

## References

### Aktuell

BUTLER 2017

Lucas P. Butler, *The social origins of persistence*. [science](#) **357** (2017), 1236–1237.

Infants can learn the value of persistence by observing adult behavior. Perhaps the key question arising from these studies is how different experiences watching adults approach challenge, effort, and perseverance shape young children's developing notions of hard work and success in real life. Much of adults' effort is opaque to children. Parents go to work, struggle with the tasks at their job, persist or give up, maintain focus or fall prey to procrastination. But how much of this is evident to their children? How do children gather the evidence necessary to make the kind of inferences seen in Leonard et al.'s study?

LEONARD 2017

Julia A. Leonard, Yuna Lee & Laura E. Schulz, *Infants make more attempts to achieve a goal when they see adults persist*. [science](#) **357** (2017), 1290–1294.

s357-1290-Supplement1.pdf, s357-1290-Supplement2.mp4

Persistence, above and beyond IQ, is associated with long-term academic outcomes. To look at the effect of adult models on infants' persistence, we conducted an experiment in which 15-month-olds were assigned to one of three conditions: an Effort condition in which they saw an adult try repeatedly, using various methods, to achieve each of two different goals; a No Effort condition in which the adult achieved the goals effortlessly; or a Baseline condition. Infants were then given a difficult, novel task. Across an initial study and two preregistered experiments (N = 262), infants in the Effort condition made more attempts to achieve the goal than did infants in the other conditions. Pedagogical cues modulated the effect. The results suggest that adult models causally affect infants' persistence and that infants can generalize the value of persistence to novel tasks.

LOVE 2017

Jenny Love et al., *The addition of heat pump electricity load profiles to GB electricity demand, Evidence from a heat pump field trial*. [Applied Energy](#) **204** (2017), 332–342.

Jenny Love, Andrew Z. P. Smith, Stephen Watson, Eleni Oikonomou, Alex Summerfield, Colin Gleeson, Phillip Biddulph, Lai Fong Chiu, Jez Wingfield, Chris Martin, Andy Stone & Robert Lowe

Previous studies on the effect of mass uptake of heat pumps on the capability of local or national electricity grids have relied on modelling or small datasets to create the aggregated heat pump load profile. This article uses the UK Renewable Heat Premium Payment dataset, which records the electricity consumption of nearly 700 domestic heat pump installations every 2 minutes, to create an aggregated load profile using an order of magnitude more sites than previously available. The aggregated profile is presented on cold and medium winter weekdays and weekends and is shown to contain two peaks per day, dropping overnight to around 40% of its peak. After Diversity Maximum Demand (ADMD) for the population

of heat pumps is calculated as 1.7 kW per site; this occurs in the morning, whereas the peak national grid demand occurs in the evening. Analysis is carried out on how heat pump ADMD varies with number of heat pumps in the sample. A simple upscaling exercise is presented to give a first order approximation of the increase in GB peak electricity demand with mass deployment of heat pumps. It is found that peak grid demand increases by 7.5 GW (14%) with 20% of households using heat pumps. The effect of the same heat pump uptake on grid ramp rate is also discussed; this effect is found to be minor. Finally, a comparison of heat pump and gas boiler operation is given, discussing day and night time operation and mean and peak power at different external temperatures.

**Highlights:**

- An aggregated load profile is constructed using data from 696 heat pumps in GB.
- It contains a morning and evening peak, falling to 40% of its peak value overnight.
- After diversity maximum demand is calculated as 1.7 kWe per heat pump.
- A first order approximation of the impact of 20% uptake of heat pumps is presented.
- This is shown to lead to the GB national grid evening peak increasing by 14%.

**Keywords:** Heat pump | Load profile | Empirical | Electricity grid | Diversity | Domestic

## MUELLER 2017

Charles J. Mueller, Christopher W. Nilsen, Daniel J. Ruth, Ryan K. Gehmlich, Lyle M. Pickett & Scott A. Skeen, *Ducted fuel injection, A new approach for lowering soot emissions from direct-injection engines*. [Applied Energy](#) **204** (2017), 206–220.

Designers of direct-injection compression-ignition engines use a variety of strategies to improve the fuel/ charge-gas mixture within the combustion chamber for increased efficiency and reduced pollutant emissions. Strategies include the use of high fuel-injection pressures, multiple injections, small injector orifices, flow swirl, long-ignition-delay conditions, and oxygenated fuels. This is the first journal publication on a new mixing-enhancement strategy for emissions reduction: ducted fuel injection. The concept involves injecting fuel along the axis of a small cylindrical duct within the combustion chamber, to enhance the mixture in the autoignition zone relative to a conventional free-spray configuration (i.e., a fuel spray that is not surrounded by a duct). The results described herein, from initial proof-of-concept experiments conducted in a constant-volume combustion vessel, show dramatically lower soot incandescence from ducted fuel injection than from free sprays over a range of charge-gas conditions that are representative of those in modern direct-injection compression-ignition engines.

**Highlights:**

- Ducted fuel injection (DFI) is a new concept for direct-injection engines.
- DFI entails injecting fuel through a tube within the combustion chamber.
- DFI can lower the amount of soot incandescence during combustion by 10 × or more.
- DFI enhances the extent of premixing that takes place before ignition.
- DFI shows promise for lowering soot emissions from direct-injection engines.

**Keywords:** Soot | Duct | Diesel | Spray | Mixing | Combustion

## WELCH 2017

Amanda Welch, Cleyde Helena & Ian Street, *Sunshine outside the ivory tower*. [science](#) **357** (2017), 1322.

Over the past few years, all three of us have left academia. It was the right decision for each of us, but we still struggled with uncertainty and a feeling of failure, and we could find little community support. We thought that sharing our experiences could help others in similar situations, so we created the Recovering Academic podcast. The specifics of our postacademic careers vary, but for us and many of our listeners, the emotional challenges have been similar.

## Anthropologie

ROSAS 2017

Antonio Rosas et al., *The growth pattern of Neandertals, reconstructed from a juvenile skeleton from El Sidrón (Spain)*. [science](#) **357** (2017), 1282–1287.

[s357-1282-Supplement.pdf](#)

Antonio Rosas, Luis Ríos, Almudena Estalrich, Helen Liversidge, Antonio García-Taberner, Rosa Hugué, Hugo Cardoso, Markus Bastir, Carles Lalueza-Fox, Marco de la Rasilla & Christopher Dean

Ontogenetic studies help us understand the processes of evolutionary change. Previous studies on Neandertals have focused mainly on dental development and inferred an accelerated pace of general growth. We report on a juvenile partial skeleton (El Sidrón J1) preserving cranio-dental and postcranial remains. We used dental histology to estimate the age at death to be 7.7 years. Maturation of most elements fell within the expected range of modern humans at this age. The exceptions were the atlas and mid-thoracic vertebrae, which remained at the 5- to 6-year stage of development. Furthermore, endocranial features suggest that brain growth was not yet completed. The vertebral maturation pattern and extended brain growth most likely reflect Neandertal physiology and ontogenetic energy constraints rather than any fundamental difference in the overall pace of growth in this extinct human.

## Judentum

MÜLLER-KESSLER 2017

Christa Müller-Kessler, *Zauberschalen und ihre Umwelt, Ein Überblick über das Schreibmedium Zauberschale*. [Abhandlungen des Deutschen Palästina-Vereins](#) **46** (2017), 59–94.

Ob der Klient, der diese Schale erwarb, die Anweisung selber lesen konnte ist zweifelhaft, da ein Drittel der Schalen jeder Sammlung mit Pseudoschriften beschrieben war. Scharlatanerie war zu jeder Zeit en vogue. Damit lässt sich der Bogen zu einer weitaus intensiver geführten Diskussion des sprachlichen Hintergrunds der Schalentexte spannen, [...]

Dabei ist im Falle der Quadratschriftschalen sicherlich von überwiegend im jüdischen Schreibermilieu angesiedelten Verfassern auszugehen, da diese sehr häufig Zitate aus dem Alten Testament enthalten oder andere eindeutig aus der jüdischen Literatur stammende Formulareile, Einschübe oder hebräische Zitate, z.B. Bibel- und Hekhalotzitate, die in den anderen Dialekten fehlen, oder auch Talmud- und Mischnaausschnitte aufweisen. Weit weniger scheint dies jedoch für die hier neu vorgelegte Gruppe von Texten im koine-babylonisch-aramäischen Dialekt zu gelten (C. Kessler 2002, 73–164). Identität von Schrift und Religionszugehörigkeit wird fast einstimmig bei den mandäischen Beschwörungen angenommen, während

eine derartige Verknüpfung von den in Manichäisch (Taf. 6B) und Estrangela geschriebenen Schalen (Abb. 4) bisher mehr der subjektiven Einschätzung überlassen blieb. Die beispielsweise angenommene Verbindung zwischen den in Manichäisch geschriebenen Schalen und der von Mani begründeten manichäischen Lehre scheint zwar zunächst plausibel (Beyer 2004, 26–27), doch bleibt derzeit nur die negative Erkenntnis, dass dafür noch kein wirklich beweiskräftiger Beleg vorgelegt wurde.

## Klima

GREKYAN 2014

Yervand Grekyan, *When the Gods Leave People, The Climatological Hypothesis of the Collapse of the Urartian State*. [Aramazd, Armenian Journal of Near Eastern Studies](#) 8 (2014), 57–94.

As far as we know, no palaeoclimatological and palaeobotanical complex research on the Armenian Highland exists,<sup>8</sup> and the researches on the whole ancient Near Eastern region were carried out taking into consideration various problems. Judging from the existing works, in the time period that interests us – the years between 700-600 B.C. – there is a water temperature decrease in the Mediterranean and the Ionian Seas that is directly proportional to the decrease of the precipitation amount in the Near East. At about 700 B.C., the climate becomes dryer in the Eastern Mediterranean regions. In addition, another phenomenon can be observed in this very region, namely, a decline in solar activity. These phenomena, that were observed over the course of the ancient Near Eastern crisis of the 12th century B.C., may help us to understand the hydro-construction projects actively carried out in Urartu and the desperate attempts made by the Urartians to save the state in the 7th century B.C.

## Kultur

SEYFRIED 2017

FRIEDERIKE SEYFRIED (Hrsg.), *China und Ägypten: Wiegen der Welt, Katalog „China und Ägypten. Wiegen der Welt“ vom 5. Juli bis zum 3. Dezember 2017 im Neuen Museum Berlin*. (München 2017).

## Neolithikum

MARQUEZ 2008

Belen Marquez, Juan Francisco Gibaja, Jesus Emilio Gonzalez, Juan Jose Ibañez & Antoni Palomo, *Projectile points as signs of violence in collective burials during the 4th and the 3rd millennia cal. BC in the North-East of the Iberian peninsula*. In: LAURA LONGO & NATALIA NIKOLAEVNA SKAKUN (Hrsg.), *“Prehistoric Technology” 40 Years Later: Functional Studies and the Russian Legacy, Proceedings of the International Congress Verona (Italy) 20–23 April 2005*. BAR International Series 1783 ([Oxford 2008](#)), 321–325.

During the Late Neolithic and the Chalcolithic in the NE of the Iberian Peninsula two main changes in the burials take place with respect to the previous period: the appearance of collective burials and the high proportion of projectile

points among the tools recovered inside the monuments. What is the meaning of these projectile points? Without ruling out the possibility that some of these points were intentionally deposited, stressing the symbolic relevance of these hunting/war tools, we think that many of them must have entered the burial place inside the bodies of the deceased people, indicating human violence. We analyse three collective burials showing many signs of violence: some points inserted in the human bones, other points broken by impact, some traumatic fractures in skulls, etc. We think that the violence observed in these burials can be characterised as systematic and organised, showing the social importance of war in this period.

Keywords: Neolithic | Chalcolithic | Iberian Peninsula | arrowheads | violence.

## PLANTINGA 2012

Theo S. Plantinga et al., *Low prevalence of lactase persistence in Neolithic South-West Europe*. [European Journal of Human Genetics](#) **20** (2012), 778–782.

Theo S. Plantinga, Santos Alonso, Neskuts Izagirre, Montserrat Hervella, Rosa Fregel, Jos W.M. van der Meer, Mihai G. Netea & Concepcion de la Rúa

The ability of humans to digest the milk component lactose after weaning requires persistent production of the lactoseconverting enzyme lactase. Genetic variation in the promoter of the lactase gene (LCT) is known to be associated with lactase production and is therefore a genetic determinant for either lactase deficiency or lactase persistence during adulthood. Large differences in this genetic trait exist between populations in Africa and the Middle-East on the one hand, and European populations on the other; this is thought to be due to evolutionary pressures exerted by consumption of dairy products in Neolithic populations in Europe. In this study, we have investigated lactase persistence of 26 out of 46 individuals from Late Neolithic through analysis of ancient South-West European DNA samples, obtained from two burials in the Basque Country originating from 5000 to 4500 YBP. This investigation revealed that these populations had an average frequency of lactase persistence of 27%, much lower than in the modern Basque population, which is compatible with the concept that Neolithic and post-Neolithic evolutionary pressures by cattle domestication and consumption of dairy products led to high lactase persistence in Southern European populations. Given the heterogeneity in the frequency of the lactase persistence allele in ancient Europe, we suggest that in Southern Europe the selective advantage of lactose assimilation in adulthood most likely took place from standing population variation, after cattle domestication, at a post-Neolithic time when fresh milk consumption was already fully adopted as a consequence of a cultural influence.

Keywords: lactase persistence | evolutionary pressure | ancient DNA | Neolithic

## Sprachlehre

### MÜLLER-KESSLER 2017

Christa Müller-Kessler, *A Trilingual Pharmaceutical Lexical List, Greek – Aramaic – Middle Persian*. [Le Muséon](#) **130** (2017), 31–69.

This trilingual plant list in Greek, Aramaic, and Middle Persian (Pahlavi) is a late copy in the Aramaic square script from the Cairo Genizah of the ninth or tenth centuries with randomly applied Palestinian vocalisation (T-S K14.22). It is the second example of a trilingual lexical list, containing plant names after Barhebraeus' plant list in the Menarath Kudhshe. The origin of the Vorlage speaks for Jundishapur as its place of completion, and Syriac used for the Aramaic glosses, since this fragment shows a number of Syriac calques, especially particles, which

came in through the translation from one Aramaic dialect into another. This unique text source demonstrates again how closely interlinked Greek, Aramaic, and Middle Iranian were in Late Antiquity, despite the loss of most of the text material from this famous academy of medical studies. What this list makes also so valuable is the application of the grades of the plants' effect that go back to Galen, as can be found in the remnant Syriac manuscript Mingana Syr. 661.