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References

Aktuell

Doctor 2018

Jason N. Doctor, Andy Nguyen, Roneet Lev, Jonathan Lucas, Tara Knight, Henu Zhao & Michael Menchine, *Opioid prescribing decreases after learning of a patient's fatal overdose*. science **361** (2018), 588–590.

s361-0588-Supplement.pdf

Most opioid prescription deaths occur among people with common conditions for which prescribing risks outweigh benefits. General psychological insights offer an explanation: People may judge risk to be low without available personal experiences, may be less careful than expected when not observed, and may falter without an injunction from authority. To test these hypotheses, we conducted a randomized trial of 861 clinicians prescribing to 170 persons who subsequently suffered fatal overdoses. Clinicians in the intervention group received notification of their patients' deaths and a safe prescribing injunction from their county's medical examiner, whereas physicians in the control group did not. Milligram morphine equivalents in prescriptions filled by patients of letter recipients versus controls decreased by 9.7 % (95 % confidence interval: 6.2 to 13.2 %; $P < 0.001$) over 3 months after intervention. We also observed both fewer opioid initiates and fewer high-dose opioid prescriptions by letter recipients.

Fyshe 2018

Alona Fyshe, *How to start a research lab*. science **361** (2018), 618.

As September approaches, a new cohort of junior faculty members are taking up their first positions as research group leaders. I was there 3 years ago, making career-shaping decisions—sometimes without much mentoring or support. I learned a lot in my first years—how to write a grant, manage rejection, and supervise students, to name just a few—and it was all trial by fire. Though I made it through and had some successes along the way, I certainly could have used advice about how to set up and run my lab. I've learned that my experience is the norm, which inspired me and a group of other early-career principal investigators to interview leaders in our fields about how they built successful research groups. Here are some of the lessons they shared.

Reich 2018

Peter B. Reich, Sarah E. Hobbie, Tali D. Lee & Melissa A. Pastore, *"Unexpected reversal of C3 versus C4 grass response to elevated CO_2 during a 20-year field experiment", Response to Comment*. science **361** (2018), 563.

Wolf and Ziska suggest that soil and species attributes can explain an unexpected 20-year reversal of C3-C4 grass responses to elevated CO2. This is consistent with our original interpretation; however, we disagree with the assertion that such explanations somehow render our results irrelevant for questioning a long-standing paradigm of plant response to CO2 based on C3-C4 differences in photosynthetic pathway.

Wolf 2018

Julie Wolf & Lewis Ziska, *"Unexpected reversal of C3 versus C4 grass response to elevated CO_2 during a 20-year field experiment"*, *Comment*. science **361** (2018), 563.

Reich et al. (Reports, 20 April 2018, p. 317) assert that the responses of C3 and C4 grass biomass to elevated CO2 "challenge the current C3-C4 [elevated CO2] paradigm," but these responses can be explained by the natural history of the experimental plants and soils without challenging this paradigm.

Amerika

Potter 2018

Ben A. Potter et al., *Current evidence allows multiple models for the peopling of the Americas*. Science Advances **4** (2018), eaat5473. DOI:10.1126/sciadv.aat5473.

SciAdv04-eaat5473-Supplement.pdf

Ben A. Potter, James F. Baichtal, Alwynne B. Beaudoin, Lars Fehren-Schmitz, C. Vance Haynes, Vance T. Holliday, Charles E. Holmes, John W. Ives, Robert L. Kelly, Bastien Llamas, Ripan S. Malhi, D. Shane Miller, David Reich, Joshua D. Reuther, Stephan Schiffels & Todd A. Surovell

Some recent academic and popular literature implies that the problem of the colonization of the Americas has been largely resolved in favor of one specific model: a Pacific coastal migration, dependent on high marine productivity, from the Bering Strait to South America, thousands of years before Clovis, the earliest widespread cultural manifestation south of the glacial ice. Speculations on maritime adaptations and typological links (stemmed points) across thousands of kilometers have also been advanced. A review of the current genetic, archeological, and paleoecological evidence indicates that ancestral Native American population expansion occurred after 16,000 years ago, consistent with the archeological record, particularly with the earliest securely dated sites after ≈15,000 years ago. These data are largely consistent with either an inland (ice-free corridor) or Pacific coastal routes (or both), but neither can be rejected at present. Systematic archeological and paleoecological investigations, informed by geomorphology, are required to test each hypothesis.

Anthropologie

Fernandez 2018

Peter J. Fernández et al., *Evolution and function of the hominin forefoot*. PNAS **115** (2018), 8746–8751.

pnas115-08746-Supplement1.pdf, pnas115-08746-Supplement2.xlsx

Peter J. Fernández, Carrie S. Mongle, Louise Leakey, Daniel J. Proctor, Caley M. Orr, Biren A. Patel, Sergio Almécija, Matthew W. Tocheri & William L. Jungers

The primate foot functions as a grasping organ. As such, its bones, soft tissues, and joints evolved to maximize power and stability in a variety of grasping configurations. Humans are the obvious exception to this primate pattern, with feet that evolved to support the unique biomechanical demands of bipedal locomotion. Of key functional importance to bipedalism is the morphology of the joints at the forefoot, known as the metatarsophalangeal joints (MTPJs), but a comprehensive

analysis of hominin MTPJ morphology is currently lacking. Here we present the results of a multivariate shape and Bayesian phylogenetic comparative analyses of metatarsals (MTs) from a broad selection of anthropoid primates (including fossil apes and stem catarrhines) and most of the early hominin pedal fossil record, including the oldest hominin for which good pedal remains exist, Ardipithecus ramidus. Results corroborate the importance of specific bony morphologies such as dorsal MT head expansion and "doming" to the evolution of terrestrial bipedalism in hominins. Further, our evolutionary models reveal that the MT1 of Ar. ramidus shifts away from the reconstructed optimum of our last common ancestor with apes, but not necessarily in the direction of modern humans. However, the lateral rays of Ar. ramidus are transformed in a more human-like direction, suggesting that they were the digits first recruited by hominins into the primary role of terrestrial propulsion. This pattern of evolutionary change is seen consistently throughout the evolution of the foot, highlighting the mosaic nature of pedal evolution and the emergence of a derived, modern hallux relatively late in human evolution.

Keywords: bipedalism | hominin evolution | metatarsals | Ardipithecus | functional morphology

Significance: A critical step in the evolutionary history leading to the origins of humankind was the adoption of habitual bipedal locomotion by our hominin ancestors. We have identified novel bony shape variables in the forefoot across extant anthropoids and extinct hominins that are linked functionally to the emergence of bipedal walking. Results indicate a consistent and generalizable pattern in hominin pedal evolution that spans from Ardipithecus to early Homo—the relatively late derivation of a modern hallux in comparison with the lateral rays. These data provide novel morphological and macroevolutionary evidence for how and when the hominin pedal skeleton evolved to accommodate the unique biomechanical demands of bipedalism.

Zichello 2018

Julia M. Zichello, *Look in the trees, Hylobatids as evolutionary models for extinct hominins*. Evolutionary Anthropology **27** (2018), 142–146.

Studying extant apes is of central importance to paleoanthropology. This approach is informative in inferring how hominin skeletal morphology reflects phylogeny, behavior, development, and ecological context. Traditionally, great apes have dominated the paleoanthropological literature as extant analogs for extinct hominins, to the exclusion of their phylogenetic sister group, the hylobatids. Phylogenetic proximity, large body size, and high encephalization quotients may have contributed to decisions to use great apes as models for hominins. However, if we reexamine hylobatids as extant models for extinct hominins—using modern phylogenetic, behavioral, and ecological data—this clade is uniquely poised to inform future frameworks in paleoanthropology. The following features make hylobatids strong analogs for extinct hominins: taxonomic diversity, the timing of diversification, hybridization between species, small body size, and reduced sexual dimorphism. Based on these shared features, hylobatids offer future opportunities to paleoanthropology, and provide a much richer extant analog than is currently recognized.

Keywords: hylobatids | hominins | evolutionary models | gibbons | siamangs

Bibel

Finkelstein 2009

Israel Finkelstein & Lily Singer-Avitz, *Reevaluating Bethel*. Zeitschrift

des Deutschen Palästina-Vereins **125** (2009), 33–48.

A reevaluation of the archaeology of Bethel indicates that the site prospered in the Iron Age I, Iron Age IIB and the late Hellenistic period, that it was weakly settled in the Late Iron Age IIA and the Iron Age IIC, and that it was probably uninhabited or almost deserted in the Babylonian and Persian periods (possibly also in the Early Iron Age IIA). Biblical references to Bethel should be read accordingly. The only possible period for the supposed strong scribal activity at Bethel is the Iron Age IIB, in the 8th century B.C.E., probably before the fall of the Northern Kingdom.

Hensel 2018

Benedikt Hensel, *Ethnic Fiction and Identity-Formation, A New Explanation for the Background of the Question of Intermarriage in Ezra-Nehemiah.* In: Magnar Kartveit & Gary N. Knoppers (Hrsg.), *The Bible, Qumran, and the Samaritans.* Studia Samaritana 10 (Berlin 2018), 133–148.

The decisive marker of the "foreigner" for the intermarriage question is preeminently and for the purposes of the narrative logic ethnic-genealogically determined, but it is aimed at the cultic-religious demarcation of the Galuth-community from "the other." The designation of the "foreigner" functions in the text as a cipher for a particular conflict, by which the "Israelite" authors of Ezra demarcate themselves from other groups, who are defined as "not Israel." It has been suggested in this essay that behind the usage of the term "foreigner" may lie other post-exilic Yahwisms, which likewise applied the "Israel" title to themselves positively and, when these other post-exilic Yahwisms are viewed historically, were equivalent to the Judean form of Yahwism. In particular, this Judean boundary-marking polemic may refer to the Samarian Yhwh-worshipers, because these worshipers were certainly no marginal religio-historical phenomenon in the post-exilic period (a "Jewish sect"), but instead were the most theological-historically significant form of Yahwism in the Levant heartland, outside of Judah.

Na'aman 2014

Nadav Na'aman, *The Jacob Story and the Formation of Biblical Israel.* Tel Aviv: Archaeology **41** (2014), 95–125.

The article argues that the pre-Priestly Jacob story is mainly a unified and coherent composition that was written in Judah in about the mid-6th century BCE. It was composed as part of a larger literary-historical work that narrated the history of Israel's three ancestors and reflects the reality in the land after the Babylonians conquered Jerusalem and annexed Judah and all other neighbouring kingdoms. The patriarchal story-cycle was intended for an audience comprised of the elite and broader community of the 'New Israel'—the inhabitants of the former kingdoms of Israel and Judah. Some of the narratives are based on oral traditions whose scope and detail cannot be established, which the author augmented by consulting a few written sources and by adding various literary and ideological elements from his own creative imagination. His composition represented a major step towards generating a sense of unity among all those remaining in the land, namely the devotees of YHWH, and it shaped the image of the earliest history of Israel for all generations to come.

Keywords: Patriarchal stories | Jacob | Abraham | Edom | Aram | Haran | New Israel

Ritmeyer 2006
Leen Ritmeyer, *The Quest, Revealing the Temple Mount in Jerusalem.* (Jerusalem 2006).

Energie

Groopman 2018
Evan E. Groopman, David G. Willingham, Alex P. Meshik & Olga V. Pravdivtseva, *Discovery of fissionogenic Cs and Ba capture five years after Oklo reactor shutdown.* PNAS **115** (2018), 8676–8681.
pnas115-08676-Supplement.pdf
Understanding the release and sequestration of specific radioactive signatures into the environment is of extreme importance for longterm nuclear waste storage and reactor accident mitigation. Recent accidents at the Fukushima and Chernobyl nuclear reactors released radioactive 137Cs and 134Cs into the environment, the former of which is still live today. We have studied the migration of fission products in the Oklo natural nuclear reactor using an isotope imaging capability, the NAval Ultra-Trace Isotope Laboratory's Universal Spectrometer (NAUTILUS) at the US Naval Research Laboratory. In Oklo reactor zone (RZ) 13, we have identified the most depleted natural U of any known material with a 235U/238U ratio of $0.3655 \pm 0.0007\,\%$ (2ó). This sample contains the most extreme natural burnup in 149Sm, 151Eu, 155Gd, and 157Gd, which demonstrates that it was sourced from the most active Oklo reactor region. We have discovered that fissionogenic Cs and Ba were captured by Ru metal/sulfide aggregates shortly following reactor shutdown. Isochrons from the Ru aggregates place their closure time at 4.98 ± 0.56 y after the end of criticality. Most fissionogenic 135Ba and 137Ba in the Ru migrated and was incorporated as Cs over this period. Excesses in 134Ba in the Ru point to the burnup of 133Cs. Cesium and Ba were retained in the Ru despite local volcanic activity since the reactor shutdown and the high level of activity during reactor operation.
Keywords: Oklo | SIMS | AMS | isotope imaging | natural fission reactor
Significance: The Oklo natural nuclear reactors provide a wealth of information regarding the migration and retention of fission products in nuclear wastes. Radioactive volatile and gaseous elements easily escape from reactor fuel into the environment without proper containment. Cesium, in particular, represents a significant environmental and health hazard. Here, we used an isotope imaging system to identify the location of sequestered fissionogenic Cs and Ba in Oklo. Cesiumand Ba were captured in Ru metal/sulfide aggregates shortly after reactor criticality ceased. These elements were otherwise nearly completely lost from the reactor. We have further discovered the most depleted natural U on Earth, indicating that these fission products were retained in the most active region of the reactor.

Judentum

Perrin 2018
Andrew B. Perrin, *The Lost World of the Aramaic Dead Sea Scrolls.* Biblical Archaeology Review **44** (2018), v, 42–48.
From these and similar observations, the material of canonical collections appears to be but soundbites of a larger conversation had among ancient Jewish scribes and communities around the figure of Daniel. As we look beyond the Aramaic text of canonical Daniel and through the Qumran Aramaic corpus as a whole,

we should conclude where we began: Where did the Aramaic texts come from? Who wrote them? Why were they written in the first place?

Klima

Humphrey 2018

Vincent Humphrey, Jakob Zscheischler, Philippe Ciais, Lukas Gudmundsson, Stephen Sitch & Sonia I. Seneviratne, *Sensitivity of atmospheric CO2 growth rate to observed changes in terrestrial water storage*. nature **560** (2018), 628–631.

n560-0628-Supplement.pdf

Land ecosystems absorb on average 30 per cent of anthropogenic carbon dioxide (CO2) emissions, thereby slowing the increase of CO2 concentration in the atmosphere1. Year-to-year variations in the atmospheric CO2 growth rate are mostly due to fluctuating carbon uptake by land ecosystems1. The sensitivity of these fluctuations to changes in tropical temperature has been well documented2–6, but identifying the role of global water availability has proved to be elusive. So far, the only usable proxies for water availability have been time-lagged precipitation anomalies and drought indices3–5, owing to a lack of direct observations. Here, we use recent observations of terrestrial water storage changes derived from satellite gravimetry7 to investigate terrestrial water effects on carbon cycle variability at global to regional scales. We show that the CO2 growth rate is strongly sensitive to observed changes in terrestrial water storage, drier years being associated with faster atmospheric CO2 growth. We demonstrate that this global relationship is independent of known temperature effects and is underestimated in current carbon cycle models. Our results indicate that interannual fluctuations in terrestrial water storage strongly affect the terrestrial carbon sink and highlight the importance of the interactions between the water and carbon cycles.

Roffet-Salque 2018

Mélanie Roffet-Salque et al., *Evidence for the impact of the 8.2-kyBP climate event on Near Eastern early farmers*. PNAS **115** (2018), 8705–8709.

pnas115-08705-Supplement.pdf

Mélanie Roffet-Salque, Arkadiusz Marciniak, Paul J. Valdes, Kamilla Pawłowska, Joanna Pyzel, Lech Czerniak, Marta Krüger, C. Neil Roberts, Sharmini Pitter & Richard P. Evershed

The 8.2-thousand years B.P. event is evident in multiple proxy records across the globe, showing generally dry and cold conditions for ca. 160 years. Environmental changes around the event are mainly detected using geochemical or palynological analyses of ice cores, lacustrine, marine, and other sediments often distant from human settlements. The Late Neolithic excavated area of the archaeological site of Çatalhöyük East [Team Poznan (TP) area] was occupied for four centuries in the ninth and eighth millennia B.P., thus encompassing the 8.2-thousand years B.P. climatic event. A Bayesian analysis of 56 radiocarbon dates yielded a high-resolution chronological model comprising six building phases, with dates ranging from before 8325–8205 to 7925–7815 calibrated years (cal) B.P. Here, we correlate an onsite paleoclimate record constructed from d2H values of lipid biomarkers preserved in pottery vessels recovered from these buildings with changes in architectural, archaeozoological, and consumption records from well-documented archaeological contexts. The overall sequence shows major changes in husbandry

and consumption practices at ca. 8.2 thousand years B.P., synchronous with variations in the d2H values of the animal fat residues. Changes in paleoclimate and archaeological records seem connected with the patterns of atmospheric precipitation during the occupation of the TP area predicted by climate modeling. Our multiproxy approach uses records derived directly from documented archaeological contexts. Through this, we provide compelling evidence for the specific impacts of the 8.2-thousand years B.P. climatic event on the economic and domestic activities of pioneer Neolithic farmers, influencing decisions relating to settlement planning and food procurement strategies.

Keywords: archaeology | climate | lipid residue analyses | hydrogen isotopes | animal bones

Significance: This study reveals that animal fats preserved in pottery vessels from the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage site of Çatalhöyük recorded the abrupt 8.2-thousand years B.P. climatic event in their hydrogen isotopic compositions. In addition, significant changes are observed in the archaeology and faunal assemblage of the site, showing how the early farming community at Çatalhöyük had to adapt to climate change. Significantly, this contribution shows that individual biomolecules preserved in ancient animal fats can be used to reconstruct paleoclimate records and thus, provides a powerful tool for the detection of climatic events at well-dated onsite terrestrial locations (i.e., at the very settlements where human populations lived).

Voosen 2018

Paul Voosen, *New geological age comes under fire*. science **361** (2018), 537–538.

Timing and extent of ancient drought used to define the Meghalayan are uncertain.

And in ancient Egypt, Greece, and elsewhere the evidence of a global drought is even murkier, adds Guy Middleton, an archaeologist at Charles University in Prague. “Nothing happened as suddenly or as synchronously as made out.” The drought makes no sense as a marker, he says. “It is new mythmaking.” Walker wishes Kathayat’s new stalagmite records had been published in time for their proposal. But he thinks that, though scattered in time and space, the signs of drought are good enough to define a new division that geologists can use to clarify their discussions of the Holocene. “The fact that this is extremely damned close is encouraging for us,” Walker adds. For Bradley, it shows the stark division between ICS, which studies Earth’s deep history, and scientists who study the recent past. “[We’re] on totally different pages, really totally different books,” Bradley says.

Kultur

Blake 2018

Khandis R. Blake, Brock Bastian, Thomas F. Denson, Pauline Grosjean & Robert C. Brooks, *Income inequality not gender inequality positively covaries with female sexualization on social media*. PNAS **115** (2018), 8722–8727.

pnas115-08722-Supplement.pdf

Publicly displayed, sexualized depictions of women have proliferated, enabled by new communication technologies, including the internet and mobile devices. These depictions are often claimed to be outcomes of a culture of gender inequality and female oppression, but, paradoxically, recent rises in sexualization are most notable in societies that have made strong progress toward gender parity. Few empirical

tests of the relation between gender inequality and sexualization exist, and there are even fewer tests of alternative hypotheses. We examined aggregate patterns in 68,562 sexualized self-portrait photographs ("sexy selfies") shared publicly on Twitter and Instagram and their association with city-, county-, and cross-national indicators of gender inequality. We then investigated the association between sexy-selfie prevalence and income inequality, positing that sexualization—a marker of high female competition—is greater in environments in which incomes are unequal and people are preoccupied with relative social standing. Among 5,567 US cities and 1,622 US counties, areas with relatively more sexy selfies were more economically unequal but not more gender oppressive. A complementary pattern emerged cross-nationally (113 nations): Income inequality positively covaried with sexy-selfie prevalence, particularly within more developed nations. To externally validate our findings, we investigated and confirmed that economically unequal (but not gender-oppressive) areas in the United States also had greater aggregate sales in goods and services related to female physical appearance enhancement (beauty salons and women's clothing). Here, we provide an empirical understanding of what female sexualization reflects in societies and why it proliferates.

Keywords: income inequality | sexualization | gender inequality | objectification | inequality

Significance: Female sexualization is increasing, and scholars are divided on whether this trend reflects a form of gendered oppression or an expression of female competitiveness. Here, we proxy local status competition with income inequality, showing that female sexualization and physical appearance enhancement are most prevalent in environments that are economically unequal. We found no association with gender oppression. Exploratory analyses show that the association between economic inequality and sexualization is stronger in developed nations. Our findings have important implications: Sexualization manifests in response to economic conditions but does not covary with female subordination. These results raise the possibility that sexualization may be a marker of social climbing among women that track the degree of status competition in the local environment.

Borgerhoff Mulder 2018

Monique Borgerhoff Mulder, *Economic inequality drives female sexualization*. PNAS **115** (2018), 8658–8660.

[T]here are places in the world where posting a sexy selfie would torpedo a woman's marriage chances or make any potentially high-investing man run a mile. [...] However, it does not mean that economically disadvantaged women post more selfies than do richer women. [...] Does this mean that poorer women are signaling their sexuality in developed nations and richer women in less-developed nations? [...] [A]s yet we simply do not know that this is the case, nor can we ever know from macrolevel data.

Grove 2018

Matt Grove, *Hunter-gatherers adjust mobility to maintain contact under climatic variation*. Journal of Archaeological Science: Reports **19** (2018), 588–595.

Population density and mobility are fundamental population parameters for hunter-gatherer groups, and their reconstruction for prehistoric populations has long been an aim of archaeological research. This endeavour has become more important than ever in recent years, with the recognition that these parameters play a key role in determining rates of cultural transmission. Potential archaeological proxies for population density and mobility are often hard to interpret, creating a need for more generic, reliable, and easily calculated indicators. Climatic variables

provide considerable promise in this area, and the analyses reported here test the efficacy of six climatic variables as potential predictors. Significant predictors are then incorporated in path analyses that assess the causal relationships between climatic variables, population density, and mobility. Results suggest that the previously established strong reciprocal relationship between population density and mobility is not due purely to common determination by climatic variables. Instead, the best supported model is consistent with the hypothesis that hunter-gatherers adjust levels of mobility so as to maintain contact with neighbouring groups at varying population densities. This ensures that opportunities for cultural transmission are maintained at similar levels regardless of climatic variation. The results lead to a number of archaeologically testable predictions concerning the relationships between climatic variables, population density, mobility, and assemblage complexity.

Keywords: Hunter-gatherer | Climatic variability | Mobility | Population density | Cultural transmission