

References

Aktuell

ABDERRAHMAN 2018

Balkees Abderrahman, *Paying it forward as a mentor*. [science](#) **361** (2018), 522.

The undergrad joining the lab where I worked as a research fellow certainly knew how to make a first impression. “I looked up your work—cool stuff!” he said when we first met. “Fancy working with the best? That’s me, of course!” He was clearly smart and ambitious. But I wasn’t sure I was qualified to take someone under my wing. I had only started in research 2 years earlier, after finishing my medical degree. The bigger hurdle was the pressure to “publish or perish,” which made me hesitant to take on extra responsibilities. But, as I reflected on my own path into research and the crucial role played by my mentor, I realized that I needed to pay it forward.

DEAN 2018

Katharine R. Dean et al., *Human ectoparasite transmission of plague during the Second Pandemic is still plausible, Reply to Park et al.* [PNAS](#) **115** (2018), E7894–E7895.

Katharine R. Dean, Fabienne Krauer, Lars Walløe, Ole Christian Lingjærde, Barbara Bramanti, Nils C. Stenseth & Boris V. Schmid

We would like to emphasize that we do not provide evidence against rat-borne plague transmission but explore an alternative explanation of human ectoparasites, which has been suggested by many plague researchers for decades. Our results support our conclusion that human ectoparasites are a plausible and likely vector of plague epidemics during the Second Pandemic.

EDELSON 2018

Micah G. Edelson, Rafael Polania, Christian C. Ruff, Ernst Fehr & Todd A. Hare, *Computational and neurobiological foundations of leadership decisions*. [science](#) **361** (2018), 467.

s361-0467-Supplement.pdf

Leaders must take responsibility for others and thus affect the well-being of individuals, organizations, and nations. We identify the effects of responsibility on leaders’ choices at the behavioral and neurobiological levels and document the widespread existence of responsibility aversion, that is, a reduced willingness to make decisions if the welfare of others is at stake. In mechanistic terms, basic preferences toward risk, loss, and ambiguity do not explain responsibility aversion, which, instead, is driven by a second-order cognitive process reflecting an increased demand for certainty about the best choice when others’ welfare is affected. Finally, models estimating levels of information flow between brain regions that process separate choice components provide the first step in understanding the neurobiological basis of individual variability in responsibility aversion and leadership scores.

FLEMING 2018

Stephen M. Fleming & Dan Bang, *Shouldering responsibility*. [science 361 \(2018\), 449–450](#).

Leaders do not shy away from responsibility when others' welfare is at stake.

It remains to be seen whether a similar approach can predict variation in leadership style, such as autocratic or democratic leadership, and identify those who will be good leaders (11). In the study of Edelson et al., participants with low responsibility aversion did not earn more money for the group. By using the tools of decision neuroscience, it may be possible to reverse engineer not only leadership decisions, but also the ingredients of good leadership.

HU 2018

Yang Hu et al., *Smoking Cessation, Weight Change, Type 2 Diabetes, and Mortality*. [New England Journal of Medicine 379 \(2018\), 623–632](#).
NEJMed379-0623-Supplement.pdf

Yang Hu, Geng Zong, Gang Liu, Molin Wang, Bernard Rosner, An Pan, Walter C. Willett, JoAnn E. Manson, Dr.P.H., Frank B. Hu, and Qi Sun

BACKGROUND: Whether weight gain after smoking cessation attenuates the health benefits of quitting is unclear.

METHODS: In three cohort studies involving men and women in the United States, we identified those who had reported quitting smoking and we prospectively assessed changes in smoking status and body weight. We estimated risks of type 2 diabetes, death from cardiovascular disease, and death from any cause among those who had reported quitting smoking, according to weight changes after smoking cessation.

RESULTS: The risk of type 2 diabetes was higher among recent quitters (2 to 6 years since smoking cessation) than among current smokers (hazard ratio, 1.22; 95 % confidence interval [CI], 1.12 to 1.32). The risk peaked 5 to 7 years after quitting and then gradually decreased. The temporary increase in the risk of type 2 diabetes was directly proportional to weight gain, and the risk was not increased among quitters without weight gain ($P < 0.001$ for interaction). In contrast, quitters did not have a temporary increase in mortality, regardless of weight change after quitting. As compared with current smokers, the hazard ratios for death from cardiovascular disease were 0.69 (95 % CI, 0.54 to 0.88) among recent quitters without weight gain, 0.47 (95 % CI, 0.35 to 0.63) among those with weight gain of 0.1 to 5.0 kg, 0.25 (95 % CI, 0.15 to 0.42) among those with weight gain of 5.1 to 10.0 kg, 0.33 (95 % CI, 0.18 to 0.60) among those with weight gain of more than 10.0 kg, and 0.50 (95 % CI, 0.46 to 0.55) among longer-term quitters (>6 years since smoking cessation). Similar associations were observed for death from any cause.

CONCLUSIONS: Smoking cessation that was accompanied by substantial weight gain was associated with an increased short-term risk of type 2 diabetes but did not mitigate the benefits of quitting smoking on reducing cardiovascular and all-cause mortality.

KERSEY 2018

Alyssa J. Kersey, Emily J. Braham, Kelsey D. Csumitta, Melissa E. Libertus & Jessica F. Cantlon, *No intrinsic gender differences in children's earliest numerical abilities*. [Science of Learning 3 \(2018\), xii, 1–10](#). DOI:10.1038/s41539-018-0028-7.

SciLearn03-a012-Supplement.pdf

Recent public discussions have suggested that the under-representation of women in science and mathematics careers can be traced back to intrinsic differences in aptitude. However, true gender differences are difficult to assess because sociocultural influences enter at an early point in childhood. If these claims of intrinsic differences are true, then gender differences in quantitative and mathematical abilities should emerge early in human development. We examined cross-sectional gender differences in mathematical cognition from over 500 children aged 6 months to 8 years by compiling data from five published studies with unpublished data from longitudinal records. We targeted three key milestones of numerical development: numerosity perception, culturally trained counting, and formal and informal elementary mathematics concepts. In addition to testing for statistical differences between boys' and girls' mean performance and variability, we also tested for statistical equivalence between boys' and girls' performance. Across all stages of numerical development, analyses consistently revealed that boys and girls do not differ in early quantitative and mathematical ability. These findings indicate that boys and girls are equally equipped to reason about mathematics during early childhood.

NASCA 2018

Carla Nasca et al., *Acetyl-L-carnitine deficiency in patients with major depressive disorder*. [PNAS 115 \(2018\), 8627–8632](#).
[pnas115-08627-Supplement.pdf](#)

Carla Nasca, Benedetta Bigio, Francis S. Lee, Sarah P. Young, Marin M. Kautz, Ashly Albright, James Beasley, David S. Millington, Aleksander A. Mathé, James H. Kocsis, James W. Murrrough, Bruce S. McEwen & Natalie Rasgon

The lack of biomarkers to identify target populations greatly limits the promise of precision medicine for major depressive disorder (MDD), a primary cause of ill health and disability. The endogenously produced molecule acetyl-L-carnitine (LAC) is critical for hippocampal function and several behavioral domains. In rodents with depressive-like traits, LAC levels are markedly decreased and signal abnormal hippocampal glutamatergic function and dendritic plasticity. LAC supplementation induces rapid and lasting antidepressant-like effects via epigenetic mechanisms of histone acetylation. This mechanistic model led us to evaluate LAC levels in humans. We found that LAC levels, and not those of free carnitine, were decreased in patients with MDD compared with age- and sex-matched healthy controls in two independent study centers. Secondary exploratory analyses showed that the degree of LAC deficiency reflected both the severity and age of onset of MDD. Moreover, these analyses showed that the decrease in LAC was larger in patients with a history of treatment-resistant depression (TRD), among whom childhood trauma and, specifically, a history of emotional neglect and being female, predicted the decreased LAC. These findings suggest that LAC may serve as a candidate biomarker to help diagnose a clinical endophenotype of MDD characterized by decreased LAC, greater severity, and earlier onset as well as a history of childhood trauma in patients with TRD. Together with studies in rodents, these translational findings support further exploration of LAC as a therapeutic target that may help to define individualized treatments in biologically based depression subtype consistent with the spirit of precision medicine.

Keywords: epigenetic | glutamate | treatment-resistant depression | childhood trauma | mGlu2

Significance: Identifying biological targets in major depressive disorder (MDD) is a critical step for development of effective mechanism-based medications. The epigenetic agent acetyl-L-carnitine (LAC) has rapid and enduring antidepressant-like effects in LAC-deficient rodents. Here, we found that LAC levels were decreased

in patients with MDD versus age- and sex-matched healthy controls in two independent study centers. In subsequent exploratory analyses, the degree of LAC deficiency reflected both the severity and age of onset of MDD. Furthermore, the lowest LAC levels were found in patients with treatment-resistant depression, whereby history of emotional neglect and being female predicted decreased LAC levels. These translational findings suggest that LAC may serve as a candidate biomarker to help the diagnosis of a clinical endophenotype of MDD.

PARK 2018

Sang Woo Park, Jonathan Dushoff, David J. D. Earn, Hendrik Poinar & Benjamin M. Bolker, *Human ectoparasite transmission of the plague during the Second Pandemic is only weakly supported by proposed mathematical models*. [PNAS 115 \(2018\), E7892–E7893](#).

Given that bubonic plague infection can cause secondary pneumonic infection, the possibility of mixed transmission modes cannot be neglected. In particular, the authors' model provides no evidence that human ectoparasite transmission was more likely to have driven the plague patterns than a highly plausible combination of pneumonic and rat-flea transmission.

Modeling studies are invaluable probes of underlying biological processes, but they provide only indirect evidence for the true mechanisms and are strongly sensitive to assumptions. While Dean et al. (1) show that human ectoparasites could plausibly have been a vector for plague transmission, their conclusion that ectoparasites were likely to have been important is not adequately supported.

POST 2018

Robert M. Post, *Myriad of implications of acetyl-L-carnitine deficits in depression*. [PNAS 115 \(2018\), 8475–8477](#).

Since LAC increases acetylation of H3K27, it raises the possibility of more permanent elimination of vulnerability to defeat-stress depression-like behaviors. This proposition could readily be tested in animals and pursued clinically. To the extent that some vulnerability to depression is based on these early childhood experiences, LAC treatment could theoretically reverse that vulnerability in the long term in a fashion different from traditional ADs, which require continued prophylactic treatment to prevent recurrent depressions.

RAWSHANI 2018

Aidin Rawshani et al., *Risk Factors, Mortality, and Cardiovascular Outcomes in Patients with Type 2 Diabetes*. [New England Journal of Medicine 379 \(2018\), 633–644](#).

Aidin Rawshani, Araz Rawshani, Stefan Franzén, Naveed Sattar, Björn Eliasson, Ann-Marie Svensson, Björn Zethelius, Mervete Miftaraj, Darren K. McGuire, Annika Rosengren, and Soffia Gudbjörnsdóttir

BACKGROUND: Patients with diabetes are at higher risk for death and cardiovascular outcomes than the general population. We investigated whether the excess risk of death and cardiovascular events among patients with type 2 diabetes could be reduced or eliminated.

METHODS: In a cohort study, we included 271,174 patients with type 2 diabetes who were registered in the Swedish National Diabetes Register and matched them with 1,355,870 controls on the basis of age, sex, and county. We assessed patients with diabetes according to age categories and according to the presence of five risk factors (elevated glycated hemoglobin level, elevated low-density lipoprotein cholesterol level, albuminuria, smoking, and elevated blood pressure). Cox regression

was used to study the excess risk of outcomes (death, acute myocardial infarction, stroke, and hospitalization for heart failure) associated with smoking and the number of variables outside target ranges. We also examined the relationship between various risk factors and cardiovascular outcomes.

RESULTS: The median follow-up among all the study participants was 5.7 years, during which 175,345 deaths occurred. Among patients with type 2 diabetes, the excess risk of outcomes decreased stepwise for each risk-factor variable within the target range. Among patients with diabetes who had all five variables within target ranges, the hazard ratio for death from any cause, as compared with controls, was 1.06 (95 % confidence interval [CI], 1.00 to 1.12), the hazard ratio for acute myocardial infarction was 0.84 (95 % CI, 0.75 to 0.93), and the hazard ratio for stroke was 0.95 (95 % CI, 0.84 to 1.07). The risk of hospitalization for heart failure was consistently higher among patients with diabetes than among controls (hazard ratio, 1.45; 95 % CI, 1.34 to 1.57). In patients with type 2 diabetes, a glycated hemoglobin level outside the target range was the strongest predictor of stroke and acute myocardial infarction; smoking was the strongest predictor of death.

CONCLUSIONS: Patients with type 2 diabetes who had five risk-factor variables within the target ranges appeared to have little or no excess risk of death, myocardial infarction, or stroke, as compared with the general population. (Funded by the Swedish Association of Local Authorities and Regions and others.)

SUNG 2018

Vanessa Sung, *Let your stars shine.* [science 361 \(2018\), 422.](#)

A few months ago, one of my fellow graduate students was offered an incredible career-building opportunity. His efforts on a student-led campaign to increase federal funding for basic research had led to an invitation to speak on a conference panel about health research advocacy. He would have a prominent platform to share his work with a large audience, and he would get to meet and network with leaders in the field. It would look great on his CV. I was happy for him, of course; he deserved it. But my feelings were complicated. I had been an equal partner in the campaign. I felt that I deserved the same opportunity. Yet I hadn't been invited, and I wasn't sure why.

Anthropologie

O'CONNELL 2018

James F. O'Connell et al., *When did Homo sapiens first reach Southeast Asia and Sahul?* [PNAS 115 \(2018\), 8482–8490.](#)

[pnas115-08482-Supplement.pdf](#)

James F. O'Connell, Jim Allen, Martin A. J. Williams, Alan N. Williams, Chris S. M. Turney, Nigel A. Spooner, Johan Kamminga, Graham Brown & Alan Cooper

Anatomically modern humans (*Homo sapiens*, AMH) began spreading across Eurasia from Africa and adjacent Southwest Asia about 50,000–55,000 years ago (ca. 50–55 ka). Some have argued that human genetic, fossil, and archaeological data indicate one or more prior dispersals, possibly as early as 120 ka. A recently reported age estimate of 65 ka for Madjedbebe, an archaeological site in northern Sahul (Pleistocene Australia–New Guinea), if correct, offers what might be the strongest support yet presented for a pre-55-ka African AMH exodus. We review evidence for AMH arrival on an arc spanning South China through Sahul and then evaluate data from Madjedbebe. We find that an age estimate of >50 ka for this site is unlikely to be valid. While AMH may have moved far beyond Africa well before 50–55 ka, data from the region of interest offered in support of this idea are not compelling.

Keywords: Homo sapiens | anatomically modern humans | Late Pleistocene | Madjedbebe | Sahul

TOMASELLO 2018

Michael Tomasello, *How children come to understand false beliefs, A shared intentionality account*. [PNAS 115 \(2018\), 8491–8498](#).

To predict and explain the behavior of others, one must understand that their actions are determined not by reality but by their beliefs about reality. Classically, children come to understand beliefs, including false beliefs, at about 4–5 y of age, but recent studies using different response measures suggest that even infants (and apes!) have some skills as well. Resolving this discrepancy is not possible with current theories based on individual cognition. Instead, what is needed is an account recognizing that the key processes in constructing an understanding of belief are social and mental coordination with other persons and their (sometimes conflicting) perspectives. Engaging in such social and mental coordination involves species-unique skills and motivations of shared intentionality, especially as they are manifest in joint attention and linguistic communication, as well as sophisticated skills of executive function to coordinate the different perspectives involved. This shared intentionality account accords well with documented differences in the cognitive capacities of great apes and human children, and it explains why infants and apes pass some versions of false-belief tasks whereas only older children pass others.

Keywords: theory of mind | false belief | shared intentionality | social cognition | development

Significance: In coming to understand minds, the greatest challenge for young children is understanding when others have a false belief. Why is that person searching for the toy over there when it is really over here? There is currently much controversy about when children come to this understanding because experiments of different types yield different results. This paper attempts to resolve the controversy by integrating theory and data in a different way. Specifically, the paper argues that young children do not just come to imagine what is in other minds on their own; rather, they come to this understanding through certain types of social and communicative interactions with others that require them to compare their respective perspectives.

WARREN 2018

Matthew Warren, *First ancient-human hybrid*. [nature 560 \(2018\), 417–418](#).

A direct descendant of two different groups of early humans has been found in Russia.

A female who died around 90,000 years ago was half Neanderthal and half Denisovan, according to genome analysis of a bone discovered in a Siberian cave. This is the first time that scientists have identified an ancient individual whose parents belonged to distinct human groups.

With equal amounts of Denisovan and Neanderthal DNA, the specimen seemed to have one parent from each hominin group. But there was another possibility: Denny's parents could have belonged to a population of Denisovan–Neanderthal hybrids. In more than 40% of cases, one of the DNA fragments matched the Neanderthal genome, whereas the other matched that of a Denisovan, suggesting that she had acquired one set of chromosomes from a Neanderthal and the other from a Denisovan. That made it clear that Denny was the direct offspring of two distinct humans, says Pääbo.

Bibel

CLINES 2018

David J. A. Clines, *The Ubiquitous Language of Violence in the Hebrew Bible*. [unknown \(2018\), preprint, 1–24](#).

Let us recall that the Hebrew Bible contains some 303,500 words.¹¹ The 10,033 occurrences are therefore 3.3% of the whole Hebrew Bible. Is that a big number?

Is it a big number? is the question I must leave you with. I cannot determine whether you should be shocked or shrug your shoulders about the quantity of violence in the Hebrew Bible, but I do believe that we are in a better position to decide the question than we were half an hour ago.

Biologie

GIBBONS 2018

Ann Gibbons, *How islands shrink people*. [science 361 \(2018\), 439](#).

Evolutionary dwarfing affected living people on the island of Flores, and may explain the stature of the extinct hobbit.

Now, genetic evidence from modern pygmies on Flores—who are unrelated to the hobbit—confirms that humans, too, are subject to so-called island dwarfing. On p. 511, an international team reports that Flores pygmies differ from their closest relatives on New Guinea and in East Asia in carrying more gene variants that promote short stature. The genetic differences testify to recent evolution—the island rule at work.

TUCCI 2018

Serena Tucci et al., *Evolutionary history and adaptation of a human pygmy population of Flores Island, Indonesia*. [science 361 \(2018\), 511–516](#).

[s361-0511-Supplement.pdf](#)

Serena Tucci, Samuel H. Vohr, Rajiv C. McCoy, Benjamin Vernot, Matthew R. Robinson, Chiara Barbieri, Brad J. Nelson, Wenqing Fu, Gludhug A. Purnomo, Herawati Sudoyo, Evan E. Eichler, Guido Barbujani, Peter M. Visscher, Joshua M. Akey & Richard E. Green

Flores Island, Indonesia, was inhabited by the small-bodied hominin species *Homo floresiensis*, which has an unknown evolutionary relationship to modern humans. This island is also home to an extant human pygmy population. Here we describe genome-scale single-nucleotide polymorphism data and whole-genome sequences from a contemporary human pygmy population living on Flores near the cave where *H. floresiensis* was found. The genomes of Flores pygmies reveal a complex history of admixture with Denisovans and Neanderthals but no evidence for gene flow with other archaic hominins. Modern individuals bear the signatures of recent positive selection encompassing the FADS (fatty acid desaturase) gene cluster, likely related to diet, and polygenic selection acting on standing variation that contributed to their short-stature phenotype. Thus, multiple independent instances of hominin insular dwarfism occurred on Flores.

Datierung

GERTOUX 2018

G rard Gertoux, *Dating the reigns of Xerxes and Artaxerxes*. In: PASCAL ATTINGER, ANTOINE CAVIGNEAUX, CATHERINE

MITTERMAYER & MIRKO NOVÁK (Hrsg.), *Text and Image, Proceedings of the 61e Rencontre Assyriologique Internationale, Geneva and Bern, 22–26 June 2015*. *Orbis Biblicus et Orientalis* 40 (Leuven 2018), 179–206.

The pivotal date of 465 BCE for the death of Xerxes has been accepted by historians for many years without notable controversy. However, according to Thucydides, Themistocles met Artaxerxes, who had succeeded Xerxes, his father, just after the fall of Naxos which occurred after the fall of Skyros at the beginning of the archonship of Phaedo in 476 BCE, according to Plutarch. Thus, the meeting with Themistocles would have occurred soon after 475 BCE, not 465. The present Achaemenid chronology is mainly derived from official Babylonian king lists, which ignore coregents and usurpers appearing in dated contracts. In addition, according to the astronomical tablet BM 32234, the death of Xerxes is dated 14/V/21 between two lunar eclipses, one on 14/III/21 (26 June 475 BCE), which was total, and a second on 14/VIII/21 (20 December 475 BCE), which was partial. Likewise, the death of Artaxerxes I is fixed precisely by Thucydides just before a partial solar eclipse (21 March 424 BCE) which would imply an absurd coregency of Darius II with a dead king for at least one year. In fact, Plutarch and Justinus described a long coregency of Artaxerxes but with his first son Darius B (434–426), not Darius II, which occurred before two short reigns, those of Xerxes II (2 months) and Sogdianus (7 months), before the reign of Darius II. The title of Xerxes (496–475) in Egypt and the data of Diodorus confirm the coregency of 10 years with Darius, as do Elephantine papyri with many double dates both in civil and lunar calendars.

Keywords: Chronology | Xerxes | Artaxerxes I | Achaemenid rulers | dating by means of calendars | Hebrew Bible and Ancient Near East | 27th Dynasty.

GERTOUX 2018

G rard Gertoux, *A Clear Dating of Dark Ages*. (2018).

The “Dark Ages” during which there are few or no written records are common in history and can even last for several centuries as the Greek Dark Ages (1200-750). They are a major obstacle to get an accurate reconstruction of ancient chronologies. Carbon-14 dating and the style of ceramics has led to significant improvement, but the uncertainty is still important since the first fall of Babylon is currently fixed in 1651, 1595, 1531 or 1499 BCE, depending on historians. Such a difference in timeline prevents from reaching the historical truth because chronology is the backbone of history. It is for this reason that from Herodotus, the “father of history” (in fact the father of scientific inquiry, including of chronology), Greek historians have gradually established a system of dating in order to write a universal history. Several systems have gradually been used (depending on authors): archontic years (753 BCE to 275 CE), Olympic years (776 BCE to 261 CE), consular years (509 BCE to 541 CE), etc. Some astronomical phenomena well identified, such as eclipses, now enable us to synchronize these ancient dating systems and anchor them on absolute dates. Then simply reconstruct the chronology of earlier periods (Persian, Babylonian, Assyrian, Egyptian, etc.) in the same way by dating some synchronisms by astronomy (see the file entitled: Dating the Fall of Babylon and Ur). Thus Babylonian reigns enable us dating the period from 1375 to 539 BCE, then Assyrian eponyms the one from 1873 to 609 BCE, Babylonian reigns again the one from 2243 to 1499 BCE and finally Egyptian reigns the one from 2632 to 1773 BCE.

GERTOUX 2018

G rard Gertoux, *Dating the reigns of Xerxes and Artaxerxes*. (2018).

The pivotal date of 465 BCE for the death of Xerxes has been accepted by historians for many years without notable controversy. However, according to Thucydides, a historian renowned for his high chronological accuracy, Themistocles met Artaxerxes, who had succeeded Xerxes, his father, just after the fall of Nexos (The Peloponnesian War I:98;137) which occurred after the fall of Skyros dated at the beginning of the archonship of Phaedo in 476 BCE, according to Plutarch (Life of Theseus §§35,36). Thus, the meeting with Themistocles would have occurred soon after 475/474, not 465/464.

The present Achaemenid chronology comes mainly from official Babylonian king lists which ignore coregents and usurpers. This official version is contradicted by contracts dated in “year, month, day” proving the existence of frequent coregencies and usurpers. In addition, according to the astronomical tablet referenced BM 32234 the death of Xerxes is dated 14/V/21 between two lunar eclipses, one dated 14/III/21 (26 June 475 BCE), which was total, and a second dated 14/VIII/21 (20 December 475 BCE), which was partial. Thus the death of Xerxes has to be dated 24 August 475 BCE. Likewise, the death of Artaxerxes I is fixed precisely by Thucydides (The Peloponnesian War IV:50-52) just before a partial solar eclipse (21 March 424 BCE) which would imply an absurd co-regency of Darius II with a dead king for at least one year! In fact, Plutarch and Justinus have effectively described a long co-regency of Artaxerxes but with his first son Darius B (434-426), not Darius II, and afterward two short reigns: Xerxes II for 2 months then Sogdianus for 7 months, which occurred before the reign of Darius II.

The arrangement of the intercalary months in a chronology without co-regency has several anomalies especially the presence of two months Ulul in a single cycle. By contrast, in a chronology with co-regency, and thus two distinct cycles, the abnormal intercalary month in year 30 of Darius (Persepolis) corresponds to another cycle ending in year 4 of Xerxes. The titulature of Xerxes (496-475) in Egypt and the data of Diodorus confirm the co-regency of 10 years with Darius (522-486), likewise Elephantine papyri with many double dates with civil and lunar calendars.

Lunar dates were supposed to come from a Babylonian calendar, but this is impossible because the city of Elephantine, in the far south of Egypt, was largely administered by Egyptian officials who used a civil calendar to date their documents. Parker (1950) assumed that the Egyptian lunar calendar began with the 1st invisibility (day after the new moon and just before the new crescent). As lunar day 1, called *psdntyw* “shining ones”, has played a major role in Egyptian religious celebrations, it is regularly quoted in ancient documents, which sometimes also date it in the civil calendar. In the papyrus Louvre 7848 containing a double date, lunar and civil, in the year 44 of Amasis, the first date (II Shemu 13) is lunar and the second (I Shemu 15) is civil and as the civil date fell on 21 September 558 BCE the lunar date fell on 9 (= 21 - 12) September 558 BCE which was a full moon day according to astronomy, not 1st invisibility “shining ones”! The lunar calendar at Elephantine with its system of double dates used by Persians officials and Jewish scribes from 500 to 400 BCE confirms that the Egyptian lunar day 1 was a full moon.

Keramik

ROLLSTON 2016

Christopher A. Rollston, *The Bullae of Baruch Ben Neriah the Scribe and the Seal of Ma'adanah Daughter of the King, Epigraphic Forgeries of the 20th Century*. In: JOSEPH AVIRAM, SHMUEL AḤITUV, ISRAEL EPH'AL, ADA YARDENI & ANAT MENDEL-

GEBEROVICH (Hrsg.), *Joseph Naveh Volume*. Eretz-Israel 32 (Jerusalem 2016), 79–90.

Klima

EVANS 2018

Nicholas P. Evans, Thomas K. Bauska, Fernando Gázquez-Sánchez, Mark Brenner, Jason H. Curtis & David A. Hodell, *Quantification of drought during the collapse of the classic Maya civilization*. *science* **361** (2018), 498–501.

s361-0498-Supplement.pdf

The demise of Lowland Classic Maya civilization during the Terminal Classic Period (≈ 800 to 1000 CE) is a well-cited example of how past climate may have affected ancient societies. Attempts to estimate the magnitude of hydrologic change, however, have met with equivocal success because of the qualitative and indirect nature of available climate proxy data. We reconstructed the past isotopic composition ($d_{18}O$, dD , $17O$ -excess, and d -excess) of water in Lake Chichancanab, Mexico, using a technique that involves isotopic analysis of the structurally bound water in sedimentary gypsum, which was deposited under drought conditions. The triple oxygen and hydrogen isotope data provide a direct measure of past changes in lake hydrology. We modeled the data and conclude that annual precipitation decreased between 41 and 54% (with intervals of up to 70% rainfall reduction during peak drought conditions) and that relative humidity declined by 2 to 7% compared to present-day conditions.

PROCTOR 2018

Jonathan Proctor, Solomon Hsiang, Jennifer Burney, Marshall Burke & Wolfram Schlenker, *Estimating global agricultural effects of geoen-gineering using volcanic eruptions*. *nature* **560** (2018), 480–483.

n560-0480-Supplement.pdf

Solar radiation management is increasingly considered to be an option for managing global temperatures^{1,2}, yet the economic effects of ameliorating climatic changes by scattering sunlight back to space remain largely unknown³. Although solar radiation management may increase crop yields by reducing heat stress⁴, the effects of concomitant changes in available sunlight have never been empirically estimated. Here we use the volcanic eruptions that inspired modern solar radiation management proposals as natural experiments to provide the first estimates, to our knowledge, of how the stratospheric sulfate aerosols created by the eruptions of El Chichón and Mount Pinatubo altered the quantity and quality of global sunlight, and how these changes in sunlight affected global crop yields. We find that the sunlight-mediated effect of stratospheric sulfate aerosols on yields is negative for both C4 (maize) and C3 (soy, rice and wheat) crops. Applying our yield model to a solar radiation management scenario based on stratospheric sulfate aerosols, we find that projected mid-twentyfirst century damages due to scattering sunlight caused by solar radiation management are roughly equal in magnitude to benefits from cooling. This suggests that solar radiation management—%

if deployed using stratospheric sulfate aerosols similar to those emitted by the volcanic eruptions it seeks to mimic—would, on net, attenuate little of the global agricultural damage from climate change. Our approach could be extended to study the effects of solar radiation management on other global systems, such as human health or ecosystem function.

Methoden

BERREY 2018

C. Adam Berrey, *Making absolute population estimates in the Intermediate Area using the area and density of ceramic sherd scatters, An application of regression analysis*. *Journal of Archaeological Science* **97** (2018), 147–158.

JAS097-0147-Supplement.pdf

The demographic dynamics of human settlements are a fundamental part of understanding complex society development, and population estimates are a fundamental part of understanding those dynamics. Many types of demographic analyses can be carried out on the basis of relative population estimates, but a deeper understanding of demographic processes can be gained by converting those estimates into absolute numbers of people. Using regression analysis this paper develops a technique for making absolute population estimates based on the area and density of ceramic sherd scatters. This technique can be used to make absolute population estimates in many parts of the world, though here its application is illustrated using data from the Intermediate Area and Amazon region. Unlike previous approaches to demographic reconstruction this technique provides a basis for establishing population error ranges for different degrees of statistical confidence.

Keywords: Population estimates | Demography | Settlement patterns | Regression analysis | Intermediate area | Isthmo-Colombian area | Northern South America