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The Role of Culture in Early Expansions of Humans (ROCEEH)

Skulls and mandibles from Dmanisi. Photo by Donald Johanson

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THE ROLE OF CULTURE IN EARLY EXPANSIONS OF HUMANS

Editorial

The twelfth issue of ROCEEH's newsletter presents research about the early appearance of body ornaments in Africa, Europe and Southwest Asia. ROCEEH's scientists were busy organizing workshops and conferences in 2016, including two workshops entitled "The Lower Paleolithic of Arabia" in Tübingen and "Data availability, management and storage – Working with databases", in Sassari, Italy. Finally, we co-organized the International Senckenberg Conference "100+25 of Homo erectus: Dmanisi and beyond" in Tbilisi, Georgia.

Early body ornaments and the dogmas of modernity: a radical enactive critique

During the last thirty years, great interest has arisen concerning how the human mind changed during the course of evolution. An initial skepticism towards the possibility of a "paleopsychology", broadly motivated by the lack of a reliable object of science, such as the ancient mind, was overcome by the joint efforts of scholars delving into different fields of enquiry. A combination of approaches grounded in archaeological theory, paleoanthropology, empirical archaeology, cognitive science, linguistics and analytic philosophy has gradually come to define the field currently known as cognitive archaeology. This discipline attempts to reconstruct the properties of ancient minds by drawing inferences from the behavioral traces left in the archaeological record by past human populations.

One of the most controversial topics in this field concerns the appearance of artifacts interpreted as body ornaments within the archaeological record of early modern human and late Neanderthal populations. These artifacts are mostly represented by a series of perforated shells interpreted as beads, which appeared at early modern human sites such as Qafzeh and Skhul in Israel dated between 135–100,000 years ago, Oued Djebbana in Algeria estimated at 100,000, Taforalt, Ifri n'Ammar and Rhafas in Morocco between 85–70,000 and Blombos Cave in South Africa about 75,000 (Fig. 1). With regard to Neanderthals, such body ornaments include comparable perforated shells from Cueva de los Aviones (ca. 50,000) and Cueva Anton (ca. 40,000) in Spain and Grotte du Renne at the Chatelperronian site of Arcy-sur-Cure, France (45–43,000). Hare and wolf bones, presumably used as pendants, emerged from Buran Kaya III in Crimea around 38,000 years ago. Furthermore, recent evidence supports that Neanderthals removed talons at Krapina, Croatia (ca. 130,000) (Fig. 2) and Combe Grenal, France (ca. 90,000), and feathers at Grotta di Fumane, Italy (at 44,000) from birds of prey, presumably for ornamental purposes.

These findings assumed great relevance because body ornaments are considered to prove the presence of symbolic abilities in their makers, which are in turn considered as the essence of what is often defined as "behavioral modernity". The appearance of body ornaments has indeed been construed as supporting the existence of social dynamics that resemble those present in historical and ethnographic contexts. Body ornaments have been argued as proof of social consciousness that includes and goes beyond the individual level, marking intra-community values, such as social role and status, but also inter-community values, such as group identity and cultural idiosyncrasies. These ornaments have been considered to reflect and express the existence of these social concepts in the mind of their users;

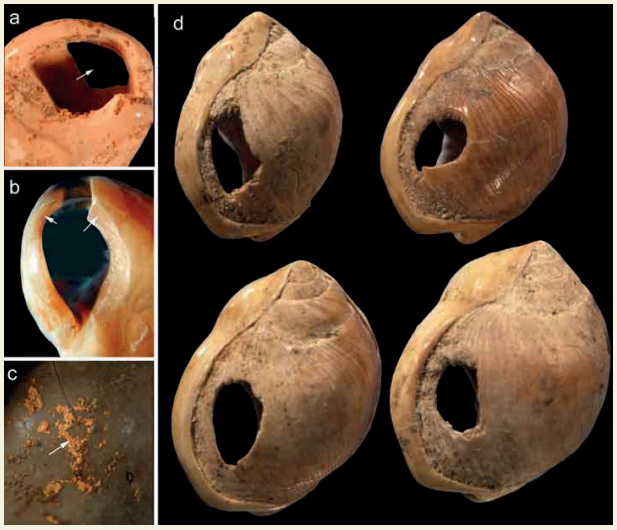
they would also support a form of language comparable with that adopted by current populations. Overall, the relationship among body ornaments, symbolism and "complex" cognitive abilities has been used to support cognitive equivalence between the ornament makers and contemporary humans. Thus, researchers conclude that behavioral modernity is not bound to "modern" anatomy, but can also extend to archaic species such as Neanderthals. Members of the ROCEEH team are currently contesting such linear connections between ornaments, symbolism, behavioral modernity and modern cognition. The criticism of this commonly held logic is articulated mainly along three multidisciplinary lines of argument, as detailed in the following discussion.

The first objection contends that the aforementioned linear connection stems from a series of "modern-centric" intuitions, that is, emotionally driven hunches. In particular, scholars have tended to include some artifact types, such as body ornaments, within a broad category of modernity, since these artifacts feel too "complex", "special" or simply "typical of modern humans" to be behaviorally "archaic". Artifacts perceived as modern are then directly associated with "modern" mental systems. However, such intuitive connections between artifacts and behavioral/cognitive modernity are already decided in advance, without undergoing a process of deep critical reflection. In this way, the entire scope of cognitive archaeology is limited to the definition of such criteria for modernity and the identification of artifacts that belong to this category within the archaeological record.

In cognitive archaeology, several counterarguments to the notion of behavioral modernity have been proposed during the last decade. Only recently has the consolidation of a more thorough multidisciplinary expertise allowed deeper criticism of this concept. On these grounds, cognitive archaeologists associated with ROCEEH have recently argued that inferences between the archaeological record and the cognitive level must result from an analytical process based on the mapping of artifacts onto theories of cognitive organization. In fact, cognitive archaeology strives to infer the minimal cognitive capabilities to explain archaeological findings. Criteria for plausibility have been defined in order to allow the selection of the best explanation among a set of possible alternatives. Most importantly, this approach emphasizes the idea that theories of past cognitive systems ought to emerge from an analytical process and cannot be decided in advance, as the traditional method based on behavioral modernity has done.

The second objection maintains that "modern-centric" intuitions persist, even when the level of analysis is raised, and minimal cognitive explanations for artifacts are properly taken into account. Indeed, artifacts and past behaviors are primarily explained by means of the most demanding cognitive processes which characterize contemporary cultures. Even in the most epistemologically informed cases, it is common to find models that explain the emergence of artifacts in terms of demanding computations employed by their makers. In particular, early body ornaments are often explained by considering their meaning as an abstract concept, such as "beauty", which is first created in the mind of the maker, then ascribed to body ornaments, and ultimately shared at the social level. Furthermore, this social sharing is often conceived in terms of full-blown theory of mind, namely the ability to understand what ornaments mean by "reading" their meaning directly within the mind of others. Simply put, the ornaments say: "I know that you know that these ornament signify beauty".

A critique of these "modern-centric" biases is articulated by following the more general approach introduced in cognitive science by philosophers Anthony Chemero, Daniel Hutto, and Erik Myin. This approach, known as radical embodied cognitive science, focuses on the extent to which it is possible to explain the cognitive life of past agents without their reliance on costly computations which they performed over mental



◀ Figure 1: Blombos Cave *Nassarius kraussianus* marine shell beads (right), with details of use-wear patterns likely related to stringing and wearing processes (left). Photos by Christopher S. Henshilwood and Francesco d´Errico. Licensed under Creative Commons Attribution-Share Alike 3.0 imported via Wikimedia Commons: https://en.wikipedia.org/wiki/File:BBC-shell-beads.jpg

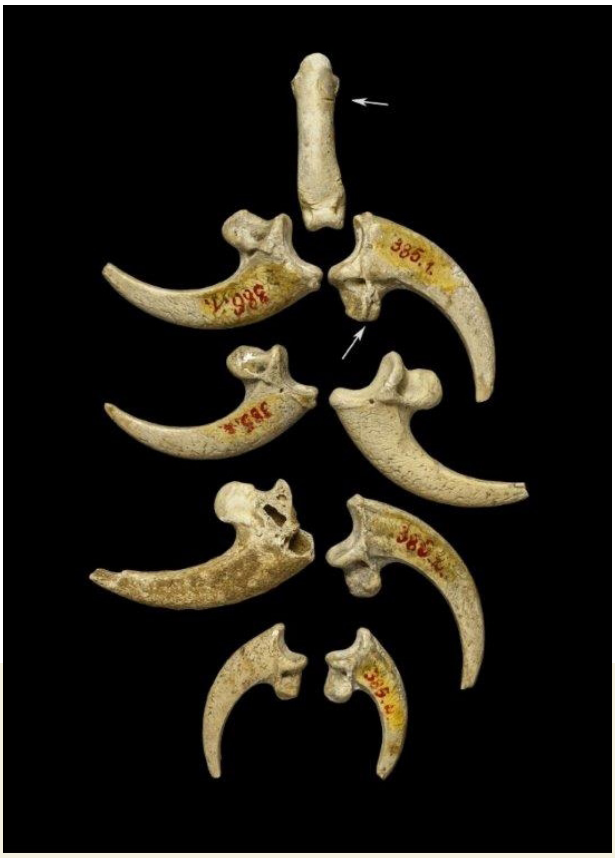
representations of the world. In contrast, radical embodied cognitive science aims to assess how the direct coupling of the body, material culture, and the environment can scaffold the cognitive process by simplifying the nature of the operation to be performed. Our approach adopts radical enactive principles to show that body ornaments do not necessarily require presumable signature properties of modern cognition, such as abstract conceptualization or theory of mind. Indeed, objects of aesthetic interest can engender emotional reactions in observers, allowing an individual to directly perceive such reactions and grounding the meaning of the object directly "in this world". This embodied relationship between humans and artifacts can supersede the need for meanings first to be imagined in the mind, and then socially shared through theory of mind.

As a third line of criticism, we argue that the mainstream logic in archaeology often allies with neurocentric models in evolutionary psychology. According to these, behaviorally modern artifacts result from a series of adaptations defining mental abilities as the tools of a Swiss Army knife, each adapted to solve a particular problem in the world. Symbolism, thus, appears as nothing more than an evolved cognitive package, through which innate meanings are programmed by natural selection in order to be attached to items and absolve the function of their significance.

Recently, these tenets have been criticized by proponents of material engagement theory, such as the cognitive archaeologists, Lambros Malafouris and Carl Knappett. This theory emphasizes the idea that artifacts are not simply the passive outcome of internal representations processed within our brain. Nor is meaning mentally constructed and then imposed onto artifacts in a linguistic fashion. In contrast, the human mind forms a series of dynamic interfaces with material culture, whereby artifacts become integrated into cognitive process. Artifacts scaffold cognition by offering new affordances for action, fostering new relationships, and creating new cognitive functions. In line with this enactive agenda, symbolism is explained as a cognitive phenomenon brought forth through the long-term engagement with non-symbolic material scaffolds. In this way, early body ornaments not only reduce the cognitive load by allowing the direct social perception of emotional reactions. They also perform a cognitive transformation by enabling new social relationships and meanings, which can become the target of linguistic labels in the long term. The emergence of narratives composed of basic propositions out of this level of embodied social perception (e.g., "everybody obeys the adorned man") could then allow humans to become familiar with a series of social relationships without the need to explicitly think about the content of other people's minds, that is, without theory of mind. At the same time, such basic narratives are social artifacts in themselves, allowing the emergence of full-blown theory of mind and linguistic representations of the kind: "I know the chief will act in the way Y when he thinks X".

This continuing project of the ROCEEH team combines the three lines of argument presented above within a unified approach. The aim is to assess to what extent a combination of direct social perception and basic narratives can explain the emergence of Paleolithic ornaments and figurative art before a full-blown theory of mind is required. The main goal of this project is to advocate that great cognitive sophistication could be obtained even within the context of qualitatively basic cognitive systems. In contrast, the presumed hallmarks of modernity might appear as quite recent cognitive developments. Preliminary analyses connecting early body ornaments to cognitive scientific theories show that these artifacts could actually be compatible with less sophisticated mental systems. If we confirm these results, the presence of body ornaments in either the early modern human or the Neanderthal record would not necessarily support their cognitive equivalence with contemporary modern humans.

Duilio Garofoli



◀ Figure 2: White-tailed eagle talons from the Krapina Neanderthal site, Croatia, ca. 130,000 years old, presumably used for ornamental reasons. http://www.eurekalert.org/multimedia/pub/87998.php – an open-access article distributed under the terms of the Creative Commons Attribution License. Photo by Luka Mjeda

Conference Reports
The Lower Paleolithic of Arabia

Workshop – Tübingen, 24–26 July 2016
Organizers: Knut Bretzke, Nicholas J. Conard

Over the past decade increased efforts in a growing number of Paleolithic field projects led to significant discoveries on the Arabian Peninsula. This has brought the Arabian Peninsula into the limelight of international archaeological research. The majority of recent publications focus on Middle Paleolithic material from Late Pleistocene contexts and are mainly discussed in the context of Out-of-Africa models. Earlier periods of hominin occupation of Arabia are underrepresented. Although Lower Paleolithic sites are well known from many parts of the Arabian Peninsula, little is known about the typo-technological diversity in these assemblages and their chronology.

The aim of this workshop was to bring together researchers working on the Lower Paleolithic of the Arabian Peninsula to foster exchange between groups working in different parts of the peninsula and to discuss environmental contexts of Lower Paleolithic sites, typo-technological characteristics of lithic assemblages, and hypotheses about the Lower Paleolithic occupation of the Arabian Peninsula. The workshop was organized at the Department of Early Prehistory and Quaternary Ecology of the University of Tübingen and sponsored by the University of Tübingen and ROCEEH. During three sessions, participants representing six teams from Russia, UK, France, USA, Germany and Saudi Arabia presented eleven papers about their work in all parts of the Arabian Peninsula. In addition to these presentations, a fourth session was organized to display and discuss lithic artifacts.

Most debates during the workshop centered on potential spatial patterns of typo-technological characteristics. Assemblages from northern and central parts of the Arabian Peninsula seem to be distinct from assemblages recovered in the south. Participants pointed to similar conclusions regarding the Middle Paleolithic record of Arabia and suggest that this could be a general pattern in Arabia, indicating that the evolution of desert environments plays a significant role for shaping the occupation of the Arabian Peninsula. Participants agreed on the importance of the continuation of scientific exchange among the groups working in Arabia. The organizers believe that this workshop laid a good foundation for future intensification of the network of Paleolithic archaeologists working in Arabia and are grateful for the financial support by ROCEEH.

Knut Bretzke

▲ Figure 3: A rare handaxe from the open-air site of Suhailah, United Arab Emirates, shown from three different perspectives. Photo by Knut Bretzke

Data availability, management and storage – Working with databases

Workshop – Sassari, Italy, 13–15 September 2016

Since April, 2016 ROCEEH has collaborated with the international focus group called Modelling Environmental Dynamics and Hominin Dispersals around the Mid-Pleistocene Revolution (METHOD) funded by the International Union for Quaternary Science. Such an international focus group unites researchers from around the globe, contributing to a specific research topic. The funds allow for the organization of training events, workshops and meetings in which results are integrated. The first training lab organized by a team consisting of Jésus Rodríguez and Ana Mateos of the Centro Nacional de Investigación sobre la Evolución Humana (Burgos), Maria-Rita Palombo (University of Rome) and Christine Hertler (ROCEEH) focused on crucial infrastructure, in particular shared data sources. The ROAD database (www.roceeh.net/road) represents the centerpiece of the project. ROCEEH took the opportunity to introduce its database to a wider audience who could practice working with it. Zara Kanaeva and Michael Märker arranged for training sessions about ROAD and its map module. The map module represents a meta-query tool which allows different databases to be joined through queries. We plan to link the module with various tool boxes which make more in-depth analyses possible and also started a wish-list for such tools. The collaboration opens the ROAD database to a wider scientific audience and establishes it as an integrative instrument to link researchers' data with published models. The next METHOD workshop, focusing on environmental dynamics and hominin dispersals, will be held in Mauer, Germany in April, 2017.

Zara Kanaeva, Christine Hertler, Michael Märker

100+25 years of *Homo erectus*: Dmanisi and beyond

International Senckenberg Conference
Tbilisi, Georgia, 20–24 September 2016

ROCEEH was one of the organizers of the first International Senckenberg Conference in Tbilisi, Georgia jointly with the Georgian National Museum Tbilisi and Senckenberg Research Institute. The conference marked the 25th anniversary of the first discovery of a hominin fossil at Dmanisi, today one of the most important hominin sites worldwide. At Dmanisi, a truly extraordinary story unfolded during the last 25 years, as the site produced five hominin skulls together with a magnificent record of the paleoenvironment around 1.8 million years ago in the Southern Caucasus.

In 1991, at the Centennial *Homo erectus* conference in Frankfurt, the "*Homo erectus* problem" was discussed from a regional perspective. Twenty-five years later, a wealth of new data from many regions of the Old World, including new sites, new hominin finds, and new environmental data, demonstrate the intriguingly high diversity within *Homo erectus*, as well as the presence of regional variants in Africa and Eurasia.

The Tbilisi Conference 2016, which was attended by nearly 100 colleagues from 25 countries, aimed at re-visiting the "*Homo erectus* enigma" by putting early evolutionary stages of the genus Homo worldwide into an evolutionary and environmental perspective, as well as a larger context. Another focal point was discussion about the role of the Caucasus as a potential, hub, refuge and/or source area for early Homo.

The sessions of the conference were structured around several topics:

- Origins of *Homo erectus* about two million years ago. Although it is commonly assumed that this species dispersed out of Africa, the possibility remains that it first evolved in Asia. The available evidence with respect to Africa and Eurasia, with special emphasis on the Caucasus, was presented and discussed, especially compared to early Homo.
- Geographical variants of *Homo erectus*: With growing evidence from Dmanisi, morphological diversity of early Homo in Africa and Eurasia is greater than ever before. Several questions were raised: What are the consequences for *Homo erectus* and/or other early Homo species? Is *Homo erectus* a single species with several regional variants, or should several species be recognized? Did *Homo erectus* give rise to *Homo sapiens*?
- Life history and way of life of *Homo erectus*, which shows adaptations of long distance running, increasing body, brain and range size, together with changes in technology and diversity in subsistence. Participants discussed how these factors relate to each other, to anatomy, functional morphology and ontogeny, as well as to environmental conditions in Eurasia and Africa.
- Dispersal and expansions of *Homo erectus*: About 1.9 million years ago *Homo erectus* started to spread in Africa, Europe, South Asia and Southeast Asia. The conference debated the driving factors behind early expansions of humans, as well as modeling approaches for the expansions of cultural capacities, and for ecospace and range expansions of *Homo erectus*.

Our very successful first International Senckenberg Conference also attracted the general public of Tbilisi. This turnout was influenced by a public lecture given by Donald Johanson on "The story of Lucy" and by the opening of a very exciting new exhibition at the Georgian National Museum on "Paleolithic of Georgia and Human Evolution". The Conference concluded with an excursion to the Dmanisi hominin site on 24 September, exactly 25 years after the discovery of the first human fossil at Dmanisi, and 125 years after the first discoveries of *Pithecanthropus erectus* in Java.

Friedemann Schrenk

▲ Figure 4: Participants at the Senckenberg Conference in Tbilisi. Photo by Georgian National Museum

▲ Figure 5: David Lordkipanidze and Reid Ferring presenting the Dmanisi site to excursion participants. Photo by Donald Johanson

Forthcoming

- METHOD workshop 2017-II „Keep calm and boldly go – Which factors in the environment drive early human expansions and have an impact on their settlements?“ **25–27 April 2017** in Mauer, Germany. Workshop organized by Christine Hertler, Jesús Rodríguez, Ana Mateos and Maria Rita Palombo in the framework of the INQUA international focus group METHOD.

- 6th Conference of the East African Association for Paleoanthropology and Paleontology
  30 July–2 August 2017 in Addis Ababa, Ethiopia. Conference supported by ROCEEH and co-organized by Christine Hertler.

- 3rd Southeast Asian Gateway Evolution conference
  28 August–1 September 2017 in Bogor, Indonesia. Session „Hominin dispersal into Southeast Asia – Evidence, paleoecological framework and modelling.“ Session organized by Hanneke Meijer and Christine Hertler.

- Annual NECLIME Meeting
  18–24 September 2017 in Yerevan, Armenia. Meeting organized by Ivan Gabrielyan, Angela Bruch, and Torsten Utescher.
  www.neclime.de/pdfs/2017_Yerevan_1st_circular.pdf

Who's who?

This issue: Sarah Rudolf, Archaeological technician

Sarah Rudolf joined the University of Tübingen in 2008 as a trainee in the Department of Early Prehistory and Quaternary Ecology. As part of her training, she participated in excavations at the well-known sites of Vogelherd and Hohle Fels in the Swabian Alb, as well as at Germolles, France and Faya in the United Arab Emirates. During her apprenticeship she learned how to excavate using a total station and document profiles. As part of her theoretical training, she attended lectures at the University.

For the next three years, Sarah worked on the Paleolithic excavation at Schöningen and coordinated the Sibudu project in South Africa. As a trainee at the Federseemuseum in Bad Buchau, she learned how to present archaeological information to the public. To improve her overall knowledge, she received advanced training at the State Office of Antiquities and Monuments in Esslingen, including advanced technical methods, such as GIS, AutoCAD and PhotoScan, and learned to apply her skills to different time periods and situations. She received further theoretical training in archaeology, geology, anthropology, prospection, botany, photography and land survey. She joined ROCEEH in April, 2016 to lead the excavations at Hohle Fels and other ROCEEH sites.

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