

References

Aktuell

HAWKS 2015

John Hawks, Darryl J. de Ruiter & Lee R. Berger, *Comment on “Early Homo at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia”*. [science 348 \(2015\), 1326](#).

Villmoare et al. (Reports, 20 March 2015, p. 1352) report on a hominin mandible from the Ledi-Geraru research area, Ethiopia, which they claim to be the earliest known representative of the genus Homo. However, certain measurements and observations for Australopithecus sediba mandibles presented are incorrect or are not included in critical aspects of the study. When correctly used, these data demonstrate that specimen LD 350-1 cannot be unequivocally assigned to the genus Homo.

PEPPE 2015

Daniel J. Peppe & Dana L. Royer, *Can climate feel the pressure?* [science 348 \(2015\), 1210–1211](#).

Changes in atmospheric pressure may be an important long-term climate forcing mechanism.

Poulsen et al. show that changes in atmospheric density caused by geologically reasonable variations in O₂ partial pressure affect the scattering of incoming solar radiation. At high atmospheric pressure, shortwave scattering intensifies, leading to a weaker greenhouse forcing and a reduction in atmospheric water vapor, global precipitation, and surface temperatures; at low atmospheric pressure, the reverse patterns are seen.

Both climate modelers and paleoclimate researchers most commonly express CO₂ in terms of volume fraction (such as parts per million by volume, or ppmv). However, if total atmospheric pressure is changing, these CO₂ estimates mean different things in terms of radiative forcing.

PORTMAN 2015

Michelle E. Portman, *You’ll be OK*. [science 348 \(2015\), 1282](#).

My work was meaningful and influential, and it supported my husband’s studies: He had just finished military service and had no family financial backing. I hoped I would get a chance to go back to school when he finished. After he finished his degree, my husband left me and our 3-year-old son.

I was on leave from work for most of this time, but I was always studying. I recall sitting at her hospital bed, reading literature and writing papers. Our daughter’s prognosis was not good, but I found in my studies not an escape but a vivid alternative that drew me in effortlessly and gave me deep satisfaction.

At the same time, work—good work that I am excited to wake up to every morning—has been a source of strength on all fronts, personal and professional. Loving what you do and believing it is important won’t ensure that everything else is perfect, but if you persist you’ll make it through. This is a message I hope to pass on to my students.

VILLMOARE 2015

Brian Villmoare et al., *Response to Comment on “Early Homo at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia”*. [science 348 \(2015\), 1326](#).

Brian Villmoare, William H. Kimbel, Chalachew Seyoum, Christopher J. Campisano, Erin DiMaggio, John Rowan, David R. Braun, J. Ramon Arrowsmith & Kaye E. Reed

Hawks et al. argue that our analysis of *Australopithecus sediba* mandibles is flawed and that specimen LD 350-1 cannot be distinguished from this, or any other, *Australopithecus* species. Our reexamination of the evidence confirms that LD 350-1 falls outside of the pattern that *A. sediba* shares with *Australopithecus* and thus is reasonably assigned to the genus *Homo*.

Anthropologie

HOOVER 2015

Kara C. Hoover, Omer Gokcumen, Zoya Qureshy, Elise Bruguera, Aulaphan Savangsuksa, Matthew Cobb & Hiroaki Matsunami, *Global Survey of Variation in a Human Olfactory Receptor Gene Reveals Signatures of Non-Neutral Evolution*. [Chemical Senses \(2015\), preprint, 1–8. DOI:10.1093/chemse/bjv030](#).

ChemSens2015-Hoover-Supplement1.docx, ChemSens2015-Hoover-Supplement2.xlsx

Allelic variation at 4 loci in the human olfactory receptor gene OR7D4 is associated with perceptual variation in the sex steroid-derived odorants, androstenone, and androstadienone. Androstadienone has been linked with chemosensory identification whereas androstenone makes pork from uncastrated pigs distasteful (“boar taint”). In a sample of 2224 individuals from 43 populations, we identified 45 OR7D4 single nucleotide polymorphisms. Coalescent modeling of frequency-site-spectrum-based statistics identified significant deviation from neutrality in human OR7D4; individual populations with statistically significant deviations from neutrality include Gujarati, Beijing Han, Great Britain, Iberia, and Puerto Rico. Analysis of molecular variation values indicated statistically significant population differentiation driven mainly by the 4 alleles associated with androstenone perception variation; however, fixation values were low suggesting that genetic structure may not have played a strong role in creating these group divisions. We also studied OR7D4 in the genomes of extinct members of the human lineage: Altai Neandertal and Denisovan. No variants were identified in Altai but 2 were in Denisova, neither of which is shared with modern humans. A functional test of modern human and a synthesized mutant Denisova OR7D4 indicated no statistically significant difference in responses to androstenone between the 2 species. Our results suggest non-neutral evolution for an olfactory receptor gene.

Keywords: Altai Neandertal | androstenone perception | Denisova | human variation | OR7D4 | selection

KHRAMEEVA 2014

Ekaterina E. Khrameeva et al., *Neanderthal ancestry drives evolution of lipid catabolism in contemporary Europeans*. [Nature Communications 5 \(2014\), 3584. DOI:10.1038/ncomms4584](#).

NatComm05-3584-Supplement1.pdf, NatComm05-3584-Supplement2.xlsx, NatComm05-3584-Supplement3.xlsx

Ekaterina E. Khrameeva, Katarzyna Bozek, Liu He, Zheng Yan, Xi Jiang, Yuning Wei, Kun Tang, Mikhail S. Gelfand, Kay Prufer, Janet Kelso, Svante Paabo, Patrick Giavalisco, Michael Lachmann & Philipp Khaitovich

Although Neanderthals are extinct, fragments of their genomes persist in contemporary humans. Here we show that while the genome-wide frequency of Neanderthal-like sites is approximately constant across all contemporary out-of-Africa populations, genes involved in lipid catabolism contain more than threefold excess of such sites in contemporary humans of European descent. Evolutionally, these genes show significant association with signatures of recent positive selection in the contemporary European, but not Asian or African populations. Functionally, the excess of Neanderthal-like sites in lipid catabolism genes can be linked with a greater divergence of lipid concentrations and enzyme expression levels within this pathway, seen in contemporary Europeans, but not in the other populations. We conclude that sequence variants that evolved in Neanderthals may have given a selective advantage to anatomically modern humans that settled in the same geographical areas.

KRIEF 2015

Sabrina Krief, Camille Daujeard, Marie-Hélène Moncel, Noemie Lamont & Vernon Reynolds, *Flavouring food: the contribution of chimpanzee behaviour to the understanding of Neanderthal calculus composition and plant use in Neanderthal diets*. *Antiquity* **89** (2015), 464–471.

In conclusion, if the presence of camomile and yarrow in calculus samples from Neanderthals can be explained as self-medication, we suggest that the data are not sufficient to exclude other deliberate food practices such as the consumption of the stomach contents of prey (thereby indirectly consuming plant material) or the addition of plants as aromatics or spices, deliberately mixing them with the prey to decrease the risk of infection.

Bibel

JAMES 2015

Peter James & Peter van der Veen, *When did Shoshenq I campaign in Palestine?* In: PETER JAMES & PETER G. VAN DER VEEN (Hrsg.), *Solomon and Shishak: Current Perspectives from Archaeology, Epigraphy, History and Chronology, Proceedings of the Third BICANE Colloquium, Sidney Sussex College, Cambridge, 26-27 March 2011*. BAR International Series 2732 (Oxford 2015), 127–136.

As argued elsewhere (in Centuries of Darkness and now in many other papers, including some in this volume), Shoshenq I – founder of the 22nd Dynasty – was not the Shishak who invaded Judah c. 925 BC. In our opinion, genuine dead-reckoning from the highest attested years from the monuments (see e.g. James & Morkot and Thijs in this volume), with Phoenician inscriptions – see van der Veen, ‘Early Iron Age Epigraphy ...’ in this volume) and the archaeology of Megiddo (see Chapman also in this volume), show that Shoshenq I must have been a pharaoh of the mid to late 9th century BC rather than the 10th.

ZERBST 2015

Uwe Zerbst & Peter van der Veen, *Does Radiocarbon Provide the Answer?* In: PETER JAMES & PETER G. VAN DER VEEN

(Hrsg.), *Solomon and Shishak: Current Perspectives from Archaeology, Epigraphy, History and Chronology, Proceedings of the Third BICANE Colloquium, Sidney Sussex College, Cambridge, 26-27 March 2011*.

BAR International Series 2732 (Oxford 2015), 199–224.

Radiocarbon dating and, closely related, dendrochronology, is becoming an increasingly important topic in the chronological debate of the ancient Near East. The dispute concerning a revision of the Iron Age chronology put forward by Finkelstein and his co-workers for archaeological reasons, is now also largely based on radiocarbon evidence. While a number of authors have argued that radiocarbon provides conclusive proof against large scale revisions, since it appears to confirm the conventional archaeological time frame, the revised chronology as put forward in Centuries of Darkness (CoD), nevertheless, raises questions, which can be fruitful for both archaeological and radiocarbon dating.

Energie

ABBOTT 2015

Researchers pin down risks of low-dose radiation. [nature 523 \(2015\), 17–18.](#)

Large study of nuclear workers shows that even tiny doses slightly boost risk of leukaemia.

The study confirmed that the risk of leukaemia does rise proportionately with higher doses, but also showed that this linear relationship is present at extremely low levels of radiation. (Other blood cancers also tended to rise with radiation doses, but the associations were not statistically significant.) Even in this large study, there was no direct evidence that workers who had accumulated extremely low doses of radiation (below a total of 50 mSv) had an increased risk of leukaemia, says Olsen. But a mathematical extrapolation of the data suggests that each accumulation of 10 mSv of exposure raised a worker's risk of leukaemia by around 3%, compared to the average risk of the group of workers in the study. The data also challenge an ICRP assumption that accumulated low-dose exposure gives a lower risk of leukaemia than does a single exposure to the same total dose (based on the idea that the body has time to recover if the assault comes in tiny, spread-out doses).

HAYDEN 2001

Howard C. Hayden, *The Solar Fraud, Why solar energy won't run the world.* (Pueblo 2001).

For decades, solar proponents have predicted that we would soon get 20% to 100% of our energy from solar sources—biomass, hydro, wind, solar-thermal, photovoltaics and others.

The dreamy-eyed predictions all failed because they were based on emotional urges and political agendas rather than honest assessments. The gurus were numerous, but solar energy is a topic of science, where votes don't count, even when they come from high-profile lawyers, political appointees, and leaders of environmental organizations.

The Solar Fraud explains the realities of solar energy, especially how much one can expect from solar sources

LEURAUD 2015

Klervi Leuraud et al., *Ionising radiation and risk of death from leukaemia and lymphoma in radiation-monitored workers (INWORKS)*,

An international cohort study. [Lancet Haematology 2 \(2015\), E276–E286.](#)

LancetHaemat02-e276-Supplement1.mp3, LancetHaemat02-e276-Supplement1.pdf

Klervi Leuraud, David B Richardson, Elisabeth Cardis, Robert D Daniels, Michael Gillies, Jacqueline A O’Hagan, Ghassan B Hamra, Richard Haylock, Dominique Laurier, Monika Moissonnier, Mary K Schubauer-Berigan, Isabelle Thierry-Chef & Ausrele Kesminiene

Background: There is much uncertainty about the risks of leukaemia and lymphoma after repeated or protracted low-dose radiation exposure typical of occupational, environmental, and diagnostic medical settings. We quantified associations between protracted low-dose radiation exposures and leukaemia, lymphoma, and multiple myeloma mortality among radiation-monitored adults employed in France, the UK, and the USA.

Methods: We assembled a cohort of 308 297 radiation-monitored workers employed for at least 1 year by the Atomic Energy Commission, AREVA Nuclear Cycle, or the National Electricity Company in France, the Departments of Energy and Defence in the USA, and nuclear industry employers included in the National Registry for Radiation Workers in the UK. The cohort was followed up for a total of 8•22 million person-years. We ascertained deaths caused by leukaemia, lymphoma, and multiple myeloma. We used Poisson regression to quantify associations between estimated red bone marrow absorbed dose and leukaemia and lymphoma mortality.

Findings: Doses were accrued at very low rates (mean 1•1 mGy per year, SD 2•6). The excess relative risk of leukaemia mortality (excluding chronic lymphocytic leukaemia) was 2•96 per Gy (90% CI 1•17–5•21; lagged 2 years), most notably because of an association between radiation dose and mortality from chronic myeloid leukaemia (excess relative risk per Gy 10•45, 90% CI 4•48–19•65).

Interpretation: This study provides strong evidence of positive associations between protracted low-dose radiation exposure and leukaemia.

Funding: Centers for Disease Control and Prevention, Ministry of Health, Labour and Welfare of Japan, Institut de Radioprotection et de Sûreté Nucléaire, AREVA, Electricité de France, National Institute for Occupational Safety and Health, US Department of Energy, US Department of Health and Human Services, University of North Carolina, Public Health England.

Grabung

STRAUS 2015

Lawrence G. Straus, Manuel R. González Morales, Jose Miguel Carretero & Ana Belen Marín-Arroyo, “*The Red Lady of El Mirón*”, *Lower Magdalenian life and death in Oldest Dryas Cantabrian Spain: an overview.* [Journal of Archaeological Science 60 \(2015\), 134–137.](#)

This synthesis article summarizes the multidisciplinary evidence and interpretations of the first substantial human burial of Magdalenian age to be discovered on the Iberian Peninsula. A robust, relatively tall, apparently healthy, probably female adult was buried at the rear of the living area in El Miron Cave in the Cantabrian Cordillera of Spain about 18,700 calendar years ago. She had lived in the cold, open environment of Oldest Dryas, with a subsistence based on hunting mainly ibex and red deer, fishing salmon and some gathering of plants, including some starchy seeds and mushrooms. The technology of her group included the

manufacture and use of stone tools and weapon elements made on both excellent-quality non-local flint and local non-flints, as well as antler projectile tips and bone needles. Her burial may have been marked by rock engravings suggestive of a female personage, by red ochre staining of a large block adjacent to her skeleton, and by engravings on the adjacent cave wall, and the burial layer itself was intensely stained with red ochre rich in specular hematite specially obtained from an apparently non-local source. The ochre may constitute the only demonstrable “grave offering”. The grave was partially disturbed by a carnivore of wolf size after the corpse had decomposed. Then, it is hypothesized that the skeleton was covered over again and (re-) stained by humans after they (or the carnivore) had removed the cranium and most of the large long bones.

Keywords: Magdalenian | Human burial | Oldest Dryas | Cantabrian Spain | El Mirón Cave

Jungpaläolithikum

TALLAVAARA 2015

Miikka Tallavaara, Miska Luoto, Natalia Korhonen, Heikki Järvinen & Heikki Seppä, *Human population dynamics in Europe over the Last Glacial Maximum*. *PNAS* **112** (2015), 8232–8237.

pnas112-08232-Supplement1.xls, pnas112-08232-Supplement2.xls, pnas112-08232-Supplement3.xls

The severe cooling and the expansion of the ice sheets during the Last Glacial Maximum (LGM), 27,000–19,000 y ago (27–19 ky ago) had a major impact on plant and animal populations, including humans. Changes in human population size and range have affected our genetic evolution, and recent modeling efforts have reaffirmed the importance of population dynamics in cultural and linguistic evolution, as well. However, in the absence of historical records, estimating past population levels has remained difficult. Here we show that it is possible to model spatially explicit human population dynamics from the pre-LGM at 30 ky ago through the LGM to the Late Glacial in Europe by using climate envelope modeling tools and modern ethnographic datasets to construct a population calibration model. The simulated range and size of the human population correspond significantly with spatiotemporal patterns in the archaeological data, suggesting that climate was a major driver of population dynamics 30–13 ky ago. The simulated population size declined from about 330,000 people at 30 ky ago to a minimum of 130,000 people at 23 ky ago. The Late Glacial population growth was fastest during Greenland interstadial 1, and by 13 ky ago, there were almost 410,000 people in Europe. Even during the coldest part of the LGM, the climatically suitable area for human habitation remained unfragmented and covered 36% of Europe.

Keywords: hunter-gatherers | demography | niche modeling | climate change | Paleolithic

Klima

ORTEGA 2015

Pablo Ortega, Flavio Lehner, Didier Swingedouw, Valerie Masson-Delmotte, Christoph C. Raible, Mathieu Casado & Pascal Yiou, *A model-tested North Atlantic Oscillation reconstruction for the past millennium*. *nature* **523** (2015), 71–74.

n523-0071-Supplement.pdf

The North Atlantic Oscillation (NAO) is the major source of variability in winter atmospheric circulation in the Northern Hemisphere, with large impacts on temperature, precipitation and storm tracks¹, and therefore also on strategic sectors such as insurance², renewable energy production³, crop yields⁴ and water management⁵. Recent developments in dynamical methods offer promise to improve seasonal NAO predictions⁶, but assessing potential predictability on multi-annual timescales requires documentation of past low-frequency variability in the NAO. A recent bi-proxy NAO reconstruction⁷ spanning the past millennium suggested that long-lasting positive NAO conditions were established during medieval times, explaining the particularly warm conditions in Europe during this period; however, these conclusions are debated. Here, we present a yearly NAO reconstruction for the past millennium, based on an initial selection of 48 annually resolved proxy records distributed around the Atlantic Ocean and built through an ensemble of multivariate regressions. We validate the approach in six past-millennium climate simulations, and show that our reconstruction outperforms the bi-proxy index. The final reconstruction shows no persistent positive NAO during the medieval period, but suggests that positive phases were dominant during the thirteenth and fourteenth centuries. The reconstruction also reveals that a positive NAO emerges two years after strong volcanic eruptions, consistent with results obtained from models and satellite observations for the Mt Pinatubo eruption in the Philippines^{8,9}.

POULSEN 2015

Christopher J. Poulsen, Clay Tabor & Joseph D. White, *Long-term climate forcing by atmospheric oxygen concentrations*. [science](#) **348** (2015), 1238–1241.

[s348-1238-Supplement.pdf](#)

The percentage of oxygen in Earth’s atmosphere varied between 10 % and 35 % throughout the Phanerozoic. These changes have been linked to the evolution, radiation, and size of animals but have not been considered to affect climate. We conducted simulations showing that modulation of the partial pressure of oxygen (pO₂), as a result of its contribution to atmospheric mass and density, influences the optical depth of the atmosphere. Under low pO₂ and a reduced-density atmosphere, shortwave scattering by air molecules and clouds is less frequent, leading to a substantial increase in surface shortwave forcing. Through feedbacks involving latent heat fluxes to the atmosphere and marine stratus clouds, surface shortwave forcing drives increases in atmospheric water vapor and global precipitation, enhances greenhouse forcing, and raises global surface temperature. Our results implicate pO₂ as an important factor in climate forcing throughout geologic time.

Kultur

LAWRENCE 2015

Dan Lawrence & T. J. Wilkinson, *Hubs and upstarts, Pathways to urbanism in the northern Fertile Crescent*. [Antiquity](#) **89** (2015), 328–344.

The origins of urbanism are a controversial subject, with neo-evolutionary progress through graduated stages of ‘civilisation’ still having significant influence despite criticism, while others in the field prefer more diverse, regionally based trajectories. Using data collected over 30 years and applying the full range of archaeological and historical sources, the authors offer an alternative reading of

the evidence, identifying multiple pathways to urbanism within a single region—northern Mesopotamia. Here, early urbanism was a phased and pulsating phenomenon that could be sustained only within particular geographic parameters and for limited periods. Older urban hubs, growing slowly, were accompanied by rapidly expanding new sites, with the combination of the different forms demonstrating the complexities of urban growth.

Keywords: Fertile Crescent | Late Chalcolithic | Early Bronze Age | urbanism | tell | survey | database | regional exchange

MORRIS 2015

Ian Morris, *Foragers, farmers, and fossil fuels, How human values evolve*. University Center for Human Values Series (Princeton 2015).

Most people in the world today think democracy and gender equality are good, and that violence and wealth inequality are bad. But most people who lived during the 10,000 years before the nineteenth century thought just the opposite. Drawing on archaeology, anthropology, biology, and history, Ian Morris, author of the best-selling *Why the West Rules—for Now*, explains why. The result is a compelling new argument about the evolution of human values, one that has far-reaching implications for how we understand the past—and for what might happen next.

Fundamental long-term changes in values, Morris argues, are driven by the most basic force of all: energy. Humans have found three main ways to get the energy they need—from foraging, farming, and fossil fuels. Each energy source sets strict limits on what kinds of societies can succeed, and each kind of society rewards specific values. In tiny forager bands, people who value equality but are ready to settle problems violently do better than those who aren't; in large farming societies, people who value hierarchy and are less willing to use violence do best; and in huge fossil-fuel societies, the pendulum has swung back toward equality but even further away from violence.

But if our fossil-fuel world favors democratic, open societies, the ongoing revolution in energy capture means that our most cherished values are very likely to turn out—at some point fairly soon—not to be useful any more.

Originating as the Tanner Lectures delivered at Princeton University, the book includes challenging responses by novelist Margaret Atwood, philosopher Christine Korsgaard, classicist Richard Seaford, and historian of China Jonathan Spence.

Metallzeiten

KIENLIN 2015

Tobias L. Kienlin, *Bronze Age Tell Communities in Context: An exploration into culture, society, and the study of European prehistory, Part 1: Critique – Europe and the Mediterranean*. (Oxford 2015).

This study comes in two parts. In the present volume, dedicated rather to deconstruction, I am afraid, an attempt is made to justify my above outlined discontent with much current theorising of the 'Bronze Age'. Since part of the problem involves lofty narratives far removed from the actual and often contradictory evidence on the ground, I tried – as far as my knowledge goes – to provide a rather dense description of the evidence that I am arguing with. This is a fast moving and exciting field of study with a growing number of current projects, so new data are regularly becoming available. However, I hope that the theoretical part of the argument established by reference to the empirical basis as outlined in this volume will withstand, and the refutation of reductionist and essentialising Bronze Age narratives undertaken here will be regarded as successful. Part 2, which is currently

in progress, will contain the attempt to develop a positive approach working with what evidence we have so far.

LING 2015

Johan Ling & Zofia Stos-Gale; Flemming Kaul, Anthony Harding, Kalle Sognnes, Dirk Brandherm & A. Bernard Knapp, *Representations of oxhide ingots in Scandinavian rock art, The sketchbook of a Bronze Age traveller?* *Antiquity* **89** (2015), 191–223.

Bronze Age trade networks across Europe and the Mediterranean are well documented; Baltic amber and bronze metalwork were particularly valued commodities. Here it is argued that demand for copper and tin led to changes in Scandinavian trade routes around 1600 BC, which can be linked to the appearance of figurative rock art images in southern Scandinavia. Images identified as oxhide ingots have been discovered in Sweden and suggest that people from Scandinavia were familiar with this characteristically Mediterranean trading commodity. Using trace element and lead isotope analysis, the authors argue that some bronze tools excavated in Sweden could have been made of Cypriot copper; these two discoveries suggest that Scandinavians were travelling to the Mediterranean, rather than acting through a middle man.

Keywords: Sweden | Cyprus | Bronze Age | oxhide ingots | rock art | trade networks | amber | lead isotopes

Some 30 years ago, the oxhide-ingot interpretation of the motifs in question may have seemed improbable. Today, however, a larger body of evidence of long-distance connections between the eastern Mediterranean and Central and Northern Europe is at hand. Consequently, it now seems possible to set aside the former scepticism over the significance of long-distance connections between the Aegean and Continental Europe (Harding 2007). The importance of Nordic or Baltic amber should be reconsidered, as we know that it reached even distant places beyond the eastern Mediterranean, such as Qatna in Syria. Nordic amber was also part of the cargo of the ship wrecked at Uluburun off the south-west Turkish coast (Mukherjee et al. 2008). The results of the metal analyses shown in Ling and Stos-Gale (above) further corroborate the evidence of connections between Northern Europe and the Mediterranean, including Cyprus.

Recently, it has been proposed that the introduction of the single-edged razor into southern Scandinavia around 1400 BC was due to influences ultimately stemming from the eastern Mediterranean (Kaul 2013). No imported Mycenaean or Minoan razor has been found in the North. As with the folding stools, it was the idea that was transmitted over long distances; this time, the idea of the shaven warrior.

Neolithikum

LÓPEZ-MONTALVO 2015

Esther López-Montalvo, *Violence in Neolithic Iberia, New readings of Levantine rock art* *Antiquity* **89** (2015), 309–327.

How violent was life in Neolithic society, and was there anything resembling organised warfare? Recent research has largely overturned ideas of peaceful farming societies. Spanish Levantine rock art offers a unique insight into conflict in Neolithic society, with images of violence, real or imagined, being acted out in scenes preserved in rockshelters. Combining this body of data with evidence from the archaeological record, a new way of understanding the imagery in rock art is here proposed. Ethnographic and anthropological methodologies allow the author to

show how socio-cultural behaviours and individual social roles can be read from rock art.

Keywords: Iberia | Neolithic | Levantine rock art | violence | warfare | social hierarchy | ethnography

MARCINIAK 2015

Arkadiusz Marciniak, Marek Z. Baránski, Alex Bayliss, Lech Czerniak, Tomasz Goslar, John Southon & R. E. Taylor, *Fragmenting times, Interpreting a Bayesian chronology for the Late Neolithic occupation of Çatalhöyük East, Turkey*. *Antiquity* **89** (2015), 154–176.

The repetitive and highly structured domestic architecture of Çatalhöyük is a distinctive feature of this important Neolithic settlement. At the very end of the sequence, however, excavations on the surface of the East Mound reveal changes in household construction and burial chambers. Bayesian analysis of 56AMS radiocarbon dates from these layers allow the date and pace of these changes to be established in detail. Settlement activity on the East Mound ceased just after 6000 cal BC, and was followed by the cessation of Neolithic burial activity a few decades later.

Keywords: Çatalhöyük | Late Neolithic | chronology | Bayesian statistics | pebble floors | burial | chambers | households

MEYER 2014

Christian Meyer et al., *Mass Graves of the LBK, Patterns and Peculiarities*. In: ALASDAIR WHITTLE & PENNY BICKLE (Hrsg.), *Early Farmers, The View from Archaeology and Science*. Proceedings of the British Academy 198 (Oxford 2014), 307–325.

Christian Meyer, Christian Lohr, Olaf Kürbis, Veit Dresely, Wolfgang Haak, Christina J. Adler, Detlef Gronenborn And Kurt W. Alt

Judging from the currently available numbers of skeletons from the sites of Talheim, Kilianstädten, Wiederstedt and Schletz, we currently have a lower boundary of about ten individuals to conservatively define such a ‘mass’ fatality event. Carefully arranged multiple burials with two or three bodies are known from LBK cemetery and settlement contexts (Peschel 1992, Veit 1996), albeit in much smaller numbers than individual inhumations, so it might be assumed that there possibly occurred a conceptual shift from careful burial to careless disposal in the range of five to ten individuals.

Future excavations and analyses might reveal if the possible conceptual shift from careful burial to careless disposal is just an artefact of the current state of research, or if it was an actual part of LBK burial customs. One has to bear in mind, however, that mass fatality events might have been masked by individual burial in a regular cemetery, a possibility which would be almost impossible to detect. Although cemeteries are rightly regarded as a more longitudinal population transect, in contrast to the transversal nature of mass graves, mass fatalities might also affect cemetery samples to an unknown degree. Nevertheless, mass graves of the LBK, once thought to be singular, are seemingly more common and probably formed at least one aspect of LBK funerary traditions in the widest sense. Put more specifically, they were already a standard way of dealing with high numbers of dead in the Early Neolithic of central Europe, and the well known characterisation of ‘diversity in uniformity’ (Modderman 1988) now seems applicable even to the LBK mass graves.

ORSCHIEDT 2009

Jörg Orschiedt & Miriam Noël Haidle, *Hinweise auf eine Krise? Die menschlichen Skelettreste von Herxheim*. In: ANDREA ZEEB-LANZ (Hrsg.), *Krisen – Kulturwandel – Kontinuitäten: Zum Ende der Bandkeramik in Mitteleuropa, Beiträge der Internationalen Tagung in Herxheim bei Landau (Pfalz) vom 14.–17. 06. 2007*. Internationale Archäologie: Arbeitsgemeinschaft, Symposium, Tagung, Kongress 10 (Rahden 2009), 41–52.

Since their discovery and similar to the individuals from the mass grave at Talheim and the earthwork of Asparn / Schletz, the human skeletal remains from the pit enclosure of Herxheim have often been taken as a proof for violent conflicts or for a crisis at the end of the Linear Pottery Culture, respectively. Yet, different from Talheim and Schletz, no clearly lethal trauma can be attributed to any of the at least 325 individuals from Herxheim. The highly fragmented sample is dominated by skull caps shaped in a recurring manner; jaws, facial and subcranial bones as well as postcranial elements are markedly underrepresented. Due to the fragmented preservation it is impossible to give a detailed demographic description of the death population, but all age classes from fetal / neonate to senile and both sexes are present. Cut marks – especially on the skull caps, less frequently on mandibles and other skeletal elements –, rare evidence of burning / heating, and the specific fragmentation of mostly fresh bones refer to a complex death ritual. Gnaw marks are rare and can mainly be attributed to rodents. The frequency of enamel hypoplasias and cribra orbitalia as an evidence of individual nutritional crises is low and the features are generally not very pronounced. In sum, the skeletal remains from Herxheim do not yield any evidence of a general crisis at the end of the LBK or a violent conflict to have caused the skeletal accumulation.

Keywords: LBK | human skeletons | manipulation | warfare | crisis | trauma

Wie die Individuen aus dem Massengrab von Talheim und dem Grabenwerk von Asparn / Schletz wurden auch die menschlichen Skelettreste aus dem Grubenwerk von Herxheim seit ihrer Entdeckung 1996 häufig als Belege für kriegerische Auseinandersetzungen bzw. eine Krise am Ende der Bandkeramik interpretiert. Anders als in Talheim und Schletz können bei den mindestens 325 Individuen von Herxheim jedoch keine eindeutig tödlichen Verletzungen nachgewiesen werden. Das stark fragmentierte Inventar wird von regelhaft zugerichteten Schädelkalotten dominiert; Kiefer, Gesichtsschädel, Schädelbasis und postkraniale Skelettelemente sind deutlich unterrepräsentiert. Aufgrund der bruchstückhaften Erhaltung kann keine detaillierte demographische Beschreibung der Totenpopulation vorgenommen werden, es wurden jedoch alle Altersklassen von fötal / neonat bis senil sowie beide Geschlechter nachgewiesen. Schnittspuren insbesondere an den Kalotten, seltener an Unterkiefern und anderen Skelettelementen, sowie rare Brandspuren weisen zusammen mit der regelhaften Zerschlagung der Knochen in relativ frischem Zustand auf ein komplexes Totenritual hin. Verbissspuren sind generell selten und stammen vor allem von Nagern. Hinweise auf individuelle Versorgungskrisen wie Schmelzhypoplasien und Cribra orbitalia treten selten auf und sind wenig ausgeprägt. Insgesamt liefern die menschlichen Skelettreste von Herxheim keine Hinweise auf eine allgemeine Krise am Ende der Bandkeramik oder eine kriegerische Auseinandersetzung als Ursache der Skelettakkumulation.

Keywords: LBK | menschliche Skelette | Manipulation | Krieg | Krise | Trauma

Story or Book

TAMAYO 2015

Daniel Tamayo, *Seveneves*. [science 348 \(2015\), 1310–1311](#).

Seveneves. Neal Stephenson. Morrow, 2015. 867 pp.

As one might expect for a space habitat orbiting in a debris cloud, many crises that the characters must overcome are puzzles in orbital mechanics. Stephenson provides delightful analogies for the relevant physical principles and does a remarkable job building the drama and bringing these moments alive (not a trivial task for phenomena that often unfold on time scales longer than a human lifetime).

As a specialist in orbital mechanics, I found myself furiously scribbling equations as I read—only to find out on the next page that Stephenson had obviously made the same calculation. In fact, I am currently at a scientific conference on orbital dynamics, and over dinner (funnily enough at the same place where one of the book’s main characters sees the moon explode) we spent half an hour arguing—not over our research but rather over the orbital mechanics in *Seveneves*. Whatever the standard is for hard science fiction, surely Stephenson has blown it out of the water.

VASEK 2015

Marie Vasek, *The Age of Cryptocurrency*. [science 348 \(2015\), 1308–1309](#).

The Age of Cryptocurrency. How Bitcoin and Digital Money Are Challenging the Global Economic Order. Paul Vigna and Michael J. Casey. St. Martin’s, 2015. 367 pp.

The Age of Cryptocurrency is a welcome break from this tradition. The first part of the book discusses how Bitcoin works technically, as well as some history behind the centralized digital currencies that predated it. It begins with a tale about Afghani women, empowered through Bitcoin to earn and save their own money. (Although traditional banking systems in Afghanistan do not serve women, using Bitcoin only requires one to have computer access.) The book goes on to tell other stories about the Bitcoin user base, taking the reader from a hacker cooperative in San Francisco, California, that is building the next generation of Bitcoin applications to a money changer in Barbados who is using Bitcoin to avoid currency controls.

Although most of the book is dedicated to the (arguably) good things that Bitcoin enables, the authors also delve into the troubles facing the digital currency movement. We mourn the demise of the first major Bitcoin exchange, Mt. Gox, which was launched in July 2010 in Tokyo and handled 70% of all Bitcoin trading by 2013. After being hacked numerous times, it finally collapsed in early 2014.