

References

Aktuell

EITAM 2019

David Eitam, ‘... *Yo-ho-ho, and a bottle of [beer]!*’ (*R.L. Stevenson*) *no beer but rather cereal-Food, Commentary to Liu et al. 2018. Journal of Archaeological Science: Reports* (2019), preprint, 1–5.

Recently, Liu and others have interpreted the Natufian narrow conical mortar cut into a boulder as a storage facility for beer-producing materials. They meticulously studied the residual plant taxa and mortars usewear and carried out experimental studies. We argue that the authors’ evidence presented does not necessarily support this interpretation. It, however, reveals direct evidence for the making of cereal-food, namely our suggestion that the Natufian NCM was specially designed for the peeling and milling of barley grains into fine flour for making bread.

Keywords: Natufian | Narrow conical mortars | Beer | Bread | Cereal-food

KRAPIVSKY 2019

P. L. Krapivsky & S. Redner, *Simple parking strategies. Journal of Statistical Mechanics* **2019**, 93404. DOI:10.1088/1742-5468/ab3a2a.

We investigate simple strategies that embody the decisions that one faces when trying to park near a popular destination. Should one park far from the target (destination), where finding a spot is easy, but then be faced with a long walk, or should one attempt to look for a desirable spot close to the target, where spots may be hard to find? We study an idealized parking process on a one-dimensional geometry where the desired target is located at $x = 0$, cars enter the system from the right at a rate λ and each car leaves at a unit rate. We analyze three parking strategies—meek, prudent, and optimistic—and determine which is optimal.

Keywords: traffic and crowd dynamics | traffic models

LIU 2019

Li Liu, Jiajing Wang, Danny Rosenberg, Hao Zhao, György Lengyel & Dani Nadel, *Archaeological reconstruction of 13,000-y old Natufian beer making at Raqefet Cave, Israel, Response to comments. Journal of Archaeological Science: Reports* (2019), preprint, 1–6.

We address several questions raised by David Eitam regarding our paper on Natufian beer brewing at Raqefet Cave, Israel. We focus on such issues as the identification of cereal-based food fermentation, the reconstruction of the fermentation process, the functions of Natufian stone mortars, and our view of beer making in relation to the transition to food production.

Keywords: Fermentation | Alcoholic beverage | Starch morphology | Stone boiling

MANN 2019

Adam Mann, *Dwarf galaxies pose new questions about dark matter and the early universe that models are struggling to answer. PNAS* **116** (2019), 19765–19767.

THUNSTRÖM 2019

Linda Thunström & Shiri Noy, *The value of thoughts and prayers*. PNAS 116 (2019), 19797–19798.

A standard response of both policy makers and private citizens to hardships—from natural disasters to mass shootings—is to offer “thoughts and prayers.” Critics argue that such gestures are meaningless and may obstruct structural reforms intended to mitigate catastrophes. In this study, we elicit the value of receiving thoughts and prayers from strangers following adversity. We find that Christians value thoughts and prayers from religious strangers and priests, while atheists and agnostics are “prayer averse”—willing to pay to avoid receiving prayers. Furthermore, while indifferent to receiving thoughts from other secular people, they negatively value thoughts from Christians.

Keywords: intercessory thoughts | intercessory prayers | willingness to pay

Anthropologie

SHAVE 2019

Robert E. Shave, Daniel E. Lieberman & Aaron L. Baggish et al., *Selection of endurance capabilities and the trade-off between pressure and volume in the evolution of the human heart*. PNAS 116 (2019), 19905–19910.

pnas116-19905-Supplement.pdf

Chimpanzees and gorillas, when not inactive, engage primarily in short bursts of resistance physical activity (RPA), such as climbing and fighting, that creates pressure stress on the cardiovascular system. In contrast, to initially hunt and gather and later to farm, it is thought that preindustrial human survival was dependent on lifelong moderate-intensity endurance physical activity (EPA), which creates a cardiovascular volume stress. Although derived musculoskeletal and thermoregulatory adaptations for EPA in humans have been documented, it is unknown if selection acted similarly on the heart. To test this hypothesis, we compared left ventricular (LV) structure and function across semiwild sanctuary chimpanzees, gorillas, and a sample of humans exposed to markedly different physical activity patterns. We show the human LV possesses derived features that help augment cardiac output (CO) thereby enabling EPA. However, the human LV also demonstrates phenotypic plasticity and, hence, variability, across a wide range of habitual physical activity. We show that the human LV’s propensity to remodel differentially in response to chronic pressure or volume stimuli associated with intense RPA and EPA as well as physical inactivity represents an evolutionary trade-off with potential implications for contemporary cardiovascular health. Specifically, the human LV trades off pressure adaptations for volume capabilities and converges on a chimpanzee-like phenotype in response to physical inactivity or sustained pressure loading. Consequently, the derived LV and lifelong low blood pressure (BP) appear to be partly sustained by regular moderate-intensity EPA whose decline in postindustrial societies likely contributes to the modern epidemic of hypertensive heart disease.

Keywords: blood pressure | physical activity | left ventricle | trade-off | human evolution

Robert E. Shave, Daniel E. Lieberman, Aimee L. Drane, Marcel G. Brown, Alan M. Batterham, Steven Worthington, Rebeca Atencia, Yedra Feltrer, Jennifer Neary, Rory B. Weiner, Meagan M. Wasfy & Aaron L. Baggish

Significance: Unlike other great apes, humans evolved multisystem capabilities for moderate-intensity EPA, but it is unknown if selection acted similarly on the

heart. We present data from a sample of humans, chimpanzees, and gorillas showing that the human (LV) evolved numerous features that help to augment stroke volume (SV), enabling moderate-intensity EPA. We also show that phenotypic plasticity of the human LV trades off pressure adaptations for volume capabilities, becoming more similar to a chimpanzee-like heart in response to physical inactivity or chronic pressure loading. Consequently, the derived human heart appears partly dependent upon moderate EPA and its absence, in combination with a highly processed diet, likely contributes to the modern epidemic of hypertensive heart disease.

Biologie

FU 2019

Yong-Bi Fu, Gregory W. Peterson, Carolee Horbach, David J. Konkin, Avigdor Beiles & Eviatar Nevo, *Elevated mutation and selection in wild emmer wheat in response to 28 years of global warming*. [PNAS 116 \(2019\), 20002–20008](#).

[pnas116-20002-Supplement.pdf](#)

Global warming has been documented to threaten wild plants with strong selection pressures, but how plant populations respond genetically to the threats remains poorly understood. We characterized the genetic responses of 10 wild emmer wheat (*Triticum dicoccoides* Koern.; WEW) populations in Israel, sampling them in 1980 and again in 2008, through an exome capture analysis. It was found that these WEW populations were under elevated selection, displayed reduced diversity and temporal divergence, and carried increased mutational burdens forward. However, some populations still showed the ability to acquire beneficial alleles via selection or de novo mutation for future adaptation. Grouping populations with mean annual rainfall and temperature revealed significant differences in most of the 14 genetic estimates in either sampling year or over the 28 y. The patterns of genetic response to rainfall and temperature varied and were complex. In general, temperature groups displayed more temporal differences in genetic response than rainfall groups. The highest temperature group had more deleterious single nucleotide polymorphisms (dSNPs), higher nucleotide diversity, fewer selective sweeps, lower differentiation, and lower mutational burden. The least rainfall group had more dSNPs, higher nucleotide diversity, lower differentiation and higher mutational burden. These characterized genetic responses are significant, allowing not only for better understanding of evolutionary changes in the threatened populations, but also for realistic modeling of plant population adaptability and vulnerability to global warming.

Keywords: wild emmer wheat | mutation | selection | exome capture | global warming

Significance: The realized threats of global warming to biodiversity have catalyzed the search for a solution to protect and conserve extant plant genetic resources. Part of the solution, however, is dependent on the knowledge of how plant populations respond genetically to these threats, which is largely lacking. We conducted a unique genomic characterization of genetic responses in 10 wild emmer wheat populations in Israel that were sampled twice in 1980 and 2008. After the 28 y of global warming, these populations displayed elevated selection, reduced diversity and temporal divergence, and carried increased mutational burdens forward. However, some populations still showed the ability to acquire beneficial alleles for future adaptation. The patterns of genetic response to rainfall and temperature were complex.

VITALE 2019

Kristyn R. Vitale, Alexandra C. Behnke & Monique A. R. Udell, *Attachment bonds between domestic cats and humans*. [Current Biology](#) **29** (2019), R864–R865.

Datierung

HOFFMANN 2019

Dirk L. Hoffmann et al., ‘Early dates for ‘Neanderthal cave art’ may be wrong’ [*J. Hum. Evol.* **125** (2018), 215–217], *Response to Aubert et al.’s reply*. [Journal of Human Evolution](#) **135** (2019), 102644.

s359-0912-Hoffmann.pdf, JHumEvo125-0215-Aubert.pdf

Contra Aubert et al. (2018), we can categorically state that (1) we did not unintentionally date carbonate deposits that were a part of the rock face or ‘canvas,’ (2) there is no question that the CaCO₃ crusts dated do provide minimum ages for the associated art since underlying pigment has been demonstrated in all cases, (3) the anthropogenic nature of the red pigment found on certain formations at Ardales cave is demonstrated by technical criteria that imply human activity, and (4) there is no need to destructively sample the paintings for further laboratory analyses of a drill core. The early emergence of cave art at La Pasiega, Maltravieso and Ardales is demonstrated by calcite dates that are correct and that stratigraphically constrain the age of the motifs they are associated with.

Dirk L. Hoffmann, Christopher D. Standish, Marcos García-Díez, Paul B. Pettitt, James A. Milton, João Zilhão, Javier J. Alcolea-González, Pedro Cantalejo-Duarte, Hipolito Collado, Rodrigo de Balbón, Michel Lorblanchet, Jose Ramos-Muñoz, Gerd-Christian Weniger & Alistair W. G. Pike

Klima

BRADLEY 2019

Kyle Bradley et al., *Earthquake-triggered 2018 Palu Valley landslides enabled by wet rice cultivation*. [Nature Geoscience](#) (2019), preprint, 1–6. DOI:10.1038/s41561-019-0444-1.

NatGeo2019.10-Bradley-Supplement.pdf

The death toll and economic impact of an earthquake can be greatly exacerbated if seismic ground shaking triggers landslides. Earthquake-triggered landslides typically occur in two different contexts: localized failure of steep slopes and resulting landslides that pose a major threat to life in areas below; and lateral spreading of nearly flat sediment plains due to shaking-induced liquefaction, which can damage large areas of critical infrastructure. Unexpected catastrophic landsliding triggered by the 28 September 2018 earthquake at Palu, Indonesia did not occur in either typical context, but produced both destructive outcomes. Here, we show that alluvial ground failure in the Palu Valley was a direct consequence of irrigation creating a new liquefaction hazard. Aqueduct-supported cultivation, primarily of wet rice, raised the water table to near ground level, saturating sandy alluvial soils that liquefied in response to strong ground shaking. Large-displacement lateral spreads occurred on slopes of 1°. Slopes steeper than 1.5° sourced long-runout landslides and debris flows that swept through villages occupying the gentler slopes below. The resulting damage and loss of life would probably not have occurred in

the absence of a raised water table. Earthquake-triggered landsliding of gentle, irrigated alluvial slopes is an under-recognized, but avoidable, anthropogenic hazard.

Kyle Bradley, Rishav Mallick, Harisma Andikagumi, Judith Hubbard, Ella Meilanda, Adam Switzer, Nairong Du, Gilles Brocard, Dedy Alfian, Benazir Benazir, Guangcai Feng, Sang-Ho Yun, Jędrzej Majewski, Shengji Wei & Emma M. Hill

GOROKHOVICH 2005

Yuri Gorokhovich, *Abandonment of Minoan palaces on Crete in relation to the earthquake induced changes in groundwater supply*. [Journal of Archaeological Science](#) **32** (2005), 217–222.

Mysterious abandonment of palaces on Crete during the Late Minoan period was always a challenging problem for archeologists and geologists. Various hypotheses explained this event by effects of tsunamis, earthquakes or climatic changes that were caused by the volcanic eruption of the Santorini volcano. While each of them or their possible combination contributed to the abandonment of palaces and following Late Minoan crisis, there is another possible cause that appeared as a result of studies within the last 20–30 years. This cause is depletion of groundwater supply caused by persistent earthquake activity that took place during the Bronze Age. This explanation is supported by field observations and numerous studies of similar phenomena in other locations.

Keywords: Minoan period | Crete | Earthquakes | Groundwater depletion

LABBÉ 2019

Thomas Labbé, Christian Pfister, Stefan Brönnimann, Daniel Rousseau, Jörg Franke & Benjamin Bois, *The longest homogeneous series of grape harvest dates, Beaune 1354–2018, and its significance for the understanding of past and present climate*. [Climate of the Past](#) **15** (2019), 1485–1501.

ClimPast15-1485-Supplement.zip

Records of grape harvest dates (GHDs) are the oldest and the longest continuous phenological data in Europe. However, many available series, including the wellknown (Dijon) Burgundy series, are error prone because scholars so far have uncritically drawn the data from 19th century publications instead of going back to the archives. The GHDs from the famous vine region of Beaune (Burgundy) were entirely drawn from the archives and critically cross-checked with narrative evidence. In order to reconstruct temperature, the series was calibrated against the long Paris temperature series comprising the 360 years from 1659 to 2018. The 664-year-long Beaune series from 1354 to 2018 is also significantly correlated with tree-ring and documentary proxy evidence as well as with the central European temperature series (from 1500). The series is clearly subdivided into two parts. From 1354 to 1987 grapes were on average picked from 28 September on, whereby during the last 31-year-long period of rapid warming from 1988 to 2018 harvests began 13 d earlier. Early harvest dates are shown to be accompanied by high pressure over western–central Europe and atmospheric blocking over Denmark. The 33 extremely early harvests comprising the fifth percentile bracket of GHDs are unevenly distributed over time; 21 of them occurred between 1393 and 1719, while this is the case for just 5 years between 1720 and 2002. Since the hot summer of 2003, 8 out of 16 spring–summer periods were outstanding according to the statistics of the last 664 years, no less than 5 among them within the last 8 years. In the Paris temperature measurements since 1659, April-to-July temperature reached the highest value ever in 2018. In sum, the 664-year-long Beaune GHD series demonstrates that outstanding hot and dry years in the past were outliers, while they have become the norm since the transition to rapid warming in 1988.

Mittelpaläolithikum

DELPIANO 2019

Davide Delpiano, Andrea Zupancich & Marco Peresani, *Innovative Neanderthals, Results from an integrated analytical approach applied to backed stone tools*. [Journal of Archaeological Science 110 \(2019\), 105011](#).

The production of prepared backed artifacts during the Paleolithic is recognized as an important step in the design of stone tools for manual activities and the development of human tool ergonomics. Backed artifacts are generally identified as proxies of so-called “modern” behavior, partly because they tend to be associated with systematic hafting, but mostly because they are widespread within Middle Stone Age (MSA) or Early Upper Paleolithic (EUP) assemblages attributed to anatomically modern humans. However, in Europe these tools were first manufactured by Neanderthal groups associated with the Mousterian of Acheulean Tradition (MAT) technocomplex and Discoid and Levallois technologies, using a range of raw materials. Investigating the reasons for this behavioral leap forward can help to unravel the development and diffusion of various aspects defining the behavioral complexity of Paleolithic humans. In this paper we present a detailed analysis of one of the oldest and richest collections of prepared backed items preserved in Europe. We study several dozens of what – in a broad sense – are considered backed artifacts, with both natural and predetermined knapped backs, recovered from unit A9 at Fumane Cave, which is dated to at least 47.6 cal ky, and is characterized by discoid technology. Our methodology integrates results obtained from technological, techno-functional and use-wear analyses, further supported by experimental data. Two distinctive types of anthropogenic modifications have been identified, both aimed at creating a back or at modifying and accommodating an already existing back. By cross-checking our Results with use-wear data, we show that some of these modifications were aimed at adjusting the shapes of the tools (knives and/or scrapers) for manual handling, although traces consistent with hafting have been recognized on a few specimens. Contextual information allows us to infer that these adjustments involved mainly tools used in precision activities, whose design and production implies varying levels of expertise and technical skills. Although still not systematic or standardized, the kinds of complex tool-making implied by backing can be considered as typical feature in the technological repertoires of late Neanderthals.

Keywords: Backed tool | Discoid technology | Use-wear | Middle Paleolithic | Italy | Hafting | Experimentation

SHAHAM 2019

Dana Shaham, Anna Belfer-Cohen, Rivka Rabinovich & Naama Goren-Inbar, *A Mousterian Engraved Bone, Principles of Perception in Middle Paleolithic Art*. [Current Anthropology 60 \(2019\), 708–716](#).

[CurrAnth60-708-Supplement.pdf](#)

The appearance of art as a constant component of human culture is attributed to several Upper Paleolithic traditions. The record of earlier artistic manifestations is rather scanty and chronogeographically varied, although crucial for studies of human behavioral evolution. Here we describe an engraved bone from the Middle Paleolithic site of Quneitra, depicting an image similar to that of another artwork found in the same layer. The results of the comparative study indicate that the two artworks from Quneitra share a unique quality of illusion—artistic manipulations that create optical effects described as the “complementary effect.” These

artistic manipulations articulate cognitive properties of the human mind at large and can be explained through the prism of the Gestalt principles of perception. The results of this study suggest that illusion is part and parcel of artistic creation from its beginnings.

The center of the motif is marked on the surface topography; on the bone it is the fossa cavity, and on the stone plaque it is a natural protrusion on the opposite face on the proximal edge.

The artistic composition of the Quneitra engraved bone seems to articulate several Gestalt principles of perceptual organization: some are actually observed, while others are the result of a visual illusion. The concentric arcs have a bilateral symmetry, a fundamental principle of perception. Empirical studies show that we automatically impose an assumption of symmetry when interpreting ambiguous visual scenes. It was also found that symmetry influences many of our perceptual judgments and is a powerful contributor to our aesthetic judgments.

Politik

PEYTON 2019

Kyle Peyton, Michael Sierra-Arévalo & David G. Rand, *A field experiment on community policing and police legitimacy*. [PNAS 116 \(2019\), 19894–19898](#).

[pnas116-19894-Supplement.pdf](#)

Despite decades of declining crime rates, longstanding tensions between police and the public continue to frustrate the formation of cooperative relationships necessary for the function of the police and the provision of public safety. In response, policy makers continue to promote community-oriented policing (COP) and its emphasis on positive, nonenforcement contact with the public as an effective strategy for enhancing public trust and police legitimacy. Prior research designs, however, have not leveraged the random assignment of police–public contact to identify the causal effect of such interactions on individual-level attitudes toward the police. Therefore, the question remains: Do positive, nonenforcement interactions with uniformed patrol officers actually cause meaningful improvements in attitudes toward the police? Here, we report on a randomized field experiment conducted in New Haven, CT, that sheds light on this question and identifies the individual-level consequences of positive, nonenforcement contact between police and the public. Findings indicate that a single instance of positive contact with a uniformed police officer can substantially improve public attitudes toward police, including legitimacy and willingness to cooperate. These effects persisted for up to 21 d and were not limited to individuals inclined to trust and cooperate with the police prior to the intervention. This study demonstrates that positive nonenforcement contact can improve public attitudes toward police and suggests that police departments would benefit from an increased focus on strategies that promote positive police–public interactions.

Keywords: community policing | field experiment | legitimacy | intergroup contact

Significance: Repeated instances of police violence against unarmed civilians have drawn worldwide attention to the contemporary crisis of police legitimacy. Community-oriented policing (COP), which encourages positive, nonenforcement contact between police officers and the public, has been widely promoted as a policy intervention for building public trust and enhancing police legitimacy. To date, however, there is little evidence that COP actually leads to changes in attitudes toward the police. We conducted a randomized trial with a large urban

police department. We found that positive contact with police—delivered via brief door-to-door nonenforcement community policing visits—substantially improved residents’ attitudes toward police, including legitimacy and willingness to cooperate. These effects remained large in a 21-d follow-up and were largest among nonwhite respondents.