Liste erstellt am 2012-11-03

Literatur

Afrika

Sinclair 2012

Paul Sinclair, Anneli Ekblom & Marilee Wood, *Trade and society on the south-east African coast in the later first millennium AD: the case of Chibuene*. Antiquity **86** (2012), 723–737.

The south-east coast of Africa in the later first millennium was busy with boats and the movement of goods from across the Indian Ocean to the interior. The landing places were crucial mediators in this process, in Africa as elsewhere. Investigations at the beach site of Chibuene show that a local community was supplying imported beads to such interior sites as Schroda, with the consequent emergence there of hierarchical power structures.
Keywords: south-east Africa, Chibuene, first millennium AD, trade and exchange, social complexity, social hierarchy, port, beach market, beads

Wood 2012

Marilee Wood, *Interconnections: Glass beads and trade in southern and eastern Africa and the Indian Ocean – 7th to 16th centuries AD*. Dissertation, Uppsala Universitet (Uppsala 2012).

Glass beads comprise the most frequently found evidence of trade between southern Africa and the greater Indian Ocean between the 7th and 16th centuries AD. In this thesis beads recovered from southern African archaeological sites are organized into series, based on morphology and chemical composition determined by LA-ICP-MS analysis. The results are used to interpret the trade patterns and partners that linked eastern Africa to the rest of the Indian Ocean world, as well as interconnections between southern Africa and East Africa. Comprehensive reports on bead assemblages from several archaeological sites are presented, including: Mapungubwe, K2 and Schroda in the Shashe-Limpopo Basin; Chibuene in southern Mozambique; Hlamba Mlonga in eastern Zimbabwe; Sibudu Cave in Kwa-Zulu-Natal, Kaole Ruins in Tanzania and Mahilaka in northwest Madagascar. The conclusions reached show that trade relationships and socio-political development in the south were different from those on the East Coast and that changes in bead series in the south demonstrate it was fully integrated into the cycles of the Eurasian and African world-system.
Keywords: glass trade beads; glass analysis; LA-ICP-MS; 7th to 16th century Indian Ocean trade; southern Africa; East Africa; Mapungubwe; K2; Schroda; Chibuene; Hlamba Mlonga; Sibudu Cave; Kaole Ruins; Mahilaka.; Humanities History and Archaeology; Humaniora Historia och arkeologi Arkeologi; Arkeologi; Archaeology;

Aktuell

Bauer 2012

Nico Bauer, Robert J. Brecha & Gunnar Luderer, *Economics of nuclear power and climate change mitigation policies*. PNAS **109** (2012), 16805–16810.

pnas109-16805-Supplement.doc
The events of March 2011 at the nuclear power complex in Fukushima, Japan, raised questions about the safe operation of nuclear power plants, with early retirement of existing

nuclear power plants being debated in the policy arena and considered by regulators. Also, the future of building new nuclear power plants is highly uncertain. Should nuclear power policies become more restrictive, one potential option for climate change mitigation will be less available. However, a systematic analysis of nuclear power policies, including early retirement, has been missing in the climate change mitigation literature. We apply an energy economy model framework to derive scenarios and analyze the interactions and tradeoffs between these two policy fields. Our results indicate that early retirement of nuclear power plants leads to discounted cumulative global GDP losses of 0.07 % by 2020. If, in addition, new nuclear investments are excluded, total losses will double. The effect of climate policies imposed by an intertemporal carbon budget on incremental costs of policies restricting nuclear power use is small. However, climate policies have much larger impacts than policies restricting the use of nuclear power. The carbon budget leads to cumulative discounted near term reductions of global GDP of 0.64 % until 2020. Intertemporal flexibility of the carbon budget approach enables higher near-term emissions as a result of increased power generation from natural gas to fill the emerging gap in electricity supply, while still remaining within the overall carbon budget. Demand reductions and efficiency improvements are the second major response strategy.
climate policy | energy economy model | mitigation scenarios | nuclear policy

Editorial 2012

Shock and law. nature **490** (2012), 446.

The Italian system's contempt for its scientists is made plain by the guilty verdict in L'Aquila.

On Monday evening, the six scientists and one government official were found guilty and sentenced to six years in prison.

As members of an official risk commission, they had all participated in a meeting held in L'Aquila on 31 March 2009, during which they were asked to assess the risk of a major earthquake in view of the many tremors that had hit the city in the previous months, and responded by saying that the earthquake risk was clearly raised but that it was not possible to offer a detailed prediction. The meeting was unusually quick, and was followed by a press conference at which the Civil Protection Department and local authorities reassured the population, stating that minor shocks did not increase the risk of a major one.

Fagin 2012

Dan Fagin, *The learning curve*. nature **490** (2012), 462–465.

Researchers say that some chemicals have unexpected and potent effects at very low doses — but regulators aren't convinced.

The newly launched US$ 20-million study, led by the NIEHS and the FDA's National Center for Toxicological Research, is the most ambitious effort ever to look for non-monotonic dose-response curves that include very low doses. Last month, researchers began handfeeding BPA to about a thousand rats at five dose levels ranging from 2.5 micrograms per kilogram of body weight up to 25,000 micrograms, plus two positive-control groups (which received much lower oestradiol doses than either Tyl or Gray used) and an unexposed control group. Vom Saal, Zoeller and other academics will be participating in the tissue analysis, allowing them to look for an array of health effects, such as metabolic changes in the prostate and mammary glands, that go well beyond those in standard regulatory protocols.

Hall 2012

Margaret I. Hall, Jason M. Kamilar & E. Christopher Kirk, *Eye shape and the nocturnal bottleneck of mammals*. Proc. Royal Society B (2012), preprint, 1–7. DOI:10.1098/rspb.2012.2258.

ProcRSocB2012-preprint-Supplement1.pdf, ProcRSocB2012-preprint-Supplement2.pdf, ProcRSocB2012-preprint-Supplement3.pdf
Most vertebrate groups exhibit eye shapes that vary predictably with activity pattern. Nocturnal vertebrates typically have large corneas relative to eye size as an adaptation for increased visual sensitivity. Conversely, diurnal vertebrates generally demonstrate smaller corneas relative to eye size as an adaptation for increased visual acuity. By contrast, several studies have concluded that many mammals exhibit typical nocturnal eye shapes, regardless of activity pattern. However, a recent study has argued that new statistical methods allow eye shape to accurately predict activity patterns of mammals, including cathemeral species (animals that are equally likely to be awake and active at any time of day or night). Here, we conduct a detailed analysis of eye shape and activity pattern in mammals, using a broad comparative sample of 266 species. We find that the eye shapes of cathemeral mammals completely overlap with nocturnal and diurnal species. Additionally, most diurnal and cathemeral mammals have eye shapes that are most similar to those of nocturnal birds and lizards. The only mammalian clade that diverges from this pattern is anthropoids, which have convergently evolved eye shapes similar to those of diurnal birds and lizards. Our results provide additional evidence for a nocturnal 'bottleneck' in the early evolution of crown mammals.

Leimgruber 2012

Kristin L. Leimgruber, Alex Shaw, Laurie R. Santos & Kristina R. Olson, *Young Children Are More Generous When Others Are Aware of Their Actions*. PLoS ONE **7** (2012), e48292. DOI:10.1371/journal.pone.0048292.
Adults frequently employ reputation-enhancing strategies when engaging in prosocial acts, behaving more generously when their actions are likely to be witnessed by others and even more so when the extent of their generosity is made public. This study examined the developmental origins of sensitivity to cues associated with reputationally motivated prosociality by presenting five-year-olds with the option to provide one or four stickers to a familiar peer recipient at no cost to themselves. We systematically manipulated the recipient's knowledge of the actor's choices in two different ways: (1) occluding the recipient's view of both the actor and the allocation options and (2) presenting allocations in opaque containers whose contents were visible only to the actor. Children were consistently generous only when the recipient was fully aware of the donation options; in all cases in which the recipient was not aware of the donation options, children were strikingly ungenerous. These results demonstrate that five-year-olds exhibit "strategic prosociality," behaving differentially generous as a function of the amount of information available to the recipient about their actions. These findings suggest that long before they develop a rich understanding of the social significance of reputation or are conscious of complex strategic reasoning, children behave more generously when the details of their prosocial actions are available to others.

Levy 2012

J. Levy, T. Foulsham & A. Kingstone, *Monsters are people too*. Biology Letters (2012), preprint, 1–4. DOI:10.1098/rsbl.2012.0850.
Animals, including dogs, dolphins, monkeys and man, follow gaze. What mediates this bias towards the eyes? One hypothesis is that primates possess a distinct neural module that is uniquely tuned for the eyes of others. An alternative explanation is that configural face processing drives fixations to the middle of peoples' faces, which is where the eyes happen to be located. We distinguish between these two accounts. Observers were presented with images of people, non-human creatures with eyes in the middle of their faces ('humanoids') or creatures with eyes positioned elsewhere ('monsters'). There was a profound and significant bias towards looking early and often at the eyes of humans and

humanoids and also, critically, at the eyes of monsters. These findings demonstrate that the eyes, and not the middle of the head, are being targeted by the oculomotor system.

Livio 2012

Mario Livio, *Why symmetry matters*. nature **490** (2012), 472–473.

Mario Livio celebrates the guiding light for modern physics.

So far, the particle discovered in July at the LHC looks a lot like the Higgs boson. More tests are needed to prove it. First, the exp erimentalists must determine the quantum spin of the new boson (the Higgs is predicted to have no spin). Second, they need to measure the rates at which it decays into other particles and compare those to theoretical expectations. Even if the boson passes these tests, symmetry and its breaking do not leave centre stage.

Marasco 2012

Ramona Marasco et al., *A Drought Resistance-Promoting Microbiome Is Selected by Root System under Desert Farming*. PLoS ONE **7** (2012), e48479. DOI:10.1371/journal.pone.0048479.

Ramona Marasco, Eleonora Rolli, Besma Ettoumi, Gianpiero Vigani, Francesca Mapelli, Sara Borin, Ayman F. Abou-Hadid, Usama A. El-Behairy, Claudia Sorlini, Ameur Cherif, Graziano Zocchi & Daniele Daffonchio

Background: Traditional agro-systems in arid areas are a bulwark for preserving soil stability and fertility, in the sight of "reverse desertification". Nevertheless, the impact of desert farming practices on the diversity and abundance of the plant associated microbiome is poorly characterized, including its functional role in supporting plant development under drought stress.

Methodology/Principal Findings: We assessed the structure of the microbiome associated to the drought-sensitive pepper plant (Capsicum annuum L.) cultivated in a traditional Egyptian farm, focusing on microbe contribution to a crucial ecosystem service, i.e. plant growth under water deficit. The root system was dissected by sampling root/soil with a different degree of association to the plant: the endosphere, the rhizosphere and the root surrounding soil that were compared to the uncultivated soil. Bacterial community structure and diversity, determined by using Denaturing Gradient Gel Electrophoresis, differed according to the microhabitat, indicating a selective pressure determined by the plant activity. Similarly, culturable bacteria genera showed different distribution in the three root system fractions. Bacillus spp. (68 % of the isolates) were mainly recovered from the endosphere, while rhizosphere and the root surrounding soil fractions were dominated by Klebsiella spp. (61 % and 44 % respectively). Most of the isolates (95 %) presented in vitro multiple plant growth promoting (PGP) activities and stress resistance capabilities, but their distribution was different among the root system fractions analyzed, with enhanced abilities for Bacillus and the rhizobacteria strains. We show that the C. annuum rhizosphere under desert farming enriched populations of PGP bacteria capable of enhancing plant photosynthetic activity and biomass synthesis (up to 40 %) under drought stress.

Conclusions/Significance: Crop cultivation provides critical ecosystem services in arid lands with the plant root system acting as a "resource island" able to attract and select microbial communities endowed with multiple PGP traits that sustain plant development under water limiting conditions.

Mienert 2012

Juergen Mienert, *Signs of instability*. nature **490** (2012), 491–492.

The finding that pools of gas hydrates — compounds that trap natural gas emissions — in ocean sediments are deeper than expected implies that the hydrates are destabilizing, and might release gigatonnes of methane.

Pennings 2012

Steven C. Pennings, *The big picture of marsh loss.* nature **490** (2012), 352–353.

A landscape-scale experiment shows that excessive nutrient levels can cause the loss of salt marshes – a result that was not seen in smaller studies. This illustrates the value of large-scale, long-term studies in ecology.

A substantial portion of fertilizers are ultimately transported into rivers and to the sea. One consequence of this increased nutrient supply is the proliferation of 'dead zones' at the mouths of the world's rivers – areas where the decomposition of fertilizer-driven algal blooms has used up most of the oxygen, leading to the death of fish and other large organisms. Wetlands could provide a solution to this problem, because they chemically transform nutrients as they flow from land to sea. In particular, coastal salt marshes transform nitrate, the most abundant form of nitrogen in fresh waters, into nitrogen gas, thereby limiting the amount of nitrogen reaching the ocean. But does providing this 'ecosystem service' to humanity have consequences for wetlands? On page 388 of this issue, Deegan et al. show that the price may be a high rate of global wetland loss.

Sharot 2012

Tali Sharot, Ryota Kanai, David Marston, Christoph W. Korn, Geraint Rees & Raymond J. Dolan, *Selectively altering belief formation in the human brain.* PNAS **109** (2012), 17058–17062.

Humans form beliefs asymmetrically; we tend to discount bad news but embrace good news. This reduced impact of unfavorable information on belief updating may have important societal implications, including the generation of financial market bubbles, ill preparedness in the face of natural disasters, and overly aggressive medical decisions. Here, we selectively improved people's tendency to incorporate bad news into their beliefs by disrupting the function of the left (but not right) inferior frontal gyrus using transcranial magnetic stimulation, thereby eliminating the engrained "good news/bad news effect." Our results provide an instance of how selective disruption of regional human brain function paradoxically enhances the ability to incorporate unfavorable information into beliefs of vulnerability.

cognition | learning | optimism

Stoeger 2012

Angela S. Stoeger, Daniel Mietchen, Sukhun Oh, Shermin de Silva, Christian T. Herbst, Soowhan Kwon & W. Tecumseh Fitch, *An Asian Elephant Imitates Human Speech.* Current Biology (2012), preprint, 1–5. DOI:10.1016/j.cub.2012.09.022.

CurrBiol2012-preprint-Supplement1.pdf, CurrBiol2012-preprint-Supplement2.mp4, CurrBiol2012-preprint-Supplement3.mp4, CurrBiol2012-preprint-Supplement4.mp4, CurrBiol2012-preprint-Supplement5.mp3, CurrBiol2012-preprint-Supplement6.mp3, CurrBiol2012-preprint-Supplement7.mp3, CurrBiol2012-preprint-Supplement8.mp3

Vocal imitation has convergently evolved in many species, allowing learning and cultural transmission of complex, conspecific sounds, as in birdsong [1, 2]. Scattered instances also exist of vocal imitation across species, including mockingbirds imitating other species or parrots and mynahs producing human speech [3, 4]. Here, we document a male Asian elephant (Elephas maximus) that imitates human speech, matching Korean formants and fundamental frequency in such detail that Korean native speakers can readily understand and transcribe the imitations. To create these very accurate imitations of speech formant frequencies, this elephant (named Koshik) places his trunk inside his mouth, modulating the shape of the vocal tract during controlled phonation. This represents a wholly novel method of vocal production and formant control in this or any other species.

One hypothesized role for vocal imitation is to facilitate vocal recognition by heightening the similarity between related or socially affiliated individuals [1, 2]. The social circumstances under which Koshik's speech imitations developed suggest that one function of vocal learning might be to cement social bonds and, in unusual cases, social bonds across species.

Anthropologie

Schurger 2012

Aaron Schurger, Jacobo D. Sitt & Stanislas Dehaene, *An accumulator model for spontaneous neural activity prior to self-initiated movement*. PNAS **109** (2012), 16776–16777.

pnas109-16776-Fulltext.pdf, pnas109-16776-Supplement.pdf

A gradual buildup of neuronal activity known as the "readiness potential" reliably precedes voluntary self-initiated movements, in the average timelocked tomovement onset. This buildup is presumed to reflect the final stages of planning and preparation for movement. Here we present a different interpretation of the premovement buildup.We used a leaky stochastic accumulator tomodel the neural decision of "when" to move in a task where there is no specific temporal cue, but only a general imperative to produce amovement after an unspecified delay on the order of several seconds. According to our model, when the imperative to produce a movement is weak, the precise moment at which the decision threshold is crossed leading tomovement is largely determined by spontaneous subthreshold fluctuations in neuronal activity. Time locking to movement onset ensures that these fluctuations appear in the average as a gradual exponential-looking increase in neuronal activity. Our model accounts for the behavioral and electroencephalography data recorded from human subjects performing the task and also makes a specific prediction that we confirmed in a second electroencephalography experiment: Fast responses to temporally unpredictable interruptions should be preceded by a slow negative-going voltage deflection beginning well before the interruption itself, even when the subject was not preparing to move at that particular moment.

resting state | autocorrelation | volition | power-law

Tymula 2012

Agnieszka Tymula, Lior A. Rosenberg Belmaker, Amy K. Roy, Lital Ruderman, Kirk Manson, Paul W. Glimcher & Ifat Levy, *Adolescents' risk-taking behavior is driven by tolerance to ambiguity*. PNAS **109** (2012), 17135–17140.

Adolescents engage in a wide range of risky behaviors that their older peers shun, and at an enormous cost. Despite being older, stronger, and healthier than children, adolescents face twice the risk of mortality and morbidity faced by their younger peers. Are adolescents really risk-seekers or does some richer underlying preference drive their love of the uncertain? To answer that question, we used standard experimental economic methods to assess the attitudes of 65 individuals ranging in age from 12 to 50 toward risk and ambiguity. Perhaps surprisingly, we found that adolescents were, if anything, more averse to clearly stated risks than their older peers. What distinguished adolescents was their willingness to accept ambiguous conditions—situations in which the likelihood of winning and losing is unknown. Though adults find ambiguous monetary lotteries undesirable, adolescents find them tolerable. This finding suggests that the higher level of risk-taking observed among adolescents may reflect a higher tolerance for the unknown. Biologically, such a tolerance may make sense, because it would allow young organisms to take better advantage of learning opportunities; it also suggests that policies that seek to inform adolescents of the risks, costs, and benefits of unexperienced dangerous behaviors may

be effective and, when appropriate, could be used to complement policies that limit their experiences.
aging | decision making | uncertainty | lifespan

Grundlagen

Trigger 2003

Bruce G. Trigger, *Understanding Early Civilizations, A Comparative Study.* (Cambridge 2003).

This book offers the first detailed comparative study of the seven best-documented early civilizations: ancient Egypt and Mesopotamia, Shang China, the Aztecs and adjacent peoples in the Valley of Mexico, the Classic Maya, the Inka, and the Yoruba. Unlike previous studies, equal attention is paid to similarities and differences in their sociopolitical organization, economic systems, religion, and culture. Many of this study's findings are surprising and provocative. Agricultural systems, technologies, and economic behaviour turn out to have been far more diverse than was expected. Yet only two basic types of political organization are found – city-states and territorial states – and they influenced economic behaviour at least as much as did environmental differences. Underlying various religious beliefs was a single, distinctive pattern that is unique to early civilization and must have developed independently in different regions of the world. Many other shared religious beliefs appear to have been transformations of a shared heritage from earlier times. Esteemed lifestyles that differed idiosyncratically from one early civilization to another influenced human behaviour in ways that often persisted despite changing material and political circumstances. These findings and many others challenge not only current understandings of early civilizations but also the theoretical foundations of modern archaeology and anthropology. The key to understanding early civilizations lies not in their historical connections but in what they can tell us about similarities and differences in human behaviour.
Bruce G. Trigger was James McGill Professor in the Department of Anthropology at McGill University. He received his PhD from Yale University and has carried out archaeological research in Egypt and the Sudan. His interests included the comparative study of early civilizations, the history of archaeology, and archaeological and anthropological theory. He received various scholarly awards, including the presitigious Prix Leon-Germ from the Quebec government, for his sustained contributions to the social sciences. He was an honorary Fellow of the Society of Antiquaries of Scotland and an honorary member of the Prehistoric Society (U.K.).

Zimmermann 2012

Andreas Zimmermann, *Cultural cycles in Central Europe during the Holocene.* Quaternary International **274** (2012), 251–258.

Cultural cycles in this paper are understood as a special case of adaptive cycles as described by Gunderson and Holling. The existence of such cultural cycles in European prehistory is well known. However, the potential of such (century long) cycles to improve understanding of mobility structures in sedentary societies is only now becoming visible.

Klima

Brienen 2012

Roel J. W. Brienen, Gerd Helle, Thijs L. Pons, Jean-Loup Guyot & Manuel Gloor, *Oxygen isotopes in tree rings are a good proxy for Amazon preci-*

pitation and El Niño-Southern Oscillation variability. PNAS **109** (2012), 16957–16962.

We present a unique proxy for the reconstruction of variation in precipitation over the-Amazon: oxygen isotope ratios in annual rings in tropical cedar (Cedrela odorata). A century-long record from northern Bolivia shows that tree rings preserve the signal of oxygen isotopes in precipitation during the wet season, with weaker influences of temperature and vapor pressure. Tree ring d18O correlates strongly with d18Oin precipitation fromdistant stations in the center and west of the basin, and with Andean ice core d18O showing that the signal is coherent over large areas. The signal correlates most strongly with basin-wide precipitation and Amazon river discharge. Weattribute the strength of this (negative) correlation mainly to the cumulative rainout processes of oxygen isotopes (Rayleigh distillation) in air parcels during westward transport across the basin. We further find a clear signature of the El Niño-Southern Oscillation (ENSO) in the record, with strong ENSO influences over recent decades, but weaker influence from 1925 to 1975 indicating decadal scale variation in the controls on the hydrological cycle. The record exhibits a significant increase in d18O over the 20th century consistent with increases in Andean d18O ice core and lake records, which we tentatively attribute to increased water vapor transport into the basin. Taking these data together, our record reveals a fresh path to diagnose and improve our understanding of variation and trends of the hydrological cycle of the world's largest river catchment.

climate change | dendrochronology | plant physiology

Deser 1993

Clara Deser & Maurice L. Blackmon, *Surface Climate Variations over the North Atlantic Ocean during Winter: 1900–1989*. Journal of Climate **6** (1993), 1743–1753.

The low-frequency variability of the surface climate over the North Atlantic during winter is described, using 90 years of weather observations from the Comprehensive Ocean-Atmosphere Data Set. Results are based on empirical orthogonal function analysis of four components of the climate system: sea surface temperature (SST), air temperature, wind, and sea level pressure. An important mode of variability of the wintertime surface climate over the North Atlantic during this century is characterized by a dipole pattern in SSTs and surface air temperatures, with anomalies of one sign east of Newfoundland, and anomalies of the opposite polarity off the southeast coast of the United States. Wind fluctuations occur locally over the regions of large surface temperature anomalies, with stronger-than-normal winds overlying cooler-than-normal SSTs. This mode exhibits variability on quasi-decadal and biennial time scales. The decadal fluctuations are irregular in length, averaging ≈9 years before 1945 and ≈12 years afterward. There does not appear to be any difference between the wind-SST relationships on the different time scales. The decadal fluctuations in SSTs east of Newfoundland are closely linked to decadal variations in sea ice in the Labrador Sea, with periods of greater than normal sea ice extent preceding by ≈2 years periods of colder-than-normal SSTs east of Newfoundland. Another dominant mode of variability is associated with the global surface warming trend during the 1920s and 1930s. The patterns of SST and air temperature change between 1900-29 and 1939-68 indicate that the warming was concentrated along the Gulf Stream east of Cape Hatteras. Warming also occurred over the Greenland Sea and the eastern subtropical Atlantic. The warming trend was accompanied by a decrease in the strength of the basin-scale atmospheric circulation (negative phase of the North Atlantic Oscillation). In marked contrast to the dipole pattern, the wind changes occurred downstream of the largest SST anomalies; hence, the gradual surface warming along the Gulf Stream may have been a result of altered ocean currents rather than local wind forcing.

Hao 2012

Qingzhen Hao et al., *Delayed build-up of Arctic ice sheets during 400,000-year minima in insolation variability*. nature **490** (2012), 393–396.

n490-0393-Supplement1.pdf, n490-0393-Supplement2.xls

Qingzhen Hao, LuoWang, Frank Oldfield, Shuzhen Peng, Li Qin, Yang Song, Bing Xu, Yansong Qiao, Jan Bloemendal & Zhengtang Guo

Knowledge of the past variability of climate at high northern latitudes during astronomical analogues of the present interglacial1 may help to inform our understanding of future climate change. Unfortunately, long-term continuous records of ice-sheet variability in the Northern Hemisphere only are scarce because records of benthic 18O content represent an integrated signal of changes in ice volume in both polar regions2. However, variations in Northern Hemisphere ice sheets influence the Siberian High3 (an atmospheric pressure system), so variations in the East Asian winter monsoon (EAWM)—as recorded in the aeolian dust deposits on the Chinese Loess Plateau—can serve as a useful proxy of Arctic climate variability before the ice-core record begins. Here we present an EAWM proxy record using grain-size variations in two parallel loess sections representative of sequences across the whole of the Chinese Loess Plateau over the past 900,000 years. The results show that during periods of low eccentricity and precessional variability at approximately 400,000-year intervals, the grain-size-inferred intensity of the EAWM remains weak for up to 20,000 years after the end of the interglacial episode of high summer monsoon activity and strong pedogenesis. In contrast, there is a rapid increase in the EAWM after the end of most other interglacials. We conclude that, for both the 400,000-year interglacials, the weak EAWM winds maintain a mild, non-glacial climate at high northern latitudes for much longer than expected from the conventional loess and marine oxygen isotope records. During these times, the less-severe summer insolation minima at 65° N (ref. 4) would have suppressed ice and snow accumulation, leading to a weak Siberian High and, consequently, weak EAWM winds.

Phrampus 2012

Benjamin J. Phrampus & Matthew J. Hornbach, *Recent changes to the Gulf Stream causing widespread gas hydrate destabilization*. nature **490** (2012), 527–530.

n490-0527-Supplement1.pdf, n490-0527-Supplement2.xls

The Gulf Stream is an ocean current that modulates climate in the Northern Hemisphere by transporting warm waters from the Gulf of Mexico into the North Atlantic and Arctic oceans1,2. A changing Gulf Stream has the potential to thaw and convert hundreds of gigatonnes of frozen methane hydrate trapped below the sea floor into methane gas, increasing the risk of slope failure and methane release3–9. How the Gulf Stream changes with time and what effect these changes have on methane hydrate stability is unclear. Here, using seismic data combined with thermal models, we show that recent changes in intermediate-depth ocean temperature associated with the Gulf Stream are rapidly destabilizing methane hydrate along a broad swathe of the North American margin. The area of active hydrate destabilization covers at least 10,000 square kilometres of the United States eastern margin, and occurs in a region prone to kilometre-scale slope failures. Previous hypothetical studies3,5 postulated that an increase of five degrees Celsius in intermediate-depth ocean temperatures could release enough methane to explain extreme global warming events like the Palaeocene–Eocene thermal maximum (PETM) and trigger widespread ocean acidification7. Our analysis suggests that changes in Gulf Stream flow or temperature within the past 5,000 years or so are warming the western North Atlantic margin by up to eight degrees Celsius and are now triggering the destabilization of 2.5 gigatonnes of methane hydrate (about 0.2 per cent of that required to cause the PETM). This destabilization extends along hundreds of kilometres of the margin and may continue for centuries. It is unlikely that the western North Atlantic margin is the

only area experiencing changing ocean currents10–12; our estimate of 2.5 gigatonnes of destabilizing methane hydrate may therefore represent only a fraction of the methane hydrate currently destabilizing globally. The transport from ocean to atmosphere of any methane released—and thus its impact on climate—remains uncertain.

Kultur

Clare 2010

Lee Clare & Hans Georg K. Gebel, *Introduction: Conflict and Warfare in the Near Eastern Neolithic*. Neo-Lithics **2010**, i, 3–5. <http://www.exoriente.org/docs/00051.pdf>.

Conflict and warfare in traditional societies can range significantly in scale from minor intrafamilial clashes at the level of small residence groups to large scale inter-community hostilities characterised by alliance formation and the annexation of foreign territories. Granted, warfare can in some instances be agent, institutionalised, and serve significant socioeconomic and ritual functions, but in others, where an increase in hostilities, particularly at the regional and supra-regional level, has an external catalyst, bellicose enterprises can culminate in the breakdown of afflicted communities, migration, adjustment of vertical differentiation within social networks, and material culture change. As such, this absence of scholarly interest with respect to the Neolithic in the Near East, with a few notable exceptions, is all the more incomprehensible.

Otterbein 2010

Keith F. Otterbein, *Early Warfare in the Near East*. Neo-Lithics **2010**, i, 56–58. <http://www.exoriente.org/docs/00051.pdf>.

I argue that warfare, if present, will prevent any preliminary steps toward plant domestication. Warfare destroys growing plants and stores of seeds, kills the gatherers, and forces site abandonment. Domestication of plants occurred on the Hilly Flanks and Piedmont Steppe of the Fertile Crescent where warfare was not occurring. In the Alluvial Desert south of the Fertile Crescent warfare was also not occurring. Here mature agricultural villages flourished. The farmers had a ready water supply from the Euphrates and Tigris Rivers. Through village fissioning chiefdoms arose. Still there was no warfare to halt the development of three-tier states. If chiefdoms had begun to destroy each other, the first pristine states in the world would not have developed. Other areas of the Old and New Worlds went through similar stages with warfare absent in north China, highland South America, and Central America. Primary states arose in those three regions. Warfare is not a causal factor in my interpretation of history. While it can be used to explain destruction and lack of development, its absence as part of a large scheme can explain both the origin of domestication and primary states.

Kupfer

Šljivar 2006

Duško Šljivar, *The earliest copper metallurgy in the central Balkans*. Metalurgija – Journal of Metallurgy **12** (2006), 93–104.

This work offers a summary of archaeometallurgical finds including special discussion of the recent finds from Belovode and Pločnik that absolutely affirm the thesis about origin and evolution of copper mining and metallurgy within Vinča culture even from its earliest phases.

Key words: Vinča culture, Pločnik, Belovode, malachite, azurite, metallurgy.

Neolithikum

Dai 2012

Fei Dai et al., *Tibet is one of the centers of domestication.* PNAS **109** (2012), 16969–16973.

pnas109-16969-Supplement.xls

Fei Dai, Eviatar Nevo, Dezhi Wu, Jordi Comadran, Meixue Zhou, Long Qiu, Zhonghua Chen, Avigdor Beiles, Guoxiong Chen and Guoping Zhang

The Near East Fertile Crescent is well recognized as a primary center of barley origin, diversity, and domestication. A large number of wild barleys have been collected from the Tibetan Plateau, which is characterized by an extreme environment. We used genome-wide diversity array technology markers to analyze the genotypic division between wild barley from the Near East and Tibet. Our results confirmed the existence of Tibetan wild barley and suggested that the split between the wild barleys in the Near East and those in Tibet occurred around 2.76 million years ago (Mya). To test the concept of polyphyletic domestication of barley, we characterized a set of worldwide cultivated barley. Some Chinese hulless and six-rowed barleys showed a close relationship with Tibetan wild barley but showed no common ancestor with other cultivated barley. Our data support the concept of polyphyletic domestication of cultivated barley and indicate that the Tibetan Plateau and its vicinity is one of the centers of domestication of cultivated barley. The current results may be highly significant in exploring the elite germplasm for barley breeding, especially against cold and drought stresses.

adaptation | evolution | harsh environment

Huang 2012

Xuehui Huang et al., *A map of rice genome variation reveals the origin of cultivated rice.* nature **490** (2012), 497–501.

n490-0497-Supplement1.pdf, n490-0497-Supplement2.pdf, n490-0497-Supplement3.zip

Xuehui Huang, Nori Kurata, Xinghua Wei, Zi-Xuan Wang, Ahong Wang, Qiang Zhao, Yan Zhao, Kunyan Liu, Hengyun Lu, Wenjun Li, Yunli Guo, Yiqi Lu, Congcong Zhou, Danlin Fan, Qijun Weng, Chuanrang Zhu, Tao Huang, Lei Zhang, Yongchun Wang, Lei Feng, Hiroyasu Furuumi, Takahiko Kubo, Toshie Miyabayashi, Xiaoping Yuan, Qun Xu, Guojun Dong, Qilin Zhan, Canyang Li, Asao Fujiyama, Atsushi Toyoda, Tingting Lu, Qi Feng, Qian Qian, Jiayang Li & Bin Han

Crop domestications are long-term selection experiments that have greatly advanced human civilization. The domestication of cultivated rice (Oryza sativa L.) ranks as one of the most important developments in history. However, its origins and domestication processes are controversial and have long been debated. Here we generate genome sequences from 446 geographically diverse accessions of the wild rice species Oryza rufipogon, the immediate ancestral progenitor of cultivated rice, and from 1,083 cultivated indica and japonica varieties to construct a comprehensive map of rice genome variation. In the search for signatures of selection, we identify 55 selective sweeps that have occurred during domestication. In-depth analyses of the domestication sweeps and genome-wide patterns reveal that Oryza sativa japonica rice was first domesticated from a specific population of O. rufipogon around the middle area of the Pearl River in southern China, and that Oryza sativa indica rice was subsequently developed from crosses between japonica rice and local wild rice as the initial cultivars spread into South East and South Asia. The domestication-associated traits are analysed through high-resolution genetic mapping. This study provides an important resource for rice breeding and an effective genomics approach for crop domestication research.

Story or Book

Brown 2012

Nancy Marie Brown, *The Abacus and the Cross*. nature **490** (2012), 479.

The Abacus and the Cross. Nancy Marie Brown (Basic Books, 2012; $16.99)

The idea that anti-scientific superstition defined the Middle Ages is challenged by science writer Nancy Marie Brown in this life of 'Scientist Pope' Gerbert of Aurillac. Gerbert devised early forms of the computer and the planetarium, and his teaching helped spread science through Europe.

Shvartsman 2012

Alex Shvartsman, *The Tell-Tale Ear*, *A sound investment*. nature **490** (2012), 440.

Smith 2006

Michael E. Smith, *How do archaeologists compare early states?* Reviews in Anthropology **35** (2006), 5–35.

Trigger, Bruce G. Understanding Early Civilizations: A Comparative Study. New York: Cambridge University Press, 2003. xiii+757 pp.

Smith, Adam T. The Political Landscape: Constellations of Authority in Early Complex Polities. Berkeley: University of California Press, 2003. xv+331 pp.

Bruce Trigger's and Adam Smith's comparative studies of state-level societies provide new theoretical approaches and are important components in a resurgence of explicit comparative analysis of early states by archaeologists. Trigger presents a massive systematic comparison of seven ancient states on an unusually large number of themes, whereas Smith carries out more intensive comparisons of a smaller sample on more limited themes. These well-written works make significant contributions to a number of areas, including empirical analysis, theory, and comparative methods.

Keywords: States, complex societies, ancient civilizations