

## Literatur

### Aktuell

#### CALLAWAY 2013

Ewen Callaway, *Dog genetics spur scientific spat, Researchers disagree over canine domestication.* [nature 498 \(2013\), 282–283.](#)

#### CRAINE 2013

Joseph M. Craine, *Long-Term Climate Sensitivity of Grazer Performance: A Cross-Site Study.* [PLoS ONE 8 \(2013\), e67065.](#)  
[DOI:10.1371/journal.pone.0067065.](#)

Climate change will affect grasslands in a number of ways, but the consequences of a warmer, drier world for grazers is uncertain. Predicting future grazer performance is complex since climate change affects both the quantity and quality of forage through a combination of processes that occur over a range of time scales. To better predict the consequences of climate change for grazer performance, a dataset was compiled of over a quarter million bison weights distributed across 22 US herds that span a large range of climates. Patterns of bison body mass among sites, age classes, and sexes were analyzed with respect to differences in geographic patterns of climate and interannual variation in climate. While short-term effects of climate variability are likely to depend on the magnitude and timing of precipitation during the year, grazers will be negatively affected by sustained hotter, drier conditions most likely associated with reductions in forage quality. Short-term, little effect of high temperatures on bison performance is observed, which suggests that the long-term effects of higher temperatures are likely to accrue over time as nitrogen availability in grasslands is reduced and forage quality declines. If relationships observed for bison are general for cattle, the economic consequences of higher temperatures due to decreased weight gain in US cattle could be on the order of US\$1B per 1uC increase in temperature. Long-term monitoring of forage quality as well as native and domesticated grazer performance is recommended to better understand climate change effects on grazers.

#### GADE 2013

Alexandra Gade, *Heavy calcium nuclei weigh in.* [nature 498 \(2013\), 307–308.](#)

The configurations of calcium nuclei make them good test cases for studies of nuclear properties. The measurement of the masses of two heavy calcium nuclei provides benchmarks for models of atomic nuclei.

#### KAHAN 2010

Dan Kahan, *Fixing the communications failure.* [nature 463 \(2010\), 296–297.](#)

People's grasp of scientific debates can improve if communicators build on the fact that cultural values influence what and whom we believe, says Dan Kahan.

#### KELLY-ARNOLD 2013

Adreanne Kelly-Arnold, Natalia Maldonado, Damien Laudier, Elena Aikawa, Luis Cardoso & Sheldon Weinbaum, *Revised microcalcification*

*hypothesis for fibrous cap rupture in human coronary arteries.* [PNAS 110 \(2013\), 10741–10746.](#)

Using 2.1- $\mu\text{m}$  high-resolution microcomputed tomography, we have examined the spatial distribution, clustering, and shape of nearly 35,000 microcalcifications ( $\mu\text{Calcs}$ )  $\geq 5 \mu\text{m}$  in the fibrous caps of 22 nonruptured human atherosclerotic plaques. The vast majority of these  $\mu\text{Calcs}$  were  $<15 \mu\text{m}$  and invisible at the previously used 6.7- $\mu\text{m}$  resolution. A greatly simplified 3D finite element analysis has made it possible to quickly analyze which of these thousands of minute inclusions are potentially dangerous. We show that the enhancement of the local tissue stress caused by particle clustering increases rapidly for gap between particle pairs ( $h$ )/particle diameter ( $D$ )  $< 0.4$  if particles are oriented along the tensile axis of the cap. Of the thousands of  $\mu\text{Calcs}$  observed, there were 193 particle pairs with  $h/D \leq 2$  (tissue stress factor  $> 2$ ), but only 3 of these pairs had  $h/D \leq 0.4$ , where the local tissue stress could increase a factor  $> 5$ . Using nondecalcified histology, we also show that nearly all caps have  $\mu\text{Calcs}$  between 0.5 and 5  $\mu\text{m}$  and that the  $\mu\text{Calcs}$   $\geq 5 \mu\text{m}$  observed in high-resolution microcomputed tomography are agglomerations of smaller calcified matrix vesicles.  $\mu\text{Calcs}$   $< 5 \mu\text{m}$  are predicted to be not harmful, because the tiny voids associated with these very small particles will not explosively grow under tensile forces because of their large surface energy. These observations strongly support the hypothesis that nearly all fibrous caps have  $\mu\text{Calcs}$ , but only a small subset has the potential for rupture.

finite element analysis of fibrous caps | microcomputed tomography imaging of microcalcifications | vulnerable plaque | clustered microcalcifications

#### MACILWAIN 2013

Colin Macilwain, *Sharing information is preferable to patenting.* [nature 498 \(2013\), 273.](#)

The US Supreme Court ruling on gene patents is a welcome boost to efforts to increase the free exchange of scientific information, says Colin Macilwain.

#### NELDER 2013

Chris Nelder, *Positive energy.* [nature 498 \(2013\), 293–295.](#)

To change attitudes towards energy scarcity and climate change, focus on transitions and solutions, not danger and loss, says Chris Nelder.

A story must also be positive to be amplified in the press. Accuracy has become boring in the world of ‘link-bait’ journalism: editors and journalists want to publish stories that are popular. If we want action on energy transition and combating climate change, we must offer concrete and viable solutions — no money goes to problems, only to fixes. We should advocate solutions in an upbeat, tractable way, tailored to particular world views.

#### PETOUKHOV 2013

Vladimir Petoukhov, Stefan Rahmstorf, Stefan Petri & Hans Joachim Schellnhuber, *From means to mechanisms, Reply to Screen and Simmonds.* [PNAS 110 \(2013\), E2328.](#)

We found that half of the quaresonant events since 1980 have occurred since 2003 (figure 3 of ref. 1), but we do not claim that this recent cluster represents a statistically significant trend; it could also be due to random variability. In summary, we feel we identified a physical mechanism that helps to understand the exceptional nature of many recent extreme events associated with persistent large-scale weather patterns. How this mechanism may affect the future incidence of such events clearly requires further study. Linear trend assessment as presented by Screen and Simmonds does not call into question any of our results.

## SCREEN 2013

James A. Screen & Ian Simmonds, *Caution needed when linking weather extremes to amplified planetary waves*. [PNAS 110 \(2013\), E2327](#).

None of these trends are statistically significant, and neither are equivalent trends for Z500 (consistent with geostrophy). We also computed equivalent trends based on the longer period 1948–2012 using data from the same source as Petoukhov et al. None of the 65-y trends are significant (at the  $P = 0.1$  level) for V300 or Z500. [...] None of the differences are statistically significant, nor are equivalent differences based on Z500. Thus, there is neither a significant linear trend nor a recent significant shift in the amplitudes of quasistationary planetary waves with wave numbers  $m = 6-8$ .

## Anthropologie

### CERLING 2013

Thure E. Cerling et al., *Stable isotope-based diet reconstructions of Turkana Basin hominins*. [PNAS 110 \(2013\), 10501–10506](#).

Thure E. Cerling, Fredrick Kyalo Manthi, Emma N. Mbuu, Louise N. Leakey, Meave G. Leakey, Richard E. Leakey, Francis H. Brown, Frederick E. Grine, John A. Hart, Prince Kaleme, Hélène Roche, Kevin T. Uno & Bernard A. Wood  
Hominin fossil evidence in the Turkana Basin in Kenya from ca. 4.1 to 1.4 Ma samples two archaic early hominin genera and records some of the early evolutionary history of Paranthropus and Homo. Stable carbon isotopes in fossil tooth enamel are used to estimate the fraction of diet derived from C3 or C4 resources in these hominin taxa. The earliest hominin species in the Turkana Basin, Australopithecus anamensis, derived nearly all of its diet from C3 resources. Subsequently, by ca. 3.3 Ma, the later Kenyanthropus platyops had a very wide dietary range—from virtually a purely C3 resource-based diet to one dominated by C4 resources. By ca. 2 Ma, hominins in the Turkana Basin had split into two distinct groups: specimens attributable to the genus Homo provide evidence for a diet with a ca. 65/35 ratio of C3- to C4-based resources, whereas P. boisei had a higher fraction of C4-based diet (ca. 25/75 ratio). Homo sp. increased the fraction of C4-based resources in the diet through ca. 1.5 Ma, whereas P. boisei maintained its high dependency on C4-derived resources.

Theropithecus | hominid

### CLAIDIÈRE 2013

Nicolas Claidière, Emily J. E. Messer, William Hoppitt & Andrew Whiten, *Diffusion Dynamics of Socially Learned Foraging Techniques in Squirrel Monkeys*. [Current Biology \(2013\), preprint, 1–5](#). [DOI:10.1016/j.cub.2013.05.036](#).

CurrBiol2013-preprint-Supplement0628.mp4, CurrBiol2013-preprint-Supplement0628.pdf

Social network analyses [1–5] and experimental studies of social learning [6–10] have each become important domains of animal behavior research in recent years yet have remained largely separate. Here we bring them together, providing the first demonstration of how social networks may shape the diffusion of socially learned foraging techniques [11]. One technique for opening an artificial fruit was seeded in the dominant male of a group of squirrel monkeys and an alternative technique in

the dominant male of a second group. We show that the two techniques spread preferentially in the groups in which they were initially seeded and that this process was influenced by monkeys' association patterns. Eigenvector centrality predicted both the speed with which an individual would first succeed in opening the artificial fruit and the probability that they would acquire the cultural variant seeded in their group. These findings demonstrate a positive role of social networks in determining how a new foraging technique diffuses through a population.

#### CUTTING 2013

Laurie E. Cutting et al., *Not All Reading Disabilities Are Dyslexia, Distinct Neurobiology of Specific Comprehension Deficits*. [Brain Connectivity](#) **3** (2013), 199–211.

[BraCon03-199-Supplement1.pdf](#), [BraCon03-199-Supplement2.pdf](#), [BraCon03-199-Supplement3.pdf](#)

Laurie E. Cutting, Amy Clements-Stephens, Kenneth R. Pugh, Scott Burns, Aize Cao, James J. Pekar, Nicole Davis & Sheryl L. Rimrodt

Although an extensive literature exists on the neurobiological correlates of dyslexia (DYS), to date, no studies have examined the neurobiological profile of those who exhibit poor reading comprehension despite intact word-level abilities (specific reading comprehension deficits [S-RCD]). Here we investigated the word-level abilities of S-RCD as compared to typically developing readers (TD) and those with DYS by examining the blood oxygenation level dependent response to words varying on frequency. Understanding whether S-RCD process words in the same manner as TD, or show alternate pathways to achieve normal word-reading abilities, may provide insights into the origin of this disorder. Results showed that as compared to TD, DYS showed abnormal covariance during word processing with right-hemisphere homologs of the left-hemisphere reading network in conjunction with left occipitotemporal underactivation. In contrast, S-RCD showed an intact neurobiological response to word stimuli in occipitotemporal regions (associated with fast and efficient word processing); however, inferior frontal gyrus (IFG) abnormalities were observed. Specifically, TD showed a higher-percent signal change within right IFG for low-versus-high frequency words as compared to both S-RCD and DYS. Using psychophysiological interaction analyses, a coupling-by-reading group interaction was found in right IFG for DYS, as indicated by a widespread greater covariance between right IFG and right occipitotemporal cortex/visual word-form areas, as well as bilateral medial frontal gyrus, as compared to TD. For S-RCD, the context-dependent functional interaction anomaly was most prominently seen in left IFG, which covaried to a greater extent with hippocampal, parahippocampal, and prefrontal areas than for TD for low- as compared to high-frequency words. Given the greater lexical access demands of low frequency as compared to high-frequency words, these results may suggest specific weaknesses in accessing lexical-semantic representations during word recognition. These novel findings provide foundational insights into the nature of S-RCD, and set the stage for future investigations of this common, but understudied, reading disorder.

**Keywords:** dyslexia; fMRI; reading comprehension; reading disorder; specific comprehension deficits

#### ENG 2013

Carolyn M. Eng, Daniel E. Lieberman, Katherine D. Zink & Michael A. Peters, *Bite Force and Occlusal Stress Production in Hominin Evolution*. [American Journal of Physical Anthropology](#) (2013), preprint, 1–14. DOI:10.1002/ajpa.22296.

AmJPhysAnth2013-preprint-Supplement.zip

Maximum bite force affects craniofacial morphology and an organism's ability to break down foods with different material properties. Humans are generally believed to produce low bite forces and spend less time chewing compared with other apes because advances in mechanical and thermal food processing techniques alter food material properties in such a way as to reduce overall masticatory effort. However, when hominins began regularly consuming mechanically processed or cooked diets is not known. Here, we apply a model for estimating maximum bite forces and stresses at the second molar in modern human, nonhuman primate, and hominin skulls that incorporates skeletal data along with species-specific estimates of jaw muscle architecture. The model, which reliably estimates bite forces, shows a significant relationship between second molar bite force and second molar area across species but does not confirm our hypothesis of isometry. Specimens in the genus *Homo* fall below the regression line describing the relationship between bite force and molar area for nonhuman anthropoids and australopiths. These results suggest that *Homo* species generate maximum bite forces below those predicted based on scaling among australopiths and nonhuman primates. Because this decline occurred before evidence for cooking, we hypothesize that selection for lower bite force production was likely made possible by an increased reliance on nonthermal food processing. However, given substantial variability among in vivo bite force magnitudes measured in humans, environmental effects, especially variations in food mechanical properties, may also be a factor. The results also suggest that australopiths had ape-like bite force capabilities.

Keywords: masticatory biomechanics; fossil hominins; diet

## MARS 2013

Rogier B. Mars, Jérôme Sallet, Franz-Xaver Neubert & Matthew F. S. Rushworth, *Connectivity profiles reveal the relationship between brain areas for social cognition in human and monkey temporoparietal cortex*. *PNAS* **110** (2013), 10806–10811.

The human ability to infer the thoughts and beliefs of others, often referred to as “theory of mind,” as well as the predisposition to even consider others, are associated with activity in the temporoparietal junction (TPJ) area. Unlike the case of most human brain areas, we have little sense of whether or how TPJ is related to brain areas in other nonhuman primates. It is not possible to address this question by looking for similar task-related activations in nonhuman primates because there is no evidence that nonhuman primates engage in theory-of-mind tasks in the same manner as humans. Here, instead, we explore the relationship by searching for areas in the macaque brain that interact with other macaque brain regions in the same manner as human TPJ interacts with other human brain regions. In other words, we look for brain regions with similar positions within a distributed neural circuit in the two species. We exploited the fact that human TPJ has a unique functional connectivity profile with cortical areas with known homologs in the macaque. For each voxel in the macaque temporal and parietal cortex we evaluated the similarity of its functional connectivity profile to that of human TPJ. We found that areas in the middle part of the superior temporal cortex, often associated with the processing of faces and other social stimuli, have the most similar connectivity profile. These results suggest that macaque face processing areas and human mentalizing areas might have a similar precursor.

comparative anatomy | cooperation | comparative cognition

## MELLARS 2013

Paul Mellars, Kevin C. Gori, Martin Carr, Pedro A. Soares & Martin

B. Richards, *Genetic and archaeological perspectives on the initial modern human colonization of southern Asia*. [PNAS 110 \(2013\), 10699–10704](#).

It has been argued recently that the initial dispersal of anatomically modern humans from Africa to southern Asia occurred before the volcanic “supereruption” of the Mount Toba volcano (Sumatra) at  $\approx 74,000$  y before present (B.P.)—possibly as early as 120,000 y B.P. We show here that this “pre-Toba” dispersal model is in serious conflict with both the most recent genetic evidence from both Africa and Asia and the archaeological evidence from South Asian sites. We present an alternative model based on a combination of genetic analyses and recent archaeological evidence from South Asia and Africa. These data support a coastally oriented dispersal of modern humans from eastern Africa to southern Asia  $\approx 60$ –50 thousand years ago (ka). This was associated with distinctively African microlithic and “backed-segment” technologies analogous to the African “Howiesons Poort” and related technologies, together with a range of distinctively “modern” cultural and symbolic features (highly shaped bone tools, personal ornaments, abstract artistic motifs, microblade technology, etc.), similar to those that accompanied the replacement of “archaic” Neanderthal by anatomically modern human populations in other regions of western Eurasia at a broadly similar date.

India | Paleolithic | archaeogenetics | mtDNA

#### SPONHEIMER 2013

Matt Sponheimer et al., *Isotopic evidence of early hominin diets*. [PNAS 110 \(2013\), 10513–10518](#).

Matt Sponheimer, Zeresenay Alemseged, Thure E. Cerling, Frederick E. Grine, William H. Kimbel, Meave G. Leakey, Julia A. Lee-Thorp, Fredrick Kyalo Manthi, Kaye E. Reed, Bernard A. Wood & Jonathan G. Wynn

Carbon isotope studies of early hominins from southern Africa showed that their diets differed markedly from the diets of extant apes. Only recently, however, has a major influx of isotopic data from eastern Africa allowed for broad taxonomic, temporal, and regional comparisons among hominins. Before 4 Ma, hominins had diets that were dominated by C3 resources and were, in that sense, similar to extant chimpanzees. By about 3.5 Ma, multiple hominin taxa began incorporating  $^{13}\text{C}$ -enriched [C4 or crassulacean acid metabolism (CAM)] foods in their diets and had highly variable carbon isotope compositions which are atypical for African mammals. By about 2.5 Ma, *Paranthropus* in eastern Africa diverged toward C4/CAM specialization and occupied an isotopic niche unknown in catarrhine primates, except in the fossil relations of grass-eating geladas (*Theropithecus gelada*). At the same time, other taxa (e.g., *Australopithecus africanus*) continued to have highly mixed and varied C3/C4 diets. Overall, there is a trend toward greater consumption of  $^{13}\text{C}$ -enriched foods in early hominins over time, although this trend varies by region. Hominin carbon isotope ratios also increase with post-canine tooth area and mandibular cross-sectional area, which could indicate that these foods played a role in the evolution of australopith masticatory robusticity. The  $^{13}\text{C}$ -enriched resources that hominins ate remain unknown and must await additional integration of existing paleodietary proxy data and new research on the distribution, abundance, nutrition, and mechanical properties of C4 (and CAM) plants.

human evolution | hominid | paleocology

#### WYNN 2013

Jonathan G. Wynn et al., *Diet of *Australopithecus afarensis* from the Pliocene Hadar Formation, Ethiopia*. [PNAS 110 \(2013\), 10495–10500](#).

Jonathan G. Wynn, Matt Sponheimer, William H. Kimbel, Zeresenay Alemseged, Kaye Reed, Zelalem K. Bedaso & Jessica N. Wilson

The enhanced dietary flexibility of early hominins to include consumption of C4/crassulacean acid metabolism (CAM) foods (i.e., foods derived from grasses, sedges, and succulents common in tropical savannas and deserts) likely represents a significant ecological and behavioral distinction from both extant great apes and the last common ancestor that we shared with great apes. Here, we use stable carbon isotopic data from 20 samples of *Australopithecus afarensis* from Hadar and Dikika, Ethiopia (>3.4–2.9 Ma) to show that this species consumed a diet with significant C4/ CAM foods, differing from its putative ancestor *Au. anamensis*. Furthermore, there is no temporal trend in the amount of C4/ CAM food consumption over the age of the samples analyzed, and the amount of C4/CAM food intake was highly variable, even within a single narrow stratigraphic interval. As such, *Au. afarensis* was a key participant in the C4/CAM dietary expansion by early australopiths of the middle Pliocene. The middle Pliocene expansion of the eastern African australopith diet to include savannabased foods represents a shift to use of plant food resources that were already abundant in hominin environments for at least 1 million y and sets the stage for dietary differentiation and niche specialization by subsequent hominin taxa.

stable isotope | bioapatite | carbon-13 | paleodiet | human evolution

## Biologie

### CERLING 2013

Thure E. Cerling, Kendra L. Chritz, Nina G. Jablonski, Meave G. Leakey & Fredrick Kyalo Manthi, *Diet of *Theropithecus* from 4 to 1 Ma in Kenya*. [PNAS 110 \(2013\), 10507–10512](#).

*Theropithecus* was a common large-bodied primate that cooccurred with hominins in many Plio-Pleistocene deposits in East and South Africa. Stable isotope analyses of tooth enamel from *T. brumpti* (4.0–2.5 Ma) and *T. oswaldi* (2.0–1.0 Ma) in Kenya show that the earliest *Theropithecus* at 4 Ma had a diet dominated by C4 resources. Progressively, this genus increased the proportion of C4-derived resources in its diet and by 1.0 Ma, had a diet that was nearly 100% C4-derived. It is likely that this diet was comprised of grasses or sedges; stable isotopes cannot, by themselves, give an indication of the relative importance of leaves, seeds, or underground storage organs to the diet of this primate. *Theropithecus* throughout the 4- to 1-Ma time range has a diet that is more C4-based than contemporaneous hominins of the genera *Australopithecus*, *Kenyanthropus*, and *Homo*; however, *Theropithecus* and *Paranthropus* have similar proportions of C4-based resources in their respective diets.

C3 | East Africa | Koobi Fora | Nachukui | baboon

## Energie

### FISHER 2013

Nicholas S. Fisher et al., *Evaluation of radiation doses and associated risk from the Fukushima nuclear accident to marine biota and human consumers of seafood*. [PNAS 110 \(2013\), 10670–10675](#).

Nicholas S. Fisher, Karine Beaugelin-Seiller, Thomas G. Hinton, Zofia Baumann, Daniel J. Madigan & Jacqueline Garnier-Laplace

Radioactive isotopes originating from the damaged Fukushima nuclear reactor in Japan following the earthquake and tsunami in March 2011 were found in resident marine animals and in migratory Pacific bluefin tuna (PBFT). Publication of this information resulted in a worldwide response that caused public anxiety and concern, although PBFT captured off California in August 2011 contained activity concentrations below those from naturally occurring radionuclides. To link the radioactivity to possible health impairments, we calculated doses, attributable to the Fukushima-derived and the naturally occurring radionuclides, to both the marine biota and human fish consumers. We showed that doses in all cases were dominated by the naturally occurring alpha-emitter  $^{210}\text{Po}$  and that Fukushima-derived doses were three to four orders of magnitude below  $^{210}\text{Po}$ -derived doses. Doses to marine biota were about two orders of magnitude below the lowest benchmark protection level proposed for ecosystems ( $10 \mu\text{Gy} \cdot \text{h}^{-1}$ ). The additional dose from Fukushima radionuclides to humans consuming tainted PBFT in the United States was calculated to be 0.9 and 4.7  $\mu\text{Sv}$  for average consumers and subsistence fishermen, respectively. Such doses are comparable to, or less than, the dose all humans routinely obtain from naturally occurring radionuclides in many food items, medical treatments, air travel, or other background sources. Although uncertainties remain regarding the assessment of cancer risk at low doses of ionizing radiation to humans, the dose received from PBFT consumption by subsistence fishermen can be estimated to result in two additional fatal cancer cases per 10,000,000 similarly exposed people.

cesium | migration

## Jungpaläolithikum

TSANOVA 2013

Tsenka Tsanova, *The beginning of the Upper Paleolithic in the Iranian Zagros, A taphonomic approach and techno-economic comparison of Early Baradostian assemblages from Warwasi and Yafteh (Iran).*

*Journal of Human Evolution* **65** (2013), 39–64.

Southwest Asia is a key region in current debates surrounding the appearance of the first cultures attributed to anatomically modern humans, particularly the Aurignacian and preceding cultural units of the Iranian Zagros, Levant, and the Balkans (Baradostian, Ahmarien, Kozarnikien, etc.). The Zagros mountain range encompasses an immense territory that remains understudied with regard to the Upper Paleolithic as well as the first bladelet industries traditionally presumed to be the work of anatomically modern humans. Concerning the emergence of the Aurignacian, the sites of Warwasi rockshelter and Yafteh cave in the central Zagros are considered to show evidence of in situ evolution of the Upper Paleolithic from the local Mousterian. This hypothesis is tested by way of a taphonomic, technotypological and economic approach applied to the Upper Paleolithic levels of Warwasi (spits LLeAA) and Yafteh (the series from the lower part of the sequence). A comparison of the techno-economic features of both assemblages demonstrates a conceptual bond with contemporaneous technocomplexes from Levant and Europe (Ahmarien, Protoaurignacian, etc.). The techno-typological Middle Paleolithic character of the Warwasi lithic assemblage permits a discussion of a possible in situ dependence/continuum from the Mousterian or perhaps particular activities linked to the type of the occupation of the site. However, bladelet technology cannot be considered as rooted in the Zagros Mousterian. Consequently the origin of the Aurignacian *sensu stricto* has to be reconsidered.

Keywords: Aurignacian | Baradostian | Mousterian | Warwasi | Yafteh | Zagros

## Klima

### DUNSTONE 2013

N. J. Dunstone, D. M. Smith, B. B. Booth, L. Hermanson & R. Eade, *Anthropogenic aerosol forcing of Atlantic tropical storms*. [Nature Geoscience \(2013\), preprint, 1–6. DOI:10.1038/NGEO1854.](#)

NatGeo2013-preprint-Supplement0624.pdf

The frequency of tropical storms in the North Atlantic region varies markedly on decadal timescales<sup>1–4</sup>, with profound socioeconomic impacts<sup>5,6</sup>. Climate models largely reproduce the observed variability when forced by observed sea surface temperatures<sup>1,8,10</sup>. However, the relative importance of natural variability and external influences such as greenhouse gases, dust, sulphate and volcanic aerosols on sea surface temperatures, and hence tropical storms, is highly uncertain<sup>11–16</sup>. Here, we assess the effect of individual climate drivers on the frequency of North Atlantic tropical storms between 1860 and 2050, using simulations from a collection of climate models<sup>17</sup>. We show that anthropogenic aerosols lowered the frequency of tropical storms over the twentieth century. However, sharp declines in anthropogenic aerosol levels over the North Atlantic at the end of the twentieth century allowed the frequency of tropical storms to increase. In simulations with a model that comprehensively incorporates aerosol effects (HadGEM2-ES; ref. 18), decadal variability in tropical storm frequency is well reproduced through aerosol-induced north–south shifts in the Hadley circulation. However, this mechanism changes in future projections. Our results raise the possibility that external factors, particularly anthropogenic aerosols, could be the dominant cause of historical tropical storm variability, and highlight the potential importance of future changes in aerosol emissions.

### LI 2013

Feng Li, Li Wu, Cheng Zhu, Chaogui Zheng, Wei Sun, Xinhao Wang, Shixun Shao, Yao Zhou, Tingting He & Suyuan Li, *Spatialetemporal distribution and geographic context of Neolithic cultural sites in the Hanjiang River Basin, Southern Shaanxi, China*. [Journal of Archaeological Science 40 \(2013\), 3141–3152.](#)

JArchSci40-3141-Supplement1.doc, JArchSci40-3141-Supplement2.doc, JArchSci40-3141-Supplement3.doc

Keywords: Spatialetemporal distribution | Geographic context | Neolithic cultural sites | Hanjiang River Basin

### SCREEN 2013

James A. Screen & Ian Simmonds, *Exploring links between Arctic amplification and mid-latitude weather*. [Geophysical Research Letters 40 \(2013\), 959–964.](#)

This study examines observed changes (1979–2011) in atmospheric planetary-wave amplitude over northern mid-latitudes, which have been proposed as a possible mechanism linking Arctic amplification and mid-latitude weather extremes. We use two distinct but equally-valid definitions of planetary-wave amplitude, termed meridional amplitude, a measure of north-south meandering, and zonal amplitude, a measure of the intensity of atmospheric ridges and troughs at  $45^{\circ}\text{N}$ . Statistically significant changes in either metric are limited to few seasons, wavelengths, and longitudinal sectors. However in summer, we identify significant increases in meridional amplitude over Europe, but significant decreases in zonal amplitude hemispherically, and also individually over Europe and Asia. Therefore, we

argue that possible connections between Arctic amplification and planetary waves, and implications of these, are sensitive to how waves are conceptualized. The contrasting meridional and zonal amplitude trends have different and complex possible implications for midlatitude weather, and we encourage further work to better understand these.

## Methoden

### BRADTMÖLLER 2013

Marcel Bradtmöller, *Step by Step, A new model for analysing and understanding tool type variation within and between lithic assemblages*. In: ANDREAS PASTOORS & BÄRBEL AUFFERMANN (Hrsg.), *Pleistocene Foragers: Their culture and environment, Festschrift in honour of Gerd-Christian Weniger for his sixtieth birthday*. Wissenschaftliche Schriften des Neanderthalmuseums 6 (Mettmann 2013), 225–235.

As mentioned regularly, the traditional typological system does not seem to be the perfect choice for producing enhanced information about human settlement activities and settlement systems. Nonetheless it is still in use. one of the problems thereby is the inherent discrete character of types, which has been proved wrong for a long time, at least for some. but due to a lack of other classification systems, the traditional system is still the best common denominator available. the aim of this paper is to present a method that could help verify results from the established typological system and enhance the information value of the modified pieces. this system of modification sequences was created during the lithic analysis of gravettian assemblages to verify the results from the typological analysis and to enhance the level of possible information.

**Keywords:** modification sequence, Arbeitsschritt Analyse, operational chain, lithic technology, typology

### CHOI 2013

Charles Choi, *Early human diets*. [PNAS 110 \(2013\), 10466](#).

The researchers wanted to analyze samples from ancient teeth for more than 20 years, but for a long time museums balked. “The method was too destructive, requiring too much material,” Cerling says. “One of the things we had to do was to be able to work on smaller samples.” The investigators now analyze less than one milligram of enamel per tooth, about 50- to 100-times less material than before, because of improvements in scientific instruments and sample preparation.

### KLEIN 2013

Richard G. Klein, *Stable carbon isotopes and human evolution*. [PNAS 110 \(2013\), 10470–10472](#).

## Mittelpaläolithikum

### HAUCK 2013

Thomas C. Hauck, Jacques Connan, Armelle Charrié-Duhaut, Jean-Marie Le Tensorer & Heba al Sakhel, *Molecular evidence of bitumen in the Mousterian lithic assemblage of Hummal (Central Syria)*. [Journal of Archaeological Science 40 \(2013\), 3252–3262](#).

Evidence for bitumen use in Middle Palaeolithic sites is an exception in Pleistocene archaeology. This paper presents the discovery of three tar-bearing Levallois artefacts found in the Mousterian sequence in Hummal (Central Syria). The organic residues were submitted to geochemical study. Gas chromatography-mass spectrometry analyses of saturated and aromatic hydrocarbons and isotopic data show the presence of bitumen. The most likely location of natural asphalt provisioning is the Shaaf outcrop in the Bichri desert. The bitumen-bearing stone tools add further important data to the growing knowledge about bitumen processing in the Middle Palaeolithic spring sites of El Kowm. Identification of the provisioning place for natural asphalt enables a more precise assumption about the site's catchment area. From a technological point of view, the tar-bearing specimens provide information on the range of tool forms selected for hafting. Ballistic features arguably indicate that the pointed Levallois blanks seem to be spear points that were fitted to a wooden handle. In at least one case, this technical procedure was seemingly executed during a brief episode of occupation and replacement of worn out implements. This small, bracketed window of detailed insight into Mousterian technology is linked with the more general relationship between Levallois technology and stone tool hafting.

**Keywords:** Syria | El Kowm | Jebel Bichri | Mousterian | Bitumen | Levallois technology | Stone tool hafting | Natural asphalt | Gas chromatography-mass spectrometry

## Religion

NEUTEL 2012

Karin Neutel, *Slaves Included? Sexual regulations and slave participation in two ancient religious groups*. In: STEPHEN HODKINSON & DICK GEARY (Hrsg.), *Slaves, Cults and Religions*. (Cambridge 2012), 133–148.

In both Paul's letters and the Philadelphia inscription, the attitude towards slaves deviated from general culture, and, to some extent, challenged the prevailing absolute dominance of free over slave. The simple fact of explicitly welcoming slaves along with free people into the group constituted a challenge to the prevalent exclusion and subordination of slaves.

It is clear that having both slave and free members, while at the same time having a strict sexual code, posed a contradiction. In Philadelphia, female slaves could not affect the group's purity and therefore did not have to abide by any rules regarding sexual actions. Paul did not set free women apart as pure, but applied the same rules to men and women without reference to slavery. Just like the Philadelphian text, Paul's regulations presuppose authority over one's own body and sexual conduct. This may have created difficulty for those slaves whose masters placed sexual demands on them.

In Philadelphia, female slaves did not belong to the community on the same terms as free women, because the former could not affect the purity of the group; their behaviour was irrelevant. Paul, on the other hand, actually complicated the position of slaves by including all members under the same conditions, with the same restrictions on their sexual actions. It seems that, even though Paul felt that full participation of slaves was important, it was even more important to him to abstain from sexual sin.