

## References

### Aktuell

FOERSTER 2016

Verena Foerster, Ralf Vogelsang, Annett Junginger, Asfawossen Asrat, Henry F. Lamb, Frank Schaebitz & Martin H. Trauth, “*Environmental change and human occupation of southern Ethiopia and northern Kenya during the last 20,000 years.*”, *Reply to the comment. Quaternary Science Reviews* **141** (2016), 130–133.

Despite these and the other issues highlighted by Wright and Forman (2016), we feel that our study makes a strong contribution to understanding the drivers of human population dynamics and migration, than traditional approaches of descriptive archaeology. Despite the fact that human decision-making within certain environmental boundaries plays an important though incalculable role, our analysis tends to support the hypothesis that ecologically favourable zones of lake marginal and precipitation rich montane habitats (refugia) were preferentially occupied during intervals of climatic stress (Fig. 1). Our work relies on the continuous palaeoclimatic record of the Chew Bahir cores, because a comparable core record is not currently available from Lake Turkana. However, the detailed, although complex, shoreline evidence for fluctuating levels of Lake Turkana, provided by Forman et al. (2014), Bloszies et al. (2015), Wright et al. (2015) and others, offers a welcome opportunity for a further test of human responses to climatic change in the region.

WRIGHT 2016

David K. Wright & Steven L. Forman, “*Environmental change and human occupation of southern Ethiopia and northern Kenya during the last 20,000 years.*”, *Comment on Quaternary Science Reviews* **129**: 333–340. *Quaternary Science Reviews* **141** (2016), 126–129.

Blome et al. (2012) argue that humans do not respond to climate change by formally abandoning areas, but by moving and reconfiguring their subsistence. As such, pulsed absences of evidence of mobile communities in the archaeological record do not necessarily reflect regional absences of occupation, but are part of a broader pattern of seasonally mobile subsistence. We advocate an interdisciplinary approach to paleodemography that emphasizes the presence of archaeological sites within spatially- and temporally-constrained paleoclimatic models, reinforced by robust anthropological, genetic and linguistic datasets.

### Anthropologie

DUNSWORTH 2016

Holly M. Dunsworth, *Thank your intelligent mother for your big brain. PNAS* **113** (2016), 6816–6818.

So, if brains are just too metabolically or energetically costly to increase in utero, then at a certain point, encephalization would occur postnatally. This pattern is what we see: The larger the mother’s brain, the smaller is the fraction of

hers that emerges from her womb. So, whether one applies the pelvic or the metabolic explanation, or both, for neonatal brain size, one is left wondering whether a runaway scenario focused on parenting is necessary, given the many existing hypotheses for hominin encephalization.

Given the large literature dedicated to the territory covered here, Piantadosi and Kidd's powerful scenario (1) is probably too simple to depict the complex evolutionary processes that brought us big brains, intelligence, and costly babies. Regardless, their research underscores the importance of child-rearing in the evolution of humankind, an importance that is often overlooked. Likewise, the work that goes into raising children is woefully undervalued both socially and economically in the United States. It is unlikely that an evolutionary appreciation for childcare will lead to massive culture and societal change, but such change may arise by a slow and gradual process.

#### WEISS 2000

Volkmar Weiss, *Die IQ-Falle, Intelligenz, Sozialstruktur und Politik*. (Graz 2000).

#### WONG 2016

Kate Wong, *Wer war Homo naledi?* [Spektrum der Wissenschaft 2016](#), vii, 20–29.

Skelette einer primitiven, womöglich sehr frühen Menschenart aus einer südafrikanischen Höhle sorgen unter den Forschern für Aufruhr. Die Einordnung dieser Homininen in unseren Stammbaum ist heftig umstritten – noch mehr allerdings manche Folgerung ihrer Entdecker.

**1** In einer kaum zugänglichen Kammer des Höhlensystems “Rising Star” bei Johannesburg lagern Fossilien des möglicherweise bisher frühesten Vertreters unserer Gattung Homo. Sie wurden im Herbst 2013 entdeckt.

**2** Zwei Expeditionen haben bisher mehr als 1500 Knochen und Fragmente von mindestens 15 Individuen zu Tage gefördert. Zeitgleich mit der Veröffentlichung ihrer Untersuchungsergebnisse präsentierten die Forscher die Fossilien im September 2015 den Medien.

**3** Die neue Art Homo naledi soll nah an der Wurzel der Menschen stehen; und ihre Vertreter hätten die Toten absichtlich in der Höhle deponiert. Diesen Schlussfolgerungen und der forcierten Bergung begegnet die Fachwelt jedoch skeptisch.

## Bibel

#### CARMIGNAC 1984

Jean Carmignac, *La naissance des Évangiles synoptiques*. (Paris 1984).

Carmignac, a noted linguist, studied the Dead Sea Scrolls. He was astonished to find the Hebrew used in the scrolls to be identical to the Semitisms of thought, vocabulary, syntax and style in the gospel of Mark. Technical investigations into both Mark and Mathew resulted in what Carmignac insists is proof that both were written in Hebrew originally. He also argues that he has proof that the gospels were written far earlier than most scholars suspect.

## Keramik

#### JORDAN 2016

Peter Jordan, Kevin Gibbs, Peter Hommel, Henny Piezonka, Fabio Silva & James Steele, *Modelling the diffusion of pottery technologies*

across Afro-Eurasia, *Emerging insights and future research*. *Antiquity* **90** (2016), 590–603.

Antiquity090-0590-Supplement.pdf

Where did pottery first appear in the Old World? Statistical modelling of radiocarbon dates suggests that ceramic vessel technology had independent origins in two different hunter-gatherer societies. Regression models were used to estimate average rates of spread and geographic dispersal of the new technology. The models confirm independent origins in East Asia (c. 16 000 cal BP) and North Africa (c. 12 000 cal BP). The North African tradition may have later influenced the emergence of Near Eastern pottery, which then flowed west into Mediterranean Europe as part of a Western Neolithic, closely associated with the uptake of farming.

Keywords: Neolithic transition | hunter-gatherers | agriculture | pottery | statistical model | radiocarbon dating | diffusion

## Klima

BIRD 2016

Douglas W. Bird, Rebecca Bliege Bird & Brian F. Coddling, *Pyrodiversity and the Anthropocene, The Role of Fire in the Broad Spectrum Revolution*. *Evolutionary Anthropology* **25** (2016), 105–116.

The Anthropocene colloquially refers to a global regime of human-caused environmental modification of earth systems associated with profound changes in patterns of human mobility, as well as settlement and resource use compared with prior eras. Some have argued that the processes generating the Anthropocene are mainly associated with population growth and technological innovation, and thus began only in the late Holocene under conditions of dense sedentism and industrial agriculture.<sup>1</sup> However, it now seems clear that the roots of the Anthropocene lie in complex processes of intensification that significantly predate transitions to agriculture.<sup>2,3</sup> What intensification is remains less clear. For some it is increasing economic productivity that increases carrying capacity, the drivers of which may be too diverse and too local to generalize.<sup>4,5</sup> For others using Boserup's ideas about agrarian intensification, increasing density in hunter-gatherer populations can produce declines in subsistence efficiency that increase incentives for investing labor to boost yield per unit area, which then elevates Malthusian limits on carrying capacity.<sup>6–8</sup> As Morgan<sup>9</sup> demonstrates in a comprehensive review, the legacy of such Boserupian intensification is alive, well, and controversial in hunter-gatherer archeology. This is a result of its potential for illuminating processes involved in transformations of forager sociopolitical and economic systems, including those dominated by harvesting more immediate-return resources and high residential mobility as well as those characterized by more delayed-return material economies with reduced residential mobility, a broader spectrum of resources, degrees of storage, and greater social stratification. Here we detail hypotheses about the processes involved in such transitions and explore the way that anthropogenic disturbance of ecosystems, especially the use of landscape fire, could be fundamentally entangled with many broad-spectrum revolutions associated with intensified foraging systems.

Keywords: intensification | behavioral ecology | disturbance ecology | Aboriginal Australia

CLARE 2014

Lee Clare & Bernhard Weninger, *The Dispersal of Neolithic Lifeways, Absolute Chronology and Rapid Climate Change in Central and West*

*Anatolia*. In: MEHMET ÖZDOĞAN NEZİH BAŞGELEN PETER KUNIHOLM (Hrsg.), *10 500–5 200 BC, Environment, settlement, flora, fauna, dating, symbols of belief, with views from north, south, east, and west*. The Neolithic in Turkey 6 ([Beyoğlu-Istanbul 2014](#)), 1–65.

In the past few years advances in palaeoclimatology have provided a range of new perspectives for climate-archaeological research both in the Pleistocene and Holocene. In recent contributions (Weninger et al. 2006, 2009, 2011; Clare et al. 2008; Clare 2013) we have repeatedly indicated the existence of some interesting coincidences between the timing of certain major cultural transitions in the Eastern Mediterranean and climate anomalies in the Holocene, referred to as Rapid Climate Change (RCC) intervals (sensu Mayewski et al. 2004; Rohling et al. 2002). Based on a compilation of Cl4-data from selected archaeological sites, in the present paper we investigate in more detail whether the dispersal of Neolithic life-ways from Turkey to Southeast Europe was triggered by RCC-conditions between 6600 and 6000 cal. BC.

#### FOERSTER 2015

Verena Foerster, Ralf Vogelsang, Annett Junginger, Asfawossen Asrat, Henry F. Lamb, Frank Schaebitz & Martin H. Trauth, *Environmental change and human occupation of southern Ethiopia and northern Kenya during the last 20,000 years*. [Quaternary Science Reviews](#) **129** (2015), 333–340.

[qsr129-0333-Comment1.pdf](#), [qsr129-0333-Reply1.pdf](#)

Our understanding of the impact of climate-driven environmental change on prehistoric human populations is hampered by the scarcity of continuous paleoenvironmental records in the vicinity of archaeological sites. Here we compare a continuous paleoclimatic record of the last 20 ka before present from the Chew Bahir basin, southwest Ethiopia, with the available archaeological record of human presence in the region. The correlation of this record with orbitally-driven insolation variations suggests a complex nonlinear response of the environment to climate forcing, reflected in several long-term and short-term transitions between wet and dry conditions, resulting in abrupt changes between favorable and unfavorable living conditions for humans. Correlating the archaeological record in the surrounding region of the Chew Bahir basin, presumably including montane and lake-marginal refugia for human populations, with our climate record suggests a complex interplay between humans and their environment during the last 20 ka. The result may contribute to our understanding of how a dynamic environment may have impacted the adaptation and dispersal of early humans in eastern Africa.

**Keywords:** Archeology | Paleoclimate | African humid period | Push factor | Adaption | Migration | Hunter-gatherers | Foragers | Pastoralism | Chew Bahir

#### PETOUKHOV 2016

Vladimir Petoukhov, Stefan Petri, Stefan Rahmstorf, Dim Coumou, Kai Kornhuber & Hans Joachim Schellnhuber, *Role of quasiresonant planetary wave dynamics in recent boreal spring-to-autumn extreme events*. [PNAS](#) **113** (2016), 6862–6867.

In boreal spring-to-autumn (May-to-September) 2012 and 2013, the Northern Hemisphere (NH) has experienced a large number of severe midlatitude regional weather extremes. Here we show that a considerable part of these extremes were accompanied by highly magnified quasistationary midlatitude planetary

waves with zonal wave numbers  $m = 6, 7,$  and  $8$ . We further show that resonance conditions for these planetary waves were, in many cases, present before the onset of high-amplitude wave events, with a lead time up to 2 wk, suggesting that quasiresonant amplification (QRA) of these waves had occurred. Our results support earlier findings of an important role of the QRA mechanism in amplifying planetary waves, favoring recent NH weather extremes.

**Keywords:** weather extremes | heat waves | waveguides | planetary waves | atmospheric dynamics

**Significance:** Weather extremes are becoming more frequent and severe in many regions of the world. The physical mechanisms have not been fully identified yet, but there is growing evidence that there are connections to planetary wave dynamics. Our study shows that, in boreal spring-to-autumn 2012 and 2013, a majority of the weather extremes in the Northern Hemisphere midlatitudes were accompanied by highly magnified planetary waves with zonal wave numbers  $m = 6, 7,$  and  $8$ . A substantial part of those waves was probably forced by subseasonal variability in the extratropical midtroposphere circulation via the mechanism of quasiresonant amplification (QRA). The results presented here support the overall hypothesis that QRA is an important mechanism driving many of the recent exceptional extreme weather events.

## Mathematik

PIANTADOSI 2016

Steven T. Piantadosi & Celeste Kidd, *Extraordinary intelligence and the care of infants*. [PNAS \*\*113\*\* \(2016\), 6874–6879](#).

We present evidence that pressures for early childcare may have been one of the driving factors of human evolution. We show through an evolutionary model that runaway selection for high intelligence may occur when (i) altricial neonates require intelligent parents, (ii) intelligent parents must have large brains, and (iii) large brains necessitate having even more altricial offspring. We test a prediction of this account by showing across primate genera that the helplessness of infants is a particularly strong predictor of the adults' intelligence. We discuss related implications, including this account's ability to explain why human-level intelligence evolved specifically in mammals. This theory complements prior hypotheses that link human intelligence to social reasoning and reproductive pressures and explains how human intelligence may have become so distinctive compared with our closest evolutionary relatives.

**Keywords:** cognitive science | evolutionary dynamics | developmental modeling

**Significance:** One mystery of human evolution is why our cognition differs qualitatively from our closest evolutionary relatives. Here we show how natural selection for large brains may lead to premature newborns, which themselves require more intelligence to raise, and thus may select for even larger brains. As we show, these dynamics can be self-reinforcing and lead to runaway selection for extremely high intelligence and helpless newborns. We test a prediction of this account: the helplessness of a primate's newborns should strongly predict their intelligence. We show that this is so and relate our account to theories of human uniqueness and the question of why humanlevel intelligence took so long to evolve in the history of life.

## Methoden

HASLAM 2016

Michael Haslam, Lydia Luncz, Alejandra Pascual-Garrido, Tiago Falótico, Suchinda Malaivijitnond & Michael Gumert, *Archaeological excavation of wild macaque stone tools*. [Journal of Human Evolution 96 \(2016\), 134–138](#).

The role of coastal and aquatic foraging in human evolution has long been a topic of debate (Colonese et al., 2011; Archer et al., 2014; Thomas, 2015), with some even suggesting that coastal resource use spurred the development of modern human behaviour (Marean, 2014). We anticipate that the extension of the macaque archaeological record back into the past, of which this study is the first step, will help reveal how a non-human animal has developed a technological response to accessing prey in what can be an inhospitable and variably accessible environment. In conjunction with evidence of aquatic foraging from primates such as great apes (Russon et al., 2014) and Neanderthals (Cortes Sanchez et al., 2011), the macaque record will eventually provide both a unique source of comparative data and a long-term record of how coastal environments may be exploited by technologically proficient animals other than modern humans.

## Methoden Ozeanien

HEUPINK 2016

Tim H. Heupink et al., *Ancient mtDNA sequences from the First Australians revisited*. [PNAS 113 \(2016\), 6892–6897](#).

Tim H. Heupink, Sankar Subramanian, Joanne L. Wright, Phillip Endicott, Michael Carrington Westaway, Leon Huynen, Walther Parson, Craig D. Millar, Eske Willerslev & David M. Lambert

The publication in 2001 by Adcock et al. [Adcock GJ, et al. (2001) Proc Natl Acad Sci USA 98(2):537–542] in PNAS reported the recovery of short mtDNA sequences from ancient Australians, including the 42,000-y-old Mungo Man [Willandra Lakes Hominid (WLH3)]. This landmark study in human ancient DNA suggested that an early modern human mitochondrial lineage emerged in Asia and that the theory of modern human origins could no longer be considered solely through the lens of the “Out of Africa” model. To evaluate these claims, we used second generation DNA sequencing and capture methods as well as PCR-based and single-primer extension (SPEX) approaches to reexamine the same four Willandra Lakes and Kow Swamp 8 (KS8) remains studied in the work by Adcock et al. Two of the remains sampled contained no identifiable human DNA (WLH15 and WLH55), whereas the Mungo Man (WLH3) sample contained no Aboriginal Australian DNA. KS8 reveals human mitochondrial sequences that differ from the previously inferred sequence. Instead, we recover a total of five modern European contaminants from Mungo Man (WLH3). We show that the remaining sample (WLH4) contains  $\approx 1.4\%$  human DNA, from which we assembled two complete mitochondrial genomes. One of these was a previously unidentified Aboriginal Australian haplotype belonging to haplogroup S2 that we sequenced to a high coverage. The other was a contaminating modern European mitochondrial haplotype. Although none of the sequences that we recovered matched those reported by Adcock et al., except a contaminant, these findings show the feasibility of obtaining important information from ancient Aboriginal Australian remains.

**Keywords:** ancient DNA | Aboriginal Australians | mitogenomics | biological sciences | anthropology



**Significance:** This report is the first publication, to our knowledge, to report the complete mitochondrial genome of an ancient Aboriginal Australian. In addition, it also provides important evidence about the reliability of the only previous publication of this kind. The paper attained international significance, although its conclusions have remained controversial. Using second generation DNA sequencing methods, we provide strong evidence that the DNA sequences reported by Adcock et al. were, indeed, contamination. Our manuscript is also important, because the research was planned and conducted and is published with the support of the Barkindji, Ngayampaa, and Muthi Muthi indigenous groups.

## Mittelpaläolithikum

HODGKINS 2016

Jamie Hodgkins, Curtis W. Marean, Alain Turq, Dennis Sandgathe, Shannon J. P. McPherron & Harold Dibble, *Climate-mediated shifts in Neandertal subsistence behaviors at Pech de l'Azé IV and Roc de Marsal (Dordogne Valley, France)*. [Journal of Human Evolution](#) **96** (2016), 1–18.

Neandertals disappeared from Europe just after 40,000 years ago. Some hypotheses ascribe this to numerous population crashes associated with glacial cycles in the late Pleistocene. The goal of this paper is to test the hypothesis that glacial periods stressed Neandertal populations. If cold climates stressed Neandertals, their subsistence behaviors may have changed requiring intensified use of prey through more extensive nutrient extraction from faunal carcasses. To test this, an analysis of Neandertal butchering was conducted on medium sized bovid/cervid remains composed of predominately red deer (*Cervus elaphus*), reindeer (*Rangifer tarandus*), and roe deer (*Capreolus capreolus*) deposited during global warm and cold phases from two French sites: Pech de l'Azé IV (Pech IV, Bordes' excavation) and Roc de Marsal (RDM). Analysis of surface modification on high survival long bones and proximal and middle phalanges demonstrates that skeletal elements excavated from the cold levels (RDM Level 4, Pech IV Level I2) at each cave have more cut marks and percussion marks than elements from the warm levels (RDM Level 9, Pech IV Level Y-Z) after controlling for fragment size. At both sites, epiphyseal fragments are rare, and although this pattern can result from carnivore consumption, carnivore tooth marks are almost nonexistent (<0.1%). Alternatively, processing epiphyseal ends for bone grease may have been a Neandertal survival strategy, and epiphyses were more intensively percussed in cold levels than in warm levels at both RDM and Pech IV. The exploitation of low marrow yield elements such as phalanges does not show a consistent pattern relating to climate, but may have been a general Neandertal behavioral characteristic, suggesting that these hominids were regularly on the edge of sufficient nutrient availability even during interglacials. Overall, the faunal assemblages from Roc de Marsal and Pech IV provide some support for the hypothesis that Neandertals were processing faunal remains more heavily during glacial periods, suggesting a response to increased nutritional stress during colder time periods.

**Keywords:** Zooarchaeology | Paleolithic archaeology | Neandertal extinction | Southwestern France | Global climate change

## Neolithikum

HOFMANOVÁ 2016

Zuzana Hofmanová et al., *Early farmers from across Europe directly descended from Neolithic Aegeans*. *PNAS* **113** (2016), 6886–6891.

pnas113-06886-Supplement1.xlsx, pnas113-06886-Supplement2.xlsx, pnas113-06886-Supplement3.xlsx

Zuzana Hofmanová, Susanne Kreutzer, Garrett Hellenthal, Christian Sell, Yoan Diekmann, David Díez-del-Molino, Lucy van Dorp, Saioa López, Athanasios Kousathanas, Vivian Link, Karola Kirsanow, Lara M. Cassidy, Rui Martiniano, Melanie Strobel, Amelie Scheu, Kostas Kotsakis, Paul Halstead, Sevi Triantaphyllou, Nina Kyparissi-Apostolika, Dushka Urem-Kotsou, Christina Ziota, Fotini Adaktylou, Shyamalika Gopalan, Dean M. Bobo, Laura Winkelbach, Jens Blöcher, Martina Unterländer, Christoph Leuenberger, Çiler Çilingiro c glu, Barbara Horejs, Fokke Gerritsen, Stephen J. Shennan, Daniel G. Bradley, Mathias Currat, Krishna R. Veeramah, Daniel Wegmann, Mark G. Thomas, Christina Papageorgopoulou & Joachim Burger

Farming and sedentism first appeared in southwestern Asia during the early Holocene and later spread to neighboring regions, including Europe, along multiple dispersal routes. Conspicuous uncertainties remain about the relative roles of migration, cultural diffusion, and admixture with local foragers in the early Neolithization of Europe. Here we present paleogenomic data for five Neolithic individuals from northern Greece and northwestern Turkey spanning the time and region of the earliest spread of farming into Europe. We use a novel approach to recalibrate raw reads and call genotypes from ancient DNA and observe striking genetic similarity both among Aegean early farmers and with those from across Europe. Our study demonstrates a direct genetic link between Mediterranean and Central European early farmers and those of Greece and Anatolia, extending the European Neolithic migratory chain all the way back to southwestern Asia.

**Keywords:** paleogenomics | Neolithic | Mesolithic | Greece | Anatolia

**Significance:** One of the most enduring and widely debated questions in prehistoric archaeology concerns the origins of Europe's earliest farmers: Were they the descendants of local hunter-gatherers, or did they migrate from southwestern Asia, where farming began? We recover genome-wide DNA sequences from early farmers on both the European and Asian sides of the Aegean to reveal an unbroken chain of ancestry leading from central and southwestern Europe back to Greece and northwestern Anatolia. Our study provides the coup de grâce to the notion that farming spread into and across Europe via the dissemination of ideas but without, or with only a limited, migration of people.

## Physik

GREENE 2016

Geoffrey L. Greene & Peter Geltenbort, *Das Neutronenrätsel*. *Spektrum der Wissenschaft* **2016**, vii, 36–41.

Zwei hochpräzise Experimente liefern unterschiedliche Ergebnisse für die Lebensdauer des Neutrons. Liegt die Differenz schlicht an Messfehlern, oder deutet sie auf ein bislang unbekanntes Phänomen?

**1** Neutronen sind als Bestandteil von Atomkernen stabil. Sind sie jedoch nicht an Protonen gebunden, zerfallen sie nach einer gewissen Zeit.

**2** Forscher wollen die mittlere Lebensdauer genau ermitteln, um die beteiligte Naturkraft besser zu verstehen. Verschiedene Verfahren liefern jedoch Daten, die nicht miteinander vereinbar sind.



3 Eine Erklärung für diese Diskrepanz wäre von fundamentaler Bedeutung. Denn erst mit einem genauen Wert für die Lebensdauer des Neutrons können Kosmologen eine ganze Reihe grundlegender Fragen über das Universum beantworten.

## Religion

NONGBRI 2013

Brent Nongbri, *Before Religion, A history of a modern concept*. (New Haven 2013).

For much of the past two centuries, religion has been understood as a universal phenomenon, a part of the natural human experience that is essentially the same across cultures and throughout history. Individual religions may vary through time and geographically, but there is an element, religion, that is to be found in all cultures during all time periods. Taking apart this assumption, Brent Nongbri shows that the idea of religion as a sphere of life distinct from politics, economics, or science is a recent development in European history a development that has been projected outward in space and backward in time with the result that religion now appears to be a natural and necessary part of our world.

Examining a wide array of ancient writings, Nongbri demonstrates that in antiquity, there was no conceptual arena that could be designated as religious as opposed to secular. Surveying representative episodes from a two-thousand-year period, while constantly attending to the concrete social, political, and colonial contexts that shaped relevant works of philosophers, legal theorists, missionaries, and others, Nongbri offers a concise and readable account of the emergence of the concept of religion.”