

References

Aktuell

CASTELVECCHI 2019

Davide Castelvecchi, *Machine learning comes up against unsolvable problem*. *nature* **565** (2019), 277.

Researchers run into a logical paradox discovered by famed mathematician Kurt Gödel.

Gödel and Cohen's work on the continuum hypothesis implies that there can exist parallel mathematical universes that are both compatible with standard mathematics — one in which the continuum hypothesis is added to the standard axioms and therefore declared to be true, and another in which it is declared false.

The authors go on to show that if the continuum hypothesis is true, a small sample is sufficient to make the extrapolation. But if it is false, no finite sample can ever be enough. In this way, they show that the problem of learnability is equivalent to the continuum hypothesis. Therefore, the learnability problem, too, is in a state of limbo that can be resolved only by choosing the axiomatic universe.

FRATER 2018

Paul N. Frater & Lauren L. Sullivan, *A short guide to working remotely*. *science* **362** (2018), 1206.

We were ecstatic when our supervisors allowed us to work remotely. Friends in graduate school, we hadn't worked in the same place in years. But our lives had taken a similar turn. Paul—a scientist at a state agency at the time—was living apart from his wife on weekdays. Every Friday he'd leave his office and drive 3 hours to spend the weekend at home, but with his wife pregnant with their first child, that situation would soon become untenable. Lauren, a newly married postdoc, lived in a different state than her husband and was growing weary of long-distance romance. Our work lives revolved around computer analyses and writing, so remote work was feasible. It seemed like an ideal solution.

Amerika

MORENO-MAYAR 2018

J. Victor Moreno-Mayar et al., *Early human dispersals within the Americas*. *science* **362** (2018), 1128. DOI:10.1126/science.aav2621.
s362-1128-Supplement.pdf

J. Victor Moreno-Mayar, Lasse Vinner, Peter de Barros Damgaard, Constanza de la Fuente, Jeffrey Chan, Jeffrey P. Spence, Morten E. Allentoft, Tharsika Vimala, Fernando Racimo, Thomaz Pinotti, Simon Rasmussen, Ashot Margaryan, Miren Iraeta Orbegozo, Dorothea Mylopotamitaki, Matthew Wooller, Clement Bataille, Lorena Becerra-Valdivia, David Chivall, Daniel Comeskey, Thibaut Deviese, Donald K. Grayson, Len George, Harold Harry, Verner Alexandersen, Charlotte Primeau, Jon Erlandson, Claudia Rodrigues-Carvalho, Silvia Reis, Murilo Q.R. Bastos, Jerome Cybulski, Carlos Vullo, Flavia Morello, Miguel Vilar, Spencer Wells, Kristian Gregersen, Kasper Lykke Hansen, Niels Lynnerup, Marta Mirazon Lahr, Kurt Kj@jr, Andre Strauss, Marta Alfonso-Durruty, Antonio Salas, Hannes

Schroeder, Thomas Higham, Ripan S. Malhi, Jeffrey T. Rasic, Luiz Souza, Fabricio R. Santos, Anna-Sapfo Malaspinas, Martin Sikora, Rasmus Nielsen, Yun S. Song, David J. Meltzer & Eske Willerslev

Studies of the peopling of the Americas have focused on the timing and number of initial migrations. Less attention has been paid to the subsequent spread of people within the Americas. We sequenced 15 ancient human genomes spanning from Alaska to Patagonia; six are ~10,000 years old (up to ~18x coverage). All are most closely related to Native Americans, including those from an Ancient Beringian individual and two morphologically distinct “Paleoamericans.” We found evidence of rapid dispersal and early diversification that included previously unknown groups as people moved south. This resulted in multiple independent, geographically uneven migrations, including one that provides clues of a Late Pleistocene Australasian genetic signal, as well as a later Mesoamerican-related expansion. These led to complex and dynamic population histories from North to South America.

Anthropologie

BOBE 2019

René Bobe & Susana Carvalho, *Hominin diversity and high environmental variability in the Okote Member, Koobi Fora Formation, Kenya*. *Journal of Human Evolution* **126** (2019), 91–105.

The newly described partial skeleton of *Paranthropus boisei* KNM-ER 47000 as well as the FwJj14E Ileret footprints provide new evidence on the paleobiology and diversity of hominins from the Okote Member of the Koobi Fora Formation at East Turkana about 1.5 Ma. To better understand the ecological context of the Okote hominins, it is necessary to broaden the geographical focus of the analysis to include the entire Omo-Turkana ecosystem, and the temporal focus to encompass the early Pleistocene. Previous work has shown that important changes in the regional vegetation occurred after 2 Ma, and that there was a peak in mammalian turnover and diversity close to 1.8 Ma. This peak in diversity included the Hominini, with the species *P. boisei*, *Homo habilis*, *Homo rudolfensis*, and *Homo erectus* co-occurring at around 1.8 Ma. There is considerable debate about whether *H. habilis* and *H. rudolfensis* indeed constitute separate species, but even if we consider them both as *H. habilis sensu lato*, the co-occurrence of three hominin species at any one time and place is rather unusually high diversity for hominin standards (even if not so for other mammalian groups such as suids, bovids, or cercopithecids). Here we use mammalian faunal abundance data to place confidence intervals on first and last appearances of hominin species in the early Pleistocene of the Omo-Turkana Basin, and use these estimates to discuss hominin diversity in the Okote Member. We suggest that in the early Pleistocene a wide range of depositional environments and vegetation types, along with a high frequency of volcanism, likely maintained high levels of environmental variability both in time and space across the Omo-Turkana region, and provided ecological opportunities for the coexistence of at least three hominin species alongside a diverse mammalian fauna.

Keywords: Koobi Fora Formation | Okote Member | Hominin diversity | Environmental variability | Faunal abundance

Bibel

BLENKINSOPP 2008

Joseph Blenkinsopp, *The Midianite–Kenite Hypothesis Revisited and the Origins of Judah*. [Journal for the Study of the Old Testament](#) **33** (2008), ii, 131–153.

The Kenite, or Midianite–Kenite, hypothesis about the origins of the cult of Yahweh first came into prominence in the late nineteenth century. It rests on four bases: an interpretation of the biblical texts dealing with the Midianite connections of Moses, allusions in ancient poetic compositions to the original residence of Yahweh, Egyptian topographical texts from the fourteenth to the twelfth century, and Cain as the eponymous ancestor of the Kenites. This article discusses the implications of the hypothesis for the ethnic origins of Judah.

Keywords: Kenites | Midianites | Cain | Moses | Jethro | Edom | Seir | Sinai | Kadesh | Teman | Shasu | Judah.

GEVA 2014

Hillel Geva, *Jerusalem’s Population in Antiquity, A Minimalist View*. [Tel Aviv: Archaeology](#) **41** (2014), 131–160.

Past estimates of ancient Jerusalem’s population have for the most part been excessively high, influenced by numbers reported in literary sources or by researchers’ subjective attitudes to the holy city. In the case of Jerusalem, utilization of a density coefficient is inadvisable due to the city’s unique religious and political history. The author deals with Jerusalem’s demography in antiquity by assessing the nature and urban composition of the different neighbourhoods of the city and concludes that the population of Jerusalem from the Bronze Age through to the Early Islamic period was considerably smaller than previously estimated.

Keywords: Jerusalem | Population estimates | City of David | Southwestern Hill

HERZOG 1984

Ze’ev Herzog, Miriam Aharoni, Anson F. Rainey & Shmuel Moshkovitz, *The Israelite Fortress at Arad*. [Bulletin of the American Schools of Oriental Research](#) **254** (1984), 1–34.

The excavations at Arad have demonstrated that an archaeological effort aimed at completely uncovering the settlement or fortress can produce an abundance of finds and permits the reconstruction of a thorough picture of its function of its development.

HIEKE 2015

Thomas Hieke, *Kennt und verurteilt das Alte Testament Homosexualität?* In: STEPHAN GOERTZ (Hrsg.), „Wer bin ich, ihn zu verurteilen?“, *Homosexualität und katholische Kirche*. Katholizismus im Umbruch 3 ([Freiburg 2015](#)), 19–52.

Kennt und verurteilt das Alte Testament Homosexualität? Die beiden Teile der Frage sind mit “Nein” zu beantworten. Das überrascht, insbesondere im Blick auf den vorangestellten Vers Lev 18,22. Ist hier nicht alles klar und die kategorische Ablehnung homosexueller Praktiken deutlich formuliert?

JOFFE 2002

Laura Joffe, *The Answer to the Meaning of Life, the Universe and the Elohistic Psalter*. [Journal for the Study of the Old Testament](#) **27** (2002), ii, 223–235.

This article asks why the Elohist Psalter (Pss. 42–83) was commissioned. It is suggested that the Elohist Psalter was constructed in order to invoke a ‘magic triangle’ (comprising God’s name, the number 42, and a blessing) for some apotropaic purpose. It is argued that this theory gains credence from two areas: first, the importance of numerical organization of large groups of Psalms; and, second, the history of the number 42, which in biblical times was a number of disaster, and in later Jewish tradition became associated with a protective name of God.

KISILEVITZ 2015

Shua Kisilevitz, *The Iron IIA Judahite Temple at Tel Moza*. [Tel Aviv: Archaeology 42 \(2015\), 147–164.](#)

The renewed excavations at Tel Moza brought to light remains of an exceptional temple complex, established in the Iron IIA (10th–9th centuries BCE). An assemblage comprised of figurines and cultic vessels was found lying on the packed earth floor of the temple courtyard. The plan of the temple and the motifs of the figurines and cultic vessels are drawn from conventions prevalent throughout the Ancient Near East. The importance and unique nature of the Tel Moza temple are accentuated by the fact that it is the first Iron Age temple to be excavated in the heart of Judah, just a few km from Jerusalem, and thus provides new insight into early Israelite religion.

Keywords: Tel Moza | Judah | Iron Age | Cult | Temple | Stands | Figurines

KNOHL 2019

Israel Knohl, *YHWH: The Original Arabic Meaning of the Name*. [unknown \(2019\), preprint, 1–10.](#)

In 1956, Shelomo Dov Goitein (1900–1985), a scholar of both Jewish and Arabic studies,[16]suggested that the name derives from the Arabic root h.w.y and the word hawaya, which means “love, affection, passion, desire.” He connected this suggestion with the passage in Exodus 34, in a set of laws known by scholars as the Ritual Decalogue. One of the laws, which forbids Israel to worship other gods, reads:

Exod 34:14 For you must not worship any other god, because YHWH, whose name is Impassioned, is an impassioned God.

Goitein suggests that “YHWH whose name is Impassioned” refers to the deity’s personal name YHWH, which means “the Impassioned One”, and that this name derives from that (proto)Arabic term for passion. This reflects the idea that YHWH’s bond with his worshipers is one of passionate love, and YHWH is upset if the worshipers “cheat” by worshipping other god.

MAZAR 1986

Amihai Mazar & Ehud Netzer, *On the Israelite Fortress at Arad*. [Bulletin of the American Schools of Oriental Research 263 \(1986\), 87–91.](#)

NA’AMAN 2011

Nadav Na’aman, *The “Discovered Book” and the Legitimation of Josiah’s Reform*. [Journal of Biblical Literature 130 \(2011\), 47–62.](#)

In conclusion, the five-part story in 2 Kings 22–23 was originally an independent historical short story, written in the time of Josiah in an effort to support and legitimize the cult reform that the king conducted. Its legitimizing function well explains the prominent role the Auffindungsbericht and the divine confirmation of the “discovered” scroll by the prophetess played in the story. The covenant in the

temple (2 Kgs 23:1-3) and the celebration of the feast of Passover, “as it is written in this book of the covenant” (23:21-23), were also integral parts of the reform and its legitimizing text. Like many other sources available to the author of the Deuteronomistic History, the story of Josiah’s reform was slightly reworked and integrated into the history he composed. Once the story was integrated within the confines of a broad literary work, the original function of the discovered scroll was lost. In its new context the “Book of the Law” became an element in the revolutionary concept of the “book” as the word of God, symbolizing the transition of authority from the prophet and the temple to the divine written word.

NELSON 1981

Richard D. Nelson, *Josiah in the Book of Joshua*. [Journal of Biblical Literature](#) **100** (1981), 531–540.

The Joshua of Dtr is in many ways a thinly disguised Josianic figure who acts out the events of Dtr’s own day on the stage of the classical past. Against the backdrop of Gilgal, Ai, and Hazor, he struts out a deuteronomistic script recalling contemporary events involving Jerusalem, Bethel, and a Judean expansion to the north. While all this was obvious to Dtr’s seventh-century readers, the passage of years and later exilic redaction have made Joshua’s make-up and costume less transparent than originally intended. In this study we have tried to capture afresh what Dtr was trying to do in the book of Joshua.

STOTT 2005

Katherine Stott, *Finding the Lost Book of the Law, Re-reading the Story of ‘The Book of the Law’ (Deuteronomy — 2 Kings) in Light of Classical Literature*. [Journal for the Study of the Old Testament](#) **30** (2005), ii, 153–169.

This article reconsiders the much discussed story of ‘the book of the law’ in 2 Kings 22–23, along with the various other references to this lawbook in the so-called ‘Deuteronomistic History’. While there has been a tendency within modern scholarship to read 2 Kings 22–23 from an historical perspective and to assume that ‘the book of the law’ was an actual book that is to be identified in some way with the book of Deuteronomy, certain commentators prefer to understand references to ‘the book of the law’ as serving a rhetorical purpose in their narrative context. This article argues that a rhetorical understanding of these references receives additional support from comparison with classical literature, where stories about lost and found documents are widely used as a literary ploy to bolster the credibility of the texts within which they appear.

TIMM 2008

Stefan Timm, *Der Tod Des Staatsfeindes, Neues Zu B3j*. [Vetus Testamentum](#) **58** (2008), 87–100.

Recently, it has been discovered that ostracon IFAO No. 1864 recto also bears an inscription. It says that B3j was killed as “great enemy” in the 5th year of Pharaoh Siptah. This means that a connection between B3j and Moses (E. A. Knauf) or even an identification of B3j with Moses (U. C. de Moor) is inappropriate. Whatever personage Egyptologists declare to be a “parallel” of Moses, B3j cannot be taken as one.

Keywords: Beya | Moses (in Egypt)

WELLHAUSEN 1892

Julius Wellhausen, *Die Kleinen Propheten, Übersetzt, mit Noten. Skizzen und Vorarbeiten* 5 (Berlin ²1893).

Bibel Methoden

USSISHKIN 1988

David Ussishkin, *The Date of the Judaeen Shrine at Arad*. [Israel Exploration Journal](#) **38** (1988), 142–157.

Summarizing their study, Herzog, Miriam Aharoni, Rainey and Moshkovitz state that ‘the excavations at Arad have demonstrated that an archaeological effort aimed at completely uncovering the settlement or fortress can produce an abundance of finds and permits the reconstruction of a thorough picture of its function and the stages of its development’. I strongly believe that the opposite is true. For a number of years I have repeatedly expressed the view that ‘no site—or even a particular level or a major structure thereof—should ever be completely excavated by one expedition. A large part of it should remain untouched in order to leave ample possibilities for further excavators to check the work’. It seems that the excavation of the Judaeen fort at Tel Arad is a case in point.

Biologie

MCWILLIAMS 2019

Thomas G. McWilliams & Anu Suomalainen, *Fate of a father’s mitochondria*. [nature](#) **565** (2019), 296–297.

A tenet of elementary biology is that mitochondria — the cell’s powerhouses — and their DNA are inherited exclusively from mothers. A provocative study suggests that fathers also occasionally contribute.

Will Luo and colleagues’ findings affect the counselling of individuals carrying diseasecausing mtDNA mutations who are considering having children? Not greatly, because paternal mitochondrial transmission seems to be exceedingly rare in humans. At present, this discovery represents an interesting conceptual breakthrough, rather than one that will directly influence clinical practice.

Energie Biologie

SUTOU 2018

Shizuyo Sutou, *Low-dose radiation from A-bombs elongated lifespan and reduced cancer mortality relative to un-irradiated individuals*. [Genes and Environment](#) **40** (2018), 26, 1–14.

The US National Academy of Sciences (NAS) presented the linear no-threshold hypothesis (LNT) in 1956, which indicates that the lowest doses of ionizing radiation are hazardous in proportion to the dose. This spurious hypothesis was not based on solid data. NAS put forward the BEIR VII report in 2006 as evidence supporting LNT. The study described in the report used data of the Life Span Study (LSS) of A-bomb survivors. Estimation of exposure doses was based on initial radiation (5%) and neglected residual radiation (10%), leading to underestimation of the doses. Residual radiation mainly consisted of fallout that poured down onto the ground along with black rain. The black-rain-affected areas were wide. Not only A-bomb survivors but also not-in-the-city control subjects (NIC) must have been exposed to residual radiation to a greater or lesser degree. Use of NIC as negative controls constitutes a major failure in analyses of LSS. Another failure of LSS is its neglect of radiation adaptive responses which include low-dose stimulation of DNA damage repair, removal of aberrant cells via stimulated apoptosis, and elimination of cancer cells via stimulated anticancer immunity. LSS

never incorporates consideration of this possibility. When LSS data of longevity are examined, a clear J-shaped dose-response, a hallmark of radiation hormesis, is apparent. Both A-bomb survivors and NIC showed longer than average lifespans. Average solid cancer death ratios of both A-bomb survivors and NIC were lower than the average for Japanese people, which is consistent with the occurrence of radiation adaptive responses (the bases for radiation hormesis), essentially invalidating the LNT model. Nevertheless, LNT has served as the basis of radiation regulation policy. If it were not for LNT, tremendous human, social, and economic losses would not have occurred in the aftermath of the Fukushima Daiichi nuclear plant accident. For many reasons, LNT must be revised or abolished, with changes based not on policy but on science.

Keywords: A-bomb survivors | Lifespan | Life Span Study | Linear no-threshold | LNT | Longevity | Residual radiation | Threshold

Isotope

FLOHR 2019

Pascal Flohr, Emma Jenkins, Helen R. S. Williams, Khalil Jamjoum, Sameeh Nuimat & Gundula Muldner, *What can crop stable isotopes ever do for us? An experimental perspective on using cereal carbon stable isotope values for reconstructing water availability in semi-arid and arid environments*. [Vegetation History and Archaeobotany \(2019\), preprint, 1–16](#). DOI:10.1007/s00334-018-0708-5.

VegHistArBot2019.01-Flohr-Supplement1.pdf, VegHistArBot2019.01-Flohr-Supplement2.xlsx, VegHistArBot2019.01-Flohr-Supplement3.pdf, VegHistArBot2019.01-Flohr-Supplement4.xlsx

This study re-assesses and reines the use of crop carbon stable isotope values (d13C) to reconstruct past water availability. *Triticum turgidum* ssp. durum (durum wheat), *Hordeum vulgare* (six-row barley) and *Sorghum bicolor* (sorghum) were experimentally grown at three crop research stations in Jordan for up to three years under ive diferent irrigation regimes: 0% (rainfall only), 40%, 80%, 100% and 120% of the crops' optimum water requirements. The results show a large variation in carbon stable isotope values of crops that received similar amounts of water, either as absolute water input or as percentage of crop requirements. We conclude that C3 crop carbon stable isotope composition should be assessed using a climate zone speciic framework. In addition, we argue that interpretation should be done in terms of extremely high values showing an abundance of water versus low values indicating water stress, with values in between these extremes best interpreted in conjunction with other proxy evidence. Carbon stable isotope values of the C4 crop Sorghum were not found to be useful for the reconstruction of water availability.

Keywords: Plant carbon stable isotope values | Experimental crop growing | Water availability | Water management

Judentum

BOYARIN 2018

Daniel Boyarin, *No Ancient Judaism*. In: MICHAEL L. SATLOW (Hrsg.), *Strength to Strength, Essays in Appreciation of Shaye J. D. Cohen*. (Providence 2018), 75–102.

In general I would suggest, users of the language who utilize Judaism to refer to something that persists from Moses Our Rabbi to Moses Mendelssohn are indeed willy-nilly speaking normatively. They have an a priori idea of what Judaism is and believe that a certain essence can be traced in all forms of the alleged “religion” throughout this history; therefore, even if Judaism be a modern term, it picks out some unique and real-thing in the world. This is a perfectly legitimate sort of normative statement a theological claim if you will—and, as such, successful within a given language game, but hardly one that is justifiable within the language game of historiography.

FRIEDLÄNDER 1881

Michael Friedländer, *The Guide for the Perplexed by Moses Maimonides, Translated from the original Arabic text.* (New York ⁴1904).

The first Edition of the English Translation of Maimonides’ *Dalalat al-Hairin* being exhausted without having fully supplied the demand, I prepared a second, revised edition of the Translation. In the new edition the three volumes of the first edition have been reduced to one volume by the elimination of the notes; besides Hebrew words and phrases have been eliminated or transliterated. By these changes the translator sought to produce a cheap edition in order to bring the work of Maimonides within the reach of all students of Theology and Jewish Literature.

HEZSER 2019

Catherine Hezser, *The Contested Image of King David in Rabbinic and Patristic Literature and Art of Late Antiquity.* In: JENS SCHROETER (Hrsg.), *Construction of Ancient Judaism(s).* (forthcoming 2019), 1–29.

What could have been the reasons behind this recasting of David that developed in Babylonia in the stammaitic period? One reason could be the loss of hope in a Davidic king-messiah who would establish a universal Israelite rule. At a time when foreign dominion had been experienced for hundreds of years, a reestablishment of Davidic rule may have seemed unlikely. Traditional Jewish messianic expectations may also have been de-emphasized as a reaction to Christian theology. What is also evident is the rabbinic attempt to re-appropriate David for Judaism. By claiming that David was a worldly rabbinic scholar, rabbis created a forceful counterimage to Christian notions of an elusive Davidic Christ/messiah. They created a figure who represented their own values and served as a role-model they could identify with.

RUNESSON 2008

Anders Runesson, Donald D. Binder & Birger Olsson, *The Ancient Synagogue from its Origins to 200 C.E. A Source Book.* Ancient Judaism and Early Christianity 72 (Leiden 2008).

Klima

KARP 2018

Allison T. Karp, Anna K. Behrensmeyer & Katherine H. Freeman, *Grassland fire ecology has roots in the late Miocene.* PNAS **115** (2018), 12130–12135.

That fire facilitated the late Miocene C4 grassland expansion is widely suspected but poorly documented. Fire potentially tied global climate to this profound biosphere transition by serving as a regional-to-local driver of vegetation change. In modern environments, seasonal extremes in moisture amplify the occurrence of fire, disturbing forest ecosystems to create niche space for flammable grasses, which in turn provide fuel for frequent fires. On the Indian subcontinent, C4 expansion was accompanied by increased seasonal extremes in rainfall (evidenced by $\delta^{18}\text{O}$ carbonate), which set the stage for fuel accumulation and fire-linked clearance during wet-to-dry seasonal transitions. Here, we test the role of fire directly by examining the abundance and distribution patterns of fire-derived polycyclic aromatic hydrocarbons (PAHs) and terrestrial vegetation signatures in n-alkane carbon isotopes from paleosol samples of the Siwalik Group (Pakistan). Two million years before the C4 grassland transition, fire-derived PAH concentrations increased as conifer vegetation declined, as indicated by a decrease in retene. This early increase in molecular fire signatures suggests a transition to more fire-prone vegetation such as a C3 grassland and/or dry deciduous woodland. Between 8.0 and 6.0 million years ago, fire, precipitation seasonality, and C4-grass dominance increased simultaneously (within resolution) as marked by sharp increases in fire-derived PAHs, $\delta^{18}\text{O}$ carbonate, and ^{13}C enrichment in n-alkanes diagnostic of C4 grasses. The strong association of evidence for fire occurrence, vegetation change, and landscape opening indicates that a dynamic fire–grassland feedback system was both a necessary precondition and a driver for grassland ecology during the first emergence of C4 grasslands.

Keywords: C4 grassland expansion | paleofire | polycyclic aromatic hydrocarbons | leaf wax carbon isotopes | Mio-Pliocene

Significance: Fire is crucial to maintaining modern subtropical grasslands, yet the geologic and ecological history of this association is not well constrained. Here, we test the role of fire during the expansion of C4 grassland ecosystems in the Mio-Pliocene through innovative molecular proxies from ancient soils in Pakistan. We produce a synoptic terrestrial record of fire and vegetation change in this region, which indicates that increased fire occurrence accompanied two stages of landscape opening. Proxy data confirm that a pronounced fire–grassland feedback was a critical component of grassland ecosystems since their origination and fostered the rise of C4-dominated grasslands. The approach presented here can be used to examine landscape-scale interactions between paleofire and vegetation for other geographic regions and climatic transitions.

KUMP 2018

Lee Kump, *Climate change and marine mass extinction*. [science](#) **362** (2018), 1113–1114.

Another factor not considered in this study is the rate of climate change during the end-Permian event. If warming and oxygen loss were imposed slowly, perhaps high-latitude organisms could have adapted to warming and oxygen loss, whereas if these changes happened quickly, massive die-off was destined to occur. Existing geochronological constraints on the fossil record suggest that the rates of these changes were rapid.

PENN 2018

Justin L. Penn, Curtis Deutsch, Jonathan L. Payne & Erik A. Sperling, *Temperature-dependent hypoxia explains biogeography and severity of end-Permian marine mass extinction*. [science](#) **362** (2018), 1130. DOI:10.1126/science.aat1327.

s362-1130-Supplement.pdf

Rapid climate change at the end of the Permian Period (≈ 252 million years ago) is the hypothesized trigger for the largest mass extinction in Earth's history. We present model simulations of the Permian/Triassic climate transition that reproduce the ocean warming and oxygen (O₂) loss indicated by the geologic record. The effect of these changes on animal survival is evaluated using the Metabolic Index (F), a measure of scope for aerobic activity governed by organismal traits sampled in diverse modern species. Modeled loss of aerobic habitat predicts lower extinction intensity in the tropics, a pattern confirmed with a spatially explicit analysis of the marine fossil record. The combined physiological stresses of ocean warming and O₂ loss can account for more than half the magnitude of the "Great Dying."

WOODARD 2019

Dawn L. Woodard, Steven J. Davis & James T. Randerson, *Economic carbon cycle feedbacks may offset additional warming from natural feedbacks*. [PNAS 116 \(2019\), 759–764](#).

pnas116-00759-Supplement.pdf

As the Earth warms, carbon sinks on land and in the ocean will weaken, thereby increasing the rate of warming. Although natural mechanisms contributing to this positive climate–carbon feedback have been evaluated using Earth system models, analogous feedbacks involving human activities have not been systematically quantified. Here we conceptualize and estimate the magnitude of several economic mechanisms that generate a carbon–climate feedback, using the Kaya identity to separate a net economic feedback into components associated with population, GDP, heating and cooling, and the carbon intensity of energy production and transportation. We find that climate-driven decreases in economic activity (GDP) may in turn decrease human energy use and thus fossil fuel CO₂ emissions. In a high radiative forcing scenario, such decreases in economic activity reduce fossil fuel emissions by 13% this century, lowering atmospheric CO₂ by over 100 ppm in 2100. The natural carbon–climate feedback, in contrast, increases atmospheric CO₂ over this period by a similar amount, and thus, the net effect including both feedbacks is nearly zero. Our work Highlights the importance of improving the representation of climate–economic feedbacks in scenarios of future change. Although the effects of climate warming on the economy may offset weakening land and ocean carbon sinks, a loss of economic productivity will have high societal costs, potentially increasing wealth inequity and limiting resources available for effective adaptation.

Keywords: carbon cycle feedbacks | climate change | economic damages | integrated assessment models | fossil fuels

Significance: The response of different economic sectors and energy infrastructure to climate warming is complex and difficult to compare with land and ocean carbon cycle feedbacks. Our analysis provides a framework for assessing such economic responses and comparing climate feedbacks in integrated assessment and earth system models. A better understanding of the potential effect of an economically driven feedback may improve our ability to estimate limits on cumulative emissions necessary to meet specific climate stabilization targets. We find that a net negative feedback from economic damages on fossil fuels may be strong enough to offset the positive feedback from terrestrial and marine ecosystems; however, these economic losses may disproportionately affect vulnerable populations and make climate mitigation more difficult.

Methoden

CHARLIER 2019

Philippe Charlier, Frédérick Gaultier & Geneviève Héry-Arnaud, *Interbreeding between Neanderthals and modern humans, Remarks and methodological dangers of a dental calculus microbiome analysis. Journal of Human Evolution* **126** (2019), 124–126.

Based on the molecular clock and a comparison between *M. oralis* subsp. *neandertalis*, isolated from a Neanderthal genome, and *M. oralis*, isolated from modern humans, they concluded that the divergence of these microbial subspecies occurred 143–112 ka, i.e., much later than the divergence between *Homo sapiens* and *H. neanderthalensis* (450–700 ka; Stringer, 2016). Based on these dates, Weyrich et al. (2017) concluded that these microorganisms could have been transferred between these hominins during interactions subsequent to their divergence, leading to the inference that modern humans and Neanderthals interbred. Although ‘interaction’ does not necessarily mean ‘interbreeding’, Weyrich et al. (2017:357, 361) apparently used these terms as synonyms throughout their article.

In our opinion, Weyrich et al.’s (2017) interpretation of their Results is not warranted for several reasons.

In conclusion, more than the supposed and very hypothetical sharing of oral germs, the best evidence of interbreeding between Neanderthals and modern humans remains the sharing of genes (Green et al., 2010; Hofreiter, 2011; Fu et al., 2015) including introgression in the human nuclear genome (Lowery et al., 2013; Zanolli et al., 2017) and virological proof of inter-species sex, such as phylogenetic analysis of the genomes of human papillomavirus 16 and 58 (HPV16 and HPV58), which are potentially involved in cervical cancer. Such phylogenetic analyses brings to light a dissociation of contemporary variants of hybridization between Neanderthals and modern humans, presumably the result of selections and mutations in a context of sexually transmitted infections (Pimenoff et al., 2017; Chen et al., 2017).

FINKELSTEIN 2008

Israel Finkelstein, *Destructions, Megiddo as a Case Study*. In: J. DAVID SCHLOEN (Hrsg.), *Exploring the Longue Duree, Essays in Honor of Lawrence E. Stager*. (Winona Lake 2008), 113–126.

The exact nature and meaning of “destruction” has never been fully deliberated on in the archaeology of the Levant. The word is used quite freely to describe ashy layers found in a dig. The fact of the matter is that not every ashy layer represents destruction, that not all destructions entail heavy conflagration, and that not all destructions are of the same nature.

The destroyer of the Megiddo VIA settlement horizon, which I would see as a revival of the Canaanite city-state system (Finkelstein 2003), aimed at a total desolation of these cities. It seems that the destroyer had no interest in exploiting their agricultural output or in their commercial advantages. The theory of a destruction by King David (recently Harrison 2004: 108) is based on an uncritical reading of the biblical text and should therefore be neglected. A Sheshonq I destruction suggested by the author (Finkelstein 2002) raises problems regarding the nature of Egyptian campaigns in Canaan (Ussishkin 1990:72–73) and may be somewhat too late for the date of this devastation, which has recently been determined by radiocarbon studies. Hence a takeover by the emerging highland Israelite entity seems to be the best solution, or at least the less problematic one.

Is there a textual echo to these groundbreaking events in the northern valleys? The answer takes me back to Larry, who suggested almost twenty years ago

(Stager 1988) that the Song of Deborah, seen by many as one of the oldest sources in the Hebrew Bible (e.g., Coogan 1978), depicts the victory of the highland Israelites over the Canaanites in the lowlands. Larry may have been right—not for twelfth-century events, but rather for tenth-century clashes that took place on the eve of the rise of the northern kingdom of Israel.

ROSE 2019

Thomas Rose, Philippe Telouk, Sabine Klein & Horst R. Marschall, *Questioning Fe isotopes as a provenance tool, Insights from bog iron ores and alternative applications in archeometry*. [Journal of Archaeological Science](#) **101** (2019), 52–62.

JAS101-0052-Supplement.xlsx

Provenancing metal artifacts with scientific methods is an established tool in archeometry to identify the metal deposits, which were exploited for the production of ancient metal objects. It is thus an important method to reconstruct ancient exchange networks and the socio-economic organization of past societies. Previously introduced isotope-based approaches (Pb, Sr, Os) and chemical analyses of slag inclusions have severe limitations concerning their application or the amount of sample required. Fe isotopes were previously suggested in a quite early stage of investigation as a potential provenance tracer and it was postulated that they would not fractionate during the smelting procedure. However, previously published analytical data from iron ores indicate a wide overlap between deposits. Further, the earlier studies on Fe isotopes did not include bog iron ores, despite their high importance in ancient metallurgy. As geochemical reactions during ore formation are complex and fractionation cannot be generally excluded, the applicability of Fe isotopes as an alternative provenance tracer still asks for further investigation.

This purely methodological study focuses on specimens from two sites of the formerly mined bog iron ore deposit Eyller Bruch (Germany), which are analyzed together with products of a smelting experiment based on these ores. The Fe isotopic composition of the bog iron ore from the investigated region suggests an intra-deposit zonation caused by environmental parameters and its overall variation is comparable with that of other deposits. The bog iron ore isotope signature largely overlaps with the isotope range of mineralizations in other regions. As a consequence of this and although the absence of Fe isotope fractionation during the smelting procedure is confirmed, the study demonstrates the lack of discriminatory power of Fe isotopes for provenance studies. Potential applications for archeometry can rather be found in the environmental parameters, especially organic matter, which seems to have a strong influence on Fe isotope compositions of bog iron ores. Zonations within deposits might be identified and could help to reconstruct the exploitation history of the deposit or to reconstruct past bog landscapes.

Keywords: Iron metallurgy | Provenancing | Bog iron ore | Iron isotopes | MC-ICP-MS | Smelting | Organic matter

Ostasien

COBO 2019

Jose M. Cobo, Joaquim Fort & Neus Isern, *The spread of domesticated rice in eastern and southeastern Asia was mainly demic*. [Journal of Archaeological Science](#) **101** (2019), 123–130.

JAS101-0123-Supplement1.pdf, JAS101-0123-Supplement2.xlsx

The Neolithic transition, i.e., the shift from hunting and gathering into farming, had a major impact in many aspects of human societies, from economics to demography and from health to ideology. There are two main models of Neolithic spread. The demic model assumes that the Neolithic spread mainly due to the diffusion of farming populations, whereas the cultural model considers that it was essentially due to transmission of cultural traits (domesticates and knowledge) from farmers to hunter-gatherers (without substantial diffusion of farmers themselves). Here we estimate the spread rate of the Neolithic transition in eastern and southeastern Asia, using Early Neolithic dates of 201 archaeological sites with domesticated rice (*Oryza sativa*). We show that domesticated rice, a staple Neolithic crop in eastern and southeastern Asia, spread at a rate of 0.72–0.92 km/yr (95 % confidence level). Comparing these results to the predictions of a demic-cultural model implies that demic diffusion explains more than 76 % of the spread observed rate, whereas cultural diffusion played a secondary role.

Keywords: Domesticated rice | Spread rate | Demic diffusion | Cultural diffusion

Religion

DRIMBE 2019

Amiel Drimbe, ‘*The Broken Bread Scattered Upon the Mountains*’, *Antioch and the Didache*. [unknown \(2019\), preprint, 1–20](#).

I suggest this condensed approach is sufficient to hint that the region of Syria, in general, and Antioch, in particular, are probable candidates for the place of provenance of the Didache’s composition. Admittedly, few of the arguments adduced here are convincing in themselves, as some of them fit other locations as well. However, taken together, these arguments create a coherent picture that makes Antioch the most probable candidate. Compared to other possible locations, the cumulative evidence for the capital of Syria is far superior.