Liste erstellt am 2015-01-24

References

Afrika

Gurdasani 2015

Deepti Gurdasani et al., *The African Genome Variation Project shapes medical genetics in Africa.* nature **517** (2015), 327–332.

n517-0327-Supplement1.pdf, n517-0327-Supplement2.pdf

Deepti Gurdasani, Tommy Carstensen, Fasil Tekola-Ayele, Luca Pagani, Ioanna Tachmazidou, Konstantinos Hatzikotoulas, Savita Karthikeyan, Louise Iles, Martin O. Pollard, Ananyo Choudhury, GrahamR. S. Ritchie, YaliXue, Jennifer Asimit, Rebecca N. Nsubuga, Elizabeth H. Young, Cristina Pomilla,Katja Kivinen, Kirk Rockett, Anatoli Kamali, Ayo P. Doumatey, Gershim Asiki, Janet Seeley, Fatoumatta Sisay-Joof, Muminatou Jallow, Stephen Tollman, Ephrem Mekonnen, Rosemary Ekong, Tamiru Oljira, Neil Bradman, Kalifa Bojang, Michele Ramsay, Adebowale Adeyemo, Endashaw Bekele, Ayesha Motala, Shane A. Norris, Fraser Pirie, Pontiano Kaleebu, Dominic Kwiatkowski, Chris Tyler-Smith, Charles Rotimi, Eleftheria Zeggini & Manjinder S. Sandhu

Given the importance of Africa to studies of human origins and disease susceptibility, detailed characterization of African genetic diversity is needed. The African Genome Variation Project provides a resource with which to design, implement and interpret genomic studies in sub-Saharan Africa and worldwide. The African Genome Variation Project represents dense genotypes from 1,481 individuals and whole-genome sequences from 320 individuals across sub-Saharan Africa. Using this resource, we find novel evidence of complex, regionally distinct hunter-gatherer and Eurasian admixture across sub-Saharan Africa. We identify new loci under selection, including loci related to malaria susceptibility and hypertension. We show that modern imputation panels (sets of reference genotypes from which unobserved or missing genotypes in study sets can be inferred) can identify association signals at highly differentiated loci across populations in sub-Saharan Africa. Using whole-genome sequencing, we demonstrate further improvements in imputation accuracy, strengthening the case for large-scale sequencing efforts of diverse African haplotypes. Finally, we present an efficient genotype array design capturing common genetic variation in Africa.

Ramesar 2015

Raj Ramesar, *African dawn* nature **517** (2015), 276–277.

The African Genome Variation Project presents genotyping and whole-genome data from individuals across sub-Saharan Africa, giving insight into population history and guiding future genomic studies on the continent.

A possible interpretation of these findings is that these Eurasian immigrants, or indeed the Khoe-San, brought with them a ‘wanderlust’ gene that was then integrated into other African groups and translated into the Bantu expansion — the series of migrations, occurring around 3,000–5,000 years ago, that spread the Niger-Congo ethnolinguistic group across much of sub-Saharan Africa.

Aktuell

Anderson 2015

Ross Anderson, Itai Ashlagi, David Gamarnik & Alvin E. Roth, *Finding long chains in kidney exchange using the traveling salesman problem.* PNAS **112** (2015), 663–668.

As of May 2014 there were more than 100,000 patients on the waiting list for a kidney transplant from a deceased donor. Although the preferred treatment is a kidney transplant, every year there are fewer donors than new patients, so the wait for a transplant continues to grow. To address this shortage, kidney paired donation (KPD) programs allow patients with living but biologically incompatible donors to exchange donors through cycles or chains initiated by altruistic (nondirected) donors, thereby increasing the supply of kidneys in the system. In many KPD programs a centralized algorithm determines which exchanges will take place to maximize the total number of transplants performed. This optimization problem has proven challenging both in theory, because it is NP-hard, and in practice, because the algorithms previously used were unable to optimally search over all long chains. We give two new algorithms that use integer programming to optimally solve this problem, one of which is inspired by the techniques used to solve the traveling salesman problem. These algorithms provide the tools needed to find optimal solutions in practice.

kidney exchange | kidney paired donation | transplantation | algorithms | computation

Bar-Oz 2015

Guy Bar-Oz, Ella Tsahar, Ido Izhaki & Simcha Lev-Yadun, *Mammalian extinction in ancient Egypt, similarities with the southern Levant.* PNAS **112** (2015), E238.

Similar patterns of wild mammalian extinction occurred in many parts of the ancient world (2), including those we have recently reported for the adjacent, but ecologically different, southern Levant (3).

The timing of extinction of a number of specific taxa in Egypt and in the southern Levant is similar. In both ecosystems, the first wave of faunal extinction occurred at the time of peak geopolitical vulnerability and a human demographic expansion.

Evans 2015

Linda Evans, *Ancient Egypt's fluctuating fauna: Ecological events or cultural constructs?* PNAS **112** (2015), E239.

Yeakel et al.'s (1) conclusions depend upon Egyptian imagery being an accurate record of extant fauna at the time it was created. However, this theory cannot be assumed.

Animals also held religious and symbolic meaning in ancient Egyptian culture, causing their images to be retained, irrespective of the species themselves.

Jokela 2015

Markus Jokela, Wiebke Bleidorn, Michael E. Lamb, Samuel D. Gosling & Peter J. Rentfrow, *Geographically varying associations between personality and life satisfaction in the London metropolitan area.* PNAS **112** (2015), 725–730.

Residential location is thought to influence people's well-being, but different individuals may value residential areas differently. We examined how life satisfaction

and personality traits are geographically distributed within the UK London metropolitan area, and how the strength of associations between personality traits and life satisfaction vary by residential location (i.e., personality–neighborhood interactions). Residential area was recorded at the level of postal districts (216 districts, n = 56,019 participants). Results indicated that the strength of associations between personality traits and life satisfaction depended on neighborhood characteristics. Higher openness to experience was more positively associated with life satisfaction in postal districts characterized by higher average openness to experience, population density, and ethnic diversity. Higher agreeableness and conscientiousness were more strongly associated with life satisfaction in postal districts with lower overall levels of life satisfaction. The associations of extraversion and emotional stability were not modified by neighborhood characteristics. These findings suggest that people's life satisfaction depends, in part, on the interaction between individual personality and particular features of the places they live.

geographical psychology | neighborhood | personality | life satisfaction | person–environment

Oishi 2015

Shigehiro Oishi, *Geography and personality: Why do different neighborhoods have different vibes?* PNAS **112** (2015), 645–646.

Yeakel 2015

Justin D. Yeakel et al., *Recovering ecological pattern and process in Ancient Egypt, Reply to Evans and Bar-Oz et al.* PNAS **112** (2015), E240.

Justin D. Yeakel, Mathias M. Pires, Lars Rudolf, Nathaniel J. Dominy, Paul L. Koch, Paulo R. Guimarães Jr. & Thilo Gross

Anthropologie

Guinote 2015

Ana Guinote, Ioanna Cotzia, Sanpreet Sandhu & Pramila Siwa, *Social status modulates prosocial behavior and egalitarianism in preschool children and adults.* PNAS **112** (2015), 731–736.

Humans are a cooperative species, capable of altruism and the creation of shared norms that ensure fairness in society. However, individuals with different educational, cultural, economic, or ethnic backgrounds differ in their levels of social investment and endorsement of egalitarian values. We present four experiments showing that subtle cues to social status (i.e., prestige and reputation in the eyes of others) modulate prosocial orientation. The experiments found that individuals who experienced low status showed more communal and prosocial behavior, and endorsed more egalitarian life goals and values compared with those who experienced high status. Behavioral differences across high- and low-status positions appeared early in human ontogeny (4–5 y of age).

social status | social hierarchies | altruism | prosocial behavior

Bibel

Bernabei 2015

Mauro Bernabei, *The age of the olive trees in the Garden of Gethsemane.* Journal of Archaeological Science **53** (2015), 43–48.

JAS053-0043-Supplement.kml

The olive trees (Olea europaea) in the Garden of Gethsemane were radiocarbon-dated with a view to providing an estimate of their ages and in order to determine whether they are even-aged or were planted at different times. All the tree trunks are hollow inside so that the central, older wood is missing. Furthermore, in several trees, a large void in the trunk's centre has led to its breaking-up into different stumps, which makes it very difficult to reconstruct the shape of each stem's basal area. In the end, only three from a total of eight olive trees could be successfully dated. They are of the same age, having started life all through the 12th century, when, during the Latin Kingdom of Jerusalem, the Crusaders were committing themselves to the restoration of Christian memories in the Holy Land. The dated ancient olive trees do, however, not allow any hypothesis to be made with regard to the age of the remaining five giant olives. Nonetheless, the dated olive trees of Gethsemane are a typical example of trees being cultivated in order to emphasize a cultural identity.

Keywords: Gethsemane | Olive tree | Tree age | Jerusalem | Crusade

Serr 2015

Marcel Serr, *Die Suche nach Golgota*. Spektrum der Wissenschaft **2015**, ii, 10–12.

Ausgrabungen in der Altstadt Jerusalems liefern neue Indizien für eine bis in die Antike zurückreichende Vermutung: Ein Felsen in der Grabeskirche war die im Neuen Testament erwähnte Hinrichtungsstätte Jesu.

Biologie

Bansal 2015

Ankita Bansal, Lihua J. Zhu, Kelvin Yen & Heidi A. Tissenbaum, *Uncoupling lifespan and healthspan in Caenorhabditis elegans longevity mutants*. PNAS **112** (2015), E277–E286.

pnas112-E0277-Supplement1.mov, pnas112-E0277-Supplement2.mov, pnas112-E0277-Supplement3.mov, pnas112-E0277-Supplement4.mov, pnas112-E0277-Supplement5.mov

Aging research has been very successful at identifying signaling pathways and evolutionarily conserved genes that extend lifespan with the assumption that an increase in lifespan will also increase healthspan. However, it is largely unknown whether we are extending the healthy time of life or simply prolonging a period of frailty with increased incidence of age-associated diseases. Here we use Caenorhabditis elegans, one of the premiere systems for lifespan studies, to determine whether lifespan and healthspan are intrinsically correlated. We conducted multiple cellular and organismal assays on wild type as well as four long-lived mutants (insulin/ insulin-like growth factor-1, dietary restriction, protein translation, mitochondrial signaling) in a longitudinal manner to determine the health of the animals as they age. We find that some long-lived mutants performed better than wild type when measured chronologically (number of days). However, all long-lived mutants increased the proportion of time spent in a frail state. Together, these data suggest that lifespan can no longer be the sole parameter of interest and reveal the importance of evaluating multiple healthspan parameters for future studies on antiaging interventions.

healthspan | lifespan | gerospan | functional capacity | healthy aging

Cernansky 2015

Rachel Cernansky, *State-of-the-Art Soil*. nature **517** (2015), 258–260.

A charcoal-rich product called biochar could boost agricultural yields and control pollution. Scientists are putting the trendy substance to the test.

In sand, through which water typically drains very quickly, biochar slowed the movement of moisture by an average of 92 %. In clay-rich soil, which usually retains water, biochar sped up movement by more than 300 %.

Gibbons 2014

Ann Gibbons, *The thoroughly bred horse*. science **346** (2014), 1439.

Genomes from ancient horses show the genetic changes wrought by domestication—and their costs. Those costs likely arose because in creating animals with desirable traits, breeders chiefly mated similar horses to each other. Such inbreeding made it more difficult for natural selection to weed out harmful mutations and allowed bad traits to hitchhike along with favored ones.

Datierung

Brown 2015

William A. Brown, *Through a filter, darkly: Population size estimation, systematic error, and random error in radiocarbon-supported demographic temporal frequency analysis*. Journal of Archaeological Science **53** (2015), 133–147.

JAS053-0133-Supplement1.csv, JAS053-0133-Supplement2.csv, JAS053-0133-Supplement3.csv, JAS053-0133-Supplement4.xlsx

Archaeologists are increasingly concerned that the non-linear relationship between the calendric and radiocarbon timelines may introduce anomalous structures into radiocarbon-supported temporal frequency distributions (tfds) – time series data describing temporal fluctuations in the frequency of archaeological, paleontological, or other geological deposits. This concern emphasizes a need for improved middle range theory on tfd formation, addressing the interaction between several stochastic processes. This paper outlines a Monte Carlo simulation designed to explore the influence of several variables on tfd morphology, including the nonlinear calendric-to-radiocarbon age relationship. The results indicate that this non-linear relationship entails greater variance between identically generated tfds over some temporal intervals than others but does not predictably lead to tfd peaks over these intervals as previously suggested. Additional variance between identically generated tfds results from small sample sizes and high values in the underlying TFD. Smoothing the tfd is a solution not only to calibration curve interference but also to sample size-dependent sampling error.

Keywords: Archaeological demography | Paleontology | Temporal frequency analysis | Radiocarbon age estimation | Monte Carlo simulation

Isotope

An 2015

Cheng-Bang An, Weimiao Dong, Hu Li, Pingyu Zhang, Yongtao Zhao, Xueye Zhao & Shi-Yong Yu, *Variability of the stable carbon isotope ratio in modern and archaeological millets, Evidence from northern China*. Journal of Archaeological Science **53** (2015), 316–322.

JAS053-0316-Supplement.doc

Stable carbon isotopic analyses of human skeletal remains may provide fundamental evidence for human dietary reconstruction and subsistence strategies. Millet is closely associated with the emergence and development of agriculture-based societies in northern China. Although often overlooked, baseline values of millet seeds are essential for using stable isotope analysis to understand past human and animal diets. Here, we report spatial and temporal variations in the d13C values of millets by analyzing modern samples, including seeds and leaves, as well as archaeological samples. The d13C values of modern foxtail millet seeds range from -13.9 to -11.3 ‰, with a mean value of -12.3 ± 0.5 ‰(1s, n = 66), while d13C values for modern common millet seeds vary between -14.3 and -12.0 ‰, with a mean value of -12.8 ± 0.6 ‰ (1s, n = 19). There is an approximately 1 ‰ temporal change in d13C for millet grains. Leaves have lower d13C values than grains, implying that eaters living on different tissues of the same plant could show different isotopic values. These background d13C values must be considered when reconstructing the dietary history of a millet-based society.

Keywords: Stable carbon isotope | Millet | Diet | Archaeobotany | Northern China

Burt 2015

Nicole M. Burt, *Individual dietary patterns during childhood, An archaeological application of a stable isotope microsampling method for tooth dentin.* Journal of Archaeological Science **53** (2015), 277–290.

Diet from the late medieval Fishergate House cemetery site (York, UK) is reconstructed using nitrogen and carbon stable isotope ratio analysis from tooth dentin. Deciduous teeth from 42 subadult individuals (fetal to 5–6 years) were used to reconstruct weaning practices at a population and an individual level. This is the first archaeological use of this microsampling method (dentin ≥.3 mg). This method allows an individual's changing diet to be reconstructed from the fetal period through weaning. The fetal signals show a complicated relationship with adult female ratios, having higher d15N values than expected. At this site, there is an unusual decoupling between peak mortality (4–6 years) and weaning (2 years). The mean d15N ratios for weaned children were enriched when compared to the adult females (12.4 ‰ ± 1.29 and 11.4 ‰ ± 1.1; statistically significant to $p < .05$). Early childhood diet is surprisingly high in marine fish and/or pork given the low socioeconomic class of the sample. This is a departure in weaned diet from contemporary communities and may be responsible for the unusual disconnect between peak mortality and weaning. When the individual dietary reconstructions were combined with each individual's rib reconstruction the presence of a true child specific diet was clear starting at approximately 2 years of age. Some individuals diverge from the population norm and have an extended breastfeeding period linked to poor health. The increased resolution of microsampling allows bioarchaeologists to test detailed time depended questions about early childhood diet and health.

Keywords: Deciduous teeth | Carbon | Nitrogen | Britain | Medieval

Reynard 2015

Linda M. Reynard & Noreen Tuross, *The known, the unknown and the unknowable, Weaning times from archaeological bones using nitrogen isotope ratios.* Journal of Archaeological Science **53** (2015), 618–625.

JAS053-0618-Supplement.pdf

Empirical observations of d15N of bone collagen by age at death from 56 archaeological sites (n = 1560) document an increase over the adult mean at ages ≈0–2

years. These observations are generally consistent with a hypothesis that posits a difference in trophic level between the nursing infant and the mother; however, using these data to reconstruct weaning ages is problematic. The assumptions used to determine age of weaning are reviewed; uncertainty in the isotopic trophic offsets, high scatter due to low sample numbers, errors in the age determination of infants, and how representative the samples are for the whole population are possible contributors to uncertainty in determining weaning times from archaeological bones. Other possible explanations for these age-related isotopic differences have generally not been considered in the archaeological literature. Factors bearing further investigation are the possibility of developmental (nondietary) differences in tissue isotopic composition, incorporation of non-protein nitrogen in milk and the effects of the gut microbiome.

Styring 2015

Amy K. Styring et al., *Refining human palaeodietary reconstruction using amino acid $\delta^{15}N$ values of plants, animals and humans*. Journal of Archaeological Science **53** (2015), 504–515.

JAS053-0504-Supplement.docx

Amy K. Styring, Rebecca A. Fraser, Rose-Marie Arbogast, Paul Halstead, Valasia Isaakidou, Jessica A. Pearson, Marguerita SchEafer, Sevasti Triantaphyllou, Soultana Maria Valamoti, Michael Wallace, Amy Bogaard & Richard P. Evershed

The large discrepancies between the estimates of animal protein consumption made with and without taking into account the d15N values of charred cereal grains and pulses illustrate the importance of plant d15N values in palaeodietary interpretations.

An established method of estimating the trophic level of an organism is through stable isotope analysis of its tissues and those of its diet. This method has been used in archaeology to reconstruct past human diet from the stable nitrogen isotope (d15N) values of human and herbivore bone collagen. However, this approach, using the 15N-enrichment of human bone collagen d15N values over associated herbivore bone collagen d15N values to predict the relative importance of animal protein, relies on the assumptions that: (i) the d15N values of plants consumed by humans and herbivores are identical, and (ii) the 15Nenrichment between diet and consumer is consistent. Bone collagen amino acid d15N values have the potential to tackle these uncertainties, as they constrain the factors influencing bone collagen d15N values. In this study, the d15N values of glutamic acid and phenylalanine in human and herbivore bone collagen isolates from Neolithic sites in Germany, Greece and Turkey were determined by gas chromatography-combustion-isotope ratio mass spectrometry. The fraction of animal protein in total dietary protein consumed by the humans was estimated by: (i) comparing bulk human and herbivore collagen d15N values, (ii) comparing bulk human and herbivore collagen and ancient charred cereal grain d15N values, (iii) comparing human bone collagen d15NGlutamic acid and d15NPhenylalanine values, and (iv) comparing d15NGlutamic acid values of human and herbivore bone collagen and estimated d15NGlutamic acid values of ancient charred cereal grains. Where determined cereal grain d15N values are higher than estimated herbivore forage values, estimates of animal protein consumption are significantly lower, emphasising the importance of the plant nitrogen contribution to human bone collagen. This study also highlights the need for further investigation into: (i) the D15NConsumer-Diet values of glutamic acid and phenylalanine in terrestrial ecosystems, and (ii) D15NGlutamic acid-Phenylalanine values of common plant foods in order to improve the accuracy and more widespread applicability of amino acid-based methods for palaeodietary reconstruction.

Keywords: Bone collagen | Cereal grains | Amino acids | Nitrogen | d15N values | Palaeodiet

Klima

Hayes 2014

Christopher T. Hayes et al., *A stagnation event in the deep South Atlantic during the last interglacial period.* science **346** (2014), 1514–1517.

s346-1514-Supplement.pdf

Christopher T. Hayes, Alfredo Martínez-García, Adam P. Hasenfratz, Samuel L. Jaccard, David A. Hodell, Daniel M. Sigman, Gerald H. Haug & Robert F. Anderson

During the last interglacial period, global temperatures were ≈2°C warmer than at present and sea level was 6 to 8 meters higher. Southern Ocean sediments reveal a spike in authigenic uranium 127,000 years ago, within the last interglacial, reflecting decreased oxygenation of deep water by Antarctic Bottom Water (AABW). Unlike ice age reductions in AABW, the interglacial stagnation event appears decoupled from open ocean conditions and may have resulted from coastal freshening due to mass loss from the Antarctic ice sheet. AABW reduction coincided with increased North Atlantic Deep Water (NADW) formation, and the subsequent reinvigoration in AABW coincided with reduced NADW formation. Thus, alternation of deep water formation between the Antarctic and the North Atlantic, believed to characterize ice ages, apparently also occurs in warm climates.

Soto-Berelov 2015

Mariela Soto-Berelov, Patricia L. Fall, Steven E. Falconer & Elizabeth Ridder, *Modeling vegetation dynamics in the Southern Levant through the Bronze Age.* Journal of Archaeological Science **53** (2015), 94–109.

JAS053-0094-Supplement1.pdf, JAS053-0094-Supplement2.pdf, JAS053-0094-Supplement3.pdf, JAS053-0094-Supplement4.pdf, JAS053-0094-Supplement5.pdf, JAS053-0094-Supplement6.pdf, JAS053-0094-Supplement7.kmz

We integrate modern spatial distributions of plant geographical regions with paleoclimatic trends to model vegetation change in the Southern Levant over the course of the mid-Holocene. This timespan witnessed the rise, collapse and redevelopment of urbanized society and settlement during the Bronze Age. This study applies GIS and statistical modeling tools (MAXENT) to vegetation data from 1696 historical and modern observation points across the region to chart potential vegetation for the present and at 100-year intervals between 5500 and 3000 calibrated years BP. A macrophysical climate model is used to create vegetation maps based on regional temperature and precipitation data. Environmental dynamics tracked over this time period, including past vegetation, temperature and precipitation, are applied to the interpretation of Bronze Age settlement and social change. Our results reveal a general trend of Mediterranean forest contraction through the Bronze Age. The "4.2 event" (ca. 4200 calibrated years BP) potentially links regional desiccation and urban collapse, and constitutes the last element in a trajectory of reduced potential forest vegetation through the Early Bronze Age. Rapid woodland expansion correlates with abrupt cooling and reurbanization at the outset of the Middle Bronze Age. Modeled vegetation shows minimum forest and maximum desert coverage consistent with a Late Bronze Age "crisis" ca. 3000 calibrated years BP. In comparison to the Bronze Age, modern potential vegetation includes the broadest extent of steppe.

Keywords: 4.2 event | Bronze Age | GIS mapping | MAXENT modeling | Southern Levant | Urban rise and collapse | Vegetation change

Kultur

MORGAN 2015

T. J. H. Morgan et al., *Experimental evidence for the co-evolution of hominin tool-making teaching and language*. Nature Communications **6** (2015), 6029. DOI:10.1038/ncomms7029.

NatComm06-6029-Supplement.pdf

T. J. H. Morgan, N. T. Uomini, L. E. Rendell, L. Chouinard-Thuly, S. E. Street, H. M. Lewis, C. P. Cross, C. Evans, R. Kearney, I. de la Torre, A. Whiten & K. N. Laland

Hominin reliance on Oldowan stone tools—which appear from 2.5 mya and are believed to have been socially transmitted—has been hypothesized to have led to the evolution of teaching and language. Here we present an experiment investigating the efficacy of transmission of Oldowan tool-making skills along chains of adult human participants (N=184) using five different transmission mechanisms. Across six measures, transmission improves with teaching, and particularly with language, but not with imitation or emulation. Our results support the hypothesis that hominin reliance on stone tool-making generated selection for teaching and language, and imply that (i) low-fidelity social transmission, such as imitation/emulation, may have contributed to the ≈700,000 year stasis of the Oldowan technocomplex, and (ii) teaching or proto-language may have been pre-requisites for the appearance of Acheulean technology. This work supports a gradual evolution of language, with simple symbolic communication preceding behavioural modernity by hundreds of thousands of years.

Metallzeiten

MOSKAL-DEL HOYO 2015

Magdalena Moskal-del Hoyo et al., *Plants and environment, Results of archaeobotanical research of the Bronze Age settlements in the Carpathian Foothills in Poland*. Journal of Archaeological Science **53** (2015), 426–444.

JAS053-0426-Supplement.kmz

Magdalena Moskal-del Hoyo, Maria Lityńska-Zając, Marta Korczyńska, Katarzyna Cywa, Tobias L. Kienlin & Klaus Cappenberg

The first permanent occupation in the micro-region localized around Janowice, in the middle valley of the Dunajec river in the Polish Carpathian Foothills, begun at the turn of the Middle Bronze Age and the Late Bronze Age. Different landscape forms were settled, in which the highest part of the hills or areas located in the proximity of the river were especially chosen for stable settlement. All of them were characterized by the presence of fertile loess and alluvial soils. Macroscopic plant remains found in different occupational phases of six archaeological sites represent cultivated and wild plants. The remains of cultivated plants confirmed that plant resources formed an important part of the past subsistence strategies. It was observed that the same spectrum of cultivated species was utilized during about one millennium of occupation in the forelands, from the beginning of the occupation until the end of the Early Iron Age. Hordeum vulgare, Triticum diccocon, Triticum spelta and Panicum miliaceum were the dominant cereal crops. A

consistent choice of varied cereal species, along with pulses, may indicate that both winter and summer crops were cultivated and the works dedicated to crop farming were distributed along various months. This strategy could also provide higher and more reliable yields. In addition, the edaphic requirements of weed remains may confirm that people used rich and moderately moist soils for cereal cultivation. Overall, a relatively early cultivation of spelt wheat and millet should be emphasized in the Carpathian Foothills since the oldest phase can be dated back to ca. 1500–1300 cal. BC. A relatively high abundance and ubiquity of spelt wheat resulted very interesting in the context of other cereal remains found in the Late Bronze Age in Poland. In addition, an Agricultural Predictive Model was prepared for the closest regions of the settlements in order to demonstrate areas with optimal environmental conditions for agricultural practices. Altogether, macroscopic plant remains are related mainly to synanthropic habitats from fields to ruderal ones. Moreover, human activities could be also responsible for the development of steppe-like plant communities, which are inferred after the finding of feather grass (Stipa sp.). The remains of wood preserved as charcoals represent a separate group of plants. They were associated to firewood collections and therefore their analysis may be used for the reconstruction of local woodlands. A major formation is the oak-hornbeam forest. Interestingly, at the end of the Subboreal period, woodlands were dominated by late-arriving species to the Polish territory, such as Carpinus betulus and Fagus sylvatica. Abies alba is also well represented, especially in settlements located on the hills. It seems that forest formations were also subjected to anthropization and the main changes included the presence of more open forests and appearance of unstable stands in different successional stages.

Keywords: Archaeobotany | Anthracology | Environmental conditions | Late Bronze Age and Early Iron Age | Carpathian Foothills | Poland

Park 2015

Jang-Sik Park & Susanne Reichert, *Technological tradition of the Mongol Empire as inferred from bloomery and cast iron objects excavated in Karakorum*. Journal of Archaeological Science **53** (2015), 49–60.

Iron objects from Karakorum, the former capital of the Mongol Empire, were metallographically examined. Most were forged out of bloomery iron, particularly those requiring superior functional properties. By contrast, approximately one third were made from cast iron, with carbon levels approximating either cast iron or ultrahigh carbon steel. The carbon concentration of the bloomery products was controlled either by a carburization treatment directed at the functional parts or by the welding of a pre-carburized steel plate to a low carbon body. By comparison, cast iron-based steelmaking was achieved by subjecting pieces of solid cast iron to a combined thermal and mechanical treatment aimed at accelerating decarburization. Some anonymous cast objects were circulated as a feedstock for this unique process, naturally taking the form of thin plates. Also, the cast products examined were contaminated with substantial amounts of sulfur and silicon, suggesting that they originated from liquid iron smelted at relatively high temperatures using fossil fuel instead of charcoal. Given these findings, it can be concluded that the Mongol Empire took advantage of an effective multi-faceted iron tradition, which combined bloomery-based and cast iron-based iron technologies. It is important to note, however, that the former still remained the key technological tradition dominating the local contemporary iron industry.

Keywords: Mongol Empire | Karakorum | Iron tradition | Bloomery iron | Cast iron | Steelmaking

Witschel 2015

Christian Witschel, *Stadt, Land, Flucht*. Spektrum der Wissenschaft **2015**, ii, 58–62.

Trieb die "Völkerwanderung" Galliens Landbevölkerung in die Städte? Oder suchte umgekehrt die gallische Oberschicht auf dem Land Zulucht vor dem römischen Fiskus? Am Beispiel der "villa rustica" decken Historiker den Gesellschaftswandel im spätantiken Gallien auf.

Methoden

Burt 2013

Nicole M. Burt & Sandra Garvie-Lok, *A new method of dentine microsampling of deciduous teeth for stable isotope ratio analysis*. Journal of Archaeological Science **40** (2013), 3854–3864.

Carbon and nitrogen stable isotope ratio analysis of dentine is a powerful tool for examining early childhood diet in past populations. Serial sampling of the dentine can reconstruct an individual's changing diet. Previous serial studies have used homogenized samples that give broad results for age categories. This study presents a new dentine microsampling technique for use in stable isotope ratio analysis that provides stable isotope signals for three important juvenile life stages: fetal life, breastfeeding, and weaning.

A sample of 35 modern deciduous teeth was collected in collaboration with the Department of Pediatric Dentistry, University of Alberta. One half of each tooth was examined histologically to locate the neonatal line, and the other half was sampled for isotopic analysis. Microsamples of dentine were collected occlusal to the neonatal line, directly apical to the neonatal line, and from the growing edge of the tooth; these should reflect the diet of the mother during pregnancy, followed by the infant's breastfeeding and weaning diets. The results of the isotopic assay show dietary changes in individual children over time that can be reasonably explained in terms of modern infant feeding practices in a diverse modern sample.

While the technique will be useful to many stable isotope researchers, it is particularly suited for studying the changing diet of a single individual. The results indicate that microsamples must be above 0.3 mg to give reliable simultaneous results for carbon and nitrogen, though accurate nitrogen results alone can be gained at much smaller weights. Further research will apply this methodology to archaeological remains.

Keywords: Stable isotope ratio analysis | Breastfeeding | Weaning age | Microsampling | Fetal life

Mittelalter

Dick 2015

Stefanie Dick, *Barbaren auf dem Thron*. Spektrum der Wissenschaft **2015**, ii, 52–57.

Germanische Anführer avancierten ab dem späten 5. Jahrhundert in ehemals römischen Provinzen zu Königen. Ihre Karriere verdankten sie einer geschickten Gratwanderung zwischen ihrer eigenen und der gallorömischen Kultur.

Mittelpaläolithikum

Dibble 2015

Harold L. Dibble, Vera Aldeias, Paul Goldberg, Shannon P. McPherron, Dennis Sandgathe & Teresa E. Steele, *A critical look at evidence from La Chapelle-aux-Saints supporting an intentional Neandertal burial*. Journal of Archaeological Science **53** (2015), 649–657.

In a paper based on recent excavations and analysis of recovered material at the French Middle Paleolithic site of La Chapelle-aux-Saints, Rendu et al. (2014) concluded that there is sufficient evidence to support the long-held interpretation that the Neandertal remains found in the bouffia Bonneval locality represents an intentional Neandertal burial. This paper critically examines their data and arguments in relation to criteria that can be used to provide an objective evaluation of such evidence. In each case, the evidence from La Chapelle-aux-Saints either fails to meet these criteria or supports other interpretations equally well. As a result, this site fails to provide unequivocal evidence in support of the notion that Neandertals intentionally interred their dead, whether in any ritualistic or symbolic context or not.

Keywords: La Chapelle-aux-Saints | Neandertal | Burial | Middle Paleolithic

Story or Book

Achtner 2015

Wolfgang Achtner, *Glaube als Daseinsbewältigung*. Spektrum der Wissenschaft **2015**, ii, 87–88.

Drei Wissenschaftler gehen den Ursprüngen der Religion nach.

Ina Wunn, Patrick Urban, Constantin Klein. Götter, Gene, Genesis. Die Biologie der Religionsentstehung. Springer Spektrum, Berlin und Heidelberg 2014, 161 S., E 24,99

Ihre Kernthese lautet: Religionen haben eine klar identiizierbare biologischsoziale Funktion, daher sind sie auch verhaltensbiologisch von ihren frühesten Anfängen bis hin zu den heute existierenden Weltreligionen erklärbar. Religionen, so die These von Wunn, Urban und Klein, helfen bei der Daseinsbewältigung durch symbolische Darstellung speziischer Ängste. Sie sind demnach Angst reduzierende Symbolsysteme.

Das Buch endet mit einer Beschreibung der Religionen Maltas, Griechenlands (Mykene, Knossos) und Israels. Die Herleitung des israelitischen Monotheismus aus dem Territorialanspruch der frühen israelitischen Könige scheint jedenfalls gewagt, zumal der Monotheismus sich im babylonischen Exil erst durchsetzte, als das Territorium bereits verloren war.

Eckart 2015

Emily Eckart, *The Left Hands of Lovers*, *Strong connection*. nature **517** (2015), 406.

"Your hand is like mine," Rosalind said. I had wondered when she'd notice. My left hand was a prosthesis.