

References

BAE 2017

Christopher J. Bae, Katerina Douka & Michael D. Petraglia, *On the origin of modern humans, Asian perspectives*. [science 358 \(2017\), 1269](#).

The traditional “out of Africa” model, which posits a dispersal of modern *Homo sapiens* across Eurasia as a single wave at $\approx 60,000$ years ago and the subsequent replacement of all indigenous populations, is in need of revision. Recent discoveries from archaeology, hominin paleontology, geochronology, genetics, and paleoenvironmental studies have contributed to a better understanding of the Late Pleistocene record in Asia. Important findings highlighted here include growing evidence for multiple dispersals predating 60,000 years ago in regions such as southern and eastern Asia. Modern humans moving into Asia met Neandertals, Denisovans, mid-Pleistocene *Homo*, and possibly *H. floresiensis*, with some degree of interbreeding occurring. These early human dispersals, which left at least some genetic traces in modern populations, indicate that later replacements were not wholesale.

BRANDT 2012

Steven A. Brandt et al., *Early MIS 3 occupation of Mochena Borago Rockshelter, Southwest Ethiopian Highlands, Implications for Late Pleistocene archaeology, paleoenvironments and modern human dispersals*. [Quaternary International 274 \(2012\), 38–54](#).

Steven A. Brandt, Erich C. Fisher, Elisabeth A. Hildebrand, Ralf Vogelsang, Stanley H. Ambrose, Joséphine Lesur & Hong Wang

Between 70 and 50 ka BP, anatomically modern humans dispersed across and out of Africa to eventually populate all inhabitable continents. Knowledge of paleoenvironments and human behavioral patterns in Africa prior to and during these dispersals is crucial for understanding how and why hunter-gatherers were able to adapt rapidly to the new environments they encountered. However, few well-dated sites from this time period are known from the Horn of Africa, one of the purported staging areas for population movements into southern Arabia and Asia. Excavations at Mochena Borago Rockshelter, situated on the western slopes of a dormant volcano where the SW Ethiopian Highlands meet the Ethiopian Rift, have yielded the first securely dated archaeological sequence for later periods of the dispersal. Three major lithostratigraphic groups incorporating occupational episodes have yielded charcoal radiocarbon ages $\approx 53\text{--}38$ ka calBP; deeper deposits have been tested but remain undated. Archaeological assemblages consist mainly of obsidian flaked stone artifacts manufactured from small, minimally prepared, single- to multi-platform flake cores; radially prepared cores are rare and blade cores are absent. Small unifacial to bifacial points from non-radial cores dominate the earliest shaped tool assemblages, and backed pieces first appear by ≈ 45 ka calBP. By ≈ 43 ka calBP, scrapers and backed pieces are predominant, rather than points. However, there is little evidence for technological change other than the appearance of bipolar technology. Mochena Borago’s archaeological sequence thus cannot be neatly classified as Middle Stone Age, Later Stone Age or “transitional” and calls into question some of the principles by which archaeologists have attempted to classify African toolmaking traditions.

BRANDT 2017

Steven Brandt, Elisabeth Hildebrand, Ralf Vogelsang, Jesse Wolfhagen & Hong Wang, *A new MIS 3 radiocarbon chronology for Mochena Borago Rockshelter, SW Ethiopia, Implications for the interpretation of Late Pleistocene chronostratigraphy and human behavior*. [Journal of Archaeological Science: Reports](#) **11** (2017), 352–369.

With excavated layers spanning a period from N49 ka to \approx 36 ka, Mochena Borago Rockshelter reveals a complex sequence of Late Pleistocene human occupation punctuated by volcanic events. Fifty-nine radiocarbon ages make Mochena Borago one of the best-dated Late Pleistocene archaeological sites in eastern and north-eastern Africa. However, complex site formation processes, dramatic stratigraphic differences between non-contiguous excavation areas, and “outlier” dates that appear in various parts of Mochena Borago’s sequence, complicate efforts to develop a secure and detailed chronology for local and regional behavioral changes. This article focuses on contiguous squares within the Block Excavation Area (BXA) trench at the northern end of the shelter. Bayesian modeling of thirty-seven dates from six major lithostratigraphic units within the BXA yields a revised series of age ranges; these differ from the previous age model (derived from weighted means) in subtle but important ways. Perspectives gained through Bayesian analysis stimulate more careful consideration of the complex site formation processes operating at Mochena Borago, the contextual integrity of the site’s robust and distinctive flaked stone artifact assemblages (lithics), and potential correlations between lithic changes and environmental events that occur on local, regional, and global scales. As these factors come into focus, Mochena Borago can serve as an important chronological benchmark to better understand human behavior in eastern and northeastern Africa around the time of the second major dispersal of *Homo sapiens*.

Keywords: MIS 3 | Ethiopia | Lithic technology | Radiocarbon | Late Pleistocene | Bayesian modeling

COMPTON 2011

John S. Compton, *Pleistocene sea-level fluctuations and human evolution on the southern coastal plain of South Africa*. [Quaternary Science Reviews](#) **30** (2011), 506–527.

Humans evolved in Africa, but where and how remain unclear. Here it is proposed that the southern coastal plain (SCP) of South Africa may have served as a geographical point of origin through periodic expansion and contraction (isolation) in response to glacial/interglacial changes in sea level and climate. During Pleistocene interglacial highstands when sea level was above .75 m human populations were isolated for periods of 360–3400 25-yr generations on the SCP by the rugged mountains of the Cape Fold Belt, climate and vegetation barriers. The SCP expands five-fold as sea level falls from .75 to .120 m during glacial maxima to form a continuous, unobstructed coastal plain accessible to the interior. An expanded and wet glacial SCP may have served as a refuge to humans and large migratory herds and resulted in the mixing of previously isolated groups. The expansive glacial SCP habitat abruptly contracts, by as much as one-third in 300 yr, during the rapid rise in sea level associated with glacial terminations. Rapid flooding may have increased population density and competition on the SCP to select for humans who expanded their diet to include marine resources or hunted large animals. Successful adaptations developed on an isolated SCP are predicted to widely disperse during glacial terminations when the SCP rapidly contracts or during the initial opening of the SCP in the transition to glacial maxima. The hy-

pothesis that periodic expansion and contraction of the SCP, as well as the coastal plain of North Africa, contributed to the stepwise origin of our species over the last 800 thousand years (kyr) is evaluated by comparing the archeological, DNA and sea-level records. These records generally support the hypothesis, but more complete and well dated records are required to resolve the extent to which sea-level fluctuations influenced the complex history of human evolution.

Keywords: Human evolution | Allopatry | Sea level | Shelf | Pleistocene | South Africa | Maghreb

CONNAH 2001

Graham Connah, *African civilizations, An archaeological perspective*. (Cambridge 2001).

CONNAH 2004

Graham Connah, *Forgotten Africa, An introduction to its archaeology*. (Abingdon 2004).

CRUZ 2014

M. Dores Cruz, *Sites, Ancestors, and Trees in the Archaeology of Southern Mozambique*. In: NEAL FERRIS, RODNEY HARRISON & MICHAEL V. WILCOX (Hrsg.), *Rethinking Colonial Pasts through Archaeology*. (Oxford 2014), 123–149.

This chapter examines the role of landscapes and natural elements as historic and memory markers, focusing on sacred trees and tree groves as part of the archaeology of the Mandlakazi region in Southern Mozambique. More specifically, it explores how trees and tree groves relate to ancestral figures that held political power and how they are an integral part of local history, and how this connection legitimises identity creation. It also considers how intangible elements such as rituals, community history, and webs of kinship relations are at once embedded and made visible through the use of landscapes and elements of nature in their construction of a collective social memory that encompasses the community of the living and of the ancestors.

Keywords: landscapes | sacred trees | tree groves | archaeology | Mandlakazi | Southern Mozambique | political power | local history | social memory | ancestors

ECO 1977

Umberto Eco, *How to Write a Thesis*. (Cambridge 2015).

Eco was aware of this predicament. As a university professor, he knew that the majority of students in Italian universities seldom attended classes, that very few of them would continue to write and do research, and that the degree they eventually earned would not necessarily improve their social conditions. It would have been easy to call for the system to be reformed so as not to require a thesis from students illequipped to write one, and for whom the benefit of spending several months working on a thesis might be difficult to justify in cold economic terms.

But Eco did not believe that education belonged to an elite, or that it should lower its standards in including the non-elite. He understood that the writing of a thesis forced many students outside of their cultural comfort zone, and that if the shock was too sudden or strong, they would give up. For him, it was about tailoring the challenge to students' needs and capabilities, but without giving up thoroughness, complexity, and rigor. If students' interests and ambitions could be met, while the limits of their sense of security were stretched, education would be achieved.

FAUVELLE 2013

François-Xavier Fauvelle, *Das Goldene Rhinoceros, Afrika im Mittelalter*. (München 2017). Originaltitel: Le Rhinoceros d’or – Histoires du Moyen Âge africain.

FRANKE 2016

Gabriele Franke, *A Chronology of the Central Nigerian Nok Culture, 1500 BC to the Beginning of the Common Era*. *Journal of African Archaeology* **14** (2016), 257–289.

The Central Nigerian Nok Culture and its well-known terracotta figurines have been the focus of a joint research project between the Goethe University Frankfurt and the National Commission for Museums and Monuments in Nigeria since 2005. One major research question concerns chronological aspects of the Nok Culture, for which a period from around the middle of the first millennium BC to the first centuries AD had been suggested by previous investigations. This paper presents and discusses the radiocarbon and luminescence dates obtained by the Frankfurt Nok project. Combining the absolute dates with the results of a comprehensive pottery analysis, a chronology for the Nok Culture has been developed. An early phase of the Nok Culture’s development begins around the middle of the second millennium BC. Its main phase, in which terracotta figurines and iron production appear, starts in the 9th century BC and ends in the 4th century BC. A later phase with vanishing evidence extends into the last centuries BC. On sites dating from the first centuries AD onwards no more Nok terracotta or pottery are found; the end of the Nok Culture is thus set around the turn of the Common Era.

Keywords: Nok Culture | Nigeria | chronology | radiocarbon dating | pottery | Iron Age

GROUCUTT 2015

Huw S. Groucutt et al., *Rethinking the Dispersal of Homo sapiens out of Africa*. *Evolutionary Anthropology* **24** (2015), 149–164.

Huw S. Groucutt, Michael D. Petraglia, Geoff Bailey, Eleanor M. L. Scerri, Ash Parton, Laine Clark-Balzan, Richard P. Jennings, Laura Lewis, James Blinkhorn, Nick A. Drake, Paul S. Breeze, Robyn H. Inglis, Maud H. Devès, Matthew Meredith-Williams, Nicole Boivin, Mark G. Thomas, and Aylwyn Scally

Current fossil, genetic, and archeological data indicate that *Homo sapiens* originated in Africa in the late Middle Pleistocene. By the end of the Late Pleistocene, our species was distributed across every continent except Antarctica, setting the foundations for the subsequent demographic and cultural changes of the Holocene. The intervening processes remain intensely debated and a key theme in hominin evolutionary studies. We review archeological, fossil, environmental, and genetic data to evaluate the current state of knowledge on the dispersal of *Homo sapiens* out of Africa. The emerging picture of the dispersal process suggests dynamic behavioral variability, complex interactions between populations, and an intricate genetic and cultural legacy. This evolutionary and historical complexity challenges simple narratives and suggests that hybrid models and the testing of explicit hypotheses are required to understand the expansion of *Homo sapiens* into Eurasia.

HERTEL 2001

Peter Hertel, *Projekt Diplomarbeit, Schreibwerkstatt*. (Osnabrück 2001). <<http://www.informatik.hs-furtwangen.de/~hanne/LATEX-DA-sws.pdf>> (2017-04-16).

Wir halten fest: Jedes Dokument, mit dem man sich wegen der Diplomarbeit beschäftigt, ist sofort in der Literaturdatenbank zu vermerken. Auch dann, wenn Sie noch gar nicht wissen können, ob das Schriftstück zitiert werden soll, oder an welcher Stelle.

JESSE 2004A

Friederike Jesse, *The Neolithic*. In: DEREK A. WELSBY & JULIE R. ANDERSON (Hrsg.), *Sudan Ancient treasures, An exhibition of recent discoveries from the Sudan National Museum*. (London 2004), 35–41.

JESSE 2004B

Friederike Jesse, *The Wadi Howar*. In: DEREK A. WELSBY & JULIE R. ANDERSON (Hrsg.), *Sudan Ancient treasures, An exhibition of recent discoveries from the Sudan National Museum*. (London 2004), 53–60.

JESSE 2010

Friederike Jesse, *Early Pottery in Northern Africa, An Overview*. *Journal of African Archaeology* 8 (2010), 219–238.

The emergence of pottery is a compelling issue for archaeologists. In Africa, pottery appeared in what now the southern part of the Sahara and the Sahel different localities and in different contexts in the 10th millennium bp. This paper aims to give an overview the available data concerning early pottery in Northern Africa. The radiocarbon evidence is considered as well as technological features of the pottery; the decoration and the site context. The areas of the earliest appearance of pottery in Northern Africa were uninhabited during hyperarid phase at the end of the Pleistocene. Intriguing questions are therefore the origin of the Early Holocene occupants and of their knowledge of potting and of course the role of early pottery in the prehistoric groups.

Keywords: Northern Africa | pottery | Early Holocene | Wavy Line

JUNIUS 2016

Henrik Junius, *Nok Early Iron Production in Central Nigeria, New Finds and Features*. *Journal of African Archaeology* 14 (2016), 291–311.

Between 2005 and 2013, new archaeometallurgical finds and features in central Nigeria resulted from several excavation campaigns conducted by the Nok research project, Goethe University, Frankfurt. This article presents the first excavation results and compares the newly generated data to the publications on the Nok iron smelting site of Taruga from 40 years ago. All newly excavated sites find close resemblance in each other in regards to dates in the middle of the first millennium BCE, furnace design, find distribution and find properties. In some cases, the finds from the Taruga valley fit in the new and homogeneous picture of Nok iron metallurgy. However, Taruga differs from the new sites in its variety of furnace design and number of furnaces.

Whereas furnace bases with a width of around one meter based on slag pits partially filled with slag seem to be the rule for all newly excavated Nok furnaces, only some furnaces at Taruga exhibit these characteristics. Furnace variability at Taruga could be explained by a longer and/or subsequent site usage through time. Modern era finds like a clay smoking pipe, the higher number of furnaces per site as well as a higher dispersion of absolute dates and the variability of furnace

design could support this assumption. This paper concentrates on the archaeological context of a specific type of early iron technology in central Nigeria; ongoing archaeometric analysis of all related finds will be presented elsewhere.

Keywords: Nok | Taruga | iron smelting | iron technology | Nigeria | West Africa

KRÖPELIN 2008

S. Kröpelin et al., *Climate-Driven Ecosystem Succession in the Sahara: The Past 6000 Years*. [science](#) **320** (2008), 765–768.

[s320-0765-Supplement.pdf](#), [s320-0765-Comment.pdf](#), [s320-0765-Reply.pdf](#)

S. Kröpelin, D. Verschuren, A.-M. Lézine, H. Eggermont, C. Cocquyt, P. Francus,, J.-P. Cazet, M. Fagot, B. Rumes, J. M. Russell, F. Darius, D. J. Conley, M. Schuster, H. von Suchodoletz,, D. R. Engstrom

Desiccation of the Sahara since the middle Holocene has eradicated all but a few natural archives recording its transition from a "green Saharato the present hyperarid desert. Our continuous 6000-year paleoenvironmental reconstruction from northern Chad shows progressive drying of the regional terrestrial ecosystem in response to weakening insolation forcing of the African monsoon and abrupt hydrological change in the local aquatic ecosystem controlled by site- specific thresholds. Strong reductions in tropical trees and then Sahelian grassland cover allowed large-scale dust mobilization from 4300 calendar years before the present (cal yr B.P.). Today's desert ecosystem and regional wind regime were established around 2700 cal yr B.P. This gradual rather than abrupt termination of the African Humid Period in the eastern Sahara suggests a relatively weak biogeophysical feedback on climate.

KRÖPELIN 2017

Stefan Kröpelin, *Klimawandel und Besiedlung der östlichen Sahara seit der letzten Eiszeit, Ein Schlüssel für die Zukunft?* In: HARALD MELLER & THOMAS PUTTKAMMER (Hrsg.), *Klimagewalten – Treibende Kraft der Evolution, Begleitband zur Sonderausstellung im Landesmuseum für Vorgeschichte Halle (Saale) 30. November 2017 bis 21. Mai 2018*. ([Darmstadt 2017](#)), 404–417.

KUPER 2006

Rudolph Kuper and Stefan Kröpelin, *Climate-Controlled Holocene Occupation in the Sahara: Motor of Africa's Evolution*. [science](#) **313** (2006), 803–807.

[s313-0803-Supplement.pdf](#)

Radiocarbon data from 150 archaeological excavations in the now hyper-arid Eastern Sahara of Egypt, Sudan, Libya, and Chad reveal close links between climatic variations and prehistoric occupation during the past 12,000 years. Synoptic multiple-indicator views for major time slices demonstrate the transition from initial settlement after the sudden onset of humid conditions at 8500 B.C.E. to the exodus resulting from gradual desiccation since 5300 B.C.E. Southward shifting of the desert margin helped trigger the emergence of pharaonic civilization along the Nile, influenced the spread of pastoralism throughout the continent, and affects sub-Saharan Africa to the present day.

MACKAY 2014

Alex Mackay, Brian A. Stewart & Brian M. Chase, *Coalescence and fragmentation in the late Pleistocene archaeology of southernmost Africa*. [Journal of Human Evolution](#) **72** (2014), 26–51.

The later Pleistocene archaeological record of southernmost Africa encompasses several Middle Stone Age industries and the transition to the Later Stone Age. Through this period various signs of complex human behaviour appear episodically, including elaborate lithic technologies, osseous technologies, ornaments, motifs and abstract designs. Here we explore the regional archaeological record using different components of lithic technological systems to track the transmission of cultural information and the extent of population interaction within and between different climatic regions. The data suggest a complex set of coalescent and fragmented relationships between populations in different climate regions through the late Pleistocene, with maximum interaction (coalescence) during MIS 4 and MIS 2, and fragmentation during MIS 5 and MIS 3. Coalescent phases correlate with increases in the frequency of ornaments and other forms of symbolic expression, leading us to suggest that population interaction was a significant driver in their appearance.

Keywords: Lithic technology | Middle and Later Stone Age | Still Bay | Howiesons Poort | Ornaments | Cultural transmission

MITCHELL 2013

PETER MITCHELL & PAUL LANE (Hrsg.), *The Oxford Handbook of African Archaeology*. (Oxford 2013).

PHILLIPSON 1993

David W. Phillipson, *African Archaeology*. (Cambridge 1993).

PHILLIPSON 2005

David W. Phillipson, *African Archaeology*. (Cambridge 2005).

REBER 2018

David Reber, Mekbib Fekadu, Florian Detsch, Ralf Vogelsang, Tamrat Bekele, Thomas Nauss & Georg Mieke, *High-Altitude Rock Shelters and Settlements in an African Alpine Ecosystem, The Bale Mountains National Park, Ethiopia*. *Human Ecology* **46** (2018), 587–600.

This first survey of rock shelters and settlements in the Bale Mountains in Ethiopia is a baseline assessment for further research into the settlement history of Africa's largest alpine highlands. Extensive GPS-based mapping and interviews resulted in two detailed maps, a catalogue of profiles, and complete photographic documentation. In total, 331 rock shelters (four permanently inhabited, 51 seasonally inhabited, and 276 currently uninhabited) and 870 settlements (207 permanently inhabited, 449 seasonally inhabited, 214 uninhabited) were recorded together with information about the activities and livelihoods of the inhabitants of the current settlements. This 2015 study was part of the Ethiopian-European research project "The mountain exile hypothesis – how humans benefited from and re-shaped African high-altitude ecosystems during Quaternary climate changes" (DFG FOR 2358). It was designed to support future management plans in this internationally important conservation area that has recently faced increasing land-use pressure and the threat of degradation.

Keywords: High-altitude habitation | Tropical mountains | Pastoralism | Settlement history | GPS mapping | Bale Mountains National Park | Ethiopia

REICHHOLF 1990

Josef H. Reichholf, *Das Rätsel der Menschwerdung, Die Entstehung des Menschen im Wechselspiel der Natur*. (München 1990).

RICHERSON 2005

Peter Richerson & Robert Boyd, *Not by genes alone, How culture transformed human evolution*. (Chicago 2005).

Humans are a striking anomaly in the natural world. While we are similar to other mammals in many ways, our behavior sets us apart. Our unparalleled ability to adapt has allowed us to occupy virtually every habitat on earth, and our societies are larger, more complex, and more cooperative than any other mammal's. In "Not by Genes Alone", Peter J. Richerson and Robert Boyd argue that only a Darwinian theory of cultural evolution can explain these unique characteristics.

"Not by Genes Alone" offers a radical interpretation of human evolution, arguing that our ecological dominance and our singular social systems stem from a psychology uniquely adapted to create complex culture. Richerson and Boyd consider culture to be essential to human adaptation, as much a part of human biology as bipedal locomotion. Drawing on work in the fields of anthropology, political science, sociology, and economics – and building their case with such fascinating examples as kayaks, clever knots, and yams that require twelve men to carry them – Richerson and Boyd convincingly demonstrate that culture and biology are inextricably linked.

In abandoning the nature-versus-nurture debate as fundamentally misconceived, "Not by Genes Alone" is a truly original and groundbreaking theory of the role of culture in evolution and a book to be reckoned with for generations to come.

RICHTER 2012

Jürgen Richter, Thomas Hauck, Ralf Vogelsang, Thomas Widlok, Jean-Marie Le Tensorer, Peter Schmid, "*Contextual areas*" of early *Homo sapiens* and their significance for human dispersal from Africa into Eurasia between 200 ka and 70 ka. [Quaternary International 274 \(2012\), 5–24](#).

The African origin of our species has essentially been accepted as a scientific fact, but evolutionary advantages connected with the reasons and circumstances of modern human dispersal remain widely unexplained or controversial. Consequently, this paper provides an overview of the natural and cultural context of earliest AMH (Anatomically Modern Humans). According to the locations and dating of AMH fossils, the focus is on E-Africa, NE-Africa and the Middle East within a time range from 200 ka to 70 ka. At least three different "contextual areas" appear to have existed at the time, two of them in E-Africa and NE-Africa, dominated by "Bifacial-plus-Levallois" technology, and the third one in the Middle East, mostly connected with an "only-Levallois" technology. A comparison with some non-AMH sites from Eurasia displays similarity of technological principles between artifact assemblages from African AMH sites and Eurasian non-AMH (early Neanderthal) sites on the one hand, and dissimilarity between African AMH sites and Middle Eastern AMH sites on the other hand. This is particularly surprising if environmental contexts are taken into account – tropical in Africa and glacial in Eurasia.

Thus, compared to their archaic neighbors (particularly early Neanderthals), earliest modern humans currently seem to lack any specific "cultural fingerprint" and their demographic success may not be explained by behavioral superiority alone. The idea of a small group of early AMH people migrating out of Africa, enabled by cultural superiority over their neighbors appears highly questionable in the light of archaeological evidence. Moreover, the concept of virtual "migration routes" deserves a revision if ethnodemographic evidence about spatial behavior of hunter-gatherers is taken into account. The proposed concept of "contextual areas" serves as a methodological alternative, comprising linked cultural and environmental features.

Keywords: Anatomically Modern Humans (AMH) | Neanderthals | Bifacial-plus-Levallois | Africa | Middle East | migration routes | Modern Human Behavioral Package (MHBP)

RICHTER 2018

Jürgen Richter, *Altsteinzeit, Der Weg der frühen Menschen von Afrika bis in die Mitte Europas*. (Stuttgart 2018).

SCHMIDT 2016

Annika Schmidt, *Excavation 2016 and XRF Analysis at the Nok Site of Ido in Central Nigeria*. *Nyame Akuma* **86** (2016), 65–70.

Features consisting of stone-pot-arrangements occur at several Nok sites, raising questions about their purpose. Previous research has suggested that they are probably graves. I used XRF analysis at the Ido site to identify chemical traces of bodies buried in such features and detected anomalies in the composition of soil collected in the features, proving the potential of the method. However, the strong deviations observed could have been caused by soil formation processes that may have masked signatures resulting from the decomposition of a body. This problem can be solved by developing a filter for background noise (e.g. using an improved sample scheme). Excavations at Ifana, excavated in August 2016, yielded well-preserved stone-pot-arrangements and stone beads (Fig. 1-2), pointing to the existence of more graves. In this site, we collected samples using a denser grid of 10 cm x 10 cm without obvious natural features that may cause disturbances. This analysis is currently ongoing.

Although at Ido we could not conclusively identify the chemical signals of the presence of a body, the interpretation of the features as graves is still possible. Comparison with similar sites and the presence of stone beads, probably as part of necklaces, strengthen this work hypothesis. The use of different and complementary lines of research (including ethnoarchaeology, different sampling strategies and scientific methods) may allow a better and stronger interpretation of this type of sites as graves.

VOGELSANG 2018

Ralf Vogelsang, Olaf Bubenzer, Martin Kehl, Svenja Meyer, Jürgen Richter & Bahru Zinaye, *When Hominins Conquered Highlands, An Acheulean Site at 3000 m a.s.l. on Mount Dendi/Ethiopia*. *Journal of Paleolithic Archaeology* **1** (2018), 302–313.

The site DEN12-A02 shows that hominins might have settled in high-altitude regions already before the advance of *Homo sapiens sapiens*. This would question the concept of modern humans' superiority in a wide range of domains, such as subsistence strategies and hunting equipment in comparison to extinct hominins (for a critical discussion of this concept see: Villa and Roebroeks 2014). In any case, for millennia modern *Homo sapiens* seemed to have no reasons to colonize high mountains in Europe.

Why hominins conquered the tropical high-altitude habitat already at this early time is still an open question. Was the area a common habitat or was it only used as a refugium during times of environmental stress? Is the case of Dendi, an exception from the general settlement scheme or is the absence of sites the result of a research deficit in high-altitude regions? It is striking that with only one exception, all Acheulean sites in high-altitude environments are located in Ethiopia. Under certain environmental conditions, high mountains in tropical zones might have been favorable ecological niches despite the general stress factor

for hominins in high altitudes. Fresh water availability may have played a key role. Modern circulation patterns suggest the Ethiopian Highlands are likely to have received more rainfall than surrounding regions of northern Africa and the Horn during prehistoric times. The region receives moisture from both the Atlantic and Indian Ocean system (Umer et al. 2004) and as a major topographic feature, the highlands capture high orographic rainfall. In the case of Mount Dendi, the crater lakes, if they already existed, might have been important water reservoirs during arid periods.

The ongoing analysis of lacustrine and terrestrial sediment cores from the crater lakes and the caldera deposits hopefully will elucidate the climate history and environmental conditions of the area and might help to answer these questions.

WENINGER 2011

Bernhard Weninger, Kevan Edinborough, Lee Clare & Olaf Jöris, *Concepts of probability in radiocarbon analysis*. [Documenta Praehistorica 38 \(2011\), 1–20](#).

In this paper we explore the meaning of the word probability, not in general terms, but restricted to the field of radiocarbon dating, where it has the meaning of ‘dating probability assigned to calibrated 14C-ages’. The intention of our study is to improve our understanding of certain properties of radiocarbon dates, which – although mathematically abstract – are fundamental both for the construction of age models in prehistoric archaeology, as well as for an adequate interpretation of their reliability.

KEY WORDS – radiocarbon calibration; Bayesian inference; noncommutative algebra; noncommutative probability; chronology