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Literatur

Aktuell

Beroza 2012

Gregory C. Beroza, *How many great earthquakes should we expect?* PNAS **109** (2012), 651–652.

Carrière 2012

Yves Carrière et al., *Large-scale, spatially-explicit test of the refuge strategy for delaying insecticide resistance.* PNAS **109** (2012), 775–780.

Yves Carrière, Christa Ellers-Kirk, Kyle Hartfield, Guillaume Larocque, Ben Degain, Pierre Dutilleul, Timothy J. Dennehy, Stuart E. Marsh, David W. Crowder, Xianchun Li, Peter C. Ellsworth, Steven E. Naranjo, John C. Palumbo, Al Fournier, Larry Antilla, and Bruce E. Tabashnik

The refuge strategy is used worldwide to delay the evolution of pest resistance to insecticides that are either sprayed or produced by transgenic Bacillus thuringiensis (Bt) crops. This strategy is based on the idea that refuges of host plants where pests are not exposed to an insecticide promote survival of susceptible pests. Despite widespread adoption of this approach, large-scale tests of the refuge strategy have been problematic. Here we tested the refuge strategy with 8 y of data on refuges and resistance to the insecticide pyriproxyfen in 84 populations of the sweetpotato whitefly (Bemisia tabaci) from cotton fields in central Arizona. We found that spatial variation in resistance to pyriproxyfen within each year was not affected by refuges of melons or alfalfa near cotton fields. However, resistance was negatively associated with the area of cotton refuges and positively associated with the area of cotton treated with pyriproxyfen. A statistical model based on the first 4 y of data, incorporating the spatial distribution of cotton treated and not treated with pyriproxyfen, adequately predicted the spatial variation in resistance observed in the last 4 y of the study, confirming that cotton refuges delayed resistance and treated cotton fields accelerated resistance. By providing a systematic assessment of the effectiveness of refuges and the scale of their effects, the spatially explicit approach applied here could be useful for testing and improving the refuge strategy in other crop-pest systems.

pesticide resistance | predictive evolutionary models | pest management | resistance management

Fritz 2012

Claudia Fritz, Joseph Curtin, Jacques Poitevineau, Palmer Morrel-Samuels & Fan-Chia Tao, *Player preferences among new and old violins.* PNAS **109** (2012), 760–763.

Most violinists believe that instruments by Stradivari and Guarneri “del Gesu” are tonally superior to other violins—and to new violins in particular. Many mechanical and acoustical factors have been proposed to account for this superiority; however, the fundamental premise of tonal superiority has not yet been properly investigated. Player’s judgments about a Stradivari’s soundmay be biased by the violin’s extraordinary monetary value and historical importance, but no studies designed to preclude such biasing factors have yet been published.We asked 21 experienced violinists to compare violins by Stradivari and Guarneri del Gesu with high-quality newinstruments. The resulting preferences were based on the violinists’ individual experiences of playing the instruments under double-blind conditions in a room with relatively dry acoustics. We found that (i)

the most-preferred violin was new; (ii) the least-preferred was by Stradivari; (iii) there was scant correlation between an instrument's age and monetary value and its perceived quality; and (iv) most players seemed unable to tell whether their most-preferred instrument was new or old. These results present a striking challenge to conventional wisdom. Differences in taste among individual players, along with differences in playing qualities among individual instruments, appear more important than any general differences between new and old violins. Rather than searching for the "secret" of Stradivari, future research might best focused on how violinists evaluate instruments, on which specific playing qualities are most important to them, and on how these qualities relate to measurable attributes of the instruments, whether old or new.
tone quality | old Italian sound | subjective evaluation | music | perception

Jefferson 2011

Jefferson T, Jones MA, Doshi P, Del Mar CB, Heneghan CJ, Hama R, Thompson MJ, *Neuraminidase inhibitors for preventing and treating influenza in healthy adults and children – a review of clinical study reports (Protocol).* Cochrane Database of Systematic Reviews **2011**, CD008965. DOI:10.1002/14651858.CD008965.

Shearer 2012

Peter M. Shearer & Philip B. Stark, *Global risk of big earthquakes has not recently increased.* PNAS **109** (2012), 717–721.
The recent elevated rate of large earthquakes has fueled concern that the underlying global rate of earthquake activity has increased, which would have important implications for assessments of seismic hazard and our understanding of how faults interact. We examine the timing of large (magnitude M $\geq$ 7) earthquakes from 1900 to the present, after removing local clustering related to aftershocks. The global rate of M $\geq$ 8 earthquakes has been at a record high roughly since 2004, but rates have been almost as high before, and the rate of smaller earthquakes is close to its historical average. Some features of the global catalog are improbable in retrospect, but so are some features of most random sequences—if the features are selected after looking at the data. For a variety of magnitude cutoffs and three statistical tests, the global catalog, with local clusters removed, is not distinguishable from a homogeneous Poisson process. Moreover, no plausible physical mechanism predicts real changes in the underlying global rate of large events. Together these facts suggest that the global risk of large earthquakes is no higher today than it has been in the past.
earthquake statistics | seismology

Snow 1912

E. C. Snow, *The Intensity of Natural Selection in Man.* nature **88** (1912), 361–361.
Mr. E. C. Snow ... has set himself to answer the following question: Has heavy infantile mortality any selective value or tendency to eliminate the more sickly and to spare the hardier children? Of the data available for the investigation of this problem, the most satisfactory are derived from the annual volumes of Prussian statistics ... Thirty rural districts in Prussia were taken, and all the children in them born in the year 1881 were considered. It was ascertained for each district how many of these children died in the first two years of life and how many in the next eight ... If the infantile mortality tends to weed out the weaker children, then in those districts in which the mortality among the children born in 1881 was highest in the years 1881 and 1882 it should tend to be lowest in the years 1883-90, since stronger children less likely to succumb to the ailments of childhood would have survived their first two years

Anthropologie

Barton 2011

C. Michael Barton, Julien Riel-Salvatore, John M. Anderies & Gabriel Popescu, *Modeling Human Ecodynamics and Biocultural Interactions in the Late Pleistocene of Western Eurasia*. HumEcol **39** (2011), 705–725.

HumEcol39-705-Supplement.pdf

Given the complex and multidimensional nature of human evolution, we need to develop theoretical and methodological frameworks to account for and model the dynamic feedbacks between co-operational biological and cultural evolutionary systems to better understand the processes that produced modern human behavior. Equally important is the generation of explicit theory-based models that can be tested against the empirical paleoanthropological record. We present a case study that examines evidence for culturally-driven behavioral change among Late Pleistocene hominins that altered the social niche occupied by hominins in western Eurasia, with consequences for subsequent biological and cultural evolution. We draw on a large sample of 167 Pleistocene assemblages across western Eurasia and employ mathematical and computational modeling to explore the feedbacks between cultural and biological inheritance. Shifts in land-use strategies changed the opportunities for social and biological interaction among Late Pleistocene hominins in western Eurasia with a cascade of consequences for cultural and biological evolution, including the disappearance of Neanderthals from the fossil and archaeological records, and the acceleration of cultural evolution among ancestors of modern humans.

Biologie

Ratliff 2011

Evan Ratliff, *Neue beste Freunde*. National Geographic **2011**, iv, 67–89.

Können Schwein und Fuchs zu Haustieren werden? Genetiker erforschen, wie der Mensch viele Wildtiere zähmen konnte – manche hingegen nicht.

Energie

Butler 2012

Declan Butler, *France 'imagines the unimaginable'*. nature **481** (2012), 121–121.

Regulator demands safety upgrades for nuclear plants to guard against a Fukushima-like disaster. The report recommends that all reactors, irrespective of their perceived vulnerability, should add a 'hard core' layer of safety systems, with control rooms, generators and pumps housed in bunkers able to withstand physical threats far beyond those that the plants themselves are designed to resist.

Klima

Archibald 2012

Sally Archibald, A. Carla Staver & Simon A. Levin, *Evolution of human-driven fire regimes in Africa*. PNAS **109** (2012), 847–852.

Human ability to manipulate fire and the landscape has increased over evolutionary time, but the impact of this on fire regimes and consequences for biodiversity and biogeochemistry are hotly debated. Reconstructing historical changes in human-derived fire regimes

empirically is challenging, but information is available on the timing of key human innovations and on current human impacts on fire; here we incorporate this knowledge into a spatially explicit fire propagation model. We explore how changes in population density, the ability to create fire, and the expansion of agropastoralism altered the extent and seasonal distribution of fire as modern humans arose and spread through Africa. Much emphasis has been placed on the positive effect of population density on ignition frequency, but our model suggests this is less important than changes in fire spread and connectivity that would have occurred as humans learned to light fires in the dry season and to transform the landscape through grazing and cultivation. Different landscapes show different limitations; we show that substantial human impacts on burned area would only have started ≈4,000 B.P. in open landscapes, whereas they could have altered fire regimes in closed/dissected landscapes by ≈40,000 B.P. Dry season fires have been the norm for the past 200-300 ky across all landscapes. The annual area burned in Africa probably peaked between 4 and 40 kya. These results agree with recent paleocarbon studies that suggest that the biomass burned today is less than in the recent past in subtropical countries.
human evolution | human ignition | savanna | fire spread model

Bradtmöller 2012

Marcel Bradtmöller, Andreas Pastoors, Bernhard Weninger & Gerd-Christian Weniger, *The repeated replacement model – Rapid climate change and population dynamics in Late Pleistocene Europe*. Quaternary International **247** (2012), 38–49.

The disappearance of Neanderthals from the Palaeolithic record in Europe remains an enigma, even after more than 150 years of research. This paper identifies Rapid Climate Change during the Glacial period as a major factor that influences a variety of cultural, economic and demographic processes during the European Palaeolithic. In particular, and in agreement with many previous authors, climatic deterioration is put forward to explain multiple population breakdown during the European Palaeolithic, as well as to explain corresponding major cultural changes. Taking the archaeological record of the Iberian Peninsula as a case study, the Repeated Replacement Model (RRM) is proposed to explain population turnover in Europe during the most extreme climatic phases of the Glacial, the occurrence of North Atlantic Heinrich Events (HE). The strong aridity of the Mediterranean during HEs appears to have limited settlement refugia to such an extreme extent that communication networks and cultural traditions broke down and were subsequently reorganized under different socio-cultural conditions. The transition from the Middle Palaeolithic to the Aurignacian during HE 4 is one of these cultural turnover periods, which saw the final (macro-scale) extinction of Neanderthals and their widespread replacement by Anatomically Modern Humans. More specifically, and recognizable by comparisons with other climatically extreme Glacial periods (i.e. HE 3, and HE 2), the model excludes the survival of geographically wider (supra-regional) human networks, but it does allow for (micro-scale) survival of scattered groups. From this model, some kind of admixture between Neanderthals and incoming groups of modern humans would indeed have been possible on a small scale. If this climatic scenario turns out to be correct, the most spectacular thing about Neanderthal disappearance might actually lie in the seemingly unspectacular nature of the processes involved.

Swann 2012

Abigail L. S. Swann, Inez Y. Fung & John C. H. Chiang, *Mid-latitude afforestation shifts general circulation and tropical precipitation*. PNAS **109** (2012), 712–716.

We show in climate model experiments that large-scale afforestation in northern mid-latitudes warms the Northern Hemisphere and alters global circulation patterns. An

expansion of dark forests increases the absorption of solar energy and increases surface temperature, particularly in regions where the land surface is unable to compensate with latent heat flux due to water limitation. Atmospheric circulation redistributes the anomalous energy absorbed in the northern hemisphere, in particular toward the south, through altering the Hadley circulation, resulting in the northward displacement of the tropical rain bands. Precipitation decreases over parts of the Amazon basin affecting productivity and increases over the Sahel and Sahara regions in Africa. We find that the response of climate to afforestation in mid-latitudes is determined by the amount of soil moisture available to plants with the greatest warming found in water-limited regions. Mid-latitude afforestation is found to have a small impact on modeled global temperatures and on global CO2, but regional heating from the increase in forest cover is capable of driving unintended changes in circulation and precipitation. The ability of vegetation to affect remote circulation has implications for strategies for climate mitigation.
ecoclimate | ecosystem-climate interactions | energy budget | land use change | land cover change

Neolithikum

Luley 1990

Helmut Luley, *Urgeschichtlicher Hausbau in Mitteleuropa, Grundlagenforschung, Umweltbedingungen und bautechnische Rekonstruktion*. Universitätsforschungen zur prähistorischen Archäologie 7 (Bonn 1992).

Stäuble 1999

Harald Stäuble & Jens Lüning, *Phosphatanalysen in bandkeramischen Häusern*. Archäologisches Korrespondenzblatt **29** (1999), 169–187.