

References

Afrika

GOSSELAIN 1999

Olivier P. Gosselain, *In Pots We Trust, The Processing of Clay and Symbols In Sub-Saharan Africa*. [Journal of Material Culture 4 \(1999\), 205–230](#).

Previous studies have illustrated the symbolic prominence of pottery making in sub-Saharan Africa. In many parts of the continent, the craft is explicitly connected to a series of other production activities and parts of the technical process often serve as a metaphor for explaining aspects of the human experience and to structure certain rituals. Barley goes as far as to speak of a ‘potting model’, one of many ways available to a culture to think about itself. It remains to be known, however, why African people specifically chose pottery making as a way to act upon/explain the world and why the activity is connected to specific realms of the human experience throughout the continent. Also, one may wonder whether potters’ behaviour could in turn be influenced by metaphors, with steps of the chaîne opératoire becoming the locus of a symbolic discourse. In an effort to answer these questions, I attempted a systematic comparison of prohibitions and rituals connected to pottery in 102 sub-Saharan societies.

Keywords: | Africa | metaphors | pottery technology | prohibitions | symbolic thinking

LANE 2009

Paul Lane, *Environmental Narratives and the History of Soil Erosion in Kondoa District, Tanzania, An Archaeological Perspective*. [International Journal of African Historical Studies 42 \(2009\), 457–483](#).

A second factor that has guided most of the interventions to contain soil erosion has been the belief that severe erosion in the area was of relatively recent origin. Pioneering geomorphological and pedological research has since demonstrated the fallacy of this “short chronology.” Coupled with the results of recent archaeological research the area aimed at documenting the changing nature and pattern of human settlement and subsistence strategies, it is now evident severe soil erosion has been a feature of these landscapes for at least ca. 12,500 years, and that the history of soil erosion has been complex, multifaceted, and variable over time.

At one level, early colonial agricultural extension officers were right- soil erosion has been a problem in the Kondoa area. However, severe soil erosion commenced much earlier than they believed, and the local population seems to have learned how to adapt their agricultural practices to live with it.

LOGAN 2014

Amanda L. Logan & M. Dores Cruz, *Gendered Taskscapes, Food, Farming, and Craft Production in Banda, Ghana in the Eighteenth to Twenty-first Centuries*. [African Archaeological Review 31 \(2014\), 203–231](#).

This article blends insights from gender, technology, and development studies with Ingold’s concept of taskscape to examine the interrelated nature of farming, food, and craft manufacture practices in Banda, Ghana during the last three

centuries. We begin by comparing two ethnoarchaeological studies that were conducted separately by the authors, one that focused on food, and the other on ceramic production, preparation, and consumption. We use these data to analyze gendered taskscapes and how they have changed in recent decades with the introduction of new technologies and major economic and environmental shifts. Building on such insights, we analyze how taskscapes shifted in earlier centuries in Banda through archaeological remains of food and craft practice at the eighteenth- to twentieth-century site of Makala Kataa. Craft production cannot be fully understood without reference to food production, preparation, and consumption; thus, viewing these practices as interrelated tasks in a gendered taskscape yields insight into the rhythms of everyday life and highlights women's often undervalued skills.

Keywords: Gender | Taskscape | Technology | Agriculture | Food | Pottery | Ethnoarchaeology | Ghana

MAYOR 2010

Anne Mayor, *Ceramic Traditions and Ethnicity in the Niger Bend, West Africa*. [Ethnoarchaeology 2 \(2010\), 5–48](#).

While anthropologists and historians have clearly underlined the dynamics of human groups, ethnoarchaeologists have emphasized the stability of modes of transmission of technical knowledge within ethnolinguistic groups. Overcoming this apparent opposition by mobilizing and confronting lines of evidence from three distinct disciplines — ethnoarchaeology, ethnohistory, and archaeology—allows me to tackle the material expression of social identities in the past. Time depth, however, coarsens the resolution of interpretation, necessitating a shift in focus from the ethnic group to the linguistic family. Research I conducted with the Swiss MAESAO team since 1988 in central Mali provides a strong case study for understanding the complex links between ethnicity and ceramics. I propose a model of interpretation of archaeological ceramics that takes into account population dynamics.

REID 2000

Robin S. Reid, Russell L. Kruska, Nyawira Muthui, Andualem Taye, Sara Wotton, Cathleen J. Wilson & Woudyalew Mulatu, *Land-use and land-cover dynamics in response to changes in climatic, biological and socio-political forces, The case of southwestern Ethiopia*. [Landscape Ecology 15 \(2000\), 339–355](#).

Few studies of land-use/land-cover change provide an integrated assessment of the driving forces and consequences of that change, particularly in Africa. Our objectives were to determine how driving forces at different scales change over time, how these forces affect the dynamics and patterns of land use/land cover, and how land-use/land-cover change affects ecological properties at the landscape scale. To accomplish these objectives, we first developed a way to identify the causes and consequences of change at a landscape scale by integrating tools from ecology and the social sciences and then applied these methods to a case study in Ghibe Valley, southwestern Ethiopia. Maps of land-use/land-cover change were created from aerial photography and Landsat TM imagery for the period, 1957–1993. A method called ‘ecological time lines’ was developed to elicit landscape-scale explanations for changes from long-term residents. Cropland expanded at twice the speed recently (1987–1993) than two decades ago (1957–1973), but also contracted rapidly between 1973–1987. Rapid land-use/land cover change was caused by the combined effects of drought and migration, changes in settlement and land tenure policy, and changes in the severity of the livestock disease, trypanosomiasis, which is transmitted by the tsetse fly. The scale of the causes and consequences of land-use/land-cover change varied from local to sub-national (regional) to international

and the links between causes and consequences crossed scales. At the landscape scale, each cause affected the location and pattern of land use/land cover differently. The contraction of cropland increased grass biomass and cover, woody plant cover, the frequency and extent of savanna burning, and the abundance of wildlife. With recent control of the tsetse fly, these ecological changes are being reversed. These complex patterns are discussed in the context of scaling issues and current conceptual models of land-use/land-cover change.

Keywords: driving forces | Ethiopia | land-cover change | land tenure policy | land-use change | settlement policy | trypanosomiasis | tsetse

SHENJERE-NYABEZI 2016

Plan Shenjere-Nyabezi, *Imperceptible realities, An ethnoarchaeological perspective on the acquisition, ownership and management of cattle by women in SE Zimbabwe*. *Azania* **51** (2016), 380–402.

Cattle have always featured prominently in archaeological and historical studies of the Farming Communities of southern Africa. Research concerns have included their role in subsistence economies as well as their social and political importance. Cattle represented wealth and status that were usable as a springboard to political power by individuals with the ability to accumulate more herds than others. At the heart of all this discourse has been the tendency to associate and link cattle with men. This has led to the development of archaeological interpretive models where an intricate relationship is drawn between men, power and cattle. In many of these models, little consideration has been given as to how cattle herds may have been acquired, their ownership or the politics of their disposal. Based on recent ethnoarchaeological inquiries in eastern Zimbabwe, this paper questions the assumed dominance of men in the cattle world of the archaeological past. It is argued that women were active participants in the acquisition of cattle and in their ownership, all the way through to their disposal. While this may not be immediately visible in the archaeological record, there is a need for archaeologists also to associate women with cattle in the past.

Keywords: Cattle | women | men | power | acquisition | ownership | southern Africa | ethnoarchaeology

STUMP 2010

Daryl Stump, “Ancient and Backward or Long-Lived and Sustainable?”, *The Role of the Past in Debates Concerning Rural Livelihoods and Resource Conservation in Eastern Africa*. *World Development* **38** (2010), 1251–1262.

Attempts by external agencies to intervene in the operation of local resource exploitation strategies frequently include reference to historical arguments. These vary in accuracy and sophistication but are nevertheless rhetorically useful since discussions of economic or environmental sustainability or degradation are substantially strengthened by historical comparisons and precedents. Focussing on examples of indigenous intensive agriculture in eastern Africa, this paper argues that relevant evidence of this sort is often unavailable or far from unambiguous. It is therefore necessary to be critical of the ways in which perceptions of the past are invoked within these discourses, and to be aware of the strengths and weaknesses of historical arguments in this regard.

Keywords: historical ecology | archeology | intensive agriculture | indigenous knowledge | east Africa

Aktuell

FRIDRIKSSON 2016

Julius Fridriksson, Grigori Yourganov, Leonardo Bonilha, Alexandra Basilakos, Dirk-Bart Den Ouden & Christopher Rorden, *Revealing the dual streams of speech processing*. [PNAS 113 \(2016\), 15108–15113](#).

Several dual route models of human speech processing have been proposed suggesting a large-scale anatomical division between cortical regions that support motor–phonological aspects vs. lexical–semantic aspects of speech processing. However, to date, there is no complete agreement on what areas subserve each route or the nature of interactions across these routes that enables human speech processing. Relying on an extensive behavioral and neuroimaging assessment of a large sample of stroke survivors, we used a data-driven approach using principal components analysis of lesion–symptom mapping to identify brain regions crucial for performance on clusters of behavioral tasks without a priori separation into task types. Distinct anatomical boundaries were revealed between a dorsal frontoparietal stream and a ventral temporal–frontal stream associated with separate components. Collapsing over the tasks primarily supported by these streams, we characterize the dorsal stream as a form-to-articulation pathway and the ventral stream as a form-to-meaning pathway. This characterization of the division in the data reflects both the overlap between tasks supported by the two streams as well as the observation that there is a bias for phonological production tasks supported by the dorsal stream and lexical–semantic comprehension tasks supported by the ventral stream. As such, our findings show a division between two processing routes that underlie human speech processing and provide an empirical foundation for studying potential computational differences that distinguish between the two routes.

Keywords: aphasia | speech production | speech comprehension | voxel-based lesion–symptom mapping | speech processing

Significance: Relatively recently, the concept of dual route neural architecture, where dorsal and ventral brain regions process information synergistically, has been applied to study of speech processing. Although a large body of work has investigated these streams in relation to human speech processing, there is little consensus regarding specific cortical regions implicated. Relying on extensive behavioral and neuroimaging data from a large sample of stroke survivors, we used a data-driven approach to localize regions crucial for motor–phonological and lexical–semantic aspects of speech processing. Results revealed distinct anatomical boundaries between a dorsal frontoparietal stream supporting a form-to-articulation pathway and a ventral temporal–frontal stream supporting a form-to-meaning pathway. This study shows clear division between two processing routes underlying human speech.

GIRARDIN 2016

Martin P. Girardin et al., *No growth stimulation of Canada’s boreal forest under half-century of combined warming and CO₂ fertilization*. [PNAS 113 \(2016\), E8406–E8414](#).

Martin P. Girardin, Olivier Bouriaud, Edward H. Hogg, Werner Kurz, Niklaus E. Zimmermann, Juha M. Metsaranta, Rogier de Jong, David C. Frank, Jan Esper, Ulf Büntgen, Xiao Jing Guo & Jagtar Bhatti

Considerable evidence exists that current global temperatures are higher than at any time during the past millennium. However, the long-term impacts of rising temperatures and associated shifts in the hydrological cycle on the productivity of ecosystems remain poorly understood for mid to high northern latitudes. Here,

we quantify species-specific spatiotemporal variability in terrestrial aboveground biomass stem growth across Canada’s boreal forests from 1950 to the present. We use 873 newly developed tree-ring chronologies from Canada’s National Forest Inventory, representing an unprecedented degree of sampling standardization for a largescale dendrochronological study. We find significant regional- and species-related trends in growth, but the positive and negative trends compensate each other to yield no strong overall trend in forest growth when averaged across the Canadian boreal forest. The spatial patterns of growth trends identified in our analysis were to some extent coherent with trends estimated by remote sensing, but there are wide areas where remote-sensing information did not match the forest growth trends. Quantifications of tree growth variability as a function of climate factors and atmospheric CO₂ concentration reveal strong negative temperature and positive moisture controls on spatial patterns of tree growth rates, emphasizing the ecological sensitivity to regime shifts in the hydrological cycle. An enhanced dependence of forest growth on soil moisture during the late-20th century coincides with a rapid rise in summer temperatures and occurs despite potential compensating effects from increased atmospheric CO₂ concentration.

Keywords: drought impacts | climate change | dendrochronology | normalized difference vegetation index | ecology

Significance: Limited knowledge about the mechanistic drivers of forest growth and responses to environmental changes creates uncertainties about the future role of circumpolar boreal forests in the global carbon cycle. Here, we use newly acquired tree-ring data from Canada’s National Forest Inventory to determine the growth response of the boreal forest to environmental changes. We find no consistent boreal-wide growth response over the past 60 y across Canada. However, some southwestern and southeastern forests experienced a growth enhancement, and some regions such as the northwestern and maritime areas experienced a growth depression. Growth–climate relationships bring evidence of an intensification of the impacts of hydroclimatic variability on growth late in the 20th century, in parallel with the rapid rise of summer temperature.

VAN ITTERSUM 2016

Martin K. van Ittersum et al., *Can sub-Saharan Africa feed itself?*
[PNAS **113** \(2016\), 14964–14969.](#)

Martin K. van Ittersum, Lenny G. J. van Bussel, Joost Wolf, Patricio Grassini, Justin van Wart, Nicolas Guilpart, Lieven Claessens, Hugo de Groot, Keith Wiebe, Daniel Mason-D’Croz, Haishun Yang, Hendrik Boogaard, Pepijn A. J. van Oort, Marloes P. van Loon, Kazuki Saito, Ochieng Adimo, Samuel Adjei-Nsiah, Alhasane Agali, Abdullahi Bala, Regis Chikowo, Kayuki Kaizzi, Mamoutou Kouressy, Joachim H. J. R. Makoi, Korodjouma Ouattara, Kindie Tesfaye & Kenneth G. Cassman

Although global food demand is expected to increase 60 % by 2050 compared with 2005/2007, the rise will be much greater in sub-Saharan Africa (SSA). Indeed, SSA is the region at greatest food security risk because by 2050 its population will increase 2.5-fold and demand for cereals approximately triple, whereas current levels of cereal consumption already depend on substantial imports. At issue is whether SSA can meet this vast increase in cereal demand without greater reliance on cereal imports or major expansion of agricultural area and associated biodiversity loss and greenhouse gas emissions. Recent studies indicate that the global increase in food demand by 2050 can be met through closing the gap between current farm yield and yield potential on existing cropland. Here, however, we estimate it will not be feasible to meet future SSA cereal demand on existing production area by yield gap closure alone. Our agronomically robust yield gap analysis for 10 countries in SSA using location-specific data and a spatial upscaling approach

reveals that, in addition to yield gap closure, other more complex and uncertain components of intensification are also needed, i.e., increasing cropping intensity (the number of crops grown per 12mo on the same field) and sustainable expansion of irrigated production area. If intensification is not successful and massive cropland land expansion is to be avoided, SSA will depend much more on imports of cereals than it does today.

Keywords: yield gaps | food self-sufficiency | food security | food availability | cereals

Significance: The question whether sub-Saharan Africa (SSA) can be self-sufficient in cereals by 2050 is of global relevance. Currently, SSA is amongst the (sub)continents with the largest gap between cereal consumption and production, whereas its projected tripling demand between 2010 and 2050 is much greater than in other continents. We show that nearly complete closure of the gap between current farm yields and yield potential is needed to maintain the current level of cereal self-sufficiency (approximately 80%) by 2050. For all countries, such yield gap closure requires a large, abrupt acceleration in rate of yield increase. If this acceleration is not achieved, massive cropland expansion with attendant biodiversity loss and greenhouse gas emissions or vast import dependency are to be expected.

WANG 2017

Qiang Wang & Kan Zhou, *A framework for evaluating global national energy security*. [Applied Energy 188 \(2017\), 19–31](#).

Unlike most ES evaluation frameworks in the literature, this study provides a new evaluation technique based on the integrated application of subjective and objective weight allocation methods—SOWA (Subjective & Objective Weight Allocation), and introduces a balance score matrix (BSM) highlighting how well a country manages the trade-offs between the three competing dimensions for evaluating global national energy security. The results show that countries are struggling to develop a comprehensively secure energy system, with only one country out of 162 achieving an ‘Excellent’ score and 37 countries achieving a ‘Good’ score, together accounting for approximately one-fourth of the sampled countries. Meanwhile, the spatial disparity in the global performance of national ES is very significant: ‘Excellent’ and ‘Good’ groups are concentrated in Western Europe and North America, while the ‘Limited’ are concentrated in Europe, Middle East and Asia; the ‘Weak’ and ‘Poor’ groups are concentrated in Africa and Asia. Overall, this proposed framework allows for the quick identification of deficiencies within three dimensions in the ES context by pinpointing the main weaknesses. The study also offers suggestions for improving the performance of countries in different categories.

Keywords: Energy security | Assessment modelling | Distribution pattern | Global ES performance

Highlights:

- We construct an evaluation framework to identify global spatial disparities in national energy security.
- The framework considers three dimensions: energy supply chain, energy consumption, and political-economic environment.
- The study identifies key deficiencies affecting the energy security performance of several country types.
- We recommend policy prescriptions based on the evaluation results.

Amerika

ERICKSON 2000

Clark L. Erickson, *An artificial landscape-scale fishery in the Bolivian Amazon*. [nature 408](#) (2000), 190–193.

Historical ecologists working in the Neotropics argue that the present natural environment is an historical product of human intentionality and ingenuity, a creation that is imposed, built, managed and maintained by the collective multi-generational knowledge and experience of Native Americans. In the past 12,000 years, indigenous peoples transformed the environment, creating what we now recognize as the rich ecological mosaic of the Neotropics. The prehispanic savanna peoples of the Bolivian Amazon built an anthropogenic landscape through the construction of raised fields, large settlement mounds, and earthen causeways. I have studied a complex artificial network of hydraulic earthworks covering 525 km² in the Baures region of Bolivia. Here I identify a particular form of earthwork, the zigzag structure, as a fish weir, on the basis of form, orientation, location, association with other hydraulic works and ethnographic analogy. The native peoples used this technology to harvest sufficient animal protein to sustain large and dense populations in a savanna environment.

PIPERNO 2000

Dolores R. Piperno, Anthony J. Ranere, Irene Holst & Patricia Hansell, *Starch grains reveal early root crop horticulture in the Panamanian tropical forest*. [nature 407](#) (2000), 894–897.

Native American populations are known to have cultivated a large number of plants and domesticated them for their starch-rich underground organs. Suggestions that the likely source of many of these crops, the tropical forest, was an early and influential centre of plant husbandry have long been controversial because the organic remains of roots and tubers are poorly preserved in archaeological sediments from the humid tropics. Here we report the occurrence of starch grains identifiable as manioc (*Manihot esculenta* Crantz), yams (*Dioscorea* sp.) and arrowroot (*Maranta arundinacea* L.) on assemblages of plant milling stones from preceramic horizons at the Aguadulce Shelter, Panama, dated between 7,000 and 5,000 years before present (BP). The artefacts also contain maize starch (*Zea mays* L.), indicating that early horticultural systems in this region were mixtures of root and seed crops. The data provide the earliest direct evidence for root crop cultivation in the Americas, and support an ancient and independent emergence of plant domestication in the lowland Neotropical forest.

Archäologie

BRAY 2000

Warwick Bray, *Ancient food for thought*. [nature 408](#) (2000), 145–146.

Archaeological evidence of unexpected modes of food production in the tropics of lowland Central and South America carries lessons for modern farmers and students of crop-plant evolution.

He has used aerial photographs and ground surveys to map a ‘lost’ prehispanic landscape of manmade earthworks, with settlement mounds, causeways, raised and drained fields, and also 500 km² of weirs and artificial ponds — which, he argues, were used for fish harvesting on a massive scale. Erickson does not say whether the Bolivian government plans to reactivate the fish weirs, but experiments have already begun with his raised fields.

Archaeological data of this kind help to resolve the dispute between historical anthropologists who accept European reports of large populations along the Amazon floodplain and in the savannas, and those members of the calorie-counting school who claim that protein scarcity imposed a limit on population growth in the lowland tropics until the introduction of European livestock.

Perhaps we should now bury for ever the concept of ‘centres of origin’ for American agriculture. Unlike plants and animals, ideas are not constrained by ecological conditions. Archaeology is beginning to demonstrate the huge variety of agricultural practices in pre-European America, and also to suggest that people everywhere began by experimenting with the cultivation of plants they were already collecting in the wild.

LINDHOLM 2015

Karl-Johan Lindholm, *Wells, Land, and History, Archaeology and Rural Development in Southern Africa*. In: CHRISTIAN ISENDAHL & DARYL STUMP (Hrsg.), *Oxford Handbook of Historical Ecology and Applied Archaeology*. (Preprint 2015), 1–23. ISBN:978-0-199-67269-1.

Historical ecology has resulted in an increased engagement by archaeologists in present-day discussions concerned with environmental change, local livelihoods, and sustainable rural development. This chapter discusses the pastoral land-use history of the Eastern Communal Area in north-eastern Namibia, southern Africa, and argues that the lack of a detailed historical analysis of the current land organization has resulted in a rather static image of people and land-use in this area. This in turn has fed into current rural development efforts, which seem to reinforce a colonial heritage. Hence, the main objective of the case study is to situate current discussions concerning rural development and conservation efforts in eastern Namibia in a historically rooted landscape. The chapter exemplifies how archaeology in combination with a landscape approach can contribute to a better understanding of the processes that have shaped the present setting of rural development efforts.

Keywords: historical ecology | Namibia | Eastern Communal Area | landscape archaeology | rural development | conservation

McKEY 2016

Doyle B. McKey, Mélisse Durécu, Marc Pouilly, Philippe Béarez, Alex Ovando, Mashuta Kalebe & Carl F. Huchzermeyer, *Present-day African analogue of a pre-European Amazonian floodplain fishery shows convergence in cultural niche construction*. *PNAS* **113** (2016), 14938–14943.

Erickson [Erickson CL (2000) *Nature* 408 (6809):190–193] interpreted features in seasonal floodplains in Bolivia’s Beni savannas as vestiges of pre-European earthen fish weirs, postulating that they supported a productive, sustainable fishery that warranted cooperation in the construction and maintenance of perennial structures. His inferences were bold, because no close ethnographic analogues were known. A similar present-day Zambian fishery, documented here, appears strikingly convergent. The Zambian fishery supports Erickson’s key inferences about the pre-European fishery: It allows sustained high harvest levels; weir construction and operation require cooperation; and weirs are inherited across generations. However, our comparison suggests that the pre-European system may not have entailed intensive management, as Erickson postulated. The Zambian fishery’s sustainability is based on exploiting an assemblage dominated by species with life histories combining high fecundity, multiple reproductive cycles, and seasonal use of floodplains. As water rises, adults migrate from permanent watercourses

into floodplains, through gaps in weirs, to feed and spawn. Juveniles grow and then migrate back to dryseason refuges as water falls. At that moment fishermen set traps in the gaps, harvesting large numbers of fish, mostly juveniles. In nature, most juveniles die during the first dry season, so that their harvest just before migration has limited impact on future populations, facilitating sustainability and the adoption of a fishery based on inherited perennial structures. South American floodplain fishes with similar life histories were the likely targets of the pre-European fishery. Convergence in floodplain fish strategies in these two regions in turn drove convergence in cultural niche construction.

Keywords: convergent evolution | cultural evolution | earthworks | historical ecology | tropical stream ecology

Significance: Erickson convincingly inferred a pre-European floodplain fishery unlike any present-day system he knew, illustrating the principle that archaeological inference should not be constrained by the range of cultural variation observed today. Our comparison of these inferences with observations from a present-day fishery in a similar environment suggests strong convergence in both the ecology of fish communities and the cultural means people have devised to exploit them, providing support for a predictive model of cultural niche construction. This conceptual framework emphasizes the synergistic action of human agency and environmental constraint in shaping patterns in the human use and management of ecosystems.

Bibel

GERTOUX 2015

Gerard Gertoux, *God's name, Readable but unpronounceable, why?* (unpublished 2015).

The understanding of God's name YHWH is so controversial that it is eventually the controversy of controversies, or the ultimate controversy. Indeed, why most of competent Hebrew scholars propagate patently false explanations about God's name? Why do the Jews refuse to read God's name as it is written and read Adonay "my Lord" (a plural of majesty) instead of it? Why God's name is usually punctuated e,â (shewa, qamats) by the Masoretes what makes its reading impossible, because the 4 consonants of the name YHWH must have at least 3 vowels (long or short) to be read, like the words 'aDoNâY and 'eLoHiM "God" (a plural of majesty), which have 4 consonants and 3 vowels? At last, why the obvious reading "Yehowah", according to theophoric names, which all begin by Yehô-, without exception, is so despised, and why the simple biblical meaning, "He will be" from Exodus 3:14, is rejected.

GERTOUX 2015

Gerard Gertoux, *Moses and the Exodus, What evidence?* (unpublished 2015).

To be or not to be is a crucial question regarding Moses as well as the Exodus because, according to the Bible, the character related to that famous event forms the basis of the Passover which meant the Promised Land for Jews and later the Paradise for Christians. However, according to most Egyptologists, there is absolutely no evidence of Moses and the Exodus in Egyptian documents, which leads them to conclude that the whole biblical story is a myth written for gullible people. Ironically, if one considers that "truth" must be based on two pillars: an accurate chronology anchored on absolute dates (Herodotus' principle) and reliable documents coming from critical editions (Thucydides' principle), that implies an

amazing conclusion: those who believe Egyptologists are actually the real gullible ones. According to Egyptian accounts the last king of the XVth dynasty, named Apopi, “very pretty” in Hebrew that is Moses’ birth name (Ex 2:2), reigned 40 years in Egypt from 1613 to 1573 BCE, then 40 years later he met Seqenenre Taa the last pharaoh of the XVIIIth dynasty and gave him an unspecified disturbing message. The eldest son of Seqenenre Taa, Ahmose Sapaïr, who was crown prince died in a dramatic and unexplained way shortly before his father. Seqenenre Taa died in May 1533 BCE, after 11 years of reign, in dramatic and unclear circumstances. The state of his mummy proves, however, that his body received severe injuries, in agreement with Psalms 136:15, and remained abandoned for several days before being mummified. Prince Kamose, Seqenenre Taa’s brother, assumed interim of authority for 3 years and threatened attack the former pharaoh Apopi, new prince of Retenu (Palestine) who took the name Moses, according to Manetho (280 BCE), an Egyptian priest and historian. In the stele of the Tempest, Kamose also blames Apopi for all the disasters that come to fall upon Egypt, which caused many deaths.

HENDEL 2004

Ronald Hendel, *The Nephilim were on the Earth, Genesis 6: 1–4 and its ancient Near Eastern context*. In: CHRISTOPH AUFFARTH & LOREN T. STUCKENBRUCK (Hrsg.), *The Fall of the Angels. Themes in Biblical narrative 6* (Leiden 2004), 11–34.

Even as Gen 6: 1-4 shows that mythology was alive and well in ancient Israel, it also shows that such stories could be controversial, since this account has been so severely truncated in the J source. Each culture creates its own discursive boundaries, which are constantly subject to negotiation and conflict. There were aspects of the full story of the Sons of God and the Daughters of Men that, according to the J source, ought not to be said. The boundaries between what can and cannot not be said are important to discern in order to attend to the distinctive features of Israelite culture in its various manifestations. Israelite religion is both like and unlike the religions of its neighbors according to these shifting boundaries of discourse and practice. Gen 6: 1-4 shows how the sexuality of the gods and their marriages with human women came into conflict with the issues are not spoken of elsewhere in the Hebrew Bible also illuminates this particular boundary of the unsayable. Sex, gods, and the allure of women are a potent and self-censoring combination in biblical discourse.

Biologie

BRINDLE 2016

Matilda Brindle & Christopher Opie, *Postcopulatory sexual selection influences baculum evolution in primates and carnivores*. *Proc. Royal Society B* **283** (2016), 20161736.

The extreme morphological variability of the baculum across mammals is thought to be the result of sexual selection (particularly, high levels of postcopulatory selection). However, the evolutionary trajectory of the mammalian baculum is little studied and evidence for the adaptive function of the baculum has so far been elusive. Here, we use Markov chain Monte Carlo methods implemented in a Bayesian phylogenetic framework to reconstruct baculum evolution across the mammalian class and investigate the rate of baculum length evolution within the primate order. We then test the effects of testes mass (postcopulatory sexual selection), polygamy, seasonal breeding and intromission duration on the baculum

in primates and carnivores. The ancestral mammal did not have a baculum, but both ancestral primates and carnivores did. No relationship was found between testes mass and baculum length in either primates or carnivores. Intromission duration correlated with baculum presence over the course of primate evolution, and prolonged intromission predicts significantly longer bacula in extant primates and carnivores. Both polygamous and seasonal breeding systems predict significantly longer bacula in primates. These results suggest the baculum plays an important role in facilitating reproductive strategies in populations with high levels of postcopulatory sexual selection.

Keywords: baculum | postcopulatory sexual selection | prolonged intromission | primates | carnivores | Bayesian phylogenetics

Datierung

GERTOUX 2014

Gerard Gertoux, *The Akhenaten's reign, An egyptological delirium!* ([unpublished 2014](#)).

The reign of Akhenaten is one of the most controversial of all Egyptian history since only about the co-regency with Am Amenhotep III there are more than 1200 books and academic articles that have been written. He has thus become the center of many other controversies: although he had only (six) daughters he would be the father of Tutankhamun (a boy!) despite the fact that the latter had clearly stated to be the son of Am Amenhotep III, although he had worshiped the sun under different shapes (At Aten, Re, Am Amun) he would be the true father of monotheism that inspired the biblical myth of Moses as well as the Jewish god Ad Adon "Lord", a plagiarism of At Aton, although he was the sovereign pontiff of Egypt, a delegation of priests of Am Amun would have plotted a religious rebellion in order to remove the heretic worship of Aton, etc. All this doesn't seem seriousness. The only way of knowing the (historical) truth is to use a chronology anchored on absolute dates (coming from astronomy). Thus the precise dating of this period confirms historical testimonies: Amenhotep III (1383-1345) reigned 11 years beside his eldest son Am Amenhotep IV (1356-1340) and was the father of Tutankhamun (1336-1327) born in 1347 BCE.

Energie

NOMURA 2017

Takahiro Nomura, Nan Sheng, Chunyu Zhu, Genki Saito, Daiki Hanzaki, Takehito Hiraki & Tomohiro Akiyama, *Microencapsulated phase change materials with high heat capacity and high cyclic durability for high-temperature thermal energy storage and transportation*. [Applied Energy](#) **188** (2017), 9–18.

Latent heat storage (LHS) technology employing phase change materials (PCMs) has received great attention as an alternative to conventional solid sensible heat storage (SHS) for future high-temperature energy utilisation systems. In this study, we report the synthesis of a core-shell type microencapsulated PCM (MEPCM) consisting of Al-25 wt % Si microspheres (mean diameter of 36.3 nm and melting temperature of 577 °C) as the core (PCM) and Al₂O₃ as the shell. The MEPCM was prepared in two steps involving (1) the formation of an AlOOH precursor shell on the PCMs microspheres by a hydroxide precipitation process in hot water and (2) heat-oxidation treatment in an O₂ atmosphere to form a stable Al₂O₃ shell. In

particular, the effects of heatoxidation temperature on the shell morphology, shell crystal structure, mechanical strength, heat capacity, and cyclic durability of the prepared MEPCMs were examined. The resultant MEPCM is composed of a stable α -Al₂O₃ shell and Al-25 wt % Si core with an effective void inside the core to allow for volume expansion of the PCMs during solid-liquid phase transitions. The heat capacity measured for this material is five times higher than that of conventional solid SHS materials. Additionally, the MEPCM exhibits excellent durability up to 300 heating and cooling cycles under oxygen atmosphere. Consequently, it can potentially be used in the next-generation LHS-based high-temperature thermal energy storage and transportation systems.

Keywords: Phase change material | Microencapsulation | Latent heat storage | Thermal energy storage | Core-shell

Highlights:

- Micro-encapsulated phase change material (MEPCM) for high temperature applications are achieved.
- The MEPCM is composed of a stable α -Al₂O₃ shell and Al-25 wt % Si core.
- The MEPCM has an effective void inside the core to allow for volume expansion of the PCMs.
- The MEPCM exhibits excellent durability up to 300 heating and cooling cycles.
- The heat capacity of the MEPCM is five times higher than that of conventional solid sensible heat storage materials.

Klima

RINTOUL 2016

Stephen Rich Rintoul et al., *Ocean heat drives rapid basal melt of the Totten Ice Shelf*. *Science Advances* **2** (2016), e1601610. DOI:10.1126/sciadv.1601610.

Stephen Rich Rintoul, Alessandro Silvano, Beatriz Pena-Molino, Esmee van Wijk, Mark Rosenberg, Jamin Stevens Greenbaum & Donald D. Blankenship

Mass loss from the West Antarctic ice shelves and glaciers has been linked to basal melt by ocean heat flux. The Totten Ice Shelf in East Antarctica, which buttresses a marine-based ice sheet with a volume equivalent to at least 3.5 m of global sea-level rise, also experiences rapid basal melt, but the role of ocean forcing was not known because of a lack of observations near the ice shelf. Observations from the Totten calving front confirm that $(0.22 \pm 0.07) \times 10^6$ m³ s⁻¹ of warm water enters the cavity through a newly discovered deep channel. The ocean heat transport into the cavity is sufficient to support the large basal melt rates inferred from glaciological observations. Change in ocean heat flux is a plausible physical mechanism to explain past and projected changes in this sector of the East Antarctic Ice Sheet and its contribution to sea level.

STOCKER 2011

B. D. Stocker, K. Strassmann & F. Joos, *Sensitivity of Holocene atmospheric CO₂ and the modern carbon budget to early human land use, Analyses with a process-based model*. *Biogeosciences* **8** (2011), 69–88.

A Dynamic Global Vegetation model coupled to a simplified Earth system model is used to simulate the impact of anthropogenic land cover changes (ALCC) on Holocene atmospheric CO₂ and the contemporary carbon cycle. The model results suggest that early agricultural activities cannot explain the mid to late Holocene CO₂ rise of 20 ppm measured on ice cores and that proposed upward revisions of Holocene ALCC imply a smaller contemporary terrestrial carbon sink.

A set of illustrative scenarios is applied to test the robustness of these conclusions and to address the large discrepancies between published ALCC reconstructions. Simulated changes in atmospheric CO₂ due to ALCC are less than 1 ppm before 1000AD and 30 ppm at 2004AD when the HYDE3.1 ALCC reconstruction is prescribed for the past 12000 years. Cumulative emissions of 69 GtC at 1850 and 233 GtC at 2004AD are comparable to earlier estimates. CO₂ changes due to ALCC exceed the simulated natural interannual variability only after 1000 AD. To consider evidence that land area used per person was higher before than during early industrialisation, agricultural areas from HYDE3.1 were increased by a factor of two prior to 1700AD (scenario H2). For the H2 scenario, the contemporary terrestrial carbon sink required to close the atmospheric CO₂ budget is reduced by 0.5 GtC yr⁻¹. Simulated CO₂ remains small even in scenarios where average land use per person is increased beyond the range of published estimates. Even extreme assumptions for preindustrial land conversion and high per-capita land use do not result in simulated CO₂ emissions that are sufficient to explain the magnitude and the timing of the late Holocene CO₂ increase.

Methoden

BLEICHER 2008

Niels Bleicher, *Einige kritische Gedanken zur Erforschung des Zusammenhangs von Klima und Kultur in der Vorgeschichte*. In: FALKO DAIM, DETLEF GRONENBORN & RAINER SCHREG (Hrsg.), *Strategien zum Überleben – Umweltkrisen und ihre Bewältigung, Tagung des Römisch-Germanischen Zentralmuseums, 19./20. September 2008*. RGZM – Tagungen 11 (Mainz 2011), 67–79.

When researching the relation of climate and culture change the applicability of results concerning the LIA for pre historic times was mostly assumed. Especially the solar activity was seen as being of central importance. This view is challenged by studies on current and future climate growth relations of cereals. Since the climate system was in a different state during e.g. the middle holocene the importance of solar fluctuations for prehistoric agriculture is questionable. To choose a different approach the author tested for a relation between tree rings and cereal harvests. The correlation appears to be unstable over time. This demonstrates that the significance of single proxies can change and the relation of climate and culture change must be understood as a non-linear system. The tools to analyse it must yet be developed.

Bei der Suche nach einem Zusammenhang zwischen Klima- und Kulturentwicklung wird oft die Übertragbarkeit der Forschungsergebnisse zur Kleinen Eiszeit auf vorgeschichtliche Epochen vorausgesetzt. Die Sonnenaktivität wurde als treibende Kraft angesehen. Das Klimasystem des mittleren Holozäns befand sich aber in einem anderen Zustand als das während der Kleinen Eiszeit. Es ist daher unklar, ob die Sonnenaktivität eine zentrale Rolle für eine vorgeschichtliche Wirtschaft gespielt haben kann. Untersuchungen zu den Klima-Ernte-Korrelationen von Getreide lassen daran Zweifel aufkommen. Daher wurde versucht, einen Zusammenhang zwischen Jahrringdaten und Getreideernten herzustellen. Die Korrelation erwies sich jedoch als zeitlich instabil. Dies zeigt, dass sich nicht nur die Bedeutung einzelner Klimaproxies wandeln kann, sondern dass der Zusammenhang zwischen Klima und Kultur ein mehrfach nichtlineares System darstellt, für dessen Erforschung erst noch die Methoden entwickelt werden müssen.

Physik

EINSTEIN 1905

Albert Einstein, *Über einen die Erzeugung und Verwandlung des Lichtes betreffenden heuristischen Gesichtspunkt*. [Annalen der Physik 322 \(1905\), 132–148](#).

EINSTEIN 1905

Albert Einstein, *Über die von der molekular kinetischen Theorie der Wärme geforderte Bewegung von in ruhenden Flüssigkeiten suspendierten Teilchen*. [Annalen der Physik 322 \(1905\), 549–560](#).

EINSTEIN 1905

Albert Einstein, *Zur Elektrodynamik bewegter Körper*. [Annalen der Physik 322 \(1905\), 891–921](#).

EINSTEIN 1905

Albert Einstein, *Ist die Trägheit eines Körpers von seinem Energieinhalt abhängig?* [Annalen der Physik 323 \(1905\), 639–641](#).

EINSTEIN 1906

Albert Einstein, *Zur Theorie der Lichterzeugung und Lichtabsorption*. [Annalen der Physik 325 \(1906\), 199–206](#).