Liste erstellt am 2011-10-08

Literatur

Aktuell

d'Costa 2011

Vanessa M. d'Costa et al., *Antibiotic resistance is ancient*. nature **477** (2011), 457–461.

n477-0457-Supplement.pdf

Vanessa M. d'Costa, Christine E. King, Lindsay Kalan, Mariya Morar, Wilson W. L. Sung, Carsten Schwarz, Duane Froese, Grant Zazula, Fabrice Calmels, Regis Debruyne, G. Brian Golding, Hendrik N. Poinar & Gerard D. Wright

The discovery of antibiotics more than 70 years ago initiated a period of drug innovation and implementation in human and animal health and agriculture. These discoveries were tempered in all cases by the emergence of resistant microbes1,2. This history has been interpreted to mean that antibiotic resistance in pathogenic bacteria is a modern phenomenon; this view is reinforced by the fact that collections of microbes that predate the antibiotic era are highly susceptible to antibiotics3. Here we report targeted metagenomic analyses of rigorously authenticated ancient DNA from 30,000-year-old Beringian permafrost sediments and the identification of a highly diverse collection of genes encoding resistance to b-lactam, tetracycline and glycopeptide antibiotics. Structure and function studies on the complete vancomycin resistance element VanA confirmed its similarity to modern variants. These results show conclusively that antibiotic resistance is a natural phenomenon that predates the modern selective pressure of clinical antibiotic use.

Grinsted 2011

Aslak Grinsted, Svetlana Jevrejeva & John C. Moore, *Comment on the subsidence adjustment applied to the Kemp et al. proxy of North Carolina relative sea level*. PNAS **108** (2011), E781.

All these alternative estimates point to a substantially greater rate of subsidence than the 1 mm/y geologic estimate. We therefore question the zero-trend assumption used in the geologic estimates.

The impact of a greater rate of subsidence is that the adjusted NCRSL has a negative preindustrial trend with a pronounced Little Ice Age minimum rather than being a record of predominantly rising sea level.

Halperin 2011

Eran Halperin, Alexandra G. Russell, Kali H. Trzesniewski, James J. Gross & Carol S. Dweck, *Promoting the Middle East Peace Process by Changing Beliefs About Group Malleability*. science **333** (2011), 1767–1769.

s333-1767-Supplement.pdf

Four studies showed that beliefs about whether groups have a malleable versus fixed nature affected intergroup attitudes and willingness to compromise for peace. Using a nationwide sample (N = 500) of Israeli Jews, the first study showed that a belief that groups were malleable predicted positive attitudes toward Palestinians, which in turn predicted willingness to compromise. In the remaining three studies, experimentally inducing malleable versus fixed beliefs about groups among Israeli Jews (N = 76), Palestinian citizens of Israel (N = 59), and Palestinians in the West Bank (N = 53)-without mentioning the adversary-led to more positive attitudes toward the outgroup and, in turn, increased willingness to compromise for peace.

Halpern 2011

Diane F. Halpern et al., *The Pseudoscience of Single-Sex Schooling*. science **333** (2011), 1706–1707.

Diane F. Halpern, Lise Eliot, Rebecca S. Bigler, Richard A. Fabes, Laura D. Hanish, Janet Hyde, Lynn S. Liben & Carol Lynn Martin

Single-sex schooling lacks scientific support and may exaggerate sexism and gender stereotyping.

A new curriculum, like a new drug or factory production method, often yields a short-term gain because people are motivated by novelty and belief in the innovation. Novelty-based enthusiasm, sample bias, and anecdotes account for much of the glowing characterization of SS education in the media. Without blind assessment, randomized assignment to treatment or control experiences, and consideration of selection factors, judging the effectiveness of inno vations is impossible. In short, although excellent public SS schools clearly exist, there is no empirical evidence that their success stems from their SS organization, as opposed to the quality of the student body, demanding curricula, and many other features also known to promote achievement at coeducational schools.

Kemp 2011

Andrew C. Kemp, Benjamin P. Horton, Jeffrey P. Donnelly, Michael E. Mann, Martin Vermeer & Stefan Rahmstorf, *Reply to Grinsted et al.: Estimating land subsidence in North Carolina*. PNAS **108** (2011), E783.

Grinsted et al. contend that the approximately 1 mm/y GIA correction we applied to North Carolina (NC) RSL reconstructions was too small, but their arguments are ill-founded and also misrepresent published results from Engelhart et al.

Odadi 2011

Wilfred O. Odadi, Moses K. Karachi, Shaukat A. Abdulrazak & Truman P. Young, *African Wild Ungulates Compete with or Facilitate Cattle Depending on Season*. science **333** (2011), 1753–1755.

s333-1753-Supplement.pdf

Savannas worldwide are vital for both socioeconomic and biodiversity values. In these ecosystems, management decisions are based on the perception that wildlife and livestock compete for food, yet there are virtually no experimental data to support this assumption. We examined the effects of wild African ungulates on cattle performance, food intake, and diet quality. Wild ungulates depressed cattle food intake and performance during the dry season (competition) but enhanced cattle diet quality and performance during the wet season (facilitation). These results extend our understanding of the context-dependent-competition-facilitation balance, in general, and are critical for better understanding and managing wildlife-livestock coexistence in human-occupied savanna landscapes.

du Toit 2011

Johan T. du Toit, *Coexisting with Cattle*. science **333** (2011), 1710–1710.

In East Africa, large wild herbivores both compete with and benefit cattle.

One standard practice in livestock production on rangelands, espoused by commercial ranchers and subsistence pastoralists alike, is the eradication of large, indigenous herbivores that are believed to compete with livestock for food. These eradication efforts have increasingly problematic implications for biodiversity conservation. So it is timely that on page 1753 of this issue, Odadi et al. report on a relatively simple experiment that tested the assumption that cattle and wildlife compete for food. Their study, conducted in an East African savanna renowned for its large herbivore diversity, revealed that cattle do compete with herbivores such as zebras and gazelles during the dry season, when

food quantity is low. In contrast, during the wet season, when food quantity is high, grazing by wildlife benefits cattle by improving the quality of forage. The . ndings highlight ecological processes that promote coexistence among large herbivores in grasslands and savannas, and hence could be useful for conservation.

Amerika

BALTER 2011

Michael Balter, *Tracing the Paths of the First Americans*. science **333** (2011), 1692.

Anthropologie

GIBBONS 2011

Ann Gibbons, *Aboriginal Genome Shows Two-Wave Settlement of Asia*. science **333** (2011), 1689–1690.

REICH 2011

David Reich et al., *Denisova Admixture and the First Modern Human Dispersals into Southeast Asia and Oceania*. American Journal of Human Genetics (2011) preprint, 1–13. <http://dx.doi.org/10.1016/j.ajhg.2011.09.005>.

AmJHumGen2011-preprint-Supplement.pdf

David Reich, Nick Patterson, Martin Kircher, Frederick Delfin, Madhusudan R. Nandineni, Irina Pugach, Albert Min-Shan Ko, Ying-Chin Ko, Timothy A. Jinam, Maude E. Phipps, Naruya Saitou, Andreas Wollstein, Manfred Kayser, Svante Pääbo and Mark Stoneking

It has recently been shown that ancestors of New Guineans and Bougainville Islanders have inherited a proportion of their ancestry from Denisovans, an archaic hominin group from Siberia. However, only a sparse sampling of populations from Southeast Asia and Oceania were analyzed. Here, we quantify Denisova admixture in 33 additional populations from Asia and Oceania. Aboriginal Australians, Near Oceanians, Polynesians, Fijians, east Indonesians, and Mamanwa (a "Negrito" group from the Philippines) have all inherited genetic material from Denisovans, but mainland East Asians, western Indonesians, Jehai (a Negrito group from Malaysia), and Onge (a Negrito group from the Andaman Islands) have not. These results indicate that Denisova gene flow occurred into the common ancestors of New Guineans, Australians, and Mamanwa but not into the ancestors of the Jehai and Onge and suggest that relatives of present-day East Asians were not in Southeast Asia when the Denisova gene flow occurred. Our finding that descendants of the earliest inhabitants of Southeast Asia do not all harbor Denisova admixture is inconsistent with a history in which the Denisova interbreeding occurred in mainland Asia and then spread over Southeast Asia, leading to all its earliest modern human inhabitants. Instead, the data can be most parsimoniously explained if the Denisova gene flow occurred in Southeast Asia itself. Thus, archaic Denisovans must have lived over an extraordinarily broad geographic and ecological range, from Siberia to tropical Asia.

Anthropologie Klima

GROVE 2011

Matt Grove, *Change and variability in Plio-Pleistocene climates: modelling*

the hominin response. Journal of Archaeological Science **38** (2011), 3038–3047.

Conclusions: The modelling presented here suggests conclusions very much in line with those of Potts, variations of which are also voiced by Kingston and Trauth and colleagues, that climatic variability rather than climatic change has beenthe driving force of human evolution. The increase in selection for plasticity peaking at 2.3–2.5 mya in Fig. 9c coincides with the first appearance of our genus, whilst the first appearance of the Oldowan occurs during the steep approach to this peak. Furthermore, the record of climatic change during this period is of low magnitude relative to several earlier and later periods (Fig. 9b). Though the research presented here analyses just a single axis of environmental variability (the temperature axis), others have found similar results via the precipitation and vegetation axes.

Research into the links between climatic change and hominin evolution has generated numerous hypotheses. In recent years, methodological refinement of, and increased research effort directed towards, reliable proxies for palaeoclimatic change have provided a growing body of data with which to test such hypotheses. Whilst many archaeologists are aware of these data, few are cognizant of the wealth of techniques developed by theoretical biologists over the last half-century to explicitly address the evolutionary consequences of adaptation to temporally heterogeneous environments. The current paper expands and adapts one such technique for use with empirical data, and applies it to a global palaeoclimatic record spanning the last five million years, in order to discern the potential impact of environmental heterogeneity on hominin evolution during this period. Of particular interest are the contributions of climatic change, associated with directional selection, and climatic variability, associated with selection for phenotypic plasticity. At this macro-scale, results suggest an early peak in selection for plasticity at approximately 2–2.7 mya, combined with three major shifts in directional selection at approximately 3.3–3.4, 1.4–1.5, and 0.5–0.6 mya. These results are employed to relate the fossil and archaeological records to a number of environmental hypotheses of human evolution. In particular, it is argued that the origins of the genus Homo and the spread of Oldowan technology are associated not with a major turnover pulse, but with a period of selection for phenotypic plasticity.

Grundlagen

Kovarovic 2011

Kris Kovarovic, Leslie C. Aiello, Andrea Cardini & Charles A. Lockwood, *Discriminant function analyses in archaeology: are classification rates too good to be true?* Journal of Archaeological Science **38** (2011), 3006–3018.

The use of discriminant function analyses (DFA) in archaeological and related research is on the increase, however many of the assumptions of this method receive a mixed treatment in the literature. Statisticians frequently use complex statistical models to investigate analytical parameters, but such idealised datasets may be hard to relate to "real-life" examples and the literature difficult to assess. Using two faunal datasets that are more typical of archaeological and related research, one comprised of sizecorrected linear measurements of bovid humeri and another of 3D geometric morphometric (GMM) shape data of African monkey skulls, and two simulated datasets, we illustrate some of the most important but often ignored issues of DFA. We specifically show why it is paramount to address "overfitting" by cross-validation when applying this method and how the probability of correctly classifying cases by chance can be properly and explicitly taken into account.

Keywords: Discriminant function analysis; Resampling; Over-fitting; Cross-validation; Classification accuracy

Isotope

Eerkens 2011

Jelmer W. Eerkens, Ada G. Berget & Eric J. Bartelink, *Estimating weaning and early childhood diet from serial micro-samples of dentin collagen*. Journal of Archaeological Science **38** (2011), 3101–3111.

Age of weaning is an important measure of parental investment, and in various human and non-human primate studies, has been correlated with a range of developmental factors such as stature, cognitive functions, obesity, ability to cope with stress, and rates of disease. Archaeological estimation of the weaning process is generally at the level of an entire burial population, creating some challenges in using such data to test anthropological theory. We describe a method that tracks the weaning process at the individual level, based on the measurement of stable nitrogen and carbon isotope ratios in serial sections of first molar dentin collagen. We apply this micro-sampling technique to a sample of individuals from CA-CCO-548, a well-studied and ancient site on the banks of Marsh Creek in Central California. Results show great variation between individuals in both the length of the weaning process, the age at which breastfeeding stopped, and the source of early complementary childhood foods.

Keywords: Weaning; Breastfeeding; Diet; Stable nitrogen and carbon isotopes; Micro-sampling

Klima

Ivany 2011

Linda C. Ivany, Thomas Brey, Matthew Huber, Devin P. Buick & Bernd R. Schöne, *El Niño in the Eocene greenhouse recorded by fossil bivalves and wood from Antarctica*. Geophysical Research Letters **38** (2011), L16709. <http://dx.doi.org/10.1029/2011GL048635>.

Quasi-periodic variation in sea-surface temperature, precipitation, and sea-level pressure in the equatorial Pacific known as the El Nino - Southern Oscillation (ENSO) is an important mode of interannual variability in global climate. A collapse of the tropical Pacific onto a state resembling a so-called 'permanent El Nino', with a preferentially warmed eastern equatorial Pacific, flatter thermocline, and reduced interannual variability, in a warmer world is predicted by prevailing ENSO theory. If correct, future warming will be accompanied by a shift toward persistent conditions resembling El Nino years today, with major implications for global hydrological cycles and consequent impacts on socioeconomic and ecological systems. However, much uncertainty remains about how interannual variability will be affected. Here, we present multi-annual records of climate derived from growth increment widths in fossil bivalves and co-occurring driftwood from the Antarctic peninsula that demonstrate significant variability in the quasi-biennial and 3-6 year bands consistent with ENSO, despite early Eocene (≈50 Mya) greenhouse conditions with global average temperature ≈10 degrees higher than today. A coupled climate model suggests an ENSO signal and teleconnections to this region during the Eocene, much like today. The presence of ENSO variation during this markedly warmer interval argues for the persistence of robust interannual variability in our future greenhouse world.

Loehle 2011

Craig Loehle, *A 2000-year global temperature reconstruction based on non-treering proxies, and correction*. Energy & Environment **18** (2011), 1049–1058.

EnergEnviro18-1049-Supplement1.csv, EnergEnviro18-1049-Supplement2.zip
Historical data provide a baseline for judging how anomalous recent temperature changes are and for assessing the degree to which organisms are likely to be adversely affected by current or future warming. Climate histories are commonly reconstructed from a variety of sources, including ice cores, tree rings, and sediment. Tree-ring data, being the most abundant for recent centuries, tend to dominate reconstructions. There are reasons to believe that tree ring data may not properly capture long-term climate changes. In this study, eighteen 2000-year-long series were obtained that were not based on tree ring data. Data in each series were smoothed with a 30-year running mean. All data were then converted to anomalies by subtracting the mean of each series from that series. The overall mean series was then computed by simple averaging. The mean time series shows quite coherent structure. The mean series shows the Medieval Warm Period (MWP) and Little Ice Age (LIA) quite clearly, with the MWP being approximately 0.3°C warmer than 20th century values at these eighteen sites.
A climatic reconstruction published in E&E (Loehle, 2007) is here corrected for various errors and data issues, with little change in the results. Standard errors and 95 % confidence intervals are added. The Medieval Warming Period (MWP) was significantly warmer than the bimillennial average during most of the period 820–1040 AD. The Little Ice Age was significantly cooler than the average during most of 1440 – 1740 AD. The warmest tridecade of the MWP was warmer than the most recent tridecade, but not significantly so.
Keywords: anthropogenic climate impacts, historical climate trends, Medieval Warming Period, Little Ice Age, hockey stick model, time series

Viau 2006

A. E. Viau, K. Gajewski, M. C. Sawada & P. Fines, *Millennial-scale temperature variations in North America during the Holocene*. Journal of Geophysical Research **111** (2006), D09102. <http://dx.doi.org/10.1029/2005JD006031>.
A mean continental July temperature reconstruction based on pollen records from across North America quantifies temperature variations of several timescales for the past 14,000 cal yr BP. In North America, temperatures increased nearly 4°C during the late glacial, reaching maximum values between 6000 and 3000 cal yr BP, after which mean July temperatures decreased. Superimposed on this orbital-scale trend are millennial-scale temperature variations that appear coherent in structure and frequency with highresolution ice, marine and other terrestrial paleoclimate records of the Holocene. During the Holocene, climate in North America appears to have varied periodically every ≈1100 years rather than the ≈1500 year cycle found during the last glacial period. Coherence at frequencies between 900 and 1100 years between land, ice, and ocean records suggests a common forcing associated with widespread surface impacts during the Holocene. These results provide important insight to the global warming debate, as the observed twentieth century temperature increase appears unprecedented compared to our mean North American temperature reconstruction of the past 14,000 years.

Kultur

Rosenhan 1973

D. L. Rosenhan, *On Being Sane in Insane Places*. science **179** (1973), 250–258.
Whenever the ratio of what is known to what needs to be known approaches zero, we tend to invent "knowledge" and assume that we understand more than we actually do. We seem unable to acknowledge that we simply don't know. The needs for diagnosis and

remediation of behavioral and emotional problems are enormous. But rather than acknowledge that we are just embarking on understanding, we continue to label patients "schizophrenic," "manic-depressive," and "insane," as if in those words we had captured the essence of understanding. The facts of the matter are that we have known for a long time that diagnoses are often not useful or reliable, but we have nevertheless continued to use them. We now know that we can-I not distinguish insanity from sanity. It is depressing to consider how that information will be used.
Recall again that a "type 2 error" in Psychiatric diagnosis does not have the same consequences it does in medical diagnosis. A diagnosis of cancer that has been found to be in error is cause for celebration. But psychiatric diagnoses are rarely found to be in error. The label sticks, a mark of inadequacy forever.

Neolithikum

Özdoğan 1997

Mehmet Özdoğan, *The beginning of Neolithic economies in southeastern Europe: an Anatolian perspective*. Journal of European Archaeology **5** (1997), ii, 1–33.

The role that Anatolia played in the formation of Neolithic cultures has gemrally been ovelooked. However, recent work indicates the presence of a new formation zone in Central Anatolia, distinct in all elements of culture from the traditional Levantine-Mesopotamian zone which also includes Southeastern Turkey, A conspectus of the recent evidence indicates that, even in areas where cultural elements are similar, there is considerable diversity in subsistence patterns. Thus it is evident that subsistence patterns were not as significant as previously envisagedin defining the status of Neolithic communities or in stimulating their appearance. Moreover, the range of available resources in the broad-ranging habitats of Central and Western Anatolia seem to have been a potent factor both in the initial Neolithic and its later developments. The Neolithic cultures of Anatolia were much less dependent upon domesticates, with sedentary life strongly supported by hunting and gathering.
The pre-pottery Neolithic of the Near East provides a model based upon extremely complex and sophisticated socio-cultural developments, with indications of a ruling elite in control of the economy and ritual life. The collapse of this system by the end of the PPNB seemingly reflected social upheavals which provoked a massive migration to other regions. Apart from this factor the rich environmental potential of the Aegean or the Balkans would have been sufficient to support the spread of the whole Neolithic population from Anatolia.

Physik

van Assche 1988

Pieter von Assche, *Ignored Priorities: First Fission Fragment (1925) and First Mention of Fission (1934)*. Nuclear Europe **6-7** (1988), 24–25.

During her scientific career Ida Noddack-Tacke twice touched upon the aspects of fission: in 1925 together with Walter Noddack and Otto Berg she really encountered a fission product and in 1934 she suggested that neutron-irradiated uranium could break up into lighter elements, adding chemical evidence that in the search for element Z = 93 lighter elements passed through the chemistry, applied on the irradiated uranium. Twice her result and her suggestion were simply not accepted. In the first case (masurium) the behavior of the scientific community had limited consequences (element Z = 43 has a wrong name and the authors of ref. 1 did not get the recognition they deserved); in the

second case (fission), the behavior in the masurium case had an amplifying effect on some respected scientists, such that their attitude eventually delayed for many years the very discovery of fission. They did not need to do what unfortunately still happens now, viz. replace *science by authority!*

Story or Book

PIDGEON 2011

Nick Pidgeon, *Normal Accidents*. nature **477** (2011), 404–405.

As Japan strives to overcome the Fukushima nuclear disaster, Nick Pidgeon reflects on Charles Perrow's classic book about why complex technologies fail.

Normal Accidents: Living with High-Risk Technologies, Charles Perrow, First published by Basic Books, 1984. Reprinted Princeton University Press: 1999. 386 pp. $ 35

Universities, for example, are interactively complex but only loosely coupled – decisions are often influenced by unanticipated factors but effects are felt slowly. By contrast, modern production lines are often tightly coupled, with close and rapid transformations between one stage and the next, but have simple relationships between those stages. Neither tends to suffer systemic accidents. When systems exhibit both high complexity and tight coupling, as at Three Mile Island, the risk of failure becomes high. Worse still, according to Perrow, the addition of more safety devices – the stock response to a previous failure – might further reduce the safety margins if it adds complexity.