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References

Aktuell

Callaway 2015

Ewen Callaway, *Crowdsourcing digs up an early human species*. nature **525** (2015), 297–298.

Palaeoanthropologist asks excavators and anatomists to study Africa's richest fossil trove.

"There's lots of fossils out there no one has ever seen, except for a few select people. Palaeo anthropology is really rotten that way," says Tracy Kivell, a palaeoanthropologist at the University of Kent in Canterbury, UK, who analysed hand bones from Rising Star and is a coauthor of the paper that describes H. naledi. "Lee is changing that and setting a new standard for what we should expect."

Berger did the same with remains of a species called Australopithecus sediba that were discovered at the Malapa site. Schwartz says that he has had trouble accessing some researchers' hominin remains even after they had been described in a journal. But when he asked Berger's team if he could purchase A. sediba casts several years ago, he got them for free. "How good can you be?" says Schwartz. "It's been refreshing and delightful that Lee Berger has always made his specimens accessible."

Kolbabová 2015

Tereza Kolbabová, E. Pascal Malkemper, Luděk Bartoš, Jacques Vanderstraeten, Marek Turčáni & Hynek Burda, *Effect of exposure to extremely low frequency magnetic fields on melatonin levels in calves is seasonally dependent*. Scientific Reports **5** (2015), 14206. DOI:10.1038/srep14206.

The question of health effects of extremely low frequency (50/60 Hz) magnetic fields (ELFMF) has been widely discussed, but the mechanisms of interaction of these fields with biological systems for intensities relevant to human and animal exposure are still under question. The melatonin (MLT) hypothesis suggests that exposure to ELFMF might decrease MLT production thereby promoting cancerogenesis. So far, most studies of MLT secretion under exposure to ELFMF reported negative or inconsistent results. Here, we measured salivary MLT in 1–2 months old cattle calves exposed to 50 Hz-MF in the hundreds of nT-range. We found an inhibitory effect of the ELFMF upon MLT secretion in winter (in accordance with the MLT hypothesis). In contrast, in summer, MLT concentration was increased by ELFMF exposure (contrary to the MLT hypothesis). The inhibitory effect in winter was much stronger than the positive effect in summer. We hypothesize that this season-dependent effect upon MLT synthesis might by mediated by an effect of ELFMF upon the serotonin metabolism and conclude that future tests of ELFMF effects should also measure serotonin levels and consider association with the seasonal effects (photoperiod or temperature) during the exposure.

Malkemper 2015

E. Pascal Malkemper et al., *Magnetoreception in the wood mouse (Apodemus sylvaticus), Influence of weak frequency-modulated radio frequency fields*. Scientific Reports **5** (2015), 9917. DOI:10.1038/srep09917.

E. Pascal Malkemper, Stephan H. K. Eder, Sabine Begall, John B. Phillips, Michael Winklhofer, Vlastimil Hart & Hynek Burda

The mammalian magnetic sense is predominantly studied in species with reduced vision such as mole-rats and bats. Far less is known about surface-dwelling (epigeic) rodents with well-developed eyes. Here, we tested the wood mouse Apodemus sylvaticus for magnetoreception using a simple behavioural assay in which mice are allowed to build nests overnight in a visually symmetrical, circular arena. The tests were performed in the ambient magnetic field or in a field rotated by 90ã. When plotted with respect to magnetic north, the nests were bimodally clustered in the northern and southern sectors, clearly indicating that the animals used magnetic cues. Additionally,mice were tested in the ambient magnetic field with a superimposed radio frequency magnetic field of the order of 100 nT. Wood mice exposed to a 0.9 to 5 MHz frequency sweep changed their preference from north-south to east-west. In contrast to birds, however, a constant frequency field tuned to the Larmor frequency (1.33 MHz) had no effect on mouse orientation. In sum, we demonstrated magnetoreception in wood mice and provide first evidence for a radical-pair mechanism in a mammal.

Rickford 2015

John R. Rickford et al., *Neighborhood effects on use of African-American Vernacular English*. PNAS **112** (2015), 11817–11822.

John R. Rickford, Greg J. Duncan, Lisa A. Gennetian, Ray Yun Gou, Rebecca Greene, Lawrence F. Katz, Ronald C. Kessler, Jeffrey R. Kling, Lisa Sanbonmatsu, Andres E. Sanchez-Ordoñez, Matthew Sciandra, Ewart Thomas & Jens Ludwig

African-American Vernacular English (AAVE) is systematic, rooted in history, and important as an identity marker and expressive resource for its speakers. In these respects, it resembles other vernacular or nonstandard varieties, like Cockney or Appalachian English. But like them, AAVE can trigger discrimination in the workplace, housing market, and schools. Understanding what shapes the relative use of AAVE vs. Standard American English (SAE) is important for policy and scientific reasons. This work presents, to our knowledge, the first experimental estimates of the effects of moving into lower-poverty neighborhoods on AAVE use. We use data on non-Hispanic African-American youth (n = 629) from a large-scale, randomized residential mobility experiment called Moving to Opportunity (MTO), which enrolled a sample of mostly minority families originally living in distressed public housing. Audio recordings of the youth were transcribed and coded for the use of five grammatical and five phonological AAVE features to construct a measure of the proportion of possible instances, or tokens, in which speakers use AAVE rather than SAE speech features. Random assignment to receive a housing voucher to move into a lower-poverty area (the intention-to-treat effect) led youth to live in neighborhoods (census tracts) with an 11 percentage point lower poverty rate on average over the next 10–15 y and reduced the share of AAVE tokens by ≈3 percentage points compared with the MTO control group youth. The MTO effect on AAVE use equals approximately half of the difference in AAVE frequency observed between youth whose parents have a high school diploma and those whose parents do not.

Keywords: neighborhood effects | segregation | language | African-American Vernacular English | code switching

Significance: We provide, to our knowledge, the first experimental evidence of neighborhood effects on the use by low-income minority youth of African-American Vernacular English (AAVE). Rising U.S. residential economic segregation may be contributing to growing differences within the population in AAVE use, which has benefits to in-group solidarity and identity but is associated with discrimination in schools and workplaces and so may exacerbate the disadvantages of youth growing

up in high-poverty areas. To the extent that the association between AAVE use and income represents a causal effect of AAVE use, our illustrative calculations suggest that neighborhood effects on speech could increase lifetime earnings by approximately $ 18,000 (≈3–4 % of lifetime income).

Woolston 2015

Chris Woolston, *When labs go bad.* nature **525** (2015), 413–415.

A toxic relationship between junior scientist and adviser can quickly turn career prospects sour.

"I revised my dissertation by taking out everything my adviser hated and putting in everything she liked." As they approach the finish line, she says, students should think less about their literary legacy and more about making their PI happy. "A lot of graduate students are obsessed with their dissertations, but the fact is that nobody is going to read them. They shouldn't get so worked up."

Anthropologie

Coxworth 2015

James E. Coxworth, Peter S. Kim, John S. McQueen & Kristen Hawkes, *Grandmothering life histories and human pair bonding.* PNAS **112** (2015), 11806–11811.

The evolution of distinctively human life history and social organization is generally attributed to paternal provisioning based on pair bonds. Here we develop an alternative argument that connects the evolution of human pair bonds to the male-biased mating sex ratios that accompanied the evolution of human life history. We simulate an agent-based model of the grandmother hypothesis, compare simulated sex ratios to data on great apes and human hunter–gatherers, and note associations between a preponderance of males and mate guarding across taxa. Then we explore a recent model that highlights the importance of mating sex ratios for differences between birds and mammals and conclude that lessons for human evolution cannot ignore mammalian reproductive constraints. In contradiction to our claim that male-biased sex ratios are characteristically human, female-biased ratios are reported in some populations. We consider the likelihood that fertile men are undercounted and conclude that the mate-guarding hypothesis for human pair bonds gains strength from explicit links with our grandmothering life history.

Keywords: grandmother hypothesis | human life history | human evolution | mate guarding | mating sex ratios

Significance: Pair bonds are universal in human societies and distinguish us from our closest living relatives. They characteristically involve men's proprietary claims over women—mate guarding—which in animals generally is both predicted and observed to be more frequent when sex ratios in the fertile ages are male-biased. A marked male bias in the fertile ages evolved in our lineage as longevity increased without an extension of female fertility. We compare the sex-ratio shift in simulations of the grandmother hypothesis to demographic data from chimpanzees and human hunter–gatherers then connect the expanded proportions of older men to benefits for mate guarding, the evolution of pair bonds, and the long recognized importance of male alliances in human social life.

Young 2015

Nathan M. Young, Terence D. Capellini, Neil T. Roach & Zeresenay Alemseged, *Fossil hominin shoulders support an African ape-like last*

common ancestor of humans and chimpanzees. PNAS **112** (2015), 11829–11834.

pnas112-11829-Supplement1.mov, pnas112-11829-Supplement2.mov

Reconstructing the behavioral shifts that drove hominin evolution requires knowledge of the timing, magnitude, and direction of anatomical changes over the past ≈6–7 million years. These reconstructions depend on assumptions regarding the morphotype of the Homo–Pan last common ancestor (LCA). However, there is little consensus for the LCA, with proposed models ranging from African ape to orangutan or generalized Miocene ape-like. The ancestral state of the shoulder is of particular interest because it is functionally associated with important behavioral shifts in hominins, such as reduced arboreality, high-speed throwing, and tool use. However, previous morphometric analyses of both living and fossil taxa have yielded contradictory results. Here, we generated a 3D morphospace of ape and human scapular shape to plot evolutionary trajectories, predict ancestral morphologies, and directly test alternative evolutionary hypotheses using the hominin fossil evidence. We show that the most parsimonious model for the evolution of hominin shoulder shape starts with an African ape-like ancestral state. We propose that the shoulder evolved gradually along a single morphocline, achieving modern human-like configuration and function within the genus Homo. These data are consistent with a slow, progressive loss of arboreality and increased tool use throughout human evolution.

Keywords: geometric morphometrics | developmental simulation | phylomorphospace | scapula | rotator cuff

Significance: Knowing the direction and pace of evolutionary change is critical to understanding what selective forces shaped our ancestors. Unfortunately, the human fossil record is sparse, and little is known about the earliest members of our lineage. This unresolved ancestor complicates reconstructions of what behavioral shifts drove major speciation events. Using 3D shape measurements of the shoulder, we tested competing evolutionary models of the last common ancestor against the fossil record. We found that a sustained shift in scapular shape occurred during hominin evolution from an African ape-like ancestor to a modern human-like form, first present in our genus, Homo. These data suggest a long, gradual shift out of the trees and increased reliance on tools as our ancestors became more terrestrial.

Energie

Mayer 2015

Klaus Mayer et al., *Uranium from German Nuclear Power Projects of the 1940s, A Nuclear Forensic Investigation.* Angewandte Chemie Int. Ed. (2015), preprint, 1–6. DOI:10.1002/anie.201504874.

AngChIE2015-Mayer-Supplement.pdf

Klaus Mayer, Maria Wallenius, Klaus Lützenkirchen, Joan Horta, Adrian Nicholl, Gert Rasmussen, Pieter van Belle, Zsolt Varga, Razvan Buda, Nicole Erdmann, Jens-Volker Kratz, Norbert Trautmann, L. Keith Fifield, Stephen G. Tims, Michaela B. Frçhlich, and Peter Steier

Here we present a nuclear forensic study of uranium from German nuclear projects which used different geometries of metallic uranium fuel. Through measurement of the 230Th/234U ratio, we could determine that the material had been produced in the period from 1940 to 1943. To determine the geographical origin of the uranium, the rare-earth-element content and the 87Sr/86Sr ratio were measured. The results provide evidence that the uranium was mined in the Czech

Republic. Trace amounts of 236U and 239Pu were detected at the level of their natural abundance, which indicates that the uranium fuel was not exposed to any major neutron fluence.

Klima

Dean 2015

Jonathan R. Dean et al., *Eastern Mediterranean hydroclimate over the late glacial and Holocene, reconstructed from the sediments of Nar lake, central Turkey, using stable isotopes and carbonate mineralogy.* Quaternary Science Reviews **124** (2015), 162–174.

qsr124-0162-Supplement1.pdf, qsr124-0162-Supplement2.xlsx

Jonathan R. Dean, Matthew D. Jones, Melanie J. Leng, Stephen R. Noble, Sarah E. Metcalfe, Hilary J. Sloane, Diana Sahy, Warren J. Eastwood & C. Neil Roberts

There is a lack of high-resolution records of hydroclimate variability in the Eastern Mediterranean from the late glacial and early Holocene. More knowledge of the speed of climate shifts and the degree to which they were synchronous with changes in the North Atlantic or elsewhere is required to understand better the controls on Eastern Mediterranean climate. Using endogenic carbonate from a sediment sequence from Nar Gölü, a maar lake in central Turkey, dated by varve counting and uranium-thorium methods, we present high-resolution (≈25 years) oxygen (d18O) and carbon isotope records, supported by carbonate mineralogy data, spanning the late glacial and Holocene. d18Ocarbonate at Nar Gölü has been shown previously to be a strong proxy for regional water balance. After a dry period (i.e. evaporation far exceeding precipitation) in the Younger Dryas, the data show a transition into the relatively wetter early Holocene. In the early Holocene there are two drier periods that appear to peak at ≈9.3 ka and ≈8.2 ka, coincident with cooling 'events' seen in North Atlantic records. After this, and as seen in other records from the Eastern Mediterranean, there is a millennial-scale drying trend through the Mid Holocene Transition. The relatively dry late Holocene is punctuated by centennial-scale drought intervals, at the times of 4.2 ka 'event' and Late Bronze Age societal 'collapse'. Overall, we show that central Turkey is drier when the North Atlantic is cooler, throughout this record and at multiple timescales, thought to be due to a weakening of the westerly storm track resulting from reduced cyclogenesis in the North Atlantic. However, some features, such as the Mid Holocene Transition and the fact the early Holocene dry episodes at Nar Gölü are of a longer duration than the more discrete 'events' seen in North Atlantic records, imply there are additional controls on Eastern Mediterranean hydroclimate.

Keywords: Oxygen and carbon isotopes | Eastern Mediterranean | Lake sediment | Holocene | Late glacial | Mid Holocene Transition | 9.3 ka event | 8.2 ka event | 4.2 ka event | Late Bronze Age

Methoden

Gillings 2015

Mark Gillings, *Mapping invisibility, GIS approaches to the analysis of hiding and seclusion.* Journal of Archaeological Science **62** (2015), 1–14.

Analyses of visibility have become a commonplace within landscape-based archaeological research, whether through rich description, simple mapping or formal

modelling and statistical analysis, the latter increasingly carried out using the viewshed functionality of GIS. The research presented here challenges current obsessions with what is visible to focus instead upon the interpretative benefits of considering the invisible and the complex interplay of visibility and concealment that frequently accompany landscape movement and experience. Having highlighted the difficulties in analysing relational properties such as invisibility and hiding using traditional archaeological techniques, a series of new GIS methodologies are presented and evaluated in the context of an original study of a series of remarkably small, visually non-intrusive prehistoric megalithic monuments. The results serve to challenge dominant interpretations of these enigmatic sites as well as demonstrating the utility, value and potential of the GISbased approaches developed.

Keywords: GIS | Viewshed | Hiding | Concealment | Affordance

Neolithikum

Günther 2015

Torsten Günther et al., *Ancient genomes link early farmers from Atapuerca in Spain to modern-day Basques*. PNAS **112** (2015), 11917–11922.

pnas112-11917-Supplement-xls.zip

Torsten Günther, Cristina Valdiosera, Helena Malmström, Irene Ureña, Ricardo Rodriguez-Varela, Óddny Osk Sverrisdóttir, Evangelia A. Daskalaki, Pontus Skoglund, Thijessen Naidoo, Emma M. Svensson, José María Bermúdez de Castro, Eudald Carbonell, Michael Dunn, Jan Storå, Eneko Iriarte, Juan Luis Arsuaga, José-Miguel Carretero, Anders Götherström & Mattias Jakobsson

The consequences of the Neolithic transition in Europe—one of the most important cultural changes in human prehistory—is a subject of great interest. However, its effect on prehistoric and modern-day people in Iberia, the westernmost frontier of the European continent, remains unresolved. We present, to our knowledge, the first genome-wide sequence data from eight human remains, dated to between 5,500 and 3,500 years before present, excavated in the El Portalón cave at Sierra de Atapuerca, Spain. We show that these individuals emerged from the same ancestral gene pool as early farmers in other parts of Europe, suggesting that migration was the dominant mode of transferring farming practices throughout western Eurasia. In contrast to central and northern early European farmers, the Chalcolithic El Portalón individuals additionally mixed with local southwestern hunter–gatherers. The proportion of hunter-gatherer-related admixture into early farmers also increased over the course of two millennia. The Chalcolithic El Portalón individuals showed greatest genetic affinity to modern-day Basques, who have long been considered linguistic and genetic isolates linked to the Mesolithic whereas all other European early farmers show greater genetic similarity to modern-day Sardinians. These genetic links suggest that Basques and their language may be linked with the spread of agriculture during the Neolithic. Furthermore, all modern-day Iberian groups except the Basques display distinct admixture with Caucasus/Central Asian and North African groups, possibly related to historical migration events. The El Portalón genomes uncover important pieces of the demographic history of Iberia and Europe and reveal how prehistoric groups relate to modern-day people.

Keywords: Ancient DNA | human prehistory | population genomics

Significance: The transition from a foraging subsistence strategy to a sedentary farming society is arguably the greatest innovation in human history. Some

modern-day groups—specifically the Basques—have been argued to be a remnant population that connect back to the Paleolithic. We present, to our knowledge, the first genome-wide sequence data from eight individuals associated with archaeological remains from farming cultures in the El Portalón cave (Atapuerca, Spain). These individuals emerged from the same group of people as other Early European farmers, and they mixed with local hunter–gatherers on their way to Iberia. The El Portalón individuals showed the greatest genetic affinity to Basques, which suggests that Basques and their language may be linked with the spread of agriculture across Europe.

Linstädter 2014

Jörg Linstädter, *Die früh- und mittelholozäne Besiedlungsgeschichte und der Beginn der produzierenden Wirtschaftsweise im Nordosten Marokkos*. Mitteilungen der Gesellschaft für Urgeschichte **23** (2014), 173–223.

Until twenty years ago, the eastern Rif of Morrocco was a nearly unexplored area. A few archaeological investigations were conducted in the surroundings of the Spanish town of Melilla and in the Beni Snassen Mountains, east of the Moulouya River. Since 1995, a Moroccan-German team has surveyed the area and documented some 200 sites. As one of the major occupation period the early and middle Holocene was worked out, including the transition from the last hunter-gatherer communities to the first food producing societies. The paper summarizes the archaeological research history of Mediterranean Morocco, explains the terminologie and methods used and presents the results of the systematic prospection and excavation of sites which contribute to the question of the transition to food production which appears in the area at about 7600 calBP. With the help of diverse on- and off-site analyses, the contemporaneous development of climate and environment was studied and human-environment relations were considered. The paper ends with the attempt to describe the complex subsistence model composed of wild and domesticated marine and terrestrial ressources by using the concept of Smith's "Low Level Food Production".

Keywords: NW Africa | Morocco | early and middle Holocene | Epipalaeolithic | Neolithic | food production

Zwanzig Jahre archäologische Forschung rückten das vorher kaum erforschte Gebiet des östlichen Rif in NO-Marokko in den Fokus der Neolithikumsforschung im westlichen Mittelmeerraum. Mit Hilfe systematische Prospektion und Ausgrabungen wurden die Besiedlungsgeschichte und die damit eng verbundene früh- bis mittelholozäne Klima- und Umweltentwicklung rekonstruiert. Besonderes Augenmerk lag dabei auf dem Wandel der Ernährungsstrategien mit dem Auftreten neolithischer Innovationen.

Schlagwörter: NW-Afrika | Marokko | Früh- und Mittelholozän | Epipaläolithikum | Neolithikum | produzierende | Wirtschaftsweise