Liste erstellt am 2021-11-21

References

Aktuell

Brand 2021

Samuel P. C. Brand et al., *COVID-19 transmission dynamics underlying epidemic waves in Kenya*. science **374** (2021), 989–994. DOI:10.1126/science.abk0414.

s374-0989-Supplement.pdf

Policy decisions on COVID-19 interventions should be informed by a local, regional and national understanding of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission. Epidemic waves may result when restrictions are lifted or poorly adhered to, variants with new phenotypic properties successfully invade, or infection spreads to susceptible subpopulations. Three COVID-19 epidemic waves have been observed in Kenya. Using a mechanistic mathematical model, we explain the first two distinct waves by differences in contact rates in high and low social-economic groups, and the third wave by the introduction of higher-transmissibility variants. Reopening schools led to a minor increase in transmission between the second and third waves. Socioeconomic and urban–rural population structure are critical determinants of viral transmission in Kenya.

Samuel P. C. Brand, John Ojal, Rabia Aziza, Vincent Were, Emelda A. Okiro, Ivy K. Kombe, Caroline Mburu, Morris Ogero, Ambrose Agweyu, George M. Warimwe, James Nyagwange, Henry Karanja, John N. Gitonga, Daisy Mugo, Sophie Uyoga, Ifedayo M. O. Adetifa, J. Anthony G. Scott, Edward Otieno, Nickson Murunga, Mark Otiende, Lynette I. Ochola-Oyier, Charles N. Agoti, George Githinji, Kadondi Kasera, Patrick Amoth, Mercy Mwangangi, Rashid Aman, Wangari Ng'ang'a, Benjamin Tsofa, Philip Bejon, Matt. J. Keeling, D. James. Nokes & Edwine Barasa

Cooper 2021

Alan Cooper et al., *"A global environmental crisis 42,000 years ago", Response to Comment*. science **374** (2021), eabh3655.

Our paper about the impacts of the Laschamps Geomagnetic Excursion 42,000 years ago has provoked considerable scientific and public interest, particularly in the so-called Adams Event associated with the initial transition of the magnetic poles. Although we welcome the opportunity to discuss our new ideas, Hawks' assertions of misrepresentation are especially disappointing given his limited examination of the material.

Alan Cooper, Chris S. M. Turney, Jonathan Palmer, Alan Hogg, Matt McGlone, Janet Wilmshurst, Andrew M. Lorrey, Timothy J. Heaton, James M. Russell, Ken McCracken, Julien G. Anet, Eugene Rozanov, Marina Friedel, Ivo Suter, Thomas Peter, Raimund Muscheler, Florian Adolphi, Anthony Dosseto, J. Tyler Faith, Pavla Fenwick, Christopher J. Fogwill, Konrad Hughen, Matthew Lipson, Jiabo Liu, Norbert Nowaczyk, Eleanor Rainsley, Christopher Bronk Ramsey, Paolo Sebastianelli, Yassine Souilmi, Janelle Stevenson, Zoe Thomas, Raymond Tobler & Roland Zech

Cooper 2021

Alan Cooper et al., *"A global environmental crisis 42,000 years ago", Response to Comment.* science **374** (2021), eabi9756.

Our study on the exact timing and the potential climatic, environmental, and evolutionary consequences of the Laschamps Geomagnetic Excursion has generated the hypothesis that geomagnetism represents an unrecognized driver in environmental and evolutionary change. It is important for this hypothesis to be tested with new data, and encouragingly, none of the studies presented by Picin et al. undermine our model.

Alan Cooper, Chris S. M. Turney, Jonathan Palmer, Alan Hogg, Matt McGlone, Janet Wilmshurst, Andrew M. Lorrey, Timothy J. Heaton, James M. Russell, Ken McCracken, Julien G. Anet, Eugene Rozanov, Marina Friedel, Ivo Suter, Thomas Peter, Raimund Muscheler, Florian Adolphi, Anthony Dosseto, J. Tyler Faith, Pavla Fenwick, Christopher J. Fogwill, Konrad Hughen, Matthew Lipson, Jiabo Liu, Norbert Nowaczyk, Eleanor Rainsley, Christopher Bronk Ramsey, Paolo Sebastianelli, Yassine Souilmi, Janelle Stevenson, Zoe Thomas, Raymond Tobler & Roland Zech

Dhar 2021

Mahesh S. Dhar et al., *Genomic characterization and epidemiology of an emerging SARS-CoV-2 variant in Delhi, India.* science **374** (2021), 995–999. DOI:10.1126/science.abj9932.

s374-0995-Supplement.pdf

Delhi, the national capital of India, experienced multiple severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreaks in 2020 and reached population seropositivity of >50 % by 2021. During April 2021, the city became overwhelmed by COVID-19 cases and fatalities, as a new variant, B.1.617.2 (Delta), replaced B.1.1.7 (Alpha). A Bayesian model explains the growth advantage of Delta through a combination of increased transmissibility and reduced sensitivity to immune responses generated against earlier variants (median estimates: 1.5-fold greater transmissibility and 20 % reduction in sensitivity). Seropositivity of an employee and family cohort increased from 42 % to 87.5 % between March and July 2021, with 27 % reinfections, as judged by increased antibody concentration after a previous decline. The likely high transmissibility and partial evasion of immunity by the Delta variant contributed to an overwhelming surge in Delhi.

Mahesh S. Dhar, Robin Marwal, Radhakrishnan VS, Kalaiarasan Ponnusamy, Bani Jolly, Rahul C. Bhoyar, Viren Sardana, Salwa Naushin, Mercy Rophina, Thomas A. Mellan, Swapnil Mishra, Charles Whittaker, Saman Fatihi, Meena Datta, Priyanka Singh, Uma Sharma, Rajat Ujjainiya, Nitin Bhatheja, Mohit Kumar Divakar, Manoj K. Singh, Mohamed Imran, Vigneshwar Senthivel, Ranjeet Maurya, Neha Jha, Priyanka Mehta, Vivekanand A, Pooja Sharma, Arvinden VR, Urmila Chaudhary, Namita Soni, Lipi Thukral, Seth Flaxman, Samir Bhatt, Rajesh Pandey, Debasis Dash, Mohammed Faruq, Hemlata Lall, Hema Gogia, Preeti Madan, Sanket Kulkarni, Himanshu Chauhan, Shantanu Sengupta, Sandhya Kabra, The Indian SARS-CoV- Genomics Consortiu, Ravindra K. Gupta, Sujeet K. Singh, Anurag Agrawal & Partha Rakshit

Hawks 2021

John Hawks, *Comment on "A global environmental crisis 42,000 years ago".* science **374** (2021), eabh1878.

Cooper et al. (Research Articles, 19 February 2021, p. 811) propose that a weakening geomagnetic field prior to the Laschamps Excursion explains megafaunal

extinctions and human cultural changes that they claim happened 42,000 years ago. However, these authors misrepresent both the data and interpretations of cited work on extinctions and human cultural changes, so the specific claims they make about extinctions and cultural changes are false.

Picin 2021

Andrea Picin et al., *Comment on "A global environmental crisis 42,000 years ago"*. science **374** (2021), eabi8330.

Cooper et al. (Research Articles, 19 February 2021, p. 811) propose that the Laschamps geomagnetic inversion ≈42,000 years ago drove global climatic shifts, causing major behavioral changes within prehistoric groups, as well as events of human and megafaunal extinction. Other scientific studies indicate that this proposition is unproven from the current archaeological, paleoanthropological, and genetic records.

Andrea Picin, Stefano Benazzi, Ruth Blasco, Mateja Hajdinjak, Kristofer M. Helgen, Jean-Jacques Hublin, Jordi Rosell, Pontus Skoglund, Chris Stringer & Sahra Talamo

Singanayagam 2021

Anika Singanayagam, Seran Hakki, Jake Dunning, Neil M. Ferguson & Ajit Lalvani et al., *Community transmission and viral load kinetics of the SARS-CoV-2 delta (B.1.617.2) variant in vaccinated and unvaccinated individuals in the UK: a prospective, longitudinal, cohort study.* Lancet Infectious Diseases (2021), preprint, 1–13. DOI:10.1016/S1473-3099(21)00648-4.

Interpretation Vaccination reduces the risk of delta variant infection and accelerates viral clearance. Nonetheless, fully vaccinated individuals with breakthrough infections have peak viral load similar to unvaccinated cases and can efficiently transmit infection in household settings, including to fully vaccinated contacts. Host–virus interactions early in infection may shape the entire viral trajectory.

Keywords: Anika Singanayagam, Seran Hakki, Jake Dunning, Kieran | Madon, Michael A Crone, Aleksandra Koycheva, Nieves Derqui-Fernandez, Jack L Barnett, Michael G Whitfield, Robert Varro, Andre Charlett, Rhia Kundu, Joe Fenn, Jessica Cutajar, Valerie Quinn, Emily Conibear, Wendy Barclay, Paul S Freemont, Graham P Taylor, Shazaad Ahmad, Maria Zambon, Neil M Ferguson, Ajit Lalvani, on behalf of the ATACCC Study Investigators

Steyer 2021

Rolf Steyer & Gregor Kappler, *Je höher die Impfquote, desto höher die Übersterblichkeit*. unknown (2021), preprint, 1–3. .

Die Korrelation zwischen der Übersterblichkeit in den Bundesländern und deren Impfquote bei Gewichtung mit der relativen Einwohnerzahl des Bundeslands beträgt .31. Diese Zahl ist erstaunlich hoch und wäre negativ zu erwarten, wenn die Impfung die Sterblichkeit verringern würde. Für den betrachteten Zeitraum (KW 36 bis KW 40, 2021) gilt also: Je höher die Impfquote, desto höher die Übersterblichkeit. Angesichts der anstehenden politischen Maßnahmen zur angestrebten Eindämmung des Virus ist diese Zahl beunruhigend und erklärungsbedürftig, wenn man weitere politische Maßnahmen ergreifen will, mit dem Ziel, die Impfquote zu erhöhen.

Terrier 2021

Camille Terrier, Daniel L. Chen & Matthias Sutter, *COVID-19 within families amplifies the prosociality gap between adolescents*

of high and low socioeconomic status. PNAS **118** (2021), e2110891118. DOI:10.1073/pnas.2110891118.

pnas118-e2110891118-Supplement.pdf

COVID-19 has had worse health, education, and labor market effects on groups with low socioeconomic status (SES) than on those with high SES. Little is known, however, about whether COVID-19 has also had differential effects on noncognitive skills that are important for life outcomes. Using panel data from before and during the pandemic, we show that COVID-19 affects one key noncognitive skill, that is, prosociality. While prosociality is already lower for low-SES students prior to the pandemic, we show that COVID-19 infections within families amplify the prosociality gap between French high school students of high and low SES by almost tripling its size in comparison to pre–COVID-19 levels.

Keywords: COVID-19 | prosociality | socioeconomic status | experiment | France

Significance: Noncognitive skills are important for lifetime outcomes. Here, we study how COVID-19 infections affect the prosociality —one key noncognitive skill with important relations to labor market outcomes—of French high school students. We put a major focus on the question whether COVID-19 has a differential effect on students from low or high socioeconomic status (SES). While it is known by now that COVID-19 has had more negative health and economic effects on people with low SES, the effects on noncognitive skills have not been studied so far. We find that COVID-19 within families amplifies the gap in prosociality between adolescents of high and low SES.

Wilder-Smith 2021

Annelies Wilder-Smith, *What is the vaccine effect on reducing transmission in the context of the SARS-CoV-2 delta variant?* Lancet Infectious Diseases (2021), preprint, 1–2. DOI:10.1016/S1473-3099(21)00690-3.

Although preventing severe disease and deaths remains the primary public health goal in the acute phase of the pandemic, and is still being achieved by available COVID-19 vaccines despite the emergence of the delta variant, addressing SARS-CoV-2 transmission is a crucial additional consideration. Reducing transmission is necessary to reduce virus circulation, reach herd immunity and end this tragic pandemic. This study confirms that COVID-19 vaccination reduces the risk of delta variant infection and also accelerates viral clearance in the context of the delta variant. However, this study unfortunately also Highlights that the vaccine effect on reducing transmission is minimal in the context of delta variant circulation.

Energie

Belden 2021

Elizabeth R. Belden, Nikolaos K. Kazantzis, Michael T. Timko & Dudley R. Herschbach et al., *Thermodynamic feasibility of shipboard conversion of marine plastics to blue diesel for self-powered ocean cleanup*. PNAS **118** (2021), e2107250118.

pnas118-e2107250118-Supplement.pdf

Collecting and removing ocean plastics can mitigate their environmental impacts; however, ocean cleanup will be a complex and energy-intensive operation that has not been fully evaluated. This work examines the thermodynamic feasibility and subsequent implications of hydrothermally converting this waste into a fuel to enable self-powered cleanup. A comprehensive probabilistic exergy analysis

demonstrates that hydrothermal liquefaction has potential to generate sufficient energy to power both the process and the ship performing the cleanup. Self-powered cleanup reduces the number of roundtrips to port of a waste-laden ship, eliminating the need for fossil fuel use for most plastic concentrations. Several cleanup scenarios are modeled for the Great Pacific Garbage Patch (GPGP), corresponding to 230 t to 11,500 t of plastic removed yearly; the range corresponds to uncertainty in the surface concentration of plastics in the GPGP. Estimated cleanup times depends mainly on the number of booms that can be deployed in the GPGP without sacrificing collection efficiency. Self-powered cleanup may be a viable approach for removal of plastics from the ocean, and gaps in our understanding of GPGP characteristics should be addressed to reduce uncertainty.

Keywords: ocean plastic | hydrothermal liquefaction | exergy analysis | Monte Carlo simulation

Elizabeth R. Belden, Nikolaos K. Kazantzis, Christopher M. Reddy, Hauke Kite-Powell, Michael T. Timko, Eduardo Italiani & Dudley R. Herschbach

Significance: Plastic waste accumulating in the world's oceans forms massive "plastic islands" in the oceanic gyres. Removing the plastic offers an opportunity to restore our oceans to a more pristine state. To clean the gyres, ships must collect and store the plastic before transporting it to port, often thousands of kilometers away. Instead, ocean plastic waste can be converted into fuel shipboard, for example, using hydrothermal liquefaction (HTL), which depolymerizes plastics at high temperature (300 °C to 550 °C) and high pressure (250 bar to 300 bar). The resulting depolymerization products, termed "blue diesel," have the potential for self-powered cleanup. The objective of this work is evaluating the thermodynamic feasibility of this scheme and its implications on cleanup.

Klima

Razanatsoa 2021

Estelle Razanatsoa, Lindsey Gillson, Malika Virah-Sawmy & Stephan Woodborne, *Synergy between climate and human land-use maintained open vegetation in southwest Madagascar over the last millennium*. The Holocene (2021), preprint, 1–13. DOI:10.1177/09596836211041731.

Holocene2021.08-Razanatsoa-Supplement.xlsx

Madagascar experienced environmental change during the Late-Holocene, and the relative importance of climatic and anthropogenic drivers is still the subject of an ongoing debate. Using palaeoecological records from the southwest region at Lake Longiza, we provide additional records to elucidate the complex history of the island and to identify the changes that occurred in the tropical dry forest during the Late-Holocene. The data showed vegetation changes associated with climate variability until AD 900 as reflected by the variation in grass, dry-adapted taxa, deciduous trees, and isotope records. An increasing effect of human activities was recorded, indicated by increased coprophilous spore concentration, as a result of a shift from foraging to pastoralism leading to further opening of the ecosystem from AD 980. At the same time, the regional palaeoclimate record showed drier conditions from around AD 1000, which could have accentuated the changes in vegetation structure. More open vegetation was likely maintained by increased use of fire and herbivory around the area, as indicated by the multiple peaks in the charcoal and spore records. Since AD 1900, the pollen record from the southwest region showed that the ecosystem became increasingly open with an increased abundance of grass, pioneer taxa, and reduced diversity, which was linked to a simultaneous effect of climate and agropastoralism activities. Our study

suggests that the dry conditions around AD 950 initiated the replacement of forest-dominant vegetation with grass-dominant communities over the last millennium, depicted as an open ecosystem at present. Subsequent changes in subsistence activities would have further maintained an open-structured ecosystem.

Keywords: fire history | herbivory activities | Late-Holocene | Madagascar | rainfall variability | vegetation dynamics

Scroxton 2017

Nick Scroxton, Stephen J. Burns, David McGee, Ben Hardt, Laurie R. Godfrey, Lovasoa Ranivoharimanana & Peterson Faina, *Hemispherically in-phase precipitation variability over the last 1700 years in a Madagascar speleothem record*. Quaternary Science Reviews **164** (2017), 25–36.

Paleoclimate studies of tropical rainfall have led to a recognition of a predominant pattern of anti-phase behavior between the Northern and Southern hemispheres at both orbital and millennial timescales. Less certain is how regional tropical rainfall patterns have changed in the late Holocene, under boundary conditions and on timescales which are most relevant to the tropics' response to a warming world. Several high-resolution southern hemisphere rainfall records are at odds with meridional movement of the mean Inter-Tropical Convergence Zone location as the major driver of Holocene tropical rainfall variability, with regional precipitation patterns resembling modern day El-Nino Southern Oscillation end members. To test emerging ideas on sub-millennial tropical rainfall variability, additional records from the southern hemisphere are required.

We present a new speleothem d18O record from Anjohibe Cave, northwestern Madagascar, which provides a quasi-annual record of monsoonal strength and precipitation amount for the last 1700 years. The majority of d18O variability in the record is at the decadal scale, and shows little to no correlation with major climate indices or cyclical climate drivers. At lower frequencies, changes in mean speleothem d18O show good correlation with other regional precipitation records both north and south of the equator. The regional coherency of tropical rainfall across the west Indian Ocean resembles expansion and contraction of the tropical rain belt and positive-Indian Ocean Dipole-like conditions at different timescales. The cause of this coherency could be related to symmetrical changes in continental sensible heating, or to a low frequency sea surface temperature climate mode.

Keywords: Holocene | Paleoclimatology | Monsoon | ITCZ | Madagascar | Southern hemisphere | Speleothems | Stable isotopes | U-Th series

Sołtysiak 2021

Arkadiusz Sołtysiak & Ricardo Fernandes, *Much ado about nothing, Assessing the impact of the 4.2 kya event on human subsistence patterns in northern Mesopotamia using stable isotope analysis*. Antiquity **95** (2021), 1145–1160.

Antiquity095-1145-Supplement.pdf

The effects of the 4.2 kya climatic event on northern Mesopotamia have been the subject of significant scholarly debate, with the notion of a megadrought that forced local populations to migrate attracting particular attention. Here, the authors analyse stable carbon (d13C) and nitrogen (d15N) isotopes in human tooth and bone samples to assess trends in subsistence practice at three sites in Syria before, during and after the presumedmegadrought event. Despite the proximity of the sites, isotopic differences between them are more significant than diachronic

change. Combined with other archaeological evidence, these results indicate a continuity in subsistence patterns, with no indication of disruption associated with the 4.2 kya event.

Keywords: Syria | Khabur Basin | stable isotopes | subsistence | drought | sustainability

YEHUDAI 2021

Maayan Yehudai & Steven L. Goldstein et al., *Evidence for a Northern Hemispheric trigger of the 100,000-y glacial cyclicity*. PNAS **118** (2021), e2020260118.

pnas118-e2020260118-Supplement.pdf

The causes of the Mid-Pleistocene Transition, the shift from ≈41-ky to 100-ky interglacial–glacial cycles and more intense ice ages, remain intensely debated, as this fundamental change occurred between ≈1,250 and 650 ka without substantial changes in astronomical climate forcings. Recent studies disagree about the relative importance of events and processes in the Northern and Southern Hemispheres, as well as whether the shift occurred gradually over several interglacial–glacial cycles or abruptly at ≈900 ka. We address these issues using a north-to-south reconstruction of the Atlantic arm of the global meridional overturning ocean circulation, a primary means for distributing heat around the globe, using neodymium (Nd) isotopes. Results reveal a period of intense erosion affecting the cratonic shields surrounding the North Atlantic between Marine Isotope Stages (MIS) 27 and 25 (≈980 and 950 ka), reected by unusually low Nd isotope ratios in deep North Atlantic seawater. This episode preceded a major ocean circulation weakening between MIS 25 and 21 (950 and 860 ka) that coincided with the rst ≈100-ky-long interglacial–glacial onset of Northern Hemisphere glaciation at around 2.4 to 2.8 Ma. The data point to a Northern Hemisphere–sourced initiation for the transition, possibly induced through regolith loss and increased exposure of the crystalline bedrock, which would lead to increased friction, enabling larger ice sheets that are characteristic of the 100-ky interglacial–glacial cycles.

Keywords: Mid-Pleistocene Transition | Nd isotopes | paleocirculation | regolith hypothesis | AMOC structure

Maayan Yehudai, Joohee Kim, Leopoldo D. Pena, Maria Jaume-Seguí, Karla P. Knudson, Louise Bolge, Alberto Malinverno, Torsten Bickert & Steven L. Goldstein

Significance: Causes of the Mid-Pleistocene Transition (MPT) from 41- to 100-ky interglacial–glacial cyclicity are debated because it occurred without changes in solar forcing, thus indicating internal climatic drivers. This study reconstructs the deep Atlantic Ocean water-mass structure through the MPT using neodymium isotopes and distinguishes Northern and Southern Hemisphere precursors. North Atlantic results document changes in glacial erosion/weathering preceding the cyclicity shift, including a major erosional episode just before a global ocean circulation weakening between ≈950–860 ka. The findings indicate changes in Northern Hemispheric ice sheets prior to that weakening were central in shaping the cyclicity shift and the post-MPT glacial climate, whereby removal of weathered material exposed crystalline bedrock, resulting in increased bedrock–ice friction that facilitated larger ice sheets.

Methoden

KHELIFA 2021

Rassim Khelifa, *The hard way*. science **374** (2021), 1018.

I signed in to our virtual lab meeting feeling especially nervous. I had volunteered to give a presentation about my background as a first-generation college student from Africa. For the first time in 8 years abroad as an international researcher, I planned to point out privileges that scientists from the Global South had to work hard to earn, but that my colleagues in Canada might take for granted. I did not know how my postdoc supervisor and fellow lab members would react. But I had decided it was worth taking a risk to raise awareness and perhaps spur action.

Religion

Jeunesse 2021

Christian Jeunesse, *Societies Without Ancestors? Why Are So Few Graves Found in the European Upper Palaeolithic and Mesolithic?* Archäologisches Korrespondenzblatt **51** (2021), 309–327.

Most specialists agree that the classical explanations (taphonomic and demographic factors; forms of treatment of the bodies leading to, all other things being equal, the non-preservation of remains) are not suficient to explain the small number of burials and human remains known for the Upper Palaeolithic-Mesolithic sequence. The explanation could well lie in the preponderance, at that time, of a funerary system relecting an assumed desire to remove and forget the dead, considered to be, at least for the most part, potentially harmful entities for the living. This system is that of "societies without ancestors", or "ghost societies", which we attempt to characterise in this article via a diversion through ethnology. From at least the Mesolithic onwards, it coexists with a second system, that of "ancestor societies".

Keywords: Mesolithic | Palaeolithic | funerary practices | animism | ontology

Die meisten Fachleute sind sich einig, dass die klassischen Erklärungen (taphonomische und demographische Faktoren; Formen der Leichenbehandlung, die unter sonst gleichen Bedingungen zur Nicht-Konservierung von Überresten führen) nicht ausreichen, um die geringe Anzahl von Bestattungen und menschlichen Überresten zu erklären, die für die spätpaläolithisch-mesolithische Sequenz bekannt sind. Die Erklärung dafür könnte darin liegen, dass zu dieser Zeit ein Bestattungssystem vorherrschte, das den vermeintlichen Wunsch widerspiegelte, die Toten zu entfernen und zu vergessen, weil sie zumindest größtenteils als potenziell schädliche Wesen für die Lebenden angesehen wurden. Dieses System ist das der "Gesellschaften ohne Vorfahren" oder "Geistergesellschaften", das wir in diesem Artikel mit einem Umweg über die Ethnologie zu charakterisieren versuchen. Zumindest ab dem Mesolithikum koexistiert es mit einem zweiten System, dem der "Ahnengesellschaften".

Keywords: Mesolithikum | Paläolithikum | Bestattungssitten | Animismus | Ontologie