

References

Afrika

CHRITZ 2015

Kendra L. Chritz, Fiona B. Marshall, M. Esperanza Zagal, Francis Kirera & Thure E. Cerling, *Environments and trypanosomiasis risks for early herders in the later Holocene of the Lake Victoria basin, Kenya*. [PNAS 112 \(2015\), 3674–3679](#).

Specialized pastoralism developed ≈ 3 kya among Pastoral Neolithic Elmenteitan herders in eastern Africa. During this time, a mosaic of hunters and herders using diverse economic strategies flourished in southern Kenya. It has been argued that the risk for trypanosomiasis (sleeping sickness), carried by tsetse flies in bushy environments, had a significant influence on pastoral diversification and migration out of eastern Africa toward southern Africa ≈ 2 kya. Elmenteitan levels at Gogo Falls (ca. 1.9–1.6 kya) preserve a unique faunal record, including wild mammalian herbivores, domestic cattle and caprines, fish, and birds. It has been suggested that a bushy/woodland habitat that harbored tsetse fly constrained production of domestic herds and resulted in subsistence diversification. Stable isotope analysis of herbivore tooth enamel ($n = 86$) from this site reveals, instead, extensive C4 grazing by both domesticates and the majority of wild herbivores. Integrated with other ecological proxies (pollen and leaf wax biomarkers), these data imply an abundance of C4 grasses in the Lake Victoria basin at this time, and thus little risk for tsetse-related barriers to specialized pastoralism. These data provide empirical evidence for the existence of a grassy corridor through which small groups of herders could have passed to reach southern Africa.

Keywords: archaeology | carbon isotopes | food production | East Africa | livestock disease

Aktuell

BRENNER 2010

Hermann Brenner, Michael Hoffmeister, Volker Arndt, Christa Stegmaier, Lutz Altenhofen & Ulrike Haug, *Protection From Right- and Left-Sided Colorectal Neoplasms After Colonoscopy, Population-Based Study*. [Journal of the National Cancer Institute 102 \(2010\), 89–95](#).

Background Colonoscopy is used for early detection and prevention of colorectal cancer, but evidence on the magnitude of overall protection and protection according to anatomical site through colonoscopy performed in the community setting is sparse. We assessed whether receiving a colonoscopy in the preceding 10-year period, compared with no colonoscopy, was associated with prevalence of advanced colorectal neoplasms (defined as cancers or advanced adenomas) at various anatomical sites.

Methods A statewide cross-sectional study was conducted among 3287 participants in screening colonoscopy between May 1, 2005, and December 31, 2007, from the state of Saarland in Germany who were aged 55 years or older. Prevalence of advanced colorectal neoplasms was ascertained by screening colonoscopy and histopathologic examination of any polyps excised. Previous colonoscopy

history was obtained by standardized questionnaire, and its association with prevalence of advanced colorectal neoplasms was estimated, after adjustment for potential confounding factors by log-binomial regression.

Results Advanced colorectal neoplasms were detected in 308 (11.4%) of the 2701 participants with no previous colonoscopy compared with 36 (6.1%) of the 586 participants who had undergone colonoscopy within the preceding 10 years. After adjustment, overall and site-specific adjusted prevalence ratios for previous colonoscopy in the previous 10-year period were as follows: overall, 0.52 (95% confidence interval [CI] = 0.37 to 0.73); cecum and ascending colon, 0.99 (95% CI = 0.50 to 1.97); hepatic flexure and transverse colon, 1.21 (95% CI = 0.60 to 2.42); right-sided colon combined (cecum to transverse colon), 1.05 (95% CI = 0.63 to 1.76); splenic flexure and descending colon, 0.36 (95% CI = 0.16 to 0.82); sigmoid colon, 0.29 (95% CI = 0.16 to 0.53); rectum, 0.07 (95% CI = 0.02 to 0.40); left colon and rectum combined (splenic flexure to rectum, referred to as left-sided elsewhere), 0.33 (95% CI = 0.21 to 0.53).

Conclusion Prevalence of left-sided advanced colorectal neoplasms, but not right-sided advanced neoplasms, was strongly reduced within a 10-year period after colonoscopy, even in the community setting.

BRENNER 2015

Hermann Brenner, Lutz Altenhofen, Christian Stock & Michael Hoffmeister, *Prevention, Early Detection, and Overdiagnosis of Colorectal Cancer Within 10 Years of Screening Colonoscopy in Germany*. [Clinical Gastroenterology and Hepatology](#) **13** (2015), 717–723.

Background & Aims: Screening colonoscopy was introduced in Germany in October 2002. We aimed to quantify its effects on prevention, early detection, and overdiagnosis of colorectal cancer (CRC) in the 10 years since its introduction.

Methods: We analyzed data from more than 4.4 million screening colonoscopies (conducted on individuals 55–79 years old from 2003 through 2012) available through the national screening colonoscopy registry. CRCs prevented, detected earlier than they would have been without screening, and overdiagnosed (cancers detected at screening colonoscopy that would not have become clinically manifest during the patient’s lifetime) were estimated by Markov models. Model parameters included sex-specific and age-specific findings at screening colonoscopy; mortality; rates of transition from nonadvanced to advanced adenoma, advanced adenoma to preclinical cancer, or preclinical cancer to clinically manifest cancer; and protection from screening colonoscopy.

Results: Overall, approximately 180,000 CRCs (1/28 screening colonoscopies) were estimated to have been prevented, and more than 40,000 CRCs (1/121 screening colonoscopies) were detected earlier than they would have been without screening, compared with approximately 4500 overdiagnoses (1/1089 screening colonoscopies). Almost all CRCs prevented or detected earlier than they would have been without screening resulted from screening colonoscopies performed on individuals up to 75 years old (97% and 89%, respectively), whereas 28% of overdiagnoses occurred from screening colonoscopies of individuals older than 75 years old.

Conclusions: On the basis of a 10-year analysis of data from a national registry in Germany, screening colonoscopies have large potential for prevention and early detection of CRC, with low risk of overdiagnosis.

Keywords: Adenomas; Colon Cancer; Colorectal Neoplasms; Tumor.

DOLGIN 2015

Elie Dolgin, *The Myopia Boom*. [nature](#) **519** (2015), 276–278.

Short-sightedness is reaching epidemic proportions. Some scientists think they have found a reason why.

Ian Morgan, a myopia researcher at the Australian National University in Canberra, estimates that children need to spend around three hours per day under light levels of at least 10,000 lux to be protected against myopia. This is about the level experienced by someone under a shady tree, wearing sunglasses, on a bright summer day. (An overcast day can provide less than 10,000 lux and a well-lit office or classroom is usually no more than 500 lux.)

Other research groups have shown that nightly eye drops with a neurotransmitter-blocking drug called atropine can also help to control myopia progression¹⁴, although the mechanism remains unclear. “We want to take a holistic approach” to tackling myopia, Sankaridurg says. But eye drops and light boxes do not have quite the appeal of sending children outside to play, which has plenty of other benefits besides those for the eyes. “It probably also increases physical activity, which decreases likelihood of obesity and enhances mood,” Rose says. “I can only see it as a win — and it’s free.”

HOFFMANN 2015

Roald Hoffmann, *Nicht alles muss aromatisch sein! Einem Kernbegriff der Chemie droht die Entwertung – durch inflationären Gebrauch.* [Spektrum der Wissenschaft 2015, iv, 78–83.](#)

SCHLICHTING 2015

H. Joachim Schlichting, *Über das Wasser gehen.* [Spektrum der Wissenschaft 2015, iv, 52–54.](#)

Warum ein Wasserläufer nicht einfach im Teich versinkt, ist längst geklärt. Die Frage aber, wie sich das Insekt auf der Oberfläche des Wassers fortbewegt, wirft ein überraschendes Problem auf.

Anthropologie

EDGAR 2015

Blake Edgar, *Stark als Paar.* [Spektrum der Wissenschaft 2015, iv, 34–39.](#)

War also Kooperation das Entscheidende? Trug Zusammenarbeit – als Paar, als Kernfamilie und auch als Stamm – letztlich zum Erfolg der Menschheit bei? Während andere Evolutionslinien untergingen, überlebte unsere eigene möglicherweise dank solchen Verhaltens. Wenn das zutrifft, dann wäre die Fähigkeit zur Kooperation unsere größte Errungenschaft in den letzten zwei Millionen Jahren. Mit dieser Kompetenz überstand die Gattung Homo in ihrer Frühzeit heftige Klimawechsel und Umweltveränderungen. Hoffen wir, dass unsere erdgeschichtlich junge Spezies diese Eigenschaft auch in Zukunft zu nutzen versteht.

GALLO 2015

Edoardo Gallo & Chang Yan, *The effects of reputational and social knowledge on cooperation.* [PNAS 112 \(2015\), 3647–3652.](#)

The emergence and sustenance of cooperative behavior is fundamental for a society to thrive. Recent experimental studies have shown that cooperation increases in dynamic networks in which subjects can choose their partners. However, these studies did not vary reputational knowledge, or what subjects know about other’s past actions, which has long been recognized as an important factor in supporting

cooperation. They also did not give subjects access to global social knowledge, or information on who is connected to whom in the group. As a result, it remained unknown how reputational and social knowledge foster cooperative behavior in dynamic networks both independently and by complementing each other. In an experimental setting, we show that global reputational knowledge is crucial to sustaining a high level of cooperation and welfare. Cooperation is associated with the emergence of dense and clustered networks with highly cooperative hubs. Global social knowledge has no effect on the aggregate level of cooperation. A community analysis shows that the addition of global social knowledge to global reputational knowledge affects the distribution of cooperative activity: cooperators form a separate community that achieves a higher cooperation level than the community of defectors. Members of the community of cooperators achieve a higher payoff from interactions within the community than members of the less cooperative community.

Keywords: cooperation | social networks | reputation | social knowledge | experiments

LESLIE 2015

Stephen Leslie et al., *The fine-scale genetic structure of the British population.* [nature](#) **519** (2015), 309–314.

[n519-0309-Supplement1.pdf](#), [n519-0309-Supplement2.xlsx](#), [n519-0309-Supplement3.xlsx](#), [n519-0309-Supplement4.xlsx](#), [n519-0309-Supplement5.xlsx](#), [n519-0309-Supplement6.xlsx](#), [n519-0309-Supplement7.xlsx](#), [n519-0309-Supplement8.xlsx](#)

Stephen Leslie, Bruce Winney, Garrett Hellenthal, Dan Davison, Abdelhamid Boumertit, Tammy Day, Katarzyna Hutnik, Ellen C. Royrvik, Barry Cunliffe, Wellcome Trust Case Control Consortium, International Multiple Sclerosis Genetics Consortium, Daniel J. Lawson, Daniel Falush, Colin Freeman, Matti Pirinen, Simon Myers, Mark Robinson, Peter Donnelly & Walter Bodmer

Fine-scale genetic variation between human populations is interesting as a signature of historical demographic events and because of its potential for confounding disease studies. We use haplotype-based statistical methods to analyse genome-wide single nucleotide polymorphism (SNP) data from a carefully chosen geographically diverse sample of 2,039 individuals from the United Kingdom. This reveals a rich and detailed pattern of genetic differentiation with remarkable concordance between genetic clusters and geography. The regional genetic differentiation and differing patterns of shared ancestry with 6,209 individuals from across Europe carry clear signals of historical demographic events. We estimate the genetic contribution to southeastern England from Anglo-Saxon migrations to be under half, and identify the regions not carrying genetic material from these migrations. We suggest significant pre-Roman but post-Mesolithic movement into southeastern England from continental Europe, and show that in non-Saxon parts of the United Kingdom, there exist genetically differentiated subgroups rather than a general ‘Celtic’ population.

Klima

FELDMAN 2015

D. R. Feldman, W. D. Collins, P. J. Gero, M. S. Torn, E. J. Mlawer & T. R. Shippert, *Observational determination of surface radiative forcing by CO₂ from 2000 to 2010.* [nature](#) **519** (2015), 339–343.

The climatic impact of CO₂ and other greenhouse gases is usually quantified in terms of radiative forcing, calculated as the difference between estimates of

the Earth's radiation field from pre-industrial and present-day concentrations of these gases. Radiative transfer models calculate that the increase in CO₂ since 1750 corresponds to a global annual mean radiative forcing at the tropopause of $1.82 \pm 0.19 \text{ Wm}^{-2}$ (ref. 2). However, despite widespread scientific discussion and modelling of the climate impacts of well-mixed greenhouse gases, there is little direct observational evidence of the radiative impact of increasing atmospheric CO₂. Here we present observationally based evidence of clear-sky CO₂ surface radiative forcing that is directly attributable to the increase, between 2000 and 2010, of 22 parts per million atmospheric CO₂. The time series of this forcing at the two locations—the Southern Great Plains and the North Slope of Alaska—are derived from Atmospheric Emitted Radiance Interferometer spectra together with ancillary measurements and thoroughly corroborated radiative transfer calculations. The time series both show statistically significant trends of 0.2 Wm^{-2} per decade (with respective uncertainties of $\pm 0.06 \text{ Wm}^{-2}$ per decade and $\pm 0.07 \text{ Wm}^{-2}$ per decade) and have seasonal ranges of $0.1\text{--}0.2 \text{ Wm}^{-2}$. This is approximately ten per cent of the trend in downwelling longwave radiation. These results confirm theoretical predictions of the atmospheric greenhouse effect due to anthropogenic emissions, and provide empirical evidence of how rising CO₂ levels, mediated by temporal variations due to photosynthesis and respiration, are affecting the surface energy balance.

RAHMSTORF 2015

Stefan Rahmstorf et al., *Exceptional twentieth-century slowdown in Atlantic Ocean overturning circulation*. [nature climate change \(2015\), preprint, 1–6](#). DOI:10.1038/NCLIMATE2554.

NatClimCh2015-Rahmstorf-Supplement.pdf

Stefan Rahmstorf, Jason E. Box, Georg Feulner, Michael E. Mann, Alexander Robinson, Scott Rutherford & Erik J. Schaffernicht

Possible changes in Atlantic meridional overturning circulation (AMOC) provide a key source of uncertainty regarding future climate change. Maps of temperature trends over the twentieth century show a conspicuous region of cooling in the northern Atlantic. Here we present multiple lines of evidence suggesting that this cooling may be due to a reduction in the AMOC over the twentieth century and particularly after 1970. Since 1990 the AMOC seems to have partly recovered. This time evolution is consistently suggested by an AMOC index based on sea surface temperatures, by the hemispheric temperature difference, by coral-based proxies and by oceanic measurements. We discuss a possible contribution of the melting of the Greenland Ice Sheet to the slowdown. Using a multi-proxy temperature reconstruction for the AMOC index suggests that the AMOC weakness after 1975 is an unprecedented event in the past millennium ($p > 0.99$). Further melting of Greenland in the coming decades could contribute to further weakening of the AMOC.

ZHANG 2015

Shuichang Zhang et al., *Orbital forcing of climate 1.4 billion years ago*. [PNAS 112 \(2015\), E1406–E1413](#).

pnas112-E1406-Supplement1.docx, pnas112-E1406-Supplement2.docx, pnas112-E1406-Supplement3.docx, pnas112-E1406-Supplement4.docx

Shuichang Zhang, Xiaomei Wang, Emma U. Hammarlund, Huajian Wang, M. Mafalda Costa, Christian J. Bjerrum, James N. Connelly, Baomin Zhang, Lizeng Bian & Donald E. Canfield

Fluctuating climate is a hallmark of Earth. As one transcends deep into Earth time, however, both the evidence for and the causes of climate change become

difficult to establish. We report geochemical and sedimentological evidence for repeated, short-term climate fluctuations from the exceptionally well-preserved ≈ 1.4 -billion-year-old Xiamaling Formation of the North China Craton. We observe two patterns of climate fluctuations: On long time scales, over what amounts to tens of millions of years, sediments of the Xiamaling Formation record changes in geochemistry consistent with long-term changes in the location of the Xiamaling relative to the position of the Intertropical Convergence Zone. On shorter time scales, and within a precisely calibrated stratigraphic framework, cyclicity in sediment geochemical dynamics is consistent with orbital control. In particular, sediment geochemical fluctuations reflect what appear to be orbitally forced changes in wind patterns and ocean circulation as they influenced rates of organic carbon flux, trace metal accumulation, and the source of detrital particles to the sediment.

Keywords: Xiamaling | Milankovitch | Mesoproterozoic | Hadley Cell | ITCZ

Story or Book

FRIZELL 2015

John Frizell, *Perfection, The price of fame*. [nature 519 \(2015\), 382](#).

“You mean this doesn’t teach me, it just does it for me.” She liked the idea of that.