Liste erstellt am 2020-03-06

References

Aktuell

von Fabeck 2020

Wolf von Fabeck, *Klimakatastrophe, Lobbyisten der fossilen Wirtschaft bagatellisieren die Warnungen des Weltklimarats IPCC.* unknown (2020), preprint, 1–5. .

Mit Gründung des IPCC im Jahr 1988 durch die Weltorganisation für Meteorologie und das Umweltprogramm der Vereinten Nationen erlangte der IPCC ein weltweites Quasi-Informationsmonopol in Klimafragen. Diese Aufwertung des IPCC wird, wie sich zunehmend herausstellt, durch die Fossilwirtschaft zur Bagatellisierung der Klimawarnungen missbraucht. Bagatellisierte Klimawarnungen bewirken eine Vernachlässigung des Klimaschutzes bei internationalen und nationalen politischen Entscheidungen. Vernachlässigung des Klimaschutzes – gleichgültig in welchem Land – lässt der Klimakatastrophe ihren Lauf und verletzt damit das Grundrecht auf Leben und körperliche Unversehrtheit und weitere Grundrechte in Deutschland

Kozowyk 2020

Paul R. B. Kozowyk, Geeske H. J. Langejans, Gerrit L. Dusseldorp & Marcel J. L. Th. Niekus, *Interpretation of Paleolithic adhesive production: Combining experimental and paleoenvironmental information, Reply to Schmidt et al.* PNAS **117** (2020), 4458–4459.

We agree that intuition cannot solve debates about Paleolithic tar production. Only through rigorous experimentation (3), uniform methods of analysis (8), and consideration of contextual information (4) can we get a better handle on the past.

Schmidt 2020

Patrick Schmidt, Maxime Rageot, Matthias Blessing & Claudio Tennie, *The Zandmotor data do not resolve the question whether Middle Paleolithic birch tar making was complex or not.* PNAS **117** (2020), 4456–4457.

Data presented in Niekus et al. (1) are explainable by different techniques and do not allow pinpointing of the complexity of Paleolithic tar making. We cannot rely on intuition or measures of effectiveness (1) to solve such debates.

Altpaläolithikum

Semaw 2020

Sileshi Semaw et al., *Co-occurrence of Acheulian and Oldowan artifacts with Homo erectus cranial fossils from Gona, Afar, Ethiopia.* Science Advances **6** (2020), eaaw4694. DOI:10.1126/sciadv.aaw4694.

SciAdv06-eaaw4694-Supplement.pdf

Although stone tools generally co-occur with early members of the genus Homo, they are rarely found in direct association with hominins. We report that both

Acheulian and Oldowan artifacts and Homo erectus crania were found in close association at 1.26 million years (Ma) ago at Busidima North (BSN12), and ca. 1.6 to 1.5 Ma ago at Dana Aoule North (DAN5) archaeological sites at Gona, Afar, Ethiopia. The BSN12 partial cranium is robust and large, while the DAN5 cranium is smaller and more gracile, suggesting that H. erectus was probably a sexually dimorphic species. The evidence from Gona shows behavioral diversity and flexibility with a lengthy and concurrent use of both stone technologies by H. erectus, confounding a simple "single species/single technology" view of early Homo.

Sileshi Semaw, Michael J. Rogers, Scott W. Simpson, Naomi E. Levin, Jay Quade, Nelia Dunbar, William C. McIntosh, Isabel Cáceres, Gary E. Stinchcomb, Ralph L. Holloway, Francis H. Brown, Robert F. Butler, Dietrich Stout & Melanie Everett

Anthropologie

Durvasula 2020

Arun Durvasula & Sriram Sankararaman, *Recovering signals of ghost archaic introgression in African populations*. Science Advances **6** (2020), eaax5097. DOI:10.1126/sciadv.aax5097.

SciAdv06-eaax5097-Supplement.pdf

While introgression from Neanderthals and Denisovans has been documented in modern humans outside Africa, the contribution of archaic hominins to the genetic variation of present-day Africans remains poorly understood. We provide complementary lines of evidence for archaic introgression into four West African populations. Our analyses of site frequency spectra indicate that these populations derive 2 to 19 % of their genetic ancestry from an archaic population that diverged before the split of Neanderthals and modern humans. Using a method that can identify segments of archaic ancestry without the need for reference archaic genomes, we built genome-wide maps of archaic ancestry in the Yoruba and the Mende populations. Analyses of these maps reveal segments of archaic ancestry at high frequency in these populations that represent potential targets of adaptive introgression. Our results reveal the substantial contribution of archaic ancestry in shaping the gene pool of present-day West African populations.

Lichtwark 2020

Glen A. Lichtwark & Luke A. Kelly, *Ahead of the curve in the evolution of human feet*. nature **579** (2020), 31–32.

The longitudinal arch has long been considered a crucial structure that provides stiffness to the human foot. Now the transverse arch is stepping into the spotlight, with a proposed central role in the evolution of human foot stiffness.

As in other work investigating foot evolution, Venkadesan et al. focused on the amount of torsion (twist) in the fourth metatarsal bone. They estimated the curvature of the transverse arch and determined which species would probably have had sufficient curvature to induce stiffening of this arch to an extent similar to that of modern humans. For example, the authors examined the species Australopithecus afarensis. This species existed more than three million years ago, and whether it walked upright in a humanlike fashion is debated. Venkadesan et al. report that the transverse arch of A. afarensis was less curved than that of a human foot and thus, according to their model, probably less stiff.

Rogers 2020

Alan R. Rogers, Nathan S. Harris & Alan A. Achenbach, *Neanderthal-Denisovan ancestors interbred with a distantly related hominin*. Science Advances **6** (2020), eaay5483. DOI:10.1126/sciadv.aay5483.

SciAdv06-eaay5483-Supplement.pdf

Previous research has shown that modern Eurasians interbred with their Neanderthal and Denisovan predecessors. We show here that hundreds of thousands of years earlier, the ancestors of Neanderthals and Denisovans interbred with their own Eurasian predecessors—members of a "superarchaic" population that separated from other humans about 2 million years ago. The superarchaic population was large, with an effective size between 20 and 50 thousand individuals. We confirm previous findings that (i) Denisovans also interbred with superarchaics, (ii) Neanderthals and Denisovans separated early in the middle Pleistocene, (iii) their ancestors endured a bottleneck of population size, and (iv) the Neanderthal population was large at first but then declined in size. We provide qualified support for the view that (v) Neanderthals interbred with the ancestors of modern humans.

Tylén 2020

Kristian Tylén, Riccardo Fusaroli, Nicolas Fay, Niels N. Johannsen, Felix Riede & Marlize Lombard et al., *The evolution of early symbolic behavior in Homo sapiens*. PNAS **117** (2020), 4578–4584.

pnas117-04578-Supplement.pdf

How did human symbolic behavior evolve? Dating up to about 100,000 y ago, the engraved ochre and ostrich eggshell fragments from the South African Blombos Cave and Diepkloof Rock Shelter provide a unique window into presumed early symbolic traditions of Homo sapiens and how they evolved over a period of more than 30,000 y. Using the engravings as stimuli, we report five experiments which suggest that the engravings evolved adaptively, becoming better-suited for human perception and cognition. More specifically, they became more salient, memorable, reproducible, and expressive of style and human intent. However, they did not become more discriminable over time between or within the two archeological sites. Our observations provide support for an account of the Blombos and Diepkloof engravings as decorations and as socially transmitted cultural traditions. By contrast, there was no clear indication that they served as denotational symbolic signs. Our findings have broad implications for our understanding of early symbolic communication and cognition in H. sapiens.

Keywords: symbolic behavior | human cognition | evolution | archeology

Kristian Tylén, Riccardo Fusaroli, Sergio Rojo, Katrin Heimann, Nicolas Fay, Niels N. Johannsen, Felix Riede & Marlize Lombard

Significance: Early symbolic behavior of Homo sapiens is challenging to address yet arguably fundamental to the success of our species. We used ancient engravings from the South African Blombos Cave and Diepkloof Rock Shelter in a number of controlled cognitive experiments to qualify discussions about the evolution of early symbolic traditions. We found that the engravings evolved over a period of 30,000 y to become more effective "tools for the mind," that is, more salient to the human eye, increasingly expressive of human intent and identity, and easier to reproduce from memory. Our experiments suggest that the engravings served as decorations and expressions of socially transmitted cultural traditions, while we found no clear evidence that they served as denotational symbolic signs.

Venkadesan 2020

Madhusudhan Venkadesan, Ali Yawar, Marcelo A. Dias, Mahesh M.

Bandi & Shreyas Mandre et al., *Stiffness of the human foot and evolution of the transverse arch*. nature **579** (2020), 97–100.

The stiff human foot enables an efficient push-off when walking or running, and was critical for the evolution of bipedalism1–6. The uniquely arched morphology of the human midfoot is thought to stiffen it5–9, whereas other primates have flat feet that bend severely in the midfoot7,10,11. However, the relationship between midfoot geometry and stiffness remains debated in foot biomechanics12,13, podiatry14,15 and palaeontology4–6. These debates centre on the medial longitudinal arch5,6 and have not considered whether stiffness is affected by the second, transverse tarsal arch of the human foot16. Here we show that the transverse tarsal arch, acting through the inter-metatarsal tissues, is responsible for more than 40 % of the longitudinal stiffness of the foot. The underlying principle resembles a floppy currency note that stiffens considerably when it curls transversally. We derive a dimensionless curvature parameter that governs the stiffness contribution of the transverse tarsal arch, demonstrate its predictive power using mechanical models of the foot and find its skeletal correlate in hominin feet. In the foot, the material properties of the intermetatarsal tissues and the mobility of the metatarsals may additionally influence the longitudinal stiffness of the foot and thus the curvature–stiffness relationship of the transverse tarsal arch. By analysing fossils, we track the evolution of the curvature parameter among extinct hominins and show that a human-like transverse arch was a key step in the evolution of human bipedalism that predates the genus Homo by at least 1.5 million years. This renewed understanding of the foot may improve the clinical treatment of flatfoot disorders, the design of robotic feet and the study of foot function in locomotion.

Madhusudhan Venkadesan, Ali Yawar, Carolyn M. Eng, Marcelo A. Dias, Dhiraj K. Singh, Steven M. Tommasini, Andrew H. Haims, Mahesh M. Bandi & Shreyas Mandre

Bibel

Bundvad 2020

Mette Bundvad & Kasper Siegismund (Hrsg.), *Vision, Narrative, and Wisdom in the Aramaic Texts from Qumran*, *Essays from the Copenhagen Symposium, 14–15 August, 2017*. Studies on the Texts of the Desert of Judah 131 (Leiden 2020).

Perrin 2020

Andrew B. Perrin, *Remembering the Past, Cultivating a Character, Memory and the Formation of Daniel in the Aramaic Pseudo-Daniel Texts (4Q243–244; 4Q245)*. In: Mette Bundvad & Kasper Siegismund (Hrsg.), *Vision, Narrative, and Wisdom in the Aramaic Texts from Qumran*, *Essays from the Copenhagen Symposium, 14–15 August, 2017*. Studies on the Texts of the Desert of Judah 131 (Leiden 2020), 6–30.

As is widely recognized in current scholarship on the Qumran Aramaic texts, these writings are generally oriented around either the antediluvian/ancestral past or the exilic age. This observation certainly accounts for the predominant compositional and narrative settings across the corpus. On literary grounds, Pseudo-Daniel is no exception: Daniel again finds himself on the payroll of the Babylonian court. However, in terms of the content of the materials associated with the persona of

Daniel in this exilic context, the majority of eras, episodes, and individuals included in the fragmentary remains were memories from the ancestral and national pasts. Pseudo-Daniel's recollections effectively straddled both the predominant settings of the Aramaic texts. While the work was set in the recent exilic past, a significant amount of its content and concerns were anchored in the more antiquated ancestral past, not least traditions from Genesis.

Grabung

Rybníček 2020

Michal Rybníček et al., *World's oldest dendrochronologically dated archaeological wood construction*. Journal of Archaeological Science **115** (2020), 105082, 1–6.

In 2018, during the construction of a motorway in the East Bohemian Region near the town of Ostrov (Czech Republic), archaeologists excavated a structure of a wooden water well lining with a square base area of 80 • 80 cm and 140 cm in height. Due to the excellent conservation of the oak timbers, studies of technological details and precise tree-ring dating were possible. The used trees were felled in the years 5256/55 BC, which makes this well the oldest dendrochronologically dated archaeological wooden construction worldwide. It is the third well from the Early Neolithic period that has been discovered in the Czech Republic within the last four years. The design consists of grooved corner posts with inserted planks. This type of construction reveals advanced technical know-how and, till now, is the only known type from this region and time period. Thanks to the combination of annually resolved and absolutely dated tree-ring widths (TRWs), the Czech oak TRW chronology has been significantly extended back to 5481 BC. Wood anatomical identification of fragments from the well filling show mainly oak (Quercus spp.) and hazel (Corylus spp.), indicating a local forest composition dominated by these taxa. The shape of the individual structural elements and tool marks preserved on their surface confirm sophisticated carpentry skills. Based on these observations, we established a model for the "chaine operatoire" from forest utilization to the final artefact at the beginning of the Early Neolithic period.

Keywords: Central Europe | Dendrochronology | Early Neolithic | Oak | Linear pottery culture (LBK) | Water well

Michal Rybníček, Petr Kočár, Bernhard Muigg, Jaroslav Peška, Radko Sedláček, Willy Tegel & Tomáš Kolář

Isotope

Bourgon 2020

Nicolas Bourgon et al., *Zinc isotopes in Late Pleistocene fossil teeth from a Southeast Asian cave setting preserve paleodietary information*. PNAS **117** (2020), 4675–4681.

pnas117-04675-Supplement.pdf

Stable carbon and nitrogen isotope ratios of collagen from bone and dentin have frequently been used for dietary reconstruction, but this method is limited by protein preservation. Isotopes of the trace element zinc (Zn) in bioapatite constitute a promising proxy to infer dietary information from extant and extinct vertebrates. The 66Zn/64Zn ratio (expressed as d66Zn value) shows an enrichment of the heavy isotope in mammals along each trophic step. However, preservation of diet-related d66Zn values in fossil teeth has not been assessed yet. Here, we analyzed enamel of

fossil teeth from the Late Pleistocene (38.4–13.5 ka) mammalian assemblage of the Tam Hay Marklot (THM) cave in northeastern Laos, to reconstruct the food web and assess the preservation of original d66Zn values. Distinct enamel d66Zn values of the fossil taxa (d66Zncarnivore < d66Znomnivore < d66Znherbivore) according to their expected feeding habits were observed, with a trophic carnivore-herbivore spacing of +0.60 ‰ and omnivores having intermediate values. Zn and trace element concentration profiles similar to those of modern teeth also indicate minimal impact of diagenesis on the enamel. While further work is needed to explore preservation for settings with different taphonomic conditions, the diet-related d66Zn values in fossil enamel from THM cave suggest an excellent long-term preservation potential, even under tropical conditions that are well known to be adverse for collagen preservation. Zinc isotopes could thus provide a new tool to assess the diet of fossil hominins and associated fauna, as well as trophic relationships in past food webs.

Keywords: zinc | stable isotopes | diagenesis | trophic ecology | diet

Nicolas Bourgon, Klervia Jaouen, Anne-Marie Bacon, Klaus Peter Jochum, Elise Dufour, Philippe Duringer, Jean-Luc Ponche, Renaud Joannes-Boyau, Quentin Boesch, Pierre-Olivier Antoine, Manon Hullot, Ulrike Weis, Ellen Schulz-Kornas, Manuel Trost, Denis Fiorillo, Fabrice Demeter, Elise Patole-Edoumba, Laura L. Shackelford, Tyler E. Dunn, Alexandra Zachwieja, Somoh Duangthongchit, Thongsa Sayavonkhamdy, Phonephanh Sichanthongtip, Daovee Sihanam, Viengkeo Souksavatdy, Jean-Jacques Hublin & Thomas Tütken

Significance: Dietary habits, especially meat consumption, represent a key aspect in the behavior and evolution of fossil hominin species. Here, we explore zinc (Zn) isotope ratios in tooth enamel of fossil mammals. We show discrimination between different trophic levels and demonstrate that Zn isotopes could prove useful in paleodietary studies of fossil hominin, or other mammalian species, to assess their consumption of animal versus plant resources. We also demonstrate the high preservation potential of pristine diet-related Zn isotope ratios, even under tropical conditions with poor collagen preservation, such as the studied depositional context in Southeast Asia. However, assessing the preservation of original d66Zn values is required for each fossil site as diagenesis may vary across and even within taphonomic settings.

Judentum

Kook 2013

Chanan Morrison, *Sapphire from the land of Israel, A new light on the weekly Torah portion from the writings of Rabbi Abraham Isaac HaKohen Kook.* (Mitzpe Yericho 2013).

Klima

Hubau 2020

Wannes Hubau & Simon L. Lewis et al., *Asynchronous carbon sink saturation in African and Amazonian tropical forests.* nature **579** (2020), 80–87.

n579-0097-Supplement.pdf

Structurally intact tropical forests sequestered about half of the global terrestrial carbon uptake over the 1990s and early 2000s, removing about 15 per cent of anthropogenic carbon dioxide emissions1–3. Climate-driven vegetation models

typically predict that this tropical forest 'carbon sink' will continue for decades4,5. Here we assess trends in the carbon sink using 244 structurally intact African tropical forests spanning 11 countries, compare them with 321 published plots from Amazonia and investigate the underlying drivers of the trends. The carbon sink in live aboveground biomass in intact African tropical forests has been stable for the three decades to 2015, at 0.66 tonnes of carbon per hectare per year (95 per cent confidence interval 0.53–0.79), in contrast to the long-term decline in Amazonian forests6. Therefore the carbon sink responses of Earth's two largest expanses of tropical forest have diverged. The difference is largely driven by carbon losses from tree mortality, with no detectable multi-decadal trend in Africa and a long-term increase in Amazonia. Both continents show increasing tree growth, consistent with the expected net effect of rising atmospheric carbon dioxide and air temperature7–9. Despite the past stability of the African carbon sink, our most intensively monitored plots suggest a post-2010 increase in carbon losses, delayed compared to Amazonia, indicating asynchronous carbon sink saturation on the two continents. A statistical model including carbon dioxide, temperature, drought and forest dynamics accounts for the observed trends and indicates a long-term future decline in the African sink, whereas the Amazonian sink continues to weaken rapidly. Overall, the uptake of carbon into Earth's intact tropical forests peaked in the 1990s. Given that the global terrestrial carbon sink is increasing in size, independent observations indicating greater recent carbon uptake into the Northern Hemisphere landmass10 reinforce our conclusion that the intact tropical forest carbon sink has already peaked. This saturation and ongoing decline of the tropical forest carbon sink has consequences for policies intended to stabilize Earth's climate.

Wannes Hubau, Simon L. Lewis, Oliver L. Phillips, Kofi Affum-Baffoe, Hans Beeckman, Aida Cuní-Sanchez, Armandu K. Daniels, Corneille E. N. Ewango, Sophie Fauset, Jacques M. Mukinzi, Douglas Sheil, Bonaventure Sonké, Martin J. P. Sullivan, Terry C. H. Sunderland, Hermann Taedoumg, Sean C. Thomas, Lee J. T. White, Katharine A. Abernethy, Stephen Adu-Bredu, Christian A. Amani, Timothy R. Baker, Lindsay F. Banin, Fidèle Baya, Serge K. Begne, Amy C. Bennett, Fabrice Benedet, Robert Bitariho, Yannick E. Bocko, Pascal Boeckx, Patrick Boundja, Roel J. W. Brienen, Terry Brncic, Eric Chezeaux, George B. Chuyong, Connie J. Clark, Murray Collins, James A. Comiskey, David A. Coomes, Greta C. Dargie, Thales de Haulleville, Marie Noel Djuikouo Kamdem, Jean-Louis Doucet, Adriane Esquivel-Muelbert, Ted R. Feldpausch, Alusine Fofanah, Ernest G. Foli, Martin Gilpin, Emanuel Gloor, Christelle Gonmadje, Sylvie Gourlet-Fleury, Jefferson S. Hall, Alan C. Hamilton, David J. Harris, Terese B. Hart, Mireille B. N. Hockemba, Annette Hladik, Suspense A. Ifo, Kathryn J. Jeffery, Tommaso Jucker, Emmanuel Kasongo Yakusu, Elizabeth Kearsley, David Kenfack, Alexander Koch, Miguel E. Leal, Aurora Levesley, Jeremy A. Lindsell, Janvier Lisingo, Gabriela Lopez-Gonzalez, Jon C. Lovett, Jean-Remy Makana, Yadvinder Malhi, Andrew R. Marshall, Jim Martin, Emanuel H. Martin, Faustin M. Mbayu, Vincent P. Medjibe, Vianet Mihindou, Edward T. A. Mitchard, Sam Moore, Pantaleo K. T. Munishi, Natacha Nssi Bengone, Lucas Ojo, Fidèle Evouna Ondo, Kelvin S.-H. Peh, Georgia C. Pickavance, Axel Dalberg Poulsen, John R. Poulsen, Lan Qie, Jan Reitsma, Francesco Rovero, Michael D. Swaine, Joey Talbot, James Taplin, David M. Taylor, Duncan W. Thomas, Benjamin Toirambe, John Tshibamba Mukendi, Darlington Tuagben, Peter M. Umunay, Geertje M. F. van der Heijden, Hans Verbeeck, Jason Vleminckx, Simon Willcock, Hannsjörg Wöll, John T. Woods & Lise Zemagho

RAMMIG 2020

Anja Rammig, *Tropical carbon sinks are out of sync.* nature **579**

(2020), 38–39.

A survey of tree establishment, growth and mortality shows that the rate at which Amazonian tropical forests take up carbon dioxide has slowed since the 1990s, whereas signs of a potential slowdown in Africa appeared only in 2010.

Hubau and colleagues monitored tree establishment, growth and mortality in 244 undisturbed old-growth forest plots in Africa across 11 countries, between 1968 and 2015, and compared their data with similar measurements from 321 plots in Amazonia.

Zharkova 2019

V. V. Zharkova, S. J. Shepherd, S. I. Zharkov & E. Popova, *Oscillations of the baseline of solar magnetic field and solar irradiance on a millennial timescale*, *Retracted Article*. Scientific Reports **9** (2019), 9197. DOI:10.1038/s41598-019-45584-3.

SciRep09-09197-Retraction.pdf

Recently discovered long-term oscillations of the solar background magnetic field associated with double dynamo waves generated in inner and outer layers of the Sun indicate that the solar activity is heading in the next three decades (2019–2055) to a Modern grand minimum similar to Maunder one. On the other hand, a reconstruction of solar total irradiance suggests that since the Maunder minimum there is an increase in the cycle-averaged total solar irradiance (TSI) by a value of about 1–1.5 Wm-2 closely correlated with an increase of the baseline (average) terrestrial temperature. In order to understand these two opposite trends, we calculated the double dynamo summary curve of magnetic field variations backward one hundred thousand years allowing us to confirm strong oscillations of solar activity in regular (11 year) and recently reported grand (350–400 year) solar cycles caused by actions of the double solar dynamo. In addition, oscillations of the baseline (zero-line) of magnetic field with a period of 1950 ± 95 years (a super-grand cycle) are discovered by applying a running averaging filter to suppress large-scale oscillations of 11 year cycles. Latest minimum of the baseline oscillations is found to coincide with the grand solar minimum (the Maunder minimum) occurred before the current super-grand cycle start. Since then the baseline magnitude became slowly increasing towards its maximum at 2600 to be followed by its decrease and minimum at ≈3700. These oscillations of the baseline solar magnetic field are found associated with a long-term solar inertial motion about the barycenter of the solar system and closely linked to an increase of solar irradiance and terrestrial temperature in the past two centuries. This trend is anticipated to continue in the next six centuries that can lead to a further natural increase of the terrestrial temperature by more than 2.5 °C by 2600.

Zharkova 2020

Zharkova V. V., Shepherd S. J., Zharkov S. I. & Popova E., *Oscillations of the baseline of solar magnetic field and solar irradiance on a millennial timescale*. arXiv (2020), 2002.06550. <http://arxiv.org/pdf/2002.06550>.

Recently discovered long-term oscillations of the solar background magnetic field associated with double dynamo waves generated in inner and outer layers of the Sun indicate that the solar activity is heading in the next three decades (2019-2055) to a Modern grand minimum similar to Maunder one. On the other hand, a reconstruction of solar total irradiance suggests that since the Maunder minimum there is an increase in the cycle-averaged total solar irradiance (TSI) by a value of about 1–1.5 W/m2 closely correlated with an increase of the baseline (average)

terrestrial temperature. In order to understand these two opposite trends, we calculated the double dynamo summary curve of magnetic field variations backward one hundred thousand years allowing us to confirm strong oscillations of solar activity in regular (11 year) and recently reported grand (350-400 year) solar cycles caused by actions of the double solar dynamo. In addition, oscillations of the baseline (zero-line) of magnetic field with a period of 1950.95 years (a super-grand cycle) are discovered by applying a running averaging filter to suppress large-scale oscillations of 11 year cycles. Latest minimum of the baseline oscillations is found to coincide with the grand solar minimum (the Maunder minimum) occurred before the current super-grand cycle start. Since then the baseline magnitude became slowly increasing towards its maximum at 2700 to be followed by its decrease and minimum at 3700. These oscillations of the baseline solar magnetic field are found associated with a long-term solar inertial motion about the barycenter of the solar system and closely linked to an increase of solar irradiance and terrestrial temperature in the past two centuries. This trend is anticipated to continue in the next five centuries that can lead to a further natural increase of the terrestrial temperature by 2.5.C.

Mathematik

KOROTAYEV 2018

Andrey Korotayev, *The 21st Century Singularity and its Big History Implications, A re-analysis*. Journal of Big History **2** (2018), iii, 71–117.

The idea that in the near future we should expect "the Singularity" has become quite popular recently, primarily thanks to the activities of Google technical director in the ield of machine training Raymond Kurzweil and his book The Singularity Is Near (2005). It is shown that the mathematical analysis of the series of events (described by Kurzweil in his famous book), which starts with the emergence of our Galaxy and ends with the decoding of the DNA code, is indeed ideally described by an extremely simple mathematical function (not known to Kurzweil himself) with a singularity in the region of 2029. It is also shown that, a similar time series (beginning with the onset of life on Earth and ending with the information revolution – composed by the Russian physicist Alexander Panov completely independently of Kurzweil) is also practically perfectly described by a mathematical function (very similar to the above and not used by Panov) with a singularity in the region of 2027. It is shown that this function is also extremely similar to the equation discovered in 1960 by Heinz von Foerster and published in his famous article in the journal "Science" – this function almost perfectly describes the dynamics of the world population and is characterized by a mathematical singularity in the region of 2027. All this indicates the existence of suiciently rigorous global macroevolutionary regularities (describing the evolution of complexity on our planet for a few billion of years), which can be surprisingly accurately described by extremely simple mathematical functions. At the same time it is demonstrated that in the region of the singularity point there is no reason, after Kurzweil, to expect an unprecedented (many orders of magnitude) acceleration of the rates of technological development. There are more grounds for interpreting this point as an indication of an inlection point, after which the pace of global evolution will begin to slow down systematically in the long term.

Methoden

Fogelin 2020

Lars Fogelin, *What I learned writing an irreverent archaeological theory book and giving it away for free.* SAA Archaeological Record **20** (2020), i, 35–37.

There is no doubt that the downloads of An Unauthorized Companion and the willingness of journals to review it are at least partly due to my existing reputation in the ield of archaeological theory—a reputation based entirely on my previous traditional publications, the use of a couple of those publications in archaeological theory classes, and my position as a tenured faculty member in a prominent archaeology program. It was a hell of a lot easier for me to give away a book and get people to read and review it than it would be for someone just starting out.

Until archaeologists accept self-published works for promotion and tenure, I cannot suggest, in good conscience, that my younger colleagues self-publish their own works. For now, all I can say is that I can see no reason why I would publish a book through an academic press ever again—there is simply no upside. It appears I am getting more readers giving my book away for free. I think it is time for archaeologists to ask why, if we are already giving away our labor to academic publishers, should we not just start giving away the product of our labor as well?

Story or Book

Ferreira 2020

Pedro Ferreira, *A fresh look at Einstein's Prague period.* nature **579** (2020), 23–24.

Michael Gordin's elegant prose uses 16 months to build a panoramic view of a century.

Einstein in Bohemia. Michael D. Gordin. Princeton Univ. Press (2020)

This is a panoramic view of twentieth-century Bohemia, with a sprinkling of Einstein. But what really carries it through is the beauty and force of Gordin's prose.

Robinson 2020

Andrew Robinson, *The Story of More.* nature **579** (2020), 24.

The Story of More. Hope Jahren Vintage (2020)

In 2009, palaeobiologist Hope Jahren was required to teach climate change. Initially reluctant, she soon conceived a vocation. Her compelling book uses statistics brilliantly to provoke self-examination. In sections on 'Life', 'Food', 'Energy' and 'Earth', it illuminates subjects from population growth to melting glaciers. If the whole planet consumed resources on the US scale, carbon dioxide emissions would be more than four times higher, she observes: "Using less and sharing more is the biggest challenge our generation will ever face."