

## Literatur

### Aktuell

BARRETT 2011

Scott Barrett, *Avoiding disastrous climate change is possible but not inevitable*. [PNAS 108 \(2011\), 11733–11734](#).

COHEN 2011

Joel E. Cohen, Øystein Kravdal & Nico Keilman, *Childbearing impeded education more than education impeded childbearing among Norwegian women*. [PNAS 108 \(2011\), 11830–11835](#).

[pnas108-11830-Supplement1.doc](#), [pnas108-11830-Supplement2.docx](#)

In most societies, women at age 39 with higher levels of education have fewer children. To understand this association, we investigated the effects of childbearing on educational attainment and the effects of education on fertility in the 1964 birth cohort of Norwegian women. Using detailed annual data from ages 17 to 39, we estimated the probabilities of an additional birth, a change in educational level, and enrollment in the coming year, conditional on fertility history, educational level, and enrollment history at the beginning of each year. A simple model reproduced a declining gradient of children ever born with increasing educational level at age 39. When a counterfactual simulation assumed no effects of childbearing on educational progression or enrollment (without changing the estimated effects of education on childbearing), the simulated number of children ever born decreased very little with increasing completed educational level, contrary to data. However, when another counterfactual simulation assumed no effects of current educational level and enrollment on childbearing (without changing the estimated effects of childbearing on education), the simulated number of children ever born decreased with increasing completed educational level nearly as much as the decrease in the data. In summary, in these Norwegian data, childbearing impeded education much more than education impeded childbearing. These results suggest that women with advanced degrees have lower completed fertility on the average principally because women who have one or more children early are more likely to leave or not enter long educational tracks and never attain a high educational level.

Norway | birth rate | parity | hazard regression | reverse causality

CYRANOSKI 2011

David Cyranoski, *No fallout legacy for Japan's farms*. [nature 475 \(2011\), 154](#).

But the most contaminated soils need urgent clean-up.

JOHNSON 2011

Neil Johnson, Spencer Carran, Joel Botner, Kyle Fontaine, Nathan Laxague, Philip Nuetzel, Jessica Turnley & Brian Tivnan, *Pattern in Escalations in Insurgent and Terrorist Activity*. [science 333 \(2011\), 81–84](#).

[S333-0081-Supplement1.pdf](#), [S333-0081-Supplement2.zip](#)

In military planning, it is important to be able to estimate not only the number of fatalities but how often attacks that result in fatalities will take place. We uncovered a simple dynamical pattern that may be used to estimate the escalation rate and timing of fatal

attacks. The time difference between fatal attacks by insurgent groups within individual provinces in both Afghanistan and Iraq, and by terrorist groups operating worldwide, gives a potent indicator of the later pace of lethal activity.

#### KAUFMANN 2011

Robert K. Kaufmann, Heikki Kauppi, Michael L. Mann & James H. Stock, *Reconciling anthropogenic climate change with observed temperature 1998–2008*. [PNAS 108 \(2011\), 11790–11793](#).

Given the widely noted increase in the warming effects of rising greenhouse gas concentrations, it has been unclear why global surface temperatures did not rise between 1998 and 2008. We find that this hiatus in warming coincides with a period of little increase in the sum of anthropogenic and natural forcings. Declining solar insolation as part of a normal eleven-year cycle, and a cyclical change from an El Nino to a La Nina dominate our measure of anthropogenic effects because rapid growth in short-lived sulfur emissions partially offsets rising greenhouse gas concentrations. As such, we find that recent global temperature records are consistent with the existing understanding of the relationship among global surface temperature, internal variability, and radiative forcing, which includes anthropogenic factors with well known warming and cooling effects.

aerosol emissions | carbon emissions | coal consumption | black carbon | stratospheric water vapor

#### ROEDIGER 2011

Henry L. Roediger III & Kathleen B. McDermott, *Remember When?* [science 333 \(2011\), 47–48](#).

Group interactions can have both negative and positive impacts on memory. Social effects on remembering can be positive as well as negative. Indeed, memory conformity may typically be beneficial. If one individual in a group forgets critical information (about food resources or dangers, for instance), then it is wise to get an updated memory from another group member. In experiments that have examined social influence when others provide accurate information, the effects are strongly positive ( 11). As with perceptual illusions, most memory illusions probably reveal adaptive processes that can sometimes undermine rather than support accurate remembering ( 12). Whether the positive effects of social influence have the same neural bases as the negative effects also awaits future investigation. However, we predict that positive memory conformity will have the same bases as the negative effects, because both reflect updating of individual memory by social means.

#### TAVONI 2011

Alessandro Tavoni, Astrid Dannenberg, Giorgos Kallis & Andreas Löschel, *Inequality, communication, and the avoidance of disastrous climate change in a public goods game*. [PNAS 108 \(2011\), 11825–11829](#).

International efforts to provide global public goods often face the challenges of coordinating national contributions and distributing costs equitably in the face of uncertainty, inequality, and freeriding incentives. In an experimental setting, we distribute endowments unequally among a group of people who can reach a fixed target sum through successive money contributions, knowing that if they fail, they will lose all their remaining money with 50% probability. In some treatments, we give players the option to communicate intended contributions. We find that inequality reduces the prospects of reaching the target but that communication increases success dramatically. Successful groups tend to eliminate inequality over the course of the game, with rich players signaling willingness to redistribute early on. Our results suggest that coordination-promoting institutions and early redistribution from richer to poorer nations are both decisive for the avoidance of global calamities, such as disruptive climate change.

## TAYLOR 2011

Rod S. Taylor, Kate E. Ashton, Tiffany Moxham, Lee Hooper & Shah Ebrahim, *Reduced Dietary Salt for the Prevention of Cardiovascular Disease: A Meta-Analysis of Randomized Controlled Trials (Cochrane Review)*. [American Journal of Hypertension](#) **24** (2011), 843–853.

### Background

Although meta-analyses of randomized controlled trials (RCTs) of salt reduction report a reduction in the level of blood pressure (BP), the effect of reduced dietary salt on cardiovascular disease (CVD) events remains unclear.

### Methods

We searched for RCTs with follow-up of at least 6 months that compared dietary salt reduction (restricted salt dietary intervention or advice to reduce salt intake) to control/no intervention in adults, and reported mortality or CVD morbidity data. Outcomes were pooled at end of trial or longest follow-up point.

### Results

Seven studies were identified: three in normotensives, two in hypertensives, one in a mixed population of normo- and hypertensives and one in heart failure. Salt reduction was associated with reductions in urinary salt excretion of between 27 and 39 mmol/24 h and reductions in systolic BP between 1 and 4 mm Hg. Relative risks (RRs) for all-cause mortality in normotensives (longest follow-up-RR: 0.90, 95 % confidence interval (CI): 0.58-1.40, 79 deaths) and hypertensives (longest follow-up RR 0.96, 0.83-1.11, 565 deaths) showed no strong evidence of any effect of salt reduction CVD morbidity in people with normal BP (longest follow-up: RR 0.71, 0.42-1.20, 200 events) and raised BP at baseline (end of trial: RR 0.84, 0.57-1.23, 93 events) also showed no strong evidence of benefit. salt restriction increased the risk of all-cause mortality in those with heart failure (end of trial RR 2.59, 1.04-6.44, 21 deaths). We found no information on participant's health-related quality of life.

### Conclusions

Despite collating more event data than previous systematic reviews of RCTs (665 deaths in some 6,250 participants) there is still insufficient power to exclude clinically important effects of reduced dietary salt on mortality or CVD morbidity. Our estimates of benefits from dietary salt restriction are consistent with the predicted small effects on clinical events attributable to the small BP reduction achieved.

Keywords: blood pressure; cardiovascular disease; diet; hypertension; meta-analysis; salt; sodium; systematic review

## Anthropologie

## GRAVEL 2011

Simon Gravel et al., *Demographic history and rare allele sharing among human populations*. [PNAS](#) **108** (2011), 11983–11988.

pnas108-11983-Supplement.docx

Simon Gravel, Brenna M. Henn, Ryan N. Gutenkunst, Amit R. Indap, Gabor T. Marth, Andrew G. Clark, Fuli Yu, Richard A. Gibbs, The 1000 Genomes Project and Carlos D. Bustamante

High-throughput sequencing technology enables population-level surveys of human genomic variation. Here, we examine the joint allele frequency distributions across continental human populations and present an approach for combining complementary aspects of

whole-genome, low-coverage data and targeted highcoverage data. We apply this approach to data generated by the pilot phase of the Thousand Genomes Project, including wholegenome 2–4 × coverage data for 179 samples from HapMap European, Asian, and African panels as well as high-coverage target sequencing of the exons of 800 genes from 697 individuals in seven populations. We use the site frequency spectra obtained from these data to infer demographic parameters for an Out-of-Africa model for populations of African, European, and Asian descent and to predict, by a jackknife-based approach, the amount of genetic diversity that will be discovered as sample sizes are increased. We predict that the number of discovered nonsynonymous coding variants will reach 100,000 in each population after ≈1,000 sequenced chromosomes per population, whereas ≈2,500 chromosomes will be needed for the same number of synonymous variants. Beyond this point, the number of segregating sites in the European and Asian panel populations is expected to overcome that of the African panel because of faster recent population growth. Overall, we find that the majority of human genomic variable sites are rare and exhibit little sharing among diverged populations. Our results emphasize that replication of disease association for specific rare genetic variants across diverged populations must overcome both reduced statistical power because of rarity and higher population divergence.

demographic inference | genetic drift | population genetics | human evolution

#### ROEBROEKS 2011

Wil Roebroeks & Paola Villa, *Reply to Sandgathe et al.: Neandertal use of fire*. [PNAS 108 \(2011\), E299](#).

Indeed, not all Middle Paleolithic sites contain good evidence for use of fire, but this information also applies to Upper Paleolithic sites and open air as well as rock shelter sites. For instance, of 89 Aurignacian sites in Southern France and Northern Spain (3), only 10 have preserved fireplaces. Many more contain fire proxies such as heated flints, burnt bones or charcoal, and ashes dispersed in the sediments. These findings are exactly the (often underreported) indicators of fire use that we have systematically studied at Middle Paleolithic sites. Again, Upper Paleolithic sites with well-preserved stratified sequences do not always have evidence of fire in all layers, which Sandgathe et al. (1) rightly point out for the Middle Paleolithic.

#### SANDGATHE 2011

Dennis M. Sandgathe, Harold L. Dibble, Paul Goldberg, Shannon P. McPherron, Alain Turq, Laura Niven & Jamie Hodgkins, *Timing of the appearance of habitual fire use*. [PNAS 108 \(2011\), E298](#).

Our own work (4, 5), which includes a strong control on taphonomic factors in the visibility of fire use, clearly indicates that, as late as mid-MIS 3, Neandertals were rarely using fire during main occupations of (at least some) cave sites in Southwestern France. Specifically, at Pech de l’Azé IV and Roc de Marsal (Dordogne, France), well-preserved hearths are evident in levels associated with warm climatic conditions, but in levels associated with cold environments (MIS 4 and 3), evidence for fire is almost nonexistent, although concentrations of lithics and butchered faunal remains are high. The fact that this finding reflects a lack of fire use is best supported by frequencies of burned flints throughout the site sequences, although these data are directly paralleled by frequencies of more ephemeral fire residues (burned bone, charcoal, and ash). We would argue that, if Neandertals had the ability to make fire at will, then evidence for it should occur with much greater frequency in Middle Paleolithic sites and occupations and especially, those sites associated with such cold stages.

## Datierung

WENINGER 2004

Bernhard Weninger & Olaf Jöris, *Glacial radiocarbon age calibration: the CalPal program*. In: TOM HIGHAM, CHRISTOPHER BRONK RAMSEY AND CLARE OWEN (Hrsg.), *Radiocarbon and Archaeology, Fourth International Symposium, St Catherine's College, Oxford 9–14 April 2002*. Oxford University school of Archaeology Monograph 62 ([Oxford 2004](#)), 9–15.

The procedure commonly known as ‘dendrochronological radiocarbon calibration’ (in the Holocene) or ‘calendrical radiocarbon age conversion’ (in the Last Glacial) is a mathematically complex process, which can only sensibly be performed by some dedicated computer program. The  $^{14}\text{C}$  calibration process is all the more complicated when the aim is to use the results of radiocarbon dating within a wider palaeoclimatological framework. In this case, one of the major problems is the correct synchronisation of timescales. Here we report on new computer software, called ‘CalPal’, which is designed to perform automatic calibration of archaeological radiocarbon ages, back to the limits of the radiocarbon method at c. 50 ka, with simultaneous synchronisation and fine-tuning of age models using palaeoclimate proxies.

## Klima

JOORDENS 2011

Josephine C. A. Joordens et al., *An astronomically-tuned climate framework for hominins in the Turkana Basin*. [Earth and Planetary Science Letters](#) **307** (2011), 1–8.

[EaPlaSciL307-001-Supplement.pdf](#)

Josephine C.A. Joordens, Hubert B. Vonhof, Craig S. Feibel, Lucas J. Lourens, Guillaume Dupont-Nivet, Jeroen H.J.L. van der Lubbe, Mark J. Sier, Gareth R. Davies & Dick Kroon

Understanding the influence of orbital climate cycles on hominin evolution remains a key challenge in paleoanthropology. The two major unresolved issues are: the absence of a climate proxy yielding high-resolution (<20 kyr) terrestrial climate records, and the lack of age control on hominin fossil occurrences at sufficiently high resolution. Here we present a novel climate proxy, strontium isotope ratios ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) of lacustrine fish fossils from the Turkana Basin, that solves these issues by recording orbitally forced variation in summer monsoon intensity over the Ethiopian Highlands. We successfully applied the climate proxy to a  $\approx 150$  kyr time interval of  $\approx 2$  million year old paleolake deposits containing hominin fossils. Existing age control of the studied interval was improved by a new magnetostratigraphic record precisely locating the base of the Olduvai chron (C2n) near the bottom of the sequence. Spectral analysis demonstrates that  $^{87}\text{Sr}/^{86}\text{Sr}$  variability is primarily determined by precession, which enables us to place hominin fossils in an astronomically-tuned climate framework. The Sr climate proxy is potentially applicable to all hominin-bearing lake deposits in the Turkana Basin, ranging in age from  $\approx 4.2$  to 0.8 million years ago (Ma). Our results demonstrate that between  $\approx 2$  and 1.85 Ma the Turkana Basin remained well-watered and inhabited by hominins even during periods of precession maxima when summer monsoon intensity was lowest. This is in contrast to other basins in the East African Rift System (EARS) that were impacted heavily by precession-forced droughts. We hypothesize that during lake phases, the Turkana Basin was an aridity refugium for permanent-water dependent fauna – including hominins – over the precessional climate cycles.

Keywords: strontium isotopes; fish apatite; Olduvai chron; precession cycles; aridity refugium

## PAUSATA 2011

Francesco S. R. Pausata, David S. Battisti, Kerim H. Nisancioglu & Cecilia M. Bitz, *Chinese stalagmite  $\delta^{18}\text{O}$  controlled by changes in the Indian monsoon during a simulated Heinrich event*. *Nature Geoscience* **4** (2011), 474–480.

NatGeo04-474-Supplement.pdf

Carbonate cave deposits in India and China are assumed to record the intensity of monsoon precipitation, because the  $\delta^{18}\text{O}$  of the carbonate tracks the isotopic signature of precipitation. These records show spatially coherent variability throughout the last ice age and suggest that monsoon strength was altered during the millennial-scale climate variations known as Dansgaard-Oeschger events and during the Heinrich cooling events. Here we use a numerical climate model with an embedded oxygen-isotope model to assess what caused the shifts in the oxygen-isotope signature of precipitation during a climate perturbation designed to mimic a Heinrich event. Our simulations show that a sudden increase in North Atlantic sea-ice extent during the last glacial period leads to cooling in the Northern Hemisphere, reduced precipitation over the Indian basin and weakening of the Indian monsoon. The precipitation is isotopically heavier over India and the water vapour exported to China is isotopically enriched. Our model broadly reproduces the enrichment of  $\delta^{18}\text{O}$  over Northern India and East Asia evident in speleothem records during Heinrich events. We therefore conclude that changes in the  $\delta^{18}\text{O}$  of cave carbonates associated with Heinrich events reflect changes in the intensity of Indian rather than East Asian monsoon precipitation.

## Neolithikum

### ROTH 2008

Georg Roth, *Geben und Nehmen, Eine wirtschaftshistorische Studie zum neolithischen Hornsteinbergbau von Abensberg-Arnhofen, Kr. Kelheim (Niederbayern)*. Dissertation Universität Köln [in 4 Bänden] (Köln 2008).

<<http://kups.ub.uni-koeln.de/4176/>>.

Südöstlich von Abensberg-Arnhofen wurde während der Jungsteinzeit (5.550–2.200 v. u. Z.) sog. Hornstein, ein kieseliges Gestein das dem Feuerstein vergleichbar ist, im Untertagebau bergmännisch gewonnen. Das ehemalige Bergwerk – von dem heute obertägig nichts mehr sichtbar ist – gehört mit einer Fläche von ca. 40 ha zu den größten prähistorische Bergbauen Mitteleuropas. In ihrer Gesamtheit stellt die hier vorgelegte Dissertation die erste umfassende Studie zu allen Aspekten eines jungsteinzeitlichen Bergbaus in Mitteleuropa dar. Dabei lassen sich die einzelnen Bände auch als Einzelstudien lesen und erfordern nur für Details die Lektüre der jeweils anderen Bände. Band I beschäftigt sich mit dem Bergwerk, Band II mit der Hornsteinverarbeitung und die Bände III und IV mit der Hornsteinweitergabe. Eine vollständige Zusammenfassung aller Ergebnisse findet sich am Ende von Band IV (S. 911 ff.).

Band I beinhaltet die Analyse der Bergwerksausgrabungen von 1998–2001. Die ausgegrabenen Flächen datieren höchstwahrscheinlich in das 43. Jh. v. u. Z. in den Zeitraum der Münchshöfener Kultur. Die Analyse der Schachtverteilungen mit räumlich-quantitativen Methoden (Triangulation und Punktfeldstatistik) führte zu einem Modell der Bergbauorganisation, nach dem jungsteinzeitliche Siedler aus benachbarten Ansiedlungen den Bergbau nur wenige Wochen im Jahr als Nischantätigkeit neben ihrem bäuerlichen Leben betrieben und dabei pro Arbeitsgruppe nur wenige Gruben pro Jahr anlegten. Eine

geostatistische Analyse (Dichteschätzung mit Kriging und anschließende Rasterkartenkalkulationen) des in den Bergbauhaldenschichten eingelagerten Schlagabfalls bestätigte das Bild der Abbauorganisation. Abschließende geostatistische Analysen der Lagerstätte und Hochrechnungen zu den Fördermengen erbrachten Informationen zur wirtschaftlichen Leistungsfähigkeit prähistorischen Bergbaus.

Band II enthält die Merkmalsanalyse von 1104 Hornsteinartefakten vom Bergwerk (vermutlich 43. Jh. v. u. Z.) und weiteren 5051 Silexartefakten aus alt- und mittelneolithischen (ca. 5.300–4.750 v. u. Z.) Siedlungen sowohl der unmittelbaren Bergwerks Umgebung als auch einer weit entfernten Abnehmersiedlung. Die vergleichende Merkmalsanalyse ergab, dass im gesamten Zeitraum keine Nachweise für eine vollzeitspezialisierte Hornsteinverarbeitung vorliegen. Im Gegenteil ist davon auszugehen, dass die Verarbeitung ebenso wie der Abbau eine nur wenige Tage bzw. Wochen umfassende Nischantätigkeit im bäuerlichen Arbeitszyklus darstellte. Während sich für die linearbandkeramischen Inventare Hinweise auf eine Weitergabe des Hornsteins im – für diese Zeit schon mehrfach beobachteten – Tausch von Hand zu Hand ergaben, weisen die mittelneolithischen Merkmalsverteilungen auf eine andere Form der Weitergabe.

Band III behandelt zunächst theoretische Erwägungen zur quantitativen räumlichen Analyse prähistorischer Güterverbreitungen. Anschließend wird die linearbandkeramische Verbreitung des Hornsteins mittels Interpolation (Minimum Curvature) geschätzt und mit Mitteln der GIS-Rasterkartenanalyse untersucht. Hier zeigt sich, dass die altneolithische Weitergabe in der bereits erwähnten Form des Tausches von Hand zu Hand erfolgte. Die Einbeziehung von Bevölkerungsdichteschätzungen ergab eine vollständige Erfassung der wirtschaftlichen Bedeutung des Arnhoferer Hornsteins zu dieser Zeit.

Band IV untersucht mit den gleichen Mitteln die (früh-)mittelneolithische Verbreitung des Arnhoferer Hornsteins (ca. 4.950–4.750/4.700 v. u. Z.). Zu dieser Zeit wird der Hornstein durch eine Form des prähistorischen Handels verbreitet, dem sog. zielgerichteten Handel. Dabei reisten die Abnehmer aus Regionen vom Rhein bis zur Moldau in die Bergwerks Umgebung nach Niederbayern und tauschten dort vor allem die plattenförmige Hornsteinvariante ein. Diese verarbeiteten sie nach ihrer Rückkehr in ihren Dörfern. Auch diese Aktivitäten können aufgrund der Quantitäten nicht mit vollzeitspezialisierten Händlern verbunden werden, sondern sind ausweislich einer Kostenoberflächenanalyse ebenfalls als wenige Wochen umfassende Nischantätigkeit anzusehen. Die wiederum mit Bevölkerungsdichteschätzungen in Bezug gesetzten Mengen geben einen Einblick in die Versorgungskapazitäten vermeintlich primitiver Wirtschaftsorganisationsformen. Abschließend wird die Nutzung des Arnhoferer Hornsteins vom späten Mittel- bis zum Ende des Endneolithikums beschrieben (4.700–2.200 v. u. Z.).

## Physik

HAUSER 1985

Ulrich Hauser, *Georg Simon Ohm (1789-1854), das Ohmsche Gesetz und das Physikalische Kabinett der alten Kölner Universität*. In: MARTIN SCHWARZBACH (Hrsg.), *Naturwissenschaften und Naturwissenschaftler in Köln zwischen der alten und der neuen Universität (1798-1919)*. Studien zur Geschichte der Universität zu Köln 2 (Köln 1985), 49–75.

## Story or Book

CASH 2011

Gordon Cash, *Thumbs, It's all relative*. *nature* **475** (2011), 260.