References

Aktuell

O'Callaghan 2023

> Jonathan O'Callaghan, *This Is What Earth Will Look Like In 250 Million Years.* nature **622** (2023), 20.
>
> Only a fraction of the planet's surface will be habitable to mammals when the next supercontinent forms.

Altpaläolithikum

Barham 2023

> L. Barham, G. A. T. Duller, I. Candy, C. Scott, J. R. Peterson & V. Rots et al., *Evidence for the earliest structural use of wood at least 476,000 years ago.* nature **622** (2023), 107–111.
>
> n622-0107-Supplement.pdf
>
> Wood artefacts rarely survive from the Early Stone Age since they require exceptional conditions for preservation; consequently, we have limited information about when and how hominins used this basic raw material1. We report here on the earliest evidence for structural use of wood in the archaeological record. Waterlogged deposits at the archaeological site of Kalambo Falls, Zambia, dated by luminescence to at least 476 ± 23 kyr ago (ka), preserved two interlocking logs joined transversely by an intentionally cut notch. This construction has no known parallels in the African or Eurasian Palaeolithic. The earliest known wood artefact is a fragment of polished plank from the Acheulean site of Gesher Benot Ya'aqov, Israel, more than 780 ka (refs. 2,3). Wooden tools for foraging and hunting appear 400 ka in Europe4–8, China9 and possibly Africa10. At Kalambo we also recovered four wood tools from 390 ka to 324 ka, including a wedge, digging stick, cut log and notched branch. The inds show an unexpected early diversity of forms and the capacity to shape tree trunks into large combined structures. These new data not only extend the age range of woodworking in Africa but expand our understanding of the technical cognition of early hominins11, forcing re-examination of the use of trees in the history of technology12,13.
>
> L. Barham, G. A. T. Duller, I. Candy, C. Scott, C. R. Cartwright, J. R. Peterson, C. Kabukcu, M. S. Chapot, F. Melia, V. Rots, N. George, N. Taipale, P. Gethin & P. Nkombwe

Milks 2023

> Annemieke Milks, *Hominins built with wood 476,000 years ago.* nature **622** (2023), 34–36.
>
> Understanding the timeline of technological developments sheds light on early societies. A remarkable finding in Africa of a structure made from shaped wood provides clues about our hominin relatives.

Amerika

PERIPATO 2023

Vinicius Peripato et al., *More than 10,000 pre-Columbian earthworks are still hidden throughout Amazonia.* science **382** (2023), 103–109.

s382-0103-Supplement.pdf

Indigenous societies are known to have occupied the Amazon basin for more than 12,000 years, but the scale of their influence on Amazonian forests remains uncertain. We report the discovery, using LIDAR (light detection and ranging) information from across the basin, of 24 previously undetected pre-Columbian earthworks beneath the forest canopy. Modeled distribution and abundance of large-scale archaeological sites across Amazonia suggest that between 10,272 and 23,648 sites remain to be discovered and that most will be found in the southwest. We also identified 53 domesticated tree species significantly associated with earthwork occurrence probability, likely suggesting past management practices. Closed-canopy forests across Amazonia are likely to contain thousands of undiscovered archaeological sites around which pre-Columbian societies actively modified forests, a discovery that opens opportunities for better understanding the magnitude of ancient human influence on Amazonia and its current state.

PHILIPPSEN 2023

Bente Philippsen, *Dating the arrival of humans in the Americas.* science **382** (2023), 36–37.

PIGATI 2023

Jeffrey S. Pigati & Kathleen B. Springer et al., *Independent age estimates resolve the controversy of ancient human footprints at White Sands.* science **382** (2023), 73–75.

s382-0073-Supplement.pdf

Human footprints at White Sands National Park, New Mexico, USA, reportedly date to between ≈23,000 and 21,000 years ago according to radiocarbon dating of seeds from the aquatic plant Ruppia cirrhosa. These ages remain controversial because of potential old carbon reservoir effects that could compromise their accuracy. We present new calibrated 14C ages of terrestrial pollen collected from the same stratigraphic horizons as those of the Ruppia seeds, along with optically stimulated luminescence ages of sediments from within the human footprint–bearing sequence, to evaluate the veracity of the seed ages. The results show that the chronologic framework originally established for the White Sands footprints is robust and reaffirm that humans were present in North America during the Last Glacial Maximum.

Jeffrey S. Pigati, Kathleen B. Springer, Jeffrey S. Honke, David Wahl, Marie R. Champagne, Susan R. H. Zimmerman, Harrison J. Gray, Vincent L. Santucci, Daniel Odess, David Bustos & Matthew R. Bennett

Anthropologie

WANG 2023

Ke Wang & Johannes Krause et al., *High-coverage genome of the Tyrolean Iceman reveals unusually high Anatolian farmer ancestry.* Cell Genomics **3** (2023), 100377, 1–18.

The Tyrolean Iceman is known as one of the oldest human glaciermummies, directly dated to 3350–3120 calibrated BCE. A previously published low-coverage genome provided novel insights into European prehistory, despite high present-day DNA contamination. Here, we generate a high-coverage genome with low contamination (15.33) to gain further insights into the genetic history and phenotype of this individual. Contrary to previous studies, we found no detectable Steppe-related ancestry in the Iceman. Instead, he retained the highest Anatolian-farmer-related ancestry among contemporaneous European populations, indicating a rather isolated Alpine population with limited gene flow from hunter-gatherer-ancestry-related populations. Phenotypic analysis revealed that the Iceman likely had darker skin than present-day Europeans and carried risk alleles associated with male-pattern baldness, type 2 diabetes, and obesity-related metabolic syndrome. These results corroborate phenotypic observations of the preserved mummified body, such as high pigmentation of his skin and the absence of hair on his head.

Highlights:
- High-coverage genome of the Iceman
- Unusually high Anatolian-farmer-related ancestry
- Dark skin and likely bald

In brief: Wang et al. reported a newly generated high-coverage genome of the Tyrolean Iceman and revealed his unusually high Anatolian-farmer-related ancestry as well as his potential male-pattern baldness and high levels of skin pigmentation.

Ke Wang, Kay Prüfer, Ben Krause-Kyora, Ainash Childebayeva, Verena J. Schuenemann, Valentina Coia, Frank Maixner, Albert Zink, Stephan Schiffels & Johannes Krause

Bibel

KNOHL 2004

Israel Knohl, *Cain, The Forefather of Humanity.* In: CHAIM COHEN, AVI HURVITZ & SHALOM M. PAUL (Hrsg.), *Sefer Moshe, The Moshe Weinfeld Jubilee Volume.* Studies in the Bible and the Ancient Near East, Qumran, and Post-Biblical Judaism (Winona Lake 2004), 63–67.

The traditions of J and P regarding the first human generations were incompatible. Even if one ignores the sharp difference in the depiction of humanity, there still is a factual disagreement: according to P, Adam's firstborn was Seth, and Noah was a descendant of Seth. However, according to our reconstruction of the J tradition, Cain was Adam's firstborn, and Noah was a descendant of Cain. The final redactors of the Pentateuch, who had to put together diverse ancient traditions, found a way to resolve the disagreement between the two traditions. Since they belonged to a priestly school, they adopted the priestly view that Noah was a descendant of Seth. In order to sever the genealogical connection between Cain and Noah, they transferred the description of Noah's birth and naming from the original ending of J's Cainite dynasty to P's Semite genealogy (Gen 5:28). In place of it, the editors inserted the story about the naming of Seth (Gen 4:25). This story presents Seth as the son who was born to Adam after the murder of Abel by Cain, harmonizing the two different traditions in this way.

The final result is the present portrayal in the Bible: a polarization of the dynasty of Cain and the dynasty of Seth. Seth and his descendants are the "sons of light", and Cain and his descendants are the "sons of darkness". This picture is typical of the priestly dualistic conception.

K N O H L 2016

Israel Knohl, *The Original Version of Deborah's Song, and its Numerical Structure.* Vetus Testamentum **66** (2016), 45–65.

The Song of Deborah (Jud 5:2-31a) is one of the Biblical texts that has been most thoroughly analyzed. In this article I wish to present a new solution to some of the basic issues relating to the song. My hypothesis is based on exegetical and historical insights that can shed light on the process of editing and sculpting that the song underwent. A distinction between the original poem and editorial additions may, in my opinion, help solve some of the major problems in our understanding of the poem and its thematic coherence. Once the kernel of the text is isolated and the editorial additions are peeled away, the original song text is revealed, which is based on a clear and elaborate numerical structure.

Keywords: The song of Deborah | numerical structure

Klima

F A G A N 2021

Brian M. Fagan & Nadia Durrani, *Climate Chaos, Lessons on survival from our ancestors.* (New York 2021).

Man-made climate change may have began in the last two hundred years, but humankind has witnessed many eras of climate instability. The Results have not always been pretty: once-mighty civilizations felled by pestilence and glacial melt and drought. But we have one powerful advantage as we face our current crisis: history. The study of ancient climates has advanced tremendously in the past ten years, to the point where we can now reconstruct seasonal weather going back thousands of years, and see just how civilizations and nature interacted. The lesson is clear: the societies that survive are the ones that plan ahead. Climate Chaos is thus a book about saving ourselves. Brian Fagan and Nadia Durrani show in remarkable detail what it was like to battle our climate over centuries, and offer us a path to safer and healthier future.

L I 2023

Feng Li, Paul A. Newman & Darryn W. Waugh, *Impacts of Stratospheric Ozone Recovery on Southern Ocean Temperature and Heat Budget.* Geophysical Research Letters (2023), preprint, 1–9. DOI:10.1029/2023GL103951.

GeoResLet2023.10-Li-Supplement.pdf

The impacts of stratospheric ozone recovery on Southern Ocean surface and interior temperature, heat content, heat uptake, and heat transport are investigated by contrasting two ensemble chemistry-climate model simulations in 2005–2099: one with fixed ozone depleting substances (ODSs) and another with decreasing ODSs. In our simulations ozone recovery significantly affects Southern Ocean temperature, with large latitudinal and vertical variations. Ozone recovery causes a dipole change of the full-depth ocean heat content (OHC) with an increase south of 60°S and a decrease between 45°S and 60°S. Integrated over latitudes south of 40°S, OHC decreases in response to ozone recovery. This ocean heat loss is shown to be driven by weakened poleward ocean heat transport (OHT) across 40°S, which is partly canceled by enhanced heat uptake. The weakening of poleward OHT into the Southern Ocean is caused by the ozone-induced equatorward shift of the meridional overturning circulation.

Plain Language Summary With the phaseout of ozone depleting substances as controlled under the Montreal Protocol and its amendments, the stratospheric

ozone layer is projected to recover to the pre-ozone hole levels in this century. Stratospheric ozone recovery can influence temperature and circulation in the atmosphere and ocean. Here we study how stratospheric ozone recovery affects Southern Ocean temperature and heat content using a coupled atmosphere-ocean-chemistry model. The strong surface westerlies over the Southern Ocean play a crucial role in ocean circulation and climate. We find that ozone recovery influences Southern Ocean through its impact on the surface westerlies. Our model results show that ozone recovery causes a weakening and equatorward shift of the strong westerlies over the Southern Ocean. As a result, the ocean circulation in the Southern Ocean weakens, leading to a weaker poleward heat transport from the lower latitude into the Southern Ocean. A weaker heat transport results in Southern Ocean cooling and a decrease of the Southern OHC.

Martin 2023

Peter E. Martin, Francis A. Macdonald, Nadine McQuarrie, Rebecca M. Flowers & Pierre J. Y. Maffre, *The rise of New Guinea and the fall of Neogene global temperatures.* PNAS **120** (2023), e2306492120.

pnas120-e2306492120-Supplement1.pdf, pnas120-e2306492120-Supplement2.xlsx, pnas120-e2306492120-Supplement3.xlsx, pnas120-e2306492120-Supplement4.xlsx, pnas120-e2306492120-Supplement5.mp4, pnas120-e2306492120-Supplement6.mp4

The ≈2,000-km-long Central Range of New Guinea is a hotspot of modern carbon sequestration due to the chemical weathering of igneous rocks with steep topography in the warm wet tropics. These high mountains formed in a collision between the Australian plate and ophiolite- bearing volcanic arc terranes, but poor resolution of the uplift and exhumation history has precluded assessments of the impact on global climate change. Here, we develop a palinspastic reconstruction of the Central Range orogen with existing surface geological constraints and seismic data to generate time–temperature paths and estimate volumes of eroded material. New (U-Th)/He thermochronology data reveal rapid uplift and regional denudation between 10 and 6 Mya. Erosion luxes from the palinspastic reconstruction, calibrated for time with the thermochronological data, were used as input to a coupled global climate and weathering model. This model estimates 0.6 to 1.2 °C of cooling associated with the Late Miocene rise of New Guinea due to increased silicate weathering alone, and this CO_2 sink continues to the present. Our data and modeling experiments support the hypothesis that tropical arc-continent collision and the rise of New Guinea contributed to Neogene cooling due to increased silicate weathering.

Keywords: silicate weathering | ophiolites | thermochronology | New Guinea | Miocene

Significance: The Earth's climate has cooled by 5 to 10 °C over the past 15 My, but it is unknown whether this interval of geological climate change is due predominantly to a decrease in CO_2 sources through volcanic outgassing or an increase in global weatherability and CO_2 sinks. New thermochronology data and a coupled weathering- climate model estimate that mountain building in New Guinea from 10 to 6 Ma increased carbon sinks and consumed the CO_2 equivalent of 0.6 to 1.2 °C, contributing to Neogene global cooling.

Rentschler 2023

Jun Rentschler, Paolo Avner, Mattia Marconcini, Rui Su, Emanuele Strano, Michalis Vousdoukas & Stéphane Hallegatte, *Global evidence of rapid urban growth in flood zones since 1985.* nature **622** (2023), 87–92.

Disaster losses are increasing and evidence is mounting that climate change is driving up the probability of extreme natural shocks1–3. Yet it has also proved politically expedient to invoke climate change as an exogenous force that supposedly places disasters beyond the inluence of local and national authorities4,5. However, locally determined patterns of urbanization and spatial development are key factors to the exposure and vulnerability of people to climatic shocks6. Using high-resolution annual data, this study shows that, since 1985, human settlements around the world—from villages to megacities—have expanded continuously and rapidly into present-day lood zones. In many regions, growth in the most hazardous lood zones is outpacing growth in non-exposed zones by a large margin, particularly in East Asia, where high-hazard settlements have expanded 60 % faster than lood-safe settlements. These results provide systematic evidence of a divergence in the exposure of countries to lood hazards. Instead of adapting their exposure, many countries continue to actively amplify their exposure to increasingly frequent climatic shocks.

Kultur

Wan 2023

Sirui Wan, Fani Lauermann, Drew H. Bailey & Jacquelynne S. Eccles, *Girls' comparative advantage in language arts explains little of the gender gap in math- related fields*, *A replication and extension.* PNAS **120** (2023), e2305629120.

Women remain underrepresented in most math- intensive ields. [Breda and Napp, Proc. Natl. Acad. Sci. U.S.A. 116, 15435 (2019)] reported that girls' comparative advantage in reading over math (i.e., the intraindividual diferences between girls' reading vs. math performance, compared to such diferences for boys) could explain up to 80 % of the gender gap in students' intentions to pursue math- intensive studies and careers, in conlict with indings from previous research. We conducted a conceptual replication and expanded upon Breda and Napp's study by using new global data (PISA2018, N = 466,165) and a recent US nationally representative longitudinal study (High School Longitudinal Study of 2009, N = 6,560). We coded students' intended majors and careers and their actual college majors. The difference between a student's math vs. reading performance explained only small proportions of the gender gap in students' intentions to pursue math- intensive ields (0.4 to 10.2 %) and in their enrollment in math- intensive college majors (12.3 %). Consistent with previous studies, our indings suggest girls' comparative advantage in reading explains a minority of the gender gap in math- related majors and occupational intentions and choices. Potential reasons for diferences in the estimated efect sizes include diferences in the operationalization of math- related choices, the operationalization of math and reading performance, and possibly the timing of measuring intentions and choices. Therefore, it seems premature to conclude that girls' comparative advantage in reading, rather than the cumulative efects of other structural and/or psychological factors, can largely explain the persistent gender gap in math- intensive educational and career choices.

Keywords: gender gap | math- intensive ields | career choice | STEM diversity

Mittelpaläolithikum

Russo 2023

Gabriele Russo et al., *First direct evidence of lion hunting and the early use of a lion pelt by Neanderthals.* Scientific Reports **13** (2023), 16405. DOI:10.1038/s41598-023-42764-0.

SciRep13-16405-Supplement.pdf

During the Upper Paleolithic, lions become an important theme in Paleolithic art and are more frequent in anthropogenic faunal assemblages. (owever, the relationship between hominins and lions in earlier periods is poorly known and primarily interpreted as interspecies competition. (ere we present new evidence for Neanderthal-cave lion interactions during the Middle Paleolithic. We report new evidence of hunting lesions on the , old cave lion skeleton found at Siegsdorf Germany that attest to the earliest direct instance of a large predator kill in human history. A comparative analysis of a partial puncture to a rib suggests that the fatal stab was delivered with a wooden thrusting spear. We also present the discovery of distal lion phalanges at least , old from Einhornhöhle Germany , representing the earliest example of the use of cave lion skin by Neanderthals in Central Europe. Our study provides novel evidence on a new dimension of Neanderthal behavioral complexity.

Gabriele Russo, Annemieke Milks, Dirk Leder, Tim Koddenberg, Britt M. Starkovich, M. Duval, J.-X. Zhao, Robert Darga, Wilfried Rosendahl, Thomas Terberger

Religion

Wolkstein 1983

Diane Wolkstein, Samuel Noah Kramer & Elizabeth Williams-Forte, *Inanna, Queen of heaven and earth – her stories and hymns from Sumer.* (New York 1983).

Sprachlehre

Cappelli 1899

Adriano Cappelli, *Lexicon Abbreviaturarum, quae in lapidus, codicibus et chartis praesertim medii-aevi occurrunt.* Manuali Hoepli (Milan 1899).