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Literatur

Afrika

Butzer 1981

Karl W. Butzer, *Rise and fall of Axum, Ethiopia, A geo-archaeological interpretation*. American Antiquity **46** (1981), 471–495.

Civilizations represent human ecosystems amenable to systematic geo-archaeological analysis. The civilization of Axum, spanning the first millennium A.D., had its settlement core on the now-denuded, subhumid plateau of northern Ethiopia. Axum, a new city, began A.D. 100 as a ceremonial center, growing to over 10,000 people, as a prosperous emporium for international trade. Intensified land use led to mass movements in slope soils before A.D. 300, but a range of clayey stream deposits also implicates strong periodic floods and seasonally abundant moisture. The paleoclimatic ensemble suggests that stronger and more reliable spring rains allowed two crops yearly without irrigation, compared to only one with modern summer rains. Trade declined after 600 and Axum was essentially landlocked by 715. Intense land pressure and more erratic rainfall favored soil destruction and ecological degradation during the seventh and eighth centuries. Largely abandoned by 800 and pillaged by border tribes, Axum retained only symbolic significance as power shifted to the more fertile lands of humid central Ethiopia. Axum shows how the spatial and temporal variability of resources, and the interactions between a society and its resource base, can be fundamental in the analysis of historical process.

Connah 1991

Graham Connah, *The salt of Bunyoro: seeking the origins of an African kingdom*. Antiquity **65** (1991), 479–494.

Excavations at the salt-making village of Kibiro, on the Ugandan shore of Lake Albert in East Africa, suggest that an important part of the economy of the Kingdom of Bunyoro originated early in the present millennium. The predominance of roulette-decorated pottery, in particular the use of carved roulettes, indicates that Kibiro was first occupied by people with northern affinities, possibly from the upper Nile region or further west. Collectively, these findings provide important clues concerning the origins of the Kingdom of Bunyoro.

Mabogunje 1968

Akin L. Mabogunje, *Urbanization in Nigeria*. (London 1968).

Shepherd 1982

Gill Shepherd, *The Making of the Swahili: A view from the southern end of the East African coast, In: From Zinj to Zanzibar: Studies in history, trade and society on the eastern coast of Africa*. Paideuma **28** (1982), 129–147.

Aktuell

Bärnighausen 2012

Till Bärnighausen, David E. Bloom & Salal Humair, *Economics of antiretroviral treatment vs. circumcision for HIV prevention*. PNAS **109** (2012), 21271–21276.

The HIV Prevention Trials Network (HPTN) 052 study, which showed the effectiveness of antiretroviral treatment in reducing HIV transmission, has been hailed as a "game changer" in the fight against HIV, prompting calls for scaling up treatment as prevention (TasP). However, it is unclear how TasP can be financed, given flat-lining support for global HIV programs. We assess whether TasP is indeed a game changer or if comparable benefits are obtainable at similar or lower cost by increasing coverage of medical male circumcision (MMC) and antiretroviral treatment (ART) at CD4 <350/µL. We develop a new mathematical model and apply it to South Africa, finding that high ART coverage combined with high MMC coverage provides approximately the same HIV incidence reduction as TasP, for $ 5 billion less over 2009–2020. MMC outperforms ART significantly in cost per infection averted ($1,096 vs. $6,790) and performs comparably in cost per death averted ($5,198 vs. $5,604). TasP is substantially less cost effective at $8,375 per infection and $7,739 per death averted. The prevention benefits of HIV treatment are largely reaped with high ART coverage. The most cost-effective HIV prevention strategy is to expand MMC coverage and then scale up ART, but the most cost-effective HIV-mortality reduction strategy is to scale up MMC and ART jointly. TasP is cost effective by commonly used absolute benchmarks but it is far less cost effective than MMC and ART. Given South Africa's current annual ART spending, the $5 billion in savings offered by MMC and ART over TasP in the next decade, for similar health benefits, challenges the widely hailed status of TasP as a game changer.

combination HIV prevention | treatment-as-prevention prioritization

Coates 2012

John H. Coates, *Congruent numbers*. PNAS **109** (2012), 21182–21183.

Fermat's discovery—and indeed every major new result proven about congruent numbers since then—has eventually led to great advances in the study of some of the deepest questions about Diophantine equations.

Demeter 2012

Fabrice Demeter, Laura L. Shackelford, Kira E. Westaway, Philippe Duringer, Thongsa Sayavongkhamdy & Anne-Marie Bacon, *Stratigraphic and dating consistency reinforces the status of Tam Pa Ling fossil, Reply to Pierret et al.* PNAS **109** (2012), E3524–E3525.

Goode 2012

Jamie Goode, *Fruity with a hint of drought*. nature **492** (2012), 351–353.

Jamie Goode tracks how our changing climate is sending ripples of disruption through the wine world.

Jack 2013

Rachael E. Jack, Oliver G. B. Garrod, Hui Yu, Roberto Caldara & Philippe G. Schyns, *Differences outweigh commonalities in the communication of emotions across human cultures, Reply to Sauter and Eisner*. PNAS **110** (2013), E181.

Jensen 2013

Kaare H. Jensen & Maciej A. Zwieniecki, *Physical Limits to Leaf Size in Tall Trees*. Physical Review Letters **110** (2013), 18104. DOI:10.1103/PhysRevLett.110.018104.

Leaf sizes in angiosperm trees vary by more than 3 orders of magnitude, from a few mm to over 1 m. This large morphological freedom is, however, only expressed in small trees, and the observed leaf size range declines with tree height, forming well-defined upper and lower boundaries. The vascular system of tall trees that distributes the products of photosynthesis connects distal parts of the plant and forms one of the largest known continuous microfluidic distribution networks. In biological systems, intrinsic properties of vascular systems are known to constrain the morphological freedom of the organism.We show that the limits to leaf size can be understood by physical constraints imposed by intrinsic properties of the carbohydrate transport network. The lower boundary is set by a minimum energy flux, and the upper boundary is set by a diminishing gain in transport efficiency.

Jin 2012

Jisuo Jin, David A. T. Harper, Robin M. Cocks, Phil J. A. McCausland, Christian M. Ø. Rasmussen & Peter M. Sheehan, *Precisely locating the Ordovician equator in Laurentia*. Geology (2012), preprint, 1–4. DOI:10.1130/G33688.1.

The Late Ordovician equatorial zone, like the zone today, had few hurricane-grade storms within 10° of the equator, as emphasized by the preservation of massive-bedded Thalassinoides ichnofacies in a trans-Laurentian belt more than 6000 km long, from the southwestern United States to North Greenland. That belt also includes nonamalgamated shell beds dominated by the brachiopod Proconchidium, which would not have been preserved after hurricane-grade storms. The belt lacks such storm-related sedimentary features as rip-up clasts, hummocky cross-stratifi cation, or large channels. In contrast, other contemporaneous Laurentian Thalassinoides facies and shell beds on either side of the belt have been disturbed by severe storms below fair-weather wave base. The position of the biofacies-defi ned equatorial belt coincides with the Late Ordovician equator deduced from paleomagnetic data from Laurentia, thus providing both a high-precision equatorial location and an independent test of the geocentric axial dipole hypothesis for that time.

Pierret 2012

Alain Pierret, Valéry Zeitoun & Hubert Forestier, *Irreconcilable differences between stratigraphy and direct dating cast doubts upon the status of Tam Pa Ling fossil*. PNAS **109** (2012), E3523.

Retallack 2013

Gregory J. Retallack, *Ediacaran life on land*. nature **493** (2013), 89–92. n493-0089-Comment.pdf

Ediacaran (635–542 million years ago) fossils have been regarded as early animal ancestors of the Cambrian evolutionary explosion of marine invertebrate phyla1, as giant marine protists2 and as lichenized fungi3. Recent documentation of palaeosols in the Ediacara Member of the Rawnsley Quartzite of South Australia4 confirms past interpretations of lagoonal–aeolian deposition based on synsedimentary ferruginization and loessic texture5,6. Further evidence for palaeosols comes from non-marine facies, dilation cracks, soil nodules, sand crystals, stable isotopic data and mass balance geochemistry4. Here I show that the uppermost surfaces of

the palaeosols have a variety of fossils in growth position, including Charniodiscus, Dickinsonia, Hallidaya, Parvancorina, Phyllozoon, Praecambridium, Rugoconites, Tribrachidium and 'old-elephant skin' (ichnogenus Rivularites7). These fossils were preserved as ferruginous impressions, like plant fossils8, and biological soil crusts9,10 of Phanerozoic eon sandy palaeosols. Sand crystals after gypsum11 and nodules of carbonate12 are shallow within the palaeosols4, even after correcting for burial compaction13. Periglacial involutions and modest geochemical differentiation of the palaeosols are evidence of a dry, cold temperate Ediacaran palaeoclimate in South Australia4. This new interpretation of some Ediacaran fossils as large sessile organisms of cool, dry soils, is compatible with observations that Ediacaran fossils were similar in appearance and preservation to lichens and other microbial colonies of biological soil crusts3, rather than marine animals1, or protists2.

Sauter 2013

Disa A. Sauter & Frank Eisner, *Commonalities outweigh differences in the communication of emotions across human cultures*. PNAS **110** (2013), E180.

Sridhar 2012

Hari Sridhar et al., *Positive Relationships between Association Strength and Phenotypic Similarity Characterize the Assembly of Mixed-Species Bird Flocks Worldwide*. AmNaturalist **180** (2012), 777–790.

Hari Sridhar, Umesh Srinivasan, Robert A. Askins, Julio Cesar Canales-Delgadillo, Chao-Chieh Chen, David N. Ewert, George A. Gale, Eben Goodale, Wendy K. Gram, Patrick J. Hart, Keith A. Hobson, Richard L. Hutto, Sarath W. Kotagama, Jessie L. Knowlton, Tien Ming Lee, Charles A. Munn, Somchai Nimnuan, B. Z. Nizam, Guillaume Péron, V. V. Robin, Amanda D. Rodewald, Paul G. Rodewald, Robert L. Thomson, Pranav Trivedi, Steven L. van Wilgenburg and Kartik Shanker

Competition theory predicts that local communities should consist of species that are more dissimilar than expected by chance. We find a strikingly different pattern in a multicontinent data set (55 presence-absence matrices from 24 locations) on the composition of mixed-species bird flocks, which are important subunits of local bird communities the world over. By using null models and randomization tests followed by meta-analysis, we find the association strengths of species in flocks to be strongly related to similarity in body size and foraging behavior and higher for congeneric compared with noncongeneric species pairs. Given the local spatial scales of our individual analyses, differences in the habitat preferences of species are unlikely to have caused these association patterns; the patterns observed are most likely the outcome of species interactions. Extending group-living and social-information-use theory to a heterospecific context, we discuss potential behavioral mechanisms that lead to positive interactions among similar species in flocks, as well as ways in which competition costs are reduced. Our findings highlight the need to consider positive interactions along with competition when seeking to explain community assembly.

Keywords: community assembly, interspecific competition, metaanalysis, mixed-species flocks, null models, positive interactions.

Tian 2012

Ye Tian, *Congruent numbers with many prime factors*. PNAS **109** (2012), 21256–21258.

Mohammed Ben Alhocain, in an Arab manuscript of the 10th century, stated that the principal object of the theory of rational right triangles is to find a square that

when increased or diminished by a certain number,mbecomes a square [Dickson LE (1971) History of the Theory of Numbers (Chelsea, New York), Vol 2, Chap 16]. In modern language, this object is to find a rational point of infinite order on the elliptic curve m y2 =x3 - x. Heegner constructed such rational points in the case that m are primes congruent to 5,7 modulo 8 or twice primes congruent to 3 modulo 8 [Monsky P (1990) Math Z 204:45–68]. We extend Heegner's result to integers m with many prime divisors and give a sketch in this report. The full details of all the proofs will be given in ref. 1 [Tian Y (2012) Congruent Numbers and Heegner Points, arXiv:1210.8231].
Gross-Zagier formula | modular curve | genus theory

Underwood 2012

Emily Underwood, *How to Build a Smarter Rock*. science **338** (2012), 1412–1413.

Predicting when and where rivers will move gigatons of rock and sediment has proved a murky problem; a new generation of electronic smart rocks could clarify matters.

Back at the laboratory, the researchers were relieved to find that the two survivors had collected data despite their rough rides. But relief turned to disappointment when they discovered that the batteries—supposedly strong enough to survive at least a month—had died after just 40 hours. During that brief period, the smart rocks very accurately recorded no movements whatsoever, Johnson says. "We are certain that those rocks stayed still," he says ruefully. "In hindsight, we should have done a lot more testing. ... I was banging my head against a wall."

Anthropologie

Brunet 2002

Michel Brunet et al., *A new hominid from the Upper Miocene of Chad, Central Africa*. nature **418** (2002), 145–151.

Michel Brunet, Franck Guy, David Pilbeam, Hassane Taisso Mackaye, Andossa Likius, Djimdoumalbaye Ahounta, Alain Beauvilain, Cécile Blondel, Hervé Bocherens, Jean-Renaud Boisserie, Louis De Bonis, Yves Coppens, Jean Dejax, Christiane Denys, Philippe Duringer, Véra Eisenmann, Gongdibé Fanone, Pierre Fronty, Denis Geraads, Thomas Lehmann, Fabrice Lihoreau, Antoine Louchart, Adoum Mahamat, Gildas Merceron, Guy Mouchelin, Olga Otero, Pablo Pelaez Campomanes, Marcia Ponce De Leon, Jean-Claude Rage, Michel Sapanet, Mathieu Schuster, Jean Sudre, Pascal Tassy, Xavier Valentin, Patrick Vignaud, Laurent Viriot, Antoine Zazzo & Christoph Zollikofer

The search for the earliest fossil evidence of the human lineage has been concentrated in East Africa. Here we report the discovery of six hominid specimens from Chad, central Africa, 2,500 km from the East African Rift Valley. The fossils include a nearly complete cranium and fragmentary lower jaws. The associated fauna suggest the fossils are between 6 and 7 million years old. The fossils display a unique mosaic of primitive and derived characters, and constitute a new genus and species of hominid. The distance from the Rift Valley, and the great antiquity of the fossils, suggest that the earliest members of the hominid clade were more widely distributed than has been thought, and that the divergence between the human and chimpanzee lineages was earlier than indicated by most molecular studies.

Burton-Chellew 2013

Maxwell N. Burton-Chellew & Stuart A. West, *Prosocial preferences do not explain human cooperation in public-goods games*. PNAS **110** (2013), 216–221.

It has become an accepted paradigm that humans have "prosocial preferences" that lead to higher levels of cooperation than those that would maximize their personal financial gain. However, the existence of prosocial preferences has been inferred post hoc from the results of economic games, rather than with direct experimental tests. Here, we test how behavior in a public-goods game is influenced by knowledge of the consequences of actions for other players. We found that (i) individuals cooperate at similar levels, even when they are not informed that their behavior benefits others; (ii) an increased awareness of how cooperation benefits others leads to a reduction, rather than an increase, in the level of cooperation; and (iii) cooperation can be either lower or higher than expected, depending on experimental design. Overall, these results contradict the suggested role of the prosocial preferences hypothesis and show how the complexity of human behavior can lead to misleading conclusions from controlled laboratory experiments.

altruism | behavioral economics | black box | framing effect | reciprocity

Castle 2012

Elizabeth Castle et al., *Neural and behavioral bases of age differences in perceptions of trust*. PNAS **109** (2012), 20848–20852.

Elizabeth Castle, Naomi I. Eisenberger, Teresa E. Seeman, Wesley G. Moons, Ian A. Boggero, Mark S. Grinblatt and Shelley E. Taylor

Older adults are disproportionately vulnerable to fraud, and federal agencies have speculated that excessive trust explains their greater vulnerability. Two studies, one behavioral and one using neuroimaging methodology, identified age differences in trust and their neural underpinnings. Older and younger adults rated faces high in trust cues similarly, but older adults perceived faces with cues to untrustworthiness to be significantly more trustworthy and approachable than younger adults. This age-related pattern was mirrored in neural activation to cues of trustworthiness. Whereas younger adults showed greater anterior insula activation to untrustworthy versus trustworthy faces, older adults showed muted activation of the anterior insula to untrustworthy faces. The insula has been shown to support interoceptive awareness that forms the basis of "gut feelings," which represent expected risk and predict risk-avoidant behavior. Thus, a diminished "gut" response to cues of untrustworthiness may partially underlie older adults' vulnerability to fraud.

aging | emotions | limbic system | socioemotional selectivity

Dominy 2012

Nathaniel J. Dominy, *Hominins living on the sedge*. PNAS **109** (2012), 20171–20172.

Corms are starch storage organs that feature in the diets of many baboons and some human populations. In fact, the corms of Cyperus esculentus, a C4 species, were once widely cultivated as a food crop in ancient Egypt, perhaps because only 150–200 g of corm tissue per day can satisfy human lipid requirements. The high quality of Cyperus corms and their role in the diets of humans and savanna-dwelling baboons suggest that C4 corms could have been a significant contributor to the elevated d13C values of A. bahrelghazali and P. boisei. A problem with this hypothesis is that corms are gritty, and microwear data argue against such a diet. It is plausible that the exogenous grit on corms exerted a strong selective pressure on hominin manual dexterity, which, in turn, was preadaptive for tool use.

Lee-Thorp 2012

Julia Lee-Thorp, Andossa Likius, Hassane T. Mackaye, Patrick Vignaud, Matt Sponheimer & Michel Brunet, *Isotopic evidence for an early shift to C4 resources by Pliocene hominins in Chad*. PNAS **109** (2012), 20369–20372.

Foods derived from C4 plants were important in the dietary ecology of early Pleistocene hominins in southern and eastern Africa, but the origins and geographic variability of this relationship remain unknown. Carbon isotope data show that Australopithecus bahrelghazali individuals from Koro Toro in Chad are significantly enriched in 13C, indicating a dependence on C4 resources. As these sites are over 3 million years in age, the results extend the pattern of C4 dependence seen in Paranthropus boisei in East Africa by more than 1.5 million years. The Koro Toro hominin fossils were found in argillaceous sandstone levels along with abundant grazing and aquatic faunal elements that, in combination, indicate the presence of open to wooded grasslands and stream channels associated with a greatly enlarged Lake Chad. In such an environment, the most abundant C4 plant resources available to A. bahrelghazali were grasses and sedges, neither of which is usually considered as standard great ape fare. The results suggest an early and fundamental shift in hominin dietary ecology that facilitated the exploitation of new habitats.

Wolpoff 2009

Milford H. Wolpoff, *How Neandertals Inform Human Variation*. American Journal of Physical Anthropology **139** (2009), 91–102.

Since their first discovery, Neandertals have served as an out-group for interpreting human variation. Their out-group role has changed over the years because in spite of the fact that Neandertals are the most abundant of all fossil remains (or perhaps because of this) their interpretation is the most controversial of all human fossils. Many believe them to be a different, albeit humanlike species, but recent genetic evidence supports anatomical interpretations indicating that interbreeding with other humans was an important aspect of human evolution. The combination of anatomical difference and restricted gene flow between populations suggests the possibility that Neandertals may have been a true human race.
KEY WORDS Neandertal; race; subspecies; human variation

Wood 2002

Bernard Wood, *Hominid revelations from Chad*. nature **418** (2002), 133–135.

The story of human origins in Africa takes a twist with the description of a 6–7-million-year-old cranium from Chad. The discovery hints at the likely diversity of early hominids.

Yamagishi 2012

Toshio Yamagishi et al., *Rejection of unfair offers in the ultimatum game is no evidence of strong reciprocity*. PNAS **109** (2012), 20364–20368.

Toshio Yamagishi, Yutaka Horita, Nobuhiro Mifune, Hirofumi Hashimoto, Yang Li, Mizuho Shinada, Arisa Miura, Keigo Inukai, Haruto Takagishi and Dora Simunovic

The strong reciprocity model of the evolution of human cooperation has gained some acceptance, partly on the basis of support from experimental findings. The

observation that unfair offers in the ultimatum game are frequently rejected constitutes an important piece of the experimental evidence for strong reciprocity. In the present study, we have challenged the idea that the rejection response in the ultimatum game provides evidence of the assumption held by strong reciprocity theorists that negative reciprocity observed in the ultimatum game is inseparably related to positive reciprocity as the two sides of a preference for fairness. The prediction of an inseparable relationship between positive and negative reciprocity was rejected on the basis of the results of a series of experiments that we conducted using the ultimatum game, the dictator game, the trust game, and the prisoner's dilemma game. We did not find any correlation between the participants' tendencies to reject unfair offers in the ultimatum game and their tendencies to exhibit various prosocial behaviors in the other games, including their inclinations to positively reciprocate in the trust game. The participants' responses to postexperimental questions add support to the view that the rejection of unfair offers in the ultimatum game is a tacit strategy for avoiding the imposition of an inferior status.
inequity aversion | other regarding preferences | assertiveness

Datierung

Lebatard 2008

Anne-Elisabeth Lebatard et al., *Cosmogenic nuclide dating of Sahelanthropus tchadensis and Australopithecus bahrelghazali: Mio-Pliocene hominids from Chad*. PNAS **105** (2008), 3226–3231.
Anne-Elisabeth Lebatard, Didier L. Bourlès, Philippe Duringer, Marc Jolivet, Régis Braucher, Julien Carcaillet, Mathieu Schuster, Nicolas Arnaud, Patrick Monié, Fabrice Lihoreau, Andossa Likius, Hassan Taisso Mackaye, Patrick Vignaud and Michel Brunet
Ages were determined at two hominid localities from the Chad Basin in the Djurab Desert (Northern Chad). In the Koro Toro fossiliferous area, KT 12 locality (16°00'N, 18°53'E) was the site of discovery of Australopithecus bahrelghazali (Abel) and in the Toros-Menalla fossiliferous area, TM 266 locality (16°15'N, 17°29'E) was the site of discovery of Sahelanthropus tchadensis (Toumaï). At both localities, the evolutive degree of the associated fossil mammal assemblages allowed a biochronological estimation of the hominid remains: early Pliocene (3–3.5 Ma) at KT 12 and late Miocene (≈7 Ma) at TM 266. Atmospheric 10Be, a cosmogenic nuclide, was used to quasicontinuously date these sedimentary units. The authigenic 10Be/9Be dating of a pelite relic within the sedimentary level containing Abel yields an age of 3.58 ± 0.27 Ma that points to the contemporaneity of Australopithecus bahrelghazali (Abel) with Australopithecus afarensis (Lucy). The 28 10Be/9Be ages obtained within the anthracotheriid unit containing Toumaï bracket, by absolute dating, the age of Sahelanthropus tchadensis to lie between 6.8 and 7.2 Ma. This chronological constraint is an important cornerstone both for establishing the earliest stages of hominid evolution and for new calibrations of the molecular clock.
beryllium-10 | absolute dating | hominid site | Abel | Toumaï

Vignaud 2002

Patrick Vignaud et al., *Geology and palaeontology of the Upper Miocene Toros-Menalla hominid locality, Chad*. nature **418** (2002), 152–155.
Patrick Vignaud, Philippe Duringer, Hassane Taïsso Mackaye, Andossa Likius, Cécile Blondel, Jean-Renaud Boisserie, Louis de Bonis, Véra Eisenmann, Ma-

rie-Esther Etienne, Denis Geraads, Franck Guy, Thomas Lehmann, Fabrice Lihoreau, Nieves Lopez-Martinez, Cécile Mourer-Chauvire, Olga Otero, Jean-Claude Rage, Mathieu Schuster, Laurent Viriot, Antoine Zazzo & Michel Brunet
All six known specimens of the early hominid Sahelanthropus tchadensis come from Toros-Menalla site 266 (TM 266), a single locality in the Djurab Desert, northern Chad, central Africa. Here we present a preliminary analysis of the palaeontological and palaeoecological context of these finds. The rich fauna from TM 266 includes a significant aquatic component such as fish, crocodiles and amphibious mammals, alongside animals associated with gallery forest and savannah, such as primates, rodents, elephants, equids and bovids. The fauna suggests a biochronological age between 6 and 7 million years. Taken together with the sedimentological evidence, the fauna suggests that S. tchadensis lived close to a lake, but not far from a sandy desert, perhaps the oldest record of desert conditions in the Neogene of northern central Africa.

Grabung

Beauvilain 2008

Alain Beauvilain, *The contexts of discovery of Australopithecus bahrelghazali (Abel) and of Sahelanthropus tchadensis (Toumaï): unearthed, embedded in sandstone, or surface collected?* South African Journal of Science **104** (2008), 165–168.
The stratigraphic contexts of two important fossil hominid specimens from Chad have been repeatedly reported as being precisely known on the basis of their supposed in situ discovery. It is here demonstrated that neither of the fossils, the holotypes of Australopithecus bahrelghazali and Sahelanthropus tchadensis, was in situ at the time of discovery.

Beauvilain 2009

Alain Beauvilain & Jean-Pierre Watté, *Was Toumaï (Sahelanthropus tchadensis) buried?* Anthropologie **47** (2009), 1–6.
Was Toumaï (Sahelanthropus tchadensis) buried? Photographs taken when the skull of Toumai was discovered establish that the holotype of one of the earliest known hominid species was probably reburied in the recent past. Taphonomic analysis reveals the likelihood of one, perhaps two, burial(s) which seemingly occurred after the introduction of Islam in the region during the 11th century. Two other hominid fossils (a left femur and a mandible) were in the same "grave" along with various mammal remains.
Toumaï | Sahelanthropus | New fossils | Burial | Femur

Wolpoff 2002

Milford H. Wolpoff, Brigitte Senut, Martin Pickford & John Hawks, *Sahelanthropus or 'Sahelpithecus'?* nature **419** (2002), 581–582.
Because the face is orthognathic rather than prognathic and the anterior teeth are small, posture is the only credible explanation of this nuchal anatomy. It is evident that Sahelanthropus did not habitually hold its head in an upright position over the spine and was not an obligate biped. This contrast with all known hominids is itself sufficient to exclude Sahelanthropus from the hominid clade as we currently understand it.
We believe that Sahelanthropus was an ape living in an environment that was later inhabited by australopithecines and, like them, it adapted with a powerful masticatory complex. A penecontemporary primate with a perfect and well-developed

postcranial adaptation to obligate bipedalism6 is more likely to have been an early hominid.

Grundlagen

Fletcher 1995

Roland Fletcher, *The linits of settlement growth, A theoretical outline.* New Studies in Archaeology (Cambridge 1995).

In this study Roland Fletcher argues that the built environment becomes a constraint on the long-term development of a settlement. It is costly to move settlements, or to demolish and rebuild from scratch, so the initial layout and buildings, and the associated forms of communication, may come to shackle further development and also to place constraints on social and political change. Using this theoretical framework, Dr Fletcher reviews world-wide settlement growth over the past 15,000 years, and concludes with a major discussion of the great transformations of human settlements – from mobile to sedentary, sedentary to urban, and agrarian urban to industrial. This book is an ambitious contribution to archaeological theory, and the questions it raises also have implications for the future of urban settlement.

Isotope

Blumenthal 2012

Scott A. Blumenthal, Kendra L. Chritz, Jessica M. Rothman & Thure E. Cerling, *Detecting intraannual dietary variability in wild mountain gorillas by stable isotope analysis of feces.* PNAS **109** (2012), 21277–21282.

We use stable isotope ratios in feces of wild mountain gorillas (Gorilla beringei) to test the hypothesis that diet shifts within a single year, as measured by dry mass intake, can be recovered. Isotopic separation of staple foods indicates that intraannual changes in the isotopic composition of feces reflect shifts in diet. Fruits are isotopically distinct compared with other staple foods, and peaks in fecal d13C values are interpreted as periods of increased fruit feeding. Bayesian mixing model results demonstrate that, although the timing of these diet shifts match observational data, the modeled increase in proportional fruit feeding does not capture the full shift. Variation in the isotopic and nutritional composition of gorilla foods is largely independent, highlighting the difficulty for estimating nutritional intake with stable isotopes. Our results demonstrate the potential value of fecal sampling for quantifying short-term, intraindividual dietary variability in primates and other animals with high temporal resolution even when the diet is composed of C3 plants.

C3 photosynthesis | feeding ecology | great apes | Uganda

Gregoricka 2012

Lesley A. Gregoricka & Susan Guise Sheridan, *Food for Thought, Isotopic evidence for dietary and weaning practices in a Byzantine urban monastery in Jerusalem.* In: Megan A. Perry (Hrsg.), *Bioarchaeology and behavior, The people of the ancient Near East.* (Gainesville 2012), 138–164.

Klima

Bibi 2013

Faysal Bibi, Antoine Souron, Hervé Bocherens, Kevin Uno & Jean-Renaud Boisserie, *Ecological change in the lower Omo Valley around 2.8 Ma.* Biology Letters (2013), preprint, 1–4. DOI:10.1098/rsbl.2012.0890.

BiolLett2013-preprint-Supplement.pdf

Late Pliocene climate changes have long been implicated in environmental changes and mammalian evolution in Africa, but high-resolution examinations of the fossil and climatic records have been hampered by poor sampling. By using fossils from the well-dated Shungura Formation (lower Omo Valley, northern Turkana Basin, southern Ethiopia), we investigate palaeodietary changes in one bovid and in one suid lineage from 3 to 2 Ma using stable isotope analysis of tooth enamel. Results show unexpectedly large increases in C4 dietary intake around 2.8 Ma in both the bovid and suid, and possibly in a previously reported hippopotamid species. Enamel d13C values after 2.8 Ma in the bovid (Tragelaphus nakuae) are higher than recorded for any living tragelaphin, and are not expected given its conservative dental morphology. A shift towards increased C4 feeding at 2.8 Ma in the suid (Kolpochoerus limnetes) appears similarly decoupled from a well-documented record of dental evolution indicating gradual and progressive dietary change. The fact that two, perhaps three, disparate Pliocene herbivore lineages exhibit similar, and contemporaneous changes in dietary behaviour suggests a common environmental driver. Local and regional pollen, palaeosol and faunal records indicate increased aridity but no corresponding large and rapid expansion of grasslands in the Turkana Basin at 2.8 Ma. Our results provide new evidence supporting ecological change in the eastern African record around 2.8 Ma, but raise questions about the resolution at which different ecological proxies may be comparable, the correlation of vegetation and faunal change, and the interpretation of low d13C values in the African Pliocene.

Keywords: stable isotope analysis, palaeoecology, diet, Africa, Pliocene

Butzer 2005

Karl W. Butzer, *Environmental history in the Mediterranean world: Cross-disciplinary investigation of cause-and-effect for degradation and soil erosion.* Journal of Archaeological Science **32** (2005), 1773–1800.

Environmental history is a multidisciplinary enterprise united by shared interests in ecological change and the complex interactions between people and the environment. Its practitioners include expertise in the natural sciences, in history or archaeology, or in political ecology and related social sciences; but there is no agreement on a common agenda and limited success in bridging methodological and epistemological divisions that impede integrative and interdisciplinary research. World-systems history and environmental history also have overlapping interests in long-term change and matters of sustainability. The Mediterranean world sustained agricultural lifeways across some 8000 years, yet its environment has repeatedly been described as degraded, suggesting conceptual confusion between transformation and destruction. This paper is didactic in purpose and uses landscape histories for the Peloponnese and eastern Spain to show that the impact of recurrent, excessive precipitation events and of reduced quality of land cover are difficult to unravel, because they commonly appear to work in tandem. As a result (a) environmental change cannot be assumed or "predicted", but must be studied inductively by experts with science skills, and (b) cause-and-effect relationships demand an understanding of ecological behavior, for which humanistic

insights are indispensable. Social science models highlight systemic relationships from socioeconomic and structural perspectives, but are less suited to deal with the complexity of environmental change or the contingencies exemplified by human resilience. Near Eastern, Greek and Roman agronomic writings offer elite "voices" that speak to cumulative technological change, scientific understanding, and the context of intensification. Rural voices can be heard through ethnography, and in eastern Spain are extended into the past by archaeology and archival research. In the absence of structural constraints, they reveal collective decision-making with respect to a shifting repertoire of agricultural strategies that take into account market opportunities, demographic growth, finite resources and environmental problems. Such adaptability spells resilience, and "good farming" is culturally embedded as a civic responsibility, both in the ethnographic present and in the older, elite agronomic writings. But if the "moral economy" erodes in the wake of food stress, tax extortion, instability, insecurity, or ideological oppression, there is little incentive to pursue long-term strategies, so that behavior focuses on short-term survival. The context for this dialectic of poor versus good ecological management may be structural, but cause-and-effect in the traditional Mediterranean world ultimately depended on ecological and human resilience. Long-term sustainability is similarly non-predictive. It depends on people, rather than social theory.
Keywords: Biotic transformation; Soil erosion; Disequilibrium; Ecological behavior; World-systems history

Scheffer 2012

Marten Scheffer, Marina Hirota, Milena Holmgren, Egbert H. Van Nes & F. Stuart Chapin III, *Thresholds for boreal biome transitions*. PNAS **109** (2012), 21384–21389.

Although the boreal region is warming twice as fast as the global average, the way in which the vast boreal forests and tundras may respond is poorly understood. Using satellite data, we reveal marked alternative modes in the frequency distributions of boreal tree cover. At the northern end and at the dry continental southern extremes, treeless tundra and steppe, respectively, are the only possible states. However, over a broad intermediate temperature range, these treeless states coexist with boreal forest (≈75 %tree cover) and with two more open woodland states (≈20 % and ≈45 % tree cover). Intermediate tree covers (e.g., ≈10 %, ≈30 %, and ≈60 % tree cover) between these distinct states are relatively rare, suggesting that they may represent unstable states where the system dwells only transiently. Mechanisms for such instabilities remain to be unraveled, but our results have important implications for the anticipated response of these ecosystems to climatic change. The data reveal that boreal forest shows no gradual decline in tree cover toward its limits. Instead, our analysis suggests that it becomes less resilient in the sense that it may more easily shift into a sparse woodland or treeless state. Similarly, the relative scarcity of the intermediate ≈10 % tree cover suggests that tundra may shift relatively abruptly to a more abundant tree cover. If our inferences are correct, climate change may invoke massive nonlinear shifts in boreal biomes.
remote sensing | tipping point | resilience | permafrost | wildfire

Kultur

Gelfand 2011

Michele J. Gelfand et al., *Differences Between Tight and Loose Cultures: A 33-Nation Study*. science **332** (2011), 1100–1104.

s332-1100-Supplement.pdf
Michele J. Gelfand, Jana L. Raver, Lisa Nishii, Lisa M. Leslie, Janetta Lun, Beng Chong Lim, Lili Duan, Assaf Almaliach, Soon Ang, Jakobina Arnadottir, Zeynep Aycan, Klaus Boehnke, Pawel Boski, Rosa Cabecinhas, Darius Chan, Jagdeep Chhokar, Alessia D'Amato, Montse Ferrer, Iris C. Fischlmayr, Ronald Fischer, Marta Fülöp, James Georgas, Emiko S. Kashima, Yoshishima Kashima, Kibum Kim, Alain Lempereur, Patricia Marquez, Rozhan Othman, Bert Overlaet, Penny Panagiotopoulou, Karl Peltzer, Lorena R. Perez-Florizno, Larisa Ponomarenko, Anu Realo, Vidar Schei, Manfred Schmitt, Peter B. Smith, Nazar Soomro, Erna Szabo, Nalinee Taveesin, Midori Toyama, Evert Van de Vliert, Naharika Vohra, Colleen Ward & Susumu Yamaguchi
With data from 33 nations, we illustrate the differences between cultures that are tight (have many strong norms and a low tolerance of deviant behavior) versus loose (have weak social norms and a high tolerance of deviant behavior). Tightness-looseness is part of a complex, loosely integrated multilevel system that comprises distal ecological and historical threats (e.g., high population density, resource scarcity, a history of territorial conflict, and disease and environmental threats), broad versus narrow socialization in societal institutions (e.g., autocracy, media regulations), the strength of everyday recurring situations, and micro-level psychological affordances (e.g., prevention self-guides, high regulatory strength, need for structure). This research advances knowledge that can foster cross-cultural understanding in a world of increasing global interdependence and has implications for modeling cultural change.

Methoden

Bernard 2012

H. Russell Bernard, *The science in social science*. PNAS **109** (2012), 20796–20799.

A recent poll showed that most people think of science as technology and engineering—life-saving drugs, computers, space exploration, and so on. This was, in fact, the promise of the founders of modern science in the 17th century. It is less commonly understood that social and behavioral sciences have also produced technologies and engineering that dominate our everyday lives. These include polling, marketing, management, insurance, and public health programs.
success of social science | public understanding of social science | social science technologies

Neolithikum

Rollefson 1992

Gary O. Rollefson & Ilse Köhler-Rollefson, *Early Neolithic Exploitation Patterns in the Levant: Cultural Impact on the Environment*. PopulationEnvironment **13** (1992), iv, 243–254.

'Ain Ghazal sustained its role as a major population center based on farming and herding throughout the 7th and 6th millennia because of its critical location at a major ecotone of biological resources. Even so, the late 6th millennium occupation of the large settlement resulted in a fundamental alteration of local resource exploitation, for pottery production after ca. 5,500 B.C. placed a new cost on fuel. Coincident with the emergence of a ceramic technology, the production of lime

plaster ceased abruptly, and economically less demanding mud plaster and huwwar were substituted.
Although the cultural impact on the environment was devastating in terms of its cumulative effects in the southern Levant, it should be emphasized that the results were not catastrophic in the sense that the effects suddenly forced the abandonment of Palestinian sites by starving, panic-stricken residents. It is unlikely that environmental changes were apparent among any of the several generations living in a settlement at one time, although oral traditions may have referred to more Eden-like conditions in the distant past.

Religion

Becker 2012

Nico Becker, Oliver Dietrich, Thomas Götzelt, Çiğdem Köksal-Schmidt, Jens Notroff & Klaus Schmidt, *Materialien zur Deutung der zentralen Pfeilerpaare des Göbekli Tepe und weiterer Orte des obermesopotamischen Frühneolithikums*. Zeitschrift für Orient-Archäologie **5** (2012), 15–43.
The authors discuss several approaches to interpret the monumental stone circles of Göbekli Tepe. The point of departure are the two central pillars, which always stand in the center of the enclosures and seem to be the most important aspect of the circles.
Turkey | Göbekli Tepe | Sanctuary | Pre-Pottery Neolithic | Contextual Analysis
Der Aufsatz lotet verschiedene Deutungsrichtungen für die monumentalen Steinkreise des Göbekli Tepe aus. Ausgegangen wird dabei von den regelhaft im Zentrum der Anlagen stehenden zwei Zentralpfeilern, die offenbar den wichtigsten Aspekt der Kreise verkörpern.
Türkei | Göbekli Tepe | Heiligtum | Präkeramisches Neolithikum | Befundanalyse

Story or Book

Frizell 2013

John Frizell, *Pest Control, To catch a rat*. nature **493** (2013), 264.
"There are plenty more rats." That was true. The warm, wet weather caused by the greenhouse effect favoured them, and ill-advised mass-poisoning programmes had produced pesticide-resistant animals — she had seen documentary footage of them seeking out poison bait and getting intoxicated on it, rolling around on their backs and then staggering off to recover.

Schmitz 2013

Birger Schmitz, *The cosmological you*. nature **493** (2013), 25.
Birger Schmitz weighs up an exploration of how the Universe permeates us.
The Universe Within: Discovering the Common History of Rocks, Planets, and People. Neil Shubin. Pantheon: 2013. 240 pp. $25.95, £20
The Universe Within is a charming and enjoyable read, but it does not reach the heights of Your Inner Fish. There is a familiar feel to some of the sections, and the book's title raises expectations that are not really met. Where are the mysteries of the brain, the laws of thought and our consciousness? These, to me, are the most amazing aspects of the 'universe within'.