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Literatur

Afrika

Kuper 2006

Rudolph Kuper, *Die holozäne Besiedlungsgeschichte der Ost-Sahara: Ein Gliederungsvorschlag*. In: Hans-Peter Wotzka (Hrsg.), *Grundlegungen: Beiträge zur europäischen und afrikanischen Archäologie, Festschrift für Manfred K. H. Eggert*. (Tübingen 2006), 233–242.

Aktuell

Kneip 2011

Stefan Kneip, *A stroke of X-ray*. nature **473** (2011), 455–456.

X-rays were discovered more than 100 years ago. They have since become a staple tool for medicine and science, so researchers are continuing their efforts to find innovative ways to produce them.

A few years ago, a discovery was made that flabbergasted scientists and laymen alike: peeling a common adhesive tape produces Xrays bright enough to take an image resolving a human digit. Writing in Applied Physics Letters, Hird et al. now describe how they have developed a prototype that promises to turn this principle of Xray production into a simple, lowcost Xray source.

Kwok 2011

Roberta Kwok, *The Real Issues in Vaccine Safety*. nature **473** (2011), 436–438.

Hysteria about false vaccine risks often overshadows the challenges of detecting the real ones.

Leask 2011

Julie Leask, *Target the fence-sitters*. nature **473** (2011), 443–445.

Past waves of vaccine rejection in industrialized nations have a lot to teach us about preventing future ones, argues Julie Leask.

Lorenz 2011

Jan Lorenz, Heiko Rauhut, Frank Schweitzer & Dirk Helbing, *How social influence can undermine the wisdom of crowd effect*. PNAS **108** (2011), 9020–9025.

pnas108-09020-Supplement.pdf, pnas108-09020-Supplement1.xls

Social groups can be remarkably smart and knowledgeable when their averaged judgements are compared with the judgements of individuals. Already Galton [Galton F (1907) Nature 75:7] found evidence that the median estimate of a group can be more accurate than estimates of experts. This wisdom of crowd effect was recently supported by examples from stock markets, political elections, and quiz shows [Surowiecki J (2004) The Wisdom of Crowds]. In contrast, we demonstrate by experimental evidence (N = 144) that even mild social influence can undermine the wisdom of crowd effect in simple

estimation tasks. In the experiment, subjects could reconsider their response to factual questions after having received average or full information of the responses of other subjects. We compare subjects' convergence of estimates and improvements in accuracy over five consecutive estimation periods with a control condition, in which no information about others' responses was provided. Although groups are initially "wise," knowledge about estimates of others narrows the diversity of opinions to such an extent that it undermines the wisdom of crowd effect in three different ways. The "social influence effect" diminishes the diversity of the crowd without improvements of its collective error. The "range reduction effect" moves the position of the truth to peripheral regions of the range of estimates so that the crowd becomes less reliable in providing expertise for external observers. The "confidence effect" boosts individuals' confidence after convergence of their estimates despite lack of improved accuracy. Examples of the revealed mechanism range from misled elites to the recent global financial crisis.
collective judgment | estimate aggregation | experimental social science | swarm intelligence | overconfidence

McNerney 2011

James McNerney, J. Doyne Farmer, Sidney Redner & Jessika E. Trancik, *Role of design complexity in technology improvement*. PNAS **108** (2011), 9008–9013.

pnas108-09008-Supplement.pdf

We study a simple model for the evolution of the cost (or more generally the performance) of a technology or production process. The technology can be decomposed into n components, each of which interacts with a cluster of d-1 other components. Innovation occurs through a series of trial-and-error events, each of which consists of randomly changing the cost of each component in a cluster, and accepting the changes only if the total cost of the cluster is lowered. We show that the relationship between the cost of the whole technology and the number of innovation attempts is asymptotically a power law, matching the functional form often observed for empirical data. The exponent a of the power law depends on the intrinsic difficulty of finding better components, and on what we term the design complexity: the more complex the design, the slower the rate of improvement. Letting d as defined above be the connectivity, in the special case in which the connectivity is constant, the design complexity is simply the connectivity. When the connectivity varies, bottlenecks can arise in which a few components limit progress. In this case the design complexity depends on the details of the design. The number of bottlenecks also determines whether progress is steady, or whether there are periods of stasis punctuated by occasional large changes. Our model connects the engineering properties of a design to historical studies of technology improvement.
design structure matrix | experience curve | learning curve | performance curve

Amerika

Benz 2001

Bruce F. Benz, *Archaeological evidence of teosinte domestication from Guilá Naquitz, Oaxaca*. PNAS **98** (2001), 2104–2106.

Analysis of the three most ancient Zea mays inflorescence fragments from Guilá Naquitz, Oaxaca, Mexico shows they did not disarticulate naturally, indicating that agricultural selection of domesticated teosinte was underway by 5,400 14C years before the present (about 4,200 dendrocalibrated years B.C.). The cooccurrence of two-ranked specimens with two rows and four rows of grain and numerous additional morphological characteristics of these specimens support hypotheses based on molecular and quantitative genetic

analyses that maize evolved from teosinte. Domestication of the wild ancestor of maize occurred before the end of the 5th millennium B.C.

Landon 2008

Amanda J. Landon, *The "How" of the Three Sisters: The Origins of Agriculture in Mesoamerica and the Human Niche*. Nebraska Anthropologist **23** (2008), 110–124.

The origins of agriculture • in Mesoamerica have long interested archaeologists and antiquarians alike. The approaches used to understand the origins of the three sisters, maize, beans and squash, have changed over time as our understanding of the ecological context and ethnographic influences have changed. In this paper, I examine the history of the study of the origins of agriculture and assess the current evolutionary and ecological approaches to the topic. In Mesoamerica, the three sisters and humans shared a coevolutionary relationship in which humans invited the plants into the human niche and the plants thrived. Over time, the plants changed both genetically and morphologically, providing more of what humans selected for, while humans changed their behavior in order to care for the plants. Both humans and the three sisters now share a symbiotic relationship, where both the plants and the humans depend on one another.

Piperno 2001

D. R. Piperno & K. V. Flannery, *The earliest archaeological maize (Zea mays L.) from highland Mexico: New accelerator mass spectrometry dates and their implications*. PNAS **98** (2001), 2101–2103.

Accelerator mass spectrometry age determinations of maize cobs (Zea mays L.) from Guilá Naquitz Cave in Oaxaca, Mexico, produced dates of 5,400 carbon-14 years before the present (about 6,250 calendar years ago), making those cobs the oldest in the Americas. Macrofossils and phytoliths characteristic of wild and domesticated Zea fruits are absent from older strata from the site, although Zea pollen has previously been identified from those levels. These results, together with the modern geographical distribution of wild Zea mays, suggest that the cultural practices that led to Zea domestication probably occurred elsewhere in Mexico. Guilá Naquitz Cave has now yielded the earliest macrofossil evidence for the domestication of two major American crop plants, squash (Cucurbita pepo) and maize.

Pope 2001

Kevin O. Pope, Mary E. D. Pohl, John G. Jones, David L. Lentz, Christopher von Nagy, Francisco J. Vega & Irvy R. Quitmyer, *Origin and Environmental Setting of Ancient Agriculture in the Lowlands of Mesoamerica*. science **292** (2001), 1370–1373.

Archaeological research in the Gulf Coast of Tabasco reveals the earliest record of maize cultivation in Mexico. The first farmers settled along beach ridges and lagoons of the Grijalva River delta. Pollen from cultivated Zea appears with evidence of forest clearing about 5100 calendar years B.C. (yr B.C.) [6200 14C years before the present (yr B.P.)]. Large Zea sp. pollen, typical of domesticated maize (Zea mays), appears about 5000 calendar yr B.C. (6000 yr B.P.). A Manihot sp. pollen grain dated to 4600 calendar yr B.C. (5800 yr B.P.) may be from domesticated manioc. About 2500 calendar yr B.C. (4000 yr B.P.), domesticated sunflower seeds and cotton pollen appear as farming expanded.

Smith 2001

Bruce D. Smith, *Documenting plant domestication: The consilience of biological and archaeological approaches*. PNAS **98** (2001), 1324–1326.

Smith 2005

Bruce D. Smith, *Reassessing Coxcatlan Cave and the early history of domesticated plants in Mesoamerica*. PNAS **102** (2005), 9438–9445.
Reanalysis and direct accelerator mass spectrometry radiocarbon dating of the cucurbit assemblage from Coxcatlan Cave provide information on the timing and sequence of the initial appearance of three domesticated plants in the Tehuacán Valley (Puebla, Mexico) and allow reassessment of the overall temporal context of plant domestication in Mexico. Cucurbita pepo is the earliest documented domesticate in the cave, dating to 7,920 calibrated calendrical (cal) years B.P. The bottle gourd (Lagenaria siceraria) is dated at 7,200 cal years B.P. Cucurbita argyrosperma does not appear until 2,065 cal years B.P. The earlier identification of Cucurbita moschata specimens is not confirmed. Seventy-one radiocarbon dates, including 23 accelerator mass spectrometry dates on cucurbits, provide ample evidence of postdepositional vertical displacement of organic materials in the western half of Coxcatlan Cave, but they also indicate that the eastern half of the cave was largely undisturbed.
archaeology | Mexico | cucurbits | agriculture

Speller 2010

Camilla F. Speller, Brian M. Kemp, Scott D. Wyatt, Cara Monroe, William D. Lipe, Ursula M. Arndt & Dongya Y. Yang, *Ancient mitochondrial DNA analysis reveals complexity of indigenous North American turkey domestication*. PNAS **107** (2010), 2807–2812.
pnas107-02807-Supplement.pdf
Although the cultural and nutritive importance of the turkey (Meleagris gallopavo) to precontact Native Americans and contemporary people worldwide is clear, little is known about the domestication of this bird compared to other domesticates. Mitochondrial DNA analysis of 149 turkey bones and 29 coprolites from 38 archaeological sites (200 BC-AD 1800) reveals a unique domesticated breed in the precontact Southwestern United States. Phylogeographic analyses indicate that this domestic breed originated from outside the region, but rules out the South Mexican domestic turkey (Meleagris gallopavo gallopavo) as a progenitor. A strong genetic bottleneck within the Southwest turkeys also reflects intensive human selection and breeding. This study points to at least two occurrences of turkey domestication in precontact North America and illuminates the intensity and sophistication of New World animal breeding practices.
Meleagris gallopavo | Southwest US | Ancestral Puebloans | Mesoamerica

Datierung

Weninger 1997

Bernhard Weninger, *Studien zur dendrochronologischen Kalibration von archäologischen ^{14}C-Daten*, *Dissertation Johann-Wolfgang-Goethe-Universität Frankfurt*. Universitätsforschungen zur prähistorischen Archäologie 43 (Bonn 1997).

Klima

Lejju 2005

B. J. Lejju, D. Taylor & P. Robertshaw, *Late-Holocene environmental variability at Munsa archaeological site, Uganda: a multicore, multiproxy approach*. The Holocene **15** (2005), 1044–1061.

Palaeoenvironmental data, in the form of 113 counts of pollen, fungal spores and charcoal abundances, 121 counts of phytoliths and 15 AMS 14C dates (11 macrofossil and 4 bulk sediment samples), have provided a means of reconstructing the late-Holocene environmental history of Munsa archaeological site, Uganda. The data were extracted from sediment cores from what is today a papyrus swamp, located within an area described by an outermost ring of earthworks at Munsa. Sediment core data indicate the general presence of forested conditions to C. AD 1100, although there is evidence for the local presence of food plants prior to this date. Deforestation from c. AD 1100 is marked in both the pollen and phytolith records, while fungal spores indicate the presence of increased numbers of herbivores post-deforestation. Indicators of deforestation and increased herbivore numbers broadly accord with the archaeological evidence for substantial occupation of the site at Munsa and the establishment of a mixed economy based on crops, cattle and iron working. Evidence for forest recovery and reduced herbivore numbers locally from C. AD 1780 could reflect abandonment of permanent settlement at the site, possibly during or following a period of drought and/or political upheaval in the region. Fungal spores and phytoliths provide evidence of agricultural activities at Munsa that have not left an imprint on pollen records, thus supporting the case for the use of multiproxies in palaeoenvironmental research, while intercore differences between the three sediment cores analysed, although relatively minor, confirm the benefits of a multicore approach. Tentative evidence for the very early presence of Musa (cultivated edible banana) is provided and warrants further study.
Key words: Africa, Uganda, archaeology, environmental variability, banana cultivation, charcoal, climate change, fire, fungal spores, pollen, phytoliths, late Holocene.

Runge 2002

Jürgen Runge, *Holocene landscape history and palaeohydrology evidenced by stable carbon isotope (δ^{13}C) analysis of alluvial sediments in the Mbari valley (5 °N / 23 °E), Central African Republic.* Catena **48** (2002), 67–87.
Pleistocene to Holocene as well as recent trends in climate have an influence on the composition of savanna-forest vegetation fringes in Africa, dominated mainly by savanna (C4) and mainly forest (C3) groups of plants. The modified vegetation cover plays an important role on the runoff processes and on the discharge of the draining river systems. Because the majority of forest-savanna borders in Central Africa is situated on geologically old planation surfaces, the main sources of palaeoenvironmental information are alluvial sediments of rivers. Therefore, this study focuses on the examination of alluvial soils and the determination of stable carbon isotopes (d13C) of organic sediments on the Mbomou plateau and in the Mbari valley in the southeast of the Central African Republic (CAR). It has been shown that there is some evidence for an ongoing increase in C3-dominated forest plants, reducing the recent extension of savannas in the study area. The most important reasons for this trend are sufficient amount of annual rainfall (> 1500 mm), decrease in bushfire frequency, and negative migration processes of the rural population due to the economic crisis in Central Africa. d13C values in fossil soil horizons show that a greater extent of forest on the Mbomou plateau occurred around 7-7.5 ka and between 2.5 and 3 ka. Drier, savanna-dominated vegetation patterns were found at 5 ka and from 1 ka to the present. The more humid and arid climate periods during the Holocene partly correspond with high and low lake levels of Lake Chad. The findings also seem to be confirmed by other studies neighbouring Central African regions as Cameroon, Gabon and Congo-Brazzaville (Batéké Plateau), which indicate a more general validity of the findings from the Mbomou plateau, especially for the period since 3 ka.
Keywords: Holocene; Palaeoenvironment; Rainforest – savanna boundary; Fluvial dynamics; Alluvial soils; Central Africa

Salzmann 2005

Ulrich Salzmann & Philipp Hoelzmann, *The Dahomey Gap: an abrupt*

climatically induced rain forest fragmentation in West Africa during the late Holocene. The Holocene **15** (2005), 190–199.

The Dahomey Gap, a savanna corridor interrupting the zonal West African rain forest, did not exist during the mid-Holocene. The pollen diagram from Lac Sele (7°9'N, 2°26'E) indicates that in southern Benin a semi-evergreen rainforest prevailed between c. 8400 and 4500 cal. yr BP The mid-Holocene marine transgression caused a spread of mangrove forest along the inland lagoons. Pollen analysis and geochemistry indicate that the Dahomey Gap became established at the onset of the late Holocene due to an abrupt climatic change between c. 4500 and 3400 cal. yr BP. Drier climatic conditions led to a rapid deterioration of the rain forest and subsequent spread of SudanoGuinean savannas. A return to wetter climatic conditions between c. 3300 and 1100 cal. yr BP resulted in a rise in the lake level and a renewed spread of forests into the savanna. During this time the Dahomey Gap consisted of a forest-savanna mosaic with a high number of pioneer tree taxa including the oil palm Elaeis guineensis After c. 1100 cal. yr BP the lake level dropped again and the Lac Sele profile indicates drier environmental conditions resulting in the establishment of an open savanna which persists until present. The palaeorecord from Lac Sele suggests that the role of humans in shaping the West African savannas has been overestimated. The opening of the Dahomey Gap and spread of the oil palm E. guineensis can now be confidentially attributed to climatic change and was not initiated by humans.

Key words: Pollen, vegetation history, geochemistry, savanna, rainforest, Dahomey Gap, sea-level change, Elaeis guineensis, Holocene, human impact.

Stanley 2003

Jean-Daniel Stanley, Michael D. Krom, Robert A. Cliff & Jamie C. Woodward, *Nile Flow Failure at the End of the Old Kingdom, Egypt: Strontium Isotopic and Petrologic Evidence*. Geoarchaeology **18** (2003), 395–402.

Strontium isotopic and petrologic information, obtained from sediment cores collected in the Nile delta of Egypt, indicate that paleoclimatic and Nile baseflow conditions changed considerably from about 4200 to 4000 cal yr B.P. in the Nile basin. Our study records a higher proportion of White Nile sediment transported during the annual floods at ca. 6100 cal yr B.P. than towards 4200 cal yr B.P., at which time suspended sediment from the Blue Nile formed a significantly larger fraction of the total load. This resulted from a decrease in vegetative cover and an increase in erosion rate accompanying the marked decline in rainfall. These new geoscience data indicate major changes in annual flooding and baseflow of the river Nile, marked short-term paleoclimatic-related events that may in part have led to the collapse of the Old Kingdom.

Kultur

Haaland 2006

Randi Haaland, *Africa and the Near East: Pot and Porridge, Bread and Oven – two food Systems maintained over 10,000 years*. In: Hans-Peter Wotzka (Hrsg.), *Grundlegungen: Beiträge zur europäischen und afrikanischen Archäologie, Festschrift für Manfred K. H. Eggert*. (Tübingen 2006), 243–243.

We can thus discern two different food systems based on porridge and bread, respectively, which have implications for these items seen as food and the symbolism surrounding these systems. A review of the beginning of cereal cultivation in the Near East shows the importance of cereals made into bread. However the evidence also makes us aware of the significance of beer as food in the early food producing societies. It has been suggested

that beer in the Near East was made just as early, or even earlier, than bread. In sub-Saharan Africa beer might have been used equally early as porridge. I think that in food ways, i.e., the complex consisting of food items, preparation technologies and associated symbolisms, we may find qualities creating a kind of 'longue durée' in Braudels sense, and we can see archaeological and ethnographic differences within the Near Eastern and African regions as variations on two contrasting themes.

Mittelpaläolithikum

Comment 2011

Matthew J. Collins & Les Copeland, *Ancient starch: Cooked or just old?* PNAS **108** (2011), E145.

Reply 2011

Amanda G. Henry, Alison S. Brooks & Dolores R. Piperno, *Reply to Collins and Copeland: Spontaneous gelatinization not supported by evidence.* PNAS **108** (2011), E146.