Liste erstellt am 2013-06-10

Literatur

Aktuell

Arnqvist 2013

Göran Arnqvist, *"Bateman in Nature: Predation on Offspring Reduces the Potential for Sexual Selection", Comment.* science **340** (2013), 549.
Byers and Dunn (Reports, 9 November 2012, p. 802) reported that sexual selection and natural selection are closely related in a wild population of pronghorns. Here, I argue that this conclusion is incorrect. Their main finding is due to the fact that, unsurprisingly, juvenile mortality and juvenile survival are negatively related across years.

Begley 2013

C. Glenn Begley, *Six red flags for suspect work.* nature **497** (2013), 433–434.
C. Glenn Begley explains how to recognize the preclinical papers in which the data won't stand up.

Bergeron 2013

P. Bergeron, A. M. Martin, D. Garant & F. Pelletier, *"Bateman in Nature: Predation on Offspring Reduces the Potential for Sexual Selection", Comment.* science **340** (2013), 549.
Byers and Dunn (Reports, 9 November 2012, p. 802) claimed that predation on offspring reduced the potential for sexual selection in pronghorn. We argue that the potential for sexual selection is not affected by random offspring mortality when relative reproductive success is considered and increases when measured with the opportunity for selection, a metric that describes the potential for selection.

Byers 2013

John Byers & Stacey Dunn, *"Bateman in Nature: Predation on Offspring Reduces the Potential for Sexual Selection", Response to Comments.* science **340** (2013), 549.
Commenters objected to the way that we counted matings and offspring to calculate Bateman slopes and disagreed with our contention that predation on offspring can decrease the potential for sexual selection. We clarify what may have been misunderstandings to argue that our methods, analyses, and conclusions are correct.

Deoni 2013

Sean C. L. Deoni et al., *Breastfeeding and early white matter development: A cross-sectional study.* NeuroImage (2013), preprint, 1–10. DOI:10.1016/j.neuroimage.2013.05.090.
Sean C. L. Deoni, Douglas C. Dean III, Irene Piryatinksy, Jonathan O'Muircheartaigh, Nicole Waskiewicz, Katie Lehman, Michelle Han & Holly Dirks
Does breastfeeding alter early brain development? The prevailing consensus from large epidemiological studies posits that early exclusive breastfeeding is associated with improved measures of IQ and cognitive functioning in later childhood and

adolescence. Prior morphometric brain imaging studies support these findings, revealing increased white matter and sub-cortical gray matter volume, and parietal lobe cortical thickness, associated with IQ, in adolescents who were breastfed as infants compared to those who were exclusively formula-fed. Yet it remains unknown when these structural differences first manifest and when developmental differences that predict later performance improvements can be detected. In this study, we used quiet magnetic resonance imaging (MRI) scans to compare measures of white matter microstructure (mcDESPOT measures of myelin water fraction) in 133 healthy children from 10 months through 4 years of age, who were either exclusively breastfed a minimum of 3 months; exclusively formula-fed; or received a mixture of breast milk and formula. We also examined the relationship between breastfeeding duration and white matter microstructure. Breastfed children exhibited increased white matter development in later maturing frontal and association brain regions. Positive relationships between white matter microstructure and breastfeeding duration are also exhibited in several brain regions, that are anatomically consistent with observed improvements in cognitive and behavioral performance measures. While the mechanisms underlying these structural differences remains unclear, our findings provide new insight into the earliest developmental advantages associated with breastfeeding, and support the hypothesis that breast milk constituents promote healthy neural growth and white matter development.
Keywords: Brain development | Breastfeeding | Myelin maturation | White matter development | Infant imaging | Myelin | Myelin water fraction | Magnetic resonance imaging

Elliott 2013

Kyle H. Elliott, Robert E. Ricklefs, Anthony J. Gaston, Scott A. Hatch, John R. Speakman & Gail K. Davoren, *High flight costs, but low dive costs, in auks support the biomechanical hypothesis for flightlessness in penguins*. PNAS **110** (2013), 9380–9384.

Flight is a key adaptive trait. Despite its advantages, flight has been lost in several groups of birds, notably among seabirds, where flightlessness has evolved independently in at least five lineages. One hypothesis for the loss of flight among seabirds is that animals moving between different media face tradeoffs between maximizing function in one medium relative to the other. In particular, biomechanical models of energy costs during flying and diving suggest that a wing designed for optimal diving performance should lead to enormous energy costs when flying in air. Costs of flying and diving have been measured in free-living animals that use their wings to fly or to propel their dives, but not both. Animals that both fly and dive might approach the functional boundary between flight and nonflight. We show that flight costs for thickbilled murres (Uria lomvia), which are wing-propelled divers, and pelagic cormorants (Phalacrocorax pelagicus) (foot-propelled divers), are the highest recorded for vertebrates. Dive costs are high for cormorants and low for murres, but the latter are still higher than for flightless wing-propelled diving birds (penguins). For murres, flight costs were higher than predicted from biomechanical modeling, and the oxygen consumption rate during dives decreased with depth at a faster rate than estimated biomechanical costs. These results strongly support the hypothesis that function constrains form in diving birds, and that optimizing wing shape and form for wing-propelled diving leads to such high flight costs that flying ceases to be an option in larger wing-propelled diving seabirds, including penguins.
adaptive landscape | energetics | flight performance | morphology

Gibbons 2013

Ann Gibbons & Michael Balter, *Meeting Briefs*. science **340** (2013), 426–427.

When Early Hominins Got a Grip

Modern humans and Neandertals have this complex of traits, as does the 800,000-year-old H. antecessor from Atapuerca, Spain. But members of Australopithecus, which lived about 1.9 million to 4 million years ago, do not. Thus, this refined precision grip arose sometime between 1.9 million years ago and 800,000 years ago. But when? No one knew, because no fragile hand bones had been discovered during this time. "There's a huge gap of 1 million years in the fossil record for hands," Ward says.

The fossil shows that by the time the Acheulean was well established, the precision grip was, too. "The discovery is significant because it corroborates evidence from other parts of the hand that the hominin hand may have become adapted to stone toolmaking with the appearance of the Acheulean," says paleoanthropologist Mary Marzke of Arizona State University, Tempe, who was not a co-author.

Ardi's a Hominin—But How Did She Move?

At the meetings, a series of talks and posters gave Ardi new recognition as a hominin. Researchers who have had their first look at fossils or casts of the 4.4-million-year-old fossils agreed with the discoverers that Ardi walked upright—albeit in a weird way—and that features in her teeth and skull make her a primitive member of the human family. But debate raged about whether she also climbed vertically in trees like an ape.

Following the Males' Trail, 1.5 Million Years Later

A footprint in sand is not a mirror image of the foot that made it, because it also reflects the type of sediment and how fast the maker was traveling. The researchers asked 20 Daasanach men and 20 women to walk and run barefoot across a strip of sand, moistened to various degrees, next to the Ileret site. The length of their footprints correlated well with the length of their feet, but print width was a poor predictor of actual foot width. The footprint dimensions were good predictors of height and reasonably good predictors of body weight, Hatala found.

HealthGap 2013

Health gap narrows. nature **497** (2013), 416.

The difference in child mortality between the world's mostand least-advantaged countries has fallen since 1990.

Jackson 2013

Brian A. Jackson, Tora K. Bikson & Patrick P. Gunn, *Human Subjects Protection and Research on Terrorism and Conflict*. science **340** (2013), 434–435.

A recent court case calls into question the ability to protect human subjects in research on terrorism and conflict.

Ornes 2013

Stephen Ornes, *Whole-climate experiments for peatlands*. PNAS **110** (2013), 9188.

Paul J. Hanson, a tree physiologist at Oak Ridge National Laboratory in Tennessee, has overseen the SPRUCE project from the beginning. Hanson says peatland bogs like the one in northern Minnesota harbor vast stores of carbon, which could be released as the ecosystem changes. "Real-time and full-scale manipulations like SPRUCE," he says, "allow researchers to quantify the response of organisms and

ecosystems to future conditions that can't be measured in the field or inferred from recorded ecological records."

de la Peña 2013

Paloma de la Peña, *The transition in southern Iberia: Insights from paleoclimatology and the Early Upper Palaeolithic*. PNAS **110** (2013), E2086.

Ramm 2013

Steven A. Ramm et al., *"Bateman in Nature: Predation on Offspring Reduces the Potential for Sexual Selection"*, *Comment*. science **340** (2013), 549.

Steven A. Ramm, Rudy M. Jonker, Klaus Reinhold, Tamás Székely, Fritz Trillmich, Tim Schmoll, Holger Schielzeth & Robert P. Freckleton

Byers and Dunn's (Reports, 9 November 2012, p.802) conclusion that predation constrains sexual selection is problematic for three reasons: their nonstandard calculation of Bateman slopes; their assertion that random processes do not influence reproductive success; and the statistically unjustifiable use of 6 variables to explain just 10 observations.

Wood 2013

Rachel E. Wood et al., *Radiocarbon dating and the paleoenvironmental record of Carihuela, Reply to de la Peña*. PNAS **110** (2013), E2087.

Rachel E. Wood, Cecilio Barroso- Ruíz, Miguel Caparrós, Jesús F. Jordá Pardo, Bertila Galván Santos & Thomas F. G. Higham

Amerika

Eren 2013

Metin I. Eren, Robert J. Patten, Michael J. O'Brien & David J. Meltzer, *Refuting the technological cornerstone of the Ice-Age Atlantic crossing hypothesis*. Journal of Archaeological Science **40** (2013), 2934–2941.

The "North Atlantic Ice-Edge Corridor" hypothesis proposes that sometime during the Last Glacial Maximum, roughly 26,500–19,000 years ago, human populations from southern France and the Iberian Peninsula made their way across the North Atlantic and colonized North America. A key element of that hypothesis is the apparent similarity between stone-tool-production techniques of Solutrean peoples of Western Europe and Clovis and purportedly pre-Clovis peoples of eastern North America, most especially the supposed intentional use of "controlled overshot flaking," a technique for thinning a bifacial stone tool during manufacture. Overshot flakes, struck from prepared edges of the tool, travel across the face and remove part of the opposite margin. Experimental and archaeological data demonstrate, however, that the most parsimonious explanation for the production of overshot flakes is that they are accidental products created incidentally and inconsistently as knappers attempt to thin bifaces. Thus, instead of representing historical divergence, overshot flakes in Clovis and Solutrean assemblages mark convergence in the use of the same simple solution for thinning bifaces that produced analogous detritus.

Keywords: Biface thinning | Clovis | Efficiency | Evolutionary convergence | Experimental archaeology | Solutrean | Overshot flaking | Peopling of North America | Paleoindian | Paleolithic | Pre-Clovis

Anthropologie

Cohen 2012

Emma Cohen, *The Evolution of Tag-Based Cooperation in Humans, The Case for Accent.* Current Anthropology **53** (2012), 588–616.

Recent game-theoretic simulation and analytical models have demonstrated that cooperative strategies mediated by indicators of cooperative potential, or "tags," can invade, spread, and resist invasion by noncooperators across a range of population-structure and cost-benefit scenarios. The plausibility of these models is potentially relevant for human evolutionary accounts insofar as humans possess some phenotypic trait that could serve as a reliable tag. Linguistic markers, such as accent and dialect, have frequently been either cursorily defended or promptly dismissed as satisfying the criteria of a reliable and evolutionarily viable tag. This paper integrates evidence from a range of disciplines to develop and assess the claim that speech accent mediated the evolution of tag-based cooperation in humans. Existing evidence warrants the preliminary conclusion that accent markers meet the demands of an evolutionarily viable tag and potentially afforded a cost-effective solution to the challenges of maintaining viable cooperative relationships in diffuse, regional social networks.

Shea 2005

John J. Shea & Ofer Bar-Yosef, *Who Were The Skhul/Qafzeh People? An Archaeological Perspective on Eurasias Oldest Modern Humans.* Journal of The Israel Prehistoric Society **35** (2005), 451–468.

Homo sapiens Late Pleistocene adaptive radiation is an event with few parallels in recent primate evolution. Viewed with 30,000 years hindsight, the speed, geographic scope, and ecologically-transforming effect of this dispersal suggest an inevitability to modern humans evolutionary success. In fact, most of the Late Pleistocene witnessed little change in Homo sapiens geographic distribution. Until around 50 Kyr, a dispassionate observer would have no basis for predicting either the extinction of rival human species or Homo sapiens current global ecological dominion. The use of such terms as "Proto-Cro-Magnons" and "early modern humans" to describe the Skhul/Qafzeh fossils implies that these humans played a role in modern human ancestry. Yet, these fossils skeletal morphology differs both from living humans and from Upper Paleolithic Europeans (Pearson 2000). Recent geochronometric advances also reveal a 40,000-year long gap between their last appearance in the Levant and the next reliably-dated occurrence of modern humans fossils in the early Upper Paleolithic. We think the time is ripe to reconsider, or at the very least to question, the evolutionary signicance of the Skhul/Qafzeh humans.

In our view, the Skhul/Qafzeh humans represent a short-lived dispersal of African Homo sapiens populations into the Levant around 130-80 Kyr. Warmer climates and early modern human population growth in Northeast Africa may have driven this dispersal. Alternatively, the Skhul/Qafzeh humans may have competitively displaced earlier archaic humans independently of climate change, but the evidence is unclear on this point. In the face of competition with Neandertals during the onset of the main Wurm Glaciation 80-50 Kyr, descendants of the Skhul/Qafzeh humans either abandoned the Levant or became extinct. This reading of the record challenges the popular model of modern human dispersal as a steady progressive march without reversals or retreats, but it is also the most parsimonious reading of the available Levantine MP geochronological and stratigraphic evidence. The Skhul/Qafzeh humans archaeological record indicates that the cultural capacities we treat as essential qualities of "humanness" evolved recently, and only among a

subset of morphologically modern-looking humans. As the late Steven Jay Gould (1985:198) put it, the human equality we take for granted today is actually a highly contingent outcome of our complex evolutionary history.

Tomasello 2012

Michael Tomasello, Alicia P. Melis, Claudio Tennie, Emily Wyman & Esther Herrmann, *Two Key Steps in the Evolution of Human Cooperation, The Interdependence Hypothesis*. Current Anthropology **53** (2012), 673–692.

Modern theories of the evolution of human cooperation focus mainly on altruism. In contrast, we propose that humans' species-unique forms of cooperation—as well as their species-unique forms of cognition, communication, and social life—all derive from mutualistic collaboration (with social selection against cheaters). In a first step, humans became obligate collaborative foragers such that individuals were interdependent with one another and so had a direct interest in the well-being of their partners. In this context, they evolved new skills and motivations for collaboration not possessed by other great apes (joint intentionality), and they helped their potential partners (and avoided cheaters). In a second step, these new collaborative skills and motivations were scaled up to group life in general, as modern humans faced competition from other groups. As part of this new group-mindedness, they created cultural conventions, norms, and institutions (all characterized by collective intentionality), with knowledge of a specific set of these marking individuals as members of a particular cultural group. Human cognition and sociality thus became ever more collaborative and altruistic as human individuals became ever more interdependent.

Biologie

Smith 2012

Jennifer E. Smith, Eli M. Swanson, Daphna Reed & Kay E. Holekamp, *Evolution of Cooperation among Mammalian Carnivores and Its Relevance to Hominin Evolution*. Current Anthropology **53** (2012), Supplement, S436–S452.

Anthropological theory suggests direct links between the origins of cooperation in hominins and a shift toward an energy-rich diet. Although the degree to which early hominins ate meat remains controversial, here we reevaluate the notion, originally suggested by Schaller and Lowther in 1969, that mammalian carnivores can shed light on human origins. Precisely when cooperation evolved in hominins or carnivores is unknown, but species from both groups cooperatively hunt large game, defend resources, guard against predators, and rear young. We present a large-scale comparative analysis of extant carnivore species, quantifying anatomical, ecological, and behavioral correlates of cooperation to determine whether metabolic rate, body and relative brain size, life history traits, and social cohesion coevolved with cooperation. We focus heavily on spotted hyenas, which live in more complex societies than other carnivores. Hyenas regularly join forces with kin and nonkin to hunt large antelope and to defend resources during intergroup conflicts and disputes with lions. Our synthesis highlights reduced sexual dimorphism, increased reproductive investment, high population density, fission-fusion dynamics, endurance hunting of big game in open habitats, and large brains as important correlates of cooperation among carnivores. We discuss the relevance of our findings to understanding the origins of cooperation in hominins.

Energie

Kharecha 2013

Pushker A. Kharecha & James E. Hansen, *Prevented Mortality and Greenhouse Gas Emissions from Historical and Projected Nuclear Power*. Environmental Science & Technology **47** (2013), 4889–4895.
EnvSciTec47-04889-Supplement1.pdf
In the aftermath of the March 2011 accident at Japan's Fukushima Daiichi nuclear power plant, the future contribution of nuclear power to the global energy supply has become somewhat uncertain. Because nuclear power is an abundant, low-carbon source of base-load power, it could make a large contribution to mitigation of global climate change and air pollution. Using historical production data, we calculate that global nuclear power has prevented an average of 1.84 million air pollution-related deaths and 64 gigatonnes of CO2-equivalent (GtCO2-eq) greenhouse gas (GHG) emissions that would have resulted from fossil fuel burning. On the basis of global projection data that take into account the effects of the Fukushima accident, we find that nuclear power could additionally prevent an average of 420 000-7.04 million deaths and 80-240 GtCO2-eq emissions due to fossil fuels by midcentury, depending on which fuel it replaces. By contrast, we assess that large-scale expansion of unconstrained natural gas use would not mitigate the climate problem and would cause far more deaths than expansion of nuclear power.

Grabung

Rust 1950

Alfred Rust, *Die Höhlenfunde von Jabrud (Syrien)*. Vor- und frühgeschichtliche Unters. a. d. schlesw.-holst. Museum vorg. Altertümer in Schleswig (Neue Folge) 8 (Neumünster 1950).

Isotope

Naito 2013

Yuichi I. Naito, Yoshito Chikaraishi, Naohiko Ohkouchi & Minoru Yoneda, *Evaluation of carnivory in inland Jomon hunter-gatherers based on nitrogen isotopic compositions of individual amino acids in bone collagen*. Journal of Archaeological Science **40** (2013), 2913–2923.
Archaeological studies including stable carbon and nitrogen isotope analyses of bone collagen from human remains have suggested their heavy dependence on terrestrial foods during the Jomon period in the inland central region in Japan. However, it is not easy to quantitatively evaluate the extent of carnivory for archaeological human remains based on the bulk collagen chemistry, because of variable 15N-enrichment factor along the trophic step and background isotopic variations in ecosystems. In order to overcome these problems and more precisely evaluate diets of prehistoric humans who strongly adapted to terrestrial environment, in this study we applied nitrogen isotope analysis of individual amino acids in bone collagen to two inland human populations in the Jomon period. Our results suggest that the two populations were predominantly dependent on the C3-plant-based terrestrial ecosystem and consumed little aquatic resources. Furthermore, their mean trophic positions (2.7 for both cases) are closer to that of the fox (2.8–3.0) rather than those of pure herbivores (2.0–2.2), and show little change

over time. These results are the first evidence that inland Jomon populations may have had more carnivorous diets than is traditionally considered.
Keywords: Amino acid | Nitrogen isotope | Ancient diet | Jomon | Trophic position

Klima

Hoffmann 2013

Sharon S. Hoffmann, Jerry F. McManus, William B. Curry & L. Susan Brown-Leger, *Persistent export of ^{231}Pa from the deep central Arctic Ocean over the past 35,000 years*. nature **497** (2013), 603–606.
n497-0603-Supplement1.pdf, n497-0603-Supplement2.xls
The Arctic Ocean has an important role in Earth's climate, both through surface processes1 such as sea-ice formation and transport, and through the production and export of waters at depth that contribute to the global thermohaline circulation2,3. Deciphering the deep Arctic Ocean's palaeo-oceanographic history is a crucial part of understanding its role in climatic change. Here we show that sedimentary ratios of the radionuclides thorium-230 (230Th) and protactinium-231 (231Pa), which are produced in sea water and removed by particle scavenging on timescales of decades to centuries, respectively4, record consistent evidence for the export of 231Pa from the deep Arctic and may indicate continuous deepwater exchange between the Arctic and Atlantic oceans throughout the past 35,000 years. Seven well-dated box-core records provide a comprehensive overview of 231Pa and 230Th burial in Arctic sediments during glacial, deglacial and interglacial conditions. Sedimentary 231Pa/230Th ratios decrease nearly linearly with increasing water depth above the core sites, indicating efficient particle scavenging in the upper water column and greater influence of removal by lateral transport at depth. Although the measured 230Th burial is in balance with itsproductioninArctic sea water, integrated depth profiles for all time intervals reveal a deficit in 231Pa burial that can be balanced only by lateral export in the water column. Because no enhanced sink for 231Pa has yet been found in the Arctic, our records suggest that deep-water exchange through the Fram strait may export 231Pa. Such exportmay have continued for the past 35,000 years, suggesting a century-scale replacement time for deep waters in the Arctic Ocean since the most recent glaciation and a persistent contribution of Arctic waters to the global ocean circulation.

Lachniet 2013

Matthew S. Lachniet, Yemane Asmerom, Juan Pablo Bernal, Victor J. Polyak & Lorenzo Vazquez-Selem, *Orbital pacing and ocean circulation-induced collapses of the Mesoamerican monsoon over the past 22,000 y*. PNAS **110** (2013), 9255–9260.
The dominant controls on global paleomonsoon strength include summer insolation driven by precession cycles, ocean circulation through its influence on atmospheric circulation, and sea-surface temperatures. However, few records from the summer North American Monsoon system are available to test for a synchronous response with other global monsoons to shared forcings. In particular, the monsoon response to widespread atmospheric reorganizations associated with disruptions of the Atlantic Meridional Overturning Circulation (AMOC) during the deglacial period remains unconstrained. Here, we present a high-resolution and radiometrically dated monsoon rainfall reconstruction over the past 22,000 y from speleothems of tropical southwestern Mexico. The data document an active Last Glacial Maximum (18–24 cal ka B.P.) monsoon with similar d18O values to the modern, and that the monsoon collapsed during periods of weakened AMOC during Heinrich

stadial 1 (ca. 17 ka) and the Younger Dryas (12.9–11.5 ka). The Holocene was marked by a trend to a weaker monsoon that was paced by orbital insolation. We conclude that the Mesoamerican monsoon responded in concert with other global monsoon regions, and that monsoon strength was driven by variations in the strength and latitudinal position of the Intertropical Convergence Zone, which was forced by AMOC variations in the North Atlantic Ocean. The surprising observation of an active Last Glacial Maximum monsoon is attributed to an active but shallow AMOC and proximity to the Intertropical Convergence Zone. The emergence of agriculture in southwestern Mexico was likely only possible after monsoon strengthening in the Early Holocene at ca. 11 ka.
stalagmite | paleoclimatology | plant domestication | cave | Sierra Madre del Sur

Sistla 2013

Seeta A. Sistla, John C. Moore, Rodney T. Simpson, Laura Gough, Gaius R. Shaver & Joshua P. Schimel, *Long-term warming restructures Arctic tundra without changing net soil carbon storage*. nature **497** (2013), 615–618.

n497-0615-Supplement1.pdf

High latitudes contain nearly half of global soil carbon, prompting interest in understanding how the Arctic terrestrial carbon balance will respond to rising temperatures1,2. Low temperatures suppress the activity of soil biota, retarding decomposition and nitrogen release, which limits plant and microbial growth3. Warming initially accelerates decomposition4–6, increasing nitrogen availability, productivity and woody-plant dominance3,7. However, these responses may be transitory, because coupled abiotic–biotic feedback loops that alter soil-temperature dynamics and change the structure and activity of soil communities, can develop8,9. Here we report the results of a two-decade summer warming experiment in an Alaskan tundra ecosystem. Warming increased plant biomass and woody dominance, indirectly increased winter soil temperature, homogenized the soil trophic structure across horizons and suppressed surface-soil-decomposer activity, but did not change total soil carbon or nitrogen stocks, thereby increasing net ecosystem carbon storage. Notably, the strongest effects were in the mineral horizon, where warming increased decomposer activity and carbon stock: a 'biotic awakening' at depth.

Wittke 2013

James H. Wittke et al., *Evidence for deposition of 10 million tonnes of impact spherules across four continents 12,800 y ago*. PNAS **110** (2013), E2088–E2097.

pnas110-E2088-Supplement.pdf

James H. Wittke, James C. Weaver, Ted E. Bunch, James P. Kennett, Douglas J. Kennett, Andrew M. T. Moore, Gordon C. Hillman, Kenneth B. Tankersley, Albert C. Goodyear, Christopher R. Moore, I. Randolph Danie, Jr., Jack H. Ray, Neal H. Lopinot, David Ferraro, Isabel Israde-Alcántara, James L. Bischoff, Paul S. DeCarli, Robert E. Hermes, Johan B. Kloosterman, Zsolt Revay, George A. Howard, David R. Kimbel, Gunther Kletetschka, Ladislav Nabelek, Carl P. Lipo, Sachiko Sakai, Allen West & Richard B. Firestone

Airbursts/impacts by a fragmented comet or asteroid have been proposed at the Younger Dryas onset (12.80 ± 0.15 ka) based on identification of an assemblage of impact-related proxies, including microspherules, nanodiamonds, and iridium. Distributed across four continents at the Younger Dryas boundary (YDB), spherule peaks have been independently confirmed in eight studies, but unconfirmed in two

others, resulting in continued dispute about their occurrence, distribution, and origin. To further address this dispute and better identify YDB spherules, we present results from one of the largest spherule investigations ever undertaken regarding spherule geochemistry, morphologies, origins, and processes of formation. We investigated 18 sites across North America, Europe, and the Middle East, performing nearly 700 analyses on spherules using energy dispersive X-ray spectroscopy for geochemical analyses and scanning electron microscopy for surface microstructural characterization. Twelve locations rank among the world's premier end-Pleistocene archaeological sites, where the YDB marks a hiatus in human occupation or major changes in site use. Our results are consistent with melting of sediments to temperatures >2,200 °C by the thermal radiation and air shocks produced by passage of an extraterrestrial object through the atmosphere; they are inconsistent with volcanic, cosmic, anthropogenic, lightning, or authigenic sources. We also produced spherules from wood in the laboratory at >1,730 °C, indicating that impact-related incineration of biomass may have contributed to spherule production. At 12.8 ka, an estimated 10 million tonnes of spherules were distributed across ≈50 million square kilometers, similar to well-known impact strewn fields and consistent with a major cosmic impact event.
Clovis–Folsom | lechatelierite | tektite | wildfires

Methoden

Shea 2011

John J. Shea, *Stone Tool Analysis and Human Origins Research*, *Some Advice from Uncle Screwtape*. Evolutionary Anthropology **20** (2011), 48–53.

The production of purposefully fractured stone tools with functional, sharp cutting edges is a uniquely derived hominin adaptation. In the long history of life on earth, only hominins have adopted this remarkably expedient and broadly effective technological strategy. In the paleontological record, flaked stone tools are irrefutable proof that hominins were present at a particular place and time. Flaked stone tools are found in contexts ranging from the Arctic to equatorial rainforests and on every continent except Antarctica. Paleolithic stone tools show complex patterns of variability, suggesting that they have been subject to the variable selective pressures that have shaped so many other aspects of hominin behavior and morphology. There is every reason to expect that insights gained from studying stone tools should provide vital and important information about the course of human evolution. And yet, one senses that archeological analyses of Paleolithic stone tools are not making as much of a contribution as they could to the major issues in human origins research.

Shea 2013

John J. Shea, *Lithic Modes A–I: A New Framework for Describing Global-Scale Variation in Stone Tool Technology Illustrated with Evidence from the East Mediterranean Levant*. Journal of Archaeological Method and Theory **20** (2013), 151–186.

Grahame Clark's framework for describing stone tool assemblages in terms of five technological "modes" enjoys wide use in European, African, and Asian prehistory. With greater usage and increases in the global archaeological database for prehistory, problems and weaknesses of Clark's framework have become apparent. This paper reviews these problems and proposes an updated framework, modes A–I, for describing variability in stone tool production strategies. The value of this new

framework for prehistory is illustrated using data from the East Mediterranean Levant.
Keywords: Prehistory | Lithic Technology | Modes | Stone Tools | Levant

Story or Book

Holyoak 2013

Keith J. Holyoak, *Thinking, Broad and Deep*. science **340** (2013), 550–551.

Surfaces and Essences, Analogy as the Fuel and Fire of Thinking. by Douglas Hofstadter and Emmanuel Sander. Basic Books, New York, 2013. 592 pp. $35, C$38. ISBN 9780465018475.

Kiser 2013

Barbara Kiser, *The Mystery of the Hanging Garden of Babylon*. nature **497** (2013), 563.

The Mystery of the Hanging Garden of Babylon: An Elusive World Wonder Traced. Stephanie Dalley. OXFORD UNIVERSITY PRESS 304 pp. £25 (2013)

The puzzling dearth of research on Babylon's Hanging Garden, one of the seven wonders of the ancient world, prompted Assyriologist Stephanie Dalley to methodically sift the evidence. Her perusal of cuneiform tablets, rock reliefs and Latin texts yielded research gold, overturning long-held ideas about the creator and location of this vertiginous marvel. From its fantastical landscaping to its advanced irrigation system, the garden emerges as a wonder indeed — of engineering, aesthetics and metaphoric richness.

Kiser 2013

Barbara Kiser, *Denial, Self-Deception, False Beliefs, and the Origins of the Human Mind*. nature **497** (2013), 563.

Denial: Self-Deception, False Beliefs, and the Origins of the Human Mind. Ajit Varki and Danny Brower. TWELVE 384 pp. $27 (2013)

Do you skydive? Deep-fry? Chain-smoke? Denial of mortality is a strange trait that is also key to human nature, argues medic Ajit Varki. His argument stems from the ideas of late geneticist Danny Brower, who asked why species such as chimpanzees have not evolved to be aware of both self and the minds of others. Varki speculates that such intersubjectivity could only arise in tandem with 'death blindness', as fear would otherwise hamstring a species' fitness. A thoughtful foray into "mind over reality".