

References

Anthropologie

PRANG 2019

Thomas Cody Prang, *The African ape-like foot of *Ardipithecus ramidus* and its implications for the origin of bipedalism*. [eLife 8 \(2019\), e44433](#).
[eLife08-e44433-Supplement.zip](#)

The ancestral condition from which humans evolved is critical for understanding the adaptive origin of bipedal locomotion. The 4.4 million-year-old hominin partial skeleton attributed to *Ardipithecus ramidus* preserves a foot that purportedly shares morphometric affinities with monkeys, but this interpretation remains controversial. Here I show that the foot of *Ar. ramidus* is most similar to living chimpanzee and gorilla species among a large sample of anthropoid primates. The foot morphology of *Ar. ramidus* suggests that the evolutionary precursor of hominin bipedalism was African ape-like terrestrial quadrupedalism and climbing. The elongation of the midfoot and phalangeal reduction in *Ar. ramidus* relative to the African apes is consistent with hypotheses of increased propulsive capabilities associated with an early form of bipedalism. This study provides evidence that the modern human foot was derived from an ancestral form adapted to terrestrial plantigrade quadrupedalism.

PRANG 2021

Thomas C. Prang, Kristen Ramirez, Mark Grabowski & Scott A. Williams, *Ardipithecus hand provides evidence that humans and chimpanzees evolved from an ancestor with suspensory adaptations*. [Science Advances 7 \(2021\), eabf2474](#). DOI:10.1126/sciadv.abf2474.
[SciAdv07-eabf2474-Supplement.pdf](#)

The morphology and positional behavior of the last common ancestor of humans and chimpanzees are critical for understanding the evolution of bipedalism. Early 20th century anatomical research supported the view that humans evolved from a suspensory ancestor bearing some resemblance to apes. However, the hand of the 4.4- million-year-old hominin *Ardipithecus ramidus* purportedly provides evidence that the hominin hand was derived from a more generalized form. Here, we use morphometric and phylogenetic comparative methods to show that *Ardipithecus* retains suspensory adapted hand morphologies shared with chimpanzees and bonobos. We identify an evolutionary shift in hand morphology between *Ardipithecus* and *Australopithecus* that renews questions about the coevolution of hominin manipulative capabilities and obligate bipedalism initially proposed by Darwin. Overall, our results suggest that early hominins evolved from an ancestor with a varied positional repertoire including suspension and vertical climbing, directly affecting the viable range of hypotheses for the origin of our lineage.

PRANG 2022

Thomas C. Prang, *New analyses of the *Ardipithecus ramidus* foot provide additional evidence of its African ape-like affinities, A reply to Chaney et al. (2021)*. [Journal of Human Evolution 164 \(2022\), 103135, 1–7](#).

JHumEvo164-a103135-Supplement.pdf

It is possible that the LCA lacked adaptations for terrestrial quadrupedalism, vertical climbing, and suspension and that Pan and Gorilla evolved all of their distinctive, shared locomotor features independently. However, such an extraordinary claim is directly contradicted by the body size and functional morphology of *Ar. ramidus*, which are definitively unlike those of any above-branch quadrupedal cercopithecoid, platyrrhine, or early Miocene hominoid. Although the morphology of *Ar. ramidus* strongly supports the hypothesis that humans evolved from an ancestor with African ape-like hands and feet, future analyses focusing on other anatomical regions will help resolve remaining questions surrounding the posture and locomotion of the last common ancestor of humans and chimpanzees.

ROKSANDIC 2022

Mirjana Roksandic, Predrag Radović, Xiu-Jie Wu & Christopher J. Bae, *Resolving the “muddle in the middle”*, *The case for Homo bodoensis sp. nov.* [Evolutionary Anthropology](#) **31** (2022), 20–29.

Recent developments in the field of palaeoanthropology necessitate the suppression of two hominin taxa and the introduction of a new species of hominins to help resolve the current nebulous state of Middle Pleistocene (Chibanian) hominin taxonomy. In particular, the poorly defined and variably understood hominin taxa *Homo heidelbergensis* (both *sensu stricto* and *sensu lato*) and *Homo rhodesiensis* need to be abandoned as they fail to reflect the full range of hominin variability in the Middle Pleistocene. Instead, we propose: (1) introduction of a new taxon, *Homo bodoensis sp. nov.*, as an early Middle Pleistocene ancestor of the *Homo sapiens* lineage, with a pan-African distribution that extends into the eastern Mediterranean (Southeast Europe and the Levant); (2) that many of the fossils from Western Europe (e.g. Sima de los Huesos) currently assigned to *H. heidelbergensis s.s.* be reassigned to *Homo neanderthalensis* to reflect the early appearance of Neanderthal derived traits in the Middle Pleistocene in the region; and (3) that the Middle Pleistocene Asian fossils, particularly from China, likely represent a different lineage altogether.

Keywords: hominin taxonomy | *Homo bodoensis* | *Homo heidelbergensis* | *Homo rhodesiensis* | Middle Pleistocene

Archäologie

DENHAM 2022

Tim Denham & Mark Donohue, *Mapping the middle ground between foragers and farmers.* [Journal of Anthropological Archaeology](#) **65** (2022), 101390, 1–13.

The terminology and definitions for farmers, foragers and those who undertake in-between subsistence strategies have attracted recurrent debate by archaeologists, anthropologists, geographers and others. These debates are plagued by semantic and conceptual confusions in terms of the definitions proffered to the ‘middle ground’ between foragers and farmers, as well as in terms of how categories are applied in the past and the present. In broad terms, perspectives diverge between considering the adoption of agriculture to be an ‘all-or-nothing’ commitment or a continuum representing various types of ‘middle ground’. A careful unpacking of data from traditional societies in Murdock’s *Ethnographic Atlas* reveals geographical structuring of the global dataset, as well as considerable differences based on local crop assemblages. In sum, agro-pastoral, cereal-based societies in Africa and Eurasia exhibit a stronger tendency with respect to subsistence dependence

on farming, while societies in North America and those reliant on root crops and arboriculture in the wet tropics tend more towards a ‘middle ground’ that incorporates aspects of farming without abandoning foraging.

Keywords: Foraging | Farming | Global distributions | Land use | Agro-pastoral | Horticulture | Arboriculture | Ethnographic Atlas | George Murdock

Bibel

BEITZEL 2022

Barry J. Beitzel, *A Sea Change? Finding the Biblical Red Sea*. [Biblical Archaeology Review 48 \(2022\), i, 60–61](#).

Given this historical and cultural context, the biblical Red Sea should not be identified exclusively with the Gulf of Aqaba. Readers and scholars alike need to take cues from the biblical text to understand the sea’s identity and location on a case-by-case basis. Although it may never be known exactly where the biblical writers understood the Exodus crossing to have taken place, it is better situated on Egypt’s eastern border—either at the Gulf of Suez or one of the reedy lakes that separated Egypt from Sinai. This traditional interpretation remains the best.

FAUST 2022

Avraham Faust & Ze’ev Safrai, *Toward a quantitative history of ancient Israel, Burials as a test case*. [Journal of Anthropological Archaeology 65 \(2022\), 101374, 1–16](#).

The southern Levant is probably the most excavated and surveyed part of the world. While many past studies have attempted to use this wealth of information, they usually focused on certain phenomena and, moreover, the data was not systematically quantified. This study presents a new, quantitative, approach to the data. We rely on two datasets: (1) the published results of salvage excavations, carried out mainly in small sites; (2) the excavations published in the New Encyclopedia of Archaeological Excavations in the Holy Land, which includes mainly central sites. These databases not only cover both large-scale excavations of major sites and salvage excavations in the countryside, but also enable a quantitative analysis which has a potential to transform our understanding of past social and demographic phenomena. To exemplify this potential, we study the proportion of burials within the different sub-sets of the databases. This broad overview reveals some drastic changes over time, including periods from which very few burials were identified (Early Bronze Age II-III, Iron Age, Middle Ages), and others in which burials comprised around half of the finds (Intermediate Bronze Age, Roman period). The paper analyzes these phenomena and highlights the potential of the data to illuminate other questions.

Keywords: Burials | “Burial Proportion” | Quantitative Analysis | Quantitative History | Southern Levant | Salvage Excavations | Settlement History

FRANK 2022

Tim Frank, *Storage and Staples in Biblical Israel*. [Biblical Archaeology Review 48 \(2022\), i, 47–47](#).

Securing and storing food was just as essential in biblical times as it is today. Across Israel, archaeologists have unearthed containers and installations used to store essential staples and foodstuffs, shedding light on everyday life in the biblical world.

Houses from the Iron Age I (1200–1000 B.C.E., before the Israelite monarchy) had greater overall storage capacity than houses from the Iron Age II (1000–586

B.C.E., during the monarchy), especially if outside storage pits are taken into account. During the Iron Age II, there were more storehouses and storage facilities that were presumably centrally administered. This indicates that there was a shift between the Iron Age I and the Iron Age II from subsistence living to more redistributive storage. Exactly how this redistributive storage was administered cannot be determined from archaeological material alone.

The constant presence of food storage among many other household activities points to a clear awareness of food security and the relative precariousness of food supply. The strong association of food storage with food preparation may also indicate at least partial control by women over the household food supply, contributing to our understanding of gender roles in the household.

MASTER 2022

Daniel M. Master, *Piece By Piece, Exploring the Origins of the Philistines*. [Biblical Archaeology Review 48 \(2022\), i, 30–39](#).

By the middle of the Iron Age, there was virtually nothing left in the material record that was distinctive to the cities of Ashkelon, Ashdod, Ekron, and Gath—and nothing that would have been recognized as “Philistine” by those earlier migrants from the 12th century.

Amos’s connection between the Philistines and Caphtor is not something that could have been derived *de novo* in the eighth century, even with the most advanced tools in our modern toolkit. Indeed, if archaeologists and geneticists had not been able to sequence genomes from that sliver of time in the 12th and 11th centuries, no one would have caught this at all. There is no reason to suggest that this connection to Caphtor was particularly important or meaningful to Amos or Jeremiah; it hardly mattered to them from where the Philistines came. Yet someone was carefully remembering this information. As continued use of the name Ikausu suggests, the Philistines were proud of their origin, and, I would argue, they remembered the name Caphtor as well. Despite all the cultural and political changes and despite intermarriage, their shared memory retained this idea. The self-image of the eighth- and seventh-century Philistines was still rooted in a long-distant, but very real, immigrant experience that took place in the 12th century. Their memory of this event defined them as a social group from their beginning until their demise at the hand of the Babylonian king Nebuchadnezzar in 604 B.C.E. The Philistines valued their distinctive origins, and, despite the vicissitudes of the Iron Age, their memory defined who they were.

Biologie

LI 2022

Yu Li et al., *Local hyperthermia therapy induces browning of white fat and treats obesity*. [Cell \(2022\), preprint, 1–18](#).
[DOI:10.1016/j.cell.2022.02.004](https://doi.org/10.1016/j.cell.2022.02.004).

[Cell2022.03-Li-Supplement1.pdf](#), [Cell2022.03-Li-Supplement2.xlsx](#)

Local application of heat leads to the activation of beige fat in mice and humans, suggesting a novel approach to counter obesity.

Highlights:

- Local hyperthermia therapy (LHT) induces thermogenesis in mouse and human adipocytes
- HSF1 is indispensable for the effects of chronic LHT against obesity in mice
- HNRNPA2B1 acts downstream of HSF1 to enhance stability of metabolic gene transcripts

- A human HSF1 variant improves HNRNPA2B1 expression and measures of beige fat function

Beige fat plays key roles in the regulation of systemic energy homeostasis; however, detailed mechanisms and safe strategy for its activation remain elusive. In this study, we discovered that local hyperthermia therapy (LHT) targeting beige fat promoted its activation in humans and mice. LHT achieved using a hydrogel-based photothermal therapy activated beige fat, preventing and treating obesity in mice without adverse effects. HSF1 is required for the effects since HSF1 deficiency blunted the metabolic benefits of LHT. HSF1 regulates Hnrnpa2b1 (A2b1) transcription, leading to increased mRNA stability of key metabolic genes. Importantly, analysis of human association studies followed by functional analysis revealed that the HSF1 gain-of-function variant p.P365T is associated with improved metabolic performance in humans and increased A2b1 transcription in mice and cells. Overall, we demonstrate that LHT offers a promising strategy against obesity by inducing beige fat activation via HSF1-A2B1 transcriptional axis.

Yu Li, Dongmei Wang, Xiaodan Ping, Yankang Zhang, Ting Zhang, Li Wang, Li Jin, Wenjun Zhao, Mingwei Guo, Fei Shen, Meiyao Meng, Xin Chen, Ying Zheng, Jiqui Wang, Dali Li, Qiang Zhang, Cheng Hu, Lingyan Xu & Xinran Ma

WOLFRUM 2022

Christian Wolfrum & Zachary Gerhart-Hines, *Fueling the fire of adipose thermogenesis*. [science](#) **375** (2022), 1229–1231.

Specialized fat tissue generates heat and holds the potential to counter metabolic diseases.

Whether the health benefits of adipose thermogenesis can be transformed into widespread therapeutic application to counteract metabolic diseases remains unclear. Increasing adipocyte energy expenditure in an older, obese, and diabetic target population poses challenges for recruiting enough thermogenic adipose tissue, which functionally decreases with age and metabolic disruption. Furthermore, thermogenic pharmacotherapies must avoid safety risks, such as excessive increases in heart rate, blood pressure, and body temperature. In addition, activating macronutrient consumption and oxidation by brown and beige adipocytes would likely require pairing with an appetite suppressant, such as glucagon-like peptide 1 receptor agonists, to prevent homeostatic food intake compensation.

Datierung

DAUGBJERG 2022

Thomas Schröder Daugbjerg, Achim Lichtenberger, Alf Lindroos, Rubina Raja & Jesper Olsen, *Revisiting radiocarbon dating of lime mortar and lime plaster from Jerash in Jordan, Sample preparation by stepwise injection of diluted phosphoric acid*. [Journal of Archaeological Science: Reports](#) **41** (2022), 103244, 1–19.

Ancient Gerasa (its Greco-Roman name)/Islamic Jerash (its later Arab name) is one of the most well-known premodern urban sites in northern Jordan, which flourished throughout antiquity and into the early Islamic period. Direct dating of mortar and plaster in Jerash is challenging due to the area's abundance of geological carbonates that hamper the use of radiocarbon mortar methodologies as shown by previous attempts. Therefore, this study revisited the important problem of Jerash mortar dating. The aim was to advance solutions to the challenges with geological carbonates through sample pre-treatment and preparation methods such as wet sieving, sedimentation, cryo2sonic and stepwise injection of diluted acid. To

characterize the samples we used alkalinity screening and cathodoluminescence microscopy. Ten plaster samples from an Umayyad house, destroyed by the earthquake in 749 CE, in Jerash were radiocarbon dated. These produced 12 conclusive dates out of 20 attempted datings, and here some samples had multiple attempted datings. These dates confirmed the early Islamic date of the house structure, while some samples suggested reuse of older material. Five comparative mortar samples from medieval Finland and Sweden critically evaluated the methodology proposed in this article. These have known ages, and they produced five conclusive dates that compared accurately with the expected ages. Compared to previous attempts at Jerash mortar dating, this study made substantial contributions to Jerash mortar dating.

Keywords: Jerash | Mortar dating | Plaster dating | Radiocarbon dating | Step-wise injection | Cathodoluminescence

Energie

HILL 2022

Jason Hill, *The sobering truth about corn ethanol*. [PNAS 119 \(2022\), e2200997119](#).

The findings of Lark et al. are all the more striking in that their estimate of GHG emissions from RFS2 represents a floor, not a ceiling. They draw this conclusion from observations of changes in farming that occurred in the United States, but there are other major emissions sources they did not explore that, when accounted for, only add to the emissions attributable to corn ethanol. Lark et al. note no fewer than three such sources: 1) greater production of nitrogen fertilizers, which are derived from fossil fuels; 2) international land use change, such as when farmers in other countries convert forests and grasslands to agriculture in response to higher commodity prices; and 3) the fuel market rebound effect, which is an overall rise in fuel consumption in response to greater fuel supply. Other studies have indicated that emissions from these sources can be substantial in their contribution to total biofuel emissions.

LARK 2022

Tyler J. Lark et al., *Environmental outcomes of the US Renewable Fuel Standard*. [PNAS 119 \(2022\), e2101084119](#).

[pnas119-e2101084119-Supplement.pdf](#)

The Renewable Fuel Standard (RFS) specifies the use of biofuels in the United States and thereby guides nearly half of all global biofuel production, yet outcomes of this keystone climate and environmental regulation remain unclear. Here we combine econometric analyses, land use observations, and biophysical models to estimate the realized effects of the RFS in aggregate and down to the scale of individual agricultural fields across the United States. We find that the RFS increased corn prices by 30% and the prices of other crops by 20%, which, in turn, expanded US corn cultivation by 2.8 Mha (8.7%) and total cropland by 2.1 Mha (2.4%) in the years following policy enactment (2008 to 2016). These changes increased annual nationwide fertilizer use by 3 to 8%, increased water quality degradants by 3 to 5%, and caused enough domestic land use change emissions such that the carbon intensity of corn ethanol produced under the RFS is no less than gasoline and likely at least 24% higher. These tradeoffs must be weighed alongside the benefits of biofuels as decision-makers consider the future of renewable energy policies and the potential for fuels like corn ethanol to meet climate mitigation goals.

Keywords: biofuels | land use change | greenhouse gas emissions | water quality | environmental policy

Tyler J. Lark, Nathan P. Hendricks, Aaron Smith, Nicholas Pates, Seth A. Spawn-Lee, Matthew Bougie, Eric G. Booth, Christopher J. Kucharik & Holly K. Gibbs

Significance: Biofuels are included in many proposed strategies to reduce anthropogenic greenhouse gas emissions and limit the magnitude of global warming. The US Renewable Fuel Standard is the world's largest existing biofuel program, yet despite its prominence, there has been limited empirical assessment of the program's environmental outcomes. Even without considering likely international land use effects, we find that the production of corn-based ethanol in the United States has failed to meet the policy's own greenhouse gas emissions targets and negatively affected water quality, the area of land used for conservation, and other ecosystem processes. Our findings suggest that profound advances in technology and policy are still needed to achieve the intended environmental benefits of biofuel production and use.

Grabung

SNYDER 2022

Frankie Snyder & Rachel Bar-Nathan, *Proof Positive, How We Used Math to Find Herod's Palace at Baniyas*. [Biblical Archaeology Review 48 \(2022\), i, 52–58](#).

Archaeology and mathematics may have identified a forgotten palace of Herod the Great at Baniyas (ancient Caesarea Philippi). The marvelous floor design that once decorated an early Roman monumental structure at the site has parallels in other Herodian palaces. Explore the similarities and learn about the ingenious step-by-step reconstruction that made the identification possible.

Islam

AL-JALLAD 2022

Ahmad Al-Jallad, *Jesus in Arabia, Tracing the Spread of Christianity into the Desert*. [Biblical Archaeology Review 48 \(2022\), i, 40–46](#).

Our project may have found the earliest reference to Christian belief among the ancient Arabs. Likely dating to the fourth century, a desert inscription written in a peculiar script appears to invoke the name of Jesus. What does this unique text reveal about Christianity's first spread to the Arabian tribes?

Isotope

SMITH 2022

Tanya M. Smith, Christine Austin, Janaína N. Ávila, Wendy Dirks, Daniel R. Green, Ian S. Williams & Manish Arora, *Permanent signatures of birth and nursing initiation are chemically recorded in teeth*. [Journal of Archaeological Science 140 \(2022\), 105564, 1–12](#).

JAS140-a105564-Supplement.pdf

In 2013 we presented a model for identifying nursing behavior from primate teeth based on rapid postnatal concentration changes in the non-essential trace element barium. Here we leverage the permanent neonatal (birth) line in the enamel

of several dozen primate M1 cusps to compare pre- and postnatal trends in barium, zinc, strontium, and oxygen, as each element is believed to evince developmental patterning. Barium and zinc are the most consistent biomarkers of nursing initiation; a majority of M1 cusps shows concentration increases from prenatal to postnatal enamel, whereas strontium shows decreases or no change with similar frequency. Exceptions to the pattern of barium increase occurred in cusps that had been mineralizing for less than three weeks, suggesting that subsequent enamel maturation has only a minor impact on detecting real time events. Oxygen isotope compositions (d18O) show rapid and marked fluctuations ($\approx 1-2\%$) within two weeks of birth in 93% of M1 cusps ($n = 27/29$). This is likely due to measurements of hypomineralized perinatal enamel and physiological changes in the body water of newborn infants. Ongoing work integrating elemental concentration gradients with isotopic variation will help establish the degree to which milk intake may cause elevated d18O in teeth. We show that chemical identification of pre-to postnatal transitions may be robust to slight planar deviations that commonly obscure growth increments under light microscopy, and could help validate the identification of potential neonatal lines, making this approach a useful complement to bioarchaeological studies and public health investigations.

Keywords: Trace element | Barium | Strontium | Zinc | Oxygen isotope | Dental development | Neonatal line | Weaning

Kultur

CRUZ Y CELIS PENICHE 2022

Patricio Cruz y Celis Peniche, *Drivers of insect consumption across human populations*. [Evolutionary Anthropology 31 \(2022\), 45–59](#).

Discussions regarding entomophagy in humans have been typically led by entomologists. While anthropologists devote much time to understanding diverse human subsistence practices, historical and cultural variation in insect consumption remains largely unexplained. This review explores the relation between variable ecologies, subsistence strategies, and social norms on insect consumption patterns across past and contemporary human populations. Ecological factors, such as the nutritional contribution of edible insects relative to those of other foraged or farmed resources available, may help explain variation in their consumption. Additionally, our evolved social learning strategies may help propagate social norms that prohibit or prioritize the consumption of some or all edible insects, independent of their profitability. By adopting a behavioral ecological and cultural evolutionary approach, this review aims to resolve current debates on insect consumption and provide directions for future research.

Keywords: cultural evolution | diet breadth model | edible insects | entomophagy | food taboos

Methoden

MICKEL 2022

Allison Mickel, *Silent Labor, Dig Workers in the Middle East*. [Biblical Archaeology Review 48 \(2022\), i, 18–20](#).

Story or Book

MAEIR 2022

Aren M. Maeir, *Pig Taboo in History*. [Biblical Archaeology Review 48 \(2022\), i, 26–28](#).

This is an excellent book on a very complex topic. It is well structured and easy to read. Let me offer just a few critical comments.

Evolution of a Taboo, Pigs and People in the Ancient Near East. By Max D. Price. (Oxford: Oxford Univ. Press, 2020), xxii + 312 pp., 19 figures (maps, graphs, plans, drawings, photos), \$34.95 (hardcover)

Price dates the textual codification of the Israelite/Judahite pig taboo to the eighth or seventh century in Judah, based on a late Iron Age dating for the Deuteronomist and Priestly sources in the Bible. However, since the dating of these sources is highly debated, it is somewhat precarious to use it as a central argument in the formation of the taboo.

Although I do not agree with the author's every statement, this book will certainly establish itself as the basic text on this important topic for many years to come.