

References

Aktuell

DESANTIS 2017

Larisa R. G. DeSantis, *I'm not your mother*. [science](#) **358** (2017), 690.

I love being a mom and all of the joy and chaos that comes with balancing the tenure track with soccer games and Girl Scouts. However, I am a mom to two amazing girls—not an endless number of graduate and undergraduate students. I love being there for students, coaching them through their first presentation at a professional meeting or seeing the look on their face when their first-author paper is finally published after months or years of hard work. But I can only help them reach their full potential as their mentor—not their mother.

D'ERRICO 2017

Francesco d'Errico & William E. Banks, *Middle Stone Age cultural variability and the risk hypothesis, Reply to Read*. [PNAS](#) **114** (2017), E10509.

We struggle to find a passage in which we state that the risk hypothesis does not account for the material culture differences that we observe between the Still Bay and Howiesons Poort cultural adaptive systems in Southern Africa.

We must design approaches [...] without assuming that ecological risk was virtually the only factor that shaped technological variability throughout human prehistory. Over the last 300,000 y, different regional cultural trajectories may have handled ecological risk in myriad ways, and we cannot assume that one size fits all.

READ 2017

Dwight W. Read, *Still Bay and Howiesons Poort sites (South Africa) are consistent with the risk hypothesis*. [PNAS](#) **114** (2017), E10508.

This pattern suggests, consistent with the risk hypothesis, that the shift from the SB complex to the HP complex was driven by ecological changes leading to expansion into the interior, a move that favored a foraging adaptation with less complex tools due to more mobile HP groups and despite the interior region having greater resource procurement risk than the coastal region.

SCHIERMEIER 2017

Quirin Schiermeier, *German row with Elsevier threatens journal access*. [nature](#) **552** (2017), 17–18.

Negotiations to reduce journal prices and promote open access are progressing slowly.

VALDEZ-WARD 2017

Evelyn Valdez-Ward, *Fighting for my Dream*. [science](#) **358** (2017), 830.

I stood in front of my research poster, anxiously waiting for the last judge to come around. Graduate school application season was looming. This was my last chance to impress the judges and find a Ph.D. program that would accept me. “Whenever you’re ready,” the judge said. This was it, my moment to shine. As I spoke, the judge appeared unimpressed, rummaging in her bag and seeming not to

pay attention to me. After I presented, she said thank you and hurriedly walked away. I held back tears, certain I had lost my chance to continue my scientific training. As I began to take my poster down, she walked back and handed me a business card with three names written on the back. My heart leapt with hope, but I had one more thing to tell her: “I’m undocumented.”

Amerika

BRAJE 2017

Todd J. Braje, Tom D. Dillehay, Jon M. Erlandson, Richard G. Klein & Torben C. Rick, *Finding the first Americans*. [science](#) **358** (2017), 592–594.

The first humans to reach the Americas are likely to have come via a coastal route.

Anthropologie

BERGSTRÖM 2017

Anders Bergström & Chris Tyler-Smith, *Paleolithic networking*. [science](#) **358** (2017), 586–587.

Genomes reveal patterns of genetic and social interactions in Neandertal and Paleolithic hunter-gatherer groups.

The Vindija woman displays a similarly low level of genetic diversity, but no signs of recent inbreeding, suggesting that mating between close relatives was not a general feature of Neandertal groups, but small group sizes probably were.

If the Sunghir group is representative of Paleolithic modern-human hunter-gatherer groups, it suggests that such groups consisted mostly of distantly related people and were connected to other groups via networks of movement. These findings mirror the conclusions from anthropological studies of present-day hunter-gatherer groups (6). The study shows that this social structure was already in place 33,000 to 35,000 years ago and may be a general feature of the modern-human hunter-gatherer lifestyle.

MACINTOSH 2017

Alison A. Macintosh, Ron Pinhasi & Jay T. Stock, *Prehistoric women’s manual labor exceeded that of athletes through the first 5500 years of farming in Central Europe*. [Science Advances](#) **3** (2017), eaao3893. DOI:10.1126/sciadv.aao3893.

The intensification of agriculture is often associated with declining mobility and bone strength through time, although women often exhibit less pronounced trends than men. For example, previous studies of prehistoric Central European agriculturalists (\approx 5300 calibrated years BC to 850 AD) demonstrated a significant reduction in tibial rigidity among men, whereas women were characterized by low tibial rigidity, little temporal change, and high variability. Because of the potential for sex-specific skeletal responses to mechanical loading and a lack of modern comparative data, women’s activity in prehistory remains difficult to interpret. This study compares humeral and tibial cross-sectional rigidity, shape, and interlimb loading among prehistoric Central European women agriculturalists and living European women of known behavior (athletes and controls). Prehistoric female tibial rigidity at all time periods was highly variable, but differed little from

living sedentary women on average, and was significantly lower than that of living runners and football players. However, humeral rigidity exceeded that of living athletes for the first ≈ 5500 years of farming, with loading intensity biased heavily toward the upper limb. Interlimb strength proportions among Neolithic, Bronze Age, and Iron Age women were most similar to those of living semi-elite rowers. These results suggest that, in contrast to men, rigorous manual labor was a more important component of prehistoric women's behavior than was terrestrial mobility through thousands of years of European agriculture, at levels far exceeding those of modern women.

PRÜFER 2017

Kay Prüfer et al., *A high-coverage Neandertal genome from Vindija Cave in Croatia*. [science](#) **358** (2017), 655–658.

s358-0655-Supplement.pdf

Kay Prüfer, Cesare de Filippo, Steffi Grote, Fabrizio Mafessoni, Petra Korlevic, Mateja Hajdinjak, Benjamin Vernot, Laurits Skov, Pinghsun Hsieh, Stéphane Peyrégne, David Reher, Charlotte Hopfe, Sarah Nagel, Tomislav Maricic, Qiaomei Fu, Christoph Theunert, Rebekah Rogers, Pontus Skoglund, Manjusha Chintalapati, Michael Dannemann, Bradley J. Nelson, Felix M. Key, Pavao Rudan, Zeljko Kucan, Ivan Gušić, Liubov V. Golovanova, Vladimir B. Doronichev, Nick Patterson, David Reich, Evan E. Eichler, Montgomery Slatkin, Mikkel H. Schierup, Aida M. Andrés, Janet Kelso, Matthias Meyer & Svante Pääbo

To date, the only Neandertal genome that has been sequenced to high quality is from an individual found in Southern Siberia. We sequenced the genome of a female Neandertal from $\approx 50,000$ years ago from Vindija Cave, Croatia, to ≈ 30 -fold genomic coverage. She carried 1.6 differences per 10,000 base pairs between the two copies of her genome, fewer than present-day humans, suggesting that Neandertal populations were of small size. Our analyses indicate that she was more closely related to the Neandertals that mixed with the ancestors of present-day humans living outside of sub-Saharan Africa than the previously sequenced Neandertal from Siberia, allowing 10 to 20% more Neandertal DNA to be identified in present-day humans, including variants involved in low-density lipoprotein cholesterol concentrations, schizophrenia, and other diseases.

SCHLEBUSCH 2017

Carina M. Schlebusch et al., *Southern African ancient genomes estimate modern human divergence to 350,000 to 260,000 years ago*. [science](#) **358** (2017), 652–655.

s358-0652-Supplement.pdf

Carina M. Schlebusch, Helena Malmström, Torsten Günther, Per Sjödin, Alexandra Coutinho, Hanna Edlund, Arielle R. Munters, Mário Vicente, Maryna Steyn, Himla Soodyall, Marlize Lombard & Mattias Jakobsson

Southern Africa is consistently placed as a potential region for the evolution of *Homo sapiens*. We present genome sequences, up to 13x coverage, from seven ancient individuals from KwaZulu-Natal, South Africa. The remains of three Stone Age hunter-gatherers (about 2000 years old) were genetically similar to current-day southern San groups, and those of four Iron Age farmers (300 to 500 years old) were genetically similar to present-day Bantu-language speakers. We estimate that all modern-day Khoe-San groups have been influenced by 9 to 30% genetic admixture from East Africans/Eur Asians. Using traditional and new approaches, we estimate the first modern human population divergence time to between 350,000 and 260,000 years ago. This estimate increases the deepest divergence among mod-

ern humans, coinciding with anatomical developments of archaic humans into modern humans, as represented in the local fossil record.

SIKORA 2017

Martin Sikora et al., *Ancient genomes show social and reproductive behavior of early Upper Paleolithic foragers*. *science* **358** (2017), 659–662.

s358-0659-Supplement.pdf

Martin Sikora, Andaine Seguin-Orlando, Vitor C. Sousa, Anders Albrechtsen, Thorfinn Korneliussen, Amy Ko, Simon Rasmussen, Isabelle Dupanloup, Philip R. Nigst, Marjolein D. Bosch, Gabriel Renaud, Morten E. Allentoft, Ashot Margaryan, Sergey V. Vasilyev, Elizaveta V. Veselovskaya, Svetlana B. Borutskaya, Thibaut Deviese, Dan Comeskey, Tom Higham, Andrea Manica, Robert Foley, David J. Meltzer, Rasmus Nielsen, Laurent Excoffier, Marta Mirazon Lahr, Ludovic Orlando & Eske Willerslev

Present-day hunter-gatherers (HGs) live in multilevel social groups essential to sustain a population structure characterized by limited levels of within-band relatedness and inbreeding. When these wider social networks evolved among HGs is unknown. To investigate whether the contemporary HG strategy was already present in the Upper Paleolithic, we used complete genome sequences from Sunghir, a site dated to $\approx 34,000$ years before the present, containing multiple anatomically modern human individuals. We show that individuals at Sunghir derive from a population of small effective size, with limited kinship and levels of inbreeding similar to HG populations. Our findings suggest that Upper Paleolithic social organization was similar to that of living HGs, with limited relatedness within residential groups embedded in a larger mating network.

Bibel

GARFINKEL 2017

Yosef Garfinkel, *The Ethnic Identification of Khirbet Qeiyafa, Why It Matters*. In: JUSTIN LEV-TOV, PAULA HESSE & ALLAN GILBERT (Hrsg.), *The Wide Lens in Archaeology, Honoring Brian Hesse's Contributions to Anthropological Archaeology*. *Archaeobiology* 2 (Atlanta 2017), 149–167.

The archaeology of the tenth century BCE in the southern Levant has been a hot topic since the 1990s. The debate can be subdivided into four main topics: the chronology of the transition from Iron Age I to Iron Age II; the settlement pattern in that period; the structure of the political organization of the period; and the historical validity of the biblical narrative concerning King David as well as the establishment of the Judean Kingdom.

WEIPPERT 2010

Manfred Weippert, *Historisches Textbuch zum Alten Testament*. *Grundrisse zum Alten Testament* 10 (Göttingen 2010).

Das vorliegende Werk bietet eine Auswahl aus der Materialgruppe „Texte“ und konzentriert sich dabei auf solche Schriftdokumente, die sich direkt oder indirekt auf Verhältnisse und Ereignisse im Zusammenhang mit Kanaan/Palästina, Israel und Juda beziehen. Die übersetzten Texte wurden im Einklang mit dem oben als Motto angeführten Prinzip Herodots ausgewählt; die eigene Meinung der

Bearbeiter kommt aber in den Einleitungen und Kommentaren in gewissem Umfang zur Sprache, ohne dass damit abweichende Interpretationen von Seiten der Leser(innen) präjudiziert werden sollen.

Klima

BENDICK 2017

R. Bendick & R. Bilham, *Do weak global stresses synchronize earthquakes?* [Geophysical Research Letters](#) **44** (2017), 8320–8327.

Insofar as slip in an earthquake is related to the strain accumulated near a fault since a previous earthquake, and this process repeats many times, the earthquake cycle approximates an autonomous oscillator. Its asymmetric slow accumulation of strain and rapid release is quite unlike the harmonic motion of a pendulum and need not be time predictable, but still resembles a class of repeating systems known as integrate-and-fire oscillators, whose behavior has been shown to demonstrate a remarkable ability to synchronize to either external or self-organized forcing. Given sufficient time and even very weak physical coupling, the phases of sets of such oscillators, with similar though not necessarily identical period, approach each other. Topological and time series analyses presented here demonstrate that earthquakes worldwide show evidence of such synchronization. Though numerous studies demonstrate that the composite temporal distribution of major earthquakes in the instrumental record is indistinguishable from random, the additional consideration of event renewal interval serves to identify earthquake groupings suggestive of synchronization that are absent in synthetic catalogs. We envisage the weak forces responsible for clustering originate from lithospheric strain induced by seismicity itself, by finite strains over teleseismic distances, or by other sources of lithospheric loading such as Earth's variable rotation. For example, quasi-periodic maxima in rotational deceleration are accompanied by increased global seismicity at multidecadal intervals.

Plain Language Summary: Large earthquakes appear to synchronize globally, in the sense that they are organized in time according to their renewal properties, and occur in groups in response to very low stress interactions.

BEVAN 2017

Andrew Bevan, Sue Colledge, Dorian Fuller, Ralph Fyfe, Stephen Shennan & Chris Stevens, *Holocene fluctuations in human population demonstrate repeated links to food production and climate.* [PNAS](#) **114** (2017), E10524–E10531.

We consider the long-term relationship between human demography, food production, and Holocene climate via an archaeological radiocarbon date series of unprecedented sampling density and detail. There is striking consistency in the inferred human population dynamics across different regions of Britain and Ireland during the middle and later Holocene. Major cross-regional population downturns in population coincide with episodes of more abrupt change in North Atlantic climate and witness societal responses in food procurement as visible in directly dated plants and animals, often with moves toward hardier cereals, increased pastoralism, and/or gathered resources. For the Neolithic, this evidence questions existing models of wholly endogenous demographic boom–bust. For the wider Holocene, it demonstrates that climate-related disruptions have been quasi-periodic drivers of societal and subsistence change.

Keywords: radiocarbon | archaeology | Britain | Ireland | agriculture

Significance: The relationship between human population, food production, and climate change is a pressing concern in need of high-resolution, long-term perspectives. Archaeological radiocarbon dates have increasingly been used to reconstruct past population dynamics, and Britain and Ireland provide both radiocarbon sampling densities and species-level sample identifications that are globally unrivalled. We use this evidence to demonstrate multiple instances of human population downturn over the Holocene that coincide with periodic episodes of reduced solar activity and climate reorganization as well as societal responses in terms of altered food-procurement strategies.

MARCOTT 2017

Shaun A. Marcott & Jeremy D. Shakun, *A record of ice sheet demise*. [science](#) **358** (2017), 721–722.

The Cordilleran ice sheet in western Canada melted sooner than previously thought.

But questions remain regarding the precise timing of Cordilleran ice sheet collapse and its connections to past sea level and abrupt climate changes. In particular, it remains unclear whether the Cordilleran ice sheet played an appreciable role in meltwater pulse-1A and whether the freshwater input was large enough to usher in a climate reversal during the last glacial termination.

MENOUNOS 2017

B. Menounos et al., *Cordilleran Ice Sheet mass loss preceded climate reversals near the Pleistocene Termination*. [science](#) **358** (2017), 781–784.

s358-0781-Supplement.pdf

B. Menounos, B. M. Goehring, G. Osborn, M. Margold, B. Ward, J. Bond, G. K. C. Clarke, J. J. Clague, T. Lakerman, J. Koch, M. W. Caffee, J. Gosse, A. P. Stroeven, J. Seguinot & J. Heyman

The Cordilleran Ice Sheet (CIS) once covered an area comparable to that of Greenland. Previous geologic evidence and numerical models indicate that the ice sheet covered much of westernmost Canada as late as 12.5 thousand years ago (ka). New data indicate that substantial areas throughout westernmost Canada were ice free prior to 12.5 ka and some as early as 14.0 ka, with implications for climate dynamics and the timing of meltwater discharge to the Pacific and Arctic oceans. Early Bølling-Allerød warmth halved the mass of the CIS in as little as 500 years, causing 2.5 to 3.0 meters of sea-level rise. Dozens of cirque and valley glaciers, along with the southern margin of the CIS, advanced into recently deglaciated regions during the Bølling-Allerød and Younger Dryas.

VOOSEN 2017

Paul Voosen, *Sloshing of Earth’s core may spike big quakes*. [science](#) **358** (2017), 575.

Tiny increase in day length could portend more quakes over next 5 years.

Exploring such global forces, the researchers eventually discovered the match with the length of day. Although weather patterns such as El Niño can drive variations in day length of a millisecond over a year or more, a periodic, decadeslong fluctuation of several milliseconds—in particular its point of peak slow down every three decades or so—lined up perfectly with the quake trend. “Of course that seems sort of crazy,” Bendick says.

Usefully, each spike, which boosts the typical 15 large earthquakes per year to between 17 and 20, happens well after the slowdown begins. “The Earth offers us

a 5-years heads up on future earthquakes, which is remarkable,” says Billham, who presented the work.

Kultur

LANSING 2017

J. Stephen Lansing et al., *Kinship structures create persistent channels for language transmission*. [PNAS 114 \(2017\), 12910–12915](#).

J. Stephen Lansing, Cheryl Abundo, Guy S. Jacobs, Elsa G. Guillot, Stefan Thurner, Sean S. Downey, Lock Yue Chew, Tanmoy Bhattacharya, Ning Ning Chung, Herawati Sudoyo & Murray P. Cox

Languages are transmitted through channels created by kinship systems. Given sufficient time, these kinship channels can change the genetic and linguistic structure of populations. In traditional societies of eastern Indonesia, finely resolved cophylogenies of languages and genes reveal persistent movements between stable speech communities facilitated by kinship rules. When multiple languages are present in a region and postmarital residence rules encourage sustained directional movement between speech communities, then languages should be channeled along uniparental lines. We find strong evidence for this pattern in 982 individuals from 25 villages on two adjacent islands, where different kinship rules have been followed. Core groups of close relatives have stayed together for generations, while remaining in contact with, and marrying into, surrounding groups. Over time, these kinship systems shaped their gene and language phylogenies: Consistently following a postmarital residence rule turned social communities into speech communities.

Keywords: language | kinship | coevolution | cultural evolution | population genetics

Significance: Associations between genes and languages occur even with sustained migration among communities. By comparing phylogenies of genes and languages, we identify one source of this association. In traditional tribal societies, marriage customs channel language transmission. When women remain in their natal community and men disperse (matrilocality), children learn their mothers’ language, and language correlates with maternally inherited mitochondrial DNA. For the converse kinship practice (patrilocality), language instead correlates with paternally inherited Y chromosome. Kinship rules dictating postmarital residence can persist for many generations and determine population genetic structure at the community scale. The long-term association of languages with genetic clades created by kinship systems provides information about language transmission, and about the structure and persistence of social groups.

Methoden

WAGNER 2017

Günter P. Wagner, *The power of negative [theoretical] results*. [PNAS 114 \(2017\), 12851–12852](#).

What is the nature of theoretical research in biology? Biology is known for having very few—if any—general laws or maybe only one: natural selection (2–4). Thus, in biology, theoretical predictions tend to have limited reach. That life exists and how it is realized among different kinds of life forms is the result of a historical process that accumulates “frozen accidents”: that is, random mutations that become selected or fixed by genetic drift. Most of what we can say in biology is inevitably contingent, as evolution and life are fundamentally contingent processes.

To understand what is going on here, it is useful to distinguish between two kinds of theoretical results: positive and negative predictions. [...] Negative predictions are of a different nature. They often are the most fundamental insights, also in the physical sciences and even in mathematics. Examples are: the impossibility of a perpetuum mobile, a device that can produce work without being supplied with energy. All of the conservation laws of physics, like the conservation of energy, are negative statements, telling us what is impossible (we cannot create energy, only convert it, at least in classical mechanics).

Sprachlehre

MEGED 1979

Aharon Meged, *Four Stories*. Guesher: Readings in easy Hebrew 1 ([Jerusalem 1979](#)).

YANAÏT-BEN-ZVI 1977

Rachel Yanait-Ben-Zvi, *We come to Eretz-Israel*. Guesher: Readings in easy Hebrew 14 ([Jerusalem 1977](#)).

Story or Book

WESTFALL 2017

Catherine Westfall, *A doubly dextrous physicist*. [nature 552 \(2017\), 28–29](#).

Catherine Westfall lauds a candid life of Enrico Fermi, pioneer of nuclear fission.

The Last Man Who Knew Everything: The Life and Times of Enrico Fermi, Father of the Nuclear Age. David N. Schwartz. Basic: 2017.

Until a few years ago, Fermi featured in only two full-length accounts. In 1954, the year he died, his wife Laura Fermi published *Atoms in the Family*, a charming, sometimes cheeky account of their marriage and family life. In 1970, Enrico Fermi, Physicist by former student Emilio Segré nicely added explanations and details of Fermi's physics. Segré's nephew Gino and co-author Bettina Hoerlin provided a more complete life and work in their lyrical *The Pope of Physics* (Henry Holt, 2016), reviewed in these pages (G. Farmelo *Nature* 538, 168–169; 2016).

Like other biographers, Schwartz shows Fermi's sweet side. But we also meet the Fermi who could be cold and lost in his work, to the detriment of relationships, particularly with his family — as Graham Farmelo noted in his review of *The Pope of Physics*. This is the man who did little to help his wife adjust to the United States after their immigration, and later alienated his son Giulio. In short, Schwartz's blunt style cuts through the gauze of hero worship.