

References

Afrika

HEIMLICH 2013

Geoffroy Heimlich, *Rock art as a source for the history of the Kongo kingdom*. In: SUSAN COOKSEY, ROBIN POYNOR & HEIN VANHEE (Hrsg.), *Kongo across the waters*. ([Gainesville 2013](#)), 34–39.

HEIMLICH 2016

Geoffroy Heimlich, *The anthropology and history of rock art in the Lower Congo in perspective*. [Antiquity 90 \(2016\), 1270–1285](#).

The rock art of the Lovo Massif region in the Lower Congo offers a fascinating and understudied example of artistic traditions, some of which predate the period of European contact. The first extensive, systematic survey of the region has identified key aspects of these rock art traditions, and has obtained radiocarbon dates that facilitate new interpretations of the relationship between the rock art and the historical kingdom of Kongo. Multiple perspectives are used to integrate anthropological, historical and archaeological data with stories from local mythology to show how the significance of this art has evolved over time. As a result of this study, the unique cultural heritage of the LovoMassif rock art has been put forward for protection under the UNESCO World Heritage list.

Keywords: Democratic Republic of the Congo | Lovo Massif | Kongo kingdom | rock art | multi-perspective

Aktuell

BEHRENS 2017

Paul Behrens, Jessica C. Kiefte-de Jong, Thijs Bosker, João F. D. Rodrigues, Arjan de Koning & Arnold Tukker, *Evaluating the environmental impacts of dietary recommendations*. [PNAS 114 \(2017\), 13412–13417](#).

[pnas114-13412-Supplement.xlsx](#)

Dietary choices drive both health and environmental outcomes. Information on diets come from many sources, with nationally recommended diets (NRDs) by governmental or similar advisory bodies the most authoritative. Little or no attention is placed on the environmental impacts within NRDs. Here we quantify the impact of nation-specific NRDs, compared with an average diet in 37 nations, representing 64% of global population. We focus on greenhouse gases (GHGs), eutrophication, and land use because these have impacts reaching or exceeding planetary boundaries. We show that compared with average diets, NRDs in high-income nations are associated with reductions in GHG, eutrophication, and land use from 13.0 to 24.8%, 9.8 to 21.3%, and 5.7 to 17.6%, respectively. In upper-middle-income nations, NRDs are associated with slight decrease in impacts of 0.8–12.2%, 7.7–19.4%, and 7.2–18.6%. In poorer middle-income nations, impacts increase by 12.4–17.0%, 24.5–31.9%, and 8.8–14.8%. The reduced environmental impact in high-income countries is driven by reductions in calories ($\approx 54\%$ of

effect) and a change in composition ($\approx 46\%$). The increased environmental impacts of NRDs in low- and middle-income nations are associated with increased intake in animal products. Uniform adoption of NRDs across these nations would result in reductions of 0.19–0.53 Gt CO₂ eqa-1, 4.32–10.6 Gt PO₃₋₄ eqa-1, and 1.5–2.8 million km², while providing the health cobenefits of adopting an NRD. As a small number of dietary guidelines are beginning to incorporate more general environmental concerns, we anticipate that this work will provide a standardized baseline for future work to optimize recommended diets further.

Keywords: sustainable diets | MRIO | environmental impacts | dietary change

Significance: Nationally recommended diets are a prominent method for informing the public on dietary choices. Although dietary choices drive both health and environmental outcomes, these diets make almost no reference to environmental impacts. Our study provides a comparison between the environmental impacts of average dietary intakes and a nation-specific recommended diet across 37 middle- and high-income nations. We find that following a nationally recommended diet in high-income nations results in a reduction in greenhouse gases, eutrophication, and land use. In upper-middle-income nations, we find a smaller reduction in impacts, and in lower-middle-income nations we find a substantial increase. The net result from largescale adoption of nationally recommended diets for countries studied here results in a reduction in environmental impacts.

BRIGHTON 2017

Caroline H. Brighton, Adrian L. R. Thomas & Graham K. Taylor, *Terminal attack trajectories of peregrine falcons are described by the proportional navigation guidance law of missiles*. *PNAS* **114** (2017), 13495–13500.

pnas114-13495-Supplement1.mov, pnas114-13495-Supplement2.mov, pnas114-13495-Supplement3.mov, pnas114-13495-Supplement4.mov, pnas114-13495-Supplement5.mov, pnas114-13495-Supplement6.mov

The ability to intercept uncooperative targets is key to many diverse flight behaviors, from courtship to predation. Previous research has looked for simple geometric rules describing the attack trajectories of animals, but the underlying feedback laws have remained obscure. Here, we use GPS loggers and onboard video cameras to study peregrine falcons, *Falco peregrinus*, attacking stationary targets, maneuvering targets, and live prey. We show that the terminal attack trajectories of peregrines are not described by any simple geometric rule as previously claimed, and instead use system identification techniques to fit a phenomenological model of the dynamical system generating the observed trajectories. We find that these trajectories are best—and exceedingly well—modeled by the proportional navigation (PN) guidance law used by most guided missiles. Under this guidance law, turning is commanded at a rate proportional to the angular rate of the line-of-sight between the attacker and its target, with a constant of proportionality (i.e., feedback gain) called the navigation constant (N). Whereas most guided missiles use navigation constants falling on the interval $3 \leq N \leq 5$, peregrine attack trajectories are best fitted by lower navigation constants (median $N < 3$). This lower feedback gain is appropriate at the lower flight speed of a biological system, given its presumably higher error and longer delay. This same guidance law could find use in small visually guided drones designed to remove other drones from protected airspace.

Keywords: peregrine falcon | pursuit | guidance law | system identification | proportional navigation

Significance: Renowned as nature’s fastest predators, peregrines are famous for their high-speed stooping and swooping attack behaviors. We used miniature GPS

receivers to track peregrines attacking dummy targets thrown by a falconer or towed by a drone and fitted a simulation describing the dynamics of the guidance system used in interception. We collected onboard video giving a falcon's-eye view of the attacks and used this to validate our conclusions for attacks on live targets. Remarkably, we find that the terminal attack trajectories of peregrines are described by the same feedback law used by visually guided missiles, but with a tuning appropriate to their lower flight speed. Our findings have application to drones designed to remove other drones from protected airspace.

DESHPANDE 2017

Aditi Deshpande, *Learning to be a mentor*. [science 358 \(2017\), 1098](#).

My early experiences mentoring undergraduate students didn't go well. My first attempt came during the second year of my Ph.D. I was still trying to learn some lab techniques myself, and I wasn't sure whether I would be able to invest the time needed to train a student. But I was interested in developing my mentoring skills, and my adviser encouraged me to give it a try. The student required hand-holding and close monitoring, and it quickly became evident that the collaboration wasn't working. After similar false starts with a few more students, I ended up being reluctant to work with undergraduate researchers at all—until a new student helped me realize what is required to mentor undergraduates, and the rewards it can bring.

D'SOUZA 2017

Raissa M. D'Souza, *Curtailing cascading failures*. [science 358 \(2017\), 860–861](#).

The failure of a small but variable set of links can bring down a supply network. However, the vulnerable set is overall small with recurrent failures, and Yang et al. suggest that “failure-based” allocation of resources could be applied more selectively to lines seen to repeatedly undergo primary failures in an attempt to reduce cascades.

FIGLIO 2017

David N. Figlio, Jeremy Freese, Krzysztof Karbownik & Jeffrey Roth, *Socioeconomic status and genetic influences on cognitive development*. [PNAS 114 \(2017\), 13441–13446](#).

Accurate understanding of environmental moderation of genetic influences is vital to advancing the science of cognitive development as well as for designing interventions. One widely reported idea is increasing genetic influence on cognition for children raised in higher socioeconomic status (SES) families, including recent proposals that the pattern is a particularly US phenomenon. We used matched birth and school records from Florida siblings and twins born in 1994–2002 to provide the largest, most populationdiverse consideration of this hypothesis to date. We found no evidence of SES moderation of genetic influence on test scores, suggesting that articulating gene-environment interactions for cognition is more complex and elusive than previously supposed.

Keywords: socioeconomic status | cognition | behavior genetics | environmental moderation | twin studies

Significance: A prominent hypothesis in the study of intelligence is that genetic influences on cognitive abilities are larger for children raised in more advantaged environments. Evidence to date has been mixed, with some indication that the hypothesized pattern may hold in the United States but not elsewhere. We conducted the largest study to date using matched birth and school administrative

records from the socioeconomically diverse state of Florida, and we did not find evidence for the hypothesis.

HOLMES 2017

Andrew M. Holmes, *Science in 17 syllables*. [science](#) **358** (2017), 966.

One Christmas, my aunt Barbara gave me a poetry book. Nestled among the pages of verse was a single haiku. For those as unfamiliar as I was, haiku is a short form of Japanese poetry presented in the West across three lines of five, seven, and five syllables. Haiku are quick to consume, but they linger in the mind. Frequently, they concern the natural world—one famous haiku describes a frog jumping into a pond—so the leap to scientific haiku, or “sciku,” is easy. (In fact, author Mary Soon Lee published a periodic table of sciku, with a verse for every element, in the 4 August issue of *Science*.) Sciku are an easy-to-digest form of public engagement. And I have found that writing sciku can be a form of career therapy, forcing me to view research through a different lens and gain a novel perspective on my own work.

KARL 2017

Raimund Karl, *Ich bin Hobbychirurg und Hobbypolizist*. [Archäologische Informationen](#) **40** (2017), 73–86.

MORISHIMA 2017

Kunihiro Morishima et al., *Discovery of a big void in Khufu’s Pyramid by observation of cosmic-ray muons*. [nature](#) **552** (2017), 386–390.

Kunihiro Morishima, Mitsuaki Kuno, Akira Nishio, Nobuko Kitagawa, Yuta Manabe, Masaki Moto, Fumihiko Takasaki, Hirofumi Fujii, Kotaro Satoh, Hideyo Kodama, Kohei Hayashi, Shigeru Odaka, Sébastien Procureur, David Attié, Simon Bouteille, Denis Calvet, Christopher Filosa, Patrick Magnier, Irakli Mandjavidze, Marc Riallot, Benoit Marini, Pierre Gable, Yoshikatsu Date, Makiko Sugiura, Yasser Elshayeb, Tamer Elnady, Mustapha Ezzy, Emmanuel Guerriero, Vincent Steiger, Nicolas Serikoff, Jean-Baptiste Mouret, Bernard Charlès, Hany Helal & Mehdi Tayoubi

The Great Pyramid, or Khufu’s Pyramid, was built on the Giza plateau in Egypt during the fourth dynasty by the pharaoh Khufu (Cheops)¹, who reigned from 2509 bc to 2483 bc. Despite being one of the oldest and largest monuments on Earth, there is no consensus about how it was built. To understand its internal structure better, we imaged the pyramid using muons, which are by-products of cosmic rays that are only partially absorbed by stone. The resulting cosmic-ray muon radiography allows us to visualize the known and any unknown voids in the pyramid in a non-invasive way. Here we report the discovery of a large void (with a cross-section similar to that of the Grand Gallery and a minimum length of 30 metres) situated above the Grand Gallery. This constitutes the first major inner structure found in the Great Pyramid since the nineteenth century. The void, named ScanPyramids’ Big Void, was first observed with nuclear emulsion films^{7–9} installed in the Queen’s chamber, then confirmed with scintillator hodoscopes^{10,11} set up in the same chamber and finally re-confirmed with gas detectors¹² outside the pyramid. This large void has therefore been detected with high confidence by three different muon detection technologies and three independent analyses. These results constitute a breakthrough for the understanding of the internal structure of Khufu’s Pyramid. Although there is currently no information about the intended purpose of this void, these findings show how modern particle physics can shed new light on the world’s archaeological heritage.

YANG 2017

Yang Yang, Takashi Nishikawa & Adilson E. Motter, *Small vulnerable sets determine large network cascades in power grids*. [science](#) **358** (2017), 886.

Our results imply that the same disturbance in a given power grid can lead to disparate outcomes under different conditions—ranging from no damage to a large-scale cascade. The association between large cascades and the triggering failures' proximity to the vulnerable set indicates that the topological and geographical properties of the vulnerable set is a major factor determining whether the failures spread widely. Because the vulnerable set is small, failures would often repeat on the same lines in the absence of interventions. Although the power grid represents a complex system in which changes can have unanticipated effects, our analysis suggests failure-based allocation of resources as a strategy in upgrading the system-for improved resilience against large cascades.

DE ZEEUW 2017

Eveline L. de Zeeuw & Dorret I. Boomsma, *Country-by-genotype-by-environment interaction in childhood academic achievement*. [PNAS](#) **114** (2017), 13318–13320.

As to how GxE interaction may manifest, several theoretical models each offer their own prediction. The diathesis-stress model predicts that genetic vulnerability, or diathesis, increases the likelihood of a trait in the presence of environmental stress. It also predicts that the heritability of the trait will be higher for children in risk environments (3). In contrast, the bioecological model predicts that risk environments will mask genetic differences between children and enriched environments will amplify genetic differences.

Anthropologie

CRAWFORD 2017

Nicholas G. Crawford et al., *Loci associated with skin pigmentation identified in African populations*. [science](#) **358** (2017), 887.

Nicholas G. Crawford, Derek E. Kelly, Matthew E. B. Hansen, Marcia H. Beltrame, Shaohua Fan, Shanna L. Bowman, Ethan Jewett, Alessia Ranciaro, Simon Thompson, Yancy Lo, Susanne P. Pfeifer, Jeffrey D. Jensen, Michael C. Campbell, William Beggs, Farhad Hormozdiari, Sununguko Wata Mpoloka, Gaonyadiwe George Mokone, Thomas Nyambo, Dawit Wolde Meskel, Gurja Belay, Jake Haut, NISC Comparative Sequencing Program, Harriet Rothschild, Leonard Zon, Yi Zhou, Michael A. Kovacs, Mai Xu, Tongwu Zhang, Kevin Bishop, Jason Sinclair, Cecilia Rivas, Eugene Elliot, Jiyeon Choi, Shengchao A. Li, Belynda Hicks, Shawn Burgess, Christian Abnet, Dawn E. Watkins-Chow, Elena Oceana, Yun S. Song, Eleazar Eskin, Kevin M. Brown, Michael S. Marks, Stacie K. Loftus, William J. Pavan, Meredith Yeager, Stephen Chanock, Sarah A. Tishkoff

We identify previously uncharacterized genes and variants associated with skin pigmentation in ethnically diverse Africans. These genes have diverse functions, from repairing UV damage to playing important roles in melanocyte biology. We show that both dark and light pigmentation alleles arose before the origin of modern humans and that both light and dark pigmented skin has continued to evolve throughout hominid history. We show that variants associated with dark pigmentation in Africans are identical by descent in South Asian and Australo-Melanesian populations. This study sheds light on the evolutionary history, and adaptive significance, of skin pigmentation in humans.

TANG 2017

Hua Tang & Gregory S. Barsh, *Skin color variation in Africa*. [science 358 \(2017\), 867–868](#).

Genetics of skin color has implications for pigmentary biology and human evolution.

It should be emphasized, however, that estimates of heritability are meaningful only to the population being studied. For example, Crawford et al. estimate that 12.8% of the phenotypic variance in skin pigmentation in Africans is attributable to SLC24A5, which reflects both the strength of allelic substitution and allele frequency. By contrast, SLC24A5 contributes almost nothing to skin color variation in Europeans because the derived allele occurs essentially at a frequency of one.

Bibel

AIKEN 2017

David Wyatt Aiken, *Philosophy, Archaeology and the Bible, Is Emperor Julian's Contra Galilaeos a Plausible Critique of Christianity?* [Journal for Late Antique Religion and Culture 11 \(2017\), 1–37](#).

In *Contra Galilaeos*, Julian makes the case that in the writings of Moses Yahweh is not the 'Most High' God, but simply one of many national gods (the biblical term is 'angels' or 'sons of god/s', bny 'l, bny 'lym, or bny 'lhym) of the ancient Near Eastern world, who received Israel as an inheritance from the hand of the Most High. Christians claim the Jewish Yahweh as their God, and appeal to the Hebrew writings to identify the qualities of that God; but Julian claims that the Jewish writings clearly depict Yahweh as a subordinate tribal god, who was neither the Creator (demiurge), nor to be identified with the God of Abraham, nor to be equated with the Most High (Hypsistos), apportioning God of Deut. 32:8-9. Julian extrapolates from this stunning premise that there is therefore no compelling comparison to be advanced between Yahweh, as depicted in the Hebrew Scriptures, and the God proclaimed by the Christians. Julian's argument will receive unexpected support from the 1929 archaeological findings of Ugarit, which have had a significant impact on helping to identify ancient Near Eastern gods alluded to in the documents of the Hebrew Bible. Indeed, Julian's analyses of the texts of the Hebrew Bible are sustained by nothing less than the accumulated mythological weight of the entire ancient Near East.

CROSS 1948

Frank M. Cross Jr. & David Noel Freedman, *The Blessing of Moses*. [Journal of Biblical Literature 67 \(1948\), 191–210](#).

In addition to orthographic archaisms, a number of other archaic features are to be found in the Blessing. These, particularly poetic diction and structure, find their closest parallels in what is acknowledged to be the oldest Israelite poetry. Further, the ode which frames the blessings, and some of the blessings themselves, have strong affinities with the Canaanite literature which influenced Israel's early poetic genius.

On the basis of these considerations, we hold that the poem as a whole was composed, most probably, in the eleventh century B. C. It may not have been written down, however, until the tenth century, during the period of literary and scribal activity which accompanied the reigns of David and Solomon.

DOLANSKY 2017

Shawna Dolansky, *Understanding Israel's 10 Commandments, Are the 10 Commandments really a moral code?* [Bible History Daily 2017, June 14.](#)

The Decalog belongs firmly to the genre of political treaty, a staple text in a world of monarchies and expanding empires. But it is unique among other such ancient treaties, in that the suzerain dictating the terms is divine, and the vassal agreeing to abide by them is the people of Israel. Thus the covenant symbolized by the Decalog is the basis, not for imperial rule, but rather for a theocracy in which a god is conceived as the overlord, and the Israelites his subjects. And so, although moral and religious laws are included in the list, the overall document would have been understood as neither a moral code nor a religious text in the ancient world. Rather, it represented the rules by which a group of people agreed to abide in exchange for the overlordship of the god YHWH.

KNOHL 2017

Israel Knohl, *The Rise, Decline, and Renewal of the Biblical Revolution*. In: JOB Y. JINDO, BENJAMIN D. SOMMER & THOMAS STAUBLI (Hrsg.), *Yehezkel Kaufmann and the Reinvention of Jewish Biblical Scholarship*. *Orbis Biblicus et Orientalis* 283 (Göttingen 2017), 167–180.

At the beginning of this study, I contrasted the idea that Israelite religion developed linearly in many stages with Kaufmann's idea of a sudden popular revolution, which occurred in Moses' time and which led to a complete rejection of idolatry.

As I articulated above, I disagree with both these paradigms. As opposed to Kaufmann, I do not think that a single revolution in Moses' time completely eradicated idolatry, but rather this eradication was a process of many years. In contrast with the idea of progression, I suggest that this process was not linear, but rather a lengthy dialectical process: first a rise in the Judges period, then a decline in the monarchic era, then a new rise and refinement at the time of the Babylonian exile.

RENDTORFF 1966

Rolf Rendtorff, *El, Ba'al und Jahwe, Erwägungen zum Verhältnis von kanaanäischer und israelitischer Religion*. [Zeitschrift für die Alttestamentliche Wissenschaft 78 \(1966\), 277–292.](#)

The designation of God in Gen 14, "El 'eljon", Creator of the heavens and the earth, cannot be the expression of a common Canaanite picture of El for the following reasons: (1) 'eljon is originally linked with El neither in the Old Testament, nor outside of it, but is an independent designation of a God; (2) El never is used outside of Ugarit in the lists of the gods for the highest place, that is, for "the most high God"; (3) El is designated either as creator of the earth (Karatepe etc.) or there may be a theogony attributed to him, but not a cosmogony (Ugarit); (4) outside of Ugarit no pantheon is connected with El, and the bene 'elim of the Old Testament are not an original designation of a pantheon. Accordingly there is in Gen 14 a combined designation of God which unites the features of various deities.

WAZANA 2017

Nili Wazana, *The Legacy of Yehezkel Kaufmann's Commentaries to Joshua and Judges*. In: JOB Y. JINDO, BENJAMIN D. SOMMER

& THOMAS STAUBLI (Hrsg.), *Yehezkel Kaufmann and the Reinvention of Jewish Biblical Scholarship*. *Orbis Biblicus et Orientalis* 283 (Göttingen 2017), 181–203.

The commentaries to the books of Joshua and Judges have never been translated, and their impact remained within Israeli circles. In his commentaries Kaufmann set out to achieve a theological goal by a literary analysis of the narratives relating to the early days of Israel in its land. Kaufmann sought proof in the books of Joshua and Judges for the historical separation between Israel and Canaan in order to reinforce his theological conviction of Israel's unique monotheistic belief. In the long run this idea was totally rejected, both the theological notion of complete separation as well as the historical reconstruction of the period of the settlement. However, his literary approach to the texts, innovative at the time, was influential.

In this literary method there is consistent continuity between the commentaries and Toledot. Kaufmann is ready to accept theories of multiple sources and authorships as well as of later additions to the text when he thinks the evidence warrants it. At the same time he curtails the use of source-criticism as a wholesale solution to all exegetical problems. Where other scholars see, for example, multiple layers in First Isaiah and Micah, Kaufmann, in contrast, regards almost all of Isa 1–33 as the product of a single eighth-century author, and most of Micah as the product of another eighth-century author. Similarly, he regards Isaiah 40–66 and 34–35 as the product of one author, rejecting the idea of Trito-Isaiah or of multiple editorial and supplemental layers in these chapters.

In retrospect, the long-lasting outcomes of his search for a theological “kingdom” via an historical investigation are valuable literary “donkeys.” In this paper I tried to shed some light on his so-far unacknowledged contribution to the literary method, and thus to place his commentaries, written in Hebrew more than fifty years ago, in the context of biblical scholarship.

ZEVIT 1990

Ziony Zevit, *Three Ways to Look at the Ten Plagues, Were they natural disasters, a demonstration of the impotence of the Egyptian gods or an undoing of Creation?* *Bible Review* 1990, iii, 16–23, 42.

Energie

TILL 1997

Charles Till, *Interview with Dr. Charles Till, co-developer of the Integral Fast Reactor*. *Frontline* 1997. <<http://www.pbs.org/wgbh/pages/frontline/shows/reaction/interviews/till.html>>.

Kultur

FREIKMAN 2017

Michael Freikman & Yosef Garfinkel, *Sealings before cities, New evidence on the beginnings of administration in the ancient Near East*. *Levant* (2017), preprint, 1–23. DOI:10.1080/00758914.2017.1323290.

The sealing of receptacles and storage facilities is one of the most conspicuous features related to early administration in the protohistoric Near East. It has been

known and discussed for decades in the context of the northern Levant and Mesopotamia. Until recently, this phenomenon had not been attested in the southern Levant. However, in this paper the authors present an assemblage of sealings discovered in the excavations of Pre-Pottery Neolithic layers at Munhata, Pottery Neolithic deposits at Sha'ar Hagolan and Middle Chalcolithic remains at Tel Tsaf, all located in the Beth-Shean Valley. We propose here, definitions of protohistoric sealings and their typology and function, and discuss the significance of this phenomenon for early administrative activity in the ancient Near East.

Keywords: Sha'ar Hagolan | Tel Tsaf | Munhata | sealings | early administration | Neolithic | Chalcolithic

WADE 2017

Lizzie Wade, *Livestock drove ancient Old World inequality*. [science](#) **358** (2017), 850.

New World societies without draft animals had smaller gaps between haves and have-nots.

In the Middle East, China, Europe, and Egypt, inequality kept climbing over time, topping out at an average Gini coefficient of about 0.6, roughly 6000 years after the start of agriculture at Pompeii in ancient Rome and Kahun in ancient Egypt.

Calculating Gini coefficients for ancient sites ought to be standard practice, says archaeologist Brian Hayden of Simon Fraser University in Burnaby, Canada, but he notes that draft animals aren't the only way to turn natural resources into heritable wealth. At Keatley Creek in British Columbia in Canada, he excavated houses up to 20 meters in diameter dating to between 2500 and 1100 years ago, and calculated a Gini coefficient of 0.38. He thinks that some families monopolized productive salmon fishing sites for generations (*Science*, 23 May 2014, p. 822), making this hunting and gathering society much less equal than others in the new data set. "The inheritance of fishing sites is exactly like the inheritance of land or cattle or anything else," Hayden says.

Metallzeiten

THIELE 2015

Ádám Thiele & Jiří Hošek, *Mechanical Properties of Medieval Bloomery Iron Materials, Comparative Tensile and Charpy-tests on Bloomery Iron Samples and S235JRG2*. [Periodica Polytechnica Mechanical Engineering](#) **59** (2015), 35–38.

Ductility, toughness and strength of medieval bloomery iron materials were highly important mechanical properties, strongly affected by their microstructure and chemical composition. An attempt was made to characterize the most important mechanical properties of representative samples of main bloomery iron materials extracted in smelting experiments and compare them to the well know reference modern steel of S235JRG2. It was confirmed that notching and the stress concentration effect of slag inclusions strongly decrease all the characteristic values of ductility and toughness of bloomery iron materials. Typical medieval bloomery P-iron is a brittle material with almost zero or very low characteristic values of ductility and toughness but revealed similarly high strength as hardened and tempered bloomery steel.

Keywords: Bloomery iron | phosphoric iron | mechanical properties | mechanical testing

Sprachlehre

WIMMER 2008

Stefan Wimmer, *Palästinisches Hieratisch, Die Zahl- und Sonderzeichen in der althebräischen Schrift*. Ägypten und Altes Testament 75 (Wiesbaden 2008).

Das Szenario, wonach die mindestens im südlichen Kanaan offenbar gut etablierte, hieratische Schreibtradition der pharaonischen Administration in der Zeit des Neuen Reiches, bzw. der Spätbronzezeit, zum Phänomen der in Juda und Israel üblichen Notierung von Zahl- und Sonderzeichen mit beigetragen hat, bleibt wahrscheinlich. Vor dem Hintergrund einer zeitlichen Beleglücke von mindestens zwei Jahrhunderten sind die paläografischen Indizien für das ramessidische Vermächtnis nur noch rudimentär.

Erst mit dem 8. Jh. setzen eindeutige Belege in erheblicher Zahl ein. Damit korrespondiert eine intensiviertere Orientierung zunächst noch beider hebräischer Reiche, später dann des nach der assyrischen Eroberung von Israel 722 vC verbliebenen Juda, am spätzeitlichen Ägypten besonders der 25. und 26. Dynastie, wie sie auf allen Ebenen – politisch, kulturell, wirtschaftlich und personal – dann nachweisbar ist. Die paläografischen Indizien für eine Anpassung an kontemporären, zunächst noch spät-hieratischen, dann und vor allem abnorm-hieratischen und früh-dernotischen Entwicklungen der Kursivschrift in Ägypten, reflektieren diesen Befund mit einem bemerkenswerten Maß an Übereinstimmung. Hinzu kommt die wiederum ab dem späten 8. Jh. und besonders dann im 7. Jh. reichlich belegte Orientierung des Schekel-Gewicht-Systems am ägyptischen Deben-Standard mit der exzeptionellen Wertnotierung auf Gewichten (KEK 42-48).

Von nicht zu unterschätzender Bedeutung bleibt die Beobachtung, dass ausschließlich in Juda und Israel hieratische Schreibungen übernommen wurden. Die geografische Verbreitung der einzelnen Fundorte, die nach Norden zu weniger werden, würde scheinbar einen Bezug zur Nähe des großen Nachbarn im Süden nahe legen. Besonders bemerkenswert ist jedoch die Verwendung des palästinischen Hieratisch auch im Nordreich Israel, zumal hier eine kulturelle Orientierung an Phönizien vorherrschte. Die Phönizier, die sich ihrerseits in der Kunst so eng an Ägypten orientierten, hatten mit den Aramäern spätestens im 8. Jh. ihr eigenes Zahlensystem entwickelt. Dennoch bleibt Israel, wie Juda im Süden, der hieratischen Tradition treu, phönizische Zahlenschreibungen finden wir hier nicht.

Story or Book

HELFRICH 2017

Judy Helfrich, *The Coupon, It's a record*. *nature* 552 (2017), 434.

“First contact,” I breathed. “Humanity missed out on first contact.” “Nup,” Roy said. “They’ll be back.” I stared at him. “They got another coupon.”