

References

Afrika

DEINO 2018

Alan L. Deino, Anna K. Behrensmeyer, Alison S. Brooks, John E. Yellen, Warren D. Sharp & Richard Potts, *Chronology of the Acheulean to Middle Stone Age transition in eastern Africa*. [science 360 \(2018\), 95–98](#).

s360-0095-Supplement.pdf

The origin of the Middle Stone Age (MSA) marks the transition from a highly persistent mode of stone toolmaking, the Acheulean, to a period of increasing technological innovation and cultural indicators associated with the evolution of Homo sapiens. We used argon-40/argon-39 and uranium-series dating to calibrate the chronology of Acheulean and early MSA artifact-rich sedimentary deposits in the Olorgesailie basin, southern Kenya rift. We determined the age of late Acheulean tool assemblages from 615,000 to 499,000 years ago, after which a large technological and faunal transition occurred, with a definitive MSA lacking Acheulean elements beginning most likely by $\approx 320,000$ years ago, but at least by 305,000 years ago. These results establish the oldest repository of MSA artifacts in eastern Africa.

Aktuell

LAWLER 2018

Andrew Lawler, *Ancient sites savaged in Yemen, Iraq*. [science 360 \(2018\), 140–141](#).

Firsthand accounts reveal worse damage than expected in war-torn regions.

[H] charged that the Saudi attacks were a conscious campaign to wreck Yemen's heritage and demoralize its citizens. "After 3 years of assessing the damage, I believe the bombing is being done with a purpose, since many of these sites are not suitable or useful for military use," he says. The destruction seems deliberate, agrees archaeologist Sarah Japp of Berlin's German Archaeological Institute. "The Saudis were given information on important cultural heritage sites, including exact coordinates," by UNESCO, said Japp, who was based in Sana'a before the war.

[T]he IS group's desire to profit from antiquities is well-known. A nearby large mound called Tell Medkuk was bulldozed completely to unearth objects for looting. From satellite data on the center of Mari, Butterlin estimates that looters dug some 1500 pits, many of them more than 5 meters deep and 6 meters wide. The situation is even worse at DuraEuropos, which until recently was a remarkably well-preserved city upstream of Mari.

NORDING 2018

Malin L. Nording, *Figuring out how I belong*. [science 359 \(2018\), 1558](#).

I was confused. I knew what was expected in theory, but I couldn't seem to grasp the reality of it. As a recently appointed assistant professor applying for university funds to buy a new piece of equipment, for example, I proudly listed all of my collaborations with other departments, certain that this would help my

chances. When I found out that I didn't get the funding, I learned the hard way that the decision was made only by faculty members within my own department, so outside collaborations weren't a selling point. I felt so ashamed for not understanding the unspoken terms, and for giving my colleagues the false impression that I knew what I was doing.

O'LOUGHLIN 2018

Luke O'Loughlin, *No one is an island*. [science 360 \(2018\), 122](#).

My supervisor waved goodbye and boarded a plane. I had just started my Ph.D. studying invasive species on a remote oceanic island, where I would be spending most of the next 3 years bashing through rainforest to count invertebrates. My supervisor had done his own Ph.D. here on Christmas Island in the Indian Ocean 2 decades earlier. He had found me a place to stay and introduced me to the handful of other ecologists who were managing the national park or conducting their own research, but I wasn't working directly with them. Everyone else attached to my project was more than 5000 kilometers away—and so were my friends, family, and entire support network. I told myself I could manage on my own.

SANGANYADO 2018

Edmond Sanganyado, *My path to contentment*. [science 360 \(2018\), 234](#).

I leapt into the air, screaming at the top of my lungs with tears rolling down my cheeks as the news sank in. I had lost both of my parents when I was 16 years old, and I had often been sent home from school for unpaid tuition as I worked my way to a bachelor's degree in my home country of Zimbabwe. But now, I was a Fulbright fellow. I was convinced that the award would propel my career to unconceivable heights. It was all the sweeter when I thought of my mother and how she used to cry over my report cards. At the time, I thought it was because I had not done well enough, but I later realized she was crying because she could not bear the idea that her poverty would keep me from reaching my full potential. I carried the burden of wanting to do her proud, and the fellowship was a huge step in that direction.

Anthropologie

BROOKS 2018

Alison S. Brooks et al., *Long-distance stone transport and pigment use in the earliest Middle Stone Age*. [science 360 \(2018\), 90–94](#).

[s360-0090-Supplement.pdf](#)

Alison S. Brooks, John E. Yellen, Richard Potts, Anna K. Behrensmeyer, Alan L. Deino, David E. Leslie, Stanley H. Ambrose, Jeffrey R. Ferguson, Francesco d'Errico, Andrew M. Zipkin, Scott Whittaker, Jeffrey Post, Elizabeth G. Veatch, Kimberly Foecke & Jennifer B. Clark

Previous research suggests that the complex symbolic, technological, and socioeconomic behaviors that typify *Homo sapiens* had roots in the middle Pleistocene <200,000 years ago, but data bearing on human behavioral origins are limited. We present a series of excavated Middle Stone Age sites from the Olorgesailie basin, southern Kenya, dating from $\geq 295,000$ to $\approx 320,000$ years ago by argon-40/argon-39 and uranium-series methods. Hominins at these sites made prepared cores and points, exploited iron-rich rocks to obtain red pigment, and procured stone tool materials from ≥ 25 - to 50-kilometer distances. Associated fauna suggests a broad resource strategy that included large and small prey. These practices

imply notable changes in how individuals and groups related to the landscape and to one another and provide documentation relevant to human social and cognitive evolution.

HLUSKO 2018

Leslea J. Hlusko et al., *Environmental selection during the last ice age on the mother-to-infant transmission of vitamin D and fatty acids through breast milk*. *PNAS* **115** (2018), E4426–E4432.

[pnas115-E04426-Supplement.pdf](#)

Leslea J. Hlusko, Joshua P. Carlson, George Chaplin, Scott A. Elias, John F. Hoffecker, Michaela Huffman, Nina G. Jablonski, Tesla A. Monson, Dennis H. O'Rourke, Marin A. Pilloud & G. Richard Scott

Because of the ubiquitous adaptability of our material culture, some human populations have occupied extreme environments that intensified selection on existing genomic variation. By 32,000 years ago, people were living in Arctic Beringia, and during the Last Glacial Maximum (LGM; 28,000–18,000 y ago), they likely persisted in the Beringian refugium. Such high latitudes provide only very low levels of UV radiation, and can thereby lead to dangerously low levels of biosynthesized vitamin D. The physiological effects of vitamin D deficiency range from reduced dietary absorption of calcium to a compromised immune system and modified adipose tissue function. The ectodysplasin A receptor (EDAR) gene has a range of pleiotropic effects, including sweat gland density, incisor shoveling, and mammary gland ductal branching. The frequency of the human-specific EDAR V370A allele appears to be uniquely elevated in North and East Asian and New World populations due to a bout of positive selection likely to have occurred circa 20,000 y ago. The dental pleiotropic effects of this allele suggest an even higher occurrence among indigenous people in the Western Hemisphere before European colonization. We hypothesize that selection on EDAR V370A occurred in the Beringian refugium because it increases mammary ductal branching, and thereby may amplify the transfer of critical nutrients in vitamin D-deficient conditions to infants via mothers' milk. This hypothesized selective context for EDAR V370A was likely intertwined with selection on the fatty acid desaturase (FADS) gene cluster because it is known to modulate lipid profiles transmitted to milk from a vitamin D-rich diet high in omega-3 fatty acids.

Keywords: mammary epithelium | dental anthropology | Beringia | adaptation | UV radiation

Significance: The frequency of the human-specific EDAR V370A isoform is highly elevated in North and East Asian populations. The gene is known to have several pleiotropic effects, among which are sweat gland density and ductal branching in the mammary gland. The former has led some geneticists to argue that the near-fixation of this allele was caused by selection for modulation of thermoregulatory sweating. We provide an alternative hypothesis, that selection instead acted on the allele's effect of increasing ductal branching in the mammary gland, thereby amplifying the transfer of critical nutrients to infants via mother's milk. This is likely to have occurred during the Last Glacial Maximum when a human population was genetically isolated in the high-latitude environment of the Beringia.

INGICCO 2018

T. Ingicco et al., *Earliest known hominin activity in the Philippines by 709 thousand years ago*. *nature* **557** (2018), 233–237.

T. Ingicco, G. D. van den Bergh, C. Jago-On, J.-J. Bahain, M. G. Chacón, N. Amano, H. Forestier, C. King, K. Manalo, S. Nomade, A. Pereira, M. C. Reyes,

A.-M. Sémah, Q. Shao, P. Voinchet, C. Falguères, P. C. H. Albers, M. Lising, G. Lyras, D. Yurnaldi, P. Rochette, A. Bautista & J. de Vos

Over 60 years ago, stone tools and remains of megafauna were discovered on the Southeast Asian islands of Flores, Sulawesi and Luzon, and a Middle Pleistocene colonization by *Homo erectus* was initially proposed to have occurred on these islands^{1–4}. However, until the discovery of *Homo floresiensis* in 2003, claims of the presence of archaic hominins on Wallacean islands were hypothetical owing to the absence of in situ fossils and/or stone artefacts that were excavated from well-documented stratigraphic contexts, or because secure numerical dating methods of these sites were lacking. As a consequence, these claims were generally treated with scepticism⁵. Here we describe the results of recent excavations at Kalinga in the Cagayan Valley of northern Luzon in the Philippines that have yielded 57 stone tools associated with an almost-complete disarticulated skeleton of *Rhinoceros philippinensis*, which shows clear signs of butchery, together with other fossil fauna remains attributed to stegodon, Philippine brown deer, freshwater turtle and monitor lizard. All finds originate from a clay-rich bone bed that was dated to between 777 and 631 thousand years ago using electron-spin resonance methods that were applied to tooth enamel and fluvial quartz. This evidence pushes back the proven period of colonization⁶ of the Philippines by hundreds of thousands of years, and furthermore suggests that early overseas dispersal in Island South East Asia by premodern hominins took place several times during the Early and Middle Pleistocene stages^{1–4}. The Philippines therefore may have had a central role in southward movements into Wallacea, not only of Pleistocene megafauna⁷, but also of archaic hominins.

Anthropologie Methoden

MAXWELL 2018

Simon J. Maxwell, Philip J. Hopley, Paul Upchurch & Christophe Soligo, *Sporadic sampling, not climatic forcing, drives observed early hominin diversity*. *PNAS* **115** (2018), 4891–4896.

[pnas115-04891-Supplement.pdf](#)

The role of climate change in the origin and diversification of early hominins is hotly debated. Most accounts of early hominin evolution link observed fluctuations in species diversity to directional shifts in climate or periods of intense climatic instability. None of these hypotheses, however, have tested whether observed diversity patterns are distorted by variation in the quality of the hominin fossil record. Here, we present a detailed examination of early hominin diversity dynamics, including both taxic and phylogenetically corrected diversity estimates. Unlike past studies, we compare these estimates to sampling metrics for rock availability (hominin-, primate-, and mammal-bearing formations) and collection effort, to assess the geological and anthropogenic controls on the sampling of the early hominin fossil record. Taxic diversity, primate-bearing formations, and collection effort show strong positive correlations, demonstrating that observed patterns of early hominin taxic diversity can be explained by temporal heterogeneity in fossil sampling rather than genuine evolutionary processes. Peak taxic diversity at 1.9 million years ago (Ma) is a sampling artifact, reflecting merely maximal rock availability and collection effort. In contrast, phylogenetic diversity estimates imply peak diversity at 2.4 Ma and show little relation to sampling metrics. We find that apparent relationships between early hominin diversity and indicators of climatic instability are, in fact, driven largely by variation in suitable rock exposure and collection effort. Our results suggest that significant improvements in the quality of

the fossil record are required before the role of climate in hominin evolution can be reliably determined.

Keywords: early hominin diversity | sampling bias | fossil record quality | Africa | climate

Significance: Paleoanthropologists have long been intrigued by the observed patterns of human evolution, including species diversity, and often invoked climatic change as the principal driver of evolutionary change. Here, we investigate whether the early hominin fossil record is of suitable quality to test these climate-forcing hypotheses. Specifically, we compare early hominin diversity to sampling metrics that quantify changes in fossil preservation and sampling intensity between 7 and 1 million years ago. We find that observed diversity patterns are governed by sporadic sampling and do not yield a genuine evolutionary signal. Many more fossil discoveries are required before existing hypotheses linking climate and evolution can be meaningfully tested.

Bibel

NIEMANN 2017

Hermann Michael Niemann, *Comments and Questions about the Interpretation of Khirbet Qeiyafa, Talking with Yosef Garfinkel*. *Zeitschrift für Altorientalische und Biblische Rechtsgeschichte* **23** (2017), 245–262.

Yosef Garfinkel has earned himself merit with the excavation of Qeiyafa. But his interpretation especially the connection of Qeiyafa with the Davidic and Solomonic respectively Judahite (state) rule in Jerusalem between 1020 and 980 BC is not verifiable. Much data speaks in favour of Qeiyafa being a comparatively independent settlement (micro-polity). It was not only characterised by Judah or the mountain region. But it was also not only Philistine in character. Sometime between 980 and 970 BC or slightly later when Gath reached the zenith of its power diplomacy between these groups came to an end. Qeiyafa very likely fell under the influence of Gath. It was probably destroyed during the eastern expansion of Gath and subsequently abandoned. Where its residents went and other questions regarding Qeiyafa remain open. Open for debate is the hypothesis of Finkelstein and Fantalkin that Qeiyafa possessed relations with the Gibeon-Bethel region. Nevertheless, this need not be an alternative to my own hypothesis.

Biographie

HALPERN 2018

Paul Halpern, *Feynman at 100*. *nature* **557** (2018), 164–165.

Paul Halpern celebrates the oeuvre of a brilliant, original scientist on his centenary.

Whereas other educators might try to coddle those who couldn't keep up, Feynman never relented. The essence of his philosophy was to find something that you can do well, and put your heart and soul into it. If not physics, then another passion — bongos, perhaps.

Biologie

GAUNITZ 2018

Charleen Gaunitz et al., *Ancient genomes revisit the ancestry of domestic and Przewalski's horses*. [science 360 \(2018\), 111–114](#).
s360-0111-Supplement.pdf

Charleen Gaunitz, Antoine Fages, Kristian Hanghøj, Anders Albrechtsen, Naveed Khan, Mikkel Schubert, Andaine Seguin-Orlando, Ivy J. Owens, Sabine Felkel, Olivier Bignon-Lau, Peter de Barros Damgaard, Alissa Mittnik, Azadeh F. Mohaseb, Hossein Davoudi, Saleh Alquraishi, Ahmed H. Alfarhan, Khaled A. S. Al-Rasheid, Eric Crubézy, Norbert Benecke, Sandra Olsen, Dorcas Brown, David Anthony, Ken Massy, Vladimir Pitulko, Aleksei Kasparov, Gottfried Brem, Michael Hofreiter, Gulmira Mukhtarova, Nurbol Baimukhanov, Lembi Lõugas, Vedat Onar, Philipp W. Stockhammer, Johannes Krause, Bazartseren Boldgiv, Sainbileg Undrakhbold, Diimaajav Erdenebaatar, Sébastien Lepetz, Marjan Mashkour, Arne Ludwig, Barbara Wallner, Victor Merz, Ilja Merz, Viktor Zaibert, Eske Willerslev, Pablo Librado, Alan K. Outram & Ludovic Orlando

The Eneolithic Botai culture of the Central Asian steppes provides the earliest archaeological evidence for horse husbandry, ≈ 5500 years ago, but the exact nature of early horse domestication remains controversial. We generated 42 ancient-horse genomes, including 20 from Botai. Compared to 46 published ancient- and modern-horse genomes, our data indicate that Przewalski's horses are the feral descendants of horses herded at Botai and not truly wild horses. All domestic horses dated from ≈ 4000 years ago to present only show $\approx 2.7\%$ of Botai-related ancestry. This indicates that a massive genomic turnover underpins the expansion of the horse stock that gave rise to modern domesticates, which coincides with large-scale human population expansions during the Early Bronze Age.

PENNISI 2018

Elizabeth Pennisi, *Human mutation rate a legacy from our past*. [science 360 \(2018\), 143](#).

By assessing mutation rates among species, researchers are understanding why they vary.

Today, 7.6 billion people inhabit Earth, but population geneticists focus on the effective population size, which is the number of people it took to produce the genetic variation seen today. In humans, that's about 10,000—not so different from that of other primates. Humans tend to form even smaller groups and mate within them. In such small groups, Harris says, “we can't optimize our biology because natural selection is imperfect.”

Klima

BRIFFA 1995

Keith R. Briffa, Philip D. Jones, Fritz H. Schweingruber, Stepan G. Shiyatov & Edward R. Cook, *Unusual twentieth-century summer warmth in a 1,000-year temperature record from Siberia*. [nature 376 \(1995\), 156–159](#).

In the current debate on the magnitude of modern-day climate change, there is a growing appreciation of the importance of long, high-resolution proxies of past climate. Such records provide an indication of natural (pre-anthropogenic) climate variability, either singly at specific geographical locations or in combination on

continental and perhaps even hemispheric scales. There are, however, relatively few records that are well dated, of high resolution and of verifiable fidelity in terms of climate response, and conspicuously few that extend over a thousand years or more. Here we report a tree-ring-based reconstruction of mean summer temperatures over the northern Urals since AD 914. This record shows that the mean temperature of the twentieth century (1901-90) is higher than during any similar period since AD 914.

PAGES 2013

PAGES 2k Consortium, *Continental-scale temperature variability during the past two millennia*. [Nature Geoscience 6 \(2013\), 339–346](#).

[NatGeo06-339-Supplement1.pdf](#), [NatGeo06-339-Supplement2.xlsx](#), [NatGeo06-339-Supplement3.xlsx](#)

Past global climate changes had strong regional expression. To elucidate their spatio-temporal pattern, we reconstructed past temperatures for seven continental-scale regions during the past one to two millennia. The most coherent feature in nearly all of the regional temperature reconstructions is a long-term cooling trend, which ended late in the nineteenth century. At multidecadal to centennial scales, temperature variability shows distinctly different regional patterns, with more similarity within each hemisphere than between them. There were no globally synchronous multi-decadal warm or cold intervals that define a worldwide Medieval Warm Period or Little Ice Age, but all reconstructions show generally cold conditions between ad 1580 and 1880, punctuated in some regions by warm decades during the eighteenth century. The transition to these colder conditions occurred earlier in the Arctic, Europe and Asia than in North America or the Southern Hemisphere regions. Recent warming reversed the long-term cooling; during the period ad 1971–2000, the area-weighted average reconstructed temperature was higher than any other time in nearly 1,400 years.

POTTS 2018

Richard Potts et al., *Environmental dynamics during the onset of the Middle Stone Age in eastern Africa*. [science 360 \(2018\), 86–90](#).

[s360-0086-Supplement.pdf](#)

Richard Potts, Anna K. Behrensmeyer, J. Tyler Faith, Christian A. Tryon, Alison S. Brooks, John E. Yellen, Alan L. Deino, Rahab Kinyanjui, Jennifer B. Clark, Catherine M. Haradon, Naomi E. Levin, Hanneke J.M. Meijer, Elizabeth G. Veatch, R. Bernhart Owen & Robin W. Renaut

Development of the African Middle Stone Age (MSA) before 300,000 years ago raises the question of how environmental change influenced the evolution of behaviors characteristic of early *Homo sapiens*. We used temporally well-constrained sedimentological and paleoenvironmental data to investigate environmental dynamics before and after the appearance of the early MSA in the Olorgesailie basin, Kenya. In contrast to the Acheulean archeological record in the same basin, MSA sites are associated with a markedly different faunal community, more pronounced erosion-deposition cycles, tectonic activity, and enhanced wet-dry variability. Aspects of Acheulean technology in this region imply that, as early as 615,000 years ago, greater stone material selectivity and wider resource procurement coincided with an increased pace of land-lake fluctuation, potentially anticipating the adaptability of MSA hominins.

Mittelpaläolithikum

KUHN 2006

Steven L. Kuhn & Mary C. Stiner, *What's a Mother to Do? The Division of Labor among Neandertals and Modern Humans in Eurasia*. [Current Anthropology 47 \(2006\), 953–980](#).

Guy Bar-Oz, Mina Weinstein-Evron, Jean-Pierre Bocquet-Appel, Erella Hovers, Katharine Macdonald, Wil Roebroeks, Kenneth Martínez, John J. Shea, Olga Soffer & Nicole M. Waguespack

Recent hunter-gatherers display much uniformity in the division of labor along the lines of gender and age. The complementary economic roles for men and women typical of ethnographically documented hunter-gatherers did not appear in Eurasia until the beginning of the Upper Paleolithic. The rich archaeological record of Middle Paleolithic cultures in Eurasia suggests that earlier hominins pursued more narrowly focused economies, with women's activities more closely aligned with those of men with respect to schedule and ranging patterns than in recent forager systems. More broadly based economies emerged first in the early Upper Paleolithic in the eastern Mediterranean region and later in the rest of Eurasia. The behavioral changes associated with the Upper Paleolithic record signal a wider range of economic and technological roles in forager societies, and these changes may have provided the expanding populations of *Homo sapiens* with a demographic advantage over other hominins in Eurasia.