Liste erstellt am 2012-12-09

Literatur

Aktuell

Lourenco 2012

Stella F. Lourenco, Justin W. Bonn, Edmund P. Fernande & Sonia Ra, *Nonsymbolic number and cumulative area representations contribute shared and unique variance to symbolic math competence*. PNAS **109** (2012), 18737–18742.

Humans and nonhuman animals share the capacity to estimate, without counting, the number of objects in a set by relying on an approximate number system (ANS). Only humans, however, learn the concepts and operations of symbolic mathematics. Despite vast differences between these two systems of quantification, neural and behavioral findings suggest functional connections. Another line of research suggests that the ANS is part of a larger, more general system of magnitude representation. Reports of cognitive interactions and common neural coding for number and other magnitudes such as spatial extent led us to ask whether, and how, nonnumerical magnitude interfaces with mathematical competence. On two magnitude comparison tasks, college students estimated (without counting or explicit calculation) which of two arrays was greater in number or cumulative area. They also completed a battery of standardized math tests. Individual differences in both number and cumulative area precision (measured by accuracy on the magnitude comparison tasks) correlated with interindividual variability in math competence, particularly advanced arithmetic and geometry, even after accounting for general aspects of intelligence. Moreover, analyses revealed that whereas number precision contributed unique variance to advanced arithmetic, cumulative area precision contributed unique variance to geometry. Taken together, these results provide evidence for shared and unique contributions of nonsymbolic number and cumulative area representations to formally taught mathematics. More broadly, they suggest that uniquely human branches of mathematics interface with an evolutionarily primitive general magnitude system, which includes partially overlapping representations of numerical and nonnumerical magnitude.
analog magnitude | Weber's law | estimation | nonsymbolic magnitude precision | mathematical cognition

Skottun 2012

Bernt C. Skottun & John R. Skoyles, *Interletter spacing and dyslexia*. PNAS **109** (2012), E2958.

Although this reduction was much smaller than for the dyslexic groups, this could be due to a floor effect. In support of this possibility is the fact that the controls make substantially fewer errors than the dyslexic subjects in the normal condition, resulting in them having less room for a decrease.
A similar argument can be made in regard to reading speed and a ceiling effect. It is thus possible that the influence of increased interletter spacing is similar in the two groups but that the effect is different due to the fact that the two groups start out from different levels of reading performance. In such a case, the larger benefit gained by the dyslexic readers from large interletter spacing would be secondary to them being poor readers rather than to a dyslexia-specific crowding impairment.

Zorzi 2012

Marco Zorzi, Chiara Barbiero, Andrea Facoetti & Johannes C. Ziegler, *Statistical and practical significance of extra-wide letter spacing for dyslexic children, Reply to Skottun and Skoyles.* PNAS **109** (2012), E2959.

In conclusion, it strikes us as rather unfortunate that Skottun and Skoyles focus on statistical significance (which is not an issue in the present study because all critical results are significant) rather than practical significance. Statistical significance asks whether differences between two sample means are unlikely to have occurred by chance. In contrast, practical significance asks whether these differences are big enough to have real meaning. Not only does the spacing benefit have real meaning for a dyslexic child, but the ease with which letter spacing can be manipulated in clinical and daily life settings, together with the potential benefits for an individual child, highlights the practical and clinical significance of the letter spacing effect.

Amerika

Masson 2012

Marilyn A. Masson, *Maya collapse cycles.* PNAS **109** (2012), 18237–18238.

Anthropologie

Brown 2012

Kyle S. Brown et al., *An early and enduring advanced technology originating 71,000 years ago in South Africa.* nature **491** (2012), 590–593.

n491-0590-Supplement1.pdf

Kyle S. Brown, Curtis W. Marean, Zenobia Jacobs, Benjamin J. Schoville, Simen Oestmo, Erich C. Fisher, Jocelyn Bernatchez, Panagiotis Karkanas & Thalassa Matthews

There is consensus that the modern human lineage appeared in Africa before 100,000 years ago1,2. But there is debate as to when cultural and cognitive characteristics typical of modern humans first appeared, and the role that these had in the expansion of modern humans out of Africa3. Scientists rely on symbolically specific proxies, such as artistic expression, to document the origins of complex cognition. Advanced technologies with elaborate chains of production are also proxies, as these often demand highfidelity transmission and thus language. Some argue that advanced technologies in Africa appear and disappear and thus do not indicate complex cognition exclusive to early modern humans in Africa3,4. The origins of composite tools and advanced projectile weapons figure prominently in modern human evolution research, and the latter have been argued to have been in the exclusive possession of modern humans5,6. Here we describe a previously unrecognized advanced stone tool technology from Pinnacle Point Site 5–6 on the south coast of South Africa, originating approximately 71,000 years ago. This technology is dominated by the production of small bladelets (microliths) primarily from heat-treated stone. There is agreement that microlithic technology was used to create composite tool components aspart of advanced projectile weapons7,8. Microlithswere common worldwide by themid-Holocene epoch, but have a patchy pattern of first appearance that is rarely earlier than 40,000 years ago9,10, and

were thought to appear briefly between 65,000 and 60,000 years ago in South Africa and then disappear. Our research extends this record to 71,000 years, shows thatmicrolithic technology originated early in South Africa, evolved over a vast time span (11,000 years), and was typically coupled to complex heat treatment that persisted for nearly 100,000 years. Advanced technologies in Africa were early and enduring; a small sample of excavated sites in Africa is the best explanation for any perceived 'flickering' pattern.

Burger 2012

Oskar Burger, Annette Baudisch & James W. Vaupel, *Human mortality improvement in evolutionary context*. PNAS **109** (2012), 18210–18214.

Life expectancy is increasing in most countries and has exceeded 80 in several, as low-mortality nations continue to make progress in averting deaths. The health and economic implications of mortality reduction have been given substantial attention, but the observed malleability of human mortality has not been placed in a broad evolutionary context. We quantify the rate and amount of mortality reduction by comparing a variety of human populations to the evolved human mortality profile, here estimated as the average mortality pattern for ethnographically observed hunter-gatherers. We show that human mortality has decreased so substantially that the difference between hunter-gatherers and today's lowest mortality populations is greater than the difference between hunter gatherers and wild chimpanzees. The bulk of this mortality reduction has occurred since 1900 and has been experienced by only about 4 of the roughly 8,000 human generations that have ever lived. Moreover, mortality improvement in humans is on par with or greater than the reductions in mortality in other species achieved by laboratory selection experiments and endocrine pathway mutations. This observed plasticity in age-specific risk of death is at odds with conventional theories of aging. biodemography | cross-species comparison | life history evolution | phenotypic plasticity | human lifespan

Green 2012

David J. Green & Zeresenay Alemseged, *Australopithecus afarensis Scapular Ontogeny, Function, and the Role of Climbing in Human Evolution*. science **338** (2012), 514–517.

s338-0514-Supplement.pdf

Scapular morphology is predictive of locomotor adaptations among primates, but this skeletal element is scarce in the hominin fossil record. Notably, both scapulae of the juvenile Australopithecus afarensis skeleton from Dikika, Ethiopia, have been recovered. These scapulae display several traits characteristic of suspensory apes, as do the few known fragmentary adult australopith representatives. Many of these traits change significantly throughout modern human ontogeny, but remain stable in apes. Thus, the similarity of juvenile and adult fossil morphologies implies that A. afarensis development was apelike. Additionally, changes in other scapular traits throughout African ape development are associated with shifts in locomotor behavior. This affirms the functional relevance of those characteristics, and their presence in australopith fossils supports the hypothesis that their locomotor repertoire included a substantial amount of climbing.

Henn 2012

Brenna M. Henn, L. L. Cavalli-Sforza & Marcus W. Feldman, *The great human expansion*. PNAS **109** (2012), 17758–17764.

Genetic and paleoanthropological evidence is in accord that today's human population is the result of a great demic (demographic and geographic) expansion that began approximately 45,000 to 60,000 y ago in Africa and rapidly resulted in human occupation of almost all of the Earth's habitable regions. Genomic data from contemporary humans suggest that this expansion was accompanied by a continuous loss of genetic diversity, a result of what is called the "serial founder effect." In addition to genomic data, the serial founder effect model is now supported by the genetics of human parasites, morphology, and linguistics. This particular population history gave rise to the two defining features of genetic variation in humans: genomes from the substructured populations of Africa retain an exceptional number of unique variants, and there is a dramatic reduction in genetic diversity within populations living outside of Africa. These two patterns are relevant for medical genetic studies mapping genotypes to phenotypes and for inferring the power of natural selection in human history. It should be appreciated that the initial expansion and subsequent serial founder effect were determined by demographic and sociocultural factors associated with hunter-gatherer populations. How do we reconcile this major demic expansion with the population stability that followed for thousands years until the inventions of agriculture? We review advances in understanding the genetic diversity within Africa and the great human expansion out of Africa and offer hypotheses that can help to establish a more synthetic view of modern human evolution.
human population growth | hunter-gatherer demography | molecular evolution

Larson 2012

Susan Larson, *Did Australopiths Climb Trees?* science **338** (2012), 478–479.

The shoulder bones of a juvenile australopith resemble those of extant apes, suggesting that tree climbing continued to be important for these bipedal early human ancestors.

McBrearty 2012

Sally McBrearty, *Sharpening the mind.* nature **491** (2012), 531–532.

The discovery of stone tools dating to 71,000 years ago at a site in South Africa suggests that the humans making them had developed the capacity for complex thought, and passed this knowledge down the generations.
Brown and colleagues' study may also help us to understand other aspects of the development and spread of modern humans. Users of the bow and arrow have a significant advantage over people limited to handdelivered weapons in both hunting and interpersonal conflict. Human populations are thought to have started migrating from Africa shortly after 100 kyr ago. If they were armed with the bow and arrow, they would have been more than a match for anything or anyone they met.

Simmons 2012

Alan Simmons, *Mediterranean Island Voyages.* science **338** (2012), 895–897.

Archaeological studies show that humans reached Mediterranean islands much earlier than previously thought.
Recent studies are beginning to provide better evidence for exceedingly ancient human occupations. On Crete, for example, artifacts that include quartz hand axes, trihedral picks, and cleavers have been interpreted as Lower Paleolithic, based on their typology and association with geological deposits that may date to ≈170,000 years ago. Research on the southern Ionian islands suggests a human presence as

early as ≈110,000 years ago; these islands are closer to the mainland than Crete is, but geological evidence indicates that they were not connected to the mainland. The implications of these findings are substantial, since the hominins responsible wo
uld be either Neanderthals or perhaps even Homo erectus.

Wilkins 2012

Jayne Wilkins, Benjamin J. Schoville, Kyle S. Brown & Michael Chazan, *Evidence for Early Hafted Hunting Technology*. science **338** (2012), 942–946.

s338-0942-Supplement.pdf

Hafting stone points to spears was an important advance in weaponry for early humans. Multiple lines of evidence indicate that ≈500,000-year-old stone points from the archaeological site of Kathu Pan 1 (KP1), South Africa, functioned as spear tips. KP1 points exhibit fracture types diagnostic of impact. Modification near the base of some points is consistent with hafting. Experimental and metric data indicate that the points could function well as spear tips. Shape analysis demonstrates that the smaller retouched points are as symmetrical as larger retouched points, which fits expectations for spear tips. The distribution of edge damage is similar to that in an experimental sample of spear tips and is inconsistent with expectations for cutting or scraping tools. Thus, early humans were manufacturing hafted multicomponent tools ≈200,000 years earlier than previously thought.

Biologie

Byers 2012

John Byers & Stacey Dunn, *Bateman in Nature: Predation on Offspring Reduces the Potential for Sexual Selection*. science **338** (2012), 802–804.

s338-0802-Supplement.pdf

Sexual selection is driven by competition for mates, and the advantage of a competitor is determined by the number of offspring it produces. Early experiments by Angus Bateman characterized this interaction, and the quantitative relationship between a male's number of mates and number of offspring is known as the Bateman slope. Sexual dimorphism, one of the most obvious results of sexual selection, largely requires a positive Bateman relationship, and the slope provides an estimate of the potential for sexual selection. However, natural selection from the environment can also influence male success, as can random effects, and some have argued for inclusion of the latter in calculations of mate success. Data from pronghorn (Antilocapra americana) reveal the presence of a positive Bateman slope in each year of a 10-year study. We found no evidence that random effects skewed male mating success; however, substantial yearly variation in the Bateman slope due to predation on fawns was evident. These results support the validity of the Bateman relationship, yet they also demonstrate that environmental or extrinsic influences can limit the potential for sexual selection.

Nadell 2012

Carey D. Nadell & Kevin R. Foster, *Mutually helping microbes can evolve by hitchhiking*. PNAS **109** (2012), 19037–19038.

Although the ability to hitchhike with beneficial mutations is certainly not unique to cooperative phenotypes, it may be especially important for cooperation. This is

because the spread of an advantageous mutation also reduces genetic variability in the local patch, which is very good for the spread of cooperative phenotypes. The result is that local patches will tend to have cooperative phenotypes or cheater phenotypes, but not both.

Wade 2012

Michael J. Wade, *Constraints on Sexual Selection*. science **338** (2012), 749–750.

Sexual selection in pronghorns is determined both by variance in mate numbers among males and by viability of the young.

Waite 2012

Adam James Waite & Wenying Shou, *Adaptation to a new environment allows cooperators to purge cheaters stochastically*. PNAS **109** (2012), 19079–19086.

pnas109-19079-Supplement1.xls

Cooperation via production of common goods is found in diverse life forms ranging from viruses to social animals. However, natural selection predicts a "tragedy of the commons": Cheaters, benefiting from without producing costly common goods, are more fit than cooperators and should destroy cooperation. In an attempt to discover novel mechanisms of cheater control, we eliminated known ones using a yeast cooperator–cheater system engineered to supply or exploit essential nutrients. Surprisingly, although less fit than cheaters, cooperators quickly dominated a fraction of cocultures. Cooperators isolated from these cocultures were superior to the cheater isolates they had been cocultured with, even though these cheaters were superior to ancestral cooperators. Resequencing and phenotypic analyses revealed that evolved cooperators and cheaters all harbored mutations adaptive to the nutrient-limited cooperative environment, allowing growth at a much lower concentration of nutrient than their ancestors. Even after the initial round of adaptation, evolved cooperators still stochastically dominated cheaters derived from them. We propose the "adaptive race" model: If during adaptation to an environment, the fitness gain of cooperators exceeds that of cheaters by at least the fitness cost of cooperation, the tragedy of the commons can be averted. Although cooperators and cheaters sample from the same pool of adaptive mutations, this symmetry is soon broken: The best cooperators purge cheaters and continue to grow, whereas the best cheaters cause rapid self-extinction. We speculate that adaptation to changing environments may contribute to the persistence of cooperative systems before the appearance of more sophisticated mechanisms of cheater control.

evolution of cooperation and cheating | experimental evolution | genetic hitchhiking | synthetic biology

Datierung

Hublin 2012

Jean-Jacques Hublin et al., *Radiocarbon dates from the Grotte du Renne and Saint-Césaire support a Neandertal origin for the Châtelperronian*. PNAS **109** (2012), 18743–18748.

pnas109-18743-Supplement1.xls, pnas109-18743-Supplement2.xls

Jean-Jacques Hublin, Sahra Talamo, Michèle Julien, Francine David, Nelly Connet, Pierre Bodu, Bernard Vandermeersch and Michael P. Richards

The transition from the Middle Paleolithic (MP) to Upper Paleolithic (UP) is marked by the replacement of late Neandertals by modern humans in Europe between

50,000 and 40,000 y ago. Châtelperronian (CP) artifact assemblages found in central France and northern Spain date to this time period. So far, it is the only such assemblage type that has yielded Neandertal remains directly associated with UP style artifacts. CP assemblages also include body ornaments, otherwise virtually unknown in the Neandertal world. However, it has been argued that instead of the CP being manufactured by Neandertals, site formation processes and layer admixture resulted in the chance association of Neanderthal remains, CP assemblages, and body ornaments. Here, we report a series of accelerator mass spectrometry radiocarbon dates on ultrafiltered bone collagen extracted from 40 well-preserved bone fragments from the late Mousterian, CP, and Protoaurignacian layers at the Grotte du Renne site (at Arcy-sur-Cure, France). Our radiocarbon results are inconsistent with the admixture hypothesis. Further, we report a direct date on the Neandertal CP skeleton from Saint-Césaire (France). This date corroborates the assignment of CP assemblages to the latest Neandertals of western Europe. Importantly, our results establish that the production of body ornaments in the CP postdates the arrival of modern humans in neighboring regions of Europe. This new behavior could therefore have been the result of cultural diffusion from modern to Neandertal groups.
stimulus diffusion | cultural modernity

Storey 2012

Michael Storey, Richard G. Roberts & Mokhtar Saidin, *Astronomically calibrated $^{40}Ar/^{39}Ar$ age for the Toba supereruption and global synchronization of late Quaternary records.* PNAS **109** (2012), 18684–18688.

pnas109-18684-Supplement1.xls, pnas109-18684-Supplement2.xls
The Toba supereruption in Sumatra, ≈74 thousand years (ka) ago, was the largest terrestrial volcanic event of the Quaternary. Ash and sulfate aerosols were deposited in both hemispheres, forming a time-marker horizon that can be used to synchronize late Quaternary records globally. A precise numerical age for this event has proved elusive, with dating uncertainties larger than the millennialscale climate cycles that characterized this period. We report an astronomically calibrated 40Ar/39Ar age of 73.88 ± 0.32 ka (1σ, full external errors) for sanidine crystals extracted from Toba deposits in the Lenggong Valley, Malaysia, 350 km from the eruption source and 6 km from an archaeological site with stone artifacts buried by ash. If these artifacts were made by Homo sapiens, as has been suggested, then our age indicates that modern humans had reached Southeast Asia by ≈74 ka ago. Our 40Ar/39Ar age is an order-of-magnitude more precise than previous estimates, resolving the timing of the eruption to the middle of the cold interval between Dansgaard-Oeschger events 20 and 19, when a peak in sulfate concentration occurred as registered by Greenland ice cores. This peak is followed by a ≈10 °C drop in the Greenland surface temperature over ≈150 y, revealing the possible climatic impact of the eruption. Our 40Ar/39Ar age also provides a high-precision calibration point for other ice, marine, and terrestrial archives containing Toba sulfates and ash, facilitating their global synchronization at unprecedented resolution for a critical period in Earth and human history beyond the range of 14C dating.
geochronology | ice core timescale | paleoclimate | volcanic ash | human dispersal

Grundlagen

Hildebrandt 2012

William R. Hildebrandt & Jerome H. King, *Distinguishing between*

darts and arrows in the archaeological record: Implications for technological change in the American West. American Antiquity **77** (2012), 789–799.

We propose a new method for differentiating archaeological atlatl darts from arrow points. Our dart-arrow index accurately distinguishes known (hafted) archaeological examples of darts and arrows. We find that ethnographic collections of hafted arrows used by previous researchers are problematic, and should not be used as control samples for differentiating darts from arrows. We use the dart-arrow index to reassess the projectile points described by Ames et al. (2010). The analysis shows that Hatwai Eared (4400–2800 B.P.) and Cascade (8500–4500 B.P.) points were darts, not arrows as Ames et al. argue, and that a major revision of the history of bow-and-arrow technology in western North America is unnecessary.

Lipo 2012

Carl P. Lipo, Robert C. Dunnell, Michael J. O'Brien, Veronica Harper & John Dudgeon, *Beveled projectile points and ballistics technology*. American Antiquity **77** (2012), 774–788.

Explanations for beveled blade edges on projectile points have been debated in North America archaeology since the first systematic description of lithic assemblages in the nineteenth century. Debate has centered around two opposing perspectives. One views beveled edges as features of projectile points that cause them to spin during flight. The other views beveling as a product of edge resharpening that is done unifacially to conserve scarce resources. Here we use a fluid-dynamics model to simulate the effect beveling has on projectiles. Expectations derived from this modeling are evaluated using windtunnel experiments. Our findings indicate that beveling produces in-flight rotation that serves as a means of increasing accuracy in relatively low-velocity flight paths.

Surovell 2012

Todd A. Surovell & Brigid S. Grund, *The associational critique of Quaternary overkill and why it is largely irrelevant to the extinction debate*. American Antiquity **77** (2012), 672–687.

The overkill hypothesis has been criticized using a simple observation— with the exception of New Zealand, there is little evidence for human hunting of extinct Quaternary faunas. We explore the legitimacy of this argument, or what we call the "Associational Critique," the idea that the paucity of evidence for the subsistence exploitation of extinct taxa weakens or falsifies overkill. Using quantitative and probabilistic models, based on the temporal depth of extinction events, human demography, and taphonomic bias, we ask how many associations with extinct fauna should have been found by this point in time in Australia, North America, and New Zealand. We conclude that such evidence should be rare in Australia, of intermediate abundance in North America, and common in New Zealand, a conclusion very much in accord with the current state of the archaeological record. We reach a similar conclusion using an analysis of the relative frequency of radiocarbon dates from each region dating to the time of coexistence of humans and extinct fauna. We argue that a scarcity of evidence for the exploitation of extinct fauna is not only consistent with overkill but also nearly every other extinction hypothesis that has been proposed, thus rendering the Associational Critique irrelevant.

Klima

Grant 2012

K. M. Grant et al., *Rapid coupling between ice volume and polar temperature over the past 150,000 years*. nature **491** (2012), 744–747.

n491-0744-Supplement1.pdf, n491-0744-Supplement2.xls

K. M. Grant, E. J. Rohling, M. Bar-Matthews, A. Ayalon, M. Medina-Elizalde, C. Bronk Ramsey, C. Satow & A. P. Roberts

Current global warming necessitates a detailed understanding of the relationships between climate and global ice volume. Highly resolved and continuous sea-level records are essential for quantifying ice-volumechanges.However, an unbiased study of the timing of past ice-volume changes, relative to polar climate change, has so far been impossible because available sea-level records either were dated by using orbital tuning or ice-core timescales, or were discontinuous in time. Here we present an independent dating of a continuous, high-resolution sea-level record1,2 in millennial-scale detail throughout the past 150,000 years. We find that the timing of ice-volume fluctuations agrees well with that of variations in Antarctic climate and especially Greenland climate.Amplitudes of ice-volumefluctuations more closely match Antarctic (rather than Greenland) climate changes. Polar climate and ice-volume changes, and their rates of change, are found to covary within centennial response times. Finally, rates of sea-level rise reached at least 1.2mper century during all major episodes of ice-volume reduction.

Kennett 2012

Douglas J. Kennett et al., *Development and Disintegration of Maya Political Systems in Response to Climate Change*. science **338** (2012), 788–791.

s338-0788-Supplement.pdf

Douglas J. Kennett, Sebastian F. M. Breitenbach, Valorie V. Aquino, Yemane Asmerom, Jaime Awe, James U. L. Baldini, Patrick Bartlein, Brendan J. Culleton, Claire Ebert, Christopher Jazwa, Martha J. Macri, Norbert Marwan, Victor Polyak, Keith M. Prufer, Harriet E. Ridley, Harald Sodemann, Bruce Winterhalder & Gerald H. Haug

The role of climate change in the development and demise of Classic Maya civilization (300 to 1000 C.E.) remains controversial because of the absence of well-dated climate and archaeological sequences. We present a precisely dated subannual climate record for the past 2000 years from Yok Balum Cave, Belize. From comparison of this record with historical events compiled from well-dated stone monuments, we propose that anomalously high rainfall favored unprecedented population expansion and the proliferation of political centers between 440 and 660 C.E. This was followed by a drying trend between 660 and 1000 C.E. that triggered the balkanization of polities, increased warfare, and the asynchronous disintegration of polities, followed by population collapse in the context of an extended drought between 1020 and 1100 C.E.

LeCompte 2012

Malcolm A. LeCompte et al., *Independent evaluation of conflicting microspherule*. PNAS **109** (2012), 17738–17739.

pnas109-17738-Fulltext.pdf, pnas109-17738-Supplement1.pdf

Malcolm A. LeCompte, Albert C. Goodyear, Mark N. Demitroff, Dale Batchelor, Edward K. Vogel, Charles Mooney, Barrett N. Rock and Alfred W. Seidel

Firestone et al. sampled sedimentary sequences at many sites across North America, Europe, and Asia [Firestone RB, et al. (2007) Proc Natl Acad Sci USA

106:16016–16021]. In sediments dated to the Younger Dryas onset or Boundary (YDB) approximately 12,900 calendar years ago, Firestone et al. reported discovery of markers, including nanodiamonds, aciniform soot, high-temperature meltglass, and magnetic microspherules attributed to cosmic impacts/ airbursts. The microspherules were explained as either cosmic material ablation or terrestrial ejecta from a hypothesized North American impact that initiated the abrupt Younger Dryas cooling, contributed to megafaunal extinctions, and triggered human cultural shifts and population declines. A number of independent groups have confirmed the presence of YDB spherules, but two have not. One of them [Surovell TA, et al. (2009) Proc Natl Acad Sci USA 104:18155–18158] collected and analyzed samples from seven YDB sites, purportedly using the same protocol as Firestone et al., but did not find a single spherule in YDB sediments at two previously reported sites. To examine this discrepancy, we conducted an independent blind investigation of two sites common to both studies, and a third site investigated only by Surovell et al. We found abundant YDB microspherules at all three widely separated sites consistent with the results of Firestone et al. and conclude that the analytical protocol employed by Surovell et al. deviated significantly from that of Firestone et al. Morphological and geochemical analyses of YDB spherules suggest they are not cosmic, volcanic, authigenic, or anthropogenic in origin. Instead, they appear to have formed from abrupt melting and quenching of terrestrial materials.
comet | microtektites | Clovis

Pringle 2012

Heather Pringle, *Did Pulses of Climate Change Drive The Rise and Fall of the Maya?* science **338** (2012), 730–731.
The high-resolution paleoclimate record is "an amazing accomplishment," says archaeologist Arlen Chase of the University of Central Florida, Orlando, who was not involved in the project. But he thinks that more climate records are still needed, because the study probably underestimates the amount of microclimatic variation in the Maya heartland. Climate at the Yok Balum site could well have been different from that at, say, Caracol, on the other side of the Maya Mountains. And at the time of collapse, some Maya migrated to a much drier region, the northern Yucatán—an odd move if drought was a driver, notes archaeologist Andrew Scherer of Brown University. He adds that although the authors suggest that less rainfall meant meager harvests, that link has yet to be established. Corn, the chief crop, requires only 400 to 600 millimeters of precipitation, and a broad swath of the Maya heartland now receives between 2000 and 3000 millimeters of rainfall annually. So if precipitation dropped 40 % in the 9th century—as another study has estimated—the change might not have seriously impacted food supplies in some areas, he says. "To suggest that a drop in rainfall will lead to agricultural failure is something we don't know," Scherer says.

Kultur

Brentjes 1991

Burchhard Brentjes, *Bergbau im Altertum, Einige Grundzüge und Tendenzen.* Das Altertum **37** (1991), 133–139.

Grünert 1991

Heinz Grünert, *Vom allgemeinen Äquivalent zum Münzgeld.* Das Altertum **37** (1991), 5–13.

Jonas 1991
Peter Jonas & Sylvia Wendt, *Maße und Gewichte der Industal-Kultur*. Das Altertum **37** (1991), 14–20.

Shah 2012
Anuj K. Shah, Sendhil Mullainathan & Eldar Shafir, *Some Consequences of Having Too Little*. science **338** (2012), 682–685.
s338-0682-Supplement.pdf
Poor individuals often engage in behaviors, such as excessive borrowing, that reinforce the conditions of poverty. Some explanations for these behaviors focus on personality traits of the poor. Others emphasize environmental factors such as housing or financial access. We instead consider how certain behaviors stem simply from having less. We suggest that scarcity changes how people allocate attention: It leads them to engage more deeply in some problems while neglecting others. Across several experiments, we show that scarcity leads to attentional shifts that can help to explain behaviors such as overborrowing. We discuss how this mechanism might also explain other puzzles of poverty.

Zwane 2012
Alix Peterson Zwane, *Implications of Scarcity*. science **338** (2012), 617–618.
The concept of scarcity helps to understand and aid decision-making, particularly in the case of very poor people.
This is an important area for further exploration because it implies that seemingly paternalistic policies, or expenditures that change outcomes relative to what would be chosen independently, may help people to arrive at outcomes that they would themselves choose in the absence of scarcity.

Kupfer

Weisgerber 1991
Gerd Weisgerber, *Die Suche nach dem altsumerischen Kupferland Makan*. Das Altertum **37** (1991), 76–90.

Mathematik

Fort 2012
Joaquim Fort, *Synthesis between demic and cultural diffusion in the Neolithic transition in Europe*. PNAS **109** (2012), 18669–18673.

Neolithikum

Rollefson 1992
Gary O. Rollefson, Alan H. Simmons & Zeidan Kafafi, *Neolithic Cultures at 'Ain Ghazal, Jordan*. Journal of Field Archaeology **19** (1992), 443–470.
Six seasons of excavations between 1982 and 1989 at the Neolithic site of 'Ain Ghazal in central Jordan have sampled only a small area of the huge settlement,

but the amounts of information recovered from the site have required that the Neolithic sequence in the southern Levant be reassessed. Clear changes in the size of the settlement, architecture, lithic typology and technology, ceramic manufacture, subsistence economy, and ritual and symbolic behavior are documented for ʻAin Ghazal's four occupational phases (Middle Pre-Pottery Neolithic B, Late Pre-Pottery Neolithic B, Pre-Pottery Neolithic C, and Yarmoukian Pottery Neolithic). These phases span an unbroken occupation period from ca. 7250 to 5000 b.c. Earlier hypotheses that climatic deterioration caused a dramatic abandonment of the southern Levant by 6000 b.c. are unwarranted. Instead, we conclude that not all the area was abandoned, and that severe changes in settlement patterns in Palestine and the Jordan Valley were primarily due to cultural degradation of the fragile ecological system.