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References

Afrika

Cruz 2014

M. Dores Cruz, *Sites, Ancestors, and Trees in the Archaeology of Southern Mozambique*. In: Neal Ferris, Rodney Harrison & Michael V. Wilcox (Hrsg.), *Rethinking Colonial Pasts through Archaeology*. (Oxford 2014), 123–149.

This chapter examines the role of landscapes and natural elements as historic and memory markers, focusing on sacred trees and tree groves as part of the archaeology of the Mandlakazi region in Southern Mozambique. More specifically, it explores how trees and tree groves relate to ancestral figures that held political power and how they are an integral part of local history, and how this connection legitimises identity creation. It also considers how intangible elements such as rituals, community history, and webs of kinship relations are at once embedded and made visible through the use of landscapes and elements of nature in their construction of a collective social memory that encompasses the community of the living and of the ancestors.

Keywords: landscapes | sacred trees | tree groves | archaeology | Mandlakazi | Southern Mozambique | political power | local history | social memory | ancestors

Aktuell

Castelvecchi 2019

Davide Castelvecchi, *Black hole imaged for first time*. nature **568** (2019), 284–285.

Picture created by Event Horizon Telescope is one of the strongest confirmations yet of Einstein's general relativity.

Finlayson 2019

Samuel G. Finlayson, John D. Bowers, Joichi Ito, Jonathan L. Zittrain, Andrew L. Beam & Isaac S. Kohane, *Adversarial attacks on medical machine learning*. science **363** (2019), 1287–1289.

Harrison 2019

Charlotte Harrison, *My mix-and-match career*. science **363** (2019), 1358.

As 170 people sat down to dinner, I breathed a sigh of relief: The conference was going well. Running it was part of my job as a university program manager, working on a project to boost biotech collaborations between academia and industry. When I started in the role a few years earlier, I thought that maybe, after years of career exploration, I had finally found the right job for me. But at the conference, I found myself wondering whether that was really what I wanted from my career. I'm a scientist, not an event planner—but I had been too busy organizing the conference to appreciate the research being discussed. Was it time for yet another change?

Papale 2019

Paolo Papale & Warner Marzocchi, *Volcanic threats to global society*. science **363** (2019), 1275–1276.

Resilience plans for globally impacting cataclysmic eruptions are needed.

Anthropologie

Will 2019

Manuel Will, Nicholas J. Conard & Christian A. Tryon, *Timing and trajectory of cultural evolution on the African continent 200,000–30,000 years ago*. In: Yonatan Sahle, Hugo Reyes-Centeno & Christian Bentz (Hrsg.), *Modern Human Origins and Dispersal*. Words, Bones, Genes, Tools: DFG Center for Advanced Studies Series (Tübingen 2019), 25–72.

The period from 200,000 to 30,000 years ago in Africa encompasses the archaeological Background for the early evolution and global dispersal of Homo sapiens. Here we provide an overview of current models of behavioral change and cultural evolution in this timeframe, followed by a review on the timing and temporal trajectory of relevant empirical data in Africa. Because recent anthropological and genetic work has highlighted the importance of structure within ancient populations of Africa, we adopt a geographically explicit perspective. We emphasize comparisons between the archaeological records of southern, northern, eastern, central and western Africa, recognizing the varying geological and environmental Backgrounds, political circumstances, and histories of research across the continent. Our review finds different records and temporal trajectories for complex material culture and behavioral innovations among the African regions, with the earliest evidence for many cultural changes already present during the late Middle Pleistocene in all areas. The bulk of the evidence, however, comes from Marine Isotope Stages (MIS) 5-3, a period characterized by complex temporal trajectories and spatial differences among and within regions. Prominent models for a late emergence of sophisticated behaviors at ≈50,000 years ago or a gradual and cumulative evolution of cultural complexity in all of Africa are not supported.

In light of these results, we advocate abandoning continent-wide, directional and unilinear models of cultural change in favor of more highly contextualized, temporally variable, and historically contingent trajectories in different regions, encapsulated in the concept of complex landscapes of cultural evolution.

Bibel

Knohl 2019

Israel Knohl, *Exodus, The History Behind the Story*. unknown (2019), preprint, 1–9.

The Elephantine Stele and the Great Harris Papyrus both describe Pharaoh Setnakhte's war against the Levantine usurper Irsu in 1186 B.C.E. Reading these accounts together with Manetho's story of the war against Osarseph offers us a possible historical context for what eventually became the Bible's story of the exodus of Israel from Egypt.

Energie

Wang 2019

Dandan Wang, Sheng Li, Song He & Lin Gao, *Coal to substitute natural gas based on combined coal-steam gasification and one-step methanation*. Applied Energy **240** (2019), 851–859.

Highlights:

- Novel coal-to-SNG based on steam gasification and one-step methanation is proposed.
- Sensible heat of syngas is recovered and converted into chemical energy of syngas.
- One-step methanation is applied due to gasification upgrade and WGS is eliminated.
- Efficient SNG synthesis and CO2 enrichment via direct methanation are realized.
- Pyrolysis and gasification experiment and thermodynamic analysis are conducted.

In the face of the requirement of clean coal utilization and greenhouse gas emission reduction, coal to substitute natural gas (SNG) production attracts increasing attention worldwide. This work proposed a coal-to-SNG process, which combines a high-efficiency coal-steam gasification and one-step methanation. Through regenerative unit, the sensible heat of the syngas can be recovered via the oxidant steam and then finally converted into chemical energy of syngas, and thereby the cold gas efficiency can be 8.8 percentage points higher than the traditional GE gasification. The H2/CO mole ratio of syngas leaving the gasifier is about 1.2 which can be used for one-step methanation directly and the traditional water gas shift process can be eliminated. Simulation and thermodynamic analysis of the whole plant are presented, and the experimental study of coke-steam gasification is carried out in a fixed bed reactor. Preliminary experiments show that when gasification temperature is higher than 1000 °C, the H2/CO ratio of the syngas is approximately 1.3–1.4. Thermodynamic analysis shows that the SNG conversion efficiency of the proposed process increases from 61.3 % to 71.7 % and the energy consumption for SNG product has been reduced from 84 GJ/t to 60.5 GJ/t, mainly due to the cold gas efficiency enhancement of gasification and elimination of water gas shift process. Besides, through the one-step methanation, the concentration of CO2 before CO2 separation unit increases from 31.1 % to 43.2 %, and the unit energy consumption in the CO2 capture decreases from 15.3 kJ/mol to 11.7 kJ/mol.

Keywords: Coal-steam gasification | One-step methanation | Carbon capture | Modelling and simulation | Thermodynamic analysis

Judentum

Blanchard 2009

Philippe Blanchard, Patrice Georges & Claude de Mecquenem, *Le cimetière juif au moyen âge, Un lieu d'exclusion?* Archéopages **25** (2009), 14–23.

Klima

Perşoiu 2019

Aurel Perşoiu, Monica Ionita & Harvey Weiss, *Atmospheric blocking induced by the strengthened Siberian High led to drying in west Asia*

during the 4.2 kaBP event, A hypothesis. Climate of the Past **15** (2019), 781–793.

Causal explanations for the 4.2 ka BP event are based on the amalgamation of seasonal and annual records of climate variability that was manifest across global regions dominated by different climatic regimes. However, instrumental and paleoclimate data indicate that seasonal climate variability is not always sequential in some regions. The present study investigates the spatial manifestation of the 4.2 ka BP event during the boreal winter season in Eurasia, where climate variability is a function of the spatiotemporal dynamics of the westerly winds. We present a multi-proxy reconstruction of winter climate conditions in Europe, west Asia, and northern Africa between 4.3 and 3.8 ka. Our results show that, while winter temperatures were cold throughout the region, precipitation amounts had a heterogeneous distribution, with regionally significant low values in W Asia, SE Europe, and N Europe and local high values in the N Balkan Peninsula, the Carpathian Mountains, and E and NE Europe. Further, strong northerly winds were dominating in the Middle East and E and NE Europe. Analyzing the relationships between these climatic conditions, we hypothesize that in the extratropical Northern Hemisphere, the 4.2 ka BP event was caused by the strengthening and expansion of the Siberian High, which effectively blocked the moisture-carrying westerlies from reaching W Asia and enhanced outbreaks of cold and dry winds in that region. The behavior of the winter and summer monsoons suggests that when parts of Asia and Europe were experiencing winter droughts, SE Asia was experiencing similar summer droughts, resulting from failed and/or reduced monsoons. Thus, while in the extratropical regions of Eurasia the 4.2 ka BP event was a century-scale winter phenomenon, in the monsoon-dominated regions it may have been a feature of summer climate conditions.

Mathematik

Pausata 2019

Francesco S. R. Pausata & Suzana J. Camargo, *Tropical cyclone activity affected by volcanically induced ITCZ shifts*. PNAS **116** (2019), 7732–7737.

pnas116-07732-Supplement.pdf

Volcanic eruptions can affect global climate through changes in atmospheric and ocean circulation, and therefore could impact tropical cyclone (TC) activity. Here, we use ensemble simulations performed with an Earth System Model to investigate the impact of strong volcanic eruptions occurring in the tropical Northern (NH) and Southern (SH) Hemisphere on the large-scale environmental factors that affect TCs. Such eruptions cause a strong asymmetrical hemispheric cooling, either in the NH or SH, which shifts the Intertropical Convergence Zone (ITCZ) southward or northward, respectively. The ITCZ shift and the associated surface temperature anomalies then cause changes to the genesis potential indices and TC potential intensity. The effect of the volcanic eruptions on the ITCZ and hence on TC activity lasts for at least 4 years. Finally, our analysis suggests that volcanic eruptions do not lead to an overall global reduction in TC activity but rather a redistribution following the ITCZ movement. On the other hand, the volcanically induced changes in El Niño-Southern Oscillation (ENSO) or sea-surface temperature do not seem to have a significant impact on TC activity as previously suggested.

Keywords: tropical cyclones | ITCZ | ENSO

Significance: Volcanic eruptions can inject a large amount of aerosol particles, which interact with solar radiation and consequently can affect the climate world-

wide, hence the intensity and frequency of extreme events for a few years following the eruption. However, only a handful of studies have investigated the impacts of volcanic eruptions on tropical cyclone activity. Through a set of sensitivity modeling experiments, our study demonstrates that volcanic eruptions by shifting the Intertropical convergence zone can impact tropical cyclone activity up to 4 years following the eruption. These results will prove valuable to society, allowing us to better prepare for the consequences of changes in tropical cyclone activity following large volcanic eruptions.

Neolithikum

Hofmann 2015

Daniela Hofmann, *The Burnt, the Whole and the Broken, Funerary Variability in the Linearbandkeramik.* In: Zoë L. Devlin & Emma-Jayne Graham (Hrsg.), *Death Embodied, Archaeological approaches to the treatment of the corpse.* Studies in Funerary Archaeology 9 (Oxford 2015), 109–128.

In the LBK, burial rites primarily stressing the dissolution of the human body existed alongside the inhumation of complete, single human bodies in cemeteries, although the latter themselves were the products of multiple relations. A rigid separation and strict evaluation of diferent kinds of burial, which stigmatises as 'deviant' those not conforming to a rite we recognise today, is unhelpful. Instead we can suggest a continuum of practices positioned between, on the one hand, creating idealised images of adorned bodies and, on the other, fragmenting the physical remains of the person. The shared aspects of these rites make them part of a coherent system or funerary logic, although there was a large degree of creativity in the details of rites and practices.

Finally, practices stressing dissolution apparently become more visible over time, as many cremations and the most spectacular instances of fragmentation – the Jungfernhöhle, Menneville or Herxheim – belong to late phases. However, cemetery and settlement burial continue throughout the sequence (Farruggia et al. 1996; Kunkel 1955; Nieszery 1995; Zeeb-Lanz et al. 2009), so that by the late LBK all these practices were in use concurrently.

These developments coincide with other trends. One is the way in which anthropomorphic figurines become rarer further west and later in the sequence (Hansen 2007, 293–302). It is tempting to see this as a shift in emphasis from one medium of displaying and fragmenting the human body – one focused on clay representations – to another, more directly concerned with the bodies of the deceased. In addition, LBK material culture – most notably houses and pottery – become ever more regionalised over time (e.g. Coudart 1998; Pechtl 2015). Apparently, individual bodies were increasingly dissolved in more visible ways at a time in which the boundaries of local groups and communities were becoming more important. Perhaps their fragmentation, circulation and deposition in selected locales and alongside other substances stood for the subsuming of diverse identities into the wider community and its deinition against others, now more explicitly celebrated. At other times, these same treatments could have been used to emphasise diferences, perhaps of status or group membership. But this will need to be argued for each context, rather than assumed.

Riedhammer 2019

Karin Riedhammer, *Early Middle Neolithic pottery decoration, Different cultural groups or just one supraregional style of its time?* In:

Ralf Gleser & Daniela Hofmann (Hrsg.), *Contacts, Boundaries & Innovation in the Fifth Millennium*, *Exploring developed Neolithic societies in central Europe and beyond*. (Leiden 2019), 129–158.

With the end of the Linear Pottery culture (LBK), a clear break in pottery development is observed everywhere in central Europe. While the Stichbandkeramik culture (SBK) emerged in the east, the new beginning in the west was characterised by the Hinkelstein group. Many different opinions have been voiced regarding the genesis of the new styles and the timing of this new beginning, as summarised in this paper. Besides the adoption of characteristics from the preceding regional stylistic groups of the LBK, the pottery of this early Middle Neolithic horizon shows a series of stylistic similarities over far distances, which in the past were interpreted as directions of influence in a diffusionist sense and partly explained by migration. In recent years, the publications on transitional settlements in northern Bohemia and the Dresden Elbe valley have given new impulses. Advances in absolute dating show that the Middle Neolithic probably began at about the same time everywhere.

The supraregional stylistic similarities of the early Middle Neolithic were examined in the course of a larger study on the development of pottery, absolute dating and certain aspects of settlement in the South-East Bavarian Middle Neolithic (Südostbayerisches Mittelneolithikum, SOB), recently completed by the author. A focus was placed on analysing stylistic aspects and absolute dates from the end of the LBK and the beginning of the Middle Neolithic in central Europe as a whole in order to understand the transition in general and to integrate the results developed for southern Bavaria into a larger context. Here, I present a subset of this data regarding the regional pottery characteristics of the early Middle Neolithic, which play a key role in understanding the beginning of the Middle Neolithic and the newly emerging contact networks after the breakdown of the LBK.

Nach dem Ende der Linearbandkeramik ist überall in Mitteleuropa ein deutlicher Bruch in der Keramikentwicklung zu beobachten. Während im Osten die Stichbandkeramische Kultur entstand ist der Neuanfang im Westen durch die Gruppe Hinkelstein gekennzeichnet. Zur Genese der neuen Stile und zum zeitlichen Ablauf dieses Neuanfanges gab es in der Vergangenheit viele unterschiedliche Meinungen, die in diesem Artikel zusammenfassend dargestellt werden. Neben der Übernahme von Eigenheiten aus den vorangegangenen regionalen Stilgruppen der LBK ist die Keramik dieses frühen mittelneolithischen Horizontes durch eine Reihe von stilistischen Ähnlichkeiten über weite Entfernungen hinweg gekennzeichnet, die in der Vergangenheit als Einflussrichtungen im diffusionistischen Sinne gedeutet und zum Teil mit Migration erklärt wurden. Die Publikationen zu Übergangssiedlungen in Nordböhmen und dem Dresdner Elbtal haben in den letzten Jahren hier neue Impulse gegeben. Fortschritte in der absoluten Datierung zeigen, dass der Neubeginn wahrscheinlich überall in etwa gleichzeitig einsetzte.

Die überregionalen stilistischen Ähnlichkeiten des frühen Mittelneolithikums wurden im Rahmen einer größeren Studie zur Entwicklung der Keramik, zu Siedlungsaspekten und zur absoluten Datierung des Südostbayerischen Mittelneolithikums (SOB) genauer beleuchtet. Innerhalb dieser Studie lag ein Fokus in der stilistischen und absolutchronologischen Untersuchung des Endes des Altneolithikums und des Beginns des Mittelneolithikums in Mitteleuropa insgesamt, um den Übergang allgemein zu verstehen und die für Südbayern erarbeiteten Ergebnisse in einen größeren Kontext einbinden zu können. Die hier vorgestellte Teilanalyse der regional auftretenden Keramik-Charakteristika des frühen Mittelneolithikums spielt dabei eine besondere Rolle um den mittelneolithischen Neuanfang und die sich neu bildenden Kontaktnetzwerke nach dem Zusammenbruch der LBK besser

zu verstehen.

Religion

Sibiu 2018

The Image of Divinity in the Neolithic and Eneolithic: Ways of Communication, Volume of the International Symposium, Sibiu, Romania, 26th–28th October 2017. (Suceava 2018).

Vazquez 2019

Pablo Vazquez III, *"O Wise One and You Other Ahuras", The Flawed Application of Monotheism Towards Zoroastrianism.* unknown (2019), preprint, 1–7.

The purpose of this essay has been to show that monotheism is flawed and irresponsible as a means of understanding and labeling Zoroastrianism, arguing instead that its theology and praxis was and remains rooted in polytheism, a far more appropriate term to use if one wishes to label and understand Zoroastrianism in modern terminology and parlance. Ancient sources have shown that premodern Zoroastrianism does not endorse the monotheist hypothesis and dispels the common misperception of Zoroastrianism as the oldest and original monotheism. Modern sources have shown us what caused this development towards monotheist thinking and shows that polytheist theology and practice remains within Zoroastrianism and at its core. As such, Zoroastrianism, which remains a complex and heterodox faith, cannot be labeled monolithically in any sense, even as polytheistic and especially as monotheistic, and in order to remain respectful of "one of the most ancient living traditions" (Hintze, 2013, p. 13) we must reject this labeling in favor of the more applicable polytheism especially when describing its historical praxis, especially towards an audience that is aware of and uses these terms.

Story or Book

Rhodes 2019

Richard Rhodes, *How to survive an apocalypse.* nature **568** (2019), 312–314.

Richard Rhodes weighs up Jared Diamond's study of national resilience in the face of catastrophe.

Upheaval: Turning Points for Nations in Crisis. Jared Diamond. Little, Brown (2019)

Among the biggest global problems Diamond mentions are the risk of nuclear war and the fact of climate change. Here, his answers are conventional. No one knows what to do about nuclear weapons, maintained as they are under the pretence that they deter the very disaster they are designed to produce. On climate change, Diamond recognizes the double challenge of reducing greenhouse-gas production while meeting the rising expectations of the developing world. But he fails to recognize that substituting renewable energy for fossil fuels without a major expansion of nuclear power will merely decarbonize the existing supply. Without nuclear power, the doubling of demand projected for the developing world in the next 30 years will be met mainly through coal — or, at best, natural gas, which produces fully half as much carbon dioxide as coal when it burns.

Diamond's historical analyses hold up better than do his contemporary assessments. Energy from fossil fuels supported the West's transformation from subsistence to long-term prosperity; today, it threatens to cook our goose. The nation-state system, embedded in international anarchy, has never dealt well with global threats. So far, the response has mostly been denial and timidity: tragedy of the commons indeed.

I read Upheaval with appreciation for its historical sweep and its generally informed speculation. If the world is going to hell in a handbasket, Diamond has not given up hope that we can change course.