

Literatur

Aktuell

DANIELS 2012

Bryan C. Daniels, David C. Krakauer & Jessica C. Flack, *Sparse code of conflict in a primate society*. [PNAS 109 \(2012\), 14259–14264](#).

Animals living in groups collectively produce social structure. In this context individuals make strategic decisions about when to cooperate and compete. This requires that individuals can perceive patterns in collective dynamics, but how this pattern extraction occurs is unclear. Our goal is to identify a model that extracts meaningful social patterns from a behavioral time series while remaining cognitively parsimonious by making the fewest demands on memory. Using fine-grained conflict data from macaques, we show that sparse coding, an important principle of neural compression, is an effective method for compressing collective behavior. The sparse code is shown to be efficient, predictive, and socially meaningful. In our monkey society, the sparse code of conflict is composed of related individuals, the policers, and the alpha female. Our results suggest that sparse coding is a natural technique for pattern extraction when cognitive constraints and small sample sizes limit the complexity of inferential models. Our approach highlights the need for cognitive experiments addressing how individuals perceive collective features of social organization.

cognition | statistical inference | collective computation | social complexity | social niche construction

FROHLICH 2012

Cliff Frohlich, *Two-year survey comparing earthquake activity and injection-well locations in the Barnett Shale, Texas*. [PNAS 109 \(2012\), 13934–13938](#).

Between November 2009 and September 2011, temporary seismographs deployed under the EarthScope USArray program were situated on a 70-km grid covering the Barnett Shale in Texas, recording data that allowed sensing and locating regional earthquakes with magnitudes 1.5 and larger. I analyzed these data and located 67 earthquakes, more than eight times as many as reported by the National Earthquake Information Center. All 24 of the most reliably located epicenters occurred in eight groups within 3.2 km of one or more injection wells. These included wells near Dallas–Fort Worth and Cleburne, Texas, where earthquakes near injection wells were reported by the media in 2008 and 2009, as well as wells in six other locations, including several where no earthquakes have been reported previously. This suggests injection-triggered earthquakes are more common than is generally recognized. All the wells nearest to the earthquake groups reported maximum monthly injection rates exceeding 150,000 barrels of water per month (24,000 m³/mo) since October 2006. However, while 9 of 27 such wells in Johnson County were near earthquakes, elsewhere no earthquakes occurred near wells with similar injection rates. A plausible hypothesis to explain these observations is that injection only triggers earthquakes if injected fluids reach and relieve friction on a suitably oriented, nearby fault that is experiencing regional tectonic stress. Testing this hypothesis would require identifying geographic regions where there is interpreted subsurface structure information available to determine whether there are faults near seismically active and seismically quiescent injection wells.

induced earthquakes | triggered earthquakes | unconventional gas development | seismic hazards | domestic energy policy

QU 2012

Qingqing Qu, Markus F. Damian & Nina Kazanina, *Sound-sized segments are significant for Mandarin speakers*. *PNAS* **109** (2012), 14265–14270.

Do speakers of all languages use segmental speech sounds when they produce words?

Existing models of language production generally assume a mental representation of individual segmental units, or phonemes, but the bulk of evidence comes from speakers of European languages in which the orthographic system codes explicitly for speech sounds. By contrast, in languages with nonalphabetical scripts, such as Mandarin Chinese, individual speech sounds are not orthographically represented, raising the possibility that speakers of these languages do not use phonemes as fundamental processing units. We used event-related potentials (ERPs) combined with behavioral measurement to investigate the role of phonemes in Mandarin production. Mandarin native speakers named colored line drawings of objects using color adjective-noun phrases; color and object name either shared the initial phoneme or were phonologically unrelated. Whereas naming latencies were unaffected by phoneme repetition, ERP responses were modulated from 200 ms after picture onset. Our ERP findings thus provide strong support for the claim that phonemic segments constitute fundamental units of phonological encoding even for speakers of languages that do not encode such units orthographically.

speech production | phonological planning | phoneme priming

RAFTERY 2012

Adrian E. Raftery, Nan Li, Hana èevèíková, Patrick Gerland & Gerhard K. Heilig, *Bayesian probabilistic population projections for all countries*. *PNAS* **109** (2012), 13915–13921.

Projections of countries' future populations, broken down by age and sex, are widely used for planning and research. They are mostly done deterministically, but there is a widespread need for probabilistic projections. We propose a Bayesian method for probabilistic population projections for all countries. The total fertility rate and female and male life expectancies at birth are projected probabilistically using Bayesian hierarchical models estimated via Markov chain Monte Carlo using United Nations population data for all countries. These are then converted to age-specific rates and combined with a cohort component projection model. This yields probabilistic projections of any population quantity of interest. The method is illustrated for five countries of different demographic stages, continents and sizes. The method is validated by an out of sample experiment in which data from 1950–1990 are used for estimation, and applied to predict 1990–2010.

The method appears reasonably accurate and well calibrated for this period. The results suggest that the current United Nations high and low variants greatly underestimate uncertainty about the number of oldest old from about 2050 and that they underestimate uncertainty for high fertility countries and overstate uncertainty for countries that have completed the demographic transition and whose fertility has started to recover towards replacement level, mostly in Europe. The results also indicate that the potential support ratio (persons aged 20–64 per person aged 65+) will almost certainly decline dramatically in most countries over the coming decades.

double logistic function | Lee-Carter method | life expectancy at birth | predictive distribution | United Nations World Population Prospects

RAHIMI 2012

Kazem Rahimi et al., *Effect of Statins on Venous Thromboembolic Events: A Meta-analysis of Published and Unpublished Evidence from*

Randomised Controlled Trials. PLoS Medicine **9** (2012), e1001310.

[DOI:10.1371/journal.pmed.1001310](https://doi.org/10.1371/journal.pmed.1001310).

Kazem Rahimi, Neeraj Bhala, Pieter Kamphuisen, Jonathan Emberson, Sara Biere-Rafi, Vera Krane, Michele Robertson, John Wikstrand, John McMurray

Background: It has been suggested that statins substantially reduce the risk of venous thromboembolic events. We sought to test this hypothesis by performing a meta-analysis of both published and unpublished results from randomised trials of statins.

Methods and Findings: We searched MEDLINE, EMBASE, and Cochrane CENTRAL up to March 2012 for randomised controlled trials comparing statin with no statin, or comparing high dose versus standard dose statin, with 100 or more randomised participants and at least 6 months' follow-up. Investigators were contacted for unpublished information about venous thromboembolic events during follow-up. Twenty-two trials of statin versus control (105,759 participants) and seven trials of an intensive versus a standard dose statin regimen (40,594 participants) were included. In trials of statin versus control, allocation to statin therapy did not significantly reduce the risk of venous thromboembolic events (465 [0.9%] statin versus 521 [1.0%] control, odds ratio [OR] = 0.89, 95% CI 0.78-1.01, $p = 0.08$) with no evidence of heterogeneity between effects on deep vein thrombosis (266 versus 311, OR 0.85, 95% CI 0.72-1.01) and effects on pulmonary embolism (205 versus 222, OR 0.92, 95% CI 0.76-1.12). Exclusion of the trial result that provided the motivation for our meta-analysis (JUPITER) had little impact on the findings for venous thromboembolic events (431 [0.9%] versus 461 [1.0%], OR = 0.93 [95% CI 0.82-1.07], $p = 0.32$ among the other 21 trials). There was no evidence that higher dose statin therapy reduced the risk of venous thromboembolic events compared with standard dose statin therapy (198 [1.0%] versus 202 [1.0%], OR = 0.98, 95% CI 0.80- 1.20, $p = 0.87$). Risk of bias overall was small but a certain degree of effect underestimation due to random error cannot be ruled out.

Conclusions: The findings from this meta-analysis do not support the previous suggestion of a large protective effect of statins (or higher dose statins) on venous thromboembolic events. However, a more moderate reduction in risk up to about one-fifth cannot be ruled out.

ROSENDAAL 2012

Frits R. Rosendaal, *Statins and Venous Thrombosis: A Story Too Good to Be True?* PLoS Medicine **9** (2012), e1001311.

[DOI:10.1371/journal.pmed.1001311](https://doi.org/10.1371/journal.pmed.1001311).

Stories too good to be true may nevertheless be true, but need to be approached with ample skepticism. Over the years, beneficial effects have been attributed to statins that go beyond lipidlowering. These include heart failure, arrhythmia, multiple sclerosis, depression, Alzheimer's dementia, osteoporosis, osteoarthritis, macular degeneration, sepsis, infections, acute lung injury, neuropathic pain, AIDS, fatty liver disease, and epilepsy.

To paraphrase Anton Chekhov, who said that when many remedies are used to treat a disease, it means the disease is incurable, one may argue that if many cures are attributed to a single drug, it may be ineffective-and non-causal explanations should be sought. A "healthy user effect" has been proposed to explain this unlikely pleiotropic action, i.e., that statins are prescribed preferentially to individuals with a favourable risk profile [13], or that the healthiest users are analysed in some observational studies [14]. Although users of a drug are rarely more healthy than non-users, a widespread primary prevention use may introduce such bias. When this type of confounding by indication is suspected, a randomised trial is the accepted method to break the link between drug prescription and prognosis.

In sum, the dogma of the haemostatic balance still holds: effective anticoagulants cause bleeding.

SPENCER 2012

Joel Q. G. Spencer & David C. W. Sanderson, *Decline in firing technology or poorer fuel resources? High-temperature thermoluminescence (HTTL) archaeothermometry of Neolithic ceramics from Pool, Sanday, Orkney*. [Journal of Archaeological Science](#) **39** (2012), 3542–3552.

JArchSci39-3542-Supplement.kmz

The Neolithic ceramic assemblage from the multi-period coastal settlement at Pool on the island of Sanday, Orkney is unique because it stratigraphically spans both the earlier round-based (including possible Unstan bowls) and later flat-based ('Grooved Ware') traditions. High-temperature thermoluminescence (HTTL) analysis objectively demonstrates that ceramics from the earliest Neolithic layers have been consistently better fired compared to examples from later layers. We suggest two interpretations of these data: either firing technology declined with changing social structures and/or adoption of a different ceramic tradition or that there was greater pressure on fuel resource and management in the later Neolithic. Paleoenvironmental and chronological evidence indicate climatic deterioration in the later Neolithic, which adds further support to an interpretation of a poorer fuel resource at that time. In addition to studies of the HTTL signal, analysis of the ambient temperature modification of the TL signal has potential to support or evaluate dating evidence, and is readily applicable to optically stimulated luminescence (OSL) age data.

Keywords: Orkney Neolithic | Ceramics | High-temperature thermoluminescence | Thermal exposure | Firing technology | Fuel resources | Palaeoclimate

WOODGETT 2012

Jim Woodgett, *We must be open about our mistakes*. [nature](#) **489** (2012), 7. Greater transparency about the scientific process and a closer focus on correcting defective data are the way forward, says Jim Woodgett.

The inherent uncertainty of research provides a safe haven for data omission, manipulation or exaggeration. Because interpretation of data is an imperfect science, there are few consequences for those tempted to oversell their findings. On the contrary, such faulty embellishment can help to determine whether a study is published – and where. More over, because failure to reproduce a published finding can be due to innocent factors, significant errors or falsehoods may be overlooked or simply pass unchallenged. As a result, modern science can churn out a flotsam of dead-end data that pollute the literature and waste precious resources.

One may argue that if a study is ignored it does no harm, but superfluous publication clutter is not benign. Minimally, it adds chaff to the wheat, but it also promotes mediocrity by example. More importantly, it provides meticulously documented evidence of apparent waste to funders and the public.

Amerika

CROWN 2012

Patricia L. Crown, Thomas E. Emerson, Jiyan Gu, W. Jeffrey Hurst, Timothy R. Pauketat & Timothy Ward, *Ritual Black Drink consumption at Cahokia*. [PNAS](#) **109** (2012), 13944–13949.

Chemical analyses of organic residues in fragments of pottery from the large site of Cahokia and surrounding smaller sites in Illinois reveal theobromine, caffeine, and ursolic acid, biomarkers for species of *Ilex* (holly) used to prepare the ritually important Black Drink. As recorded during the historic period, men consumed Black Drink in portions of the American Southeast for ritual purification. This first demonstrated discovery of

biomarkers for Ilex occurs in beaker vessels dating between A.D. 1050 and 1250 from Cahokia, located far north of the known range of the holly species used to prepare Black Drink during historic times. The association of Ilex and beaker vessels indicates a sustained ritual consumption of a caffeine-laced drink made from the leaves of plants grown in the southern United States.

archaeology | organic residue analysis | caffeinated drinks | Mississippian ritual

Anthropologie

ERIKSSON 2012

Anders Eriksson & Andrea Manica, *Effect of ancient population structure on the degree of polymorphism shared between modern human populations and ancient hominins*. [PNAS 109 \(2012\), 13956–13960](#).

Recent comparisons between anatomically modern humans and ancient genomes of other hominins have raised the tantalizing, and hotly debated, possibility of hybridization. Although several tests of hybridization have been devised, they all rely on the degree to which different modern populations share genetic polymorphisms with the ancient genomes of other hominins. However, spatial population structure is expected to generate genetic patterns similar to those that might be attributed to hybridization. To investigate this problem, we take Neanderthals as a case study, and build a spatially explicit model of the shared history of anatomically modern humans and this hominin. We show that the excess polymorphism shared between Eurasians and Neanderthals is compatible with scenarios in which no hybridization occurred, and is strongly linked to the strength of population structure in ancient populations. Thus, we recommend caution in inferring admixture from geographic patterns of shared polymorphisms, and argue that future attempts to investigate ancient hybridization between humans and other hominins should explicitly account for population structure.

ABBA-BABA | D statistic | Neanderthal introgression | stepping stone model | out-of-Africa

GALOR 2002

Oded Galor & Omer Moav, *Natural selection and the origin of economic growth*. [Quarterly Journal of Economics 117 \(2002\), 1133–1191](#).

This research develops an evolutionary growth theory that captures the interplay between the evolution of mankind and economic growth since the emergence of the human species. The theory suggests that the struggle for survival that had characterized most of human existence generated an evolutionary advantage to human traits that were complementary to the growth process, triggering the takeoff from an epoch of stagnation to sustained economic growth.

“It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change” [Charles Darwin].

KAPLAN 2000

David Kaplan, *The Darker Side of the “Original Affluent Society”*. [Journal of Anthropological Research 56 \(2000\), 301–324](#).

Hunter-gatherers emerged from the “Man the Hunter” conference in 1966 as the “original affluent society”. The main features of this thesis now seem to be widely accepted by anthropologists, despite the strong reservations expressed by certain specialists in foraging societies concerning the data advanced to support the claim. This essay brings together a portion of the data and argumentation in the literature that raise a number of questions about hunter-gatherer affluence. Three topics are addressed: How “hard” do foragers work? How well-fed are members of foraging societies? And what do we mean by “work”,

“leisure”, and “affluence” in the context of foraging societies? Finally, this essay offers some thoughts about why, given the reservations and critical observations expressed by anthropologists who work with foragers, the thesis seems to have been enthusiastically embraced by most anthropologists.

MATHIAS 2012

Rasika A. Mathias et al., *Adaptive Evolution of the FADS Gene Cluster within Africa*. [PLoS ONE 7 \(2012\), e44926. DOI:10.1371/journal.pone.0044926](#). Rasika A. Mathias, Wenqing Fu, Joshua M. Akey, Hannah C. Ainsworth, Dara G. Torgerson, Ingo Ruczinski, Susan Sergeant, Kathleen C. Barnes, Floyd H. Chilton
Long chain polyunsaturated fatty acids (LC-PUFAs) are essential for brain structure, development, and function, and adequate dietary quantities of LC-PUFAs are thought to have been necessary for both brain expansion and the increase in brain complexity observed during modern human evolution. Previous studies conducted in largely European populations suggest that humans have limited capacity to synthesize brain LC-PUFAs such as docosahexaenoic acid (DHA) from plantbased medium chain (MC) PUFAs due to limited desaturase activity. Population-based differences in LC-PUFA levels and their product-to-substrate ratios can, in part, be explained by polymorphisms in the fatty acid desaturase (FADS) gene cluster, which have been associated with increased conversion of MC-PUFAs to LC-PUFAs. Here, we show evidence that these high efficiency converter alleles in the FADS gene cluster were likely driven to near fixation in African populations by positive selection ,85 kya. We hypothesize that selection at FADS variants, which increase LC-PUFA synthesis from plantbased MC-PUFAs, played an important role in allowing African populations obligatorily tethered to marine sources for LCPUFAs in isolated geographic regions, to rapidly expand throughout the African continent 60-80 kya.

ROGERS 1994

Alan R. Rogers, *Evolution of Time Preference by Natural Selection*. [American Economic Review 84 \(1994\), iii, 460–481](#).

This paper entertains the hypothesis that human time preferences are in evolutionary equilibrium (i.e. that no mutation changing time preferences could be favored by natural selection). This hypothesis implies that the marginal rate of substitution (MRS) holding Darwinian fitness constant must equal the MRS holding utility constant. Furthermore, in a market economy the latter must equal the MRS in exchange. Exploiting these principles, I find that the long-term real interest rate should equal $\ln(2)$ per generation (about 2 percent per year) and that young adults should discount the future more rapidly than their elders.

Biologie

PALUMBI 2001

Stephen R. Palumbi, *Humans as the World’s Greatest Evolutionary Force*. [science 293 \(2001\), 1786–1790](#).

In addition to altering global ecology, technology and human population growth also affect evolutionary trajectories, dramatically accelerating evolutionary change in other species, especially in commercially important, pest, and disease organisms. Such changes are apparent in antibiotic and human immunodeficiency virus (HIV) resistance to drugs, plant and insect resistance to pesticides, rapid changes in invasive species, life-history change in commercial fisheries, and pest adaptation to biological engineering products. This accelerated evolution costs at least \$33 billion to \$50 billion a year in the United States. Slowing and controlling arms races in disease and pest management have been

successful in diverse ecological and economic systems, illustrating how applied evolutionary principles can help reduce the impact of humankind on evolution.

Grundlagen

TURNER 2012

B. L. Turner II & Jeremy A. Sabloff, *Classic Period collapse of the Central Maya Lowlands: Insights about human-environment relationships for sustainability*. *PNAS* **109** (2012), 13908–13914.

The ninth century collapse and abandonment of the Central Maya Lowlands in the Yucatán peninsular region were the result of complex human-environment interactions. Large-scale Maya landscape alterations and demands placed on resources and ecosystem services generated high-stress environmental conditions that were amplified by increasing climatic aridity. Coincident with this stress, the flow of commerce shifted from land transit across the peninsula to sea-borne transit around it. These changing socioeconomic and environmental conditions generated increasing societal conflicts, diminished control by the Maya elite, and led to decisions to move elsewhere in the peninsular region rather than incur the high costs of maintaining the human-environment systems in place. After abandonment, the environment of the Central Maya Lowlands largely recovered, although altered from its state before Maya occupation; the population never recovered. This history and the spatial and temporal variability in the pattern of collapse and abandonment throughout the Maya lowlands support the case for different conditions, opportunities, and constraints in the prevailing human-environment systems and the decisions to confront them. The Maya case lends insights for the use of paleo- and historical analogs to inform contemporary global environmental change and sustainability.
Mesoamerica | complex systems | land management

Isotope

FERNANDES 2012

Ricardo Fernandes, Marie-Josée Nadeau & Pieter M. Grootes, *Macronutrient-based model for dietary carbon routing in bone collagen and bioapatite*. *Archaeological and Anthropological Sciences* (2012) preprint, 1–11. DOI:10.1007/s12520-012-0102-7.

Carbon stable isotope ratios ($\delta^{13}\text{C}$), measured in human bone collagen ($\delta^{13}\text{C}_{\text{collagen}}$) and bioapatite ($\delta^{13}\text{C}_{\text{bioapatite}}$), are commonly used indicators in ancient human diet reconstruction. The underlying assumption is that human tissues broadly reflect the $\delta^{13}\text{C}$ signal of dietary food sources ($\delta^{13}\text{C}_{\text{diet}}$) plus an isotopic offset. However, interpretation of results may be confounded by the differentiated routing of macronutrients (energy, that is carbohydrates and lipids, and protein) having associated different isotopic signals ($\delta^{13}\text{C}_{\text{energy}}$, $\delta^{13}\text{C}_{\text{protein}}$). Multiple regression analyses were conducted on data from controlled animal feeding experiments compiled by Froehle et al. (*J Archaeol Sci* 37:2662-2670, 2010). We derived a simple algebraic macronutrient-based model with $\delta^{13}\text{C}_{\text{bioapatite}}=10.1+\delta^{13}\text{C}_{\text{diet}}$ (‰) and $\delta^{13}\text{C}_{\text{collagen}}=4.8+0.74 \delta^{13}\text{C}_{\text{protein}}+0.26 \delta^{13}\text{C}_{\text{energy}}$ (‰). While the established relationship for $\delta^{13}\text{C}_{\text{bioapatite}}$ is similar to previously known results, the model also suggests that $\delta^{13}\text{C}_{\text{collagen}}$ signal contributions originate from surprisingly consistent proportions of protein and energy macronutrients. Given that feeding experiments explore extreme variations in the proportion of diet macronutrients, the applicability of the proposed model and its predictions were tested in a variety of well-known, wild animal and human, natural contexts. Possible biochemical mechanisms explaining these empirical results are discussed.

Keywords: Carbon stable isotopes | Dietary routing | Animal feeding experiments | Macronutrients | Bone collagen | Bioapatite

SZPAK 2012

Paul Szpak, Jean-François Millaire, Christine D. White & Fred J. Longstaffe, *Influence of seabird guano and camelid dung fertilization on the nitrogen*. [Journal of Archaeological Science](#) **39** (2012), 3721–3740.

JArchSci39-3721-Supplement.xls

Organic fertilizers have the capacity to alter the nitrogen isotopic composition of plants. Camelid dung and seabird guano are two potentially important fertilizers in the agricultural systems of western South America, particularly Peru and Chile. This paper presents isotopic data (d13C and d15N) from field grown plants (maize, *Zea mays*) fertilized with the following four treatments: CO (control, no fertilizer applied), AS (ammonium sulfate, a chemical fertilizer), DU (camelid dung), and SG (seabird guano). Plants were grown in experimental plots in the Virú Valley, northern Peru. Plants fertilized with the chemical fertilizer presented very similar isotopic compositions compared to the control. Conversely, the camelid dung fertilized plants were characterized by higher d15N values compared to the control plants (by 1.8 to 4.2‰ depending on the plant part). The seabird guano fertilized plants were greatly enriched in 15N in comparison to the control plants (by 11.3 to 20.0‰). The results of this study have important implications for the reconstruction of human diet using isotopic data derived from bone collagen and related tissues, particularly in the prehispanic Andes, but also in Europe and North America during the 19th century, when Peruvian seabird guano was used extensively. Specifically, the interpretation of the relative contributions of plant and animal protein to the diet on the basis of bulk isotopic compositions of bone collagen (or similar tissues) may be confounded by camelid dung fertilization if the carbon isotopic compositions of the two sources are similar. Likewise, the interpretation of the relative contributions of maize and marine protein may be confounded by seabird guano fertilization.

Keywords: Nitrogen stable isotopes | Fertilizer | Guano | Camelid dung | Andes | Paleo-diet | Agriculture

Kultur

CLARK 2006

Gregory Clark & Gillian Hamilton, *Survival of the Richest: The Malthusian Mechanism in Pre-Industrial England*. [Journal of Economic History](#) **66** (2006), 707–736.

Fundamental to the Malthusian model of pre-industrial society is the assumption that higher income increased reproductive success. Despite the seemingly inescapable logic of this model, its empirical support is weak. We examine the link between income and net fertility using data from wills on reproductive success, social status and income for England 1585-1638. We find that for this society, close to a Malthusian equilibrium, wealth robustly predicted reproductive success. The richest testators left twice as many children as the poorest. Consequently, in this static economy, social mobility was predominantly downwards. The result extends back to at least 1250 in England.

CLARK 2007

Gregory Clark & David Jacks, *Coal and the Industrial Revolution, 1700–1869*. [European Review of Economic History](#) **11** (2007), 39–72.

How important was coal to the Industrial Revolution? Despite the huge growth of output, and the grip of coal and steam on the popular image of the Industrial Revolution, recent

cliometric accounts have assumed coalmining mattered little to the Industrial Revolution. In contrast both E. A. Wrigley and Kenneth Pomeranz have made coal central to the story. This article constructs new series on coal rents, the price of coal at pithead and at market, and the price of firewood, and uses them to examine this issue. We conclude coal output expanded in the Industrial Revolution mainly as a result of increased demand rather than technological innovations in mining. But that expansion could have occurred at any time before 1760. Further, our coal rents series suggests that English possession of coal reserves made a negligible contribution to Industrial Revolution incomes.

DÍAZ-ANDREU 2012

Margarita Díaz-Andreu & Carlos García Benito, *Acoustics and Levantine rock art: auditory perceptions in La Valltorta Gorge (Spain)*. [Journal of Archaeological Science](#) **39** (2012), 3591–3599.

This article explores the relevance of acoustics as a factor for in the production and active use of Levantine rock art in Spain. The renowned rock art area of La Valltorta Gorge serves as a case study. Two experiments are described; the first assessed whether the sites with the most painted motifs had better acoustics than those with fewer motifs. The second tested which areas in La Valltorta Gorge had better acoustics and whether there was a difference between the acoustics of the decorated area and the contiguous sectors of the Gorge where no paintings have been found. In both experiments different sounds and pitches were used. The results suggest a strong relationship between the painted areas and the sonority of the place, with the major sites generally having provided the best results, with the exception of the sonority when facing the rock art panels. It is suggested that La Valltorta Gorge was chosen to be decorated with a view to increasing the perceptual impact of the rituals that may have been held at rock art sites due to the amplification caused by the echoing and resonance.

Keywords: Rock art | Archaeoacoustics | Levantine style | La Valltorta Gorge | Spain | Echo | Resonance | Religious practices

GALOR 2000

Oded Galor & David N. Weil, *Population, Technology, and Growth: From Malthusian stagnation to the demographic transition and beyond*. [American Economic Review](#) **90** (2000), iv, 807–828.

This paper develops a unified growth model that captures the historical evolution of population, technology, and output. It encompasses the endogenous transition between three regimes that have characterized economic development. The economy evolves from a Malthusian regime, where technological progress is slow and population growth prevents any sustained rise in income per capita, into a Post-Malthusian regime, where technological progress rises and population growth absorbs only part of output growth. Ultimately, a demographic transition reverses the positive relationship between income and population growth, and the economy enters a Modern Growth regime with reduced population growth and sustained income growth.

MOKYR 1988

Joel Mokyr, *Is There Still Life in the Pessimist Case? Consumption during the Industrial Revolution, 1790–1850*. [Journal of Economic History](#) **48** (1988), 69–92.

Recent research on the standard-of-living controversy has argued that a marked improvement in the economic well-being of British workers began shortly after 1815 and continued unabated until 1850. I test that new optimism by generating a synthetic annual “standard-of-living variable” for the period 1790 to 1850. The variable is based on estimating a relation between living standards and the consumption of some key commodities

for 1855 to 1900 and then using that relation to “retrocast” living standards for 1790 to 1850. The results strongly suggest that the hypothesis of no or little improvement cannot be rejected.

MOKYR 2005

Joel Mokyr, *The Intellectual Origins of Modern Economic Growth*. [Journal of Economic History](#) **65** (2005), 285–351.

The intellectual origins of the Industrial Revolution are traced back to the Baconian program of the seventeenth century, which aimed at expanding the set of useful knowledge and applying natural philosophy to solve technological problems and bring about economic growth. The eighteenth-century Enlightenment in the West carried out this program through a series of institutional developments that both increased the amount of knowledge and its accessibility to those who could make best use of it. Without the Enlightenment, therefore, an Industrial Revolution could not have transformed itself into the sustained economic growth starting in the early nineteenth century.

PRESCOTT 2004

Edward C. Prescott & W.P. Carey Chair, *Why Do Americans Work So Much More Than Europeans?* [Federal Reserve Bank of Minneapolis Quarterly Review](#) **28** (2004), i, 2–13.

Americans now work 50 percent more than do the Germans, French, and Italians. This was not the case in the early 1970s, when the Western Europeans worked more than Americans. This article examines the role of taxes in accounting for the differences in labor supply across time and across countries; in particular, the effective marginal tax rate on labor income. The population of countries considered is the G-7 countries, which are major advanced industrial countries. The surprising finding is that this marginal tax rate accounts for the predominance of differences at points in time and the large change in relative labor supply over time.

PSACHAROPOULOS 1994

George Psacharopoulos, *Returns to Investment in Education: A Global Update*. [World Development](#) **22** (1994), 1325–1343.

The paper provides a comprehensive update of the profitability of investment in education at a global scale. The rate of return patterns established in earlier reviews are upheld: namely, that primary education continues to be the number one investment priority in developing countries; the returns decline by the level of schooling and the country’s per capita income; investment in women’s education is in general more profitable than that for men; returns in the private competitive sector of the economy are higher than among those working in the public sector; and that the public financing of higher education is regressive. The above findings are discussed in the context of controversies in the field, concluding that investment in education continues to be a very attractive investment opportunity in the world today – both from the private and the social point of view.

Mathematik

GAVRILETS 2012

Sergey Gavrilets, *On the evolutionary origins of the egalitarian syndrome*. [PNAS](#) **109** (2012), 14069–14074.

The evolutionary emergence of the egalitarian syndrome is one of the most intriguing unsolved puzzles related to the origins of modern humans. Standard explanations and

models for cooperation and altruism—reciprocity, kin and group selection, and punishment—are not directly applicable to the emergence of egalitarian behavior in hierarchically organized groups that characterized the social life of our ancestors. Here I study an evolutionary model of group living individuals competing for resources and reproductive success. In the model, the differences in fighting abilities lead to the emergence of hierarchies where stronger individuals take away resources from weaker individuals and, as a result, have higher reproductive success. First, I show that the logic of within-group competition implies under rather general conditions that each individual benefits if the transfer of the resource from a weaker group member to a stronger one is prevented. This effect is especially strong in small groups. Then I demonstrate that this effect can result in the evolution of a particular, genetically controlled psychology causing individuals to interfere in a bully-victim conflict on the side of the victim. A necessary condition is a high efficiency of coalitions in conflicts against the bullies. The egalitarian drive leads to a dramatic reduction in within-group inequality. Simultaneously it creates the conditions for the emergence of inequity aversion, empathy, compassion, and egalitarian moral values via the internalization of behavioral rules imposed by natural selection. It also promotes widespread cooperation via coalition formation.
despotic | hawk-dove | bystander

ISERN 2012

Neus Isern & Joaquim Fort, *Modelling the effect of Mesolithic populations on the slowdown of the Neolithic transition*. [Journal of Archaeological Science](#) **39** (2012), 3671–3676.

The expansion of the Neolithic transition in Europe took place gradually from the Near East across the whole continent. At Northern Europe, observations show a slowdown in the speed of the Neolithic front in comparison to other regions of the continent. It has been suggested that the presence of high population densities of hunter-gatherers at the North could have been the main cause for this slowdown. This proposal has recently been described by a mathematical model that takes into account: (i) the resistance opposed by the Mesolithic populations to the advance of Neolithic populations in their territory, and (ii) a limitation on the population growth dynamics due to the competition for space and resources. But these two effects are not equally responsible for the slowdown of the spread. Indeed, here we show that the limitation on the population growth dynamics seems to have been the main cause of the delay of the expansion of farming in Northern Europe.

Keywords: Neolithic transition | Slowdown of Neolithic expansion | Northern Europe | Neolithic-Mesolithic interaction | Reaction-diffusion equations

Methoden

FAIGENBAUM 2012

Shira Faigenbaum et al., *Multispectral images of ostraca: acquisition and analysis*. [Journal of Archaeological Science](#) **39** (2012), 3581–3590.

Shira Faigenbaum, Barak Sober, Arie Shaus, Murray Moinester, Eli Piasetzky, Gregory Bearman, Michael Cordonsky, Israel Finkelstein

We examine how multispectral imaging can be used to document and improve reading of ancient inscriptions. The research focuses on ostraca, texts written in ink on ceramic potsherds. Three corpora of Hebrew ostraca dating to the Iron Age II were imaged in visible and near infrared light using a state-of-the-art commercial spectral imager. To assess the quality of images, we used a new quality evaluation measure which takes into account various contrast and brightness transformations. We show that there exists a wavelength range where the readability of ostraca is enhanced. Moreover, we show that it

is sufficient to use certain bandpass filters to achieve the most favorable image. Our study paves the way towards a low cost multispectral method of imaging ostraca inscriptions.
Keywords: Visible and near infrared photography | Multispectral imaging | Ostraca | Epigraphy | Hebrew epigraphy | Contrast evaluation | Potential contrast | CMI

Mittelpaläolithikum

TRINKAUS 2012

Erik Trinkaus, *Neandertals, early modern humans, and rodeo riders*. [Journal of Archaeological Science](#) **39** (2012), 3691–3693.

In 1995 Berger and Trinkaus (*J. Archaeol. Sci.* 22, 841–852) proposed that the anatomical distribution of Neandertal trauma, with a predominance of upper body lesions, reflected close-quarter ambush hunting as dictated by the available Middle Paleolithic weaponry (the “Rodeo rider” hypothesis). The necessity for mobility among these Late Pleistocene foragers, as a factor possibly reducing the number of preserved lower limb injuries, was considered as an alternative explanation. The accumulating data on Upper Paleolithic injuries and Middle Paleolithic weaponry, considerations of differential skeletal susceptibility of minor trauma, and evidence of interhuman violence, plus the importance of mobility for Late Pleistocene human existence, suggest that hunting injuries may explain only part of the pattern. The purpose of this note is not to resolve to ultimate factors behind the anatomical distribution of traumatic lesions among the Neandertals (or early modern humans). It is 1) to emphasize that there are multiple probable contributing factors other than close-quarter ambush hunting due to the limitations of Middle Paleolithic weaponry, and 2) to open the discussion to alternative interpretations.

Keywords: Trauma | Mobility | Middle Paleolithic | Upper Paleolithic | Spears

Neolithikum

GHERSA 1994

C. M. Ghersa, M. L. Roush, S. R. Radosevich & S. M. Cordray, *Coevolution of Agroecosystems and Weed Management*, *Weed-management practices have become closely linked to social and economic, rather than biological, factors*. [BioScience](#) **44** (1994), 86–94.

Story or Book

BALLANTYNE 2012

Tony Ballantyne, *If only . . . , A taste of your own medicine*. [nature](#) **489** (2012), 170.

“This is outrageous!” snarled Sacha. “How can this happen?”

“Oh, that’s easy,” said James. “Magic.”

“Magic?” said Sacha, her eyes suddenly shining. “You mean there’s really such a thing?”