



Ritual in Human Evolution
Interdisciplinary Perspectives

Program & Abstracts





RITUAL IN HUMAN EVOLUTION

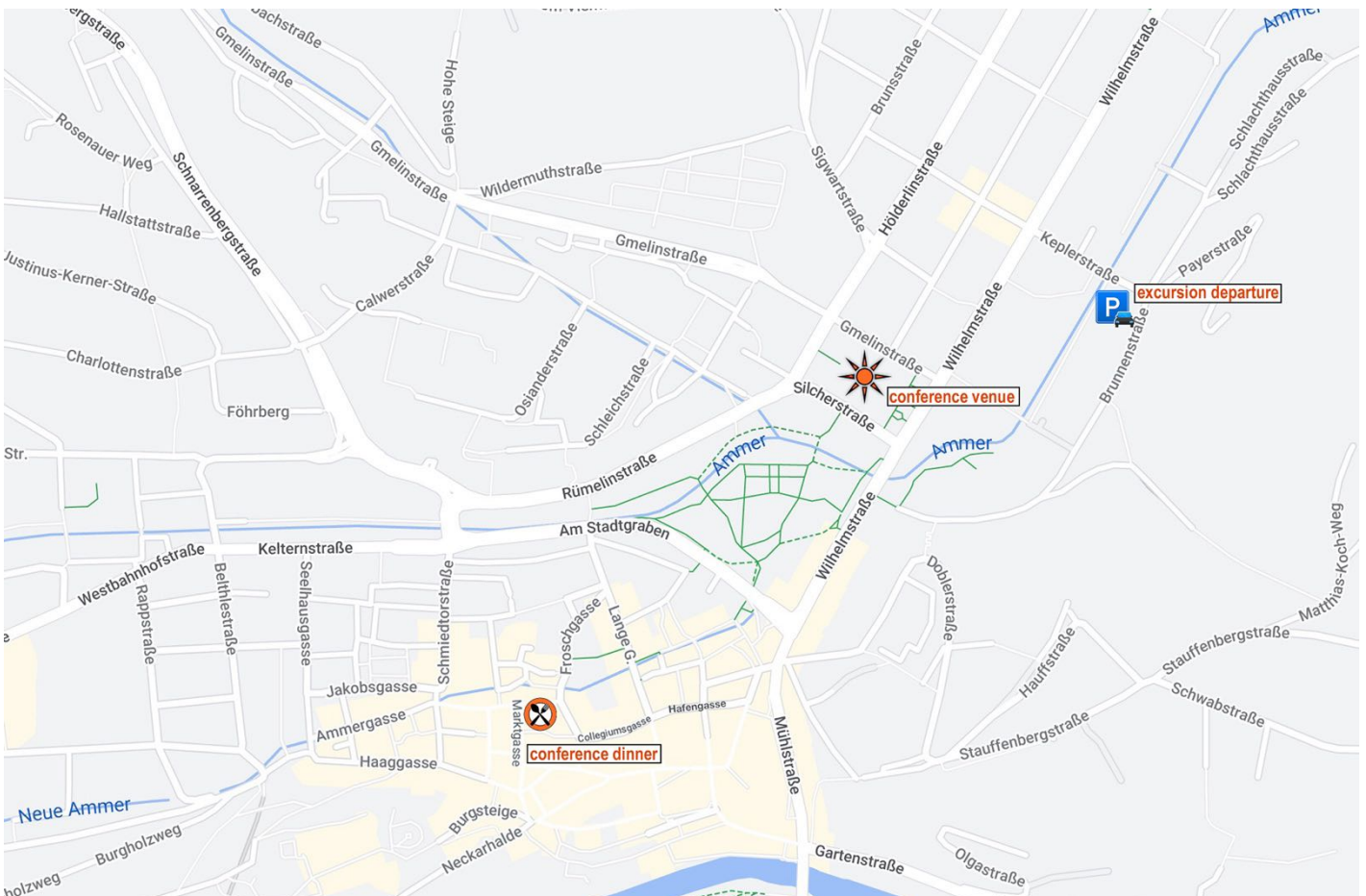
Interdisciplinary Perspectives

International Conference
Tübingen, Oct. 4–6, 2023

sponsored by

Fritz Thyssen Stiftung
für Wissenschaftsförderung

Location:
Neue Aula (1st floor: "Großer und Kleiner Senat")
Geschwister-Scholl-Platz
72074 Tübingen



PROGRAM

WEDNESDAY, OCT. 4, 2023

08:15 – 09:00 Arrival, registration

09:00 – 09:30 Official opening of the conference & welcome address

Session 1: What do we know about ritual behavior of today's *Homo sapiens*?

09:30 – 10:00 Dimitris Xygalatas:
Ritual, embodiment, and emotional alignment

10:00 – 10:30 Thea Skaanes:
If power is the answer – what is the question? An exploration of core mechanisms in the technology of rituals among the egalitarian hunting and gathering Hadza

10:30 – 11:00 Martin Lang:
The evolution of human ritual behavior as a cooperative signaling platform

11:00 – 11:30 Coffee break

11:30 – 12:00 Jana Nenadalová:
The darkness and the mind: How sensory deprivation can induce a spiritual experience

12:00 – 12:30 Jan Krátký:
Anxiety and ritualistic behavior in economic decision making

12:30 – 13:00 Discussion

13:00 – 14:00 Lunch and coffee

Session 2: What do we know about the ritualized behavior of our closest primate relatives?

14:00 – 14:30 Aman Kalan:
Where is the ritual in ritualized? An analysis of chimpanzee accumulative stone throwing

14:30 – 15:00 Claudio Tennie:
Non-human great ape rituals – do they exist?

- 15:00 – 15:30 Coffee break
- 15:30 – 16:00 Federica Dal Pesco:
*Elaborate ritualized greetings in the Guinea baboon (*Papio papio*):
Implications for understanding the evolution of human rituals*
- 16:00 – 16:30 Catherine Hobaiter:
*Once upon a time: Exploring the origins of symbols and rituals
through ape gesture*
- 16:30 – 17:00 Discussion

Evening program

- 17:30 – 18:30 Nicholas Conard:
Keynote Lecture – The evolution of ritual and the evidence for
Paleolithic *Gesamtkunstwerke* in the caves of the Swabian Jura
- 19:30 Conference dinner:
Ristorante "Alte Kunst", Marktgasse 8 (see map)

THURSDAY, OCT. 5, 2023

Session 3: What do we know about the oldest rituals in the Paleolithic?

- 09:00 – 09:30 Rimtautas Dapschauskas:
*Ritual as an engine of demographic expansion during the Middle
Stone Age of Africa*
- 09:30 – 10:00 Michelle C. Langley:
*Differentiating ritual items from children's material culture: Difficulties
in identification and does it even matter?*
- 10:00 – 10:30 Davorka Radovčić:
Examples of Neanderthal ritual behavior at the Krapina Paleolithic site
- 10:30 – 11:00 Coffee break
- 11:00 – 11:30 Nohemi Sala:
*Forensic taphonomy as an approach to the analysis of mortuary
behavior in the Paleolithic period*

11:30 – 12:00 Patrick Randolph-Quinney:
*Navigating the cadaveric island: Integrating forensic and paleo-
taphonomy to understand Paleolithic mortuary ritual*

12:00 – 12:30 Discussion

12:30 – 13:30 Lunch

Session 4: What are the connections between ritual behavior and Paleolithic art?

13:30 – 14:00 Sibylle Wolf:
The Lion Man of Hohlenstein-Stadel cave: A ritual deposition?

14:00 – 14:30 Ria Litzenberg:
*Figurative art in the Swabian Aurignacian: Everyday objects or ritual
items?*

14:30 – 15:00 Pablo Arias:
*Sacred spaces? Looking for evidence of ritual activities associated to
rock and portable art in the Magdalenian of Southwest Europe*

15:00 – 15:30 Coffee break

15:30 – 16:00 Larissa Mendoza Straffon:
*The origins of artists: Specialization of art and ritual in the European
Upper Paleolithic*

16:00 – 16:30 Harald Floss:
*Meeting in the dark: Ice age cave art as an expression of Upper
Paleolithic rituals?*

16:30 – 17:00 Discussion

Evening program

17:30 – 18:30 Guided tour to the *Museum Ancient Cultures* in the Hohentübingen
Castle (UNESCO World Heritage "Caves and Ice Age Art in the
Swabian Jura")

FRIDAY, OCT. 6, 2023

Excursion (optional)

08:30 **Departure from Tübingen,**
Brunnenstr. 29 at the parking garage
(see map)

10:00 – 11:30 Urgeschichtliches Museum
Blaubeuren (URMU): guided tour

11:30 – 12:30 Lunch at the courtyard of the URMU
(lunch packages for the participants
are provided)

Stroll to the Blautopf
(largest karst spring in Germany)

12:40 **Departure from Blaubeuren**

13:00 – 14:00 Hohle Fels Cave: guided tour

14:30 – 15:30 Geißenklösterle Cave: guided tour

16:45 – 17:00 **Arrival in Tübingen**





ABSTRACTS

General Introduction

Since the 19th century, the phenomenon of ritual has captured the attention of various scientific disciplines, such as theology, sociology, and ethnography. In the last 25 years, empirical research applying the theories and research tools of cognitive sciences has yielded a significant increase in knowledge about the psychologically active elements of rituals. Despite this impressive accumulation of data and the many years of theorizing, researchers rarely delve into questions about the evolutionary origins of this distinctly human behavior. Moreover, attempts to integrate the latest discoveries from prehistoric archaeology—especially those from the Paleolithic era—into evolutionary-cognitive perspectives on ritual are typically lacking. Hence, the purpose of this conference is to unite researchers from distinct disciplines and foster a fruitful interdisciplinary dialog. We aim to collectively assess our current understanding of ritual evolution and identify shared research perspectives. We believe that the scientific investigation of ritual evolution demands a genuinely cross-disciplinary approach—one that deliberately transcends the historical barriers between the humanities and natural sciences. Scholars from prehistoric archaeology, psychology, primatology, anthropology, and other fields within the social and cognitive sciences will explore various aspects related to the four central themes of the conference:

1. What do we know about ritual behavior of today's *Homo sapiens*?
2. What do we know about the ritualized behaviors of our closest primate relatives?
3. What do we know about the oldest rituals in the Paleolithic?
4. What are the connections between the evolution of ritual and Paleolithic art?

Session 1: What do we know about ritual behavior of today's *Homo sapiens*?

Through ethnographic accounts, historical records, and archaeological excavations, we have gained insight into a wide array of ritual practices of *Homo sapiens*. Especially in the field of cultural anthropology, the differences and peculiarities of rituals in various cultures have long been emphasized. Nevertheless, the humanities have also managed to transcend the mere description of individual case studies, striving instead to generalize the function and structure of rituals through cross-cultural comparison. For the study of ritual evolution, observations from (sub)recent hunter-gatherer societies are particularly intriguing. The profound influence of group rituals on the development of group identity, prosocial behavior and cooperation beyond narrow familial ties, and the transmission of social norms bears great significance for the evolution of *Homo sapiens* as an ultra-social species.

In recent years, an increasing number of quantitative studies in the burgeoning field of *Cognitive Science of Religion* have provided mounting empirical evidence for the positive effect of rituals on prosocial behavior and group cohesion, but also on tribal conflicts within contemporary human societies. The influence of communal rituals on demographic factors, including the establishment of cross-regional social networks, cultural knowledge transmission, and on the scope and pace of cumulative cultural evolution, can be explored using methodological tools from quantitative ethnography and mathematical modeling. Furthermore, experimental research demonstrates how certain elements of ritual behavior can regulate emotions and potentially evoke spiritual experiences. Additionally, some intriguing insights stem from clinical observations, while others explore the distinct effects of different types of rituals on both working and long-term memory.

These scientific endeavors demonstrate that dissecting the phenomenon of ritual into its psychologically effective building blocks is highly fruitful in enhancing our understanding of how it functions at both individual and collective levels. Session 1 will primarily revolve around discussing recent empirical research on rituals among contemporary humans. This discussion will also encompass reflection on key terminology, concepts, and research methodologies.

Dimitris Xygalatas

Department of Anthropology, Department of Psychological Sciences, Experimental Anthropology Lab, University of Connecticut, USA

Title

Ritual, embodiment, and emotional alignment

Abstract

Social theorists have long argued that rituals can function as vehicles for social coordination and that, in that capacity, may have played a key role in the evolution of human sociality. However, the mechanisms underlying these effects have only recently been studied. In this paper, I will discuss ritual's ability to facilitate the alignment of people's bodies, actions, and emotions by presenting findings from an interdisciplinary research program that combines

laboratory and field methods and discussing the implications of such findings for ritual's role in promoting social coordination and group cohesion.

Thea Skaanes

The National Museum of World Culture (Världskulturmuseet), Göteborg, SWEDEN

Title

If power is the answer—what is the question? An exploration of core mechanisms in the technology of rituals among the egalitarian hunting and gathering Hadza

Abstract

Ritual as a human technology enables us to conjure, negotiate, and manipulate power—yet not in the sense of power as political, economic, or hierarchic power. The power in this presentation is found in the power of power objects, in power substances, in places as sources of power, and in the ability to instrumentalize and navigate through time itself. Through the case of the egalitarian hunting and gathering Hadza of Tanzania, we explore some of the core mechanisms of ritual practices and how the assemblage of different entities of power are instrumental in navigating life itself.

Martin Lang

Laboratory for the Experimental Research of Religion (LEVYNA), Department for the Study of Religions, Faculty of Arts, Masaryk University, CZECH REPUBLIC

Title

The evolution of human ritual behavior as a cooperative signaling platform

Abstract

Collective ritual is virtually omnipresent across past and present human cultures and is thought to play an essential role in facilitating cooperation, yet little is known about its evolution in the hominin lineage. We examine whether collective ritual could have evolved as a complex signaling system facilitating mutualistic cooperation under socio-ecological pressures in the Pleistocene. Specifically, we identify similarity, coalitional, and commitment signals as the building blocks of the contemporary signaling systems in hunter-gatherers and trace the presence of these signals in non-human primates and the hominin archaeological and paleoanthropological record. Next, we establish the underlying cognitive mechanisms facilitating these signals and review the evidence of the earliest presence of these mechanisms as well as evidence for selective pressures on the evolution of cooperative communication. The synthesis of these streams of evidence suggests that ritualized cooperative signals might have first evolved in the Early Pleistocene in the form of similarity signals, whereas coalitional and commitment signals would start appearing in the early and late Middle Pleistocene until, eventually, coalescing into a signaling system. By the arrival of *Homo sapiens*, it is possible that collective ritual as a staged and repetitively performed signaling act constituted an important adaptation facilitating collective action.

Jana Nenadalová

Laboratory for the Experimental Research of Religion (LEVYNA), Department for the Study of Religions, Faculty of Arts, Masaryk University, CZECH REPUBLIC

Title

The darkness and the mind: How sensory deprivation can induce a spiritual experience

Abstract

Be it the loneliness and darkness of the caves where Paleolithic people created the first arts, ancient Greek prophets descending underground in search of the ultimate Truth or current alternative-spiritual enthusiasts searching for visions in deprivation tanks, the tendency to withdraw to dark and remote places and achieve religious or other special experiences seems to be a widespread human tendency crossing the boundaries of cultures and times. But why do humans seek dark and quiet places to establish their private rituals and achieve special experiences—what neurological and behavioral mechanisms lie behind the efficacy of darkness?

In the talk, I will use predictive processing theory to focus on the neuro-cognitive foundations of religious and other special experiences under sensory deprivation. To illustrate the expected neural mechanisms that enable us to experience shared cultural content as subjectively real, I will present the results of my recent research on so-called “Dark therapy” —an alternative spiritual technique during which people are withdrawing to complete darkness for usually one week. The predictive processing-based analysis of achieved spiritual experiences will be further supported by an ethological view of prestige-based relations among the practitioners and a more general theoretical view on the role of authority in achieving religious experience.

Jan Krátký

Laboratory for the Experimental Research of Religion (LEVYNA), Department for the Study of Religions, Faculty of Arts, Masaryk University, CZECH REPUBLIC

Title

Anxiety and ritualistic behavior in economic decision making

Abstract

Rich and orchestrated rituals have attracted attention since the early days of ethnographic work. However, rituals have also gradually gained interest in evolutionary theorizing on human behavior and have started to appear in popular outlets. Increasingly, we hear questions about the benefits of ritual behavior and the motivating factors behind their performance. Drawing inspiration from the classic observations documented by Malinowski and insights from recent developments in cognitive mechanisms that may contribute to the reproduction of ritual behaviors, our research focuses on paradigms that aim to isolate and explore the psychological and physiological factors that underlie ritual behavior.

Among the various underlying factors, a prominent role is attributed to stress and anxiety. Stress alters the outward expressions of behavior in subjects, making it more repetitive, limiting the range of behavioral responses, and increasing predictability. Arguably, this drives individuals to take greater risks while inhibiting their ability to explore new ideas and pathways. Through a series of controlled studies, utilizing standardized measures commonly employed in economics and controlling for hormonal levels, we aim to explore the relationships between these factors.

The first study used naturally occurring hormonal fluctuations among women, which, according to ovulatory shift hypothesis, should result in different behavioral patterns. In the second study, we employed an artificially induced but habituated ritual to examine whether such a ritual can serve as a means of protection against aversive anxiety-inducing experiences. In both studies, standardized measures of risk-taking behavior, exploratory tendencies, and cognitive load were applied.

Session 2: What do we know about the ritualized behavior of our closest primate relatives?

Since the 1950s, when it became clear that our early ancestors were hominins possessing comparable characteristics in brain volume and body structure to present-day non-human primates, the observation of primate behavior gained recognition as a valuable resource for modeling evolutionary history. Today, there is broad consensus within evolutionary disciplines that behavioral observations in non-human primates offer valuable insights into the evolutionary origins of various facets of human behavior. Relatively complex ritualized behaviors (displays, social grooming, etc.) are primarily used to regulate social relationships in the dominance hierarchy and in mating. But occasionally elaborated displays are also directed towards impressive natural phenomena such as heavy rainfall, storms, wildfires, and large waterfalls. Furthermore, highly differentiated responses to the death of group members are particularly well-documented in our closest relatives—the chimpanzees—both in wild and captive settings. Although most of the evidence is available for chimpanzee behavior, observational and experimental data related to ritualized behaviors in other primate species, such as gorillas and baboons, also expanded significantly in recent years. Additionally, numerous behavioral experiments comparing the cognitive abilities of non-human primates with those of human infants are yielding valuable insights into the evolution of human ritual.

This session aims to assess our current understanding of ritualized behaviors in non-human primates. Through this evaluation, we can explore the question of which behavioral elements of human ritual can be traced back to a primate basis and which may have evolved later in our lineage, long after the divergence from the last common ancestor with *Pan*.

Aman Kalan

Department of Anthropology, University of Victoria, British Columbia, CANADA

Title

Where is the ritual in ritualized? An analysis of chimpanzee accumulative stone throwing

Abstract

Ritualized behavior in non-humans has long been recognized as a set of predictive actions that over evolutionary time have become stereotyped signals or displays in a species' communicative repertoire. The 'ritual' in this case, refers to the behavior becoming a meaningful signal within an animal society. However, ritual in reference to humans often implies so much more than simply a meaningful set of actions to a society, or does it? In this talk, I will first deconstruct the terms ritualized and ritual from the perspective of an animal ethologist. I will then introduce the accumulative stone throwing behavior (AST) seen in wild chimpanzees to: 1) illustrate the unique and rare aspects of this behavior among non-human primates, and 2) dissect the reasons why this behavior has evoked widespread perceptions of animal ritual, and incredulously, religion. I then argue for a shift in focus from the behavior itself to the accumulative stone throwing sites, i.e., the trees and assembled rocks. Using such a lens, I examine the power and significance of 'place' for chimpanzee accumulative stone throwing behavior, aspects that are also highly relevant for human ritual. Drawing on recent results, I will demonstrate how the distribution of accumulative stone throwing sites in the landscape correlates with particular chimpanzee resources to illustrate the potential significance of these places. In doing so, I will propose alternative hypotheses for why this behavior can provide insight into the evolutionary origins of ritual with an emphasis on place or location. These hypotheses will guide future research regarding potential symbolic components to AST which will be essential to broader discussions regarding ritual interpretations of this behavior.

Claudio Tennie

Junior research group leader ("Tools and Culture among Early Hominins") in the Department of Early Prehistory and Quaternary Ecology, University of Tübingen, GERMANY

Title

Non-human great ape rituals—do they exist?

Abstract

Here I will explore the potential for rituals in non-human great apes (henceforth: apes). To do so, I will first derive a minimal definition of ritual—consisting of two main components: symbolism and copying. Using this minimal definition I shall then examine available evidence for rituals in apes to assess whether they exhibit these components. Owing to the fact that only these can produce relevant data, I will focus on the case of apes untrained and unenculturated by humans (i.e. on relevant apes). It is regrettable that dedicated studies on ape ritual are still lacking. However, the data that is so far available—mainly via other (undedicated) sources—shows that relevant apes are unlikely to spontaneously show even

minimal rituals. By further relaxing the definition, one may identify potential cases of “proto-(minimal)-ritual”, such as ape “rain dance”, “object-in-ear” behavior, and surplus nest-making procedures. Future, dedicated work may identify clearer cases of proto-ritual or even clear cases of minimal ritual behavior in apes. Currently, however, this evidence is either weak or rare (as in proto-rituals) or absent (as in minimal rituals). This suggests severe limitations in the breadth and range of ape rituals. I will end my talk by briefly discussing the implications of these findings for inferences of ritual in the last common ancestor of humans and apes and in early hominins.

***Federica Dal Pesco*^{1, 2}, *Julia Fischer*^{1, 2, 3}**

¹ Cognitive Ethology Laboratory, German Primate Center, Göttingen, GERMANY

² Leibniz ScienceCampus Primate Cognition, Göttingen, GERMANY

³ Department for Primate Cognition, Georg-August-University Göttingen, GERMANY

Title

Elaborate ritualized greetings in the Guinea baboon (*Papio papio*): Implications for understanding the evolution of human rituals

Abstract

Effective communication promotes group cohesion and cooperation and is key in solving the adaptive challenges of group living. One such mechanism is the use of ritualized behaviors, which are thought to have played an important role in the evolution of complex societies and are considered to be the precursors to symbolic rituals. Ritualized greetings are common among males living in multi-male groups and aid in balancing the trade-offs of male co-residence. While greetings are widespread in the animal kingdom, the behavioral repertoire described in the genus *Papio* is exceptional, as it involves potentially harmful behaviors such as genital fondling that could easily put male reproductive success at risk. *Papio* has long been considered a model for unveiling the processes influencing human socioecological evolution. With its various social systems characterized by differential levels of cooperation and aggression, *Papio* serves as an ideal model for determining the function of ritualized greetings and elucidating the evolutionary underpinnings of human rituals. At one extreme of the spectrum are the tolerant Guinea baboons, which live in complex multilevel societies that may comprise several hundred individuals and display male philopatry, frequent male-male affiliation and cooperation, and comparatively low levels of aggression. We found that Guinea baboon greetings are extremely elaborate, intense and more reciprocated compared with the ones described for all other baboon species. In this tolerant species, male-male greetings occur independently of context and constitute brief honest communicative exchanges aimed at signaling commitment among party members, testing relationships among spatially tolerant partners, and accentuating relationship strength among highly affiliated males. Although lacking the complex symbolism of human rituals, Guinea baboon greetings appear to serve analogous functions, notably in strengthening in-group affiliation and promoting cooperation. Our research findings lend support to human evolutionary hypotheses positing that the development of fully symbolic

behavior, commonly attributed to changes in population densities, may have been fostered by a shift from aggressive to cooperative and tolerant social styles.

Catherine Hobaiter

School of Psychology & Neuroscience, Centre for Social Learning & Cognitive Evolution, University of St Andrews, UNITED KINGDOM

Title

Once upon a time: Exploring the origins of symbols and rituals through ape gesture

Abstract

Decades of research with other species have established that language is not needed to learn from each other, to organise where and when to forage, to pass on essential cultural knowledge about tools and foods, and about passing cultural fads and songs, to co-ordinate hunts, patrol for territorial disputes, or engage in richly structured social politics. Within hominin history, arguments that language was necessary for the transmission of knowledge about complex stone tool manufacture are undermined by the spontaneous production of simple flaked tools in naïve users, and the effective acquisition of sophisticated forms through simple gesture-based instruction. Nevertheless, while we share substantial similarities with other species – in particular other apes – in the cognitive tools in our communicative tool kits, there remain striking differences in what humans use their communication for: human language sits at the heart not only of our communication, but of our culture. The evolution of symbolic meanings and the use of language in culture and ritual appear to represent a Rubicon between human and other species' communication. However, to ask comparative questions about the evolutionary emergence of symbols and rituals in communication, we have to change the ways in which explore communication in other apes. I will summarise our findings from the systematic study of ape gesture, touching on apes' capacity for flexible, intentional use of large gestural repertoires, the way in which gestures are combined, and the ways in which different types of meaning are expressed and constructed in context. I will highlight that to understand cultural – and potential ritual – aspects of other species' communication, we must consider how they use their gestures. I will present early evidence of the presence of cultural dialects and ask to what extent apes have the capacity for symbolic meaning. I will suggest new avenues that highlight the importance of rhythm and ritual in the use of ape communication as a means to form and maintain important social relationships.

Session 3: What do we know about the oldest rituals in the Paleolithic?

Since the early 2000s, a multitude of new archaeological discoveries have questioned many longstanding ideas about the origins of modern cognitive capacities. Moreover, archaeological research on the cognitive evolution of *Homo* has gained significant attention through large-scale, interdisciplinary, database-driven projects (e.g., ROCEEH, From Lucy to Language, TracSymbols). In the process of theorizing about the emergence of modern cognitive capacities, the phenomenon of ritual is also receiving growing scrutiny from an archaeological viewpoint. The inquiry into humanity's earliest rituals is closely tied to the debate on the origins of "symbolic behavior" in Paleolithic archaeology. On the one hand, the *Middle Stone Age* in Africa (approximately 300,000 to 30,000 years ago) plays a central role in the debate, with many newly excavated sites and assemblages, along with significant advances in dating methods and research techniques. On the other hand, mounting evidence of behaviors that cannot be explained on purely utilitarian grounds is emerging from Neanderthal contexts. Nevertheless, the interdisciplinary dialog with non-archaeological ritual studies is still in its infancy. Concepts and insights from *Cognitive Science of Religion* have been integrated only to a very limited degree into the discussion so far. Furthermore, crucial methodological challenges persist in establishing reliable criteria for identifying ritual behavior in the material remains.

This session aims to discuss both archaeological sites and specific artifact types that shed light on the evolution of ritual during the Pleistocene. Meta-analyses that examine the long-term development of ritual evolution are also presented. Additionally, conceptual and theoretical considerations are explored, addressing the identification of ritual behavior within the archaeological and fossil record of the Paleolithic period.

Rimtautas Dapschauskas

Heidelberg Academy of Sciences and Humanities – The Role of Culture in Early Expansions of Humans (ROCEEH) at the University of Tübingen / Department of Prehistory and Middle Eastern Archaeology, University of Heidelberg, GERMANY

Title

Ritual as an engine of demographic expansion during the Middle Stone Age of Africa

Abstract

The extent of human sociality, which goes beyond nepotism (kin selection) and reciprocal altruism observable in many other social species on this planet, is unprecedented in the natural world. One important factor in this expansion of sociality was undoubtedly collective ritual—a powerful psycho-social technique which binds social groups together. Many ethnographic observations over the last two centuries as well as a growing number of experimental studies in recent years have provided a plethora of empirical evidence for the positive influence of collective rituals on cooperative behavior, prosociality, group cohesion, and cultural learning in social groups. Collective rituals enable the expansion of social networks and increase the number and reliability of internal connections in those networks.

Larger, denser and more stable social networks accelerate and intensify cumulative cultural evolution, leading to more (and more varied) technological innovations. On top of that, the establishment of trust in ritually constructed extended family groups and fictive kin improves cooperative alloparenting for highly dependent and energy-hungry children, with a positive impact on birth rates. Thus, collective rituals must have been crucial for the acceleration of cumulative cultural evolution and the demographic expansion of *Homo sapiens* which we observe during the Late Pleistocene.

The question for Paleolithic archaeology is, to what extent are we able to detect this long-term development in the archaeological record? This is a real challenge because many aspects of ritual do not materialize. One promising exception might be ochre finds (reddish earth pigments utilized by humans) which preserve well and are found in relatively large numbers alongside stone artifacts in many archaeological sites from the Middle Stone Age. Multiple lines of evidence suggest that this material was used primarily for ritual behavior during this period. It can therefore be used to trace intensifying ritual activity during an era when our species evolved modern cognitive capacities and expanded demographically first on and eventually out of the African continent.

In this talk I will present the results of the most comprehensive meta-analysis of ochre use to date, spanning 500,000 to 40,000 years ago, based on data from more than one hundred archaeological sites in Africa. The long-term pattern of ochre use indicates that collective ritual first evolved slowly and gradually, starting about 500,000 years ago during the transitional period between the Early and Middle Stone Age followed by a modest increase and geographical spread during the first half of the Middle Stone Age. However, during the second half of the Middle Stone Age, approximately 160,000 to 40,000 years ago, we observe a significant acceleration whereby ochre use becomes a habitual cultural phenomenon across most of the African continent. This pattern can be interpreted as a material manifestation of a significant intensification of ritual activity which helped to facilitate the demographic expansion of *Homo sapiens* populations throughout the African continent just before our species' permanent and successful dispersal across the globe.

Michelle Langley

Griffith Experimental Archaeological Research (GEAR) Lab, Australian Research Centre for Human Evolution, Griffith University, AUSTRALIA

Title

Differentiating ritual items from children's material culture: Difficulties in identification and does it even matter?

Abstract

The study of ritual behavior as enacted throughout human evolution—and in more recent times—relies on archaeologists being able to adequately identify items likely to have been used in ritual practice. From these artefacts, and their distribution across space and time, we develop narratives surrounding the origins and importance of ritual behavior to different human communities. Recently, it has been highlighted that there is tremendous overlap

between artefacts traditionally assigned to 'ritual' behaviors, and those utilized in the secular world of children. This paper explores this overlap in artefact attributes and whether it will be possible for archaeologists to disentangle secular child-related from ritual material culture. It will also discuss whether this separation is necessary if we are to gain further insights into ritual practices in the deep past.

Davorka Radovčić

Department of Geology and Paleontology, Croatian Natural History Museum (Hrvatski prirodoslovni muzej), CROATIA

Title

Examples of Neanderthal ritual behavior at the Krapina Paleolithic site

Abstract

Within the last decade, studies highlighting various aspects of complex Neanderthal behavior have amassed: from particularly placed stalagmites within the Bruniquel cave to various sites indicating Neanderthal use of pigment, either for body adornment or parietal art to Neanderthal procurement of feather and eagle talons for personal adornment. Various evidence from the Krapina Neanderthal site, dated to around 130,000 BP, indicate that the early Neanderthal population that frequented the cave for generations engaged in complex behaviors that can be further interpreted as being symbolic. For example, Krapina Neanderthal bones were fragmented, purposefully broken, and mixed with faunal remains. In addition, some contain anthropogenic cut marks and a very few exhibit burnt marks. Although this combination of exhibited preservation and taphonomic changes led Gorjanović-Kramberger to conclude that cannibalism was practiced at the site, an alternative interpretation of the cut marks and, more importantly, their occurrence pattern is that of purposeful defleshing and cleaning of the bones, either for ritual cannibalism or preparation of the bones for secondary burial. A series of perimortem cut marks on the most complete Krapina cranium also speaks against a simple hypothesis of cannibalism because of its unique combination with regard to both the location of the cut marks and 35 of them occurring in a parallel fashion.

The Krapina site has also yielded other indicators of symbolic behavior. Of particular significance are eight white-tailed eagle talons in the collection, accompanied by an additional phalanx that must have been procured elsewhere on at least three occasions and brought to the site. All the talons exhibit signs of Neanderthal manipulation, with one analyzed using infrared spectrometry confirming the presence of charcoal and ochre traces that are also visually evident on all specimens. Evidence of preserved sinew within a cut mark on one of the talons hints strongly that they were somehow tied together as a collection. Although we cannot reconstruct how the talons were used or worn, their obvious manipulation can only mean that they had a definite ascribed potent meaning. The same holds true for an allochthonous mudstone rock that was again collected by the Krapina Neanderthals, which was brought to the rock shelter probably due to its aesthetical appeal.

Researchers publishing similar examples from Neanderthal contexts are usually wary of calling these types of findings as evidencing for art or ritual behavior. Admittedly, some of the interpretations of the above examples are circumstantial: We will never be able to reconstruct or know the reasons for certain seemingly non-functional objects, nor the meaning these objects posed to their collectors or makers. However, it is the Neanderthal context that makes these and other similar interpretations particularly contentious. When comparable types of discoveries are found within the context of anatomically modern humans, and especially those of a later date, there is usually no controversy surrounding their attribution to art and ritual, although the steps to such interpretations are exactly the same.

Nohemi Sala

Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), Burgos, SPAIN

Title

Forensic taphonomy as an approach to the analysis of mortuary behavior in the Paleolithic period

Abstract

Sometime during the Middle Pleistocene or early Late Pleistocene, the European continent witnessed the emergence of one of the most extraordinary human behaviors, the culture of death. The culture of death refers to a funerary behavior including some form of intentional treatment of the dead that implies a non-occasional or non-fortuitous practice and therefore forms part of the cultural practices of ancestral populations. This activity also implies a clear symbolic element and the cognitive complexity that this entails, although this symbolic behavior is not always expressed in artefacts that may be preserved in the fossil record (e.g., grave goods). This leads to possible multiple expressions of the culture of death, varying in their complexity among Pleistocene hominins. These diverse expressions seem to show geographic and temporal variations, even within the same hominin species, including temporal discontinuities in their manifestation, and can be traced in the fossil record.

The emergence of the culture of death is one of the most interesting and contentious areas of research in the field of human evolution, since it provides a window into understanding the origin and evolution of the human mind. When did our ancestors begin to acquire funerary practices? How has this behavior manifested itself across time and space? Did this behavior independently arise in various human species? To answer these questions, we must rely on the only source of information available to us: the paleoanthropological record. In some of the cases, distinguishing these behaviors archaeologically is not easy, especially when dealing with ancient populations.

To discern when the culture of death appeared and how it has expressed itself during the Paleolithic, taphonomic analyses of Middle and Upper Pleistocene hominins are being carried out to find clues of funerary rites. Taphonomic and forensic analyses on human remains form a readily available dataset for exploring wider funerary activity, and hence could be essential for human evolutionary thanatology. The depositional origin of hominin

fossils is usually interpreted in the light of their contextual framework, particularly in cases tied to funeral activities. However, the bones themselves are seldom subject to detailed taphonomic observations. In contrast, Paleolithic cannibalistic assemblages are accompanied by abundant taphonomic studies. Thanks to novel methodological approaches in taphonomy and the discovery of exceptional fossil sites, we are succeeding in elucidating fundamental facets of our ancestors' behavior.

Patrick Randolph-Quinney

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Title

Navigating the cadaveric island: Integrating forensic and paleo-taphonomy to understand Paleolithic mortuary ritual

Abstract

The experience of mortality is fundamental to what it means to be human and an integral part of the human evolutionary journey. Until recently researchers considered awareness of death to be a uniquely human trait—one that is now be recognized in chimpanzees, elephants, and other cognate species possessing theory of mind. However, this realization has not stopped researchers of hominin behavior from treating mortuary ritual as a Rubicon to be crossed in becoming somehow “fully human”. Historically this has seen a focus on identifying primary burial as evidence that the Rubicon has been successfully waded.

In funerary archaeology a primary burial is recognized as skeleton in a state of anatomical integrity, inferred from elements in direct anatomical articulation, affected only by *in situ* decomposition. In taphonomic terms such assertions have been based on a classical paleotaphonomy, which examines the context and content of depositional sites as a means of interpreting formation processes. This remains a fundamentally inductive intuitive approach, with significant evidential shortcomings. In contrast, neo or actualistic taphonomy is hypothetico-deductive and based on experimental modelling of real-world post-mortem settings. Actualistic forensic taphonomy (often undertaken experimentally at human forensic decomposition facilities—colloquially known as “body farms”) indicates that the absence of anatomical articulations does not mean the deposition is not a primary one. Instead understanding the hierarchy of decomposition is critical, as are the associations between regions of anatomical association, disassociation, and the voids produced during decomposition through time. Increasingly human-based neo-taphonomic studies have provided a robust framework to allow accurate and nuanced understanding of the processes occurring within anthropogenic burial deposits. This approach recognizes the burial environment as a 4D ecological system (the cadaveric island), where endogenous and exogenous factors play a significant role in determining the final recovery state of biological remains—a state that may be significantly different from the initial deposition (burial) state of the body.

This paper will address ways to integrate actualistic and paleo-taphonomic approaches in the reconstruction and interpretation of hominin mortuary behaviors. I will argue that whilst archaeologists have begun to adopt systems-based approaches such as archaeoanthatological (after Boulestin and Duday) or Machine-Learning based modelling, that these are fundamentally paleotaphonomic and largely atheoretical in nature. The lack of theoretical rigor is perplexing. Perreault (Quality of the Archaeological Record, 2019) has argued that the interpretive processes borrowed by archaeologists operate over very short time scales—so much so that most of them are in fact irremediably affected by both underdetermination and equifinality in the deep-time archaeological record. In many areas of burial taphonomy this is exacerbated by inappropriate taphonomic analogues applied in inappropriate ways, coupled with the lack of a common lexicon. Integrating forensic taphonomic modelling more fully into the paleosciences may circumvent some of these issues in the evaluation and interpretation of past events and provide a robust tool with which to address fundamental issues. However, forensic taphonomy suffers from its own set of theoretical issues. This paper will endeavor to find common ground and a way forward.

Session 4: What are the connections between ritual behavior and Paleolithic art?

The history of research concerning the origin and meaning of Paleolithic art is long and complex, associated with numerous controversies surrounding large-scale interpretative frameworks. However, there seems to be a profound relationship between ritual behavior and art creation when viewed through an evolutionary lens. Both activities share several socio-psychological building blocks, including non-instrumentality, costliness, spatial and/or temporal framing, sensory pageantry, symbolism, style, and tradition. Hence, separating these two phenomena is hardly possible in most traditional societies and many archaeologists have connected Paleolithic art with ritualistic and spiritual practices. However, the interdisciplinary integration of concepts and findings from contemporary cognitive disciplines is still in its early stages, mirroring the absence seen in the discourse surrounding the earliest rituals in the *Middle Stone Age* and *Middle Paleolithic*.

Furthermore, there is no consensus as to whether the arts evolved as a by-product of ritual, or if ritual and art can be traced back to a shared and more fundamental origin that initially emerged through natural and sexual selection in the Pleistocene. In any case, it seems unlikely that art can be reduced to a single aesthetic impulse. Rather, art constitutes a complex ensemble of various motivations, emotions, and cognitive capacities of different evolutionary ages. The emergence of the first cave paintings, figurative artworks, and musical instruments at the beginning of the Upper Paleolithic seem to represent a sudden creative explosion in human evolution. However, when viewed in the context of the evolution of ritual, these archaeological discoveries could just as well signify an endpoint in the long development that preceded it.

The objective of this session is to explore the numerous evolutionary, psychological, and archaeological connections between art and ritual. In doing so, presenters will highlight outstanding individual finds and important localities, in addition to addressing conceptual and theoretical problems.

Sibylle Wolf

Senckenberg Centre for Human Evolution and Palaeoenvironment (SHEP) at the University of Tübingen, GERMANY

Title

The Lion Man of Hohlenstein-Stadel Cave: A ritual deposition?

Abstract

The Lion Man, discovered in the Hohlenstein-Stadel Cave near Asselfingen in the Swabian Jura (southwestern Germany), has remained an enigma since its discovery in 1939. Dating back approximately 40,000 years, the Lion Man is simultaneously the oldest known representation of a therianthrope (animal-human hybrid) worldwide and the largest of all Ice Age figurines. Only 30 years after the excavation the nearly 300 fragments of the figurine were pieced together. By 1969, significant portions of the figurine were still missing. Even after the first professional restoration in 1988 large gaps persisted. It wasn't until the restoration work in 2012 and 2013 that the figurine saw substantial completion, utilizing discoveries from excavations conducted between 2009 and 2013, as well from rediscoveries of fragments in the stock of the Ulmer Museum. This restoration process offered an opportunity to analyze the individual fragments, shedding light on lingering questions regarding the deposition of the figurine during the Aurignacian period. Notably, the associated personal ornaments hold significant importance for its interpretation. In this presentation, I argue that the Lion Man figurine was intentionally and most likely ritually deposited in the Hohlenstein-Stadel Cave.

Ria Litzenberg

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Title

Figurative art in the Swabian Aurignacian: Everyday objects or ritual items?

Abstract

The Swabian Jura is one of the most important discovery regions for the study of early figurative art. Four cave sites in the Ach Valley (Hohle Fels, Geißenklösterle) and Lone Valley (Vogelherd, Hohlenstein-Stadel) have yielded three-dimensional statuettes dating to the beginning of the Upper Paleolithic in Europe. They mark the onset of a new phase of complex artistic expression which is observed in several cultural centers during the Aurignacian. The objects are mostly carved from ivory and depict animals, humans and

hybrid creatures. The detailed and naturalistic style as well as the small size of the pieces—usually between 4 and 8 cm—make them unique among other representations of Ice Age art. While the caves of the Swabian Jura and the context of the statuettes have been studied extensively, the actual meaning and function of the artworks still remain a topic of debate. The talk aims to review existing hypotheses about the objects and categorize them into two distinct groups: (1) Interpretations with a ritual character, and (2) interpretations that propose an everyday function for the artifacts. These hypotheses will then be cross-checked with the actual archaeological evidence. Which line of interpretation is supported by the detailed stratigraphic and contextual information available today? Additionally, is the presumed dichotomy between the “profane everyday” and the “ritual serving a higher purpose” even applicable in this case? Which models are compelling and effectively incorporate the living conditions and realities of hunter-gatherers in the early Upper Paleolithic?

Pablo Arias

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Title

Sacred spaces? Looking for evidence of ritual activities associated to rock and portable art in the Magdalenian of Southwest Europe

Abstract

The Magdalenian of southwestern Europe offers a unique context for analyzing the symbolic behavior of Pleistocene hunter-gatherers, particularly in relation to their rituals. Spanning from around 18,000 to 11,750 cal BC, this region presents important advantages:

- The largest sample of Paleolithic art in the world.
- A well-established and robust chronological framework.
- Evidence of cultural relationships across the region, as attested by stylistic similitude and evidence of long-distance interchange, such as the distribution of lithic raw materials or marine mollusk shells.
- Several complex sites have been interpreted as ritual areas.

As part of the PrehMIND project, we are employing an interdisciplinary methodological approach to investigate key sites that contribute to the study of Magdalenian symbolism. This entails the development of a 3D Geographic Information System (GIS) for Magdalenian rock art, allowing statistical analysis of the relationships between the images, the cave’s topography, and among themselves. Additionally, the system allows spatial analyses of selected contexts with concentrations of portable art. There will also be a re-analysis of the archaeological record within the so-called Magdalenian “sanctuaries”, as well as detailed investigations of other indicators of symbolic behavior, such as personal adornment and funerary practices.

With that approach we attempt to contribute to the understanding of the early stages of the development of symbolic thinking, thus providing new insights to Prehistoric Archaeology,

as well as other disciplines such as Social Anthropology, Sociology and Philosophy. The preliminary results of this project are presented in this conference.

Larissa Mendoza Straffon

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Title

The origins of artists: Specialization of art and ritual in the European Upper Paleolithic

Abstract

The European Upper Paleolithic is characterized by a notable increase in the frequency and variety of visual art objects and ritual spaces. Scholars have presented two main opposing scenarios to explain this so-called “creative explosion”: one based on cognitive drivers and the other on socio-technological change. The former argues that cognitive adaptations related to working memory, consciousness, or neural architecture led to a sudden burst of art forms in this period. Because cultural innovations often diversify quickly until one or a few successful types become established, cognitive hypotheses predict variation in early art forms followed by a gradual standardization. In contrast, the social scenario suggests that the availability of materials, techniques, and knowledge would constrain art and ritual from the start, with early art objects being generic and non-specific, and becoming more diverse as they acquired specific functions. Based on the record of Upper Paleolithic visual art, the second scenario appears more plausible.

In this paper, I will argue that the Paleolithic ‘explosion’ can be explained by the specialization of art and ritual practices. I review evidence from the Aurignacian onwards, indicating a continuous accumulation and differentiation of art media and ritual contexts, symptomatic of specialization. I also discuss that such process likely led to the emergence new social categories such as “artists” and “ritual specialists”. This proposal is consistent with a broader trend towards cultural and technological specialization over the Upper Paleolithic.

Harald Floss

Department of Early Prehistory and Quaternary Ecology, University of Tübingen, GERMANY

Title

Meeting in the dark: Ice age cave art as an expression of Upper Paleolithic rituals?

Abstract

Homo sapiens of the European Upper Paleolithic tended to go into deep caves, leaving behind paintings, engravings and sculptures that we nowadays call Ice Age art. But what was the purpose of going into these dark, wet and dangerous environments far from sunlight and familiar surroundings? We can largely rule out everyday motives, such as acquiring food or raw materials. We think that these caves were visited in planned and

collective actions to make contact with the world of the ghosts and ancestors within the framework of rituals. Like other researchers before us, we think that the cave wall functioned as a membrane between the world on this side and the world beyond. The qualitative condensation of the representations towards the end of the cave, the presence of “half” animals entering or leaving the wall, the sticking of artefacts into crevices of the cave wall and other indications of apotropaic behavior point in this direction. It seems to us that the ambivalent human-animal relationship between animistic beliefs and simple food supply is the key to understanding a conflict in these hunter-gatherer groups that could only be resolved through ritual. Our contribution is not intended as an incontrovertible conclusion, but rather as a brainstorming attempt to understand the behavioral patterns of these Upper Paleolithic societies.

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