Liste erstellt am 2014-05-10

Literatur

Aktuell

AAP 2014

American Academy of Pediatrics, *Many infants still not placed on their backs to sleep*. Science Daily **2014**, May. 3, 1–2. http://www.sciencedaily.com/releases/2014/05/140503082718.htm.

"Given that supine sleep positioning significantly reduces an infant's risk for SIDS, it is worrisome that only two-thirds of full-term infants born in the U.S. are being placed back-to-sleep," said lead author Sunah S. Hwang, MD, MPH, FAAP, [...] "Although the precise cause of SIDS is still unknown, we do know that safe sleep practices, such as sleeping on the back, reduces the risk of infant death in the first year of life," Dr. Hwang said. "The Back-to-Sleep campaign reduced the rate of SIDS by 50 percent in the 1990s. Since 2001, this rate has remained stagnant."

Bellott 2014

Daniel W. Bellott et al., *Mammalian Y chromosomes retain widely expressed dosage-sensitive regulators*. nature **508** (2014), 494–499.

Daniel W. Bellott, Jennifer F. Hughes, Helen Skaletsky, Laura G. Brown, Tatyana Pyntikova, Ting-Jan Cho, Natalia Koutseva, Sara Zaghlul, Tina Graves, Susie Rock, Colin Kremitzki, Robert S. Fulton, Shannon Dugan, Yan Ding, Donna Morton, Ziad Khan, Lora Lewis, Christian Buhay, Qiaoyan Wang, JenniferWatt, Michael Holder, Sandy Lee, Lynne Nazareth, Steve Rozen, Donna M. Muzny, Wesley C. Warren, Richard A. Gibbs, Richard K.Wilson & David C. Page

The human X and Y chromosomes evolved from an ordinary pair of autosomes, but millions of years ago genetic decay ravaged theYchromosome, and only three per cent of its ancestral genes survived.Wereconstructed the evolution of the Y chromosome across eight mammals to identify biases in gene content and the selective pressures that preserved the surviving ancestral genes. Our findings indicate that survival was nonrandom, and in two cases, convergent across placental and marsupial mammals. Weconclude that the gene content of the Y chromosome became specialized through selection to maintain the ancestral dosage of homologous X–Ygene pairs that function as broadly expressed regulators of transcription, translation and protein stability. We propose that beyond its roles in testis determination and spermatogenesis, the Y chromosome is essential for male viability, and has unappreciated roles in Turner's syndrome and in phenotypic differences between the sexes in health and disease.

Cortez 2014

Diego Cortez et al., *Origins and functional evolution of Y chromosomes across mammals*. nature **508** (2014), 488–493.

Diego Cortez, Ray Marin, Deborah Toledo-Flores, Laure Froidevaux, Angélica Liechti, Paul D. Waters, Frank Grützner & Henrik Kaessmann

Y chromosomes underlie sex determination in mammals, but their repeat-rich nature has hampered sequencing and associated evolutionary studies. Here we trace Y evolution across 15 representativemammals on the basis of high-throughput genome and transcriptome sequencing. We uncover three independent

sex chromosome originations in mammals and birds (the outgroup). The original placental and marsupial (therian)Y, containing the sex-determining gene SRY, emerged in the therian ancestor approximately 180 million years ago, in parallel with the first of five monotreme Y chromosomes, carrying the probable sex-determining gene AMH. The avian W chromosomearose approximately 140 million years ago in the bird ancestor.The small Y/W gene repertoires, enrichedin regulatory functions,were rapidly defined following stratification (recombination arrest) and erosion events and have remained considerably stable. Despite expression decreases in therians, Y/W genes show notable conservation of proto-sex chromosome expression patterns, although various Y genes evolved testis-specificities through differential regulatory decay. Thus, although some genes evolved novel functions through spatial/temporal expression shifts, most Y genes probably endured, at least initially, because of dosage constraints.

Kintisch 2014

Eli Kintisch, *Into the Maelstrom*. science **344** (2014), 250–253.

Jennifer Francis has made waves linking the melting Arctic to extreme weather around the world. But a storm of criticism has forced the climate scientist to defend her hypothesis.

When the jet meanders far to the south over North America in winter, for instance, the result is cold snaps; when it meanders far to the north, temperatures can warm well above normal. Building on that work, Francis and Vavrus began examining changes in the amplitude of jet stream meanders, or how far the crests of its bends reach north and south. Combing through atmospheric data, they found that the amplitudes in the fall and winter had increased by roughly 150 kilometers over the past 30 years, as the Arctic warmed. The northern peaks (called ridges by meteorologists) tended to stretch farther toward the Arctic, they found. The southern dips, known as troughs, were apparently affected less, but overall the jet stream seemed to be becoming more sinuous. Like the weakening of the winds themselves, that increased "waviness," as some researchers call it, would tend to slow the eastward movement of weather patterns. The result: Weather conditions of all sorts—dry periods and warm spells, or storms and cold snaps—would persist. In North America, for example, large pools of Arctic air would linger longer over the continent, as they did during this past winter.

Krieger 2014

Kim Krieger, *Biofuels heat up*. nature **508** (2014), 448–449.

A new generation of industrial plants can make liquid fuels from almost any organic scraps — from corn stalks and wood chips to urban rubbish.

Pennisi 2014

Elizabeth Pennisi, *Ancient DNA Holds Clues to Gene Activity in Extinct Humans*. science **344** (2014), 245–246.

Schneider 2014

Ralph Schneider, *Sea levels from ancient seashells*. nature **508** (2014), 465–466.

The isotopic composition of oxygen in sea water correlates with changes in global mean sea level. Microfossils carrying oxygen-isotope signals have been used to extend sea-level records as far back as 5 million years ago.

Rohling et al. overcome these problems by converting 18O/16O ratios of fossilized planktonic foraminifera that proliferated in the surface waters of the eastern Mediterranean Sea directly into sea-level variations — an approach previously

developed for a study5 of the Red Sea, and which does not require temperature and ice-volume effects to be disentangled first. Their method depends on a hydraulic model of water exchange through the Strait of Gibraltar, which connects the North Atlantic Ocean and the Mediterranean Sea. This exchange mechanism not only controls the balance of evaporation and water renewal in the Mediterranean, but also strongly affects the seawater oxygen-isotope ratios recorded in planktonic foraminifera. Assuming that there have been no major tectonic movements in the Strait of Gibraltar during the past 5 Myr that affect its depth and width, the oxygen-isotope signal from these foraminifera is simply a function of global sealevel variations relative to the modern hydraulic state of the Mediterranean Sea.

Telzer 2014

Eva H. Telzer, Andrew J. Fuligni, Matthew D. Lieberman & Adriana Galván, *Neural sensitivity to eudaimonic and hedonic rewards differentially predict adolescent depressive symptoms over time*. PNAS **111** (2014), 6600–6605.

The pursuit of happiness and reward is an impetus for everyday human behavior and the basis of well-being. Although optimal well-being may be achieved through eudaimonic activities (e.g., meaning and purpose), individuals tend to orient toward hedonic activities (e.g., pleasure seeking), potentially placing them at risk for ill-being. We implemented a longitudinal study and followed adolescents over 1 y to examine whether neural sensitivity to eudaimonic (e.g., prosocial decisions) and hedonic (e.g., selfish rewards and risky decisions) rewards differentially predicts longitudinal changes in depressive symptoms. Ventral striatum activation during eudaimonic decisions predicted longitudinal declines in depressive symptoms, whereas ventral striatum activation to hedonic decisions related to longitudinal increases in depressive symptoms. These findings underscore how the motivational context underlying neural sensitivity to rewards can differentially predict changes in well-being over time. Importantly, to our knowledge, this is the first study to show that striatal activation within an individual can be both a source of risk and protection.

adolescence | fMRI | depression

Anthropologie

Bermúdez de Castro 2004

José María Bermúdez de Castro, María Martinón-Torres, Marina Lozano, Susana Sarmiento & Ana Muela, *Paleodemography of the Atapuerca – Sima De Los Huesos Hominin Sample, A Revision and New Approaches to the Paleodemography of the European Middle Pleistocene Population*. Journal of Anthropological Research **60** (2004), 5–26.

This article analyzes the mortality profiles of two Middle Pleistocene hominin samples, one from the Sima de los Huesos (SH) site in the Sierra de Atapuerca (Spain) (MNI = 28), and another (MNI = 26) selected from various other European sites. In the SH mortality distribution, 64 percent of the individuals died between the ages of 11 and 20 years, but there is only one individual under the age of 10. In the sample from other European sites, there are four individuals under 10, but the number of individuals in the 11-20 year range is lower (39 percent) than in the SH sample. In both samples, the percentage of individuals who died after the age of 30 is very similar (14.3 percent in SH and 11.5 percent at the other sites), and the differences between both distributions (when infants and children are

excluded) are not statistically significant. This article considers whether these mortality distributions follow a catastrophic or an attritional pattern. The discussion is presented in the framework of our current knowledge of the life history pattern of the Homo heidelbergensis species and the age structure and mortality profile of living foraging groups.

Castellano 2014

Sergi Castellano et al., *Patterns of coding variation in the complete exomes of three Neandertals*. PNAS **111** (2014), 6666–6671.

Sergi Castellano, Genís Parra, Federico A. Sánchez-Quinto, Fernando Racimo, Martin Kuhlwilm, Martin Kircher, Susanna Sawyer, Qiaomei Fu, Anja Heinze, Birgit Nickel, Jesse Dabney, Michael Siebauer, Louise White, Hernán A. Burbano, Gabriel Renaud, Udo Stenzel, Carles Lalueza-Fox, Marco de la Rasilla, Antonio Rosas, Pavao Rudan, Dejana Brajkovi≈c, Äeljko Kucan, Ivan Gušic, Michael V. Shunkov, Anatoli P. Derevianko, Bence Viola, Matthias Meyer, Janet Kelso, Aida M. Andrés & Svante Pääbo

We present the DNA sequence of 17,367 protein-coding genes in two Neandertals from Spain and Croatia and analyze them together with the genome sequence recently determined from a Neandertal from southern Siberia. Comparisons with present-day humans from Africa, Europe, and Asia reveal that genetic diversity among Neandertals was remarkably low, and that they carried a higher proportion of amino acid-changing (nonsynonymous) alleles inferred to alter protein structure or function than present-day humans. Thus, Neandertals across Eurasia had a smaller long-term effective population than present-day humans. We also identify amino acid substitutions in Neandertals and present-day humans that may underlie phenotypic differences between the two groups. We find that genes involved in skeletal morphology have changed more in the lineage leading to Neandertals than in the ancestral lineage common to archaic and modern humans, whereas genes involved in behavior and pigmentation have changed more on the modern human lineage.

ancient DNA | exome capture | site frequency spectra | paleogenetics

Moleón 2014

Marcos Moleón, José A. Sánchez-Zapata, Antoni Margalida, Martina Carrete, Norman Owen-Smith & José A. Donázar, *Humans and Scavengers, The Evolution of Interactions and Ecosystem Services*. BioScience **64** (2014), 394–403.

Since the origin of early Homo species during the Late Pliocene, interactions of humans with scavenging birds and mammals have changed in form through shifting ecological scenarios. How humans procured meat during the Quaternary Period changed from confrontational scavenging to hunting; shepherding of wild animals; and, eventually, intensive husbandry of domesticated animals. As humans evolved from carcass consumers to carcass providers, the overall relationship between humans and scavengers shifted from competition to facilitation. These changing interactions have translated into shifting provisioning (by signaling carcass location), regulating (e.g., by removing animal debris and controlling infectious diseases), and cultural ecosystem services (e.g., by favoring human language and social cooperation skills or, more recently, by enhancing ecotourism) provided by scavenging vertebrates. The continued survival of vultures and large mammalian scavengers alongside humans is now severely in jeopardy, threatening the loss of the numerous ecosystem services from which contemporary and future humans could benefit.

Keywords: ecosystem services, global environmental change, human evolution, interspecific interactions, scavenger

Wall-Scheffler 2012

Cara M. Wall-Scheffler, *Energetics, Locomotion, and Female Reproduction, Implications for Human Evolution*. Annual Review of Anthropology **41** (2012), 71–85.

In our reconstructions of human evolution, a few key questions consistently rise to the surface. These questions tend to revolve around how the morphology of previous hominin species would have allowed them to gain access to resources during key life-history events, particularly gestation and lactation. Here the data surrounding the interactions between these key issues are assessed, making particular notes of recent advances in the fields of energetics and biomechanics as they relate to locomotion during reproduction. Reconstructions of body mass, lower limb length, and pelvic breadth suggest diverse mobility strategies for different hominin species and may offer some clues about the demographic shifts occurring in the late Pleistocene.

Keywords: optimal walking speed, cost of transport, pelvis, sexual dimorphism

Klima

Francis 2012

Jennifer A. Francis & Stephen J. Vavrus, *Evidence linking Arctic amplification to extreme weather in mid-latitudes*. Geophysical Research Letters **39** (2012), L6801.

Arctic amplification (AA) – the observed enhanced warming in high northern latitudes relative to the northern hemisphere – is evident in lower-tropospheric temperatures and in 1000-to-500 hPa thicknesses. Daily fields of 500 hPa heights from the National Centers for Environmental Prediction Reanalysis are analyzed over N. America and the N. Atlantic to assess changes in north-south (Rossby) wave characteristics associated with AA and the relaxation of poleward thickness gradients. Two effects are identified that each contribute to a slower eastward progression of Rossby waves in the upper-level flow: 1) weakened zonal winds, and 2) increased wave amplitude. These effects are particularly evident in autumn and winter consistent with sea-ice loss, but are also apparent in summer, possibly related to earlier snow melt on high-latitude land. Slower progression of upper-level waves would cause associated weather patterns in mid-latitudes to be more persistent, which may lead to an increased probability of extreme weather events that result from prolonged conditions, such as drought, flooding, cold spells, and heat waves.

Mohtadi 2014

Mahyar Mohtadi et al., *North Atlantic forcing of tropical Indian Ocean climate*. nature **509** (2014), 76–80.

n509-0076-Supplement1.pdf, n509-0076-Supplement2.xls

Mahyar Mohtadi, Matthias Prange, Delia W. Oppo, Ricardo De Pol-Holz, Ute Merkel, Xiao Zhang, Stephan Steinke & Andreas Lückge

The response of the tropical climate in the Indian Ocean realm to abrupt climate change events in the North Atlantic Ocean is contentious. Repositioning of the intertropical convergence zone is thought to have been responsible for changes in tropical hydroclimate during North Atlantic cold spells1–5, but the dearth of

high-resolution records outside the monsoon realmin the Indian Ocean precludes a full understanding of this remote relationship and its underlying mechanisms. Here we show that slowdowns of the Atlantic meridional overturning circulation during Heinrich stadials and the Younger Dryas stadial affected the tropical Indian Ocean hydroclimate through changes to theHadley circulation including a southward shift in the rising branch (the intertropical convergence zone) and an overallweakening over the southern Indian Ocean. Our results are based on new, high-resolution sea surface temperature and seawater oxygen isotope records of welldated sedimentary archives from the tropical eastern Indian Ocean for the past 45,000 years, combined with climate model simulations of Atlantic circulation slowdown under Marine Isotope Stages 2 and 3 boundary conditions. Similar conditions in the east and west of the basin rule out a zonal dipole structure as the dominant forcing of the tropical Indian Ocean hydroclimate ofmillennial-scale events. Results from our simulations and proxy data suggest dry conditions in the northern Indian Ocean realm and wet and warm conditions in the southern realm during North Atlantic cold spells.

Rohling 2014

E. J. Rohling, G. L. Foster, K. M. Grant, G. Marino, A. P. Roberts, M. E. Tamisiea & F. Williams, *Sea-level and deep-sea-temperature variability over the past 5.3 million years*. nature **508** (2014), 477–482.

n508-0477-Supplement.pdf

Ice volume (and hence sea level) and deep-sea temperature are key measures of global climate change. Sea level has been documented using several independent methods over the past 0.5 million years (Myr). Older periods, however, lack such independent validation; all existing records are related to deep-sea oxygen isotope (d18O) data that are influenced by processes unrelated to sea level. For deep-sea temperature, only one continuous high-resolution (Mg/Ca-based) record exists, with related sea-level estimates, spanning the past 1.5 Myr. Here we present a novel sea-level reconstruction, with associated estimates of deep-sea temperature, which independently validates the previous 0–1.5 Myr reconstruction and extends it back to 5.3 Myr ago. We find that deep-sea temperature and sea level generally decreased through time, but distinctly out of synchrony, which is remarkable given the importance of ice-albedo feedbacks on the radiative forcing of climate. In particular, weobserve a large temporal offset during the onset of Plio-Pleistocene ice ages, between a marked cooling step at 2.73 Myr ago and the first major glaciation at 2.15 Myr ago. Last, we tentatively infer that ice sheets may have grown largest during glacials with more modest reductions in deep-sea temperature.

Mittelalter

DeWitte 2014

Sharon N. DeWitte, *Health in Post-Black Death London (1350–1538), Age Patterns of Periosteal New Bone Formation in a Post-Epidemic Population*. American Journal of Physical Anthropology (2014), preprint, 1–8. DOI:10.1002/ajpa.22510.

Previous research has shown that the Black Death targeted older adults and individuals who had been previously exposed to physiological stressors. This project investigates whether this selectivity of the Black Death, combined with post-epidemic rising standards of living, led to significant improvements in patterns of skeletal stress markers, and by inference in health, among survivors and their descendants. Patterns of periosteal lesions (which have been previously shown, using

hazard analysis, to be associated with elevated risks of mortality in medieval London) are compared between samples from pre-Black Death (c. 1,000–1,300, n=464) and post-Black Death (c. 1,350–1,538, n=133) London cemeteries. To avoid the assumptions that stress markers alone provide a direct measure of health and that a change in frequencies of the stress marker by itself indicates changes in health, this study assesses age-patterns of the stress marker to obtain a more nuanced understanding of the population-level effects of an epidemic disease. Age-at-death in these samples is estimated using transition analysis, which provides point estimates of age even for the oldest adults in these samples and thus allows for an examination of physiological stress across the lifespan. The frequency of lesions is significantly higher in the post-Black Death sample, which, at face value, might indicate a general decline in health. However, a significant positive association between age and periosteal lesions, as well as a significantly higher number of older adults in the postBlack Death sample more likely suggests improvements in health following the epidemic.

Keywords: medieval plague; frailty; paleodemography; paleoepidemiology

DeWitte 2014

Sharon N. DeWitte, *Mortality Risk and Survival in the Aftermath of the Medieval Black Death*. PLoS ONE **9** (2014), e96513. DOI:10.1371/journal.pone.0096513.

pone09-e96513-Supplement.docx

The medieval Black Death (c. 1347-1351) was one of the most devastating epidemics in human history. It killed tens of millions of Europeans, and recent analyses have shown that the disease targeted elderly adults and individuals who had been previously exposed to physiological stressors. Following the epidemic, there were improvements in standards of living, particularly in dietary quality for all socioeconomic strata. This study investigates whether the combination of the selective mortality of the Black Death and post-epidemic improvements in standards of living had detectable effects on survival and mortality in London. Samples are drawn from several pre- and post-Black Death London cemeteries. The preBlack Death sample comes from the Guildhall Yard (n = 75) and St. Nicholas Shambles (n = 246) cemeteries, which date to the 11th–12th centuries, and from two phases within the St. Mary Spital cemetery, which date to between 1120-1300 (n = 143). The St. Mary Graces cemetery (n = 133) was in use from 1350–1538 and thus represents post-epidemic demographic conditions. By applying Kaplan-Meier analysis and the Gompertz hazard model to transition analysis age estimates, and controlling for changes in birth rates, this study examines differences in survivorship and mortality risk between the pre- and post-Black Death populations of London. The results indicate that there are significant differences in survival and mortality risk, but not birth rates, between the two time periods, which suggest improvements in health following the Black Death, despite repeated outbreaks of plague in the centuries after the Black Death.

Mittelpaläolithikum

Hardy 2010

Bruce L. Hardy, *Climatic variability and plant food distribution in Pleistocene Europe, Implications for Neanderthal diet and subsistence*. Quaternary Science Reviews **29** (2010), 662–679.

Contrary to their cold-adapted image, Neanderthals inhabited Pleistocene Europe during a time of great climatic fluctuation with temperatures ranging from as

warm as present-day during the last interglacial to as cold as those of the last glacial maximum. Cold-adapted Neanderthals are similarly most often associated with the exploitation of large mammals who are themselves cold-adapted (mammoth, bison, reindeer, etc.). Cold, high-latitude environments are typically seen as lacking in plants generally and in plant foods in particular. Plant foods are therefore usually ignored and Neanderthals are increasingly being viewed as top carnivores who derived the vast majority of their diet from meat. Support for this hypothesis comes largely from stable isotope analysis which tracks only the protein portion of the diet. Diets high in lean meat largely fulfill micronutrient needs but can pose a problem at the macronutrient level. Lean meat can compose no more than 35 % of dietary energy before a protein ceiling is reached. Exceeding the protein ceiling can have detrimental physiological effects on the individual. Neanderthals would have needed energy from alternative sources, particularly when animals are fat-depleted and lean meat intake is high. Underground storage organs (USOs) of plants offer one such source, concentrating carbohydrates and energy. USOs could also provide an important seasonal energy source since they are at their maximum energy storage in late fall/winter.

Although Paleolithic sites are increasingly yielding plant remains, their presence is rare and they are often given only passing mention in Neanderthal dietary reconstructions. The complexity and number of potential wild plant foods, however, defies easy discussion. Native European wild edible plants with starchy USOs would have been potentially available throughout the Neanderthal range, even during the coldest periods of the Late Pleistocene.

Hardy 2011

Bruce L. Hardy & Marie-Hélène Moncel, *Neanderthal Use of Fish, Mammals, Birds, Starchy Plants and Wood 125–250,000 Years Ago*. PLoS ONE **6** (2011), e23768. DOI:10.1371/journal.pone.0023768.

Neanderthals are most often portrayed as big game hunters who derived the vast majority of their diet from large terrestrial herbivores while birds, fish and plants are seen as relatively unimportant or beyond the capabilities of Neanderthals. Although evidence for exploitation of other resources (small mammals, birds, fish, shellfish, and plants) has been found at certain Neanderthal sites, these are typically dismissed as unusual exceptions. The general view suggests that Neanderthal diet may broaden with time, but that this only occurs sometime after 50,000 years ago. We present evidence, in the form of lithic residue and use-wear analyses, for an example of a broad-based subsistence for Neanderthals at the site of Payre, Arde'che, France (beginning of MIS 5/end of MIS 6 to beginning of MIS 7/end of MIS 8; approximately 125–250,000 years ago). In addition to large terrestrial herbivores, Neanderthals at Payre also exploited starchy plants, birds, and fish. These results demonstrate a varied subsistence already in place with early Neanderthals and suggest that our ideas of Neanderthal subsistence are biased by our dependence on the zooarchaeological record and a deep-seated intellectual emphasis on big game hunting.

Spikins 2014

Penny Spikins, Gail Hitchens, Andy Needham & Holly Rutherford, *The cradle of thought, Growth, learning, play and attachment in Neanderthal children*. Oxford Journal of Archaeology **33** (2014), 111–134.

Childhood is a core stage in development, essential in the acquisition of social, practical and cultural skills. However, this area receives limited attention in archaeological debate, especially in early prehistory. We here consider Neanderthal

childhood, exploring the experience of Neanderthal children using biological, cultural and social evidence. We conclude that Neanderthal childhood experience was subtly different from that of their modern human counterparts, orientated around a greater focus on social relationships within their group. Neanderthal children, as reflected in the burial record, may have played a particularly significant role in their society, especially in the domain of symbolic expression. A consideration of childhood informs broader debates surrounding the subtle differences between Neanderthals and modern humans.

Physik

Fall 2014

A. Fall, B. Weber, M. Pakpour, N. Lenoir, N. Shahidzadeh, J. Fiscina, C. Wagner & D. Bonn, *Sliding Friction on Wet and Dry Sand.* Physical Review Letters **112** (2014), 175502. DOI:10.1103/PhysRevLett.112.175502.

We show experimentally that the sliding friction on sand is greatly reduced by the addition of some—but not too much—water. The formation of capillary water bridges increases the shear modulus of the sand, which facilitates the sliding. Too much water, on the other hand, makes the capillary bridges coalesce, resulting in a decrease of the modulus; in this case, we observe that the friction coefficient increases again. Our results, therefore, show that the friction coefficient is directly related to the shear modulus; this has important repercussions for the transport of granular materials. In addition, the polydispersity of the sand is shown to also have a large effect on the friction coefficient.

Story or Book

Dawson 2014

Robert Dawson, *Pop-Ups*, *Captive audience.* nature **508** (2014), 560.

Last year's ubiquitous red circle-X was a wistful memory of more civilized times.