

References

Aktuell

BOYAJIAN 2015

T. S. Boyajian et al., *Planet Hunters X, KIC 8462852 – Where’s the flux?* [arXiv \(2015\), 1509.03622](https://arxiv.org/abs/1509.03622). <<http://arxiv.org/pdf/1509.03622>>.

T. S. Boyajian, D. M. LaCourse, S. A. Rappaport, D. Fabrycky, D. A. Fischer, D. Gandolfi, G. M. Kennedy, M. C. Liu, A. Moor, K. Olah, K. Vida, M. C. Wyatt, W. M. J. Best, F. Ciesla, B. Csák, T. J. Dupuy, G. Handler, K. Heng, H. Korhonen, J. Kovács, T. Kozakis, L. Kriskovics, J. R. Schmitt, Gy. Szabo, R. Szabo, J. Wang, S. Goodman, A. Hoekstra & K. J. Jek

Over the duration of the Kepler mission, KIC 8462852 was observed to undergo irregularly shaped, aperiodic dips in flux down to below the 20% level. The dipping activity can last for between 5 and 80 days. We characterize the object with high-resolution spectroscopy, spectral energy distribution fitting, and Fourier analyses of the Kepler light curve. We determine that KIC 8462852 is a main-sequence F3 V/IV star, with a rotation period of 0.88 d, that exhibits no significant IR excess. In this paper, we describe various scenarios to explain the mysterious events in the Kepler light curve, most of which have problems explaining the data in hand. By considering the observational constraints on dust clumps orbiting a normal main-sequence star, we conclude that the scenario most consistent with the data in hand is the passage of a family of exocomet fragments, all of which are associated with a single previous breakup event. We discuss the necessity of future observations to help interpret the system.

Keywords: stars: individual (KIC 8462852) | chaos | stars: peculiar | stars: activity | comets: | general | planets and satellites: dynamical evolution and stability

CASTELVECCHI 2015

Davide Castelvecchi, *The impenetrable proof*. [nature 526 \(2015\), 178–181](https://doi.org/10.1038/nature13131).

Shinichi Mochizuki claims to have solved one of the most important problems in mathematics. The trouble is, hardly anyone can work out whether he’s right.

Three years on, Mochizuki’s proof remains in mathematical limbo — neither debunked nor accepted by the wider community. Mochizuki has estimated that it would take an expert in arithmetic geometry some 500 hours to understand his work, and a maths graduate student about ten years. So far, only four mathematicians say that they have been able to read the entire proof.

But so far, the few who have understood the work have struggled to explain it to anyone else. “Everybody who I’m aware of who’s come close to this stuff is quite reasonable, but afterwards they become incapable of communicating it,” says one mathematician who did not want his name to be mentioned.

DANCE 2015

Amber Dance, *Science and Culture: Making a pitch for female engineers*. [PNAS 112 \(2015\), 12545–12546](https://doi.org/10.1073/pnas.1254512112).

The field of engineering needs another hero like MacGyver, says Randy Atkins, director of communications at the NAE. Engineers apply their scientific knowledge

to solve all kinds of problems and create a better world, but young people aren't cognizant of their crucial role. Ask a sixth grader what an engineer is, he laments, and they'll answer, "Isn't that the guy who drives the train?" The NAE, the Viterbi School, and Zlotoff want to do for engineering what CSI: Crime Scene Investigation did for forensic sciences, bringing a technical job to the fore and making it cool.

Some competitors and judges, particularly those with engineering backgrounds, expressed interest in a female character who would be a role model without perpetuating a stereotype. "In the media, the female scientists are often very eccentric or overly sexualized," says finalist Nao Murakami, a doctoral student in aerospace engineering at the University of Washington in Seattle. "You don't have to look like a supermodel to become an engineer." She and others also commented that the character should not be a supergenius or holder of multiple doctorates, like some television scientists, but an engineer with a realistic career path.

EFFERSON 2015

Charles Efferson, Sonja Vogt, Amy Elhadi, Hilal El Fadil Ahmed & Ernst Fehr, *Female genital cutting is not a social coordination norm.* [science](#) **349** (2015), 1446–1447.

[s349-1446-Supplement.pdf](#)

New data from Sudan question an influential approach to reducing female genital cutting.

Heterogeneity means that a single critical threshold is unlikely to exist. Each family will have its own threshold. Thus, the claim that a public declaration will reduce cutting lacks empirical foundation. A public declaration of abandonment runs the risk of merely assembling families who already place a low intrinsic value on cutting, while the families who give it high intrinsic value will remain unconvinced. Public declarations indicate neither widespread abandonment nor that a program has coopted coordination incentives in a way that will lead to reductions in cutting.

FISMAN 2015

Raymond Fisman, Pamela Jakiela, Shachar Kariv & Daniel Markovits, *The distributional preferences of an elite.* [science](#) **349** (2015), 1300.

[s349-1300-Supplement.pdf](#)

We studied the distributional preferences of an elite cadre of Yale Law School students, a group that will assume positions of power in U.S. society. Our experimental design allows us to test whether redistributive decisions are consistent with utility maximization and to decompose underlying preferences into two qualitatively different tradeoffs: fair-mindedness versus self-interest, and equality versus efficiency. Yale Law School subjects are more consistent than subjects drawn from the American Life Panel, a diverse sample of Americans. Relative to the American Life Panel, Yale Law School subjects are also less fair-minded and substantially more efficiency-focused. We further show that our measure of equality-efficiency tradeoffs predicts Yale Law School students' career choices: Equality-minded subjects are more likely to be employed at nonprofit organizations.

Results: YLS subjects were substantially more efficiency-focused than were the ALP subjects drawn from the general population. Overall, 79.8% of YLS subjects were efficiency-focused, versus only 49.8% of the ALP sample. The YLS subjects displayed this distinctive preference for efficiency over equality in spite of overwhelmingly (by more than 10 to 1) self-identifying as Democrats rather than Republicans. In addition, YLS subjects were less likely to be classified as fair-minded and more likely to be classified as selfish than were the ALP subjects. Subjects

from the intermediate elite fell between the YLS and ALP subjects with respect to efficiency-mindedness but were less likely to be fair-minded and more likely to be selfish than were the YLS subjects. We also demonstrate the predictive validity of our experimental measure of equality-efficiency tradeoffs by showing that it predicts the subsequent career choices of YLS subjects: More efficiency-focused behavior in the laboratory was associated with a greater likelihood of choosing private sector employment after graduation, whereas more equality-focused behavior was associated with a greater likelihood of choosing nonprofit sector employment.

Conclusion: Our findings indicate sharp differences in distributional preferences between subjects of varying degrees of eliteness. These results provide a starting point for future research on the distinct preferences of the elite and differences in distributional preferences across groups more generally. From a policy perspective, our results suggest a new explanation for the modesty of the policy response to the rise in income inequality in the United States: Regardless of party, the policymaking elite is significantly more focused on efficiency vis-a-vis equality than is the U.S. public.

GIBBONS 2015

Ann Gibbons, *Humanity's long, lonely road*. [science 349 \(2015\), 1270](#).

Oldest ancient nuclear DNA suggests humans and Neandertals parted ways early.

Scanning this DNA, Meyer and his colleagues found that the two Sima fossils share far more genetic markers with Neandertals than with Denisovans or modern humans. “Indeed, the Sima de los Huesos specimens are early Neandertals or related to early Neandertals,” Meyer said at the meeting. That suggests that the split of Denisovans and Neandertals should be moved back in time, he added. And because Neandertals and Denisovans were more closely related to each other than to modern humans, the ancestors of modern humans must have split away from the tree even earlier, perhaps 550,000 to 765,000 years ago, Meyer suggested. (All three groups did interbreed at low levels after their evolutionary paths diverged—which may explain the Denisovan-like mtDNA in the first Sima fossil to be sequenced.)

GIBBONS 2015

Ann Gibbons, *Cave was lasting home to Denisovans*. [science 349 \(2015\), 1270–1271](#).

Dates and DNA solidify presence of elusive human relative in Siberia

Now, state-of-the-art DNA analysis on the Denisovan molars and new dates on cave material show that Denisovans occupied the cave surprisingly early and came back repeatedly. The data suggest that the girl lived at least 50,000 years ago and that two other Denisovan individuals died in the cave at least 110,000 years ago and perhaps as early as 170,000 years ago, according to two talks here last week at the meeting of the European Society for the study of Human Evolution.

“How secure is the association of the Denisovans with the [dated] animal remains?” asked geochronologist Daniel Richter of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and Leuphana University in Lüneburg. But Douka stressed that the dates were from cutmarked animal bones and ornaments, and were consistent across three cave chambers.

HAINMUELLER 2015

Jens Hainmueller, Dominik Hangartner & Giuseppe Pietrantuono, *Naturalization fosters the long-term political integration of immigrants*. [PNAS 112 \(2015\), 12651–12656](#).

Does naturalization cause better political integration of immigrants into the host society? Despite heated debates about citizenship policy, there exists almost no evidence that isolates the independent effect of naturalization from the nonrandom selection into naturalization. We provide new evidence from a natural experiment in Switzerland, where some municipalities used referendums as the mechanism to decide naturalization requests. Balance checks suggest that for close naturalization referendums, which are decided by just a few votes, the naturalization decision is as good as random, so that narrowly rejected and narrowly approved immigrant applicants are similar on all confounding characteristics. This allows us to remove selection effects and obtain unbiased estimates of the long-term impacts of citizenship. Our study shows that for the immigrants who faced close referendums, naturalization considerably improved their political integration, including increases in formal political participation, political knowledge, and political efficacy.

Keywords: naturalization | immigration | integration | natural experiment | citizenship

Significance: The political integration of immigrant minorities is one of the most pressing policy issues many countries face today. Despite heated debates, there exists little rigorous evidence about whether naturalization fosters or dampens the integration of immigrants into the political fabric of the host society. Our study provides new causal evidence on the long-term effects of naturalization on political integration. Our research design takes advantage of a natural experiment in Switzerland that allows us to separate the independent effect of naturalization from the nonrandom selection into naturalization. We find that in our sample, naturalization caused long-lasting improvements in political integration, with immigrants becoming likely to vote and attaining considerably higher levels of political efficacy and political knowledge.

HE 2015

Lixia He, Ke Zhou, Tiangang Zhou, Sheng He & Lin Chen, *Topology-defined units in numerosity perception*. [PNAS 112 \(2015\), E5647–E5655](#).

What is a number? The number sense hypothesis suggests that numerosity is “a primary visual property” like color, contrast, or orientation. However, exactly what attribute of a stimulus is the primary visual property and determines numbers in the number sense? To verify the invariant nature of numerosity perception, we manipulated the numbers of items connected/enclosed in arbitrary and irregular forms while controlling for low-level features (e.g., orientation, color, and size). Subjects performed discrimination, estimation, and equality judgment tasks in a wide range of presentation durations and across small and large numbers. Results consistently show that connecting/ enclosing items led to robust numerosity underestimation, with the extent of underestimation increasing monotonically with the number of connected/enclosed items. In contrast, grouping based on color similarity had no effect on numerosity judgment. We propose that numbers or the primitive units counted in numerosity perception are influenced by topological invariants, such as connectivity and the inside/outside relationship. Beyond the behavioral measures, neural tuning curves to numerosity in the intraparietal sulcus were obtained using functional MRI adaptation, and the tuning curves showed that numbers represented in the intraparietal sulcus were strongly influenced by topology.

Keywords: number | numerosity perception | topological invariants | global-first topological perception | functional MRI adaptation

Significance: What is a number? The answer to this age-old and fundamental question of philosophy has increasingly benefited from recent scientific investiga-

tion using psychology and neuroscience. To verify the invariant nature of numerosity perception, we manipulated the numbers of items connected/enclosed in arbitrary and irregular forms while controlling for various low-level visual features in different tasks and across small and large numbers. Results were consistent with the topological account, namely that numbers were strongly influenced by topological invariants (connectivity and the inside/outside relationship): connecting/enclosing items led to robust numerosity underestimation, with the extent of underestimation increasing monotonically with the number of connected/enclosed items. Brain image results also provided evidence that numbers represented in the intraparietal sulcus were influenced by topology.

MACCOUN 2015

Robert MacCoun & Saul Perlmutter, *Hide results to seek the truth.* [nature 526 \(2015\), 187–189.](#)

More fields should, like particle physics, adopt blind analysis to thwart bias, urge Robert MacCoun and Saul Perlmutter.

NUZZO 2015

Regina Nuzzo, *Fooling Ourselves.* [nature 526 \(2015\), 182–185.](#)

Humans are remarkably good at self-deception. But growing concern about reproducibility is driving many researchers to seek ways to fight their own worst instincts.

SCHIERMEIER 2015

Quirin Schiermeier, *A tag of one's own.* [nature 526 \(2015\), 281–283.](#)

Digital identifiers can sort out different scientists with the same names, and create a lifelong record of their work.

SERVICK 2015

Kelly Servick, *Can 23andMe have it all?* [science 349 \(2015\), 1472–1477.](#)

The consumer genetics company has amassed DNA from more than a million people. Now, it wants to find drugs to treat them.

23andMe is now working with FDA to bring its health reports for customers back by the end of the year. In February, the agency approved 23andMe's test for whether a person carries a recessive mutation that could give offspring Bloom syndrome, a rare disease that affects the stability of DNA structure and elevates the risk of cancer. FDA also exempted other such carrier tests from its premarket review process, meaning the company won't have to seek approval before providing those results to customers. But it's not clear whether or when 23andMe will resume providing other kinds of health information, such as drug responses and disease risks.

SILBERZAHN 2015

Raphael Silberzahn & Eric L. Uhlmann, *Many hands make tight work.* [nature 526 \(2015\), 189–191.](#)

Crowdsourcing research can balance discussions, validate findings and better inform policy, say Raphael Silberzahn and Eric L. Uhlmann.

Of the 29 teams, 20 found a statistically significant correlation between skin colour and red cards (see 'One data set, many analysts'). The median result was that darkskinned players were 1.3 times more likely than light-skinned players to receive

red cards. But findings varied enormously, from a slight (and non-significant) tendency for referees to give more red cards to light-skinned players to a strong trend of giving more red cards to dark-skinned players.

Had any one of these 29 analyses come out as a single peer-reviewed publication, the conclusion could have ranged from no race bias in referee decisions to a huge bias. Most researchers would find this broad range of effect sizes disturbing. It means that taking any single analysis too seriously could be a mistake, yet this is encouraged by our current system of scientific publishing and media coverage.

SOLOW 2015

Andrew R. Solow, *Extreme weather, made by us?* [science 349 \(2015\), 1444–1445](#).

Individual climate events cannot be attributed to anthropogenic climate change.

For example, even if it is certain that anthropogenic climate change has caused the frequency of European heat waves to double, as estimated in (9), the odds that this summer's European heat wave was caused by anthropogenic climate change are only even.

If the conventional wisdom about single-event attribution remains intact, one thing has changed. Up to now, efforts to connect single events to anthropogenic climate change have been confined to the scientific literature, including special issues of the *Bulletin of the American Meteorological Society* [e.g., (10)]. However, the market expanded this year with a widely cited report by the private organization Climate Central attributing this summer's European heat wave to anthropogenic climate change (9). As with any expanding market, it is important that consumers have a clear understanding of what they are getting.

WALD 2015

Chelsea Wald, *The aesthetic brain*. [nature 526 \(2015\), Supplement, S2–S3](#).

By studying how the brain responds to beauty, researchers hope to understand why we give some people an easier ride or appreciate certain artworks.

A few studies have also indicated that, unlike other regions such as the orbito-frontal cortex, the amygdala may respond to attractiveness in a non-linear way — the reaction gets stronger the more beautiful or ugly a face is, and weaker for more neutral-looking visages. “The signal is saying, there's something here that's kind of weird, kind of unexpected, not what I'm used to,” Mende-Siedlecki says.

The amygdala also contributes to judgements of trustworthiness, says Mende-Siedlecki. This overlap might be efficient for the brain, but as a side effect it could play a part in what psychologists call the attractiveness halo effect — a reflexive presumption that external beauty indicates overall goodness. Such a neural short cut can lead to all sorts of social benefits for attractive people, from better grades to more lenient punishments.

YOH0 2015

Rachel Yoho, *How science fairs shaped my career*. [science 349 \(2015\), 1578](#).

Today, many schools are moving away from inquiry-based science education. A common argument against science fairs is that they take away from family time. But this needn't be the case: My parents embraced the adventure. Research rarely goes smoothly, so my parents and I have a number of now-entertaining memories from my science fair projects. The stories range from developing an efficient system to remove maggots from manure with my dad to nearly falling into a frigid reservoir with my mom while collecting water samples.

My science fair projects helped me develop many skills beyond doing research itself: I learned how to read the literature, write up results, and give presentations. I discovered that one of the most important skills for a young scientist's success is finding good mentors. Although another common complaint about science fairs is that they do not offer equal opportunities to all students, I do not feel that having two parents from nonscience backgrounds ever was a barrier.

I encourage schools and funding agencies to consider the many career benefits before removing science fairs from the curriculum.

Bibel

SANDERS 2015

Paul Sanders, *Missing Link in Hebrew Bible Formation*. [Biblical Archaeology Review 41](#) (2015), vi, 46–52, 74, 76.

This shows for the first time that the Masoretic copyists reproduced an older consonantal text as faithfully as possible and did not allow their copies to deviate from the original. Only meaningless variants were sometimes still accepted.

How can this be explained? I think there is only one convincing solution: The very Torah scroll of which the Ashkar-Gilson Manuscript and London Manuscript are remnants was consulted by the Masoretes of Tiberias. In other words, this seventh- or eighth-century Torah scroll must have figured prominently when they produced the nowstandard text of the Hebrew Bible.

The Ashkar-Gilson and London Manuscripts prove that this process of stabilization had already come to an end some centuries before the Masoretes started to produce the earliest Bible codices. The Masoretes reproduced a text that had already been stabilized and no longer allowed any deviations. It was not their goal to innovate—but rather to preserve the finest textual traditions that existed at the time.

Biologie

PYWELL 2015

Richard F. Pywell, Matthew S. Heard, Ben A. Woodcock, Shelley Hinsley, Lucy Ridding, Marek Nowakowski & James M. Bullock, *Wildlife-friendly farming increases crop yield, Evidence for ecological intensification*. [Proc. Royal Society B 282](#) (2015), 20151740.

Ecological intensification has been promoted as a means to achieve environmentally sustainable increases in crop yields by enhancing ecosystem functions that regulate and support production. There is, however, little direct evidence of yield benefits from ecological intensification on commercial farms growing globally important foodstuffs (grains, oilseeds and pulses). We replicated two treatments removing 3 or 8 % of land at the field edge from production to create wildlife habitat in 50–60 ha patches over a 900 ha commercial arable farm in central England, and compared these to a business as usual control (no land removed). In the control fields, crop yields were reduced by as much as 38 % at the field edge. Habitat creation in these lower yielding areas led to increased yield in the cropped areas of the fields, and this positive effect became more pronounced over 6 years. As a consequence, yields at the field scale were maintained—and, indeed, enhanced for some crops—despite the loss of cropland for habitat creation. These results suggested that over a 5-year crop rotation, there would be no adverse impact on overall yield in terms of monetary value or nutritional energy. This study provides a clear

demonstration that wildlife-friendly management which supports ecosystem services is compatible with, and can even increase, crop yields.

Subject Areas: ecology, environmental science

Keywords: sustainable intensification of agriculture | ecosystem services | agri-environment schemes | pest control | pollination

Datierung

HÖFLMAYER 2013

F. Höflmayer, A. Hassler, W. Kutschera & E. M. Wild, *Radiocarbon Data for Aegean Pottery in Egypt, New Evidence from Saqqara (Lepsius) Tomb 16 and its Importance for LM IB/LH IIA*. In: ANDREW J. SHORTLAND & C. BRONK RAMSEY (Hrsg.), *Radiocarbon and the Chronologies of Ancient Egypt*. (Oxford 2013), 110–120.

While radiocarbon dates for dynastic Egypt are generally in accordance with historical estimations based on textual data, absolute calendar dates for the Aegean early Late Bronze Age are still under discussion. Estimations based on archaeological synchronisms with Egypt are up to 120 years younger than radiocarbon data for the Late Minoan IA and IB periods. In this respect, further radiocarbon data from Egyptian contexts containing Aegean imports are of considerable interest for the ongoing chronological debate. In this contribution, we present new scientific dating evidence for Saqqara (Lepsius) tomb 16, containing an imported Late Helladic IIA alabastron and discuss its importance for absolute calendar dates for Late Minoan IB and Late Helladic IIA.

Energie

DERYABINA 2015

T. G. Deryabina, S. V. Kuchmel, L. L. Nagorskaya, T. G. Hinton, J. C. Beasley, A. Lerebours & J. T. Smith, *Long-term census data reveal abundant wildlife populations at Chernobyl*. *Current Biology* **25** (2015), R824–R826.

CurrBiol25-R0824-Supplement.pdf

Extremely high dose rates during the first six months after the accident significantly affected animal health and reproduction at Chernobyl. However, any potential long-term radiation damage to populations is not apparent from our trend analysis of large mammal abundances. Increases in elk and wild boar populations in the Chernobyl exclusion zone occurred at a time (early 1990s) when these species were undergoing a rapid decline in former Soviet Union countries owing to major socio-economic changes (which resulted in increased rural poverty and weakened wildlife management). Our data on time trends cannot separate likely positive effects of human abandonment of the Chernobyl exclusion zone from a potential negative effect of radiation (though we could detect no such negative effect in our test of Hypothesis 1). Nevertheless, they represent unique evidence of wildlife's resilience in the face of chronic radiation stress.

None of our three hypotheses postulating radiation damage to large mammal populations at Chernobyl were supported by the empirical evidence. The results from these unique data will help society balance the negative impacts to wildlife from chronic radiation exposures against how “the removal of humans alleviates one of the more persistent and ever growing stresses experienced by natural ecosystems”.

SAUCHYN 2015

David J. Sauchyn, Jeannine-Marie St-Jacques & Brian H. Luckman, *Long-term reliability of the Athabasca River (Alberta, Canada) as the water source for oil sands mining*. [PNAS 112 \(2015\), 12621–12626](#).

Exploitation of the Alberta oil sands, the world's third-largest crude oil reserve, requires fresh water from the Athabasca River, an allocation of 4.4% of the mean annual flow. This allocation takes into account seasonal fluctuations but not long-term climatic variability and change. This paper examines the decadal-scale variability in river discharge in the Athabasca River Basin (ARB) with (i) a generalized least-squares (GLS) regression analysis of the trend and variability in gauged flow and (ii) a 900-y tree-ring reconstruction of the water-year flow of the Athabasca River at Athabasca, Alberta. The GLS analysis removes confounding transient trends related to the Pacific Decadal Oscillation (PDO) and Pacific North American mode (PNA). It shows long-term declining flows throughout the ARB. The tree-ring record reveals a larger range of flows and severity of hydrologic deficits than those captured by the instrumental records that are the basis for surface water allocation. It includes periods of sustained low flow of multiple decades in duration, suggesting the influence of the PDO and PNA teleconnections. These results together demonstrate that low-frequency variability must be considered in ARB water allocation, which has not been the case. We show that the current and projected surface water allocations from the Athabasca River for the exploitation of the Alberta oil sands are based on an untenable assumption of the representativeness of the short instrumental record.

Keywords: paleohydrology | statistical hydrology | oil sands | Alberta | climate variability

Significance: We show that current and projected surface water allocations from the Athabasca River, Alberta, Canada, for the exploitation of the Alberta oil sands are based upon an untenable assumption of the representativeness of the short instrumental gauge record. Our trend analysis of the instrumental data shows declining regional flows. Our tree-ring reconstruction shows periods of severe and prolonged low flows not captured by the instrumental record.

Jungpaläolithikum

HUSSAIN 2015

Shumon T. Hussain & Harald Floss, *Streams as Entanglement of Nature and Culture, European Upper Paleolithic River Systems and Their Role as Features of Spatial Organization*. [Journal of Archaeological Method and Theory \(2015\), preprint, 1–57](#). DOI:10.1007/s10816-015-9263-x.

JArchMethTheo2015-Hussain-Supplement.docx

Large river valleys have long been seen as important factors to shape the mobility, communication, and exchange of Pleistocene hunter-gatherers. However, rivers have been debated as either natural entities people adapt and react to or as cultural and meaningful entities people experience and interpret in different ways. Here, we attempt to integrate both perspectives. Building on theoretical work from various disciplines, we discuss the relationship between biophysical river properties and sociocultural river semantics and suggest that understanding a river's persona is central to evaluating its role in spatial organization. By reviewing the literature and analyzing European Upper Paleolithic site distribution and raw material transfer patterns in relation to river catchments, we show that the role of prominent

ivers varies considerably over time. Both ecological and cultural factors are crucial to explaining these patterns. Whereas the Earlier Upper Paleolithic record displays a general tendency toward conceiving rivers as mobility guidelines, the spatial consolidation process after the colonization of the European mainland is paralleled by a trend of conceptualizing river regimes as frontiers, separating archaeological entities, regional groups, or local networks. The Late Upper Paleolithic Magdalenian, however, is characterized again by a role of rivers as mobility and communication vectors. Tracing changing patterns in the role of certain river regimes through time thus contributes to our growing knowledge of human spatial behavior and helps to improve our understanding of dynamic and mutually informed human-environment interactions in the Paleolithic.

Keywords: Pleistocene river systems | Upper Paleolithic spatial organization | Ecocultural systems | Nature-culture entanglement | Affordances | Focality

Klima

CHEN 2015

Tianyu Chen, Laura F. Robinson, Andrea Burke, John Southon, Peter Spooner, Paul J. Morris & Hong Chin Ng, *Synchronous centennial abrupt events in the ocean and atmosphere during the last deglaciation*. *science* **349** (2015), 1537–1541.

s349-1537-Supplement.pdf

Antarctic ice-core data reveal that the atmosphere experienced abrupt centennial increases in CO₂ concentration during the last deglaciation (\approx 18 thousand to 11 thousand years ago). Establishing the role of ocean circulation in these changes requires high-resolution, accurately dated marine records. Here, we report radiocarbon data from uranium-thorium-dated deep-sea corals in the Equatorial Atlantic and Drake Passage over the past 25,000 years. Two major deglacial radiocarbon shifts occurred in phase with centennial atmospheric CO₂ rises at 14.8 thousand and 11.7 thousand years ago. We interpret these radiocarbon-enriched signals to represent two short-lived (less than 500 years) “overshoot” events, with Atlantic meridional overturning stronger than that of the modern era. These results provide compelling evidence for a close coupling of ocean circulation and centennial climate events during the last deglaciation.

Kultur

JÄGER 2015

Gerhard Jäger, *Support for linguistic macrofamilies from weighted sequence alignment*. *PNAS* **112** (2015), 12752–12757.

pnas112-12752-Supplement1.svg, pnas112-12752-Supplement2.svg, pnas112-12752-Supplement3.svg, pnas112-12752-Supplement4.csv

Computational phylogenetics is in the process of revolutionizing historical linguistics. Recent applications have shed new light on controversial issues, such as the location and time depth of language families and the dynamics of their spread. So far, these approaches have been limited to single-language families because they rely on a large body of expert cognacy judgments or grammatical classifications, which is currently unavailable for most language families. The present study pursues a different approach. Starting from raw phonetic transcription of core vocabulary items from very diverse languages, it applies weighted string alignment to track both phonetic and lexical change. Applied to a collection of \approx 1,000 Eurasian

languages and dialects, this method, combined with phylogenetic inference, leads to a classification in excellent agreement with established findings of historical linguistics. Furthermore, it provides strong statistical support for several putative macrofamilies contested in current historical linguistics. In particular, there is a solid signal for the Nostratic/Eurasiatic macrofamily.

Keywords: linguistic macrofamilies | phylogenetic methods | historical linguistics | cultural evolution | mass lexical comparison

Significance: This article reports findings regarding the automatic classification of Eurasian languages using techniques from computational biology (such as sequence alignment, phylogenetic inference, and bootstrapping). Main results are that there is solid support for the hypothetical linguistic macrofamilies Eurasiatic and Austro-Tai. Unlike comparable previous work, these findings do not depend on manual assessments of etymological facts. This study contributes to ongoing efforts to push the limits of linguistic reconstruction further back in time, and thus to open a window into the pre-Neolithic human past. The methodological approach pursued here can be seen as a statistically informed and automatized version of Joseph Greenberg's mass lexical comparison, which yielded intriguing results regarding deep genetic relations between languages but has remained controversial among experts.

Neolithikum

KUIJT 2007

Ian Kuijt, Bill Finlayson & Jode MacKay, *Pottery Neolithic landscape modification at Dhra'*. [Antiquity 81 \(2007\), 106–118](#).

This report of the discovery of low walls running across the slopes east of the Dead Sea presents an important landmark in the history of farming, for these were terrace walls put in place to conserve soil and control water around 6 000 cal BC. The authors point to some of the implications of what they see as early landscape modification at the scale of a small community or household.

Keywords: West Asia | Near East | Dead Sea | Jordan | Neolithic | PN | PPNC | agriculture | farming | irrigation

Story or Book

NIELD 2015

Ted Nield, *The continental conundrum*. [nature 526 \(2015\), 192–193](#).

Ted Nield hails a biography of Alfred Wegener, who proposed the theory preceding plate tectonics.

Alfred Wegener: Science, Exploration, and the Theory of Continental Drift. Mott T. Greene. Johns Hopkins University Press: 2015.

Sharing his lifelong need for physical exertion with his older brother and fellow explorer Kurt, Wegener developed a love of ballooning that led to their 1906 world record of 52.5 hours of continuous flight. His passion for the outdoors led him towards understanding the natural world through physics.

When he died aged just 50 in 1930, from a heart attack on the Greenland ice sheet, he left no disciples. 'Cosmic physics' broke up like a supercontinent. As a result, Wegener makes a challenging subject, which Greene tackles through extensive archival research, travel and circumstantial evidence. Wegener left no extensive notebooks; much of his unpublished writing was destroyed by war or neglect, and he was not given to personal revelation. Like many polar explorers, he was wrapped up in his work.

The result is a magnificent, definitive and indefatigable tribute to an indefatigable man.