to use and interpret this material. This workshop promises to be informative and integrative. Come and get your hands dirty!*

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**14.00**  
**Brigette F. Cohen**

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**Workshop on Carnivore Taphonomy in Africa: Experimental protocols, referential frameworks and knowledge gaps**

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*Department of Archaeology,  
University of Cape Town, South  
Africa*

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Meet at the Archaeology  
department, 2<sup>nd</sup> floor in the  
Origins Centre

*Carnivore taphonomy in Africa has previously focussed on large animals, particularly hyenas and felids, feeding on large-bodied prey. The taphonomic modifications of many African carnivore species have yet to be investigated. This gap blinds researchers to potential carnivore signatures in archaeological settings, and obligates researchers to infer African carnivore activity based on the modification patterns of European or American species. Additionally, there is little uniformity in experimental protocols or taphonomic criteria. Making comparisons between experiments or researchers inaccurate. This workshop aims to provide faunal analysts with the opportunity to discuss these issues and investigate ways to ameliorate these problems.*

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**14.00**  
**Javier Baena Preysler**

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**Knapping: Middle Palaeolithic technologies**

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*University of Madrid*

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Meet at the Origins Centre

*Middle Paleolithic experimental technology or knapping the MP. With this workshop, our aim is to show to a general public the variability of the lithic knapping technologies with particular attention to the European concepts of the Mousterian. From the beginning, participants will appreciate in detail particular solutions present in several knapping methods, and can at the same time actively participate in the knapping process and understand how this process is the result of many technical behaviors acquired by past human communities. By teaching some technical resources, the participants will appreciate the skillful and complete process present in the production of lithic tools.*

## **Short info on social events**

### **Tuesday 20<sup>th</sup> of March**

17.30 for 18.00

Cocktail reception at the Origins Centre Museum.

Finger food

Ethiopian Tej served by the Wits Microbrewery

### **Wednesday 21<sup>st</sup> of March**

17.30 for 18.00

Braai evening, meet by the Wits Club

Food included in the ticket

There is a cash bar. No cards accepted.

### **Thursday 22<sup>nd</sup> of March**

17.30 for 18.00

Conference dinner at Mike's kitchen in Parktown

Please do not walk alone to the venue. Ask volunteers or others for a lift or take an Uber or taxi.

Food and a drink included in the ticket, other drinks can be purchased from the bar.

# **Thursday 22<sup>nd</sup> of March**

## **Wits Club, Wits Braamfontein West Campus**

### **8.30 Walking Tall, The Tree of Life**

*Walking Tall, The Tree of Life is a professional physical theatre production and science workshop presented by PAST's acclaimed Walking Tall Educational Theatre Project. The workshop addresses aspects of the Life Sciences curriculum related to evolution, including genetics, natural selection and deep time. The theatre production depicts the shared origins of life and humankind, taking audiences on a 4.6 billion-year journey through time from the origins of the Earth to present day, focusing on the major stages of human evolution. It shows how an understanding of the shared origins of humankind is a powerful tool for combatting discrimination, and how the shared origins of all living things help to promote the conservation of nature and biodiversity. Walking Tall has reached over 1.3 million people, primarily schoolchildren, students and teachers as well as community, government and corporate audiences across Africa and in Europe.*

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Introduced by Professor Robert Blumenshine, Chief Scientific, Education and Fundraising Strategist for PAST and Professor of Anthropology at Rutgers University

9.30 Coffee/tea

### **9.50 Paper presentations**

Chaired by Dr. Sam Challis

**9.50**

**Karin Scott\* & Mariette Harcombe**

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**The ancients had skills: fostering public understanding through experimental archaeology**

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*\*Corresponding author,  
[kayscott@mweb.co.za](mailto:kayscott@mweb.co.za)  
HeritageworX, South Africa*

*Public archaeology is as much an activity as a theoretical concept. By including practical sessions in our courses, HeritageworX strives to create a better understanding of artefact type, manufacture, use and cultural significance. In doing so we stamp out false perceptions that “the ancients were primitive” and supplant them with “the ancients had skills”. From trying your own hand at making rock-art pigments, brushes and artwork, to knapping stone tools, skinning and butchering a bush pig, hafting spears and throwing atlats, we strive to bring the archaeological record to life in a manner which no textbook, lecture or documentary film can.*

## Notes

## 10.05

**Magnus M. Haaland<sup>1\*</sup>,  
Christopher Miller<sup>2,3</sup>&  
Christopher S. Henshilwood<sup>1,4</sup>**

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**Doing site-oriented  
depositional experiments?  
This is why you should  
consider taking a  
micromorphological block  
sample!**

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<sup>1</sup>Institute for Archaeology, History,  
Culture and Religion, University of  
Bergen, Norway

<sup>2</sup>Institute for Archaeological  
Sciences, University of Tübingen,  
Tübingen, Germany

<sup>3</sup>Senckenberg Centre for Human  
Evolution and Paleoenvironment,  
University of Tübingen, Tübingen,  
Germany

<sup>4</sup>Evolutionary Studies Institute,  
University of the Witwatersrand,  
Johannesburg, South Africa

*Micromorphology represents an effective micro-analytical technique that allows for the study of micro-stratigraphic relationships at archaeological sites and the correct identification of processes associated with them. A micromorphological investigation of an archaeological site involves the collection of structurally intact blocks of sediment in the field, and the subsequent microscopic study of these blocks through petrographic thin section analysis in a laboratory. Robust interpretations of archaeological thin sections often rely on access to comparative samples with known depositional history. Making a sediment-based comparative library for many different depositional scenarios is, however, extremely time consuming. Perhaps your depositional experiment can contribute?*

## 10.15

**Joshua Kumbani<sup>1\*</sup>, Justin  
Bradfield<sup>1,2</sup>, Neil Rusch<sup>1</sup>,  
Sarah Wurz<sup>1,3</sup>**

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**Musical instruments from  
the Later Stone Age at  
Klasies River and Matjes  
River?**

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Archaeology and Environmental  
Studies, University of the  
Witwatersrand, Johannesburg,  
South Africa

<sup>2</sup>Department of Anthropology and  
Development Studies and Centre  
for Anthropological Research,  
University of Johannesburg, South  
Africa

<sup>3</sup>SFF Centre for Early Sapiens  
Behaviour (SapienCE), AHKR  
Institute, University of Bergen,  
Norway

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*Archaeomusicology is under-researched in South Africa, indeed Africa as a whole. This is in spite of the fact that music is a highly pervasive form of social and symbolic expression found in all human societies. In the southern Cape, for example, the ancient musical expression has received virtually no attention, despite the intense focus on the origins and development of complex cognition or symbolic expression within the Middle Stone Age. For the Later Stone Age and ethnographically known populations social dynamics and symbolism are discussed, and here too musical expression per se is not often addressed. The subject of this paper is the sound-producing aerophone and the two forms that receive attention here are sometimes referred to as the bullroarer and the 'woer-woer'. Morphologically similar artefacts have been found in the Later Stone Age layers from Klasies River and Matjes River. The artefacts resemble the ethnographic instruments that were swung or spun to produce sound as recorded by, for example, Kirby. Here we report on our experimental approach to study the use-wear patterns that are produced on woer-woer or bullroarer bone instruments. The results of this experimental study will be used to assess whether the archaeological artefacts from Klasies River and Matjes River were indeed used for sound-making and musical purposes.*



## Notes

10.25

Lucinda Backwell<sup>1,2</sup>, Justin Bradfield<sup>2,3,4\*</sup>, Kristian J. Carlson<sup>5,2</sup>, Tea Jashashvili<sup>6,7,2</sup>, Lyn Wadley<sup>2</sup> & Francesco d'Errico<sup>8,2</sup>

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**The application of experimental archaeology and high resolution computed tomography to identifying the function of bone implements**

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<sup>1</sup>Instituto Superior de Estudios Sociales (ISES-CONICET), Tucumán, Argentina.

<sup>2</sup>Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg, South Africa

<sup>3</sup>School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, Johannesburg, South Africa

<sup>4</sup>Centre for Anthropological Research, University of Johannesburg, South Africa

<sup>5</sup>Department of Cell and Neurobiology, Keck School of Medicine, University of Southern California, Los Angeles, USA

<sup>6</sup>USC Molecular Imaging Centre (MIC), Department of Radiology, Keck School of Medicine, University of Southern California, Los Angeles, USA

<sup>7</sup>Department of Geology and Palaeontology, Georgian National Museum, Tbilisi, Georgia

<sup>8</sup>Centre National de la Recherche Scientifique, UMR 5199 - PACEA, Université de Bordeaux, France.

10.50

Jerome Reynard

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**Walking on bones: an experimental study on the effects of trampling on bone and its implication for occupational intensity**

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Email:

[Jerome.reynard@wits.ac.za](mailto:Jerome.reynard@wits.ac.za)

University of the Witwatersrand, Johannesburg, South Africa

*Reliably identifying arrows in the archaeological record is a challenging endeavour, and one that has far-reaching consequences for our understanding of the emergence of complex behaviour. Stress-related fractures that result from specific mechanical forces may be used to identify tools that have experienced mechanical force consistent with use as a hunting weapon. Ongoing experimental studies are using high-resolution CT scans to characterise microfractures in bone tools that develop from use in particular activities. We present CT results of six experimental bone points subject to desiccative conditions and longitudinal impact from bow hunting. The results are compared with a purported MSA arrowhead.*

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## 10.40 DISCUSSION

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*The effects of trampling are significant agents of bone modification at archaeological sites. Yet what constitutes 'trampling modification' and can it be mistaken for intentional bone polish? In this study, trampling experiments were conducted to explore the effects of abrasion and to determine the types of surface modification that could occur on bone in coastal sediment. The results show that modification caused by trampling can generally be differentiated from butchery markings. Using these experiments, and specific case studies, I also argue that trampling may be a significant proxy for occupation intensity, particularly in enclosed rock shelters or cave sites.*

## Notes

11.05

**A. Val<sup>1,2\*</sup>, S. Costamagno<sup>3</sup>, E. Discamps<sup>3</sup>, E. Claud<sup>4</sup>, M. Deschamps<sup>3,5</sup>, V. Mourre<sup>3</sup>, M.-C. Soulier<sup>3</sup> & C. Thiébaud<sup>3</sup>**

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**An experimental approach to test the influence of stone tool type on microscopic morphology of cut-marks with an application to the archaeological record**

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<sup>2</sup>Evolutionary Studies Institute, University of the Witwatersrand, Johannesburg, South Africa

<sup>3</sup>CNRS UMR 5608 TRACES, Université de Toulouse Jean Jaurès, France

<sup>4</sup>INRAP GSO, Centre de recherches archéologiques LGV SEA, France

<sup>5</sup>UNIARQ, Centro de Arqueologia da Universidade de Lisboa, Portugal

*A multivariate approach was applied to test the existence of microscopic differences in the morphology of cut-marks produced by simple, unretouched, flakes and three types of Mousterian stone tools (denticulates, cleavers and Mousterian points). Cut-marks on red deer (Cervus elaphus) long bones defleshed using different lithic implements during experimental butchery of whole carcasses were analysed using low magnification microscopy. Following existing studies, sixteen variables were recorded and the resulting dataset was statistically tested for significant differences between tool types. The same microscopic analysis was then applied to an archaeological sample of red deer long bone fragments from a Middle Palaeolithic site from France. Our results show that microscopic differences between cut-marks produced by simple flakes and those made by tools are not statistically significant and that important overlap exists between the cut-marks produced by the three types of tools. The application of the experimental results to the archaeological sample thus proved difficult. This study underlines the need for a cautious use of this type of method when analysing archaeological material.*

11.20

**Briana Pobiner<sup>1\*</sup>, Robert Kaplan<sup>2</sup>, Kris Kovarovic<sup>3</sup>, Jacklyn Rogers<sup>4</sup>, Charles Higson<sup>3</sup> & William Schindler<sup>4</sup>**

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**Investigating the Influence of Timing of Access and Butcher Experience on Cut Mark Variables with a Stone Tool Butchery Experiment**

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<sup>1</sup>Department of Anthropology, Smithsonian Institution, USA

<sup>2</sup>Department of Anthropology, Montgomery College, USA

<sup>3</sup>Department of Anthropology, Durham University, UK

<sup>4</sup>Department of Archaeology, Dickinson College, USA

<sup>5</sup>Department of Anthropology, Washington College, USA

*We conducted butchery experiments on pig limbs with Oldowan-style flakes, varying the amount of flesh removed before butchery and butcher expertise, to investigate the effects on cut mark number and length. While defleshed bones had more and longer cut marks than fleshed bones, and the novice butcher created fewer and shorter cut marks than the expert, these relationships were not statistically significant. Novice butcher cut mark length is much more variable than both expert butcher and 1.5 myr fossil cut marks from Koobi Fora, Kenya, and the fossil cut marks are significantly shorter than those created by both modern butchers.*

## Notes

11.35

**Jackson S. Kimambo<sup>1\*</sup> &  
Stephen Merritt<sup>2</sup>**

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**Traces of butchering and  
burning on skeletal limb  
element: Preliminary results  
of an experimental study**

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<sup>1</sup>Archaeology, University of Dar es  
Salaam, Tanzania

<sup>2</sup>University of Alabama at  
Birmingham, USA

*Traces of fire in the archaeological record provide information about how past humans used and controlled fire for various activities such as cooking, warmth and security. For example, FxJj 20, a Pleistocene site in the Koobi Fora Formation dating to 1.6 Mya, contains possible burned sediment and bone in association with stone tools. This research presents preliminary results of a 2017 actualistic study at Koobi Fora. The aim of this study was to investigate traces of butchery on fragmented burned limb bone skeletal elements using actualistic experimental butchering. Butchering was completed by a local Dassanech man specialised in the use of sharp lithics for butchering domesticated ungulates. Lithics (a basalt non-cortical flake, hammer and anvil) were used to ensure comparability with Earlier Stone Age site records. Two burning trials were completed on a pile of charcoal that measured 1 m in diameter and 10 cm in depth at the Karari Camp in Turkana, northern Kenya. Each trial included all limb fragments of one goat that was burned for 20 hours. The results revealed that individual skeletal elements and fragments often displayed traces of burning which are associated with different temperatures. Calcination on fragmented burned limb bones occur mostly on the mid-shaft portion. Calcined portions of bone preserve cut marks better than charred portions. Limb bone fragments are common in archeological records and are likely to represent traces of burning and butchering. Further work will allow the authors to better understand these processes in the archeological record in Koobi Fora.*

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11.45 DISCUSSION/COFFEE BREAK

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## Notes

## 12.10

Anaïs Canevet<sup>1</sup>; David Cochard<sup>1</sup>; Christopher Knüsel<sup>1</sup>; Michel Brenet<sup>1,2</sup>; Marion Corbé<sup>1</sup>; Anne-Marie Moigne<sup>3,4</sup>; Thibault Bienvenu<sup>5</sup>; Marine Fabrer<sup>1</sup>; Lee Rozada<sup>6</sup>; Daniel Cusimano<sup>7</sup>; Jennifer Parkinson<sup>8</sup>; Socorro Báez-Molgado<sup>9</sup>; William Henry Gilbert<sup>10,11</sup> & Antoine Souron<sup>1\*</sup>

*A Kolpochoerus majus (Suidae) cranium from Middle Pleistocene (0.6 Ma) deposits of Bodo, Ethiopia displays fractures on the vault and a linear mark on the occipital bone. Using an actualistic approach, we experimentally produced similar fractures and marks with various objects on a collection of heads of wild boars (Sus scrofa) from Tautavel, France. The results suggest that the fractures are consistent with peri-mortem blunt force trauma, and that the mark on the occipital resembles butchery cut marks. This fossil cranium could therefore represent the earliest direct evidence of animal acquisition and processing by hominids.*

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**An actualistic replication of a cranial fracture and linear mark observed on a Middle Pleistocene (0.6 Ma) fossil suid from Bodo, Ethiopia: human predation or natural cause?**

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## Notes

12.25

**Stephanie Edwards Baker**

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**A review on digital techniques for analysing carnivore-induced modifications and the future for cave taphonomy**

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Centre for Anthropological Research, University of Johannesburg, South Africa

*The mechanism of identifying a bone accumulator in cave deposits has seen much development over the past 100 years since the initial discovery of what is now the Cradle of Humankind. Initial techniques involved direct macroscopic comparisons between modern carnivores and those fossils within deposits. The advances in scanning and digital techniques have allowed for an unforeseen array of data collection regarding the palimpsest nature of cave deposits. While manuals like the “Atlas of Taphonomic Identifications” (Fernández-Jalvo & Andrews, 2016) have made scanned bone modifications accessible, we need to critically assess the validity and possible compounded issues with such manuals.*

*Fernández-Jalvo, Y. & Andrews, P., 2016. Atlas of Taphonomic Identifications: 10001 + Images of Fossil and Recent Mammal Bone Modification. New York, Springer.*

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12.40

**Brigette F. Cohen<sup>1</sup>\* & Job M. Kibii<sup>2</sup>**

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**Wild dog (*Lycaon pictus*) as a bone accumulator? Experimental taphonomic analysis of a large canid on leporid prey**

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<sup>2</sup>Palaeontology and Palaeoanthropology, National Museums Kenya, Nairobi, Kenya

*The wild dog (*Lycaon pictus*) is a gregarious canid found in many African contexts. Taphonomic research on wild dogs, like many other small carnivores is lacking. Carnivore taphonomy in Africa has focussed on large carnivores, like hyena and felids, feeding on large body-size prey. There are however, substantial gaps in African carnivore taphonomy. This study presents the results of an actualistic feeding experiment, utilising captive wild dogs and leporid (domestic rabbit) carcasses. This is one of the first studies to investigate wild dog modifications on small sized prey, and greatly expands the limited taphonomic framework for African canids.*

## Notes

12.50

**Tesfaye Wondyifraw  
Tsegaye**

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**An ethnoarchaeological  
study of hide working with  
iron scrapers in East Gojjam,  
Northwestern Ethiopia**

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*In northwestern Ethiopia, hide working is a skilled practice that involves turning raw hides into processed leather products. Hide workers use iron blades in wood hafts for scraping with plant oils for hair removal, softening, and coloring the hides. The study uniquely focuses on the specialized use of iron scrapers, which establishes a strong relationship between hide workers and ironsmiths who are the sole suppliers of the tool. No archaeological record relating to iron hide working scrapers nor the process of smelting and smithing of iron is available for Ethiopia, except the recovery of iron slags from some Aksumite sites. This paper offers an ethnographic study and description (chaîne opératoire) of the procurement, production, and use of hides with iron scrapers among the Amhara people living in the Enarj Enawga and Enemay districts of northwestern Ethiopia. The objective was to reveal details about the production, use, and discard of hides and iron scrapers. I focus on the local history of changes in raw material use for the scraping blade, and how tools are produced by iron smiths and subsequently hafted, transformed in shape and size through use, recycled into other tools, and eventually discarded by hide workers.*

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13.05 Lunch

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### **14.00 Paper presentations**

Chaired by Dr. Tammy Hodgskiss

14.00

**Matthew V. Caruana\* &  
Kathleen Kuman**

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**Characterizing bipolar  
reduction at Swartkrans  
Cave**

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*Bipolar knapping is an important method of lithic reduction found at numerous Earlier Stone Age sites across Africa, Europe and Asia. Typically, this knapping method is associated with the exploitation of quartz pebbles because of their small size, crystalline structure and brittle nature. Most publications describing bipolar features on cores and flakes focus on this association with quartz, but rarely are other materials discussed. Recent analysis of the Oldowan assemblage from Swartkrans Member 1 (2.19 – 1.8 Ma) has identified bipolar knapping across a variety of material types and found that the signatures of this reduction are consistent across quartz, quartzite and chert, although some features vary with the size and shape of the raw material packages. We present results on experimental knapping using the bipolar method on quartz and quartzite materials to characterize features of core and flake products in newly described Oldowan materials from Swartkrans. Some features are consistent, such as crushed platforms, opposing impact marks for smaller sized cores, and flat cleaved surfaces. Others, however, occur in lesser frequencies, such as ridged surfaces, segment-shaped removals, spalled pieces and splinter-shaped flakes. These we relate to the size and shape of the raw materials.*

## Notes

14.15

Justin Pargeter<sup>1,2\*</sup> & Paloma de la Peña<sup>3</sup>

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**Crystal quartz bipolar reduction: Results of a knapping experiment with reference to southern African Stone Age contexts**

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<sup>3</sup>Evolutionary Studies Institute & School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, South Africa

*Southern Africa's Late Pleistocene lithic record has several instances in which toolmakers systematically reduced crystal (hyaline) quartz with a bipolar strategy. Little systematic experimental work exists to explain this widespread process. Our experiments aim to describe the process of crystal quartz bipolar reduction, its successes and failures, and the resulting products. We then compare these data to several instances of Later Pleistocene crystal quartz bipolar reduction at Boomplaas Cave in South Africa and Ntloana Tšoana in Lesotho. Our results show that bipolar reduction is uniquely suited to crystal knapping and the close relationship between quartz crystals and blade/bladelet production.*

14.30

Ravindra Devra<sup>1\*</sup> & Anilkumar Devara<sup>2</sup>

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**A Report on Lithic Knapping: Experimental Archaeological Screening of Nubian Like Point Technology Dispersals in India**

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<sup>2</sup>Department of Archaeology & Ancient History, The M. S. University of Baroda, Vadodara, Gujarat, India

*Lithic technology is important to the understanding of modern human dispersals. Analysis of recent data for the occurrence of Nubian Point technology in different parts of South Asia shows the potential of such studies in understanding human migrations. Humans had to face various challenges when moving from Africa to Arabia and South Asia, and lithic raw material variability represents one significant challenge. We provide detailed descriptions of experimental knapping of Nubian technology in the Indian context on local raw material. The primary objective of this work is to replicate African technology in diverse environmental settings. Initial results suggest that Nubian-like point technology was present in South Asia during the late Pleistocene, but regional variations in the lithic technology are very likely due to variations in the available raw material.*

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14.40 DISCUSSION

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## Notes

14.50

Justin Pargeter<sup>1,2</sup>, Natasha Phillips<sup>3,4</sup>, Alex Mackay<sup>3,4</sup>, Marika Low<sup>3,4</sup>

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**Open-air preservation of miniaturised lithics: Experimental research in the Cederberg Mountains, Southern Africa**

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<sup>4</sup>Department of Archaeology, University of Cape Town, South Africa

*Open-air archaeology plays a limited role in southern African Late Pleistocene research, with most studies focused on rock shelter assemblages. Recently, archaeologists have noted discrepancies in the composition of Late Pleistocene lithic assemblages between some of the region's open-air and rock shelter sites. For example, although relatively abundant in rock shelters, Late Pleistocene Later Stone Age (LSA, c. 44 – 12 kcal. BP) bipolar cores are rare in open-air contexts. In this paper, we assess this discrepancy by testing for differential preservation of specific artefact classes and sizes in semi-arid open-air conditions. We placed a replicated assemblage of miniaturised cores and flakes on an archaeologically-sterile sediment surface in the Doring River Valley (South Africa) and recorded their movements over 22 months. Our results indicate that bipolar and freehand cores moved comparable distances within the study interval and that surface slope is the strongest predictor of miniaturised tool movement. We also show that 1) relatively flat lithics move disproportionately more and 2) random artefact orientations do not preclude local (ie., metre) scale artefact transport. Our data suggest that the paucity of open-air bipolar artefacts in Late Pleistocene LSA assemblages may have more to do with human behavioural variability at landscape scales than differential preservation.*

15.05

David Witelson<sup>1</sup> & Paloma de la Peña<sup>2,3\*</sup>

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**Trampling vs. retouch in a lithic assemblage: A case study from a Middle Stone Age spring site, Steenbokfontein 9KR (Limpopo, South Africa)**

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<sup>3</sup>School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, Johannesburg, South Africa

*Following the technological analysis of the lithic material from Steenbokfontein 9KR (Waterberg-Limpopo, South Africa), we hypothesize that the stone tools were knapped on top of disintegrated regolith layers and subsequently exposed for some time at the surface, perhaps for some millennia. The reason for this hypothesis is two-fold: the stone tools seem highly trampled and the percentage of retouch is extremely high for an archaeological assemblage. In order to test this hypothesis, we designed and performed a trampling experiment with silicified siltstone from the Waterberg to see if it was possible to distinguish retouch material from trampled material. We describe here an experimental program to assist distinguishing between i) anthropogenically produced pieces (retouched) and ii) pieces that are the result of natural and/or post-depositional processes (pseudo-retouched), such as trampling and long-term exposure. Moreover, we present the results of different technological tests to see which qualitative variables of our analysis were most successful in distinguishing between these two processes.*

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15.20 DISCUSSION/COFFEE BREAK

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## Notes

16.00

Isaya O. Onjala

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**Society, Archaeological landscape and the preservation of Dry Stone Building Tradition in Southwestern Kenya**

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University of Science and  
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*The last four decades have seen a number of research projects in southwestern Kenya attempt to understand the social organizations of groups of people who settled the region during the 2<sup>nd</sup> Millennium AD, and to find out why some traditions, particularly, the Dry Stone Building Tradition (DSBT), remain relevant until today. This paper provides interpretations of the archaeological features and related uses the walls are put to by the present populations in southwestern Kenya. It provides information on past societies, the creation of a robust archaeological landscape, which is the subject of archaeological investigation presently, and the preservation of a traditional skill (the DryStone Building Tradition) that would have otherwise died out. It is argued that the DSBT, which is still visible today in a number of areas (pictured below), forms a window through which the Archaeological Landscape (AL) and the formation of early Societies (S) can be seen.*



*Dry-Stone Building Tradition (DSBT) in Southwestern Kenya*

16.10

Dawn Green

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**Circle imprints of the Eastern Cape Drakensberg: using experimental archaeology as an independent line of evidence**

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University of South Africa, South  
Africa

*Circle imprints have been identified in at least six rock shelters in the Eastern Cape Drakensberg. Oral evidence indicated that these relatively homogenous circle imprints were made by Sotho and Xhosa women drying dung, sometimes mixed with clay, on rock shelter walls. To test this theory, a replication experiment was undertaken with the assistance of members of the local community. I report on and discuss this process and how it exposed an ingenious technology.*

## Notes

16.20

**Robert Tendai  
Nyamushosho\* & Shadreck  
Chirikure**

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**Unpacking service in  
context: An experimental  
study of Mananzve pottery  
(CE 1185-1730) using  
Kalanga ethnography**

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Materials Laboratory, Department  
of Archaeology, University of Cape  
Town, South Africa

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*Clay potteries are one of the antiquities that have been extensively used by Iron Age archaeologists to study precolonial farming communities of southern Zambezia. Whilst typological seriations of these potteries have played a pivotal role towards establishing group identities, roles of the pots in the daily lives of these communities largely remain unexplored. As an attempt to bridge this gap, pottery recovered from Mananzve (CE 1185-1730), one of the multi-component sites situated in south-western Zimbabwe was experimentally studied using Kalanga ethnography. Ultimately results from the study revealed a wide range of contexts in which the pottery probably served before eventual discard.*

16.35

**Jan C. De Vynck**

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**Modern analogues  
determine hunter-gatherer  
economies within the Cape  
Floristic Region and test  
archaeological theory**

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University of the Witwatersrand,  
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*Ethnography can inform Archaeology. Methods from various disciplines such as ethnobotany, phenology and human behavioural ecology based on archaeological results and theory, have exposed aspects of the economical energetic potential of the Cape Floristic Region for hunter-gatherers. Foraging experiments were performed with Khoe-San descendants on plant food, fuel wood and intertidal resources and the data are employed in agent based models, both on extant and extinct habitats. Here, modern analogues of intertidal foraging experiments are discussed as case study to test archaeological theory. Intertidal resources have been hypothesized to have played an integral role on human cognitive evolution through, firstly, the addition of its nutritional benefits and, secondly, from its potential productivity and dependability which would favour pro-social proclivities within hunter-gatherer groups and between different groups. Both hypotheses agree that these resources had to be productive and a long term addition to diet. Intertidal foraging experiments showed both impressive productivity and resilience to long term human exploitation and supported both hypotheses. A short discussion on additional intertidal foraging experiments with non-metal implement production, foraging and processing is given to further explain the value of specific ethnographic approaches in understanding pre-historic economies and human behavioural dynamics.*

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16.50 DISCUSSION

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17.00 CONFERENCE CLOSURE, DR. SILJE EVJENTH  
BENTSEN