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Literatur

Afrika

Eren 2013

Metin I. Eren, Fernando Diez-Martin & Manuel Dominguez-Rodrigo, *An empirical test of the relative frequency of bipolar reduction in Beds VI, V, and III at Mumba Rockshelter, Tanzania, Implications for the East African Middle to Late Stone Age transition.* Journal of Archaeological Science **40** (2013), 248–256.

JArchSci40-0248-Supplement1.xls

Mumba Rockshelter, Tanzania, is the only East African site spanning a continuous record of more than 100,000 years, including the Middle Stone Age (MSA) to Late Stone Age (LSA) Transition. Rather than examine the presence or absence of traditional markers of "behavioral modernity", we have endeavored here to respond to the calls of Shea (2011) and Basell (2008) by examining the proportional similarity of a trait present throughout the MSA–LSA sequence at Mumba Rockshelter: the bipolar technique of lithic reduction. We use a quantified, experimentally derived proxy to track the relative amount of bipolar percussion among Mumba's Beds VI, V, and III, namely, waste shatter. Our examination of Mehlman's previously unanalyzed collections from Mumba demonstrates that in terms of bipolar production Bed V is statistically indistinguishable from the Late Stone Age (LSA) Bed III, but significantly different from the Middle Stone Age (MSA) Bed VI. Given that Bed V dates to 56.9 ± 4.8 – 49.1 ± 4.3 ka cal BP, this result is consistent with other evidence that the origins of the LSA in East Africa began well before 40 kya, and that Mumba Bed V represents one of the earliest manifestations of the LSA in East Africa. We conclude with a discussion of factors that may have influenced the increased dependence of bipolar production at the site.

Keywords: East Africa | Middle to Late Stone Age transition | Mumba Rockshelter | Tanzania | Stone tools | Bipolar (Anvil) reduction | Quartz | Territoriality | Microliths | Time and energy constraints

LaViolette 2005

Adria LaViolette and Jeffrey Fleisher, *The Archaeology of Sub-Saharan Urbanism, Cities and their Countrysides.* In: Ann Brower Stahl (Hrsg.), *African Archaeology, A Critical Introduction.* Blackwell Studies in Global Archaeology 3 (Oxford 2005), 327–352.

MacDonald 1998

K. C. MacDonald, *Before the Empire of Ghana, Pastoralism and the origins of cultural complexity in the Sahel.* In: Graham Connah (Hrsg.), *Transformations in Africa, Essays on Africa's later past.* (London 1998), 71–103.

The Empire of Ghana is the earliest textually recorded state in West Africa, yet the ethnic identity of its founders, the time of its foundation, and its socioeconomic basis have remained subjects for conjecture. In this chapter, past arguments which posit a postmetallurgical origin for complex societies in West Africa are

reexamined and challenged in the light of recent research. In particular, it is advanced that the first complex societies of semiarid West Africa should be sought not in the Empire of Ghana, but in what are termed 'Mobile Elites'—transitory peaks of pastoral wealth and power accumulation which occurred in the Sahara and Sahel from 4000 BC.
A case for the existence of Saharan complex societies by the late Holocene pluvial is supported by the presence of three phenomena: cattle accumulation, valued objects in polished stone, and monuments. A plethora of pastoral or agro-pastoral traditions lacking substantial settlement sites, but possessing burial monuments, are known to have existed across the Sahara from 4000 BC. Associated with these cultures were common assemblages of polished stone axes, hachettes, bracelets, and beads, made of raw materials whose sources are scattered across the continent. Despite this, their ceramic and lithic traditions are distinctive, indicating diverse traditions sharing a common set of valued items and practices.
A form of social stratification within these societies is evidenced by contemporary tumulus and open burial strategies in the Central Sahara, and by the uneven distribution of grave goods at better excavated sites such as]ebel Moya (Sudan). It is asserted that despite their highly mobile nature, often taken as being prohibitive for the formation of complex society in the absence of preexisting states, these pastoral traditions independently developed prestige-goods economies leading to individual and lineage wealth accumulation. It is further suggested that where these usually transitory Mobile Elites encountered additional climatic or cultural stimuli, semisedentary 'Chiefdoms' or 'Medium Scale Societies' developed (for example Dhar Tichitt–Walata and Kerma).

Mitchell 2005

Peter Mitchell, *Modeling Later Stone Age Societies in Southern Africa*. In: Ann Brower Stahl (Hrsg.), *African Archaeology, A Critical Introduction*. Blackwell Studies in Global Archaeology 3 (Oxford 2005), 150–173.

Aktuell

Crockford 2012

Susan J. Crockford & Yaroslav V. Kuzmin, *Comments on Germonpré et al.* Journal of Archaeological Science **39** (2012), 2797–2801.
Comments on Germonpré et al., Journal of Archaeological Science 36, 2009 "Fossil dogs and wolves from Palaeolithic sites in Belgium, the Ukraine and Russia: osteometry, ancient DNA and stable isotopes", and Germonpré, Lázkičková-Galetová, and Sablin, Journal of Archaeological Science 39, 2012 "Palaeolithic dog skulls at the Gravettian Předmostí site, the Czech Republic"
Issues related to the identification of Late Pleistocene dogs from different sites in Eurasia, triggered by recent publications (see Germonpré et al., 2009, 2012; Ovodov et al., 2011), are discussed. The main focus is the problem of how to distinguish wolves from early dogs on the basis of skull and teeth morphology. The studies by Germonpré et al. (2009, 2012), reporting so-called 'Palaeolithic dogs' from P≈redmostí, Goyet, and other sites in Eastern and Central Europe, have some serious deficiencies. In our opinion, more work needs to be done to understand the biological mechanisms involved in wolf domestication and until then, it is premature to classify these Palaeolithic canids as fully domesticated dogs or even incipient dogs.

Keywords: Domestication | Canids (Canidae) | Palaeolithic dogs (Canis familiaris L.) | Late Pleistocene wolves (Canis lupus L.) | Osteometry | Radiocarbon dating

d'Errico 2012

Francesco d'Errico et al., *Use of poison remains the most parsimonious explanation for Border Cave castor bean extract, Reply to Evans.* PNAS **109** (2012), E3291.

Francesco d'Errico, Lucinda Backwell, Paola Villa, Ilaria Degano, Jeannette J. Lucejko, Marion K. Bamford, Thomas F. G. Higham, Maria Perla Colombini and Peter B. Beaumont

Evans 2012

Adrian Anthony Evans, *Arrow poisons in the Palaeolithic?* PNAS **109** (2012), E3290.

Discovering the use of poisons as part of prehistoric hunting technology is generally anticipated; Ellis' review of ethnographic data (2) highlights a clear link between the use of lithic tipped arrows and the use of toxins, and I contend, as does Ambrose (3), that the use of poisons likely started at the inception of arrow technology, and intimate knowledge of poisons enabled the production and use of otherwise inefficient but light hunting gear.

Nevertheless, there are weaknesses in d'Errico et al.'s evidence which one hopes can be rebutted. Given the questions surrounding these results, I am not sure that this can be considered the "oldest known secure evidence of the use of poison for hunting purposes".

Germonpré 2009

Mietje Germonpré et al., *Fossil dogs and wolves from Palaeolithic sites in Belgium, the Ukraine and Russia, Osteometry, ancient DNA and stable isotopes.* Journal of Archaeological Science **36** (2009), 473–490.

Mietje Germonpré, Mikhail V. Sablin, Rhiannon E. Stevens, Robert E. M. Hedges, Michael Hofreiter, Mathias Stiller and Viviane R. Després

Using multivariate techniques, several skulls of fossil large canids from sites in Belgium, Ukraine and Russia were examined to look for possible evidence of the presence of Palaeolithic dogs. Reference groups constituted of prehistoric dogs, and recent wolves and dogs. The fossil large canid from Goyet (Belgium), dated at c. 31,700 BP is clearly different from the recent wolves, resembling most closely the prehistoric dogs. Thus it is identified as a Palaeolithic dog, suggesting that dog domestication had already started during the Aurignacian. The Epigravettian Mezin 5490 (Ukraine) and Mezhirich (Ukraine) skulls are also identified as being Palaeolithic dogs. Selected Belgian specimens were analyzed for mtDNA and stable isotopes. All fossil samples yielded unique DNA sequences, indicating that the ancient Belgian large canids carried a substantial amount of genetic diversity. Furthermore, there is little evidence for phylogeographic structure in the Pleistocene large canids, as they do not form a homogenous genetic group. Although considerable variation occurs in the fossil canid isotope signatures between sites, the Belgian fossil large canids preyed in general on horse and large bovids.

Keywords: Upper Palaeolithic | Canidae | Dog | Skull | Ancient DNA | Stable isotopes

Germonpré 2012

Mietje Germonpré, Martina Lázničková-Galetová & Mikhail V. Sablin, *Palaeolithic dog skulls at the Gravettian Předmostí site, the Czech Republic.* Journal of Archaeological Science **39** (2012), 184–202.

Whether or not the wolf was domesticated during the early Upper Palaeolithic remains a controversial issue. We carried out detailed analyses of the skull material from the Gravettian Předmostí site, Czech Republic, to investigate the issue. Three complete skulls from P≈redmostí were identified as Palaeolithic dogs, characterized by short skull lengths, short snouts, and wide palates and braincases relative to wolves. One complete skull could be assigned to the group of Pleistocene wolves. Three other skulls could not be assigned to a reference group; these might be remains from hybrids or captive wolves. Modifications by humans of the skull and canine remains from the large canids of Předmostí indicate a specific relationship between humans and large canids.
Keywords: Gravettian | Předmostí | Dog (Canis familiaris) | Wolf (Canis lupus) | Domestication | Skull | Canine

Germonpré 2013

Mietje Germonpré et al., *Palaeolithic dogs and the early domestication of the wolf, A reply to the comments of Crockford and Kuzmin (2012).* Journal of Archaeological Science **40** (2013), 786–792.
Mietje Germonpré, Mikhail V. Sablin, Viviane Després, Michael Hofreiter, Martina Lázničková-Galetová, Rhiannon E. Stevens & Mathias Stiller
This is a response to the comments of Crockford and Kuzmin (2012) on our identification of Palaeolithic dogs from different European Palaeolithic sites. In their comments Crockford and Kuzmin (2012) present some errors, misunderstandings and misrepresentations that we remedy here. In our opinion, the early wolf domestication must be regarded as an intimate relationship between humans and canids including the breeding of the latter by prehistoric people, resulting in the European Palaeolithic dogs.
Keywords: Wolf domestication | Palaeolithic dogs | Aurignacian | Gravettian | Multivariate statistics | Europe

Relethford 2012

John H. Relethford & Michael H. Crawford, *Genetic Drift and the Population History of the Irish Travellers.* American Journal of Physical Anthropology (2012), preprint, 1–6. DOI:10.1002/ajpa.22191.
The Irish Travellers are an itinerant group in Ireland that has been socially isolated. Two hypotheses have been proposed concerning the genetic origin of the Travellers: (1) they are genetically related to Roma populations in Europe that share a nomadic lifestyle or (2) they are of Irish origin, and genetic differences from the rest of Ireland reflect genetic drift. These hypotheses were tested using data on 33 alleles from 12 red blood cell polymorphism loci. Comparison with other European, Roma, and Indian populations shows that the Travellers are genetically distinct from the Roma and Indian populations and most genetically similar to Ireland, in agreement with earlier genetic analyses of the Travellers. However, the Travellers are still genetically distinct from other Irish populations, which could reflect some external gene flow and/or the action of genetic drift in a small group that was descended from a small number of founders. In order to test the drift hypothesis, we analyzed genetic distances comparing the Travellers to four geographic regions in Ireland. These distances were then compared with adjusted distances that account for differential genetic drift using a method developed by Relethford (Hum Biol 68 (1996) 29–44). The unadjusted distances show the genetic distinctiveness of the Travellers. After adjustment for the expected effects of genetic drift, the Travellers are equidistant from the other Irish samples, showing their Irish origins and population history. The observed genetic differences are thus a reflection of genetic drift, and there is no evidence of any external gene flow.

Tito 2012

Raul Y. Tito et al., *Insights from Characterizing Extinct Human Gut Microbiomes.* PLoS ONE **7** (2012), e51146. DOI:10.1371/journal.pone.0051146.

Raul Y. Tito, Dan Knights, Jessica Metcalf, Alexandra J. Obregon-Tito, Lauren Cleeland, Fares Najar, Bruce Roe, Karl Reinhard, Kristin Sobolik, Samuel Belknap, Morris Foster, Paul Spicer, Rob Knight, Cecil M. Lewis Jr
In an effort to better understand the ancestral state of the human distal gut microbiome, we examine feces retrieved from archaeological contexts (coprolites). To accomplish this, we pyrosequenced the 16S rDNA V3 region from duplicate coprolite samples recovered from three archaeological sites, each representing a different depositional environment: Hinds Cave (≈8000 years B.P.) in the southern United States, Caserones (1600 years B.P.) in northern Chile, and Rio Zape in northern Mexico (1400 years B.P.). Clustering algorithms grouped samples from the same site. Phyletic representation was more similar within sites than between them. A Bayesian approach to source-tracking was used to compare the coprolite data to published data from known sources that include, soil, compost, human gut from rural African children, human gut, oral and skin from US cosmopolitan adults and non-human primate gut. The data from the Hinds Cave samples largely represented unknown sources. The Caserones samples, retrieved directly from natural mummies, matched compost in high proportion. A substantial and robust proportion of Rio Zape data was predicted to match the gut microbiome found in traditional rural communities, with more minor matches to other sources. One of the Rio Zape samples had taxonomic representation consistent with a child. To provide an idealized scenario for sample preservation, we also applied source tracking to previously published data for Ötzi the Iceman and a soldier frozen for 93 years on a glacier. Overall these studies reveal that human microbiome data has been preserved in some coprolites, and these preserved human microbiomes match more closely to those from the rural communities than to those from cosmopolitan communities. These results suggest that the modern cosmopolitan lifestyle resulted in a dramatic change to the human gut microbiome.

Anthropologie

Mitchell 2010

Peter Mitchell, *Genetics and southern African prehistory: an archaeological view.* Journal of Anthropological Sciences **88** (2010), 73–92.

Southern African populations speaking languages that are often – but inaccurately – grouped together under the label 'Khoisan' are an important focus of molecular genetic research, not least in tracking the early stages of human genetic diversification. This paper reviews these studies from an archaeological standpoint, concentrating on modern human origins, the introduction of pastoralism to southern Africa and admixture between the region's indigenous foragers and incoming Bantu-speaking farmers. To minimise confusion and facilitate correlation with anthropological, linguistic and archaeological data it emphasises the need to use ethnolinguistic labels accurately and with due regard for the particular histories of individual groups. It also stresses the geographically and culturally biased nature of the genetic studies undertaken to date, which employ data from only a few 'Khoisan' groups. Specific topics for which the combined deployment of genetic and archaeological methods would be particularly useful include the early history of Ju-≠Hoan- and Tuu-speaking hunter-gatherers, the expansion of Khoe-speaking populations, the chronology of genetic exchange between hunter-gatherers and

farmers, and the origins of the Sotho/Tswana- and Nguni-speaking populations that dominate much of southern Africa today.
Keywords – Southern Africa, Genetics, 'Khoisan', Archaeology, Hunter-gatherers, Pastoralism, Sotho/Tswana, Nguni.

Datierung

ARMIT 2013

Ian Armit, Graeme T. Swindles & Katharina Becker, *From dates to demography in later prehistoric Ireland? Experimental approaches to the meta-analysis of large ^{14}C data-sets.* Journal of Archaeological Science **40** (2013), 433–438.

JArchSci40-0433-Supplement1.xlsx, JArchSci40-0433-Supplement2.xlsx
We present a series of iterative methods to examine the problems associated with summed probability functions (SPFs) based on archaeological radiocarbon data. As a case study we use an SPF generated from a substantial radiocarbon data-set from the Irish Later Bronze and Iron Ages. We use simple numerical methods to show that real patterns can be deciphered from SPFs that can be used to trace and evaluate patterns of change. However, our results suggest that SPFs should not be used as a simple index of past human activity.
Keywords: Radiocarbon | AMS | Summed probability functions | Ireland | Demography

Energie

WALDROP 2012

M. Mitchell Waldrop, *Radical Reactors.* nature **492** (2012), 26–29.

For decades, one design has dominated nuclear reactors while potentially better options were left by the wayside. Now, the alternatives might finally have their day.
"So there was always this vision that there would be a recycled-spent-fuel infrastructure that would allow you to recover more of the fuel's energy," says William Magwood, a former director of the Office of Nuclear Energy at the US Department of Energy (DOE) and now a member of the US Nuclear Regulatory Commission. A worldwide network of reprocessing plants would take the spent fuel, chemically extract the still-usable components — mostly uranium-235, plus the fissionable plutonium-239 formed when neutrons are captured by non-fissile uranium-238 — and then turn them into fresh reactor fuel. Ultimately, the plan was to transition to a new generation of 'breeder' reactors designed to maximize plutonium production. The only waste would be a comparatively small residue of intensely radioactive fission products that would decay within a few centuries, and could be disposed of in, say, a well-designed concrete bunker.
But then, in May 1974, India tested a nuclear bomb made with plutonium extracted from reactor fuel. So in April 1977, US President Jimmy Carter banned commercial reprocessing. President Ronald Reagan lifted that ban a few years later, but the costs of the facilities were so high that only two commercial reprocessing plants have been opened for reactor fuel since then, both in France. Research on breeder reactors largely ceased, because they seemed to make little sense without reprocessing. And engineers found themselves left with a complicated disposal problem: they would now have to isolate tens of thousands of tonnes of spent fuel for hundreds of centuries, thanks to the 24,100year half-life of plutonium-239. No one has yet worked out how to guarantee isolation on that timescale.

Grabung

Darvill 2012
Timothy Darvill, Peter Marshall, Mike Parker Pearson & Geoff Wainwright, *Stonehenge remodelled*. Antiquity **86** (2012), 1021–1040.
We are pleased to present the latest account of the sequence of burial and construction at the site of Stonehenge, deduced by its most recent excavators and anchored in time by the application of Bayesian radiocarbon modelling. Five prehistoric stages are proposed, of varied duration, and related by our authors to neighbouring monuments in the Stonehenge environs. While it may never be possible to produce a definitive chronology for this most complex of monuments, the comprehensive and integrated achievement owed to these researchers has brought us much closer to that goal. It is from this firm platform that Stonehenge can begin its new era of communication with the public at large.
Keywords: Britain,Neolithic, Beaker, Bronze Age, megalithic, Stonehenge, sarsen, bluestone, trilithon, radiocarbon, Bayesian modelling

Grundlagen

Fletcher 1995
Roland Fletcher, *The limits of settlement growth, A theoretical outline*. New studies in archaeology (Cambridge 1995).

Fletcher 1998
Roland Fletcher, *African urbanism: scale, mobility and transformations*. In: Graham Connah (Hrsg.), *Transformations in Africa, Essays on Africa's later past*. (London 1998), 104–138.
Indigenous precolonial African urban settlements displayed considerable diversity. They ranged from small, compact settlements, only tens of hectares in extent, to massive, dispersed settlements covering between 30 and 60 square kilometers such as Kampala and Old Oyo. Some were managed using literacy, as in the Islamic north of Nigeria, yet most of the very extensive ones were not. Mobility played a significant role in their social life. In some cases, as in Ethiopia, the entire community moved seasonally. In the West African forest regions there are indications that a substantial part of a residential community may have moved in and out of its main settlement episodically and seasonally. Residential relocation seems to have played a significant role in the scale and transformations of large African urban communities.
The diversity of African indigenous urban settlements suggests that conventional, universalistic models will not suffice to explain their remarkable characteristics. Instead we need to combine an appreciation of culturally unique social transformations with a recognition of the behavioral constraints with which those communities had to cope. Together these otherwise divergent approaches may help to explain the specific outcomes of a myriad alternative ways in which communities of many thousands of people were organized.

Hiscock 2011
Peter Hiscock, Chris Clarkson & Alex Mackay, *Big debates over little tools, ongoing disputes over microliths on three continents*. World Archaeology **43** (2011), 653–664.

After more than a century, debate over the explanation of microliths continues. We review debates on three continents (Australia, India and southern Africa), and argue that depictions of them as purely symbolic items manufactured for public display are implausible. Two different mechanisms dominate recent discussions:
1) exchange of symbolically loaded artefacts as a device for constructing cultural connections and establishing access to territory/resources, and
2) microliths as portable and standardized tools that helped buffer foragers against economic risk and/or scheduling difficulties by increasing multi-functionality and tool readiness as an aid in reducing fluctuations in resource capture. We show that there is a different history and pattern to microlith use on each continent and dissimilar environmental contexts for microlith-intensive phases. This conclusion challenges any notion that a single simple process underpins microlith use across the globe and implies that comparative studies might enhance understandings of this process of technological change.
Keywords: Palaeolithic; microliths; backed artefacts; environment; exchange.

Klima

Schmidt 2012

Isabell Schmidt et al., *Rapid climate change and variability of settlement patterns in Iberia during the Late Pleistocene.* Quaternary International **274** (2012), 179–204.

Isabell Schmidt, Marcel Bradtmöller, Martin Kehl, Andreas Pastoors, Yvonne Tafelmaier, Bernhard Weninger & Gerd-Christian Weniger
Due to its diverse geographic and climatic conditions, the Iberian Peninsula is well suited for studies into the relationship between climate, environment and hunter-gatherer adaptation. With focus on the archaeological record, this paper examines to what extent diachronic variations in site density on the Iberian Peninsula are related to climate variability and cultural change. Studies are based on a comprehensive record of technocomplexes that date from the late Middle Palaeolithic, early Upper Palaeolithic, Gravettian and Solutrean. The record comprises altogether 152 archaeological cave sites and rock shelters. Analysis reveals strong regional differences between Northern and Southern Iberia, both in isochronic and in diachronic perspective. This is expressed by the strongly different patterns of human presence in these regions. In particular, within both regions major cultural changes coincide with the environmental impact of North Atlantic Heinrich Events (HE). From previous studies, it is known that the human population on the Iberian Peninsula (IP) must have suffered strongly under the extremely variable climate conditions during the Late Pleistocene. Based on extensive site-mapping, the hypothesis is that during HE a major disintegration of habitats must have occurred, with various but strongly isolated patchy refugia remaining. Further, during HE, Southern Iberia could not uphold its previous function in providing a reliable refuge for humans. Not only does climatic deterioration during the different HE repeatedly lead to a near-complete breakdown of settlement patterns, but following each HE there is a major reorganization in settlement patterns on the IP.

Sohi 2012

Saran P. Sohi, *Carbon Storage with Benefits.* science **338** (2012), 1034–1035.

Biochar—a material related to charcoal—has the potential to benefit farming as well as mitigate climate change. A key attraction of biochar is that it can enhance the fertility and resilience of crop land. If biochar production could be made

profitable through its use in agriculture, this would distinguish it from costly geoengineering measures to mitigate climate change.

Kultur

Windler 2013

Arne Windler, Rainer Thiele & Johannes Müller, *Increasing inequality in Chalcolithic Southeast Europe, The case of Durankulak*. Journal of Archaeological Science **40** (2013), 204–210.

Economic measurement tools allow a quantification of social differences not only for modern societies, but also for prehistoric communities. The use of Gini indices and Lorenz curves for the much discussed Chalcolithic cemetery of Durankulak (Bulgaria) indicates an average increase in material items from 5000 cal BC onwards and a tendency of these items to be distributed somewhat more equally. Towards the end of the Chalcolithic sequence, however, strongly growing inequality was associated with lower average welfare. The steep increase in social inequality might be one of the main reasons for the collapse of Chalcolithic societies around 4100 cal BC in Durankulak, but also in other South East European regions.
Keywords: Social inequality | Neolithic and Chalcolithic Bulgaria | Collapse

Metallzeiten

van der Merwe 1980

Nikolaas Johannes van der Merwe, *Production of high carbon steel in the African Iron Age, The direct steel process*. In: R. E. Leakey & B. A. Ogot (Hrsg.), *Proceedings of the 8th Panafrican Congress of Prehistory and Quaternary Studies, Nairobi, September 1977*. (Nairobi 1980), 331–334.

The questions which arise naturally from the evidence presented are whether the direct steel process was invented and used in Africa exclusively, and when the invention took place. Regarding origins, no examples of direct steel materials are known from outside Africa. A possible example from Roman Britain (Bell 1912) shows variable microstructures and high-carbon areas in an iron bloom, but it would seem to be the result of welding together several pieces of bloom in a crucible, in the course of which carburization occurred in the welds. It is still possible, of course, that the direct steel method had a wider distribution than currently recognized, but no evidence for it exists at the moment. The antiquity of the direct steel process in Africa can only be guessed. The archaeological examples (admittedly few) date from the Later Iron Age and cover an area from Ethiopia to South Africa. Ethnographic examples are known from West Africa, Tanzania and Rhodesia. Both natural draught and forced draught furnaces are involved. The possibility that the method dates from the Early Iron Age cannot be excluded, although there is no evidence for it. It can be hypothesized with somewhat higher probability, on technological grounds, that the large, natural-draught furnaces of West and Central Africa were invented as a specialized adaptation to the direct steel process. These high-temperature furnaces date from the Late Iron Age, but this does not necessarily imply invention of the direct steel process during the second millenium AD. The answers to these questions will, no doubt, emerge as a result of metallographic and/or chemical investigations of iron specimens. For now, it will suffice to conclude that African metallurgists invented the only direct method for the production of steel known in metallurgical history.

Mittelpaläolithikum

Pinhasi 2012

R. Pinhasi et al., *New chronology for the Middle Palaeolithic of the southern Caucasus suggests early demise of Neanderthals in this region.* Journal of Human Evolution **63** (2012), 770–780.

R. Pinhasi, M. Nioradze, N. Tushabramishvili, D. Lordkipanidze, D. Pleurdeau, M.-H. Moncel, D. S. Adler, C. Stringer, T. F. G. Higham
Neanderthal populations of the southern and northern Caucasus became locally extinct during the Late Pleistocene. The timing of their extinction is key to our understanding of the relationship between Neanderthals and anatomically modern humans (AMH) in Eurasia. Recent re-dating of the end of the Middle Palaeolithic (MP) at Mezmaiskaya Cave, northern Caucasus, and Ortvale Klde, southern Caucasus, suggests that Neanderthals did not survive after 39 ka cal BP (thousands of years ago, calibrated before present). Here we extend the analysis and present a revised regional chronology for MP occupational phases in western Georgia, based on a series of model-based Bayesian analyses of radiocarbon dated bone samples obtained from the caves of Sakajia, Ortvala and Bronze Cave. This allows the establishment of probability intervals for the onset and end of each of the dated levels and for the end of the MP occupation at the three sites.
Our results for Sakajia indicate that the end of the late Middle Palaeolithic (LMP) and start of the Upper Palaeolithic (UP) occurred between 40,200 and 37,140 cal BP. The end of the MP in the neighboring site of Ortvala occurred earlier at 43,540–41,420 cal BP (at 68.2 % probability). The dating of MP layers from Bronze Cave confirms that it does not contain LMP phases.
These results imply that Neanderthals did not survive in the southern Caucasus after 37 ka cal BP, supporting a model of Neanderthal extinction around the same period as reported for the northern Caucasus and other regions of Europe. Taken together with previous reports of the earliest UP phases in the region and the lack of archaeological evidence for an in situ transition, these results indicate that AMH arrived in the Caucasus a few millennia after the Neanderthal demise and that the two species probably did not interact.
Keywords: Radiocarbon | Western Georgia | Sakajia | Ortvala | Bronze Cave | Homo neanderthalensis

Neolithikum

Ellwood 2013

Emily C. Ellwood, M. Paul Scott, William D. Lipe, R. G. Matson & John G. Jones, *Stone-boiling maize with limestone, Experimental results and implications for nutrition among SE Utah preceramic groups.* Journal of Archaeological Science **40** (2013), 35–44.

Groups living on Cedar Mesa, SE Utah in the late Basketmaker II period (Grand Gulch phase, AD 200–400) were heavily maize-dependent, but lacked beans as a supplemental plant protein, and pottery vessels for cooking. Common occurrence of limestone fragments in their household middens suggests 1) limestone may have been used as the heating element for stone-boiling maize and 2) this practice might have made some maize proteins more available for human nutrition. Experiments examined these possibilities; results indicate that stone-boiling with Cedar Mesa limestone creates an alkaline cooking environment suitable for nixtamalization of maize kernels, and that maize cooked in this fashion shows significant increases in

availability of lysine, tryptophan, and methionine. Archaeological limestone fragments from a Grand Gulch phase site show amounts of fragmentation and changes in density consistent with repeated heating. While not conclusive, these data indicate that further research (e.g., examination of archaeological limestone fragments for maize starch grains or phytoliths) is warranted. It is suggested that greater attention be paid to archaeological indications of stone-boiling with limestone among maize-dependent but pre-pottery societies.
Keywords: Basketmaker II | Preceramic | Maize | Nixtamalization | Stone boiling | Experimental archaeology