

References

Aktuell

COBEY 2017

Kelly Cobey, *Illegitimate journals scam even senior scientists*. [nature](#) **549** (2017), 7.

Kelly Cobey has seen a litany of researchers preyed on by predatory journals — and has ideas on how to stop it.

CRESPI 2017

Bernard J. Crespi, *Shared sociogenetic basis of honey bee behavior and human risk for autism*. [PNAS](#) **114** (2017), 9502–9504.

Most importantly, a substantial proportion of bees (almost 15% of those tested), responded consistently to neither brood nor threat, and could be categorized as “socially unresponsive.” The adaptive significance, if any, of such social indifference remains unclear, for honey bees as well as for the other social insect species with many inactive workers, and for humans.

The main upshot of Shpigler et al.’s study is that they found statistically significantly high levels of overlap of the genes differentially expressed among honey bees varying in social responsiveness, with both human autism risk genes and human brain gene expression in autism versus controls (Fig. 1). These results are remarkable in indicating that a central aspect of sociality in humans and honey bees is underlain by an overlapping set of genes, with a strong implication of core, universal sociogenetic circuitry orchestrating social behavior in other animals as well.

What, in turn, can honey bee behavior teach us about autism? Most directly, it points us toward a key, adaptively varying phenotype at the center of autism-related cognition and behavior: social responsiveness itself. Social responsiveness can be as simple as replying to one’s name, forming an affective attachment, or engaging in a short conversation, the key point being that focus on such adaptive behaviors makes clear that to best study autism, we need to better understand typical social behaviors and how they can grade smoothly even into severe autism. [...] This logic of analyzing autism by studying typical sociality may seem counterintuitive, but it falls squarely into the standard medical paradigm of understanding disease as maladaptation and extremes of trade-offs, by determining what specific adaptive system or systems has become altered or disrupted, and how.

DRUMMOND 2017

Caitlin Drummond & Baruch Fischhoff, *Individuals with greater science literacy and education have more polarized beliefs on controversial science topics*. [PNAS](#) **114** (2017), 9587–9592.

Although Americans generally hold science in high regard and respect its findings, for some contested issues, such as the existence of anthropogenic climate change, public opinion is polarized along religious and political lines. We ask whether individuals with more general education and greater science knowledge, measured in terms of science education and science literacy, display more (or less) polarized beliefs on several such issues. We report secondary analyses of a nationally representative dataset (the General Social Survey), examining the predictors

of beliefs regarding six potentially controversial issues. We find that beliefs are correlated with both political and religious identity for stem cell research, the Big Bang, and human evolution, and with political identity alone on climate change. Individuals with greater education, science education, and science literacy display more polarized beliefs on these issues. We find little evidence of political or religious polarization regarding nanotechnology and genetically modified foods. On all six topics, people who trust the scientific enterprise more are also more likely to accept its findings. We discuss the causal mechanisms that might underlie the correlation between education and identity-based polarization.

Keywords: science literacy | polarization | science communication | science education | trust

Significance: Public opinion toward some science and technology issues is polarized along religious and political lines. We investigate whether people with more education and greater science knowledge tend to express beliefs that are more (or less) polarized. Using data from the nationally representative General Social Survey, we find that more knowledgeable individuals are more likely to express beliefs consistent with their religious or political identities for issues that have become polarized along those lines (e.g., stem cell research, human evolution), but not for issues that are controversial on other grounds (e.g., genetically modified foods). These patterns suggest that scientific knowledge may facilitate defending positions motivated by nonscientific concerns.

MOHER 2017

David Moher, Larissa Shamseer & Kelly Cobey, *Stop this waste of people, animals and money*. [nature 549 \(2017\), 23–25](#).

Predatory journals have shoddy reporting and include papers from wealthy nations, find David Moher, Larissa Shamseer, Kelly Cobey and colleagues.

The United States produced more articles in our sample than all other countries save India. Harvard University (with 9 articles) in Cambridge, Massachusetts, and the University of Texas (with 11 articles across all campuses) were among the eight institutions with the most articles. Articles in our sample consistently failed to report key information necessary for readers to assess, reproduce and build on the findings. Fewer than 10% of studies claiming to be randomized controlled trials described how patients were allocated to treatment groups; where blinding was possible, fewer than one-quarter noted whether patients and outcome assessors were blinded to group assignment.

Although adherence to and enforcement of guidelines is patchy even in mainstream publications, reporting quality in our sample was much worse. Articles were particularly deficient in descriptions of study methods, results and — for clinical trials and systematic reviews — study registration.

We need to cut off the supply of manuscripts to these illegitimate outfits. If not, predatory journals will continue to erode the integrity of scientific scholarship.

SHEN 2017

Helen H. Shen, *Singing in the brain*. [PNAS 114 \(2017\), 9490–9493](#).

Songbirds are helping scientists decipher the foundations of human speech. But new work on bats may provide missing pieces of the puzzle.

In the first stage of the project, Cooper and his fellow bats have learned to winnow their spontaneous chatter down to a single call that they produce consistently to receive a reward. (Yartsev says each animal naturally settles on a preferred call after playing with the computer for a few weeks.) The exact call doesn't matter, as long as each animal reliably reproduces the same sound. In the next phase, the bats will hear their own call played back to them, and will be rewarded for answering the computer's call with theirs. The researchers will then gradually distort

the computer’s side of the conversation, doling out smoothie only when the bat matches the altered calls. Ultimately, Yartsev hopes to elicit sounds that no longer resemble “normal” bat calls, but are rather totally novel, learned vocalizations.

Yartsev thinks bats could offer something songbirds don’t. Whereas zebra finches learn and sing a single song over and over, some bats appear to develop a vocabulary of sounds that they use flexibly in different combinations, similar to how human speech works.

SHPIGLER 2017

Hagai Y. Shpigler, Michael C. Saul, Frida Corona, Lindsey Block, Amy Cash Ahmed, Sihai D. Zhao & Gene E. Robinson, *Deep evolutionary conservation of autism-related genes*. [PNAS 114 \(2017\), 9653–9658](#).

[pnas114-09653-Supplement1.xls](#), [pnas114-09653-Supplement2.xls](#), [pnas114-09653-Supplement3.xls](#), [pnas114-09653-Supplement4.xls](#)

E. O. Wilson proposed in Sociobiology that similarities between human and animal societies reflect common mechanistic and evolutionary roots. When introduced in 1975, this controversial hypothesis was beyond science’s ability to test. We used genomic analyses to determine whether superficial behavioral similarities in humans and the highly social honey bee reflect common molecular mechanisms. Here, we report that gene expression signatures for individual bees unresponsive to various salient social stimuli are significantly enriched for autism spectrum disorder-related genes. These signatures occur in the mushroom bodies, a high-level integration center of the insect brain. Furthermore, our finding of enrichment was unique to autism spectrum disorders; brain gene expression signatures from other honey bee behaviors do not show this enrichment, nor do datasets from other human behavioral and health conditions. These results demonstrate deep conservation for genes associated with a human social pathology and individual differences in insect social behavior, thus providing an example of how comparative genomics can be used to test sociobiological theory.

Keywords: autism | evolution | honey bee | social behavior | transcriptomics

Significance: Sociobiological theory proposed that similarities between human and animal societies reflect similar evolutionary origins. We used comparative genomics to test this controversial idea by determining whether superficial behavioral similarities between humans and honey bees reflect shared molecular mechanisms. We found unique and significant enrichment for autism spectrum disorder-related genes in the neurogenomic signatures of a high-level integration center of the insect brain in bees unresponsive to two different salient social stimuli. These results demonstrate deep conservation for genes implicated in autism spectrum disorder in humans and genes associated with social responsiveness in honey bees. Comparative genomics thus provides a means to test theory on the biology of social behavior.

ZHANG 2017

Zhen Zhang, Niklaus E. Zimmermann, Andrea Stenke, Xin Li, Elke L. Hodson, Gaofeng Zhu, Chunlin Huang & Benjamin Poulter, *Emerging role of wetland methane emissions in driving 21st century climate change*. [PNAS 114 \(2017\), 9647–9652](#).

[pnas114-09647-Supplement.xlsx](#)

Wetland methane (CH₄) emissions are the largest natural source in the global CH₄ budget, contributing to roughly one third of total natural and anthropogenic emissions. As the second most important anthropogenic greenhouse gas in the atmosphere after CO₂, CH₄ is strongly associated with climate feedbacks. However, due to the paucity of data, wetland CH₄ feedbacks were not fully assessed

in the Intergovernmental Panel on Climate Change Fifth Assessment Report. The degree to which future expansion of wetlands and CH₄ emissions will evolve and consequently drive climate feedbacks is thus a question of major concern. Here we present an ensemble estimate of wetland CH₄ emissions driven by 38 general circulation models for the 21st century. We find that climate change-induced increases in boreal wetland extent and temperature-driven increases in tropical CH₄ emissions will dominate anthropogenic CH₄ emissions by 38 to 56 % toward the end of the 21st century under the Representative Concentration Pathway (RCP2.6). Depending on scenarios, wetland CH₄ feedbacks translate to an increase in additional global mean radiative forcing of 0.04 W • m⁻² to 0.19 W • m⁻² by the end of the 21st century. Under the “worst-case” RCP8.5 scenario, with no climate mitigation, boreal CH₄ emissions are enhanced by 18.05 Tg to 41.69 Tg, due to thawing of inundated areas during the cold season (December to May) and rising temperature, while tropical CH₄ emissions accelerate with a total increment of 48.36 Tg to 87.37 Tg by 2099. Our results suggest that climate mitigation policies must consider mitigation of wetland CH₄ feedbacks to maintain average global warming below 2 °C.

Keywords: global warming potential | climate feedbacks | inundation | radiative forcing | climate mitigation

Significance: Conventional greenhouse gas mitigation policies ignore the role of global wetlands in emitting methane (CH₄) from feedbacks associated with changing climate. Here we investigate wetland feedbacks and whether, and to what degree, wetlands will exceed anthropogenic 21st century CH₄ emissions using an ensemble of climate projections and a biogeochemical methane model with dynamic wetland area and permafrost. Our results reveal an emerging contribution of global wetland CH₄ emissions due to processes mainly related to the sensitivity of methane emissions to temperature and changing global wetland area. We highlight that climate-change and wetland CH₄ feedbacks to radiative forcing are an important component of climate change and should be represented in policies aiming to mitigate global warming below 2 °C.

Anthropologie

GIERLIŃSKI 2017

Gerard D. Gierliński et al., *Possible hominin footprints from the late Miocene (c. 5.7 Ma) of Crete?* [Proceedings of the Geologists' Association \(2017\), preprint, 1–14. DOI:10.1016/j.pgeola.2017.07.006.](#)

Gerard D. Gierliński, Grzegorz Niedźwiedzki, Martin G. Lockley, Athanassios Athanassiou, Charalampos Fassoulas, Zofia Dubicka, Andrzej Boczarowski, Matthew R. Bennett & Per Erik Ahlberg

We describe late Miocene tetrapod footprints (tracks) from the Trachilos locality in western Crete (Greece), which show hominin-like characteristics. They occur in an emergent horizon within an otherwise marginal marine succession of Messinian age (latest Miocene), dated to approximately 5.7 Ma (million years), just prior to the Messinian Salinity Crisis. The tracks indicate that the trackmaker lacked claws, and was bipedal, plantigrade, pentadactyl and strongly entaxonic. The impression of the large and non-divergent first digit (hallux) has a narrow neck and bulbous asymmetrical distal pad. The lateral digit impressions become progressively smaller so that the digital region as a whole is strongly asymmetrical. A large, rounded ball impression is associated with the hallux. Morphometric analysis shows the footprints to have outlines that are distinct from modern non-hominin primates and resemble those of hominins. The interpretation of these footprints

is potentially controversial. The print morphology suggests that the trackmaker was a basal member of the clade Hominini, but as Crete is some distance outside the known geographical range of pre-Pleistocene hominins we must also entertain the possibility that they represent a hitherto unknown late Miocene primate that convergently evolved human-like foot anatomy.

Keywords: Primate | Hominini | Ichnology | Trace fossils | Tracks | Neogene | Greece

Bibel

DAVID 2016

Arlette David, Robert A. Mullins & Nava Panitz-Cohen, *A Mnhpr^c Scarab From Tel Abel Beth Maacah*. [Journal of Ancient Egyptian Interconnections](#) **9** (2016), 1–13.

During excavations at Tell Abil el-Qameh, identified as the biblical Abel Beth Maacah and located in the Upper Galilee on the modern border between Israel, Lebanon and Syria, a high-quality Mnhpr^a scarab was found in an Iron Age I context, just above substantial Late Bronze IIB remains. Its typology suggests it to be a product from the reign of Ramses II's. Prompted by this discovery, we examine aspects of Egyptian involvement in this region during the time of Dynasty 19. It is suggested that following the outcome of the battle of Qadesh and the destruction of Hazor sometime in the 13th century BCE, the geo-political balance shifted and the area of the Upper Galilee and the northern Jordan Valley became a buffer zone, with more of an economic, rather than a military role. Egyptian interests in this northern reach of their empire were governed by mediators, rather than by the direct rule characteristic of Beth-Shean and the area to its south.

HENDEL 2017

Ronald Hendel, *God and the Gods in the Tetrateuch*. In: JÜRGEN VAN OORSCHOT & MARKUS WITTE (Hrsg.), *The Origins of Yahwism*. Beihefte zur Zeitschrift für die alttestamentliche Wissenschaft (Berlin 2017), 237–264.

The historical and cultural resonances of these native histories of religion allow us to discern the arguments and adversaries with which these histories are engaged. We can, at least in part, map these native histories onto a modern construction of the history of Israelite and ancient Near Eastern religions. There are many gaps in our knowledge, and much of the connective tissue of the modern historical model is tentative or hypothetical. In some respects the E portrayal seems more traditional in its concept of national gods, comparable to the conceptuality of the Mesha stele. The representation of religion in J seems innovative in its projection of Yhwh religion to the primeval past. P's history of religion is also innovative: it is arguably the first – and perhaps only – monotheism in history, if we take the term as denoting one god with no remainder. There are implications for a modern history of religion here, even if P's religious system was largely hypothetical or fictive in its formulation. But any history of religion has its fictive parts, which perhaps most clearly express the desires of the present.

In a sense the histories of religion in J, E, and P are counter-memories to each other, since they take different position on the events of the past and their relation to the present. But I do not presume that these sources knew each other. In this respect the concept of cultural memory allows us to discern their relationship as alternative discourses within the broader field of Israelite cultural memory. Even in the composite Pentateuch they operate as reservoirs of memory, which subsequent

communities selectively recall, harmonize, and reinterpret to suit their present interests. The history of God and the gods is still being refashioned today, in part by modern historians of religion, and in part by those who take the Bible's histories as authoritative. The revelation of the God of Abraham, Isaac, and Jacob is still a topic of intense commitment and argument – by the pious, by the philosophers and scholars, and by the biblical authors themselves, whose narrative claims are still contested.

OTTO 1979

Eckart Otto, *Jakob in Sichem, Überlieferungsgeschichtliche, archäologische und territorialgeschichtliche Studien zur Entstehungsgeschichte Israels*. Beiträge zur Wissenschaft vom Alten und Neuen Testament 110 (Stuttgart 1979).

YOUNGER 2007

K. Lawson Younger, Jr., *Neo-Assyrian and Israelite History in the Ninth Century, The Role of Shalmaneser III*. In: H. G. M. WILLIAMSON (Hrsg.), *Understanding the History of Ancient Israel*. Proceedings of the British Academy 143 (Oxford 2007), 243–277.

In whatever scheme of periodization used for Neo-Assyrian history in the ninth century, the reign of Shalmaneser III stands out. His rule had great impact on most of the states of the Levant as the Assyrian empire expanded beyond its traditional borders. Moreover, in the history of the Northern Kingdom of Israel, Shalmaneser's reign serves as a bridge between two important periods, impacting the Omride and Jehuic periods through his 853 and 841 campaigns. This study has analysed these campaigns and investigated some of their problems. The resistance offered by Ahab in conjunction with the western alliance that fought Shalmaneser at Qarqar in 853 gave way to the tribute gift of Jehu towards the conclusion of Shalmaneser's 841 campaign. Ahab was a participant in 'a grand alliance' that was able to resist Assyrian expansion; Jehu became an Assyrian paragon for the submissive client king, helping to define the vastness of the Assyrian state at the end of Shalmaneser's reign. While many years would pass before the Assyrians would accomplish the conquest of Israel, these initial contacts between Shalmaneser III and Ahab and Jehu demonstrate the two options that the Israelite monarchs would implement throughout the stormy relationship with the 'Great King(s) of Assyria' until the fall of Samaria and the land's incorporation into the Assyrian provincial system.

Biologie

HAMMER 2017

Tobin J. Hammer, Daniel H. Janzen, Winnie Hallwachs, Samuel P. Jaffe & Noah Fierer, *Caterpillars lack a resident gut microbiome*. PNAS 114 (2017), 9641–9646.

Many animals are inhabited by microbial symbionts that influence their hosts' development, physiology, ecological interactions, and evolutionary diversification. However, firm evidence for the existence and functional importance of resident microbiomes in larval Lepidoptera (caterpillars) is lacking, despite the fact that these insects are enormously diverse, major agricultural pests, and dominant herbivores in many ecosystems. Using 16S rRNA gene sequencing and quantitative PCR, we characterized the gut microbiomes of wild leaf-feeding caterpillars in the United

States and Costa Rica, representing 124 species from 15 families. Compared with other insects and vertebrates assayed using the same methods, the microbes that we detected in caterpillar guts were unusually low-density and variable among individuals. Furthermore, the abundance and composition of leaf-associated microbes were reflected in the feces of caterpillars consuming the same plants. Thus, microbes ingested with food are present (although possibly dead or dormant) in the caterpillar gut, but host-specific, resident symbionts are largely absent. To test whether transient microbes might still contribute to feeding and development, we conducted an experiment on field-collected caterpillars of the model species *Manduca sexta*. Antibiotic suppression of gut bacterial activity did not significantly affect caterpillar weight gain, development, or survival. The high pH, simple gut structure, and fast transit times that typify caterpillar digestive physiology may prevent microbial colonization. Moreover, host-encoded digestive and detoxification mechanisms likely render microbes unnecessary for caterpillar herbivory. Caterpillars illustrate the potential ecological and evolutionary benefits of independence from symbionts, a lifestyle that may be widespread among animals.

Keywords: insects | herbivory | Lepidoptera | symbiosis | mutualism

Significance: Microorganisms residing within animal tissues as symbionts can be critically important to many aspects of animal biology. For example, the microbiomes of many insects, such as aphids, honeybees, and termites, can provide nutrients, deter pathogens, and help digest food. We examined whether caterpillars also engage in intimate microbial partnerships. Across a broad diversity of caterpillar species, we found that microbes in the gut are extremely low-abundance and predominantly leaf-derived, suggesting their transient nature. Furthermore, suppressing bacteria in tobacco hornworms (*Manduca sexta*) had no detectable effect on caterpillar growth or survival. With caterpillars as a prominent—but possibly not unique—example of relative autonomy, the degree of reliance on microbes is an underappreciated yet likely important dimension of animal biodiversity.

Judentum

BEN-SASSON 1969A

HAIM HILLEL BEN-SASSON (Hrsg.), *Geschichte des jüdischen Volkes, Band 1: Von den Anfängen bis zum 7. Jahrhundert.* (München 1978).

BEN-SASSON 1969B

HAIM HILLEL BEN-SASSON (Hrsg.), *Geschichte des jüdischen Volkes, Band 2: Das Mittelalter – vom 7.–17. Jh.* (München 1979).

BEN-SASSON 1969C

HAIM HILLEL BEN-SASSON (Hrsg.), *Geschichte des jüdischen Volkes, Band 3: Vom 17. Jh. bis zur Gegenwart.* (München 1980).

SANDERS 2000

Seth Sanders, *Invisible Races, The Search for a Lost Tribe of Israel by Tudor Parfitt.* [Transition](#) **85** (2000), 76–97.

Yet on a deeper level, what is most important about the Lemba is precisely what is so ordinary about them: like the Polish Jews who look like Poles, or the Yemenite Jews who look like Arabs, their physiology tells a story that seems at

odds with their heritage. The secret that all these people share isn't really biological, but historical: it is history that allows Poles and Yemenites to think of themselves as Jews, and history that will allow the Lemba to reestablish their links to a broader Jewish community.

Klima

MORENO GARCÍA 2015

Juan Carlos Moreno García, *Climatic change or sociopolitical transformation? Reassessing late 3rd millennium BC in Egypt*. In: HARALD MELLER, HELGE WOLFGANG ARZ, REINHARD JUNG & ROBERTO RISCH (Hrsg.), *2200 BC – Ein Klimasturz als Ursache für den Zerfall der Alten Welt? 7. Mitteldeutscher Archäologentag vom 23. bis 26. Oktober 2014 in Halle (Saale)*. Tagungen des Landesmuseums für Vorgeschichte Halle 12 ([Halle 2015](#)), 79–84.

Contrary to traditional interpretations of the end of the Old Kingdom, recent archaeological research shows no trace of climatic or subsistence crisis. Instead, Egypt appears more and more involved in international exchange circuits where mobile populations and autonomous traders played a considerable role. Technical innovations in weaponry, textile production and pottery reveal intense contacts with Nubia and the Levant. In fact, Nubians and especially Asiatics became a far from negligible part of the Egyptian society. It appears, then, that the end of the monarchy had finally more to do with internal struggles between competing sectors of the ruling elite and with control of wealth flows than with environmental causes. In fact, some regions and social sectors flourished and their later integration within the reunified Middle Kingdom monarchy remained somewhat incomplete as they managed to keep a certain autonomy.

Klimawandel oder soziopolitische Veränderungen? Eine Neueinschätzung des späten 3. Jts. v. Chr. in Ägypten Entgegen der bisherigen Vorstellungen kann die neuere Forschung keine Hinweise auf eine Klima- oder Subsistenzkrise am Ende des Alten Reiches festmachen. Stattdessen scheint Ägypten mehr und mehr in ein internationales Austauschnetzwerk eingebunden gewesen zu sein, in dem mobile Bevölkerungsgruppen und unabhängige Handelsleute eine wichtige Rolle spielten. Technische Neuerungen bei den Waffen sowie in der Textil- und Keramikherstellung belegen intensive Kontakte mit Nubien und der Levante. Tatsächlich stellten Nubier und vor allem Vorderasiaten einen nicht zu vernachlässigenden Teil der ägyptischen Gesellschaft dar. Das Ende der Monarchie scheint also letztlich eher von internen Machtkämpfen zwischen konkurrierenden Teilen der regierenden Schicht und von der Herrschaft über die Wohlstandsverteilung bestimmt gewesen zu sein als von Umweltverhältnissen. Gewisse Regionen und soziale Schichten florierten sogar und ihre spätere Integration in das wiedervereinigte Mittlere Reich blieb in gewisser Weise unvollständig, indem es ihnen gelang, ein gewisses Maß an Autonomie beizubehalten.

SANDERMAN 2017

Jonathan Sanderman, Tomislav Hengl & Gregory J. Fiske, *Soil carbon debt of 12,000 years of human land use*. [PNAS 114 \(2017\), 9575–9580](#).

Human appropriation of land for agriculture has greatly altered the terrestrial carbon balance, creating a large but uncertain carbon debt in soils. Estimating the size and spatial distribution of soil organic carbon (SOC) loss due to land use and land cover change has been difficult but is a critical step in understanding whether

SOC sequestration can be an effective climate mitigation strategy. In this study, a machine learning-based model was fitted using a global compilation of SOC data and the History Database of the Global Environment (HYDE) land use data in combination with climatic, landform and lithology covariates. Model results compared favorably with a global compilation of paired plot studies. Projection of this model onto a world without agriculture indicated a global carbon debt due to agriculture of 133 Pg C for the top 2 m of soil, with the rate of loss increasing dramatically in the past 200 years. The HYDE classes “grazing” and “cropland” contributed nearly equally to the loss of SOC. There were higher percent SOC losses on cropland but since more than twice as much land is grazed, slightly higher total losses were found from grazing land. Important spatial patterns of SOC loss were found: Hotspots of SOC loss coincided with some major cropping regions as well as semiarid grazing regions, while other major agricultural zones showed small losses and even net gains in SOC. This analysis has demonstrated that there are identifiable regions which can be targeted for SOC restoration efforts.

Keywords: agriculture | soil organic matter | climate change | soil degradation

Significance: Land use and land cover change has resulted in substantial losses of carbon from soils globally, but credible estimates of how much soil carbon has been lost have been difficult to generate. Using a data-driven statistical model and the History Database of the Global Environment v3.2 historic landuse dataset, we estimated that agricultural land uses have resulted in the loss of 133 Pg C from the soil. Importantly, our maps indicate hotspots of soil carbon loss, often associated with major cropping regions and degraded grazing lands, suggesting that there are identifiable regions that should be targets for soil carbon restoration efforts.

VOOSEN 2017

Paul Voosen, *2.7-million-year-old ice opens window on past*. [science 357 \(2017\), 630–631](#).

Record-setting Antarctic core holds atmospheric carbon dioxide from start of the ice ages

The ice revealed atmospheric carbon dioxide (CO₂) levels that did not exceed 300 parts per million, well below today’s levels. Some models of ancient climate predict that such relatively low levels would be needed to tip Earth into a series of ice ages. But some proxies gleaned from the fossils of animals that lived in shallow oceans had indicated higher CO₂ levels. If the new result holds up, says Yige Zhang, a paleoclimatologist at Texas A&M University in College Station, the proxies will need to be recalibrated. “We have some work to do.”

But these contortions also confound the neat ordering of the annual layers—making it impossible to date the ice by counting them. Michael Bender, a Princeton geochemist on the discovery team, solved the problem by finding a way to date chunks of ice directly from trace amounts of argon and potassium gases they contain. Although not as precise as other dating methods, Bender says, the technique can date ice to within 100,000 years or so.

Kupfer

BINDE 1986

Gisela Binde, *Beitrag zur Mineralogie, Geochemie und Genese des Kasserits*. Freiburger Forschungshefte C 411 (Leipzig 1986). Dissertation, Bergakademie Freiberg.

KIENLIN 2013

Tobias L. . Kienlin, *Copper and Bronze, Bronze Age metalworking in context*. In: HARRY FOKKENS & ANTHONY HARDING (Hrsg.), *The Oxford Handbook of the European Bronze Age*. (Oxford 2013), 414–436.

The precise way, however, in which tin bronze entered this system is subject to debate. Tin was most likely won from alluvial stream deposits carrying tin-oxide minerals. These might have been used directly to produce bronze by co-smelting with copper ores or by adding tin oxide to molten copper under reduced conditions. This process might account for highly variable tin contents at the beginning of the Bronze Age. But later, when tin contents stabilized in the 8–12 per cent range (the 10 per cent typically cited in the literature is an idealized value, hardly achieved in practice), it is more likely that metallic tin was produced and added to the liquid copper.

SVIZZERO 2017

Serge Svizzero & Clem Tisdell, *The Demise of the Únetice Culture due to the Reduced Availability of Natural Resources for Bronze Production, A Draft*. [University of Queensland Working Paper 2017, Sep. 7](#). Economics, Environment and Ecology No. 205.

After a long period of prosperity, the Unetice (2300-1600 B.C.) – a Central European Early Bronze Age culture – collapsed in few decades without obvious reason. Since Unetice was the first bronze metalworkers of Central Europe, we examine whether the reduced availability of bronze could have triggered the social collapse. We claim that it could have been so since such reduction could have implied changed trade routes, socio-economic turmoil and severe disruption of the social stratification. We provide a detailed analysis of two reasons related to shortages of inputs used to produce bronze which could explain the demise of bronze production. The first is about tin ores which could have been exhausted or become extremely scarce since only alluvial deposits of tin were used by followers of the Unetice culture. The second is about wood since the production of bronze requires huge quantities of wood and charcoal used as fuel, leading to deforestation. Both reasons are complementary, and combined with the reduced productivity of agriculture implied by the anthropogenic pressure on ecosystems, all three may have led to a bronze crisis, and the demise of the Unetice culture.

Keywords: Bronze production | Central Europe | deforestation | Early Bronze Age | social and cultural collapse | Únetice culture | unsustainable development.

Neolithikum

ETHIER 2017

Jonathan Ethier et al., *Earliest expansion of animal husbandry beyond the Mediterranean zone in the sixth millennium BC*. [Scientific Reports 7 \(2017\), 7146](#). DOI:10.1038/s41598-017-07427-x.

Jonathan Ethier, Eszter Bánffy, Jasna Vuković, Krassimir Leshtakov, Krum Bacvarov, Mélanie Roffet-Salque, Richard P. Evershed & Maria Ivanova

Finally, dairying represents not only an efficient economic strategy, but also provides an important dietary component. Milk was one of the main potential sources of dietary fat for the first Balkan farmers, together with lard, oily fish and probably waterfowl. Having in mind that pigs were barely represented in the faunal assemblages from the northern Balkans and the Carpathian Basin, and

that non-ruminant lipids were very rare among the residues in pottery, we can regard dairying as a key strategy of obtaining fat in this geographic region. Fresh milk in small-scale non-industrial animal husbandry is a seasonal product. Peak lactation in temperate climates generally coincides with the warm season, when pastures can support the high nutritional requirements of lactating stock. Being a perfect medium for pathogenic microbial growth, in the hot months milk spoils to an ill-smelling liquid within hours, if not consumed or heated and processed in a controlled manner (for example through controlled souring by lactic bacteria). The low frequency or absence of the -13,910*T allele, associated with continued production of lactase into adulthood (and thus with the ability to digest fresh milk), in hunter-gatherer and early farming populations in Europe, suggests that high-lactose fresh milk could not have been consumed in large quantities by the first farmers. Hence, most of the milk must have been processed without delay both to reduce its lactose content and to convert it into a storable year-round staple food. The increase in dairying observed in this study thus represents a remarkable example of complex cultural behavior employed to circumvent the limitations of environment and of human and animal biology.

Since their domestication in the Mediterranean zone of Southwest Asia in the eighth millennium BC, sheep, goats, pigs and cattle have been remarkably successful in colonizing a broad variety of environments. The initial steps in this process can be traced back to the dispersal of farming groups into the interior of the Balkans in the early sixth millennium BC, who were the first to introduce Mediterranean livestock beyond its natural climatic range. Here, we combine analysis of biomolecular and isotopic compositions of lipids preserved in prehistoric pottery with faunal analyses of taxonomic composition from the earliest farming sites in southeast Europe to reconstruct this pivotal event in the early history of animal husbandry. We observe a marked divergence between the (sub)Mediterranean and temperate regions of Southeast Europe, and in particular a significant increase of dairying in the biochemical record coupled with a shift to cattle and wild fauna at most sites north of the Balkan mountain range. The findings strongly suggest that dairying was crucial for the expansion of the earliest farming system beyond its native bioclimatic zone.

Religion

GEIGER 1833

Abraham Geiger, *Was hat Mohammed aus dem Judenthume aufgenommen?* Preisschrift, Bonn (United States 2016). Dissertation, Universität Marburg.

Story or Book

KISER 2017

Barbara Kiser, *The Influential Mind*. [nature 549 \(2017\), 29](#).

The Influential Mind, Tali Sharot. Little Brown (2017)

Advertising, politics, education — any juxtaposition of human and message involves influence. But why might a patently ill-informed demagogue sway more people than a scientist? In this perceptive study, cognitive neuroscientist Tali Sharot isolates seven factors central to influence. She shows how US President John F. Kennedy framed the space race emotionally as risk and opportunity, boosting neural synchronization and encouraging adherence to his view; and how

“taming the amygdala” (the brain structure key to processing emotions) can reduce stress and susceptibility to fear-mongering.