Liste erstellt am 2013-11-30

Literatur

Afrika

Dimmendaal 2008

Gerrit J. Dimmendaal, *Language Ecology and Linguistic Diversity on the African Continent*. Language and Linguistics Compass **2** (2008), 840–858.

Africanists have been criticized by comparative linguists working on language families in other parts of the world for being lumpers. The present contribution reviews current views among specialists on genetic diversity on the African continent. In addition, some of the causal mechanisms behind this language diversity are investigated. More specifically, the role played by innovations in subsistence economies and climatological changes is discussed. Special emphasis, however, is put on attitudes towards the role of language as a marker of social identity and their effect on language diversity.

Aktuell

Bissell 2013

Mina Bissell, *The risks of the replication drive*. nature **503** (2013), 333–334.

The push to replicate findings could shelve promising research and unfairly damage the reputations of careful, meticulous scientists, says Mina Bissell.
A collaborator noticed that her group could not reproduce its own data convincingly when using cells from a cell bank. She had obtained the original cells from another investigator. And they had been cultured under conditions in which they had drifted.

Cho 2013

Adrian Cho, *Dark Matter's Dark Horse*. science **342** (2013), 552–555.

A rare yes/no effort promises to prove either that hypothetical particles called axions are the universe's elusive dark matter—or that they can't be.

Conlon 2013

B. P. Conlon et al., *Activated ClpP kills persisters and eradicates a chronic biofilm infection*. nature **503** (2013), 365–370.

n503-0365-Supplement.xlsx
B. P. Conlon, E. S.Nakayasu, L. E. Fleck, M. D. LaFleur, V. M. Isabella, K. Coleman, S. N. Leonard, R. D. Smith, J. N. Adkins & K. Lewis
Chronic infections are difficult to treat with antibiotics but are caused primarily by drug-sensitive pathogens. Dormant persister cells that are tolerant to killing by antibiotics are responsible for this apparent paradox. Persisters are phenotypic variants of normal cells and pathways leading to dormancy are redundant, making it challenging to develop anti-persister compounds. Biofilms shield persisters from the immune system, suggesting that an antibiotic for treating a chronic infection should be able to eradicate the infection on its own.Wereasoned that a compound capable of corrupting a target in dormant cells will kill persisters. The

acyldepsipeptide antibiotic (ADEP4) has been shown to activate the ClpP protease, resulting in death of growing cells. Here we show that ADEP4-activated ClpP becomes a fairly nonspecific protease and kills persisters by degrading over 400 proteins, forcing cells to self-digest. Null mutants of clpP arise with high probability, but combining ADEP4 with rifampicin produced complete eradication of Staphylococcus aureus biofilms in vitro and in a mouse model of a chronic infection. Our findings indicate a general principle for killing dormant cells—activation and corruption of a target, rather than conventional inhibition. Eradication of a biofilm in an animal model by activating a protease suggests a realistic path towards developing therapies to treat chronic infections.

Gerdes 2013

Kenn Gerdes & Hanne Ingmer, *Killing the survivors*. nature **503** (2013), 347–349.

Antibiotic-tolerant, dormant variants of otherwise antibiotic-sensitive bacteria underlie many chronic and relapsing infections. A small molecule has been identified that can efficiently eradicate these persister cells.

Inglis 2013

Ben Inglis, Kai Buckenmaier, Paul SanGiorgio, Anders F. Pedersen, Matthew A. Nichols & John Clarke, *MRI of the human brain at 130 microtesla*. PNAS **110** (2013), 19194–19201.

We present in vivo images of the human brain acquired with an ultralow field MRI (ULFMRI) system operating at a magnetic field B0 ≈ 130 μT. The system features prepolarization of the proton spins at Bp ≈ 80 mT and detection of the NMR signals with a superconducting, second-derivative gradiometer inductively coupled to a superconducting quantum interference device (SQUID). We report measurements of the longitudinal relaxation time T1 of brain tissue, blood, and scalp fat at B0 and Bp, and cerebrospinal fluid at B0. We use these T1 values to construct inversion recovery sequences that we combine with Carr–Purcell–Meiboom–Gill echo trains to obtain images in which one species can be nulled and another species emphasized. In particular, we show an image in which only blood is visible. Such techniques greatly enhance the already high intrinsic T1 contrast obtainable at ULF. We further present 2D images of T1 and the transverse relaxation time T2 of the brain and show that, as expected at ULF, they exhibit similar contrast. Applications of brain ULFMRI include integration with systems for magnetoencephalography. More generally, these techniques may be applicable, for example, to the imaging of tumors without the need for a contrast agent and to modalities recently demonstrated with T1rho contrast imaging (T1 in the rotating frame) at fields of 1.5 T and above.

Leek 2013

Peter J. Leek, *Storing Quantum Information in Schrödinger's Cats*. science **342** (2013), 568–569.

Superposition states created with more than 100 photons enable the storage of multiple bits of quantum information.

Sutherland 2013

William J. Sutherland, David Spiegelhalter & Mark Burgman, *Twenty tips for interpreting scientific claims*. nature **503** (2013), 335–337.

This list will help non-scientists to interrogate advisers and to grasp the limitations of evidence, say William J. Sutherland, David Spiegelhalter and Mark A. Burgman.

Vlastakis 2013

Brian Vlastakis et al., *Deterministically Encoding Quantum Information Using 100-Photon Schrödinger Cat States*. science **342** (2013), 607–610.

s342-0607-Supplement.pdf

Brian Vlastakis, Gerhard Kirchmair, Zaki Leghtas, Simon E. Nigg, Luigi Frunzio, S. M. Girvin, Mazyar Mirrahimi, M. H. Devoret & R. J. Schoelkopf

In contrast to a single quantum bit, an oscillator can store multiple excitations and coherences provided one has the ability to generate and manipulate complex multiphoton states. We demonstrate multiphoton control by using a superconducting transmon qubit coupled to a waveguide cavity resonator with a highly ideal off-resonant coupling. This dispersive interaction is much greater than decoherence rates and higher-order nonlinearities to allow simultaneous manipulation of hundreds of photons. With a tool set of conditional qubit-photon logic, we mapped an arbitrary qubit state to a superposition of coherent states, known as a "cat state." We created cat states as large as 111 photons and extended this protocol to create superpositions of up to four coherent states. This control creates a powerful interface between discrete and continuous variable quantum computation and could enable applications in metrology and quantum information processing.

Amerika

Beck 2010

Charlotte Beck & George T. Jones, *Clovis and Western Stemmed, Population migration and the meeting of two technologies in the Intermountain West*. American Antiquity **75** (2010), 81–116.

The Intermountain West is rarely included in discussions of the North American Paleoindian record, largely because there is so little evidence for Clovis in that region. What has been ignored in these discussions is the presence of an early record in the region associated not with Clovis, but with a different technology, the main diagnostic of which is the large, con tracting stemmed projectile point. Dates associated with this technology are comparable to the earliest Clovis dates on the Plains. An examination of the spatial and temporal distributions of Clovis diagnostics suggests that elements of this tech nology arrived relatively late in the Intermountain West, apparently the termination of a diffusion (or migration) process that began in the southern Plains or Southeast, moved northward along the Rocky Mountain front, and eventually onto the Columbia Plateau. We argue that initial colonization of the intermountain region most likely involved groups moving inland from the Pacific coast carrying a non-Clovis technology, which was already in place by the time Clovis technology arrived.

Dillehay 1999

Tom D. Dillehay et al., *On Monte Verde: Fiedel's confusions and misrepresentations*. (Lexington 1999). `http://www.uky.edu/Projects/MonteVerde/`.

Dillehay-1999.pdf

Tom D. Dillehay, Michael B. Collins, Mario Pino, Jack Rossen, Jim Adovasio, Carlos Ocampo, Ximena Navarro, Pilar Rivas, David Pollack, A. Gwynn Henderson, Jose Saavedra, Patricio Sanzana, Pat Shipman, Marvin Kay, Gaston Munoz, Anastasios Karathanasis, Donald Ugent, Michael Cibull and Richard Geissler

A more detailed response to Fiedel was not written at the time of his review, because the editors of Discovering Archaeology limited us to 700 words. The editors of Discovering Archaeology would not publish the long response provided below. Since Fiedel's review was published in Discovering Archaeology and avoided peer review, we have been unable to make this reply available through conventional avenues (i.e., technical scientific journals). In addition, Fiedel's factual and interpretive errors are so numerous, the response we've had to produce to rebut him is prohibitively long for most journals. Thus, this website.

Goebel 2013

Ted Goebel et al., *Serpentine Hot Springs, Alaska, Results of excavations and implications for the age and significance of northern fluted points.* Journal of Archaeological Science **40** (2013), 4222–4233.

JArchSci40-4222-Supplement.pdf

Ted Goebel, Heather L. Smith, Lyndsay DiPietro, Michael R. Waters, Bryan Hockett, Kelly E. Graf, Robert Gal, Sergei B. Slobodin, Robert J. Speakman, Steven G. Driese & David Rhode

The dispersal of Homo sapiens across the New World is one of the greatest chapters in the history of our species; however, major questions about this late Pleistocene diaspora remain unanswered. Two contentious issues are the timing of colonization of the Bering Land Bridge and origin of Clovis, which at 13,000 calendar years ago is the earliest unequivocal complex of archaeological sites in temperate North America, known by its specialized fluted spear points. One hypothesis is that fluting technology emerged in Beringia and from there was carried southbound, with fluted points becoming the diagnostic "calling card" of early Paleoindians spreading across the Western Hemisphere. Fluted points have long been known from Alaska, yet until now they have never been found in a datable geologic context, making their relationship to Clovis a mystery. Here we show that a new archaeological site at Serpentine Hot Springs, Bering Land Bridge National Preserve, Alaska, contains fluted points in a stratified geologic deposit dating to no earlier than 12,400 calendar years ago. Our results suggest that Alaska's fluted-point complex is too young to be ancestral to Clovis, and that it instead represents either a south-to-north dispersal of early Americans or transmission of fluting technology from temperate North America. These results suggest that the peopling of the Americas and development of Paleoindian technology were much more complex than traditional models predict.

Keywords: Bering Land Bridge | Peopling of the Americas | Fluted points | Paleoindian technology

Rowe 2003

Marvin W. Rowe & Karen L. Steelman, *Comment on "some evidence of a date of first humans to arrive in Brazil".* Journal of Archaeological Science **30** (2003), 1349–1351.

J Archaeol Sci 30 (2003) 351 reported extremely interesting dates on a calcite layer covering a pictograph at the Toca da Bastiana rock shelter within the Serra da Capivara National Park, Piaui, Brazil. Thermoluminescence and electron paramagnetic resonance ages indicate that humans were present in Brazil prior to 35 ky ago. We report radiocarbon dates for rock paintings at the same rock shelter and other nearby shelters that contradict Watanabe et al.'s results.

Keywords: First Americans; Radiocarbon dating; Calcium oxalate; Toca da Bastiana, Piauí, Brazil; Rock art

Watanabe 2003

Shigueo Watanabe et al., *Some Evidence of a Date of First Humans to Arrive in Brazil*. Journal of Archaeological Science **30** (2003), 351–354.

Shigueo Watanabe, Walter Elias Feria Ayta, Henrique Hamaguchi, Nièdе Guidon, Eliany S. La Salvia, Silvia Maranca and Oswaldo Baffa Filho

A calcite formation was found on a rockwall painting at Toca da Bastiana rockshelter at Serra da Capivara National Park, Piaui, Brazil. Thermoluminescence and EPR dating of this calcite gave an age of 35 to 43 ka, indicating that humans lived there prior to 35 ka ago. This result supports the radiocarbon dates ranging up to 48 ka BP found earlier for this site.

Keywords: dating; thermoluminescence; EPR; radiocarbon; calcite

Anthropologie

Mussweiler 2013

Thomas Mussweiler & Axel Ockenfels, *Similarity increases altruistic punishment in humans*. PNAS **110** (2013), 19318–19323.

Humans are attracted to similar others. As a consequence, social networks are homogeneous in sociodemographic, intrapersonal, and other characteristics—a principle called homophily. Despite abundant evidence showing the importance of interpersonal similarity and homophily for human relationships, their behavioral correlates and cognitive foundations are poorly understood. Here, we show that perceived similarity substantially increases altruistic punishment, a key mechanism underlying human cooperation. We induced (dis)similarity perception by manipulating basic cognitive mechanisms in an economic cooperation game that included a punishment phase. We found that similarity-focused participants were more willing to punish others' uncooperative behavior. This influence of similarity is not explained by group identity, which has the opposite effect on altruistic punishment. Our findings demonstrate that pure similarity promotes reciprocity in ways known to encourage cooperation. At the same time, the increased willingness to punish norm violations among similarity-focused participants provides a rationale for why similar people are more likely to build stable social relationships. Finally, our findings show that altruistic punishment is differentially involved in encouraging cooperation under pure similarity vs. in-group conditions.

Bibel

Finkelstein 2006

Israel Finkelstein & Eli Piasetzky, *^{14}C and the Iron Age chronology debate, Rehov, Khirbet En-Nahas, Dan, and Megiddo*. Radiocarbon **48** (2006), iii, 373–386.

A recently published volume, The Bible and Radiocarbon Dating: Archaeology, Text and Science (Levy and Higham 2005), provides data related to the debate over the chronology of the Iron Age strata in the Levant (for a review, see Carmi 2006). The present article comments on several chapters in the volume. The article highlights methodological problems, such as insecure stratigraphic provenance of 14C samples, and demonstrates how unjustified selection of data can bias the result. The article offers a new interpretation to some of the results and shows that the full set of measurements from Tel Rehov supports the Low Chronology system.

Garfinkel 2011

Yosef Garfinkel, *The Birth & Death of Biblical minimalism*. Biblical Archaeology Review **37** (2011), iii, 46–53.

The basic minimalist argument now to be considered is very simple: Even if David was a historical figure (given the Tel Dan stela), and even if the transition from Iron Age I to Iron Age II began at the end of the 11th century B.C.E. in Judah (given the dating of Khirbet Qeiyafa), there was still no kingdom in Judah in the tenth century B.C.E. because Qeiyafa (on the Judahite/Philistine border) is a Philistine site, part of the kingdom of Gath, identified as Tell es-Safi, less than 10 miles west of Qeiyafa. To us, it is clear that Qeiyafa is not a Philistine site.
These standardized jars from tenth-century Qeiyafa were apparently an early development of the common eighth-century B.C.E. jar handles stamped l'melekh (" belonging to the king"). Both the l'melekh handles and our Qeiyafa handles impressed with fingerprints reflect a centrally organized society imposing governmental regulation—in short, a state.

Gertoux 2013

Gerard Gertoux, *David and Solomon's kingdoms: legend or history?* (unpublished 2013).

The David and Solomon's kingdoms are no longer considered as historical by minimalist archeologists. According to Israel Finkelstein and Neil Silberman, for example, authors of The Bible Unearthed: Archaeology's New Vision of Ancient Israel and the Origin of Its Sacred Texts, at the time of the kingdoms of David and Solomon, Jerusalem was populated by only a few hundred residents or less, which is insufficient for an empire stretching from the Euphrates to Eilath. They suggest that due to religious prejudice, the authors of the Bible suppressed the achievements of the Omrides. Some Biblical minimalists like Thomas L. Thompson go further, arguing that Jerusalem became a city and capable of being a state capital only in the mid-seventh century. Likewise, Finkelstein and others consider the claimed size of Solomon's temple implausible. A review of methods and arguments used by these minimalists shows that they are impostors for writing history. The historical testimonies dated by a chronology anchored on absolute dates (backbone of history) are replaced by archaeological remains dated by carbon-14 (backbone of myths). The goal of these unfounded claims is clearly the charring of biblical accounts.

Biologie

McConnell 2013

Michael J. McConnell et al., *Mosaic Copy Number Variation in Human Neurons*. science **342** (2013), 632–637.

s342-0632-Supplement.pdf, s342-0632-Supplement1.xlsx, s342-0632-Supplement2.xlsx, s342-0632-Supplement3.xlsx

Michael J. McConnell, Michael R. Lindberg, Kristen J. Brennand, Julia C. Piper, Thierry Voet, Chris Cowing-Zitron, Svetlana Shumilina, Roger S. Lasken, Joris R. Vermeesch, Ira M. Hall & Fred H. Gage

We used single-cell genomic approaches to map DNA copy number variation (CNV) in neurons obtained from human induced pluripotent stem cell (hiPSC) lines and postmortem human brains. We identified aneuploid neurons, as well as numerous subchromosomal CNVs in euploid neurons. Neurotypic hiPSC-derived neurons had larger CNVs than fibroblasts, and several large deletions were found in hiPSC-derived neurons but not in matched neural progenitor cells. Single-cell

sequencing of endogenous human frontal cortex neurons revealed that 13 to 41 % of neurons have at least one megabase-scale de novo CNV, that deletions are twice as common as duplications, and that a subset of neurons have highly aberrant genomes marked by multiple alterations. Our results show that mosaic CNV is abundant in human neurons.

Macosko 2013

Evan Z. Macosko, & Steven A. McCarroll, *Our Fallen Genomes*. science **342** (2013), 564–565.

One implication is that cells are most careless about replicating the parts of their genomes that they are not using. An important direction will therefore be to ascertain the extent to which somatic CNVs affect genes that neurons use, and how these mutations influence the cells' physiological properties.

Datierung

Bruns 1980

Michael Bruns, Ingeborg Levin, K. O. Münnich, H. W. Hubberten & S. Fillipakis, *Regional sources of volcanic carbon dioxide and their influence on ^{14}C content of present-day plant material*. Radiocarbon **22** (1980), 532–536.

14C measurements were made on present-day plant material with short integration times (tree leaves and sprouts) in the Eifel area, western Germany, where ancient volcanism produces gaseous emanations of considerable yield. Plants growing near sources emanating 14C-free CO2 show a significant depletion in the period of their growth. The same effect is found in the 14C content of recent samples from the Thera (Santorini) Archipelago/Greece. This mixing of "dead" CO2 may lead to pseudo ages in archaeologic or geologic samples of up to 1600 years in samples from the vicinity of C02 emanating sources.

Saupe 1980

Francis Saupe, Osvaldo Strappa, Rene Coppens, Bernard Guillet & Robert Jaegy, *A possible source of error in ^{14}C dates, Volcanic emanations (examples from the Monte Amiata district, provinces of Gros Seto and Sienna, Italy)*. Radiocarbon **22** (1980), 525–531.

Wood from regular timbering of a shallow seated mine in Tuscany gave 14C ages of 5730 ± 100 years BP, much too old to be attributed to one of the known civilizations of Italy. This mine is located in a region of declining volcanic activity, noticeable especially through numerous emanations (natural or incidentally induced by drillings). It was suspected that the analyzed wood had grown in an environment where the normal atmosphere had been diluted by volcanic emanations. To check this hypothesis, living plants (trees, bushes and reeds) and volcanic emanations have been sampled and their 14C content measured. All present day plants are depleted in 14C, giving a fictitious age different from 0 (1805, 1820, 2540, 4350 years BP). Of the gaseous emanations sampled, two have a high pressure and show virtually no 14C (>41,000 years BP). Two others have a pressure close to atmospheric, and small amounts of 14C were introduced by atmospheric contamination (22,570 and 30,580 years BP). Conclusion: plants grown in the vicinity of volcanic emanations have 14C activities that are too low because of a natural 14C dilution and yield anomalously high ages. The d13C values obtained for two of these plants (-27.4 ‰ and -23.7 ‰) are close to the average for plants in general (-25 ‰), whereas the CO2 of mofettes is heavier than atmospheric CO2.

Isotope

Fraser 2013

R. A. Fraser, A. Bogaard, M. Charles, A. K. Styring, M. Wallace, G. Jones, P. Ditchfield & T. H. E. Heaton, *Assessing natural variation and the effects of charring, burial and pre-treatment on the stable carbon and nitrogen isotope values of archaeobotanical cereals and pulses.* Journal of Archaeological Science **40** (2013), 4754–4766.

JArchSci40-4754-Supplement1.doc, JArchSci40-4754-Supplement2.doc, JArchSci40-4754-Supplement3.doc, JArchSci40-4754-Supplement4.doc, JArchSci40-4754-Supplement5.doc, JArchSci40-4754-Supplement6.doc

The aim of this study is to assess the potential of charred archaeobotanical cereal grain and pulse seed d13C and d15N values to provide evidence of crop growing conditions and as a potential component of palaeodietary studies. In order to reliably interpret archaeobotanical d13C and d15N values it is necessary to take into account the impact of charring, burial and laboratory pre-treatment procedures.We examine the effects of charring and burial on bulk d13C, d15N, %C, %N and C:N ratios in modern cereal and pulse material, and of cleaning by acidebaseeacid (ABA) pre-treatment on modern and archaeobotanical charred material. Our study utilised bulk grain and seed samples to help account for within-ear/pod and between-plant variability in d13C and d15N values. Heating at relatively low temperatures and for prolonged times (230 °C for up to 24 h) is conducive to the formation of well preserved, undistorted charred cereal grain and pulse seed. Heating for 24 h has a systematic and predictable effect on d15N values, with increases of around 1 ‰ on average in cereal grains and pulse seeds, and no consistent impact on d13C values. Increases in d15N are likely due to the loss of lighter 14N via N-containing volatiles. Burial (for up to 2 years) and ABA pre-treatment have no significant effects on d13C or d15N values. After pre-treatment, however, the %C and %N contents of the archaeobotanical material more closely resembles that of the modern charred grains and seeds, suggesting that archaeobotanical remains accumulate non-structural material during burial but retain their original carbon and nitrogen content. Therefore %C, %N contents and C:N ratios can provide useful criteria for assessing archaeobotanical preservation.

Keywords: Archaeobotany | Carbon isotopes | Nitrogen isotopes | Preservation | Pre-treatment

Styring 2013

A. K. Styring et al., *The effect of charring and burial on the biochemical composition of cereal grains*, *Investigating the integrity of archaeological plant material.* Journal of Archaeological Science **40** (2013), 4767–4779.

JArchSci40-4767-Supplement.pdf

A. K. Styring, H. Manning, R. A. Fraser, M. Wallace, G. Jones, M. Charles, T. H. E. Heaton, A. Bogaard & R. P. Evershed

Stable isotope analysis of charred archaeobotanical cereal grains has the potential to provide direct evidence of crop growing conditions in the past and to refine palaeodietary predictions. If isotope values of archaeobotanical material are to be considered robust, it is necessary to characterise the compositional changes associated with their charring and burial. This study used a suite of analytical techniques, including FT-IR and solid state 13C NMR, to characterise changes in the biochemical composition of modern einkorn grains with heating at 230 °C for 2 h, 4 h, 8 h and 24 h, encompassing conditions that replicate their undistorted

ancient counterparts. The biochemical composition of archaeobotanical charred einkorn grains was also investigated by FT-IR and solid state 13C NMR in order to assess the changes in composition which occur during burial. Results of FT-IR and solid-state 13C NMR show that heating of modern einkorn grains resulted in Maillard reactions between cereal proteins and starch, forming high molecular weight melanoidins, which contain both alkyl and aromatic carbon. Loss of low molecular weight carbon and nitrogen-containing volatiles resulted in a slight but non-systematic increase in the d13C values and a systematic increase of 0.8 ‰ in the d15N values of the charred einkorn grains. Solid-state 13C NMR shows that the ancient charred einkorn grains consisted entirely of aromatic carbon and retained a similar proportion of nitrogen to their modern 24 h charred counterparts, despite a significantly lower concentration of amino acids. This indicates that the amino acid nitrogen in the ancient charred grains was retained in the stable melanoidins whose polymeric structure makes them resistant to subsequent degradation.
Keywords: Cereal grains | Heat treatment | Chars | Ancient | FTIR | NMR | Maillard

Judentum

Hartman 2013

Gideon Hartman, Guy Bar-Oz, Ram Bouchnick & Ronny Reich, *The pilgrimage economy of Early Roman Jerusalem (1st century BCEe70 CE) reconstructed from the $\delta^{15}N$ and $\delta^{13}C$ values of goat and sheep remains*. Journal of Archaeological Science **40** (2013), 4369–4376.
JArchSci40-4369-Supplement.doc
Religious and historical sources suggest that pilgrimage formed a major source of Jerusalem's economy during the Early Roman period due to the Temple's role as a religious and judicial center for the Jewish diaspora. Until now, this assertion has been supported by little material evidence. In this study, the carbon and nitrogen isotope values of local arcahaeological and, modern wild herbivores from known environments were used to determine the environmental origins of domesticated sheep and goat that were traded and consumed in Early Roman Jerusalem. Pinpointing the environmental origins of these herd animals can determine if they were raised in specialized farms in the vicinity of Jerusalem, brought to the city by local pilgrims, or were part of organized importation of sacrifice animals from desert regions that lie beyond the boundaries of the province of Judea. The results indicate that at minimum 37 % of the goat and sheep consumed in Jerusalem during the Early Roman period were brought from desert regions. The inter-provincial importation of animals to Jerusalem to meet high demands for sacrifice by pilgrims is the first material evidence for large scale economic specialization in the city. Furthermore, the results imply that desert animals were further marketed for domestic use in contemporaneous farm sites out of Jerusalem.
Keywords: Archaeology | Second Temple | Southern Levant | Paleoenvironment

Jungpaläolithikum

Nikolskiy 2013

Pavel Nikolskiy & Vladimir Pitulko, *Evidence from the Yana Palaeolithic site, Arctic Siberia, yields clues to the riddle of mammoth hunting*. Journal of Archaeological Science **40** (2013), 4189–4197.

JArchSci40-4189-Supplement.doc
It has become commonplace to talk about humans hunting mammoths, and overhunting is thought to have been one of the causes of the mammoth extinction. However, definite evidence of mammoth kills by humans remains surprisingly scarce. Here we show convincing evidence of mammoth hunting in the Siberian Arctic between 29 000 and 27 000 14C years BP. Our data set, from the Yana Upper Palaeolithic site (Siberian Arctic), includes the following: fragments of lithic points and ivory shaft embedded in two mammoth scapulae; two identical holes made by projectiles in a mammoth scapula and a pelvic bone; mammoth tongue bones found in the cultural layer far away from the main mammoth bone accumulation, indicating the consumption of fresh mammoth meat; and a narrow mammoth bone size distribution, implying hunting selection based on animal size. The data suggest that Palaeolithic Yana humans hunted mammoths sporadically, presumably when ivory was needed for making tools. Such nonintensive hunting practiced by humans over millennia would not be fatal to a sustainable mammoth population.
Keywords: Palaeolithic | Pleistocene | Arctic Siberia | Yana RHS site | Mammoth mass accumulation | Human behavior | Mammoth hunting | Hunting technology

Klima

Neugebauer 2012

Ina Neugebauer et al., *A Younger Dryas varve chronology from the Rehwiese palaeolake record in NE-Germany*. Quaternary Science Reviews **36** (2012), 91–102.

Ina Neugebauer, Achim Brauer, Nadine Dräger, Peter Dulski, Sabine Wulf, Birgit Plessen, Jens Mingram, Ulrike Herzschuh & Arthur Brande
The first 1400-year floating varve chronology for north-eastern Germany covering the late Allerød to the early Holocene has been established by microscopic varve counts from the Rehwiese palaeolake sediment record. The Laacher See Tephra (LST), at the base of the studied interval, forms the tephrochronological anchor point. The fine laminations were examined using a combination of micro-facies and mXRF analyses and are typical of calcite varves, which in this case provide mainly a warm season signal. Two varve types with different sub-layer structures have been distinguished: (I) complex varves consisting of up to four seasonal sub-layers formed during the Allerød and early Holocene periods, and, (II) simple two sub-layer type varves only occurring during the Younger Dryas. The precision of the chronology has been improved by varve-to-varve comparison of two independently analyzed sediment profiles based on well-defined micro-marker layers. This has enabled both (1) the precise location of single missing varves in one of the sediment profiles, and, (2) the verification of varve interpolation in disturbed varve intervals in the parallel core. Inter-annual and decadal-scale variability in sediment deposition processes were traced by multi-proxy data series including seasonal layer thickness, highresolution element scans and total organic and inorganic carbon data at a five-varve resolution. These data support the idea of a two-phase Younger Dryas, with the first interval (12,675–12,275 varve years BP) characterised by a still significant but gradually decreasing warm-season calcite precipitation and a second phase (12,275–11,690 varve years BP) with only weak calcite precipitation. Detailed correlation of these two phases with the Meerfelder Maar record based on the LST isochrone and independent varve counts provides clues about regional differences and seasonal aspects of YD climate change along a transect from a location proximal to the North Atlantic in the west to a more continental site in the east.

Keywords: Varve chronology | Micro-facies | Micro-XRF | Younger Dryas | North-eastern Germany

OVERPECK 2013

Jonathan T. Overpeck, *The challenge of hot drought*. nature **503** (2013), 350–351.

An analysis of North American drought variability over the past millennium shows that it is not unusual for widespread drought to persist for years, prompting fresh thinking about our ability to deal with such climate conditions.
Cook et al. tap a continental array of 1,000-year drought records based on tree rings to show how the 2012 pan-continental drought pattern has occurred in 12 % of years since the tenth century. More importantly, the authors' study highlights how no major US region is immune to such drought, and that we understand quite a lot about how sea surface temperatures drive the differing patterns of drought.

ROSENTHAL 2013

Yair Rosenthal, Braddock K. Linsley & Delia W. Oppo, *Pacific Ocean Heat Content During the Past 10,000 Years*. science **342** (2013), 617–621.

s342-0617-Supplement.pdf
Observed increases in ocean heat content (OHC) and temperature are robust indicators of global warming during the past several decades. We used high-resolution proxy records from sediment cores to extend these observations in the Pacific 10,000 years beyond the instrumental record. We show that water masses linked to North Pacific and Antarctic intermediate waters were warmer by 2.1 ± 0.4°C and 1.5 ± 0.4°C, respectively, during the middle Holocene Thermal Maximum than over the past century. Both water masses were ≈0.9°C warmer during the Medieval Warm period than during the Little Ice Age and ≈0.65° warmer than in recent decades. Although documented changes in global surface temperatures during the Holocene and Common era are relatively small, the concomitant changes in OHC are large.

ROUTSON 2011

Cody C. Routson, Connie A. Woodhouse & Jonathan T. Overpeck, *Second century megadrought in the Rio Grande headwaters, Colorado, How unusual was medieval drought?* Geophysical Research Letters **38** (2011), L22703.

GeoResLet38-L22703-Supplement1.txt, GeoResLet38-L22703-Supplement2.doc, GeoResLet38-L22703-Supplement3.pdf, GeoResLet38-L22703-Supplement4.txt
A new tree-ring record from living and remnant bristlecone pine (Pinus aristata) wood from the headwaters region of the Rio Grande River, Colorado is used in conjunction with other regional records to evaluate periods of unusually severe drought over the past two millennia (B.C. 268 to A.D. 2009). Our new record contains a multi-century period of unusual dryness between 1 and 400 A.D., including an extreme drought during the 2nd century. Characterized by almost five decades of drought (below average ring width), we hypothesize this megadrought is equally, if not more severe than medieval period megadroughts in this region. Published paleoclimate time series help define the spatial extent, severity, and potential causes of the 2nd century megadrought. Furthermore, this early period of unusual dryness has intriguing similarities to later medieval period aridity. Our findings suggest we should anticipate similar severe drought conditions in an even warmer and drier future.

Kultur

Derex 2013

Maxime Derex, Marie-Pauline Beugin, Bernard Godelle & Michel Raymond, *Experimental evidence for the influence of group size on cultural complexity*. nature **503** (2013), 389–391.

n503-0389-Supplement.pdf

The remarkable ecological and demographic success of humanity is largely attributed to our capacity for cumulative culture1–3. The accumulation of beneficial cultural innovations across generations is puzzling because transmission events are generally imperfect, although there is large variance in fidelity. Events of perfect cultural transmission and innovations should be more frequent in a large population4. As a consequence, a large population size may be a prerequisite for the evolution of cultural complexity4,5, although anthropological studies have produced mixed results6–9 and empirical evidence is lacking10. Here we use a dual-task computer game to show that cultural evolution strongly depends on population size, as players in larger groups maintained higher cultural complexity. Wefound that when group size increases, cultural knowledge is less deteriorated, improvements to existing cultural traits are more frequent, and cultural trait diversity is maintained more often. Our results demonstrate how changes in group size can generate both adaptive cultural evolution and maladaptive losses of culturally acquired skills. As humans live in habitats for which they are ill-suited without specific cultural adaptations11,12, it suggests that, in our evolutionary past, group-size reduction may have exposed human societies to significant risks, including societal collapse13.

Richerson 2013

Peter Richerson, *Group size determines cultural complexity*. nature **503** (2013), 351–352.

Many animals use culture, the ability to learn from others, but only humans create complex culture. A laboratory experiment tests which characteristics of our social networks give us this capacity.

The authors' findings support the hypothesis that group size plays an important part in cultural evolution: the probability of a group maintaining the ability to construct the complex tool (the net) over the course of the experiment, the probability of maintaining the ability to construct both tools, and the quality of both tools all increased as a function of group size.

Mathematik

Johnson 2013

Valen E. Johnson, *Revised standards for statistical evidence*. PNAS **110** (2013), 19313–19317.

Recent advances in Bayesian hypothesis testing have led to the development of uniformly most powerful Bayesian tests, which represent an objective, default class of Bayesian hypothesis tests that have the same rejection regions as classical significance tests. Based on the correspondence between these two classes of tests, it is possible to equate the size of classical hypothesis tests with evidence thresholds in Bayesian tests, and to equate P values with Bayes factors. An examination of these connections suggest that recent concerns over the lack of reproducibility of scientific studies can be attributed largely to the conduct of significance tests at

unjustifiably high levels of significance. To correct this problem, evidence thresholds required for the declaration of a significant finding should be increased to 25–50:1, and to 100–200:1 for the declaration of a highly significant finding. In terms of classical hypothesis tests, these evidence standards mandate the conduct of tests at the 0.005 or 0.001 level of significance.

Mittelpaläolithikum

Richter 2006

Jürgen Richter, *Neanderthals in their landscape*. In: B. Demarsin & M. Otte (Hrsg.), *Neanderthals in Europe*, *Proceedings of the International Conference, held in the Gallo-Roman Museum in Tongeren (September 17–19th 2004)*. (Tongeren 2006), 17–32.

The physical and cultural remnants of Neanderthals have been found within a large variety of environmental contexts, and, obviously, there was no Neanderthal standard environment. Despite the fact that Neanderthals are widely regarded as having anatomically adapted to survive under cold climatic conditions, we must probably accept them as potentially ubiquist hominids. Through 100.000 years of Neanderthal (in strict sense) existence, between 130.000 and 30.000 years B.P., their environment changed several times under the influence of major climatic oscillations. A variety of different landscapes all over Europe and the Near East was inhabited and used by Neanderthals.

Physik

Machta 2013

Benjamin B. Machta, Ricky Chachra, Mark K. Transtrum & James P. Sethna, *Parameter Space Compression Underlies Emergent Theories and Predictive Models*. science **342** (2013), 604–607.

s342-0604-Supplement.pdf

The microscopically complicated real world exhibits behavior that often yields to simple yet quantitatively accurate descriptions. Predictions are possible despite large uncertainties in microscopic parameters, both in physics and in multiparameter models in other areas of science. We connect the two by analyzing parameter sensitivities in a prototypical continuum theory (diffusion) and at a self-similar critical point (the Ising model). We trace the emergence of an effective theory for long-scale observables to a compression of the parameter space quantified by the eigenvalues of the Fisher Information Matrix. A similar compression appears ubiquitously in models taken from diverse areas of science, suggesting that the parameter space structure underlying effective continuum and universal theories in physics also permits predictive modeling more generally.