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References

Aktuell

Jacquet 2016

Pierre O. Jacquet, Nicolas Baumard & Coralie Chevallier, *Does culture get embrained?* PNAS **113** (2016), E2873.

More importantly, the authors do not consider the possibility that differences between individuals living in different environments have nothing to do with culture-specific neurobiological mechanisms but should rather be construed as the result of phenotypic plasticity. Such insistence on culture-specific mechanisms is puzzling given the impressive number of studies demonstrating that both human and nonhuman animals routinely modulate their behavior in response to specific ecologies and express different phenotypes as a result (4, 5). In that framework, group differences in response to social norm violations would simply arise because the stimulus at stake (passive smoking in the United States, promiscuous sex in China) is ecologically relevant to a greater number of participants in one of the groups.

Mu 2016

Yan Mu, Shinobu Kitayama, Shihui Han & Michele J. Gelfand, *Culture and the neurobiology of norm violation detection*, *Reply to Jacquet et al.* PNAS **113** (2016), E2874–E2875.

We fully agree with Jacquet, Baumard, and Chevallier that one must be cautious in interpreting cross-cultural data. However, none of the specific methodological points they make are warranted and their characterization of our theoretical perspective on cultural neuroscience is misinformed.

Anthropologie

Madhusoodanan 2016

Jyoti Madhusoodanan, *Ancient teeth reveal clues about microbiome evolution.* PNAS **113** (2016), 5764–5765.

"We know almost nothing about the evolution of the human microbiome," says Warinner. "We have dramatically altered our lifestyles over the last several centuries; how has this affected our microbes?"

Warinner 2016

Christina Warinner et al., *Pathogens and host immunity in the ancient human oral cavity.* NatGen **46** (2016), 336–344.

NatGen46-0336-Supplement1.pdf, NatGen46-0336-Supplement2.zip

Christina Warinner, João F. Matias Rodrigues, Rounak Vyas, Christian Trachsel, Natallia Shved, Jonas Grossmann, Anita Radini, Y. Hancock, Raul Y. Tito, Sarah Fiddyment, Camilla Speller, Jessica Hendy, Sophy Charlton, Hans Ulrich Luder, Domingo C. Salazar-García10–, Elisabeth Eppler, Roger Seiler, Lars H. Hansen, José Alfredo Samaniego Castruita, Simon Barkow-Oesterreicher, Kai Yik Teoh, Christian D. Kelstrup, Jesper V. Olsen, Paolo Nanni, Toshihisa Kawai,

Eske Willerslev, Christian von Mering, Cecil M. Lewis Jr, Matthew J. Collins, M. Thomas P. Gilbert, Frank Rühli & Enrico Cappellini

Calcified dental plaque (dental calculus) preserves for millennia and entraps biomolecules from all domains of life and viruses. We report the first, to our knowledge, high-resolution taxonomic and protein functional characterization of the ancient oral microbiome and demonstrate that the oral cavity has long served as a reservoir for bacteria implicated in both local and systemic disease. We characterize (i) the ancient oral microbiome in a diseased state, (ii) 40 opportunistic pathogens, (iii) ancient human–associated putative antibiotic resistance genes, (iv) a genome reconstruction of the periodontal pathogen Tannerella forsythia, (v) 239 bacterial and 43 human proteins, allowing confirmation of a long-term association between host immune factors, 'red complex' pathogens and periodontal disease, and (vi) DNA sequences matching dietary sources. Directly datable and nearly ubiquitous, dental calculus permits the simultaneous investigation of pathogen activity, host immunity and diet, thereby extending direct investigation of common diseases into the human evolutionary past.

Archäologie

Braje 2016

Todd J. Braje, *Evaluating the Anthropocene, Is there something useful about a geological epoch of humans?* Antiquity **90** (2016), 504–518.

The concept of the Anthropocene has become increasingly prominent in recent years, but is it best defined as a geological period or as part of a longer-term pattern of human actions? And when did it begin? Todd Braje launches this Debate feature by arguing for a shift away from definitions and toward an emphasis on the human causes and consequences. This piece is followed by a series of reactions from geologists and anthropologists, with a concluding reply from the author.

Biologie

Holz 2016

Ronald W. Holz & Arun Anantharam, *Food deprivation induces presynaptic plasticity in the autonomic nervous system.* PNAS **113** (2016), 5766–5767.

Wang 2016

Manqi Wang, Qian Wang & Matthew D. Whim, *Fasting induces a form of autonomic synaptic plasticity that prevents hypoglycemia.* PNAS **113** (2016), E3029–E3038.

During fasting, activation of the counter-regulatory response (CRR) prevents hypoglycemia. A major effector arm is the autonomic nervous system that controls epinephrine release from adrenal chromaffin cells and, consequently, hepatic glucose production. However, whether modulation of autonomic function determines the relative strength of the CRR, and thus the ability to withstand food deprivation and maintain euglycemia, is not known. Here we show that fasting leads to altered transmission at the preganglionic – chromaffin cell synapse. The dominant effect is a presynaptic, long-lasting increase in synaptic strength. Using genetic and pharmacological approaches we show this plasticity requires neuropeptide Y, an adrenal cotransmitter and the activation of adrenal Y5 receptors. Loss of

neuropeptide Y prevents a fasting-induced increase in epinephrine release and results in hypoglycemia in vivo. These findings connect plasticity within the sympathetic nervous system to a physiological output and indicate the strength of the final synapse in this descending pathway plays a decisive role in maintaining euglycemia.

Keywords: hypoglycemia | autonomic nervous system | synaptic plasticity | adrenal | chromaffin cells

Significance: To prevent a fall in blood glucose during fasting, the counterregulatory response is activated. An important component of this pathway involves the autonomic nervous system and release of epinephrine from the adrenal gland. This autonomic response is often referred to as a reflex, implying the output is hardwired and inflexible. Here we show the strength of the terminal synapse that controls epinephrine release is actually highly plastic. Fasting leads to a long-lasting increase in synaptic strength by a process that requires neuropeptide Y and Y5 receptors. In the absence of neuropeptide Y, synaptic strengthening is absent, epinephrine release is reduced, and the mice become hypoglycemic. These findings indicate that the response to fasting involves significant autonomic synaptic plasticity.

Grabung

Putzer 2016

Andreas Putzer, Daniela Festi & Klaus Oeggl, *Was the Iceman really a herdsman? The development of a prehistoric pastoral economy in the Schnals Valley*. Antiquity **90** (2016), 319–336.

Antiquity090-0319-Supplement.pdf

The discovery of the Iceman in 1991 led to considerable speculation about the reason for his presence at such a remote location in the high Alps. One theory suggested that he was engaged in transhumant pastoralism when he met his death. Recent archaeological and palynological studies, however, have found no evidence of pastoral activities in this region during the Chalcolithic period. Regular exploitation of this upland landscape appears to have begun no earlier than the Middle Bronze Age. The theory that the Iceman was a high-altitude herdsman therefore appears to be untenable.

Keywords: Bronze Age | Alpine archaeology | the Iceman (' ¿ Otzi') | transhumance | pollen | analyses

Isotope

Sjögren 2016

Karl-Göran Sjögren, T. Douglas Price & Kristian Kristiansen, *Diet and Mobility in the Corded Ware of Central Europe*. PLoS ONE **11** (2016), e155083. DOI:10.1371/journal.pone.0155083.

pone11-e0155083-Supplement1.docx, pone11-e0155083-Supplement2.pdf

Isotopic investigations of two cemetery populations from the Corded Ware Culture in southern Germany reveal new information on the dating of these graves, human diet during this period, and individual mobility. Corded Ware Culture was present across much of temperate Europe ca. 2800–2200 cal. BC and is represented by distinctive artifacts and burial practices. Corded Ware was strongly influenced by the Yamnaya Culture that arose in the steppes of eastern Europe and western

Eurasia after 3000 BC, as indicated by recent aDNA research. However, the development of CW on different chronological and spatial scales has to be evaluated. Examination of the CW burials from southern Germany supports an argument for substantial human mobility in this period. Several burials from gravefields and larger samples from two large cemeteries at Lauda-Königshofen "Wöllerspfad" and at Bergheinfeld "Hühnerberg" contributed the human remains for our study of bone and tooth enamel from the Corded Ware Culture. Our results suggest that Corded Ware groups in this region at least were subsisting on a mix of plant and animal foods and were highly mobile, especially the women. We interpret this as indicating a pattern of female exogamy, involving different groups with differing economic strategies.

Klima

Anagnostou 2016

Eleni Anagnostou et al., *Changing atmospheric CO_2 concentration was the primary driver of early Cenozoic climate.* nature **533** (2016), 380–384.

n533-0380-Supplement.xlsx

Eleni Anagnostou, Eleanor H. John, Kirsty M. Edgar, Gavin L. Foster, Andy Ridgwell, Gordon N. Inglis, Richard D. Pancost, Daniel J. Lunt & Paul N. Pearson

The Early Eocene Climate Optimum (EECO, which occurred about 51 to 53 million years ago)1, was the warmest interval of the past 65 million years, with mean annual surface air temperature over ten degrees Celsius warmer than during the pre-industrial period2–4. Subsequent global cooling in the middle and late Eocene epoch, especially at high latitudes, eventually led to continental ice sheet development in Antarctica in the early Oligocene epoch (about 33.6 million years ago). However, existing estimates place atmospheric carbon dioxide (CO2) levels during the Eocene at 500–3,000 parts per million5–7, and in the absence of tighter constraints carbon–climate interactions over this interval remain uncertain. Here we use recent analytical and methodological developments8–11 to generate a new high-fidelity record of CO2 concentrations using the boron isotope (.11B) composition of well preserved planktonic foraminifera from the Tanzania Drilling Project, revising previous estimates6. Although species-level uncertainties make absolute values difficult to constrain, CO2 concentrations during the EECO were around 1,400 parts per million. The relative decline in CO2 concentration through the Eocene is more robustly constrained at about fifty per cent, with a further decline into the Oligocene12. Provided the latitudinal dependency of sea surface temperature change for a given climate forcing in the Eocene was similar to that of the late Quaternary period13, this CO2 decline was sufficient to drive the well documented high- and low-latitude cooling that occurred through the Eocene14. Once the change in global temperature between the pre-industrial period and the Eocene caused by the action of all known slow feedbacks (apart from those associated with the carbon cycle) is removed2–4, both the EECO and the late Eocene exhibit an equilibrium climate sensitivity relative to the preindustrial period of 2.1 to 4.6 degrees Celsius per CO2 doubling (66 per cent confidence), which is similar to the canonical range (1.5 to 4.5 degrees Celsius15), indicating that a large fraction of the warmth of the early Eocene greenhouse was driven by increased CO2 concentrations, and that climate sensitivity was relatively constant throughout this period.

Kultur

Crist 2016

Walter Crist, Alex de Voogt & Anne-Elizabeth Dunn-Vaturi, *Facilitating Interaction, Board Games as Social Lubricants in the Ancient Near East*. Oxford Journal of Archaeology **35** (2016), 179–196.

This re-evaluation of existing data on board games from the Near Eastern Bronze Age demonstrates their function as social lubricants in crosscultural interaction. Board games are situated theoretically as liminoid practices, which lie outside the bounds of normative social behaviour and allow for interaction across social boundaries. Utilizing double-sided game boards, with an indigenous game on one side and a newly introduced game on the other, the games of senet, mehen and twenty squares provide evidence for social interactions. Cypriots had adopted Egyptian mehen and senet by the third millennium BC, and indigenized the games. This lies in contrast to the game of twenty squares, which had a particular role among elites in the Late Bronze Age interaction sphere. This anthropological discussion of evidence relating to gaming seeks to inspire further research on the role of board games in society.

Metallzeiten

de Groote 2016

Kevin Rowan de Groote, *'Twas When My Shield Turned Traitor', Establishing the Combat Effectiveness of the Greek Hoplite Shield*. Oxford Journal of Archaeology **35** (2016), 197–212.

Greek hoplite warfare has traditionally been explored through the extant textual and pictorial evidence. This has resulted in an incomplete picture, with much of the focus on the strategic and tactical aspects of battle, to the neglect of practical and functional considerations of combat. As a consequence, many of our understandings of the nature of hoplite combat, the how, remain deficient. In this paper, I explore the structural and functional aspects of the hoplite shield, the single most important item in the Greek hoplite's panoply, to determine its efficacy in a combat environment. Through a set of controlled practical experiments, the effectiveness of the hoplite shield is tested to establish its defensive qualities vis-a-vis the long thrusting spear, the hoplite's primary offensive weapon.

Story or Book

Alden 2016

J. W. Alden, *Project Earth is Leaving Beta, Get ready for a brand new experience!* nature **533** (2016), 432.

The new 'End of the World' event is scheduled for 21 December. We expect a doomsday cult or two to arise before then, as some of you will unwittingly communicate this date to your avatars in dreams. For this reason, we're keeping the nature of the apocalypse a secret until the end is upon you.