newsletter 25 | 2025

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

Elephant area: An articulated elephant skeleton was discovered during the early excavations of the Notachirico site, Italy. Our research demonstrates that the elephant was not butchered, as initially believed. Photo: Marie-Hélène Moncel.

HEIDELBERGER AKADEMIE DER WISSENSCHAFTEN
Akademie der Wissenschaften des Landes Baden-Württemberg

THE ROLE OF CULTURE IN EARLY EXPANSIONS OF HUMANS

Editorial

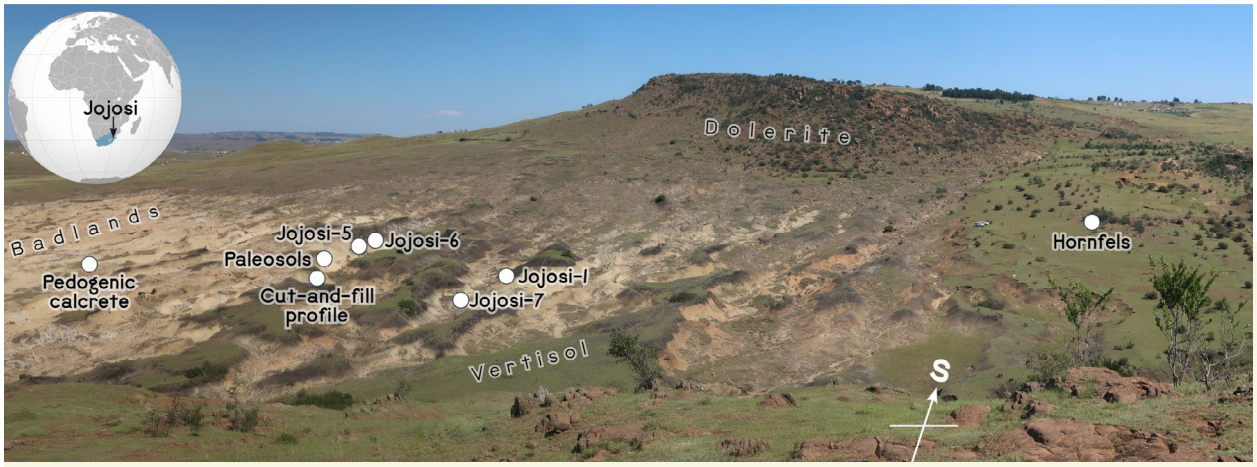
The 25th ROCEEH newsletter focuses on evidence of early human occupation found by our team in the gullies of northern KwaZulu-Natal, South Africa. The setting of the finds makes it possible to study the interaction of humans and environment using multidisciplinary methods. Next, we discuss Lateurope, an ERC project which aims to answer the question of why Western Europe was settled so much later than other regions of Eurasia. The project integrates a variety of approaches and is supported by ROCEEH's modeling center in Frankfurt. We also take a closer look at Sibhudu, a key site of the South African MSA, which was declared a World Heritage Site by UNESCO in 2024. ROCEEH's speaker, Nicholas Conard, and his team have worked there for well over a decade. Finally, we report on an international workshop about Southeast Asian prehistory and human behavior held in Manila, Philippines, and present a new publication analyzing situated learning in a community of practice of bow hunting as reflected through children's play tools.

The Jojosi Dongas' hidden history of early humans and landscapes

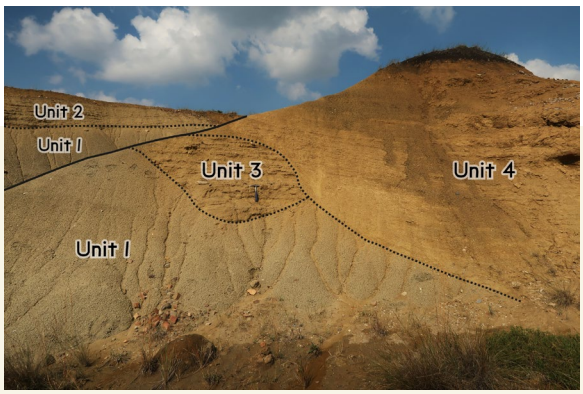
The Jojosi Dongas reflect a highly erosive landscape located in the north of the province of KwaZulu-Natal, South Africa (Fig. 1). The local term 'donga' refers to a geomorphologic phenomenon created by a process called gully erosion, in which deep channels are cut into the landscape by the linear flow of water (Fig. 2). The gully walls reveal a jumble of sedimentary layers and remnants of early human occupation, testifying to a complex site history.

A Middle Pleistocene landscape archive

The bedding of the Jojosi sediments is best described as a cut-and-fill morphology. Turbulent water flow carved U- and V-shaped trenches into the ancient landscape and deposited conglomerates of cobbles and boulders at the bottom. Well-sorted bands of sand, silt, and clay reflect deposition by flowing water under much calmer conditions and varying flow velocities. Thin laminations of clayey sediment indicate slow deposition by downslope creep and rain wash. Remnants of buried soil horizons with carbonaceous root channels can be traced for hundreds of meters, indicating favorable paleoenvironmental conditions for soil formation (Fig. 3). All these features together make the Jojosi Dongas an instructive environmental archive. The geoscientific investigations by Dr. Christian Sommer (ROCEEH), Dr. Svenja Riedesel (University of Cologne) and Dr. Greg A. Botha (University of KwaZulu-Natal) address the geomorphic history of the study area using methods such as stratigraphic correlation, luminescence dating, geochemical and spectroscopic fingerprinting, drone mapping and computational modeling.



▲ Figure 1. Panoramic view of the Jojosi Dongas. Jojosi-1, 5, 6, 7 are archaeological excavation sites, and the cut-and-fill profile, paleosols, and pedogenic calcretes are of geoscientific significance. Photo: Christian Sommer.



▲ Figure 2. Gully walls expose a succession of sedimentary bodies whose cut-and-fill morphology represents cycles of landscape stability and instability. Photo: Christian Sommer.

Extending the geomorphic record

A reference frame developed from similar colluvial deposits in northern KwaZulu-Natal has revealed region-wide phases of alternating landscape stability and instability throughout the Late Pleistocene up to about 120,000 years ago. However, this reference could not be correlated with the Jojosi Dongas, and for good reason: The luminescence dating results show that the Jojosi Dongas predate other known deposits. In fact, the dates extend the maximum age of such landscape archives back to more than 600,000 years ago. The team is currently working to incorporate the field evidence into a computer simulation that will explain the formation of the landscape in interaction with climatic and ecological processes – and their implications for early human environments.

▲ Figure 3. Christian Sommer and Felix Weinschenk collecting samples for geoscientific analysis from two paleo-soil horizons. Calcareous root channels and pedogenic carbonates indicate past phases of landscape stability associated with soil formation. Photo: Lawrence Msimanga.

Stone lines reveal buried knapping floors

The finding of many stone tools scattered across the surface and in the channels, attributed mostly to the Early and Middle Stone Ages, led Dr. Aaron Mazel and Dr. Greg Botha to conduct excavations at the site in the early 1990s. Along the channel walls, they discovered stone lines that had weathered out of the clayey sediment. Excavation revealed that these were intact "knapping floors", workshops for stone tools and their debris that remained in place for tens of thousands of years. More than thirty years later, the archaeological team led by Priv.-Doz. Dr. Manuel Will (University of Tübingen) including Dr. Matthias Blessing (University of Connecticut), Lawrence Msimanga (ArcheoTask), Gunther Möller (University of Tübingen) and Dr. Aaron Mazel (University of the Witwatersrand) excavated three additional workshops and identified many more Middle Stone Age sites. Their preservation and completeness are remarkable and allowed Gunther Möller to refit the fragments and thereby retrace and understand the production process. The local outcrop

of hornfels, which served as raw material, proved to be exceptionally suitable for the manufacture of stone tools and attracted people from the surrounding area.

An exceptional open-air site

These extraordinary conditions were what prompted Dr. Will to apply for funding from the German Research Foundation (DFG) and launch the Jojosi project. Most of the region's sensational Stone Age sites are caves and rockshelters, such as the UNESCO World Heritage site of Sibhudu Cave (read more in this newsletter), where ROCEEH has been involved for more than a decade. However, the Jojosi Dongas represent a notable exception. Stratified open-air archaeological sites with good preservation are rare due to their exposure to weathering. The knapping floors allow a high-resolution glimpse into compact moments of prehistory that lasted only a few minutes or hours (Fig. 4).

▲ Figure 4. Manuel Will excavating a lens of lithic remains. The excellent preservation and completeness of all clast sizes allows this to be identified as a knapping floor. OSL dating suggests deposition during Marine Isotope Stage 6 (191-130 years BP). Photo: Matthias Blessing.

Interdisciplinary questions

The combination of archaeological and geoscientific research allows open questions to be approached from an interdisciplinary perspective: Why are the conditions of preservation at Jojosi so exceptional? How endangered are the archaeological sites through ongoing erosion? What were the environmental conditions like during the early human occupation? How did this influence resource availability and the use of space in the wide landscape? The fieldwork phase was completed in November, 2024 (Fig. 5), and the first results are already available. Further publications on geomorphology and a synthesis paper are planned for later in 2025.

▲ Figure 5. The Jojosi Team 2023, from upper left to lower right: Manuel Will, Hanna Pehnert, Lawrence Msimanga, Svenja Riedesel, Gunther Möller, Greg A. Botha, Christian Sommer, Matthias Blessing. Photo: ROCEEH.

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Christian Sommer, Svenja Riedesel, Manuel Will

Lateurope: Why was Western Europe settled by hominins later than other regions of Eurasia?

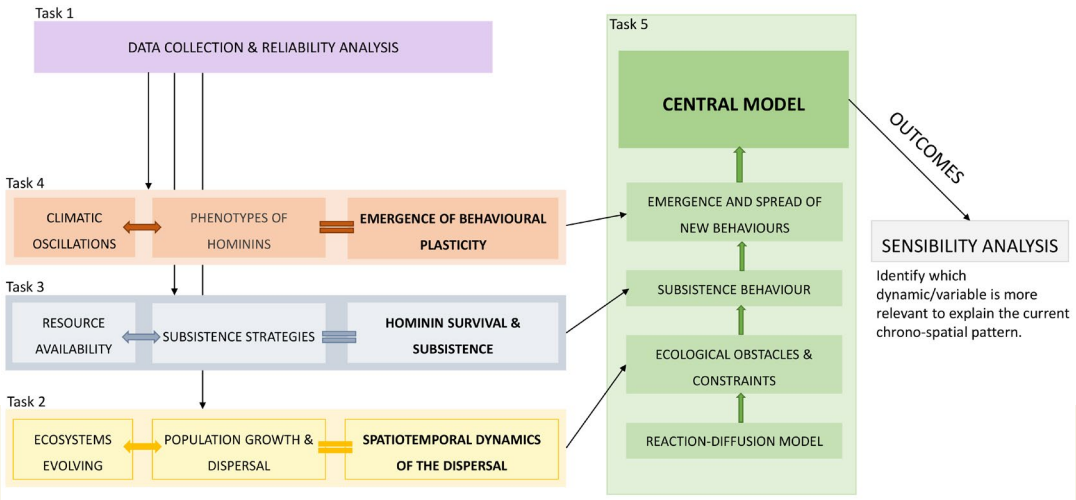
Following their initial dispersal beyond the African continent, hominins rapidly spread across Eurasia. Waves of dispersals reached as far as China and Southeast Asia as the evidence from Longgupo Cave, the Sangiran Dome, and Mojokerto in Java illustrates. The coast of the Mediterranean was also included in these early settlements, but the remote areas towards the Atlantic Ocean and the North Sea were occupied only later. The Lateurope project explores the question, why was Western Europe settled by hominins so much later than other regions of Eurasia?

◀ Figure 6. LCTs: An in-situ large cutting tool at the excavation in Notarchirico. Photo: Marie-Hélène Moncel.

Implementing a highly interdisciplinary approach, Lateurope searches for the reasons that prevented hominins from permanent and early settlements in the dynamic and variable environments of Western Europe during the time from the Early Pleistocene to the early Middle Pleistocene, about 900,000 to 600,000 years ago. Were there topographic barriers such as mountain ranges, wide rivers, or swamps that rendered some regions inaccessible? Archaeological evidence from the Levant and Asia, however, illustrates that hominins managed to explore a wide variety of environments and thrived under diverse climatic and ecological conditions. Therefore, environmental conditions alone cannot be responsible for the inaccessibility of certain regions. Further constraints may result from inflexible behavior and/or technological limitations. Lateurope integrates a wide variety of approaches at different scales and focusses on a set of key localities on the Mediterranean and in France and the United Kingdom.

At the site of Notarchirico in Italy, for instance, an international team of researchers aims to characterize hominin strategies in Southern Europe. Dated between 700 and 610 ka, the sequence records ten phases of occupation covering two interglacial events, MIS 17 and 15, bracketing the glacial period corresponding to MIS 16. Hominins came to the shores of a lake, possibly for scavenging large herbivores such as elephants (see cover picture), and collected local stones to produce large cutting tools (LCTs) (Fig. 6) as well as smaller flakes from siliceous nodules. Preliminary results on use-wear show plant and wood working, and evidence of butchery, both indicating domestic activities at the site. In the sequence, neither technological trends can be identified, nor gradients in climatic conditions, except for the presence or absence of LCTs. The material has yielded the earliest remains of a lion in Western Europe (> 610 ka), enriching our knowledge about the composition of the carnivore guild at the onset of the Acheulean (handaxe culture) in Europe. In order to complement data collected by its field work, Lateurope uses the ROAD database for data mining and geospatial analysis.

The interdisciplinary and comprehensive approach used by Lateurope integrates modeling (Fig. 7). We apply both traditional approaches such as environmental niche modeling in conjunction with cutting edge reconstructions of the environment and its dynamics on a continental scale, as well as agent-based modeling (ABM) to explore responses in spatial behavior of early hominins caused by variable resource densities and geographic distributions.



▲ Figure 7. In Lateurope, the modeling strategy follows a strict protocol, thereby fitting subordinate models to the empirical parts of the project. Graphic: Carolina Cucart Mora.

The modeling team in Lateurope, supported by the ROCEEH modeling center in Frankfurt, manages three levels of integration. Specifically, we begin with an environmental reconstruction of Eurasia over time, focusing on transitions between glacial and interglacial periods and vice versa. Subsequently, climate and environmental reconstructions are coupled with data on hominin presence to build niche and habitat suitability models. This information will be used to parameterize four agent-based models designed to understand the different domains of hominin-environment interactions at different temporal and spatial scales. The integration of the ABMs within each other will be done in a stepwise manner. The first ABM aims to reconstruct the evolution of Eurasian ecosystems over time and how this may have affected the dispersal of hominin populations. The second will analyze how hominin subsistence and mobility strategies adapted to different conditions at the local scale. A third ABM will be constructed to understand the emergence of behavioral plasticity in relation to climatic oscillations and how this feature may have favored the survival of hominin populations on a regional scale. Finally, the fourth model integrates the impact of environmental and geographical barriers, the emergence of new behaviors in Eurasia, and their influence on the dispersal process. The last agent-based model will be validated by comparing the speed and direction of population advance with the earliest dates of occupation in the different regions of Eurasia.

The Lateurope project has already started to produce outcomes. Through a large database and revision of the available sites in Western Europe, we apply new methodologies to investigate the behavioral strategies of hominins from more than one million to 500,000 years ago in a strict chronological framework and at various scales. Since the project focuses on Western Europe between 1.5 million and 500,000 years ago, our studies are primarily directed towards the (re-) evaluation of well-known sites, as well as new ones. The research covers, for instance, exhaustive analysis of the technological characteristics of the lithic assemblages; the characterization of subsistence patterns of the groups through faunal and taphonomic studies; mobility studies based on raw materials; and local climatic reconstructions using isotopes. In relation to the modelling, our aim is to identify the relevant dynamics and variables that explain the current spatiotemporal pattern of the occupation of Western Europe.

Lateurope is funded by the European Research Council and runs until 2027.

Marie-Hélène Moncel, Carolina Cucart Mora, and Christine Hertler

South-Africa's Sibhudu Cave named a UNESCO World Heritage Site

Sibhudu is a key site of the South African Middle Stone Age (MSA) and, since 2011, has been explored archaeologically by Nicholas Conard (Senckenberg Centre for Human Evolution

▼ Figure 8. A view over Sibhudu rockshelter and the ongoing excavations. Photo: Mohsen Zeidi.

Paleoenvironment, and PI of ROCEEH). The University of Tübingen supported the local and national governments to gain the UNESCO World Heritage nomination together with two other key South African MSA sites (Diepkloof Rock Shelter and Pinnacle Point Site Complex) under the title "The Appearance of Modern Man: The Pleistocene Settlement Sites of South Africa".

Sibhudu is located on the east coast of South Africa in the Province of KwaZulu-Natal, about 15 km from the Indian Ocean and around 40 km north of Durban. Situated on a sandstone cliff overlooking the uThongathi River, the rockshelter covers an area of approximately 55 by 12 meters (Fig. 8). The South African MSA dates back some 300,000 to 30,000 years and represents a crucial period for the early cultural evolution of our own species, *Homo sapiens*. The MSA occupations of Sibhudu range from over 80,000 to 35,000 years ago, preserving organic material and providing detailed information about the behavior of its inhabitants. This makes Sibhudu an excellent archive for the early cultural development of our ancestors,

▲ Figure 9. Nicholas Conard and Nothando Shabalala, a Heritage Officer from the local monument preservation authority named AMAFA, discussing a find. Photo: Mohsen Zeidi.

▼ Figure 10. Stratigraphy of Sibhudu rockshelter with Ria Litzenberg squatting in front of the section which shows dozens of thin archaeological layers. Photo: Mohsen Zeidi.

before *Homo sapiens* successfully colonized Eurasia and replaced Neanderthals and other archaic human species.
Sibhudu was first discovered in 1983, and systematic exploration began in 1998, led by Lyn Wadley of the University of Witwatersrand in Johannesburg, South Africa. After more than a decade of work comprising over 20 field seasons, she handed over the direction of the excavation to Nicholas Conard in 2011 (Fig. 9). Since then, the team from Tübingen has carried out annual excavations. Further collaboration with various international experts - such as zooarchaeologists, archaeobotanists and geoarchaeologists - provides a diverse picture of the archaeological remains recovered at the site.

The site has a high-resolution, centimeter-level detail of archaeological contexts and requires extreme care during excavation (Fig. 10). The find densities of archaeological material are extremely high, including tens of thousands of stone tools and animal bones, indicating repeated and intense use of the site as a residential camp by early modern humans. The high degree of preservation of organic material is also unusual for this period. All artifacts and buckets found during excavation are measured using a total station so that their exact location can be traced later using the 3D coordinates. Each bucket full of sediment is also carefully sieved and searched for small finds.

The organic find spectrum includes bedding made from vegetation, bone tools, and even adhesive, animal and plant residues on stone tools. Here archaeologists found the oldest evidence of the construction of plant mats as sleeping and working places, evidence of the use of bone tools and evidence of early symbolic behavior in the form of shell beads. In addition, one of the oldest arrowheads made of bone was found at the side, providing some of the earliest evidence for the invention of this technique. This provide unique glimpses into the lives of our ancestors: they were capable of abstract and complex thinking bone and stone, mastered the use of fire, hunted animals and also knew how to use plant resources for themselves.

From its inception, ROCEEH has supported research in Sibhudu and other South African archaeological sites financially and with personnel. Congratulations to be named a UNESCO World Heritage Site!

Julia Heß

International workshop on Southeast Asian prehistory and human behavior in material culture

4–8 March 2025, at Ateneo de Manila University, Philippines

An international team of researchers met in Manila to discuss perspectives on archaeology in the Philippines. The meeting was organized by Riczar Fuentes, who presently holds the Koenigswald fellowship, as well as Mylene Lising and Alfred Pawlik. The workshop focused on traceology, a method used to identify and interpret the traces left by behind by lithic tools when they are used on various materials. This rapidly developing field of research was complemented by a series of presentations focused on integrating a wide array of research approaches and strategies. Christine Hertler presented the ROAD database and discussed options for both data storage and data retrieval with the participants. The ROAD database offers an integrative knowledge base for archaeological, paleontological, and paleoanthropological information.

The participants then enjoyed a two-day field trip to Kalinga province and the Cagayan valley in northern Luzon. They visited the sites of Tabuk, Kalinga, and Callao Cave, and saw shell middens along the Cagayan River. These sites illustrate that hominins already inhabited the northern part of the Philippines during the late Early and Middle Pleistocene. Although the evidence is sparse at present, all of the localities deserve and require further studies.

Christine Hertler

▲ Figure 11. The participants of the workshop on Southeast Asian prehistory and human behavior in material culture at Ateneo de Manila. Photo: Riczar Fuentes.

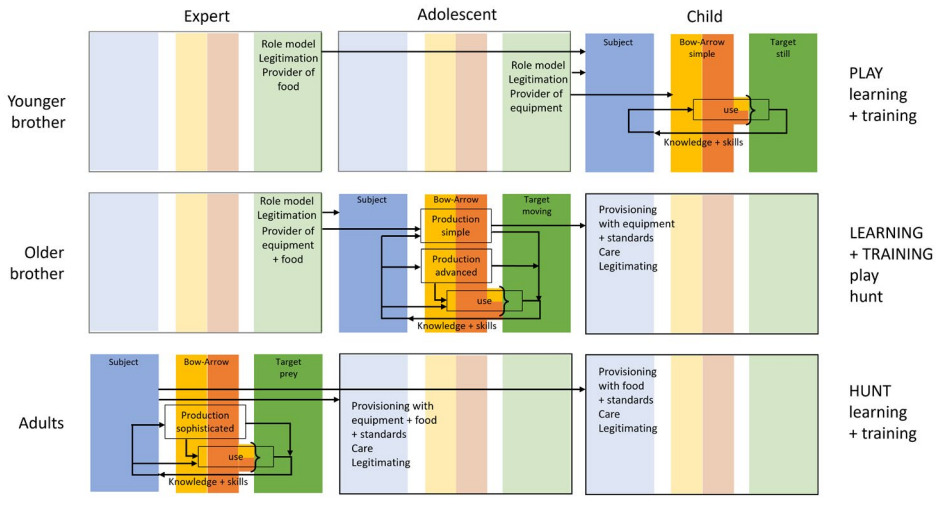
Becoming a bow hunter

A set of objects represents the material remains of children's play, which we can rarely identify in the archaeological record. A Wodaabe boy made the set of bow, arrows and quiver for his younger brother. This play set, which ethnographer Mette Bovin brought from Niger to the Moesgaard Museum in Denmark in 1987, mimics those of adults. Although it is not fully functional, the set represents all major characteristics including the composition of the bow (wooden stave and plastic string), the arrows (wooden shaft and metal projectile), and the quiver (bark and plastic string) as well as the complementary function of these three elements (Fig. 12). The ethnographic context of the material record opens the view of a community of practice – the social network behind the handling, making, using and learning of such a tool set – and the fluid roles an individual can take within it (Meyer et al. 2025).

▲ Figure 12. The Wodaabe play set of bow-arrow-quiver used as the basis for the construction of the cognigrams discussed in this article. From the Ethnographic Collections at Moesgaard Museum, Photo: Jacob Due.

The basic concepts of bow-and-arrow, composition and complementarity, are cognitively demanding (Lombard & Haidle 2012). The little Wodaabe boy began to engage with the tools by using the play set for entertainment; through playful shooting, he incidentally acquired shooting skills. For the older brother who made the bow set, caring for his younger sibling by providing him with toys gave an opportunity to practice and improve knowledge and skills in bow-and-arrow making. The experienced bow hunters did not interact directly, but they supported the activities by providing encouragement and cutting tools and letting the boys use the raw material. The cognition triggered by the bow and arrow extends across individuals and generations; its construction and use activated the metacognition of the individuals involved. The bow became a practical and cognitive extension not only for the young user, but also for his older peer and their parental generation. Conversely, any reconstruction of the behavioral and cognitive processes associated with this bow-and-arrow set must consider the participation of multiple individuals and their position in the chains that transmit social information, which also affected the ontogenetic unfolding of the historically specific, situated cognition of all participants.

A cognigram analysis of the Wodaabe bow-and-arrow-set (Fig. 13) has to differentiate between the manufacture of bow, arrows, and quiver on the one hand and their use on the other, each with different subjects (elder versus younger brother), aims (producing a bow-arrow-quiver that the young boy can use versus shooting arrows at selected objects), and activities (selecting raw materials, manipulating and assembling them



▲ Figure 13. Becoming a Wodaabe bow hunter – an overview
Situated learning through legitimate peripheral participation in a community of practice of Wodaabe bow hunters. This cognigram depicts the differing perspectives of the younger brother, older brother, and adults through the connecting arrows. The performances of the expert, adolescent and child are highlighted. The complexity of the performances is reduced in favor of clarity. Graphic: M.N. Haidle.

versus handling bow-and-arrow in a complementary way to hit targets). The tool set represents not only one problem-solution unit but a sequence of decoupled but aligned problem-solution activities in which both manufacture and use include different problem perceptions in the beginning, and satisfactions of the respective needs in the end. Here the cognitive processes are distributed across at least three parties of the group belonging to separate generations.

Growing up in the community of practice of Wodaabe bow makers and users and the process of becoming an expert is associated with a shift in conscious and unconscious objectives in different degrees and sets from play to hunt. Practices such as approaching and shooting at different targets change. New performances are introduced such as the manufacture of bow-arrow-quiver sets of different qualities including the selection and preparation of raw materials and the use of equipment such as knife and drill. Together, these elements form the bow hunting complex. The process of becoming an expert is embedded in a social network of age-graduated, skilled and knowledgeable group members. With their performances, the more advanced group members set standards for the less experienced; they provide ideas, access to tools and certain materials, and legitimate the range of behavior of the learners. Starting at the periphery of the community of practice, children receive a largely ready-made resource space and learning environment from others, in which risks, duties, and also possibilities are limited. With expanding experience, knowledge, and skill, both legitimate resource space and learning environment broaden. Less is predetermined; the challenges grow as do the responsibilities for oneself and the less experienced; new and more demanding fields of activity are added. With each performance, but also interactions with other group members, additional knowledge and skills are acquired. With increasing mastery of progressively complex performances, adolescents turn into experts who form the center of the community of practice. The transformation process from novice to expert is accompanied by a shift from a mainly receiving to a primarily providing role within the group.

The bow-arrow-quiver set for playing represents a setting of situated learning with different learning possibilities and an increasing participation in communities of practice (Lave & Wenger 1991). Knowledge, proficiency in application, and making sense of the different procedures and elements are mainly achieved by material engagement. By decoupling the different performances of manufacture and use of the elements of the bow-arrow-quiver set, the learning packages are reduced, and it becomes easier to gain expertise playfully and without formal apprenticeship. Having learnt the small units through the provisioning of specific technologies, children master additional steps of knowledge and skill within these concrete technological domains with ease. Thus, the manageable complexity in tool behavior overall may increase.

Lave and Wenger emphasize the process of slow growth into the community of practice, from the periphery with only few insights, little knowledge, and limited skills to fully mature practice through increasing participation. Although their study focuses on apprentice-master relations, their results can, with due modification, be transferred to the play situation around the bow-arrow-quiver set. They describe the tasks of the novices as, "…short and simple, the costs of errors are small, the apprentice has little responsibility for the activity as a whole." The young boy improves his understanding and handling of the tool set as well as aiming at appropriate targets, while the elder boy advances to the stage of embedded peer learning where the range of tasks and their complexity increases. The costs (of errors), however, remain small; neither good material nor the experts' bow hunting activities get spoiled. The elder brother improves his knowledge about the interdependencies of the elements of the tool set and gains experience in the production processes as well as the transformative properties of different materials; the functionality of the result is then tested by the younger. Although not mentioned in the reports about Wodaabe bow-and-arrow play, it is quite likely that the older boys have (limited) access to the hunting weapon sets of the adults, applying knowledge about their equipment, behavior, and conversations as models for their simpler and incomplete performance of making the play set. With an increase of legitimate participation, their knowledge and skills advance, and they slowly approach the center of the community of practice.

Children play, and the presence of play-related objects in the past can tell us much about the society in question. Better understanding of: 1) the relationships between play and learning; 2) the interdependence between individual and social learning; 3) the role of material equipment provided by more advanced group members creating an enriched learning environment for beginners; and 4) the interplay between the different subgroups in a community of practice and the fluid transition between different stages of expertise with different aims, roles and legitimations gives us an idea of social networks and developmental processes normally hidden in the archaeological context.

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Miriam N. Haidle

New column: ROCEEH-publications

Baumann, C., **Kandel, A.W.** & Hussain, S.T. (2025): Evidence for the catalytic role of humans in the assembly and evolution of European Late Pleistocene scavenger guilds. Quaternary Science Reviews 349, 109148, ISSN 0277-3791. https://doi.org/10.1016/j.quascirev.2024.109148

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Forthcoming

■ Developing International Geoarchaeology & AK Geoarchäologie 2025

21-25 May 2025, Tübingen, Germany

Christian Sommer will present new results from geoscientific and archaeological work at the Jojosi Dongas, KwaZulu-Natal, South Africa.

You can find more details here: https://sites.google.com/view/dig2025/home

■ International ROCEEH symposium "Diversifying networks - how culture diffuses the environment"

8-10 October 2025, Frankfurt, Germany

Together with a group of invited speakers ROCEEH examines how hominins shaped themselves and their environment and explores cultural environments as niches for other species. The rules for social interactions were critically changed by adaptations in sociality. This opened new spaces for early hominins. Hominin mobility is investigated by means of state-of-the-art procedures in modeling and simulation. The event is open for registered participants.

You can find more details here:
News | Heidelberg Academy of Humanities and Sciences

Who's who?

This issue: Christian Sommer

Christian Sommer is one of the genuine ROCEEH offspring. He completed his doctorate and now works as a post-doctoral researcher in ROCEEH. As a geographer, he is responsible for the ROAD geodata infrastructure and spatial analyses. His research focuses on paleogeographic landscape development and geomorphology, with an emphasis on Southern Africa.

After studying Physical Geography with a specialization in remote sensing and geoinformatics, Sommer followed in the position of Dr. Michael Märker, who left ROCEEH for a professorship in Pavia, Italy. As a PhD student supervised by his predecessor, as well as Prof. Dr. Hochschild and Prof. Conard, Christian dealt with the history of the landscape around Sibhudu Cave and the southern Drakensberg, where ROCEEH has been active for many years.

His role in ROCEEH is to maintain the ROAD database and in particular the spatial data infrastructure. The paradigms of open science, FAIR[1] data and networking are important to him to ensure a long and sustainable future for the database. He is therefore pleased that ROCEEH has been able to work as a team on difficult issues such as the opening of the database to the public, licensing, and integration with external services. His current projects include the revision of the geodata warehouse, the integration of ROAD into interactive Wikipedia maps, and a library in R statistical software that facilitates access for external users. With his geostatistical background he has also been involved in some exciting macroarchaeological and diachronic studies conducted by the ROCEEH community, such as the spread of ochre in Africa, the ecological niche of Neanderthals, and the spatial distribution of portable art.

When Chris isn't in his office in Tübingen, he's probably out conducting field work in Southern Africa, in the province of KwaZulu-Natal, or soon in southern Namibia and Eswatini. His research focuses on Quaternary environmental change and what we can learn from the past with regard to current global environmental change. He uses a mix of classical geomorphological fieldwork, remote sensing data collected from drones to satellites, and computer modeling to study the processes that shape the landscape, past and present. He always enjoys interdisciplinary collaboration with archaeologists from the ROCEEH community, both for the good company and because only by combining culture and environment can we gain comprehensive insights into early human expansions.

[1] FAIR means Findable, Accessible, Interoperable, Reusable, attributes which represents the current gold standard for maintaining data.

COORDINATORS Miriam Haidle (scientific)
Julia Heß (administrative)

Senckenberg Research Institute
Senckenberganlage 25
D-60325 Frankfurt/Main
miriam.haidle@uni-tuebingen.de
julia.hess@senckenberg.de
www.roceeh.net

EDITORS Julia Heß and
Andrew W. Kandel

THE ROLE
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