

Literatur

Afrika

MANNING 2011

Katie Manning, Ruth Pelling, Tom Higham, Jean-Luc Schwenniger & Dorian Q. Fuller, *4500-Year old domesticated pearl millet (*Pennisetum glaucum*) from the Tilemsi Valley, Mali: new insights into an alternative cereal domestication pathway*. *Journal of Archaeological Science* **38** (2011), 312–322.

JArchSci38-0312-Supplement.doc

We report here new evidence from the Lower Tilemsi Valley in northeastern Mali, which constitutes the earliest archaeobotanical evidence for domesticated pearl millet (*Pennisetum glaucum*), predating other finds from Africa or India by several centuries. These materials provide further morphological details on the earliest cultivated pearl millet.

Our results demonstrate that pearl millet non-shattering evolved earlier than the start of grain size increases and that once domesticated, pearl millet spread widely and rapidly. Additional attention is given to the dating of these materials, highlighting potential flaws in the use of organic chaff tempered pottery to date occurrences of pearl millet. A revised chronology, based on detailed Bayesian modelling, is presented for the Lower Tilemsi region.

Keywords: Pearl millet; Domestication; Chaff-temper; Agro-pastoralism; Tilemsi Valley

Aktuell

ANDEREGG 2010

William R. L. Anderegg, James W. Prall, Jacob Harold & Stephen H. Schneider, *Expert credibility in climate change*. *PNAS* **107** (2010), 12107–12109.

pnas107-12107-Comment.pdf, pnas107-12107-Reply.pdf, pnas107-12107-Supplement.pdf

Although preliminary estimates from published literature and expert surveys suggest striking agreement among climate scientists on the tenets of anthropogenic climate change (ACC), the American public expresses substantial doubt about both the anthropogenic cause and the level of scientific agreement underpinning ACC. A broad analysis of the climate scientist community itself, the distribution of credibility of dissenting researchers relative to agreeing researchers, and the level of agreement among top climate experts has not been conducted and would inform future ACC discussions. Here, we use an extensive dataset of 1,372 climate researchers and their publication and citation data to show that (i) 97-98% of the climate researchers most actively publishing in the field surveyed here support the tenets of ACC outlined by the Intergovernmental Panel on Climate Change, and (ii) the relative climate expertise and scientific prominence of the researchers unconvinced of ACC are substantially below that of the convinced researchers.

citation analyses | climate denier | expertise | publication analysis | scientific prominence

DESSLER 2010

A. E. Dessler, *A Determination of the Cloud Feedback from Climate Variations over the Past Decade*. *science* **330** (2010), 1523–1527.

Estimates of Earth's climate sensitivity are uncertain, largely because of uncertainty in the long-term cloud feedback. I estimated the magnitude of the cloud feedback in response to short-term climate variations by analyzing the top-of-atmosphere radiation budget

from March 2000 to February 2010. Over this period, the short-term cloud feedback had a magnitude of 0.54 ± 0.74 (2s) watts per square meter per kelvin, meaning that it is likely positive. A small negative feedback is possible, but one large enough to cancel the climate's positive feedbacks is not supported by these observations. Both long- and short-wave components of short-term cloud feedback are also likely positive. Calculations of short-term cloud feedback in climate models yield a similar feedback. I find no correlation in the models between the short- and long-term cloud feedbacks.

HERSHKOVITZ 2010

Israel Hershkovitz, Patricia Smith, Rachel Sarig, Rolf Quam, Laura Rodríguez, Rebeca García, Juan Luis Arsuaga, Ran Barkai & , *Middle Pleistocene Dental Remains From Qesem Cave (Israel)*. [American Journal of Physical Anthropology \(2010\) preprint, 1–18](http://dx.doi.org/10.1002/ajpa.21446). <<http://dx.doi.org/10.1002/ajpa.21446>>.

This study presents a description and comparative analysis of Middle Pleistocene permanent and deciduous teeth from the site of Qesem Cave (Israel). All of the human fossils are assigned to the Acheulo-Yabrudian Cultural Complex (AYCC) of the late Lower Paleolithic. The Middle Pleistocene age of the Qesem teeth (400-200 ka) places them chronologically earlier than the bulk of fossil hominin specimens previously known from southwest Asia. Three permanent mandibular teeth (C1-P4) were found in close proximity in the lower part of the stratigraphic sequence. The small metric dimensions of the crowns indicate a considerable degree of dental reduction although the roots are long and robust. In contrast, three isolated permanent maxillary teeth (I2, C1, and M3) and two isolated deciduous teeth that were found within the upper part of the sequence are much larger and show some plesiomorphous traits similar to those of the Skhul/Qafzeh specimens. Although none of the Qesem teeth shows a suite of Neanderthal characters, a few traits may suggest some affinities with members of the Neanderthal evolutionary lineage. However, the balance of the evidence suggests a closer similarity with the Skhul/Qafzeh dental material, although many of these resemblances likely represent plesiomorphous features.

KEY WORDS Acheulo-Yabrudian; Homo sapiens; Neanderthal; tooth; Israel

IZUMA 2010

Keise Izuma, Madoka Matsumoto, Kou Murayama, Kazuyuki Samejima, Norihiro Sadato & Kenji Matsumoto, *Neural correlates of cognitive dissonance and choice-induced preference change*. [PNAS 107 \(2010\), 22014–22019](https://doi.org/10.1073/pnas.107-22014-Supplement.pdf).

According to many modern economic theories, actions simply reflect an individual's preferences, whereas a psychological phenomenon called "cognitive dissonance" claims that actions can also create preference. Cognitive dissonance theory states that after making a difficult choice between two equally preferred items, the act of rejecting a favorite item induces an uncomfortable feeling (cognitive dissonance), which in turn motivates individuals to change their preferences to match their prior decision (i.e., reducing preference for rejected items). Recently, however, Chen and Risen [Chen K, Risen J (2010) *J Pers Soc Psychol* 99:573-594] pointed out a serious methodological problem, which casts a doubt on the very existence of this choice-induced preference change as studied over the past 50 y. Here, using a proper control condition and two measures of preferences (self-report and brain activity), we found that the mere act of making a choice can change self-report preference as well as its neural representation (i.e., striatum activity), thus providing strong evidence for choice-induced preference change. Furthermore, our data indicate that the anterior cingulate cortex and dorsolateral prefrontal cortex tracked the degree of cognitive dissonance on a trial-by-trial basis. Our findings provide important insights into the neural basis of how actions can alter an individual's preferences.

attitude | cognitive control | conflict | neuroeconomics | value

KAPTCHUK 2010

Ted J. Kaptchuk et al., *Placebos without Deception: A Randomized Controlled Trial in Irritable Bowel Syndrome*. *PLoS ONE* **5** (2010), e15591.

<<http://dx.doi.org/10.1371/journal.pone.0015591>>.

Ted J. Kaptchuk, Elizabeth Friedlander, John M. Kelley, M. Norma Sanchez, Efi Kokkotou, Joyce P. Singer, Magda Kowalczykowski, Franklin G. Miller, Irving Kirsch & Anthony J. Lembo

Background: Placebo treatment can significantly influence subjective symptoms. However, it is widely believed that response to placebo requires concealment or deception. We tested whether open-label placebo (non-deceptive and nonconcealed administration) is superior to a no-treatment control with matched patient-provider interactions in the treatment of irritable bowel syndrome (IBS).

Methods: Two-group, randomized, controlled three week trial (August 2009-April 2010) conducted at a single academic center, involving 80 primarily female (70%) patients, mean age 47.6 with IBS diagnosed by Rome III criteria and with a score ≥ 150 on the IBS Symptom Severity Scale (IBS-SSS). Patients were randomized to either open-label placebo pills presented as “placebo pills made of an inert substance, like sugar pills, that have been shown in clinical studies to produce significant improvement in IBS symptoms through mind-body self-healing processes” or no-treatment controls with the same quality of interaction with providers. The primary outcome was IBS Global Improvement Scale (IBS-GIS). Secondary measures were IBS Symptom Severity Scale (IBS-SSS), IBS Adequate Relief (IBS-AR) and IBS Quality of Life (IBS-QoL).

Findings: Open-label placebo produced significantly higher mean (6SD) global improvement scores (IBS-GIS) at both 11-day midpoint (5.261.0 vs. 4.061.1, $p=.001$) and at 21-day endpoint (5.061.5 vs. 3.961.3, $p = .002$). Significant results were also observed at both time points for reduced symptom severity (IBS-SSS, $p = .008$ and $p = .03$) and adequate relief (IBS-AR, $p = .02$ and $p = .03$); and a trend favoring open-label placebo was observed for quality of life (IBS-QoL) at the 21-day endpoint ($p = .08$).

Conclusion: Placebos administered without deception may be an effective treatment for IBS. Further research is warranted in IBS, and perhaps other conditions, to elucidate whether physicians can benefit patients using placebos consistent with informed consent.

KELLY 2010

Brendan Kelly, Andrew Whiteley & David Tallmon, *The Arctic melting pot*. *nature* **468** (2010), 891.

n468-0891-Supplement.pdf

Hybridization in polar species could hit biodiversity hard, say Brendan Kelly, Andrew Whiteley and David Tallmon.

KERR 2010

Richard A. Kerr, *El Niño Lends More Confidence to Strong Global Warming*. *science* **330** (2010), 1465.

LAWLER 2010

Andrew Lawler, *American Schools of Oriental Research Annual Meeting*. *science* **330** (2010), 1472–1473.

A Change of Biblical Proportions Strikes Mideast Archaeology

Finkelstein says the goal is to overcome the “strong ideological agenda” pervading the field. The team has adopted state-of-the-art methods, including analyzing human and animal DNA and ancient pollen, to resolve controversial questions about the pace and timing of migrations and construction, such as the size and power of 10th century B.C.E. Jerusalem in the time of David and Solomon.

Tracking the Med's Stone Age Sailors

By carefully sorting genetic data from living people, Roy King of Stanford University in Palo Alto, California, said in a talk that around 6000 B.C.E., early seafarers indeed spread their seed – both agricultural and genetic – from their homeland in the Near East as far west as Marseilles, but no farther.

Keeping Watch as the Old Kingdom Crumbled

The structure at Ras Budran on the southern Sinai Peninsula also hints at the precariousness of Egypt's Old Kingdom, suggesting an increasingly desperate trading and military strategy in the waning days of the 22nd century B.C.E.

LOOSER 2010

Christine E. Looser & Thalia Wheatley, *The Tipping Point of Animacy: How, When, and Where We Perceive Life in a Face*. [Psychological Science](#) **21** (2010), 1854–1862.

Faces capture humans' attention; yet, beyond aesthetic appreciation, it is presumably not the face itself that interests people but the mind behind it. Minds think, feel, and act in ways that have direct consequences for well-being, but despite their importance, how minds are perceived in faces is not well understood. We investigated this mechanism by presenting participants with morphed images created from animate (human) and inanimate (mannequin) faces. Life and mind were perceived to “appear” at a consistent location on the morph continuum, close to the human endpoint. This location constituted a categorical boundary, as evidenced by increased sensitivity to differences in image pairs that straddled this tipping point. Additionally, the impression of life was gleaned from the eyes more than from other facial features. These results suggest that human beings are highly attuned to specific facial cues, carried largely in the eyes, that gate the categorical perception of life.

Keywords: animacy, face perception, faces, eyes

PRONIN 2010

Emily Pronin & Matthew B. Kugler, *People believe they have more free will than others*. [PNAS](#) **107** (2010), 22469–22474.

[pnas107-22469-Supplement.pdf](#)

Four experiments identify a tendency for people to believe that their own lives are more guided by the tenets of free will than are the lives of their peers. These tenets involve the a priori unpredictability of personal action, the presence of multiple possible paths in a person's future, and the causal power of one's personal desires and intentions in guiding one's actions. In experiment 1, participants viewed their own pasts and futures as less predictable a priori than those of their peers. In experiments 2 and 3, participants thought there were more possible paths (whether good or bad) in their own futures than their peers' futures. In experiment 4, participants viewed their own future behavior, compared with that of their peers, as uniquely driven by intentions and desires (rather than personality, random features of the situation, or history). Implications for the classic actor-observer bias, for debates about free will, and for perceptions of personal responsibility are discussed.

agency | attribution | psychology | self-other | introspection

My first act of free will shall be to believe in free will.

William James

We have to believe in free will. We've got no choice.

Isaac Bashevis Singer

TODRANK 2010

Josephine Todrank, Giora Heth & Diego Restrepo, *Effects of in utero odorant exposure on neuroanatomical development of the olfactory bulb and odour*

preferences. *Proc. Royal Society B* (2010) preprint, 1–7. <<http://dx.doi.org/10.1098/rspb.2010.2314>>.

Mother's dinner, daughter's nose

The smell of mouse mothers' food influences the olfactory anatomy of their pups, and primes them to prefer the same flavours as their mothers.

Josephine Todrank at the University of Colorado, Denver, and her colleagues studied lines of mice in which select olfactory sensory neurons that responded to smells such as cherry or mint were tagged with the gene for green fluorescent protein. The mothers were given scented food while either gestating or nursing their litters, or during both phases. When their pups were tested at 20 days old, fluorescence revealed larger glomeruli – bundles of synapses – formed by neurons specific to the smells added to their mother's food. Pups also preferred the smells of the food their mothers ate.

Such preferences could predispose animals to choose familiar and safe foods, although in humans they could backfire to plant the seed of preference for alcohol or unhealthy foods, the authors say.

Abstract: Human babies and other young mammals prefer food odours and flavours of their mother's diet during pregnancy as well as their mother's individually distinctive odour. Newborn mice also prefer the individual odours of more closely related-even unfamiliar-lactating females. If exposure to in utero odorants- which include metabolites from the mother's diet and the foetus's genetically determined individual odour-helps shape the neuroanatomical development of the olfactory bulb, this could influence the perception of such biologically important odours that are preferred after birth. We exposed gene-targeted mice during gestation and nursing to odorants that activate GFP-tagged olfactory receptors (ORs) and then measured the effects on the size of tagged glomeruli in the olfactory bulb where axons from olfactory sensory neurons (OSNs) coalesce by OR type. We found significantly larger tagged glomeruli in mice exposed to these activating odorants in amniotic fluid, and later in mother's milk, as well as significant preferences for the activating odour. Larger glomeruli comprising OSNs that respond to consistently encountered odorants should enhance detection and discrimination of these subsequently preferred odours, which in nature would facilitate selection of palatable foods and kin recognition, through similarities in individual odours of relatives.

Keywords: odour exposure; olfactory bulb; odour preferences; neuroanatomical development; mice

Anthropologie

PERANI 2010

Daniela Perani et al., *Functional specializations for music processing in the human newborn brain*. *PNAS* **107** (2010), 4758–4763.

[pnas107-04758-Supplement.pdf](#)

Daniela Perani, Maria Cristina Saccuman, Paola Scifo, Danilo Spada, Guido Andreolli, Rosanna Rovelli, Cristina Baldoli & Stefan Koelsch

In adults, specific neural systems with right-hemispheric weighting are necessary to process pitch, melody, and harmony as well as structure and meaning emerging from musical sequences. It is not known to what extent the specialization of these systems results from long-term exposure to music or from neurobiological constraints. One way to address this question is to examine how these systems function at birth, when auditory experience is minimal. We used functional MRI to measure brain activity in 1- to 3-day-old newborns while they heard excerpts of Western tonal music and altered versions of the same excerpts. Altered versions either included changes of the tonal key or were permanently dissonant. Music evoked predominantly right-hemispheric activations in primary and higher order auditory cortex. During presentation of the altered excerpts, hemodynamic responses

were significantly reduced in the right auditory cortex, and activations emerged in the left inferior frontal cortex and limbic structures. These results demonstrate that the infant brain shows a hemispheric specialization in processing music as early as the first postnatal hours. Results also indicate that the neural architecture underlying music processing in newborns is sensitive to changes in tonal key as well as to differences in consonance and dissonance.

auditory cortex | functional MRI | neonates | emotion

ROSE 2010

Jeffrey I. Rose, *New Light on Human Prehistory in the Arabo-Persian Gulf Oasis*. *Current Anthropology* **51** (2010), 849–883.

The emerging picture of prehistoric Arabia suggests that early modern humans were able to survive periodic hyperarid oscillations by contracting into environmental refugia around the coastal margins of the peninsula. This paper reviews new paleoenvironmental, archaeological, and genetic evidence from the Arabian Peninsula and southern Iran to explore the possibility of a demographic refugium dubbed the “Gulf Oasis,” which is posited to have been a vitally significant zone for populations residing in southwest Asia during the Late Pleistocene and Early Holocene. These data are used to assess the role of this large oasis, which, before being submerged beneath the waters of the Indian Ocean, was well watered by the Tigris, Euphrates, Karun, and Wadi Batin rivers as well as subterranean aquifers flowing beneath the Arabian subcontinent. Inverse to the amount of annual precipitation falling across the interior, reduced sea levels periodically exposed large portions of the Arabo-Persian Gulf, equal at times to the size of Great Britain. Therefore, when the hinterlands were desiccated, populations could have contracted into the Gulf Oasis to exploit its freshwater springs and rivers. This dynamic relationship between environmental amelioration/desiccation and marine transgression / regression is thought to have driven demographic exchange into and out of this zone over the course of the Late Pleistocene and Early Holocene, as well as having played an important role in shaping the cultural evolution of local human populations during that interval.

Biologie

PRIDEAUX 2010

Gavin J. Prideaux et al., *Timing and dynamics of Late Pleistocene mammal extinctions in southwestern Australia*. *PNAS* **107** (2010), 22157–22162.

[pnas107-22157-Supplement.pdf](#)

Gavin J. Prideaux, Grant A. Gully, Aidan M. C. Couzens, Linda K. Ayliffe, Nathan R. Jankowski, Zenobia Jacobs, Richard G. Roberts, John C. Hellstrom, Michael K. Gagan and Lindsay M. Hatcher

Explaining the Late Pleistocene demise of many of the world’s larger terrestrial vertebrates is arguably the most enduring and debated topic in Quaternary science. Australia lost >90% of its larger species by around 40 thousand years (ka) ago, but the relative importance of human impacts and increased aridity remains unclear. Resolving the debate has been hampered by a lack of sites spanning the last glacial cycle. Here we report on an exceptional faunal succession from Tight Entrance Cave, southwestern Australia, which shows persistence of a diverse mammal community for at least 100 ka leading up to the earliest regional evidence of humans at 49 ka. Within 10 millennia, all larger mammals except the gray kangaroo and thylacine are lost from the regional record. Stable-isotope, charcoal, and small-mammal records reveal evidence of environmental change from 70 ka, but the extinctions occurred well in advance of the most extreme climatic phase. We conclude that the arrival of humans was probably decisive in the southwestern Australian extinctions,

but that changes in climate and fire activity may have played facilitating roles. One-factor explanations for the Pleistocene extinctions in Australia are likely oversimplistic.
climate change | human hunting | megafauna | fire history | paleoecology

WILF 2010

Herbert S. Wilf & Warren J. Ewens, *There's plenty of time for evolution*. [PNAS](#) **107** (2010), 22454–22456.

Objections to Darwinian evolution are often based on the time required to carry out the necessary mutations. Seemingly, exponential numbers of mutations are needed. We show that such estimates ignore the effects of natural selection, and that the numbers of necessary mutations are thereby reduced to about $K \log L$, rather than K^L , where L is the length of the genomic “word,” and K is the number of possible “letters” that can occupy any position in the word. The required theory makes contact with the theory of radix-exchange sorting in theoretical computer science, and the asymptotic analysis of certain sums that occur there.

mutations | natural selection | geometric distribution

Grundlagen

KAUFMANN 2011

Cristian Kaufmann, María A. Gutiérrez, María C. IJlvarez, Mariela E. González & Agustina Massigoge, *Fluvial dispersal potential of guanaco bones (*Lama guanicoe*) under controlled experimental conditions: the influence of age classes to the hydrodynamic behavior*. [Journal of Archaeological Science](#) **38** (2011), 334–344.

Hydrodynamic sorting is a taphonomic process able to transport and scatter bones deposited in archaeological and paleontological sites. This study presents the results of experimentation performed in an artificial flume with guanaco (*Lama guanicoe*) bones of different ontogenetic development, dry and saturated in water, in hydric flows velocities of 15 and 30 cm/s. The obtained results show that bone global density, the age of the individual, the dry or wet bone state, and the hydric flow velocity influence significantly bone dispersion. In this way, bones from immature individuals with unfused secondary growth centers and relatively low bulk density have better possibility of being transported than fused bones from adult individuals. Taking into account the results obtained in this experimentation and the feasibility of discriminating age categories in fossil assemblages, two bone groups with differential potential transport are presented in this paper. These transport groups constitute a methodological tool to evaluate the role hydric current may had played in the formation of a fossil assemblage.

Keywords: Taphonomy; Flume experiments; *Lama guanicoe*; Age profile

OPPENHEIMER 2006

Daniel M. Oppenheimer, *Consequences of Erudite Vernacular Utilized Irrespective of Necessity: Problems with Using Long Words Needlessly*. [Applied Cognitive Psychology](#) **20** (2006), 139–156.

Most texts on writing style encourage authors to avoid overly-complex words. However, a majority of undergraduates admit to deliberately increasing the complexity of their vocabulary so as to give the impression of intelligence. This paper explores the extent to which this strategy is effective. Experiments 1-3 manipulate complexity of texts and find a negative relationship between complexity and judged intelligence. This relationship held regardless of the quality of the original essay, and irrespective of the participants' prior expectations of essay quality. The negative impact of complexity was mediated by

processing fluency. Experiment 4 directly manipulated fluency and found that texts in hard to read fonts are judged to come from less intelligent authors. Experiment 5 investigated discounting of fluency. When obvious causes for low fluency exist that are not relevant to the judgement at hand, people reduce their reliance on fluency as a cue; in fact, in an effort not to be influenced by the irrelevant source of fluency, they over-compensate and are biased in the opposite direction. Implications and applications are discussed.

Isotope

OELZE 2011

Vicky M. Oelze, Angelina Siebert, Nicole Nicklisch, Harald Meller, Veit Dresely & Kurt W. Alt, *Early Neolithic diet and animal husbandry: stable isotope evidence from three Linearbandkeramik (LBK) sites in Central Germany*. [Journal of Archaeological Science](#) **38** (2011), 270–279.

The first appearance of the Neolithic Linearbandkeramik (LBK) in Central Germany occurred during the 6th millennium BC. However, though LBK sites are abundant in the German loess areas, there are only a few studies that reconstruct the diet of these first farmers using biochemical methods. Here we present the largest study undertaken to date on LBK material using stable isotope analysis of carbon and nitrogen to reconstruct human diet and animal husbandry strategies. We analyzed the bone collagen of 97 human individuals and 45 associated animals from the sites of Derenburg, Halberstadt and Karsdorf in the Middle ElbeSaale region of Central Germany. Mean adult human values are -19.9 ± 0.4 ‰ for d13C and 8.7 ± 0.8 ‰ for d15N. The d13C values are typical for terrestrial, temperate European regions, whereas the d15N values fall within an expected range for farming societies with a mixed diet consisting of products from domestic animals and plants. The consumption of unfermented dairy products is unlikely as there is direct palaeogenetic evidence of lactose intolerance available for one of the sites. There are no clear indications for dietary differences in sex. Young children under three years of age are enriched in d15N due to breastfeeding indicating that weaning likely occurred around the age of three years. The fauna exhibit mean d13C values of -20.9 ± 0.8 ‰ and mean d15N values of 7.0 ± 0.9 ‰ respectively. Variation in the d13C and d15N in the domestic animals is probably caused by different livestock managements.

Keywords: Neolithic; Linearbandkeramik; Diet; Isotopes; Carbon; Nitrogen

Klima

KAMENOS 2010

Nicholas A. Kamenos, *North Atlantic summers have warmed more than winters since 1353, and the response of marine zooplankton*. [PNAS](#) **107** (2010), 22442–22447.

[pnas107-22442-Supplement.pdf](#)

Modeling and measurements show that Atlantic marine temperatures are rising; however, the low temporal resolution of models and restricted spatial resolution of measurements (i) mask regional details critical for determining the rate and extent of climate variability, and (ii) prevent robust determination of climatic impacts on marine ecosystems. To address both issues for the North East Atlantic, a fortnightly resolution marine climate record from 1353–2006 was constructed for shallow inshore waters and compared to changes in marine zooplankton abundance. For the first time summer marine temperatures are shown to have increased nearly twice as much as winter temperatures since 1353. Additional climatic instability began in 1700 characterized by ≈ 5 –65 year climate oscillations that appear to be a recent phenomenon. Enhanced summer-specific warming reduced the abundance of

the copepod *Calanus finmarchicus*, a key food item of cod, and led to significantly lower projected abundances by 2040 than at present. The faster increase of summer marine temperatures has implications for climate projections and affects abundance, and thus biomass, near the base of the marine food web with potentially significant feedback effects for marine food security.

coralline algae | rhodolith | maerl | seasonal

MENNE 2010

Matthew J. Menne, Claude N. Williams Jr. & Michael A. Palecki, *On the reliability of the U.S. surface temperature record*. *Journal of Geophysical Research* **115** (2010), D11108. <<http://dx.doi.org/10.1029/2009JD013094>>.

Recent photographic documentation of poor siting conditions at stations in the U.S. Historical Climatology Network (USHCN) has led to questions regarding the reliability of surface temperature trends over the conterminous United States (CONUS). To evaluate the potential impact of poor siting/instrument exposure on CONUS temperatures, trends derived from poor and well sited USHCN stations were compared. Results indicate that there is a mean bias associated with poor exposure sites relative to good exposure sites; however, this bias is consistent with previously documented changes associated with the widespread conversion to electronic sensors in the USHCN during the last 25 years. Moreover, the sign of the bias is counterintuitive to photographic documentation of poor exposure because associated instrument changes have led to an artificial negative ("cool") bias in maximum temperatures and only a slight positive ("warm") bias in minimum temperatures. These results underscore the need to consider all changes in observation practice when determining the impacts of siting irregularities. Further, the influence of nonstandard siting on temperature trends can only be quantified through an analysis of the data. Adjustments applied to USHCN Version 2 data largely account for the impact of instrument and siting changes, although a small overall residual negative ("cool") bias appears to remain in the adjusted maximum temperature series. Nevertheless, the adjusted USHCN temperatures are extremely well aligned with recent measurements from instruments whose exposure characteristics meet the highest standards for climate monitoring. In summary, we find no evidence that the CONUS average temperature trends are inflated due to poor station siting.

MUNOZ 2010

Samuel E. Munoz, Konrad Gajewski & Matthew C. Peros, *Synchronous environmental and cultural change in the prehistory of the northeastern United States*. *PNAS* **107** (2010), 22008–22013.

[pnas107-22008-Supplement.pdf](#)

Climatic changes during the late Quaternary have resulted in substantial, often abrupt, rearrangements of terrestrial ecosystems, but the relationship between these environmental changes and prehistoric human culture and population size remains unclear. Using a database of archaeological radiocarbon dates alongside a network of paleoecological records (sedimentary pollen and charcoal) and paleoclimatic reconstructions, we show that periods of cultural and demographic change in the northeastern United States occurred at the same times as the major environmental-climatic transitions of that region. At 11.6, 8.2, 5.4, and 3.0 kyr BP (103 calendar years before present), changes in forest composition altered the distribution, availability, and predictability of food resources which triggered technological adjustments manifested in the archaeological record. Human population level has varied in response to these external changes in ecosystems, but the adoption of maize agriculture during the late Holocene also resulted in a substantial population increase. This study demonstrates the long-term interconnectedness of prehistoric human cultures and the ecosystems they inhabited, and provides a consolidated environmental-cultural framework from

which more interdisciplinary research and discussion can develop. Moreover, it emphasizes the complex nature of human responses to environmental change in a temperate region.
climate change | data synthesis | paleoecology | prehistoric cultures

STENNI 2011

B. Stenni et al., *Expression of the bipolar see-saw in Antarctic climate records during the last deglaciation*. *NatGeo* 4 (2011), 46–49.

NatGeo04-046-Supplement.pdf

B. Stenni, D. Buiron, M. Frezzotti, S. Albani, C. Barbante, E. Bard, J. M. Barnola, M. Baroni, M. Baumgartner, M. Bonazza, E. Capron, E. Castellano, J. Chappellaz, B. Delmonte, S. Falourd, L. Genoni, P. Iacumin, J. Jouzel, S. Kipfstuhl, A. Landais, B. Lemieux-Dudon, V. Maggi, V. Masson-Delmotte, C. Mazzola, B. Minster, M. Montagnat, R. Mulvaney, B. Narcisi, H. Oerter, F. Parrenin, J. R. Petit, C. Ritz, C. Scarchilli, A. Schilt, S. Schüpbach, J. Schwander, E. Selmo, M. Severi, T. F. Stocker and R. Udisti

Ice-core records of climate from Greenland and Antarctica show asynchronous temperature variations on millennial timescales during the last glacial period¹. The warming during the transition from glacial to interglacial conditions was markedly different between the hemispheres, a pattern attributed to the thermal bipolar see-saw². However, a record from the Ross Sea sector of East Antarctica has been suggested to be synchronous with Northern Hemisphere climate change³. Here we present a temperature record from the Talos Dome ice core, also located in the Ross Sea sector. We compare our record with ice-core analyses from Greenland, based on methane synchronization⁴, and find clearly asynchronous temperature changes during the deglaciation. We also find distinct differences in Antarctic records, pointing to differences in the climate evolution of the Indo-Pacific and Atlantic sectors of Antarctica. In the Atlantic sector, we find that the rate of warming slowed between 16,000 and 14,500 years ago, parallel with the deceleration of the rise in atmospheric carbon dioxide concentrations and with a slight cooling over Greenland. In addition, our chronology supports the hypothesis that the cooling of the Antarctic Cold Reversal is synchronous with the Bølling-Allerød warming in the northern hemisphere 14,700 years ago⁵.